



Safety and Operations Committee

Board Information Item III-B

June 10, 2021

Silver Line Phase 2 Update

Washington Metropolitan Area Transit Authority

Board Action/Information Summary

☐ Action ☒ Information

MEAD Number:
202270

Resolution:
☐ Yes ☒ No

TITLE:

Silver Line Phase 2 Update

PRESENTATION SUMMARY:

Staff will present the Board with an update on the status of Silver Line Phase 2 open issues including an outline of key activities that have to be completed prior to Acceptance.

PURPOSE:

To provide the Safety and Operations Committee with an update on status of open issues on the Silver Line Phase 2 project.

DESCRIPTION:

Capital Rail Constructors, a joint venture of **Clark Construction Group, LLC** and **Kiewit Infrastructure South Co.**, is the design-build contractor for Package A of the Silver Line Phase 2 (mainline and stations), and **Hensel Phelps Construction Company** is the design-build contractor for Package B (Dulles Rail Yard). Major subcontractors and consultants under these entities include **Mass. Electric Construction Company**, **Parsons Corporation**, **Dewberry**, **Systra**, and **M.C. Dean**.

Major consultants and contractors supporting Metro's efforts on the project include **Mott MacDonald**, **Gannett Fleming**, **HNTB**, and **Cubic Transportation Systems**.

Key Highlights:

- As part of Metro's ongoing review of the Silver Line Phase 2 project, of the 17 issues included in the Board briefing on March 11, 2021, three issues have been resolved (Snow Melter Calrods, Insufficient Line of Sight to Signals, and Embedded Track Deficiencies); 11 Issues are currently being remediated ("Underway"), and three issues remain "Unresolved".
- It should be noted that while remediation is underway on several issues based on an agreed upon path forward, discussions with the Airports Authority are continuing with regard to funding of future maintenance/replacement costs on issues where accepting "as is" or

remediation is not fully compliant with the approved design specifications/performance requirements.

- Throughout the duration of this project, a number of quality issues have been identified. These fall in the categories of non-compliance with design and/or performance requirements, unapproved design modifications, premature component failures, or safety concerns. Since the March 11, 2021 update to the Board, several items have progressed to the remediation phase (agreed upon path forward) and a few remain unresolved (no agreed upon path forward). However, as the project approaches Substantial Completion (SSCD now projected by the Airports Authority to be in the third quarter of 2021) satisfactory resolution of all issues must occur prior to SSCD, Operational Testing, or at the very latest prior to acceptance/start of revenue service. The current status of the open issues is included in the attached presentation.
- Metro will establish a revenue service date after all identified deficiencies have been resolved to meet acceptance standards.
- As the intended future owner and operator, Metro determines when all the conditions necessary for Metro acceptance have been satisfied, and whether Phase 2 of the project is accepted into the Adopted Regional System (ARS).

Background and History:

Phase 2 of the Silver Line will extend the Metrorail system into Loudoun County, Virginia, and provide 11.4 miles of new track from the interim terminus at Wiehle-Reston East Station, through the Washington Dulles International Airport, to a terminus in Loudoun County. It includes six new Metrorail stations (Reston Town Center, Herndon, Innovation Center, Washington Dulles International Airport, Loudoun Gateway, and Ashburn), and a new service & inspection yard.

Metro's role and responsibilities for the design-build phase of the Silver Line Phase 2 project are as defined in the Cooperative Agreement executed between the Airports Authority and Metro on August 7, 2013.

The Board of Directors amended the Adopted Regional System (ARS) to incorporate the Dulles Metrorail Extension (Silver Line) subject to the fulfillment of certain "ARS Contingencies" adopted in Resolution 2012-24. Additional conditions precedent for acceptance are established in Article 6 of the Cooperative Agreement.

Discussion:

Construction of the Silver Line Phase 2 is nearing completion. Facility construction is complete, and systems installations and testing are well

advanced.

In addition to Dynamic Testing Readiness, the project will advance through several milestones moving towards the start of revenue service. The milestones are defined and summarized as follows:

- Dynamic Testing Readiness – determination that the contractor has completed the work in accordance with the contract documents which renders the project safe and capable of supporting dynamic testing. This determination is supported by documentation of the following: final alignment and track configuration; operational traction and third rail power; completion of prerequisite automatic train control static testing; activation of contractor start-up railroad safety procedures; and verification of train, track and structure clearances.
- Substantial Completion (SC) – the work is substantially complete. System Performance Demonstration is complete. All conditions of substantial completion have been met, and the project is ready for operational readiness testing. Conditions to substantial completion include performance of contractor inspections and tests, delivery of record documents and spare parts, completion of training and contractor safety certification, correction of all defects that materially adversely impact the operations of the Project, and provision of O & M manuals and punch list completion schedule.
- Operational Readiness Date (ORD) – the date on which Metro determines that the Project is sufficiently complete for Metro to commence simulated rail service. A key condition of operational readiness is the successful completion of operational readiness testing conducted by Metro.

Between ORD and Acceptance, Metro has provisional care, custody and control of the project, and performs activities in preparation for revenue service. These activities include verification that conditions precedent for acceptance have been met; simulated service; emergency drills; safety certification; mobilization of stations and yard; rekeying all facilities; providing escorts to support contractor punch list completion; control right-of-way operations; and performance of preventive maintenance inspections. An outline of these activities is included in the attached presentation.

Metro's acceptance determination is supported by the completion of certain ARS Acceptance Tasks, verification that all conditions precedent for acceptance have been met, and Metro's determination that Phase 2 is eligible and ready for Metro Acceptance.

The conditions precedent for acceptance of Phase 2 into the ARS as established in the Cooperative Agreement are summarized as follows:

- Condition 1. Punch List – all punch list work completed to Metro’s satisfaction. If not completed, Metro has the right to complete punch list items at the Airport Authority’s expense.
- Condition 2. Property Transfers – the Airports Authority shall have transferred to Metro the appropriate property interests as indicated in the approved Right-of-Ways plans.
- Condition 3. Spare Parts and Training – Metro shall have received all spare parts, O&M manuals, and necessary training.
- Condition 4. Record Deliverables – record deliverables have been received by Metro.
- Condition 5. Assignment of Warranties – all warranties have been assigned to Metro, and all documentation necessary to enforce the warranties has been provided to Metro.
- Condition 6. Permits – the Airports Authority shall have obtained for Metro all land use and permitting approvals necessary for Metro’s operations.
- Condition 7. Payments – the Airports Authority shall have paid Metro all funds due and owing.
- Condition 8. Safety and Security – project has achieved certification by Metro Chief Safety Officer.
- Condition 9. Insurance – Metro shall have received all certificates of insurance.
- Condition 10. Storm Water Management – the Airports Authority shall have obtained maintenance agreements as required.

The update on status of currently open issues is as follows:

Resolved

- Insufficient Line of Sight to Track Signals
- Non-Compliant Snow Melter Calrods
- Embedded Track Deficiencies (Yard)

Underway

- Malfunctioning UPS Fans (Mainline and Yard)
- Rail Car Hoists
- Surge Arrestor Failures
- Precast Panels in Yard

- Fuel Center Slabs
- Tight Gauge at Switches in Yard
- Cracked Impedance Bonds
- Damaged Direct Fixation Fasteners
- Cracked Third Rail Insulators
- Cracked Third Rail Cover Brackets
- Incorrect Distance between Insulated Joints (IJ's) and Signals at Dulles Yard

Unresolved

- Non-Compliant Clearance at Yard Elevator Machine Rooms
- Station Platform Paver Installation
- Turntable Deficiencies at Service & Inspection Building at Dulles Yard

In summary, since the March 11, 2021 briefing to the Safety & Operations Committee:

- Three Issues have been Resolved
- 11 are Underway (being resolved or have agreed upon path forward), and
- Three are Unresolved

It should be noted that while remediation is underway on several issues based on an agreed upon path forward, discussions with MWAA are continuing regarding funding of future maintenance/replacement costs on issues where accepting "as is" or remediation is not fully compliant with the approved design specifications/performance requirements.

Updates on the status of all open issues are discussed in the attached presentation.

FUNDING IMPACT:

There is no direct impact on funding for presenting this update. The approved WMATA FY2022 Budget includes funding for a revenue start date of January 1, 2022.	
Project Manager:	Neil Nott
Project Department/Office:	Capital Delivery/Project Implementation and Planning (CAPD/PICO)

TIMELINE:

Previous Actions	August 2013 – Metro and the Airports Authority executed the negotiated Cooperative Agreement that provides for Metro support throughout the design-build phase of the Silver Line Phase 2 project.
Anticipated actions	Board Action approving Service Plan and Title VI Equity

after presentation	Analysis Acceptance of Silver Line Phase 2
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Silver Line Phase 2 Update

Safety & Operations Committee
June 10, 2021



Purpose

1 Update on the Status of Open Issues

2 Information on Prerequisite Activities
& Milestones

3 Review Project Schedule

Status of Significant Open Issues

Open/Unresolved Issues Summary

Issue Status	March 11, 2021	June 10, 2021
<i>Resolved Issues (removed from list)</i>	1	3
"Underway" - tentative agreement exists and resolution in progress	7	11
"Unresolved" - lack agreement on path to resolution	9	3
<i>New Issues</i>	1	0
<i>Total Count of Open Issues</i>	17	14

- “Resolved” since March 11, 2021, briefing: Insufficient Line of Sight to Signals; Non-Compliant Snow Melter/Calrods; Embedded Track Deficiencies at Yard

Open Issues by Status & Impact

*Impacts System Performance Demonstration
(Airports Authority Substantial Completion)*

*Impacts Operational Readiness
(WMATA Project Acceptance)*

Underway

- Malfunctioning UPS Fans (Mainline and Yard)

- Rail Car Hoists
- Surge Arrestors
- Precast Panels at Yard
- Fuel Center Slabs
- Tight Gauge at Switches in Yard
- Cracked Impedance Bonds
- Damaged Direct Fixation Fasteners
- Cracked Third Rail Insulators
- Cracked Third Rail Cover Brackets
- Incorrect Distance Between Insulated Joints and Signals at Yard

Unresolved

[None]

- Non-Compliant Clearance in Yard Elevator Machine Room
- Station Platform Pavers
- Turntable Deficiencies at Yard

Turntable Deficiencies at Yard

- Concern is undue wear on railcar wheels and on center turntable bearing due to:
 - Shop track misaligned with the turntable rails (horizontal & vertical)
 - Excessive gaps between turntable and shop tracks
 - Deflection of turntable exceeds maximum allowed when railcars pass over



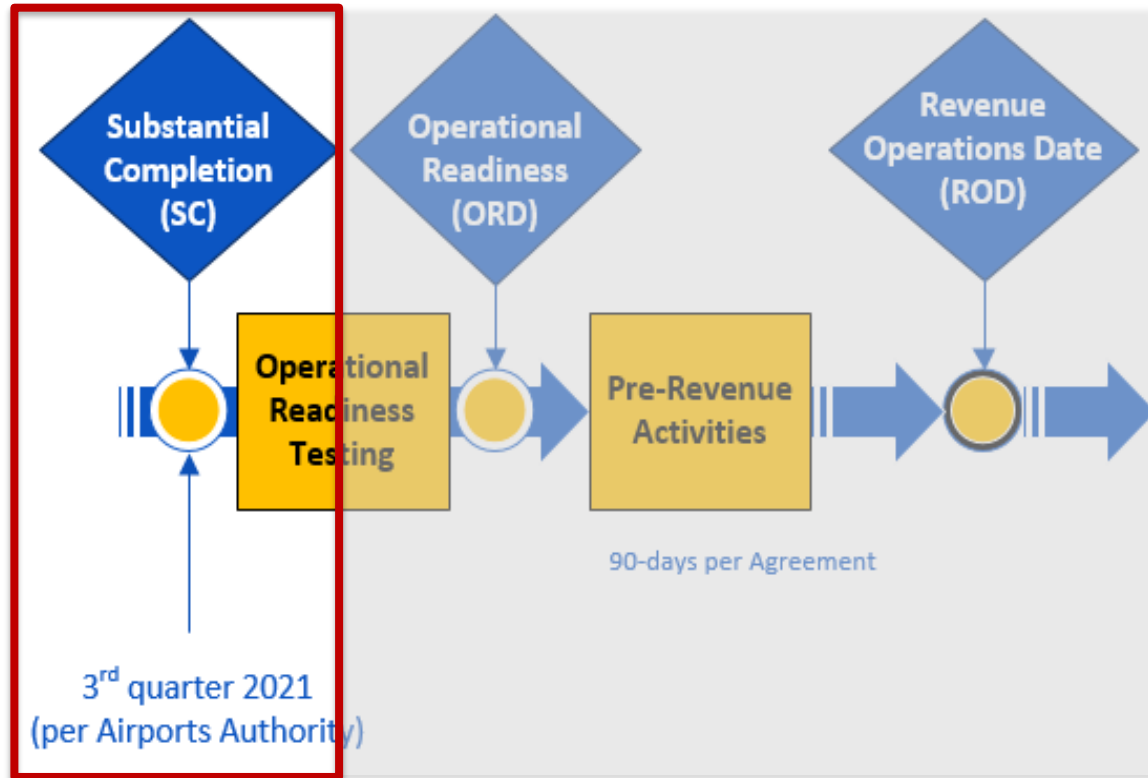
Significant Open Items Progress

Open Issue	Progress Since March
Damaged Direct Fixation Fasteners	<ul style="list-style-type: none">▪ Contractor submitted root cause analysis indicating damage done from installation process▪ WMATA and Airports Authority analysis supports contractor conclusion
Station Platform Paver System	<ul style="list-style-type: none">▪ Airports Authority directed contractor to perform remedial work required to repair failing joint material▪ WMATA believes remediation will not fully address system deficiencies resulting in future costs
Insufficient Line of Sight to Signals	<ul style="list-style-type: none">▪ Issue resolved through agreement to install repeater signal
Non-Compliant Snow Melter/Calrods	<ul style="list-style-type: none">▪ Issue resolved through agreement to provide compliant “Calrods” as spares
Embedded Track Deficiencies at Yard	<ul style="list-style-type: none">▪ Issue resolved through agreement on minor remedial work to be performed

**See appendix for status of all open items*

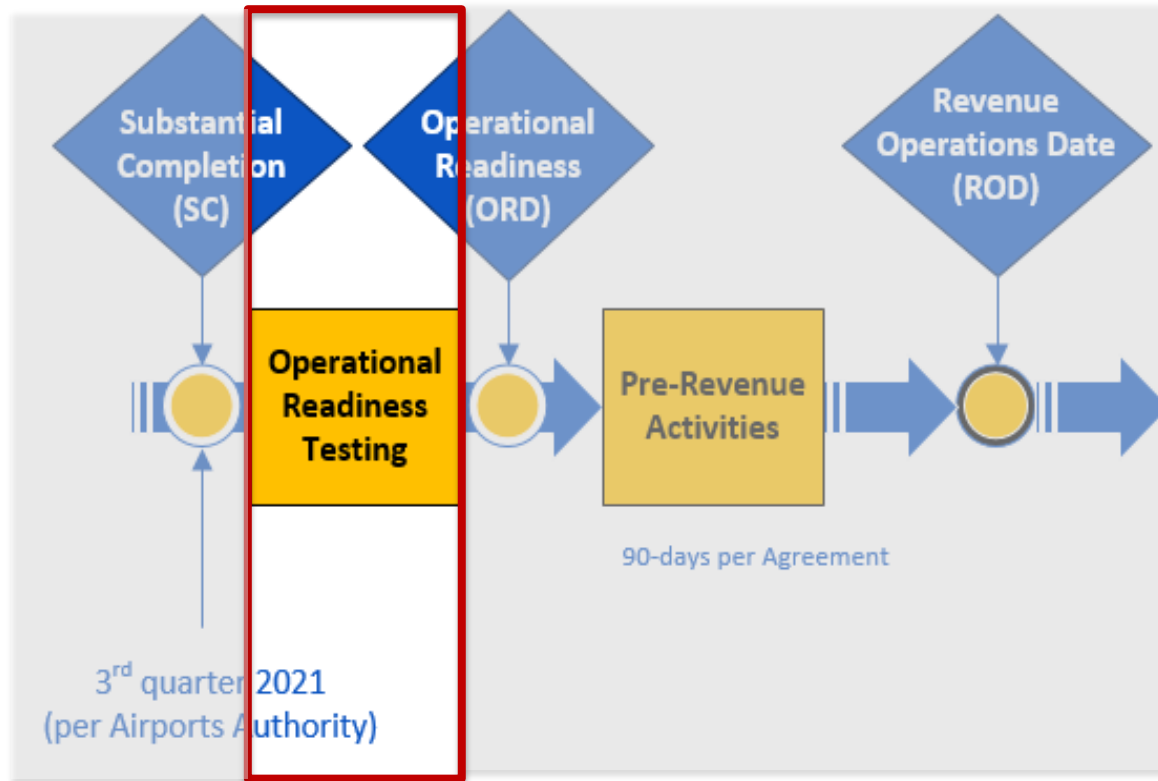
Project Schedule: Prerequisite Activities & Milestones

Schedule: Projected Substantial Completion



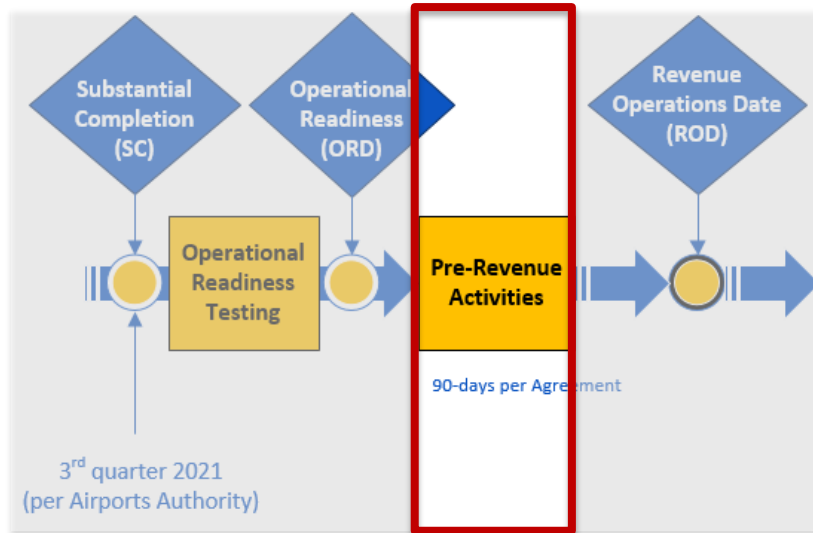
- Airports Authority projects Substantial Completion in third quarter 2021 (Package A)
- Critical path through “Level F” ATC testing
- June 26/27 weekend shutdown of Wiehle-Reston Station for final integration of Phase 2

Schedule: Operational Readiness Testing



- WMATA's period for testing to determine Operational Readiness
- No fixed duration for ORT, as it depends on testing not completed prior to Substantial Completion.
- Package A contract assumes Contractor care for 60 days after SSCD

Schedule: Significant WMATA Work after ORD



▪ **On boarding Assets**

- Complete Asset Database
- Implement Warranty Management
- Verify and Tag all Assets
- Transfer or Creation of Utility and Consumables Supply Accounts

▪ **Staff & First Responder Familiarization**

- Conduct Staff Orientation
- Execute Emergency Exercises

- Establish Access Controls
- Conduct First Responder Training

▪ **Final Documents**

- Complete Safety Certification
- Execute Maintenance and Property Conveyance Agreements

▪ **Policy & Procedure Updates**

- Update Maintenance Policies
- Update Standard Operating Procedures, Operational Systems, and Training

▪ **Final Station Mobilization**

- Marketing Campaign/Advertising Installs
- Implement Parking Operations per County Agreements
- Distribute Station Maintenance Materials (e.g., Snow Removal Equipment)
- Deployment of kiosk materials & Station AEDS
- Deploy New System Maps Systemwide
- Exercise Automatic Fare Collection Equipment

Update Summary

Issues Remain Unresolved or Open

- WMATA continues to work with the Airports Authority to mutually agree on a path forward to resolve open issues as required to achieve key milestones:
 - Systems Performance Demonstration (Substantial Completion)
 - Operational Readiness
 - Acceptance of the Project by WMATA for Revenue Operations

Schedule & Further Considerations

- Airports Authority's response to the open issues will determine path forward and timing for WMATA acceptance of the project and ultimate start of passenger service

Appendix: Full List Open Issues

Open Issues: Component Failures

Issue	Date Identified	Description/Status
Surge Arrestor Failures	March 2016	Systemic positive surge arrestor failures experienced throughout project; WMATA reviewing final root cause analysis by Airports Authority
Malfunctioning UPS Fans (Yard & Mainline)	March 2018	UPS exhaust fans continually running at high speed, burning out fan motors; solution has been implemented on mainline and demonstration completed. Implementation at Yard and incident-free system performance demonstration will close issue
Cracked Impedance Bonds	October 2019	11 bonds significantly cracked, required replacement bonds; WMATA remains concerned about 40 other locations identified with imperfections; Contractor's revised root cause analysis under review by WMATA
Cracked 3 rd Rail Insulators	April 2020	Contractor has replaced 1500+ insulators that were exhibiting cracks - root cause analysis identifies over-tightening as cause – contractor corrected torque and replacing cracked brackets – WMATA concerned about residual impacts of over-tightening on brackets not replaced
Damaged Direct Fixation Track Fasteners	May 2020	Approximately 10,000 damaged direct fixation track fasteners required replacement - WMATA and Airports Authority analysis supports contractor root cause conclusion
Cracked Third Rail Cover Brackets	February 2021	5,000+/- brackets (of a total of approximately 50,000) are cracked; root cause analysis identifies over-tightening as cause – WMATA concerned about residual impacts of over-tightening on brackets not replaced

Open Issues: Stations & Systems

Issue	Date Identified	Status
Station Platform Paver Installation	November 2017	<p>Systemic joint failures at pavers, water penetrating setting bed, significant efflorescence deposits at the platform edges</p> <p>Airports Authority directed contractor to perform remedial work required to repair failing joint material</p> <p>WMATA's concern remains that this work will not fully address system deficiencies; working with Airports Authority to identify comprehensive program to address the issues</p>
Incorrect Distance Between Insulated Joints (IJ) and Signals (Yard)	June 2019	<p>WMATA concern is insufficient distance between the signals and related IJ's to ensure safe train movement</p> <p>Field review conducted to confirm locations where conditions would allow distance to be increased. WMATA and Airports Authority continue to review scope and timing of mitigations</p>

Open Issues: Yard

Issue	Date Identified	Status
Railcar Hoists at Dulles Yard	April 2016 / September 2020	During performance testing issues were identified with the control systems, auto chock systems, and others; Airports Authority, WMATA and contractor continue to work through issues
Tight Gauge at Switches in Dulles Yard		Tight gauge identified at 39 switches in Dulles Yard; Mitigation acceptance pending verification of gauge following completion of Dynamic testing
Precast Concrete Wall panel Cracks at Dulles Yard Buildings		Airports Authority concluded cracking on surface of exterior wall panels due to panel connections restraining panel thermal and shrinkage movement; cracking has stabilized Metro OIG Sept. 2020 report concluded that sealer application is acceptable remediation; however, costs for future re-application of sealer should be considered – responsibility for cost of re-application not identified
Fuel Center Deficiencies at Dulles Yard	July 2018	Recommendation of Metro OIG March 2020 Interim Report was that contractor provide evidence that final construction complies with design requirements - acceptance request for nonconforming slab in progress

Open Issues: Yard (continued)

Issue	Date Identified	Status
Non-Compliant Clearance in Elevator Machine Room	May 2018	Metro assesses that elevator machine room equipment clearances do not meet code requirements;
Turntable Deficiencies at Service & Inspection Building	October 2020	Issues include excessive rocking, gaps and misalignment at flange way, undocumented modifications; Follow up inspection/demonstration on April 28 identified continuing issues that are being further examined