

Revenue Vehicle Preventative Maintenance (PM) Processes Audit

Report #: 2022-14

Executive Summary

Audit Scope & Objective

The audit scope covered all types of revenue vehicles; ST Express Bus, '1 Line' Link Light Rail, Sounder Commuter Rail, and Tacoma Link Light Rail for the service year 2022 (January 1 through December 31). The population used for analysis included all vehicles and all preventative maintenance services performed during this year.

The audit objective was to determine whether Sound Transit has effective controls in place to ensure that the Preventative Maintenance for Revenue Vehicles is performed in accordance with Federal Transit Administration (FTA), Federal Railroad Administration (FRA) and internal requirements to ensure the transit system remains safe and efficient.

Audit Results

There are **no findings** and **one observation** for this audit.

Conclusion

Overall, we found through data analysis and field observations that preventative maintenance processes across all modes are performed consistently for all vehicles providing revenue service. The frequencies of these maintenance services meet required standards (regulatory and internal) and help ensure that operations remain safe through regular inspections and proactive repairs and replacements.

Our observation, also known as an 'additional opportunity for improvement', was related to utilization of data and system access provided by partner agencies to increase the robustness of oversight ST performs over maintenance activities, specifically for ST Express and Sounder. Additional details regarding this opportunity for improvement have been provided to the audit clients.

Audit Results

The following table summarizes the analysis performed during Field Work and the associated exceptions (if any):

Criteria	Tests Performed	Results	Finding or Observation
ST Express IGAs, Maintenance Plans, procedures, etc.	Field Observation, Data Analysis of 303 current buses	No exceptions.	Observation 1: Utilization and access to partner maintenance systems and data
Link 1 Line IGAs, Maintenance Plans, procedures, etc.	Field Observation, Data Analysis of 99 current LRVs	No exceptions.	None
Sounder Commuter Rail IGAs, Maintenance Plans, procedures, etc.	Field Observation, Data Analysis of 50 current cabs/cars/locomotives	No exceptions.	Observation 1: Utilization and access to partner maintenance systems and data
Tacoma Link Light Rail Maintenance Plans, procedures, etc.	Field Observation, Data Analysis of 3 current LRVs	No exceptions.	None

Fieldwork and analysis for this audit focused on the oversight that Sound Transit (ST) provides of partner agencies providing preventative maintenance services, except for Tacoma Link which ST directly manages. Auditors visited each modal maintenance facility to observe PM activities, information recording, meet with maintainers, supervisors, and other staff to confirm PM processes and challenges are consistent across all levels.

Through our conversations, we found that *safety* and ensuring the *assets are available to provide established levels of service* are the top priorities across all levels and modes. We also observed across all activities a significant number of individuals that bring a wealth of industry experience, take pride in the work they do and feel that one of the main strengths or positives of their work are the teams they work in.

In our data analysis, we confirmed that prescribed, regular-interval preventative maintenance is consistently performed and recorded. In some rare cases, non-safety-critical maintenance (e.g., driver headrest replacement) may be deferred in order to prioritize safety or operation critical maintenance. All operations are facing industry challenges including replacement part procurement and labor shortages.

Overall, we found that current preventative maintenance processes are working well across all modes; however, we noted that these operations are not currently able to scale to meet the increased demand for services as the system continues to expand. Specifically, adequate labor resources to perform maintenance activities is the primary barrier. Additional recommendations have been shared with staff and are available upon request.

Background

Preventative Maintenance (PM) at Sound Transit is a collaborative process between staff at ST and various partner agencies who provide transit and maintenance services on behalf of Sound Transit, through Intergovernmental Agreements (IGAs). The requirements of these IGAs are guided by industry standards set by the Federal Transit Administration (FTA), Federal Railroad Administration (FRA), other governing bodies and the asset manufacturers (to ensure asset warranties stay in effect).

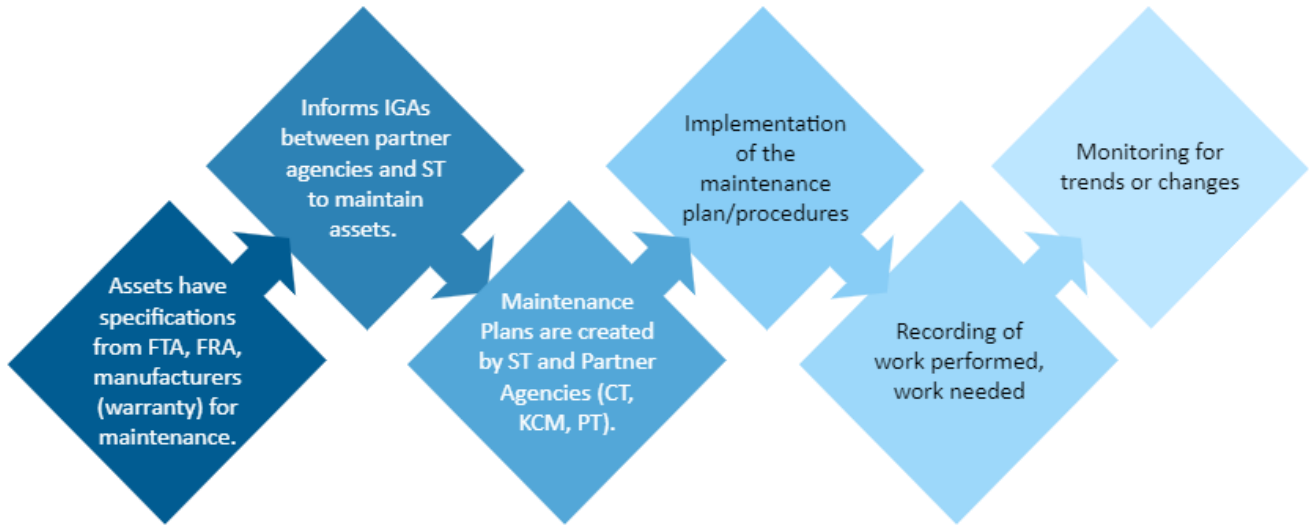


Chart 1 – Preventative Maintenance Processes

Informed by the IGAs, each partner agency has developed their own maintenance manuals, processes, and procedures to ensure that all requirements are met, at the right time, in an efficient way. As these plans and procedures are executed, ST staff provides oversight through reports provided by the partner agencies, data monitoring and trend analysis, as well as on-site spot checks and observations.

Maintenance, specifically Preventative Maintenance (PM), is critical to ensuring vehicles providing service remain safe, are available for service when needed, and fulfill their useful life. Across the transit industry, risks related to deferring or canceling maintenance services are a common concern as agencies face limited funding, staffing and capital resources, among other challenges.

Considering these industry challenges and Sound Transit's upcoming service expansions, this area was chosen for audit at this time. The audit aimed to understand whether current ST processes were functioning as expected and whether the current processes are prepared to scale-up to meet upcoming increased service demands.

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Methodology

Standards

We conducted this performance audit in accordance with our charter and Generally Accepted Government Auditing Standards (GAGAS or “Yellow Book”) issued by the United States Government Accountability Office (GAO) and with the International Standards for the Professional Practice of Internal Auditing” The Institute of Internal Auditors’ (IIA) International Professional Practices Framework (IPPF or “Red Book”) which includes the Core Principles for the Professional Practice of Internal Auditing, the Code of Ethics, the International Standards for the Professional Practice of Internal Auditing (the Standards), and the Definition of Internal Auditing.

These standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Additionally, the Audit Division is also committed to following safety oversight standards set forth by the Federal Transit Administration (FTA), Federal Railroad Administration (FRA); as well as all other relevant requirements or standards for auditing.

Audit Processes

Our audits are risk-based and focus on the areas with the highest potential risk impacts or likelihood at the time of observation. Each audit starts by examining the current processes in place relative to (1) Laws or Regulatory Requirements, (2) Agency Policies and Procedures and (3) Industry Best Practices. During the “Planning” phase, we assess the engagement-specific conditions and risk, which informs the engagement objectives and scope. At this time, relevant controls to mitigate these risks are also identified.

The audit “Field Work” phase then examines the design of the identified controls to determine if the intent meets the regulations, policies, etc. If the controls are designed to adequately mitigate the risk (control environment), we move on to assess the degree to which the controls are mitigating the risk (control activities). Any areas identified where the control environment or activities do not adequately mitigate the identified risk are identified as an exception. Exceptions are then defined as Findings if they are significant or Observations if they are an opportunity for improvement.

All Findings are risk-rated based on potential likelihood and impact, there are no Findings for this audit and hence no ratings assigned.

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Diversity, Equity, and Inclusion Review

This audit considered Diversity, Equity, and Inclusion (DEI) through the lenses of distribution of assets and workforce development.

In our performed analytics we noted no instances of uneven distribution of assets across the system or uneven distribution of maintenance services to specific assets for reasons not related to operational or safety reasons. Currently there appears to be no inequitable distribution of assets or service related specifically to Preventative Maintenance services performed.

We also considered how DEI is currently incorporated into workforce development, with the consideration that hiring and maintaining labor needs is one of the primary challenges across the system. We found through our field observations that each partner agency and ST are working to expand opportunities and career promotion into areas that were not previously prioritized such as high schools, trade/vocational institutions, geographically larger areas, community events and other areas.

The goal of these efforts is to reach a broader, more diverse workforce and strengthen the goal of ST to have a workforce that is reflective of the community it serves.

Appendices

Appendix A: Title of Rights

Sound Transit's Title VI notice of rights

Sound Transit conducts Title VI equity analyses for service and fare decisions to ensure they are made as equitably as possible.

More information on Sound Transit's Title VI notice of rights and the procedures to file a complaint may be obtained by:

- Phone: 888-889-6368; TTY Relay 711;
- Email: stdiscriminationcomplaint@soundtransit.org;
- Mailing to Sound Transit, Attn: Customer Service, 401 S. Jackson St. Seattle, Washington 98104-2826; or
- Visiting our offices located at 401 S. Jackson St. Seattle, Washington 98104.

A complaint may be filed directly with the Federal Transit Administration Office of Civil Rights, Attention: Complaint Team, East Building, 5th Floor – TCR, 1200 New Jersey Avenue, SE, Washington, DC 20590 or call 888-446-4511.

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