



May 25, 2022

Mr. Patrick Johnson  
Director – Audit Division  
Sound Transit  
401 S. Jackson Street  
Seattle, WA, 98104

**Subject: Management Response Letter from the Internal Audit of November 26, 2021  
Link light rail incident**

Dear Mr. Johnson:

First of all, I want to thank you and the agency’s auditors for fulfilling my request to complete the audit of the November 26, 2021 incident that took place on our Link system following the Apple Cup.

This difficult day for Sound Transit and our passengers revealed the implicit need for multiple departments to improve operations and communications. Your findings about this preventable incident and the ensuing communications failures that occurred that night will inform and improve the commitment of each relevant Sound Transit department and our operating partner King County Metro to continue working on remedial actions.

By detailing exactly what happened, why it happened, and what Sound Transit and King County Metro could and should have done to avoid the dangerous breakdown in procedures, your audit supports the agency’s continuous work to improve our practices and keep our riders and employees safe.

In response to your audit, staff have developed a wide array of corrective action plans (CAPs) that span across Sound Transit, as well as our oversight of and processes and procedures for our contractor, King County Metro. The CAPs, found as an attachment, describe how we will improve and have better processes and procedures in place to ensure something like this never happens again.

I am grateful for your thorough and diligent work to complete the audit and the opportunity to provide our agency response and set of actions we are moving forward with. We have already made several changes to improve, and we will continue to track to closure and coordinate with your team through our regular Safety reporting process on other corrective actions still in progress.

Sincerely,

Peter M. Rogoff  
Chief Executive Officer

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**CHIEF EXECUTIVE OFFICER**  
**Peter M. Rogoff**

# Memo

May 25, 2022

To:	Sound Transit Board of Directors
From:	Peter Rogoff, Chief Executive Officer
Subject:	November 26, 2021 Link Light Rail Service Event - Corrective Action Plans

In response to the audit and the 40 findings identified, agency staff have developed a wide array of corrective action plans (CAPs) that span across the agency, as detailed in the attached document. In total, staff developed over 70 individual corrective actions to prevent future train damage and stoppages and improving our passenger communications response during incidents. Although a lead department has been identified for all corrective actions, cross-departmental collaboration is key and is being exercised for full action plan implementation.

In summary, the main themes of the corrective actions are:

- Improving quality, testing, and rail activation processes and procedures to capture a wider array of upstream checkpoints to prevent similar incidents
- Studying the feasibility of design changes for Series 1 and Series 2 vehicles to improve passenger experience during incidents.
- Studying options for improved signage and audio messages at stations and onboard trains to improve communications during incidents
- Reviewing and revising the training program for King County Metro (KCM) staff and clarifying expectations for staffing levels to support special events, evenings, holidays and weekends.
- Reviewing and revising standard operating and standard maintenance procedures to improve clarity in incident response, passenger communications, and core system validation
- Enhancing the agency's multi-year training, drill and exercise plan to test internal readiness
- Developing better internal incident notification tools and procedures and improving procedures to ensure proper handover of communication responsibilities
- Improving public safety/security special event staffing and crowd control planning
- Exploring opportunities to improve the utilization of the agency's social media channels for communication during incidents

While some of these corrective actions are complete, many are underway, and more will be implemented over the course of the next year. The actions and timelines reflected on the attached document are staff's best estimate at this time and may change as implementation of the various actions moves forward.

Audit Finding Category	Location of Finding (Final Report Page #)	Finding Description	Corrective Action Plans (CAPs)	Lead Department	Corrective Action(s) Projected Completion
Causes of Train damage and stoppage	Pg. 35	a.1. Since the rod holding the EMI was designed and installed above the top of rail, the engineer of record (EOR) should have sought approval of a deviation from design criteria, which did not occur.	<p>ACTION 1: Portfolio Services Office (PSO) - Document deviation and obtain Material Review Board (MRB) approval for short term solution. Short term solution included survey of existing condition of bolts and further cut bolts throughout system to ensure 3/4" running clearance through floating slab section under worst case (crush load) conditions.</p> <p>ACTION 2: PSO - Work with the Engineer of Record to identify a long term solution that may or may not require a deviation. Engineering will document and update the short-term solution deviation, if required.</p> <p>ACTION 3: PSO - Review existing Engineering Procedures and hosting conversations with current consultant designers and Sound Transit engineering to identify gaps in existing procedures to ensure unique conditions of the system are properly addressed in the design process.</p> <p>ACTION 4: PSO - Update the design criteria to improve clarity of criteria regarding top of rail criteria. Engineering will issue a Notice to Designer to clarify this language.</p>	PSO	Q2 2022
Causes of Train damage and stoppage	Pg. 35	a.2. It was noted on shop drawings of the Northgate Link Extensions' (NGLE) electromagnetic interference (EMI) conduit hanger that the rods which hold the EMI hangers on the floating slab had 1) protruded above the TOR in design and after installation, and 2) that the EMI "Top of Rod was to be field cut"; however, it was unclear on the shop drawing where to make the cut.	<p>ACTION 1: King County Metro - Trim EMI rods to address strikes to light-rail vehicles.</p> <p>ACTION 2: PSO (including Quality), Safety, Northgate Link's Systems contractor and Construction Management Contractor (CMC) - Investigate the root cause(s) that allowed the rods to go untrimmed during design and construction of Northgate Link. This effort will look at procedural compliance as well as process gaps, oversight responsibilities and permanent corrective actions for future projects.</p> <p>ACTION 3: PSO - Implement any permanent corrective actions identified from completion of Action 1.</p>	PSO	Q2 2022
Causes of Train damage and stoppage	Pg. 41	a.3. Testing of the dynamic envelope was limited to areas above and to the sides of the vehicle and neglected to verify that the spacing between the track gauge was free of obstacles above the top of rail as specified by design criteria.	<p>ACTION 1: PSO - Update the Link and Tacoma Link (Hilltop) testing procedures to include testing of the entire dynamic envelope including measurements between the track gauge.</p> <p>ACTION 2: PSO - Investigate the testing verification process to identify any process gaps and make corrective actions, including special procedures for unique conditions.</p> <p>ACTION 3: PSO - Update the Sytems Integration Test Program Plan (SITPP) to reflect corrective actions identified in Action 2.</p>	PSO	Q3 2022
Causes of Train damage and stoppage	Pg. 40	a.4. Siemens vehicle testing did not fully consider configuration differences between Series 1 and Series 2 light rail vehicles. These differences include suspension compression under heavy passenger load, ensuring constant floor height above top of rail, and ensuring proper clearance of conduit, couplers and cables.	<p>ACTION 1: Design, Engineering, and Construction Management (DECM) - Perform root cause analysis with Siemens to determine how design requirements for clearance under full load not followed.</p> <p>ACTION 2: DECM - Implement corrective actions identified from completion of Action 1.</p> <p>ACTION 3: PSO - Modify Series 2 vehicle train line cable hanger to lift cables to accommodate all passenger loads.</p> <p>ACTION 4: DECM - Complete field modification instruction (FMI) on design change for all Series 2 light-rail vehicle (LRV) on order.</p>	DECM	Q4 2022
Causes of Train damage and stoppage	Pg. 40	a.5. Sound Transit requires ground clearance testing to check ground clearances before introducing new vehicles into the transit system. The Siemens ground clearance testing for the Series 2 vehicles was completed. However, testing was incomplete because it was not done to simulate "crush load" weight nor tested at a historically high-ridership location.	<p>ACTION 1: DECM - Perform root cause analysis with Siemens to determine how verification requirements for clearance under full load did not contemplate the suspension movement under passenger loading.</p> <p>ACTION 2: PSO - Update and verify vehicle ground clearance verification measurements to accommodate for crush passenger loads.</p> <p>ACTION 3: PSO - Test loaded Series 1 and 2 vehicle on alignment to verify expected clearance in dynamic condition for worst case (crush load) condition and verify Action 2.</p>	PSO	Q3 2022
Causes of Train damage and stoppage	Pg. 42	a.6. As part of its safety certification and field inspection oversight processes, Sound Transit verifies all items prior to approving projects to open for revenue service. While vehicle dynamic clearance testing is a certifiable item, the EMI rod identified between track clearances was not specifically listed in any check list which is why it was not verified prior to opening the Northgate Link Extension.	Corrective actions identified in response to findings a.1, a.2 and a.3 will also address this finding.	PSO	See timelines for findings a.1, a.2, and a.3.

Audit Finding Category	Location of Finding (Final Report Page #)	Finding Description	Corrective Action Plans (CAPs)	Lead Department	Corrective Action(s) Projected Completion
Causes of Train damage and stoppage	Pg. 36	a.7. While Sound Transit prescribed a 60-day transition period from completion of the Northgate Link capital project to the initiation of revenue service to resolve any final capital project deliverables, the current procedures governing this transition period do not prescribe when that period should formally begin, do not formally designate responsible and accountable authorities for the transition, and do not ensure that all pre-revenue and revenue planning activities will be thoroughly completed prior to revenue service.	ACTION 1: PSO - Update current rail activation plans and relevant subplans for all current construction projects to clearly articulate predecessor activities to the start of pre-revenue service as well as start of revenue service and designate the responsible and accountable authorities for making the decision to advance the project into pre-revenue and revenue service.	PSO	Q3 2022
Causes of Train damage and stoppage	Pg. 46	a.8. Beginning a month prior to the Nov. 26 event, maintenance work orders recorded several other incidents where 1-Line trains were striking an object under the vehicle, later determined to be the EMI rod that damaged the train on the night of Nov. 26. While these incidents were properly entered into the work order system, none of them were escalated to Sound Transit Operations or Safety for evaluation.	ACTION 1: Operations, Safety and King County Metro (KCM) - develop staff training to address agency knowledge on Safety Management Systems (SMS) and safety management process, including escalation and regulatory reporting.  ACTION 2: Operations / KCM - Develop procedures to address escalation requirements to include notifications to Sound Transit Operations (notifications from KCM Rail Safety to Sound Transit Safety will be respective to those departments).	Operations	Q2 2023
Causes of Train damage and stoppage	Pg. 46	a.9. Link Standard Maintenance Procedures do not provide clear guidance on what mechanics do when they observe damage to light rail vehicles.	ACTION 1: Operations / KCM - Revise respective standard maintenance procedures (SMPs) to enhance instructions for communicating critical hazards, damage and defects to respective management structures.  Corrective actions identified for finding a.8 will also help to address this finding.	Operations	Q2 2023
Effectiveness of communications	Pg. 48	b.01. This event reveals that multiple failures occurred because Sound Transit does not have adequate processes in place to ensure passengers are promptly informed when emergencies occur. Furthermore, Sound Transit does not exercise sufficient oversight of its contracted operator.	ACTION 1: Operations - Review Standard Operating Procedure (SOP) to ensure Operators prioritize on-board vehicle communications and providing timely updates to passengers as they work to resolve train operations during service disruptions.  ACTION 2: Operations - Issue rail bulletin to reinforce existing protocols for expedited staff dispatch and prompt staging of rescue trains.  ACTION 3: Operations - Issue rail bulletin to reinforce that any vehicle without a working public address (PA) system is not allowed into revenue service or is taken out of service as soon as issue is identified.  ACTION 4: Operations - Work with KCM to implement refresher training to relevant staff, including but not limited to Operators, Rail Chiefs, Link Control Center (LCC) Controllers, etc., to communicate revised approach and clarity around roles and responsibilities on passenger communications on-board vehicles and at stations during evacuation incidents.  ACTION 5: Operations - Explore standardizing the process for formally requesting CITRS provide additional coverage and staffing for the LCC during high-ridership events, weekends and off-hours to facilitate the announcements to passengers.  ACTION 6: Operations - Develop performance management framework for Operations and oversight of KCM and other relevant Link contractors, including but not limited to service level agreements.  ACTION 7: Passenger Experience (PX) - Develop and install QR codes that take passengers to service alert section of the Sound Transit web page in all vehicles and in stations in areas of high visibility.  ACTION 8: PX - Co-locate Sound Transit passenger information coordinators (PIC) staff and KCM staff in new LCC to enable better passenger communications at stations and via Sound Transit external communications channels.  ACTION 9: Communications - Develop procedures that specify and make the agency's social media channels, including Twitter, a more useful channel for rider alerts. This procedure should also establish service-specific Twitter handles, including one for Link, that do not include Tweets on topics not related to service.  ACTION 10: PX - Develop budget request to add two additional PICs to be able to monitor the service Twitter feed in 2022, providing a total of eight coordinators and a supervisor. This level of staffing will cover all hours Link is open.  ACTION 11: PX / IT - Fully implement a new passenger alerts system procured from IBI Group to create a centralized information hub to help expedite the amount of time it takes a PIC to send out alerts once they receive the information.	Operations	Q4 2023

Audit Finding Category	Location of Finding (Final Report Page #)	Finding Description	Corrective Action Plans (CAPs)	Lead Department	Corrective Action(s) Projected Completion
Effectiveness of communications	Pg. 29	b.02. As the service owner, Sound Transit owns the risk for any incidents or accidents involving 1-Line service. Sound Transit contracts the operations, and safety response and investigation actions to KCM. Instances such as the Nov. 26 event require KCM to promptly notify WSDOT within reporting thresholds. However, in this event, KCM interpreted WSDOT's guidance for this event as a passenger transfer and not an emergency evacuation. This delayed emergency response, communication protocols, and caused the two agencies to miss required safety reporting deadlines.	POST AUDIT NOTE: During the incident KCM did follow SOP 7.01, which included previously established guidelines for emergency evacuations and reporting. WSDOT State Safety Oversight (SSO) office released new guidance for emergency evacuations in December 2021.  ACTION 1: Operations / KCM - Revise SOPs 4.2 and 7.01 to incorporate new SSO guidance language (released December 2021) in regards to emergency evacuations and passenger transfers, to ensure clarity, definition and responsibilities for each are clear.	Operations	Q2 2023
Effectiveness of communications	Pg. 30	b.03. Intergovernmental Agreements (IGAs) established between Sound Transit (ST) and King County Metro (KCM) define each agency's roles and responsibilities during emergency & incident management. However, current contractual language is not clear enough to delineate each agency's roles & responsibilities. Sound Transit believes it cannot exercise any direct authority to respond to emergencies and that incident roles and responsibilities were solely at the authority of KCM. At the time of the event, incident roles & responsibilities were neither clarified nor communicated between ST and KCM.	POST AUDIT NOTE: The IGA provides in-depth details regarding roles and responsibilities during emergency and incident management under '7.5 Notifications of Emergencies, Service Disruptions, Incidents and Accidents'.  ACTION 1: Operations / KCM - Review IGA and identify opportunities to add clarity on emergency response roles and responsibilities and bridge gaps in Sound Transit oversight responsibilities.  Corrective actions identified in response to findings b.02 and b.08 will also help address this finding.	Operations	Q4 2023
Effectiveness of communications	Pg. 44	b.04. Link Standard Operating Procedures (SOPs) are developed and agreed upon by both Sound Transit and KCM every 10 years. However, prior to the next scheduled update, several Link SOPs critical to incident and emergency protocols should be reviewed and updated to include the following: • Bus Bridge Procedures (2009) • LRV Passenger Transfer & Evacuation Procedure (2017) • LCC Notification of a Disabled Train (2009) • Emergency Train Back-up Procedures (2016) LRV Public Address Announcements (2015) • LCC Public Address Announcements (2009).	ACTION 1: Operations / KCM - Review and update the respective SOPs identified in finding to add any needed clarifications relating emergency protocols and incident responses.  Corrective actions identified in response to findings b.02 will also help address this finding.	Operations	Q2 2023
Effectiveness of communications	Pg. 27	b.05 While the operator followed prescribed training and SOPs by communicating with the LCC and troubleshooting the Series 2 train with a secondary handheld radio, they did not have a secondary means to communicate issues to the passengers, nor did they follow procedures to attempt an announcement to the passengers.	ACTION 1: PSO - Validate technical functionality of PA under severed trainline conditions, for both vehicle types (Series 1 and Series 2).  Corrective actions identified in response to findings b.08 will also help address this finding.	PSO	Q3 2022
Effectiveness of communications	Pg. 30	b.06. During special events, ST staff draw from various departments to serve in an oversight role performing crowd control, helping ensure trains meet tight schedules, and monitoring KCM's provided service quality and overall performance. In this instance, ST special event staff did not have training or SOPs on what to do during emergency situations.	ACTION 1: Operations - Revise special event operating plans and briefings to include an emergency response roles and responsibilities section.  ACTION 2: Safety - Develop procedures that specify that before and after special events driving high ridership, Sound Transit, where feasible, will deploy additional security staff to stations. In addition to supporting riders during normal operations they will be available to assist with incident responses.	Safety	Q3 2022
Effectiveness of communications	Pg. 29	b.07. King County Metro, as the emergency response authority on behalf of Sound Transit, did not establish an Incident Command within prescribed guidelines to support coordination and collaboration with required response partners.	ACTION 1: Agency - Analyze Incident Command responsibilities at the agency level and whether changes are required on how Incident Command functions across the agency and all its modes.  Corrective actions identified in response to findings b.02 and b.08 will also help address this finding.	Safety	Q1 2023
Effectiveness of communications	Pg. 31	b.08. King County Metro LRV Operator training did not include additional components to prepare operators for the changing service environment to include areas such as safety critical training (disabled train in the tunnel). Frequency of training should also be re-evaluated.	POST AUDIT NOTE: The Northgate extension includes at-grade, tunnel and elevated guideway segments, similar to that of the current environment between UW and Angle Lake stations. Rail operators would not experience any unknown additional components within the Northgate extension.  ACTION 1: Operations / KCM - Evaluate and revise the training program materials and update to address any potential gaps in information, including but not limited to current and future alignments, and clarity on roles and responsibilities based on the National Incident Management System (NIMS) guidelines.  ACTION 2: Operations / KCM - Evaluate and potentially revise cadence of current training program.  ACTION 3: Operations / KCM - Implement refresher training based on outcomes of actions 1 and 2.	Operations	Q4 2023
Effectiveness of communications	Pg. 54	b.09. ST Operations Duty Managers are assigned on a rotational basis as part of ST's oversight of Link light rail day-to-day operations. From this event, we found there are no official procedures or training clarifying roles and responsibilities, who to contact in the event of an emergency, clear guidance on what information to report, when to escalate and when to follow up.	ACTION 1: Operations - Create training document for new hires and for those roles that have Duty Manager responsibilities.  ACTION 2: Operations - Implement training utilizing document from Action 1.  Corrective actions identified in response to findings b.19 and b.22 will also help address this finding.	Operations	Q1 2023

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Effectiveness of communications	Pg. 51	b.10. Per the Link IGA, ST delegates LCC duties to KCM, who is required to maintain SCADA systems; however, the SCADA system between UW Station and U District Station was not working properly on November 25, 2021 (the day prior) and was not prioritized as a critical repair. This affected the LCC's capability to remotely access the Public Address (PA) system for stations and capability to have visual confirmation of passengers walking in the tunnels.	<p>POST AUDIT NOTE: Operations and KCM found that the SCADA system outage didn't impact the ability to use the PA system remotely, rather the PA system at UW Station was set to local and LCC didn't have the ability to override it remotely.</p> <p>ACTION 1: Operations / KCM - Evaluate and review staffing to ensure clarity on on-call vs on-site support requirements during special events and holidays. Not applicable.</p> <p>ACTION 2: Operations / KCM - Work with KCM management to staff accordingly, including for maintenance support during special events and holidays and provide a plan to address this issue in the near-term.</p> <p>ACTION 3: Operations - Monitor staffing levels during special events and holidays to ensure enough support is available to support operations and maintenance.</p> <p>ACTION 4: Operations - Develop new SOP that outlines process for validating critical systems prior to special events, incorporate into special event plan.</p> <p>ACTION 5: Operations - Develop new SOP that outlines process for validating core systems for day to day operations. (This is redundant of action 4 above)</p>	Operations	Q3 2023
Effectiveness of communications	Pg. 52	b.11. On Thursday, November 25th an after-hours Network Outage was reported affecting transactions. As part of processes, the outage caused some LCC SCADA systems to be offline (cameras near cross-passages, and train tracking) between U District and University of Washington (UW) Station during the Apple Cup. During interviews, we were told that the SCADA repair was not prioritized due to the fact that "on-call staffing" was not available during the holiday & special event period. This was further confirmed when we found no SCADA work orders entered on weekends or holidays.	Corrective actions identified in response to finding b.10 will also help address this finding.	Operations	See timeline for finding b.10.
Effectiveness of communications	Pg. 53	b.12. Sound Transit conducts fire protection confidence testing as required by the Seattle Fire Department for PA systems readiness. However, prior to the Apple Cup event, the PA system was not tested to ensure operability. We also found that confidence tests do not test door alarms at the cross passages.	<p>ACTION 1: Operations / KCM - Determine the craft and frequency for confidence tests on cross passages door alarms.</p> <p>ACTION 2: Operations / KCM - Develop preventative maintenance (PM) procedures for new cross passage inspection, following completion of Action 1.</p> <p>Corrective actions identified in response to finding b.10 will also help address this finding.</p>	Operations	Q2 2023
Effectiveness of communications	Pg. 50	b.13. Link SOP 6.14 (Link Control Center PA Announcements) states that "passengers should be advised to exit the station in an emergency situation." The LCC controller stated they attempted to make this announcement. However, staff realized later that remote use of the of the public address system was not available due to the SCADA system outage.	Corrective actions identified in response to finding b.10 will also help address this finding.	Operations	See timeline for finding b.10.
Effectiveness of communications	Pg. 52	b.14. The cameras mounted near the cross passages are viewable through CCTV by the LCC when in normal operation. However, because of the SCADA outage, these cameras were offline. Additionally, no cross passages in the ST tunnel system are equipped with cameras as they are not included in the design criteria.	<p>POST-AUDIT NOTE: A review of the camera configuration (placement &amp; quantity) found that it conforms to the current design criteria and is sufficient to detect an individual(s) entering or exiting the cross passage.</p> <p>Corrective actions identified in response to finding b.10 will also help address this finding.</p>	PSO	Q3 2022
Effectiveness of communications	Pg. 47	b.15. Other Sound Transit modes (i.e., Sounder trains) have "in case of emergency" evacuation signs posted to ensure passengers are aware of emergency exits and how to exit the vehicle. However, no "in case of emergency signs" are posted in either type of Link light rail vehicles.	<p>ACTION 1: Passenger Experience (PX) - Research options (i.e. signage, vehicle announcements, etc.) that ensure that train evacuations include provisions for emergency train situations, including for non-English/limited-English speaking passengers and American Disabilities Act (ADA) compliance.</p> <p>ACTION 2: After Action 1 is complete, determine best approach for further action, if any.</p>	Passenger Experience	Q3 2022
Effectiveness of communications	Pg. 47	b.16. On other Sound Transit modes (i.e., Sounder trains) audio messages tell passengers what to do in case of an emergency. There are no such messages on either Series 1 and Series 2 Link vehicles.	Corrective actions identified in response to finding b.15 will also help address this finding.	Passenger Experience	See timeline for finding b.15.
Effectiveness of communications	Pg. 47	b.17. Series 2 vehicles are equipped with blue lighting to illuminate the doors, and emergency door manual release controls; in this event, with the loss of power, this was the only lighting that was working. Passengers had no secondary emergency illumination to see emergency door release controls.	<p>ACTION 1: DECM - Review Series 2 light-rail vehicle design with Siemens to determine feasibility of additional lighting redundancy.</p> <p>ACTION 2: DECM - After action 1 is complete, determine whether to request a change proposal for additional lighting redundancy.</p>	DECM	Q2 2022

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Effectiveness of communications	Pg. 50	b.18. In established procedures, if there are emergencies that cause significant delays to trains, KCM arranges and implements bus bridges to retain service between affected stations. KCM then communicates these details to Sound Transit staff to communicate to passengers. In this event, the bus bridges were arranged, but notifications and orders were only being sent to and from King County Metro and excluded Sound Transit.	<p>ACTION 1: Operations / KCM - Review and clarify bus bridge implementation protocols, including verifying process for communicating details of bus bridge to passengers and to verify Northgate bus stops are including in the information.</p> <p>ACTION 2: PX - verify Link station signage includes Link shuttle stop information.</p> <p>ACTION 3: PX - After Action 2 is complete, if changes are need to the station signage, update station signage by the service change.</p> <p>ACTION 4: PX / Operations - Review and work with KCM on ensuring the bus operator big books includes most recent information on Link shuttle / bus bridges, including coverage for Northgate, Roosevelt, and U District stations.</p> <p>ACTION 5: PX / Operations - After Action 4 is completed, if changes are needed, work with KCM to update Link shuttle information in bus operator big book by service change.</p> <p>ACTION 6: Operations / Communications - Create standard command post [internal communications] template to aid on-call duty managers in their individual ability to provide consistent and succinct messaging to internal stakeholders.</p>	Operations	Q3 2023
Effectiveness of communications	Pg. 37	b.19. Two tabletop emergency exercises for the Northgate Link Extension (NGLE) occurred in March and August 2021. These exercises are required to be completed prior to the opening of new transit services, as required by federal and state, and ST certification guidance, and they are the responsibility of Sound Transit Emergency Management staff. After-action reports for both exercises noted that relevant parties from ST Communications and Passenger Experience (PX) did not attend, and that first responders attended the March exercise but not the August exercise	<p>ACTION 1: Safety - Develop procedures that specify that an After-Action Review (AAR) with cross-department staff that identifies areas for improvements and will take place following major service incidents like the one on 11.26. When appropriate, these AARs will be coordinated with the Transportation Safety and Security Post-Incident debrief, and in support of any required incident notification to state and federal partners.</p> <p>ACTION 2: Safety - Update the agency's multi-year training and exercise plan to include pro-active exercises (beyond state and federal mandated) that focus on emergency response and passenger communications and outline expectations for departmental participation and follow-up reporting.</p> <p>ACTION 3: Safety - Develop budget request for the addition 1.5 FTEs to develop, enhance and provide a consistent drill and exercise program and to support implementation of Action 2.</p> <p>ACTION 4: Safety - Develop a list of targeted internal stakeholders (including but not limited to Communications, Operations, Passenger Experience, etc.) to inform development and implementation of internal exercises, to supplement those outlined in Action 2.</p> <p>ACTION 5: Safety - Execute 2022 internal exercises as outlined in Action 1 and Action 5.</p> <p>ACTION 6: Safety - Implement end of year full-scale exercise to re-drill the 11.26 Incident (or similar) scenario validating actions and items identified in the incident investigation and action plans outlined in response to the incident. The exercise will include internal stakeholder outlined in Action 4 plus KCM.</p>	Safety	Q4 2022
Effectiveness of communications	Pg. 37	b.20. Both tabletop exercises to prepare for NGLS service did not consider the differences between the Series 1 and Series 2 trains.	POST-AUDIT NOTE: Staff have verified that information for both Series 1 and Series 2 trains were included in the training materials for the NGLS tabletop exercises. In addition, no management action is proposed for this finding, as the differences in design between Series 1 and Series 2 trains don't impact emergency evacuations and both trains meet Sound Transit and Federal specifications and requirements.	Safety	N/A
Effectiveness of communications	Pg. 54	b.21. The ST Agency Incident Notification SOP for Safety instructs that the ST Executive Director of Operations notifies the CEO of a major incident. While we found that this procedure was revised in 2020, it was not used, nor followed.	Corrective actions identified in response to finding b.19 will also help address this finding.	Safety	See timeline for finding b.19.
Effectiveness of communications	Pg. 54	b.22. No procedures have been developed to ensure the positive confirmation of handover/takeover of duties and updating of phone forwarding for various ST duty officers (Communications, PX, Security, and Operations Duty Managers).	<p>ACTION 1: Safety - Procure mass communication tool that not only ensures positive confirmation and redundancy in handover and verification between duty managers and officers and in communicating major incidents between internal stakeholders, but also ensures that key staff are promptly aware of an incident and executing appropriate responses.</p> <p>ACTION 2: Safety - Develop procedures that outline process and roles and responsibilities for utilization of the mass communications tool identified in Action 1.</p> <p>Corrective actions identified in response to finding b.19 will also help address this finding.</p>	Safety	Q3 2022



Audit Finding Category	Location of Finding (Final Report Page #)	Finding Description	Corrective Action Plans (CAPs)	Lead Department	Corrective Action(s) Projected Completion
Effectiveness of communications	Pg. 57	b.23. The Communications Duty Officer would have been notified of the incident by "rider alerts" to their duty cell phone; in this event, communications were not received due to the duty cell phone malfunctioning, and there was no backup system.	<p>POST-AUDIT NOTE: The Communications Duty Officer's phone was properly working but transfer of duties was not done properly. The Customer Service Duty Officer's phone was the one that was malfunctioning.</p> <p>ACTION 1: Communications - Develop protocol for verifying phone forwarding functionality at the time the a new communications duty officer takes over.</p> <p>ACTION 2: PX - Add another active Customer Service Duty Officer for special events.</p> <p>ACTION 3: PX / Safety - Define what constitutes a "special event" and respective triggers for additional staffing support for consistency across the agency, and define where this documentation should live.</p> <p>Corrective actions identified in response to finding b.19 will also help address this finding.</p>	Communications	Q3 2022
Effectiveness of communications	Pg. 56	b.24. Sound Transit does not notify passengers of issues with "Rider Alerts" through website updates, Twitter posts, subscriber text messages and email alerts for those who sign up. No capability currently exists to send an immediate alert to passengers on a train, though this is under development with the upcoming Passenger Information Management System (PIMS).	<p>ACTION 1: IT - Implement new Passenger Information Management System (PIMS) capabilities on-board both Series 1 and Series 2 LRVs to enable more rapid and live train communications.</p> <p>ACTION 2: IT / PSO / DECM / Operations - Explore possibilities and dependencies of potentially moving up or further phasing the implementation of PIMS on-board Series 1 or Series 2 LRVs to enable more rapid and live train communications sooner, where feasible.</p>	IT	Q4 2024
Effectiveness of communications	Pg. 57	b.25. Passenger Experience (PX) staff maintain a duty officer rotation to facilitate information to our passengers and the public using "Rider Alerts" through website updates and Twitter, and through subscriber text and email alerts for those who sign up. In this event, because of the lack of official procedures to transfer duty officer responsibilities, the PX Duty Officer phone number was not transferred properly.	<p>POST-AUDIT NOTE: The Communications Duty Officer's phone was properly working but transfer of duties was not done properly. The Customer Service Duty Officer's phone was the one that was malfunctioning.</p> <p>Corrective actions identified for finding b.22 and b.23 will also help to address this finding.</p>	Passenger Experience	See timelines for findings b.22 and b.23.
Effectiveness of communications	Pg. 47	b.26. "See something wrong" signage is posted for passengers on the Series 1 vehicles to contact ST Security in the event of an emergency; however, no such signage is posted on Series 2 vehicles.	<p>ACTION 1: PX - Add "See Something, Say Something" signage to Series 2 vehicles.</p>	Passenger Experience	Q4 2022
Effectiveness of communications	Pg. 56	b.27. KCM staffs the LCC Customer Service Desk between 5 a.m. and 8 p.m., Monday through Friday, excluding holidays. Our interviews found that when the service desk is not staffed, the duties are handed over to the ST Operations Duty Manager but this is not formalized in a documented process or procedures.	<p>POST-AUDIT NOTE: Customer Service Desk responsibilities are documented in the roles and responsibilities of the Customer Service Duty Officer, not the Operations Duty Manager. Procedures for transfer of responsibilities is noted in procedure 10.3 Alert Guidelines and Requirements.</p> <p>ACTION 1: PX - Update procedures to change roles and responsibilities for this work from Customer Service Duty Officer to PICs.</p>	Passenger Experience	Q2 2022
Effectiveness of communications	Pg 37	b.28. ST Safety certification processes, along with Link SOPs articulate that first responders will be trained to have access to and utilize station emergency communications systems and assist in tunnel evacuations. However, during this event, first responders did not remember and/or realize the capabilities they had from their training to access and operate these systems.	<p>ACTION 1: Safety - Develop and forward quarterly training bulletins/alerts to first responders that support service disruptions and active incident responses.</p> <p>ACTION 2: Safety - Develop annual familiarization tours and refresher trainings with local fire departments, generally in the fall timeframe. While this action depends on Action 5 in response to finding b.19 [1.5 FTEs] being approved, if not approved, action becomes staff evaluating alternative methods to provide these services.</p>	Safety	Q4 2023
Effectiveness of communications	Pg. 55	b.29. Sound Transit Public Safety staff lack formalized procedures for crowd management, mitigations, and large events.	<p>ACTION 1: Safety - Develop formal procedures for crowd management and outline roles and responsibilities for internal and contracted (i.e. security vendor, law enforcement, etc.) staff.</p> <p>ACTION 2: Safety - Revise Public Safety crowd control plan to incorporate outcomes of Action 1.</p> <p>Corrective actions identified for finding b.06 will also help to address this finding.</p>	Safety	Q2 2022
Effectiveness of communications	Pg. 55	b.30. Contracted security staff lack formalized training for special events, escalator monitoring, crowd management, and slips and falls. Additionally, they do not have formalized SOPs for special events.	<p>ACTION 1: Safety - Review procedures for Security staff station monitoring roles and responsibilities to ensure clarity, including for escalator monitoring and slips and falls.</p> <p>Corrective actions identified for finding b.06 and b.29 will also help to address this finding.</p>	Safety	Q3 2022
Effectiveness of communications	Pg. 50	b.31. Signage along the Link service area does show the station the train is going to and that trains are running every 8-15 minutes. At the time of the event, they did not provide any visual indication of delays for trains nor approximate time trains would arrive at stations, and many passengers were confused about the status of service.	<p>ACTION 1: IT - Install and implement PIMS to enhance capabilities of current Link stations to facilitate rider information and communications at the stations.</p>	IT	Q4 2022