Subject: Stage 2 Light Rail Transit Project

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Report to Transit Commission and Light Rail Sub-Committee on 31 May 2024

and Council 12 June 2024

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Ward: Citywide

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Rapport présenté au Commission du transport en commun et Sous-comité du train léger

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REPORT RECOMMENDATION

That the Joint Meeting of Transit Commission and Light Rail Sub-Committee, and Council, receive this report for information.

RECOMMANDATION DU RAPPORT

Que la réunion conjointe de la Commission du transport en commun et du Sous

comité du train léger et le Conseil municipal prennent connaissance de ce rapport à titre informatif.

EXECUTIVE SUMMARY

This report provides an update on the Trillium Line Extension Project, including an overview of Trial Running, as well as the Confederation Line East and West project.

On the Trillium Line (Line 2 and 4), final construction activity, as well as final testing and commissioning continues. The Signaling and Train Control System (S&TCS) testing was successfully achieved with nine vehicles on the Trillium Line, followed by headway testing. Vehicle testing continues between the Bayview, Limebank, and Airport stations with clean up guideway work along various sections of the alignment. Tracking of critical project elements is done through the Rail Activation Management Program (RAMP). There remains a number of activities for the Trillium Line startup including completion of final testing and commissioning activity, building occupancy, Trial Running, final safety certification, Substantial Completion and final regulatory approvals.

Trial Running is a 21-day period that commences upon the successful completion of testing and commissioning. TransitNEXT (TNEXT) is required to demonstrate there are no deficiencies to prevent safe running of the system infrastructure, that there is an adequate number of trained staff and resources to maintain the system infrastructure, and that there are an adequate number of trained staff available to support Trial Running operating requirements. Trial Running is one of the final contractual steps and is used to demonstrate compliance with the overall reliability requirements for the system.

Progress on the Confederation Line East and Confederation Line West continues, with significant roadworks and detours ongoing.

In the East, a significant milestone was achieved with the initial testing of the Light Rail Vehicle (LRV) on the Stage 2 tracks. System testing, particularly for the Overhead Catenary System (OCS) and Traction Power Sub-Station (TPSS) continue with the ongoing work for the Communications-Based Train Control (CBTC) SAT testing near Montreal Station.

For Confederation Line West, construction of stations, guideway and the cut and cover tunnel continue, as a series of detours continue to be necessary to enable various construction activities. Excavation, and structural work on walls and roof progresses in the Parkway tunnel, as well as in the Connaught and Pinecrest tunnels. All stations are under construction, with principally structural work ongoing at Westboro, Kichi Sibi, Sherbourne and New Orchard stations. Stations further along continue working on interior finishes and testing and commissioning.

RÉSUMÉ

Ce rapport fait le point sur le projet de prolongement de la Ligne Trillium, y compris un aperçu du rodage d'essai, et sur le projet de prolongement de la Ligne de la Confédération vers l'est et l'ouest.

Sur la ligne Trillium (Lignes 2 et 4), les derniers travaux de construction ainsi que les derniers essais et la mise en service se poursuivent. Les essais du système de signalisation et de contrôle des trains ont été réalisés avec succès avec neuf véhicules sur la Ligne Trillium. Des essais sur les intervalles ont ensuite été effectués. La mise à l'essai des véhicules se poursuit entre les stations Bayview, Limebank et Airport, de même que des travaux de nettoyage de la voie de guidage, le long de divers tronçons du tracé. Le suivi des éléments critiques du projet est effectué par l'entremise du Programme de gestion de la mise en œuvre du train (PGMOT) de la Ville. Il reste un certain nombre d'activités à effectuer en vue du démarrage de la Ligne Trillium, notamment l'achèvement des essais finaux et des activités de mise en service, l'occupation des bâtiments, le rodage, l'attestation de sécurité finale, le quasi achèvement des travaux et l'obtention des autorisations réglementaires finales.

Le rodage est une période de 21 jours qui commence une fois les essais et la mise en service effectués avec succès. TransitNEXT doit démontrer qu'il n'y a pas de défauts qui empêchent le fonctionnement sécuritaire de l'infrastructure du réseau, qu'il y a un nombre adéquat d'employés et de ressources formés pour assurer l'entretien de l'infrastructure du réseau, et qu'il y a un nombre adéquat d'employés formés disponibles pour soutenir les exigences d'exploitation du rodage. Le rodage est une des ultimes étapes contractuelles et sert à démontrer la conformité aux exigences globales en matière de fiabilité pour l'ensemble du réseau.

Les travaux sur la Ligne de la Confédération vers l'est et la Ligne de la Confédération vers l'ouest progressent et d'importants ouvrages routiers et des détours sont en cours.

Dans l'est, une étape importante a été franchie avec les premiers essais de la voiture de train léger sur les voies d'Étape 2. La mise à l'essai des systèmes, en particulier pour le système de suspension caténaire et la sous-station de traction électrique, se poursuivent, en plus des essais d'acceptation du système de commande des trains par communications près de la station Montréal.

Pour ce qui est de la Ligne de la Confédération vers l'ouest, les travaux de construction des stations, de la voie de guidage et du tunnel en tranchée couverte se poursuivent; les détours mis en place pour permettre la réalisation des différents travaux de construction sont toujours nécessaires. Les travaux d'excavation et de construction des murs et du toit progressent dans les tunnels de la promenade, Connaught et Pinecrest. Des travaux de construction sont en cours dans toutes les stations, plus particulièrement des travaux

structurels aux stations Westboro, Kìchì Sìbì, Sherbourne et New Orchard. Dans les stations plus éloignées, les travaux de finition intérieure, de mise à l'essai et de mise en service se poursuivent.

BACKGROUND

On March 6, 2019, Council approved the Contract Award of Ottawa's Stage 2 Light Rail Transit Projects and Related Matters report (ACS2019-TSD-OTP-0001).

TransitNEXT (TNEXT) was awarded the contract to design, build, finance, and maintain the Trillium Line extension, including the Airport Link. The Trillium Line will operate from Bayview Station to Limebank Station (Line 2) and include the Airport Link (Line 4).

East/West Connectors (EWC) was awarded the contract to design, build, and finance the Confederation Line extensions. The project will extend Line 1 from Blair Station to Trim Station in the east and from Tunney's Pasture Station to Moodie Station (Line 1), and to Baseline Station (Line 3).

As part of the 2022-2026 Council Governance Review report, Council approved the following Motion 2022 - 03/06, moved by Councillor Desroches and seconded by Mayor Sutcliffe:

> THEREFORE BE IT RESOLVED that City Council establish a Light Rail Sub-Committee of Council to provide oversight over non-operational matters related to the Confederation Line 1 and the construction of Confederation Stage 2 and Trillium Lines.

Based on this motion, Transit Services provides a regular Stage 2 Light Rail Transit Project presentation to Light Rail Sub-Committee (LRSC). The following report provides an overview on Trial Running for the Trillium Line (Lines 2 and 4), the Stage 2 Rail Activation Management Program (RAMP) Scorecard Analysis, project schedule and delivery risks, an overview of the Stage 2 O-Train East-West construction updates, followed by an overview of the Stage 1 and Stage 2 Contingency Funds and Stage 1 and Stage 2 Capital Budgets.

DISCUSSION

This report, and the presentation prepared for the May 31, 2024 joint meeting of Light Rail Sub-Committee (LRSC) and Transit Commission, delivers an update on progress of the Trillium Line Extension Project, including an overview of Trial Running, as well as the O-Train Confederation East and West extensions. An overview of the Stage 1 and Stage 2 Contingency Funds and Capital Budgets is also provided.

The City of Ottawa has taken significant steps to apply lessons learned from the Stage 1 project and ensure their integration into the planning, procurement, and delivery of the

Stage 2 project. Moreover, many of the recommendations stemming from the Ottawa Light Rail Transit (OLRT) Public Inquiry have been embedded in the Stage 2 program and are being implemented as part of the works. The Inquiry recommendations and the City's response to complete the work is outlined in the Action Plan Status Update – Response to OLRT Public Inquiry Recommendations (ACS2023-TSD-TS-0016).

The City of Ottawa continues to prioritize the implementation of lessons learned as the Stage 2 project progresses. City staff consistently apply the knowledge gained from previous work to improve operations and the development of the Stage 2 project.

1. Trillium Line Extension Construction

On the Trillium Line (Line 2 and 4), final construction activity, as well as final testing and commissioning, is well underway. The Signaling and Train Control System (S&TCS) testing was successfully achieved with nine vehicles on the Line, followed by headway testing. Vehicle testing continues between Bayview, Limebank, and Airport stations.

Work is progressing at the new Albion (Walkley) Maintenance and Storage Facility (MSF), including the commissioning of the train wash equipment, communications cable and device installation.

Concurrently, the closeout of deficiencies on all Trillium Line stations is progressing, including elevator adjustments and inspections, cleanup and final installation of aluminum composite panels at the stations, final glazing installation, and final communications device commissioning.

Ottawa Fire Service (OFS) continues with life safety/fire alarm demonstration and deficiency closeout for all stations. Building Code Services (BCS) occupancy permit meetings are in progress for all stations. Elevator inspections have been completed and final certificates are being processed.

Civil works at Limebank Station bus loop, Leitrim and Bowesville Station Park & Ride continued, including concrete pours and asphalting. Permanent fence installation along sections of the guideway continued as operational signage installation along the guideway progressed. Bridge work continues at the University Road pedestrian bridge with the installation of light fixtures and bridge approach work remaining. Soft and hard landscaping works continue to take place at all the stations.

1.1. Trillium Line Rail Activation Management Program (RAMP) Scorecard Analysis

The Rail Activation Management Program (RAMP) structure and reporting mechanisms ensure a comprehensive tracking and support for all activities and milestones leading up to the public launch of Line 2 and Line 4. Further information can be found in the report presented to Light Rail Sub-Committee on June 19, 2023 – Rail Operational Readiness – Trillium Line (ACS2023-TSD-RCP-0012).

Regularly scheduled RAMP meetings assemble key stakeholders, including RAMP leads, Stage 2 contractors, subject-matter experts (SMEs), and support staff. These meetings serve as a platform to exchange updates, coordinate activities, identify emerging issues, and assign responsibilities for resolution. Identification of critical activities are essential for a successful public launch. These activities take into consideration services that may have high-impact disruptions, form the basis of the RAMP Scorecard.

A progress summary of critical activities for the RAMP Scorecard include:

1.1.1. System Installation, Integration, Testing and Commissioning

Work continues on final signal and train control testing, communication systems (cameras, building management systems, etc.) testing, and final integration between the Transit Operations Control Centre and the field devices. This work is expected to be largely complete in Q2 2024. As of May 12, 2024, approximately 90 per cent of field devices were communicating to the control centre with a number of remaining devices related to works in non-critical areas. Final fire system testing, testing of the countdown passenger information messages on the station displays, and some residual integration tests are remaining.

1.1.2. Operations and Maintenance Readiness

Overall, progress is satisfactory across multiple areas, including regulatory approvals, operating plans and procedures, safety and security certification, emergency preparedness, pre-launch coordination, live testing, Trial Run planning, and bus service readiness. Key items that are being monitored closely are as follows:

a. Regulatory Approvals: Building Code Services Occupancy Permits and Technical Standards and Safety Authority (TSSA) approvals for elevators are progressing. All final inspections for elevators have been completed and the City is waiting for the TSSA certificates – this work is effectively complete. Final occupancy walks with Building Code Services are ongoing and occupancy certificates for all stations are expected in late Q2.

b. Training Program, Staffing and Recruitment, and Maintenance Readiness: Work is progressing well in these areas. The team is closely monitoring train and system performance as part of building confidence in the reliability of the system. It is expected that the training program will be largely complete in early June with some final residual training outstanding at that time.

c. Maintenance Management Performance Reporting System (MMPRS): In order to support reporting of train and service availability, the maintainer is required to

provide a performance reporting system. The maintainer is reporting completion of this system in mid-May with future software updates to be applied.

1.1.3. Customer-Facing Projects

There is remaining work with the payphone installation (available for emergency and distress calls) installation and the readiness of some customer-facing systems that are being tracked closely.

1.2. Project Risks

Importantly, the project is still considered under construction and there are remaining risks that can affect completion timelines. Project risk factors that could further delay project works include:

1.2.1. Safety and Security Management

A significant safety incident during the remaining construction period, due to the complexity of the operation increasing during testing and commissioning of trains, would result in a significant delay. The rollout of TNEXT's Construction Safety Management Plan (CSMP) accompanied with City presence on-site will be used to help prevent the occurrence of a major safety incident.

Furthermore, systemwide testing is used as a final demonstration that the design, construction, and commissioning have been successful; however, this process has the potential to identify new, critical safety issues which would require additional project time to resolve. To help mitigate this risk and assess the possibility as early as possible in the project, there has been a progressive ramp-up of testing activities from an individual component level to system integration testing level along with interface control documents to identify and manage the interfaces.

1.2.2. Systemwide Testing / Performance

In addition to safety issues that could emerge during testing, the testing process may identify additional technical, reliability, and/or performance issues that require additional time to resolve. Specifically, the process could identify issues with reliability of a specific vehicle system or infrastructure element that requires time to correct.

To date, a software revision has been applied to the train control system to correct an error with the handling of movements at the rail diamonds, an update to the onboard vehicle software was completed to correct an issue with screen performance, and an issue related to the train control function at the end of the line is being investigated.

1.2.3. Training Completion

Training of Diesel Rail Operators and Diesel Rail Controllers is a critical final step in bringing the system into service. This step is nearing completion, and the current plan is for training to wrap up in early June.

1.2.4. Regulatory Requirements

Critical to the opening of Trillium Line (Line 2) and Airport Link (Line 4) are the rail regulatory approvals from Transport Canada and approvals from Building Code Services / Ottawa Fire Services. In terms of significant progress, TNEXT has obtained TSSA approvals for use of all of the elevators at all the stations. The focus of the next step is to obtain occupancy permits and fire life safety approvals for all stations.

1.2.5. Construction Completion

Notwithstanding completion of final commissioning, training, and achievement of regulatory approvals, final completion of construction is being closely tracked. Key remaining works include the following:

- Closeout and commissioning of final fire safety systems in order to achieve station occupancy.
- Remaining civil works, including Leitrim Park and Ride asphalting for the planned parking area, Limebank Station / Main Street Road and traffic light activations, and traffic intersection work near Hunt Club Road.
- Completion of the multiuse pathway along the guideway between Hunt Club Road and Earl Armstrong Road including the planned pedestrian crossings at Hunt Club Road, Lester Road, Leitrim Road and Earl Armstrong Road.

As part of building on the collaborative approach to project delivery, the City is working with TransitNEXT to identify items that are not required for Substantial Completion. Items such as final landscaping, some specific roadway works, and some multiuse pathway work could potentially be deferred.

1.2.6. Third-Party Development / Construction Interface

Third-party construction works near the Trillium Line have the potential to cause impacts to the project and in the future, to operations of the line. Coordination of construction interface points with these projects is critical to maintain the safety of the respective construction sites and the Trillium Line operation.

For example, the proposed New Campus Development (NCD) sites for the Ottawa Hospital are bisected by City-owned railway property. The hospital parking garage is being constructed over part of Line 2. The means and methods to support this construction are under review and there may be impacts to service in the future.

Similarly, there are active and planned construction projects that abut the Trillium Line being led by Ottawa Community Housing, Carleton University, and at Somerset that have the potential to affect Trillium Line operations on a temporary basis or short-term basis. Close coordination between the various parties is required to ensure safe operation.

1.3. Trial Running Overview

Systemwide testing (Bayview Station through to Limebank Station, and South Keys Station through to Airport Station) began in summer 2023. Testing of the communications system, as well as signal and train control system has progressed and is nearing completion.

There has been a steady and gradual ramp up of vehicle running time on the network since January 2024 through to today. The joint City-TNEXT project teams started running nine trains, five days a week in January and more recently, started running trains on weekends. This test running of trains is critical to surfacing technical issues as well as providing valuable training time to the operations and maintenance teams.

The next major milestone is to increase the running hours on the line to match the final service plan. An increase in operating hours to match the service hours will be enacted once the training activities have been completed in early June.

The effect of matching the service plan hours is that it will restrict the available maintenance hours for infrastructure inspections and for inspections, cleaning, and refueling of the vehicles. The maintenance team needs to demonstrate that it can consistently and reliably complete the required maintenance activities during the limited overnight window. Similarly, the operations team needs to demonstrate that it can reliably operate the system for the full-service schedule including with the final operator shift structure.

Ideally, the system will be operated at the final service plan levels for a period of eight to ten weeks prior to opening to the public. Within this period, a decision will be made to start Trial Running once it has been clearly demonstrated all prerequisites have been met, that the operations and maintenance teams can deliver the required service levels and that the integrated system meets the reliability and performance objectives.

Further details on Trial Running are noted below.

1.3.1. Trial Running Objectives

The fundamental objective of Trial Running is to exercise the complete integrated system infrastructure, including all subsystems, operating personnel, and operating procedures, to confirm readiness for revenue service. This can be subdivided into the following key objectives:

i. To validate the performance of the system infrastructure with operating and maintenance staff trained on the operation of the system infrastructure and standard operating procedures (SOPs).

ii. To exercise and validate the operating schedules and operational performance requirements.

iii. To exercise and confirm the operating reliability of the subsystems simulated under various operating conditions (normal and emergency).

Trial Running is a 21-day period that commences upon the successful completion of testing and commissioning. TNEXT is required to demonstrate there are no deficiencies to prevent safe running of the system infrastructure, that there is an adequate number of trained staff and resources to maintain the system infrastructure, and that there are an adequate number of trained staff available to support Trial Running operating requirements.

Trial Running is one of the final contractual steps in confirming readiness for passenger service and includes demonstrating compliance with the overall reliability requirements for the comprehensive system. The Trial Running period spans 21 days and includes two segments:

Simulated Passenger Service (14 days):

During this segment, a full regular service schedule will run on the entire line for 14 days to simulate passenger service.

Failure Scenario Management (7 days):

This segment is specifically dedicated to testing various failure management scenarios typical of those encountered in regular Revenue Service such as door issues and immobilized trains.

1.3.2. Trial Running Public Inquiry Recommendations

The Stage 1 Confederation Line project has provided valuable insights and lessons learned that continue to shape the development of Trial Running. Following the comprehensive review conducted by the Ottawa Light Rail Transit Public Inquiry, several critical recommendations have emerged. These recommendations highlight the necessity of detailed Trial Running standards, realistic testing conditions, independent oversight, and thorough evaluations of maintenance.

1.3.2.1. Recommendation #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.

Response: The City has added specific criteria into the Stage 2 agreements in order to address this gap. The additional criteria for Trial Running were included in the contract and are based on the performance specifications that the parties have agreed to apply to the system in operation.

1.3.2.2. Recommendation #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.

Response: The City has added specific criteria into the Stage 2 agreements in order to address this gap. The additional criteria for Trial Running have been included in the contract and are based on the performance specifications that the parties have agreed to apply to the system in operation. Additionally, the requirements and criteria need to be achieved over a longer period to demonstrate consistency.

1.3.2.3. Recommendation #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.

Response: The Independent Certifier and Systems Integration Verifier have been assigned to provide independent oversight for Trial Running.

1.3.2.4. Recommendation #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.

Response: The independent Systems Integration Verifier has been assigned to provide oversight for Trial Running. Material changes are unlikely but if required, would be documented by the City and presented to Council in order to provide full transparency and documentation of the change.

1.3.2.5. Recommendation #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.

Response: A comprehensive approach to evaluate maintenance work and systems will be implemented during Trial Running. Oversight will be provided by the field observation team, ensuring daily monitoring of system infrastructure operations, in addition to the standard practices of OC Transpo superintendents. Furthermore, a dedicated consultant has been assigned to oversee overnight maintenance activities, ensuring comprehensive coverage. These activities will be carried out and reported daily during Trial Running.

To conclude, the lessons learned from Stage 1, coupled with the recommendations from the Ottawa Light Rail Transit Public Inquiry, serve as valuable guiding principles for enhancing the effectiveness and reliability of subsequent project stages. By incorporating these insights and recommendations, the project aims to mitigate risks, improve performance, and deliver a transit system that meets the needs and expectations of its users and stakeholders.

1.3.3. Trial Running Prerequisites

Prior to commencing Trial Running, a comprehensive set of prerequisites must be fulfilled to ensure the readiness and functionality of the transit system. These prerequisites cover various aspects of infrastructure such as fleet, safety, and operational preparedness to ensure the system is ready and safe for simulated passenger service. The prerequisites are outlined as follow.

1) The integrated System Infrastructure has been tested.
2) The complete fleet is fully tested and ready for passenger service.
3) The complete signaling and train control system and associated Transit Operations Control Centre (TOCC) equipment is fully tested and ready for passenger service.
4) There are no outstanding defects (major or minor) affecting rail systems functionality, including track, signals, and communications.
5) There are no major defects, safety defects, or incomplete vehicle modification programs.
6) All stations are substantially complete with only minor deficiencies remaining.

7) TNEXT is fully mobilized and ready to commence maintenance, including availability of required maintenance staff, parts, maintenance equipment, Maintenance Management and Performance Reporting System (MMPRS), and completion of training.

8) TNEXT has submitted the Maintenance & Rehabilitation Compliance Verification & Validation Matrix.

9) The City is fully mobilized, trained and ready to operate the System.

To verify the prerequisites outlined above, all test reports, confirming the successful completion of all elements, must be submitted to the City for review and validation. Any remaining deficiencies not affecting system functionality are to be promptly agreed upon, addressed, and tracked in the minor deficiency list.

Furthermore, the receipt of Occupancy Permits and Construction Certificates signifies the substantial completion of all stations. The City will undertake the responsibility to verify the readiness of TNEXT to ensure its capability to efficiently maintain the system.

1.3.4. Performance Criteria for Trial Running Acceptance:

The performance criteria that must be achieved for Trial Running to be considered successful are as follows:

1.3.4.1. Simulated Passenger Service (14 days):

During this segment, a full regular service schedule will run on the entire line for 14 days to simulate passenger service. The primary pass/fail criteria for this phase are as follows:

Service Reliability Standard: TNEXT must achieve a minimum of 98.5 per cent on-time performance over the 14-day period, as specified in the Project Agreement. The calculation of the 98.5 per cent on-time performance is based on a train departing the terminus station no later than 30 seconds after its scheduled departure time, while respecting a minimum terminus dwell time of 3 minutes. The overall on-time performance of 98.5 per cent will be calculated using a 14-day rolling average of the on-time performance achieved each day.

Trial Running is one of the final contractual steps in confirming readiness for passenger service and includes demonstrating compliance with the overall reliability requirements for the comprehensive system. The Trial Running period is used to collect operating data and evaluate system reliability, availability, and maintainability performance to ensure the system is ready for passenger service. If additional time is required to achieve a 14-day rolling average of 98.5 per cent on-time performance, the simulated passenger service demonstration period will be extended.

System Infrastructure Performance: TNEXT is also required to demonstrate that the integrated system (vehicles, stations, and infrastructure) perform reliably through the Trial Running period such that the performance criteria for Trial Running are achieved and that would otherwise lead to zero performance deductions during the Maintenance Period.

1.3.4.2. Failure Scenario Management (7 days):

This segment is specifically dedicated to testing various failure management scenarios typical of those encountered in regular Revenue. Although the pass/fail outcome for Trial Running acceptance is not determined by this segment, its purpose is to validate the effectiveness of the City and TNEXT in implementing failure management standard operating procedures (SOPs) in preparation for revenue service.

The City intends to evaluate these scenarios by observing and reporting on staff actions using an established format. The desired outcomes will be outlined and verified against, and any potential areas of improvement will be addressed through process reviews with staff. During the 7-day period, staff will engage in various high-level activities, including practicing the implementation of diversionary routes to address track issues, seamlessly swapping out trains from service to minimize disruptions, and simulating launch delays to ensure effective management and minimal impact on service reliability and passenger experience.

1.3.5. Trial Running Assessment Activities

To ensure the readiness and functionality of the transit system and to evaluate the adherence to the performance criteria, the following Trial Running assessments will be conducted:

1.3.5.1. Service Reliability Standard:

The on-time performance of the transit system will be monitored and recorded through the Maintenance Management and Performance Reporting System (MMPRS). This program uses the data generated by the signaling and train control system to determine the on-time performance for each given day.

1.3.5.2. System Infrastructure Performance:

To assess the overall functionality and performance of critical infrastructure components, field inspection activities will be conducted throughout Trial Running. The inspection team will be formed of representatives from the City and TNEXT, along with the independent System Integration Verifier. Any identified issues will be validated, tracked, and logged following a standardized procedure to ensure the integrated system performs reliably throughout the

Trial Running period. This will ensure that the performance criteria for Trial Running are achieved and that would otherwise lead to zero performance deductions during the Maintenance Period.

A summary of daily performance will be completed based on the results obtained from the Maintenance Management and Performance Reporting System (MMPRS) and observations for each day during Trial Running. This summary will be used in the Trial Running Evaluation process.

1.3.6. Trial Running Evaluation Process

The Trial Running Evaluation process involves two main groups:

1.3.6.1. Internal Working Group:

The Internal Working Group includes representatives from the Rail Construction Program team, Rail Contracts team, Engineering Services team, and Chief Safety Officer. Additionally, the independent System Integration Verifier will be part of the group.

The purpose of the Internal Working Group is to review and evaluate all information gathered during the assessment phase, including checklists, data generated by MMPRS, Key Performance Measures (KPMs), work orders, notes, and issues identified by the field observation team. These daily meetings are held to discuss the activities of the previous day, facilitating detailed discussion on the achievement of the performance criteria and to resolve any disputed information. Ultimately, a recommendation of agreed upon system performance will be provided to the Trial Running Leadership Team.

1.3.6.2. Trial Running Leadership Team:

The leadership team, consisting of senior management from both the City and TNEXT, convenes daily to review recommendations from the internal working group on system performance data and agree on the previous day's performance. As part of this team, the Independent Certifier ensures that specified travel times, headways, and operational performance requirements are achieved to their satisfaction. Additionally, the independent System Integration Verifier will be part of the team, providing independent oversight of the Trial Running to ensure contractual requirements have been met.

1.3.7. Communications Plan

As part of our commitment to transparency, we have developed a comprehensive communication plan for Trial Running, encompassing both daily reporting and comprehensive technical summaries. The daily summary to Council offers a succinct and informative snapshot of Trial Running progress, providing council

members with vital information for their decision-making processes. A final draft of the template for this is attached to this report.

Key components of this summary include:

- Service Reliability Standard
- System Infrastructure Performance
- Identified Issues: Any critical issues discovered during the trial, along with brief description and corresponding action plans.

During Trial Running:

- Daily Summary to Council: Sharing daily outcomes, including on-time performance.

Conclusion of Trial Running:

- Technical Briefing: Conducting a thorough technical briefing for Council to summarize the outcomes of Trial Running.

These strategies aim to foster transparency, facilitate informed decision-making, and promote public trust in the trial running process.

1.4. Closeout and Final Steps to Passenger Service

Following completion of the Trial Running period, a number of steps are required to close out the construction term, achieve Substantial Completion, and open for passenger service. A summary of the residual steps and required final reports is as follows:

1. Receipt of the Systems Integration Verifier's report on Trial Running;
2. Completion and submission by TNEXT of the final Engineering and Safety Assurance Case (ESAC) otherwise known as the safety case;
3. Final review of the TNEXT safety case by the City of Ottawa's Independent Safety Auditor (ISA);
4. Certification of Substantial Completion by the Independent Certifier including confirmation of the Minor Deficiency List and verification of the handover for New Municipal Infrastructure (NMI);
5. Issuance of a Certificate of Fitness for operation of the line by the Canadian Transportation Agency; and,
6. Confirm of a Notice of Change in Operations to Transport Canada followed by the issuance of a Railway Operating Certificate by Transport Canada.

With the above contractual completion requirements, safety approvals, and regulatory approvals in place, the City of Ottawa would have the necessary authorization to open the Trillium Line for service. With the authorization in place, the City of Ottawa would further rely on the following supporting evidence to place the system into service:

I. The overall system had been thoroughly exercised with extensive running of nine train operations between January 2024 through May 2024;

II. The system had been operated and maintained at the final service levels and in the final system configuration for a recommended period of eight to ten weeks after completion of training; and,

III. No new or emergent safety or reliability defects arose during the final running period that require additional rectification time before opening the system to the public.

Assuming all elements noted above have been achieved, the City of Ottawa would be in a position to recommend an opening date to the Light Rail Subcommittee.

2. Confederation Line East Extension

In the East, a significant milestone was achieved with the first testing of light rail vehicles (LRV) on the Stage 2 tracks. System testing, particularly for the Overhead Catenary System (OCS) and Traction Power Sub-Station (TPSS) continue. Communications-based train control (CBTC) testing near Montreal Station is ongoing.

OCS cable installation continues between Jeanne d'Arc and Trim stations with completion of the end-to-end system expected to be finished this summer. In support of future train testing, the Wayside Radio Unit (WRU) installation in the guideway and cable pulling in the cable trough is ongoing between Jeanne d'Arc, Convent Glen, Place d'Orléans, and Trim stations. Internal work at the TPSS buildings for all five stations is ongoing, with the TPSS energized at Montreal Station.

Correction of trackwork deficiencies is ongoing. Finishing works at Montréal and Jeanne d'Arc stations continue with ongoing mechanical and electrical work at Convent Glen, Place d'Orléans, and Trim stations. Civil works outside the guideway, including grading, drainage, headwall installation, slope finish, and guardrail installation along OR-174, has begun. Rehabilitation of Jeanne d'Arc Blvd. and the bridge continue. Noise wall installation work on the south side of the highway (B-06) has begun with the continuation of grading works at Trim Park and Ride.

3. Confederation Line West Extension

For Confederation Line West, construction of stations, guideway and the cut and cover tunnel continue in all areas. A series of detours continue to be necessary to enable various construction activities.

Excavation, and structural work on walls and roof progresses in the Parkway tunnel, as well as in the Connaught and Pinecrest tunnels. The Parkway tunnel has less than 100 metres of tunnel structure to be completed before installation of fire systems, rail systems, and communication systems can begin in all areas.

All stations are under construction, with principally structural work ongoing at Westboro, Kichi Sibi, Sherbourne and New Orchard stations. Stations further along continue working on interior finishes and testing and commissioning. Interior finishing and testing and commissioning work is ongoing in Lincoln Fields, Algonquin, Pinecrest and Moodie stations. Emergency egress tunnel at Bayshore Station continues with the removal of the Support of Excavation (SOE) walls and installation of utility connections. Testing and commissioning for occupancy is ongoing at the LMSF and near Moodie Station. Elevator installation has started at Queensview Station with escalator and elevator installation continuing at Moodie Station.

FINANCIAL IMPLICATIONS

1. Stage 1 and Stage 2 Contingency Funds

The Stage 1 Confederation Line contingency fund is $115 million. To date, $101.29 million from the total fund has been spent. Remaining funds are primarily related to property requirements and remaining commercial matters.

The original Stage 2 contingency fund of approximately $152 million was increased by $25 million (approved by Council July 06, 2022) and an additional $110 million (approved by Council November 22, 2023) due to unforeseen costs and improvements to the project. Approximately $223 million of the Stage 2 contingency fund has been committed to date. As per the last funding report, a residual budget pressure is forecasted for City and other costs however that pressure will be addressed at a future date.

2. Stage 1 and Stage 2 Capital Budgets

In keeping with Council's approved 2017 Stage 2 Report (ACS2017-TSD-OTP-0001), 2019 Stage 2 Report (ACS2019-TSD-OTP-0001), 2022 Stage 2 Report (ACS2022-FSD-FIN-0009) and 2023 Stage 2 Report (ACS2023-TSD-RCP-0017), approximately $3.561 billion has been spent as of April 30, 2024, and relates to the RTG MOU for Belfast Yard and vehicle assembly mobilization ($444 million), Confederation Line extension mobilization and construction period payments ($1.924 billion), Trillium Line extension construction period payments and financial close for the Revenue Vehicle Supply

Contract ($633 million), and contingency ($109 million). The remaining $451 million was spent on planning, procurement, project delivery and City retained scope.

April 30, 2024 Project Description	Authority	Actual Expenditures	Funds Reserved/Committed	Unspent/ Uncommitted
Stage 1				
Confederation Line Program	2,130,000,000	2,130,000,000	-	-
Contingency	115,000,000	101,285,615	13,714,385	-
Total Stage 1	2,245,000,000	2,231,285,615	13,714,385	-
Stage 2				
Confederation Line Extensions DBF Contract	2,680,832,113	1,924,200,756	756,631,357	-
Trillium Line Extension DBFM Contract	850,966,493	633,254,899	79,189,603	-
Deferred Equity (Maintenance Term)	-	-	138,521,990	-
RTG Stage 2 MOU (includes 38 Alstom vehicles)	516,184,423	444,435,013	71,719,665	29,745
City Costs (includes planning, procurement, property acquisitions, City retained scope, and delivery oversight)	574,629,108	450,805,718	43,390,616	80,432,775
Contingency	287,640,000	108,595,708	114,717,130	64,327,162
Total Stage 2	4,910,252,137	3,561,292,094	1,204,170,362	144,789,681

Delays could have implications on the project's budget. Staff will report to Committee and Council on any adjustments to the contingency budget as and when required.

LEGAL IMPLICATIONS

There are no legal impediments to receiving this report for information.

ACCESSIBILITY IMPACTS

All components of the Stage 2 LRT project adhere to the *Accessibility for Ontarians with Disabilities Act* (AODA). Any policy or procedural development, as well as customer communications and public engagement identified in the report's recommendations will include the application of the City's Equity and Inclusion Lens. Staff will continue to engage persons with disabilities and accessibility stakeholders to ensure that their perspectives are considered and incorporated, and to promote inclusion. Staff will also ensure that any applicable accessibility legislation, standards and guidelines are adhered to during the execution of the projects and initiatives identified in this report.

ASSET MANAGEMENT IMPLICATIONS

The City of Ottawa' Comprehensive Asset Management program uses widely accepted asset management practices and long-range financial planning, in compliance with

provincial asset management regulations, to manage the City's infrastructure portfolio worth over $70 billion to provide for the safe delivery of reliable and affordable services to the community. Asset management is an internationally recognized and implemented practice that supports informed, transparent decision making, giving Council a framework to provide direction on the appropriate balance of service delivery, cost, and risk, through a process of optimizing the lifecycle management of the City's assets which support the services it delivers. The implementation of the Comprehensive Asset Management program enables the City to effectively manage existing and new infrastructure to maximize benefits, reduce risk, and provide safe and reliable levels of service to community users. The report identifies potential improvements to the Business Case and Project Management Policy and Project Management Framework. These are guiding documents to the Comprehensive Asset Management program, and as such, any changes to these core documents will be reviewed and reflected in the program.

RURAL IMPLICATIONS

The City's transportation network, including light rail transit, is designed to provide options for all residents. Once completed, Stage 2 LRT will span from Trim Rd. to Moodie Dr. and south all the way to Riverside South. Rural residents will have access to Park and Ride lots at various stations which will allow them to easily use public transit.

For Line 2 specifically, there will be Park and Ride lots at Bowesville Station, Leitrim Station, and Greenboro Station.

TERM OF COUNCIL PRIORITIES

The 2023-2026 Term of Council Priorities include:

- A city that is more connected with reliable, safe and accessible mobility options.
- A city that it is green and resilient.

SUPPORTING DOCUMENTATION

Document 1 - Trillium Line Trial Running and Daily Operating Summary

DISPOSITION

As outlined in this report, Transit Services will provide ongoing information to Council as Trial Running is completed and Handover of Line 2 and Line 4 is finalized. The information provided to Council will include:

- Daily updates throughout Trial Running.
- A technical briefing when Trial Running is complete.

- A technical report provided to Light Rail Sub-Committee, Transit Commission and Council before Line 2 and Line 4 is handed over to the City of Ottawa.