

2020 Rail Fixed Guideway Public Transportation System Safety Report

WSDOT STATE SAFETY OVERSIGHT PROGRAM



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WSDOT's State Safety Oversight Program helps ensure that rail transit agencies in Washington implement and comply with their safety programs.

As part of this effort, the State Safety Oversight Program oversees rail transit agencies' efforts to track, mitigate, and eliminate hazards in their systems.

The State Safety Oversight Program publishes this report annually to document the safety of rail transit agencies in the state. The report also fulfills reporting requirements in [RCW 81.104.115](#) and [49 CFR Part 674](#).¹

¹ WSDOT submits an online report directly to the Federal Transit Administration (FTA) by March 15 annually. *The Rail Fixed Guideway Public Transportation System Safety Report* consolidates information in the online report in a narrative report to meet the state's reporting requirement.

INTRODUCTION

In 1996, the Federal Transit Administration (FTA) authorized rail state safety oversight programs in 49 U.S.C. Section 5330. Washington established the State Safety Oversight Program in 1997 when then Governor Gary Locke designated WSDOT as the state safety oversight agency.

In 2012, as part of Moving Ahead for Progress in the 21st Century Act, Congress set higher expectations and responsibilities for safety oversight and safety performance for transit agencies, states, and FTA in 49 U.S.C. Section 5329.

In 2016, FTA published 49 CFR Part 674, a final rule based on Section 5329. The rule strengthened state safety oversight agencies' authority to investigate accidents and oversee rail properties' implementation of system safety program plans and public transportation agency safety plans.

In 2018, FTA certified the State Safety Oversight Program as compliant with 49 CFR Part 674 with a letter to Governor Jay Inslee.

To communicate its safety oversight responsibilities for rail transit agencies, the State Safety Oversight Program publishes the [Washington State Rail Safety Oversight Program Standard](#). The program standard establishes safety requirements for operators of rail fixed guideway public transportation systems.

The State Safety Oversight Program uses reviews, inspections, and investigations of the systems to ensure compliance with the program standard, as well as state and federal laws and rules.

The State Safety Oversight Program has safety oversight over the following rail transit agencies and their rail fixed guideway public transportation systems:

- **Sound Transit (agency)**
 - Link Light Rail (system)
 - Tacoma Link (system)
- **City of Seattle (agency)**
 - Seattle Streetcar (system)
 - Seattle Center Monorail (system)

FTA defines rail fixed guideway public transportation systems as any fixed guideway system that:

- Uses rail.
- Operates for public transportation.
- Is within the jurisdiction of a state.
- Is not under the jurisdiction of the Federal Railroad Administration.

Rail fixed guideway public transportation systems include rapid rail, heavy rail, light rail, monorail, trolley, inclined plane, funicular, and automated guideway. The systems exclude Amtrak passenger rail and ferry service.

RAIL FIXED GUIDEWAY PUBLIC TRANSPORTATION SYSTEMS IN WASHINGTON

SOUND TRANSIT

Link Light Rail

- Accidents and incidents in 2020: 7
- Open corrective action plans in 2020: 12

System Description

Sound Transit owns Link Light Rail and contracts with King County Metro for operations and maintenance of Link Light Rail. As the owner of the system, Sound Transit has safety, fiscal and performance oversight of the contract.

In July 2009, Sound Transit opened the initial 13.9-mile-long segment of Link Light Rail. The segment includes sections of aerial, tunnel, and at-grade track. The segment also utilizes the Downtown Seattle Transit Tunnel.

In December 2009, Sound Transit opened an aerial 1.7-mile-long extension between Tukwila International Boulevard and Seattle-Tacoma International Airport, known as the Airport Link.

In March 2016, Sound Transit opened a 3.5-mile-long northern extension known as the University Link. The extension includes twin-bored tunnel track and two new underground stations at Capitol Hill and the University of Washington.

In September 2016, Sound Transit opened an aerial 1.6-mile-long extension from the SeaTac Airport Station at the southern terminus of the Airport Link. Known as the South 200th Street Extension, it also includes the Angle Lake station.

The Link Light Rail trains are 95 feet long and weigh approximately 105,000 pounds. The vehicles are double articulated with a three-truck (six-axle) configuration. The trains are capable of running up to four-cars. An overhead contact wire energized at 1,500 volts of direct current powers the trains. Alternating-current motors propel the trains. Each train's capacity limit is 200 passengers, with seating for 74 passengers.



Sound Transit is planning future extensions of Link Light Rail, including:

- Northgate Link Light Rail Expansion: North to Lynnwood and Everett**
 Sound Transit plans to open the Northgate Link Light Rail Expansion in October 2021. The extension will add three stations and over four miles to the system.
- East Link: East to Redmond**
Sound Transit plans to open East Link in 2024.
 The extension will add more than two stations, 150 rail vehicles, and over three miles to the system.

- South to Kent, Des Moines, Federal Way, and the Tacoma Dome**

With this extension, Link Light Rail will connect with Tacoma Link by 2030. The extension will add more than four stations and over 10 miles to the system.

Sound Transit expects Link Light Rail to grow to more than 62 miles of track by 2024. The annual capital budget for the system is \$2.5 billion.

Tacoma Link

- Accidents and incidents in 2020: 0
- Open corrective action plans in 2020: 0

System Description

Sound Transit owns, operates, and maintains Tacoma Link.

Tacoma Link began service in August 2003. The system runs for 1.6 miles through downtown Tacoma (Tacoma Dome Station to the Theater District/South 9th Street Station), making six stops along the route. Sound Transit added the Theater District Station in 2011. Each station has low-level boarding platforms, shelter canopies, pedestrian and street lighting, benches, and an information aide. Sound Transit plans to add 2.4 miles and six new stations by 2022 and another six-mile extension by 2039.

Tacoma Link light-rail trains run every 12 to 24 minutes depending on the time of day. Rides on the system are free thanks to funding from the Tacoma Business Improvement Area.

Tacoma Link uses three Skoda 10T electric-powered, light-rail vehicles. The vehicles travel at street level and an overhead catenary wire energized at 750 volts of direct current supplies power. Each vehicle operates as a single car. Cabs at either end allow operators to alternate the direction of travel without turning the

cars around. The vehicles have a maximum capacity of 56 passengers.

Tacoma Link's operation and maintenance facility is located just east of the Tacoma Dome Station at the southern terminus of the line. The facility provides ongoing daily maintenance, running repair, and regular inspections. The operation and maintenance facility also houses the administrative offices for Tacoma Link operations and an operator check-in and dispatch area.



CITY OF SEATTLE

Seattle Streetcar

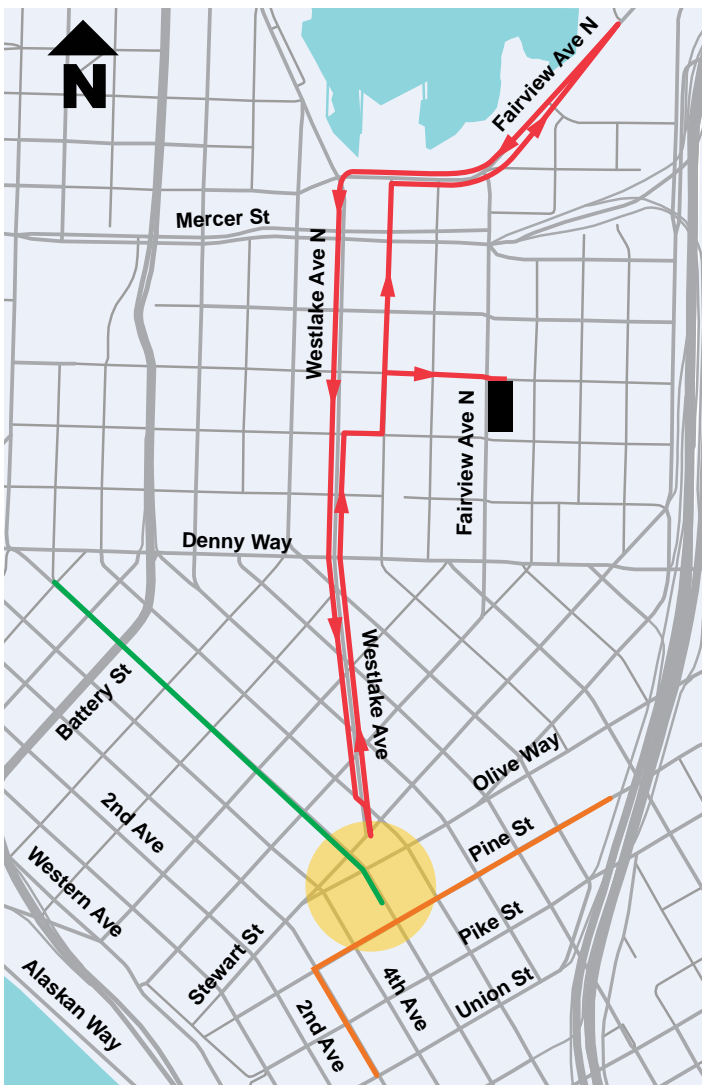
- Accidents and incidents in 2020: 0
- Open corrective action plans in 2020: 3

System Description

The Seattle Streetcar is equipped and owned by the City of Seattle and is operated and maintained by King County Metro under an interlocal agreement established in 2007.

The Seattle Streetcar consists of two lines:

- **The South Lake Union Streetcar**
A 1.3-mile-long, seven-stop line connecting the South Lake Union neighborhood to Downtown Seattle. The line opened to the public in 2007.



South Lake Union Streetcar

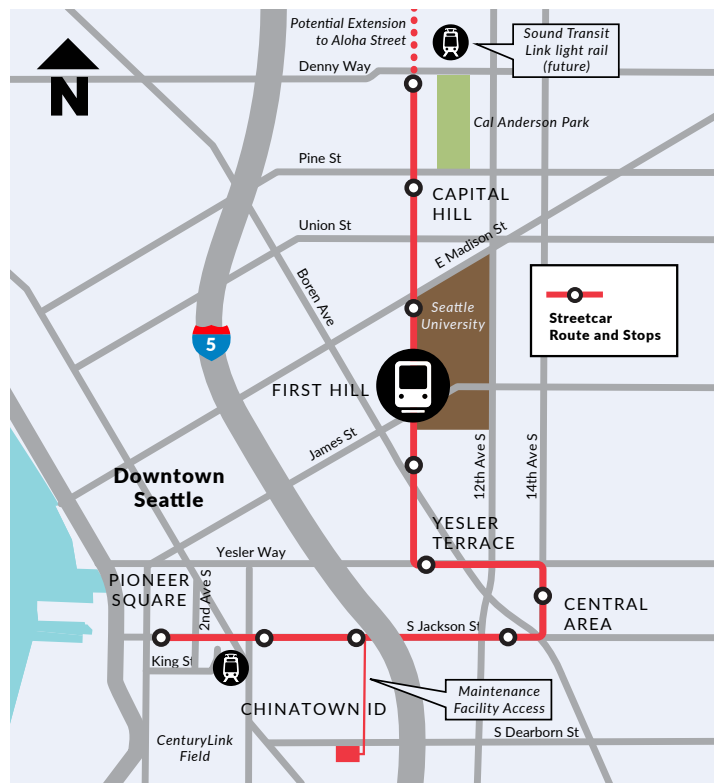
- **The First Hill Streetcar**
A 2.5-mile-long, 10-stop line connecting Pioneer Square and Capitol Hill via Chinatown, Little Saigon, Yesler Terrace, and First Hill. The line opened to the public in January 2016.

Both routes offer frequent service, with streetcars arriving every 10-15 minutes except late at night.

The system has 21 operators and normally recruits new operators from the King County Metro bus service.

The South Lake Union Streetcar fleet consists of three modern streetcars supplied by Inekon. The air-conditioned, ADA-accessible streetcars carry up to 140 passengers.

The First Hill Streetcar fleet consists of six, 66-foot-long modern streetcar vehicles. The cars draw traction power from an overhead contact system providing 750 volts of direct current, and operate with power from an on-board energy-storage system. Each car seats 30 passengers and accommodates another 40 standing passengers. Two wheelchair passenger locations are in the standing area.



First Hill Streetcar

Seattle Center Monorail

- Accidents and incidents in 2020: 0
- Open corrective action plans in 2020: 10

System Description

The City of Seattle owns the Seattle Center Monorail. Seattle Monorail Services has operated and maintained the monorail under contract since 1994. Seattle Monorail Services is a private corporation owned by RailSafe Inc., and is responsible for all aspects of its obligations under the concession agreement between Seattle Monorail Services and the City of Seattle.

The Monorail was built for the 1962 Seattle World's Fair to link the fairgrounds with downtown Seattle. The system is slightly less than 1 mile in length at the present day, but, when it opened in 1962, it extended beyond Westlake Center and was slightly longer than 1 mile.

More than 60 pre-stressed, 70-foot-tall concrete piers support the track the Monorail rides on. The elevated tracks allow for minimal interference with vehicle traffic. The system is composed of two trains (Blue and Red). Each train runs on a dedicated beam. ALWEG Rapid Transit Company built the trains in West Germany in 1961. The trains operate on 700 volts of direct current supplied by contact rails on each beam.

The Monorail has become an important fixture in Seattle for residents and tourists, serving as a link to the light-rail station at Westlake Center or to tourist destinations in Seattle Center.

The Monorail trains typically run in one direction at a time. The one-way trip departs every 10 minutes with a travel time of about two minutes. The trains operate at a top speed of 50 miles per hour, making the Monorail the fastest full-sized monorail system in the United States. Each train can carry up to 200 passengers per trip. With the current hours of operation Monday–Friday, 7:30 a.m.–11 p.m. and Saturday–Sunday, 8:30 a.m.–11 p.m., the trains carry approximately 5,000–8,000 passengers per day or about 2–3 million passengers per year.



2020 STATE SAFETY OVERSIGHT PROGRAM UPDATES

Throughout 2020, WSDOT's State Safety Oversight Program worked with rail transit agencies as the agencies prepared their public transportation agency safety plans. This work included reviewing FTA guidance about the four components of safety management systems, and roles of the accountable executive and chief safety officer. The work also included discussing the relationship between the outgoing system safety program plan and the incoming agency safety plan.

In June 2020, the State Safety Oversight Program began coordinating with Sound Transit, FTA and a project management oversight consultant on integrating efforts to safety certify near-term projects, including Northgate Link, Hilltop, operations and maintenance facility-east, and new rail vehicles. The State Safety Oversight Program is responsible for reviewing safety certification materials and activities. The goal of this review is to issue a concurrence that Sound Transit's certification of projects entering service complies with state and federal safety and security requirements. Safety certification will keep the program busy into 2040.

From Summer to Fall of 2020, Seattle Streetcar, Seattle Center Monorail, Link Light Rail and Tacoma

Link finalized their public transit agency safety plans. The State Safety Oversight program reviewed each plan for compliance with federal standards.

In September 2020, the State Safety Oversight Program completed a full review and update of its Rail Safety Oversight Program Standard. The updated program standard better defines the state's activities in rail transit safety oversight. Throughout the update, the State Safety Oversight Program collaborated with the two agencies it oversees, gathering comments and sharing revisions up until final publication.

In 2020, the program devoted 5,998 employee hours to carry out its responsibilities. WSDOT employees involved in administering the program included:

- State Safety Oversight Program manager
- WSDOT Public Transportation Division director
- Transit safety oversight specialists
- FTA compliance officer
- WSDOT Public Transportation Division Capital Program manager
- Data analyst
- Administrative assistant

ACCIDENTS, INCIDENTS, AND CORRECTIVE ACTION PLANS

Rail transit agencies report accidents and incidents to WSDOT's State Safety Oversight Program that meet at least one of the following thresholds:

- Fatality
- Serious injuries
- Collision involving a rail transit vehicle
- Runaway train
- Evacuation for life safety reasons
- Derailment
- Property damage that disrupts operations

When an accident or incident occurs, the rail transit agency conducts an investigation on the State Safety Oversight Program's behalf using approved investigation procedures. The State Safety Oversight Program may also choose to conduct its own investigation in addition or complementary to the rail transit agency's investigation. The State Safety

Oversight Program's role in every investigation is to:

- Ensure that investigators collect and analyze all available evidence.
- The program has access to all of the evidence.
- Ensure that investigators examine probable root causes and causal factors of the accident or incident.

Once the investigation is complete, the State Safety Oversight Program must adopt a final investigation report.

For any accident or incident, the State Safety Oversight Program ensures that rail transit agencies eliminate or adequately mitigate the hazards and deficiencies that caused it. In some cases, elimination and mitigation require the development of a corrective action plan. The State Safety Oversight Program and the rail transit agency track the corrective action plan until the agency completes the plan.

Accidents and incidents

| Sound Transit | | | | | | | | City of Seattle | | | | | | | | Total | | | |
|-----------------|------|------|------|-------------|------|------|------|-------------------|------|------|------|-------------------------|------|------|------|-------|------|------|------|
| Link Light Rail | | | | Tacoma Link | | | | Seattle Streetcar | | | | Seattle Center Monorail | | | | | | | |
| 2017 | 2018 | 2019 | 2020 | 2017 | 2018 | 2019 | 2020 | 2017 | 2018 | 2019 | 2020 | 2017 | 2018 | 2019 | 2020 | 2017 | 2018 | 2019 | 2020 |
| 13 | 10 | 17 | 7 | 2 | 1 | 3 | 0 | 3 | 6 | 6 | 0 | 0 | 0 | 0 | 0 | 18 | 17 | 26 | 7 |

Accident and incident roll-up*

| Type | Sound Transit | | | | | | | | City of Seattle | | | | | | | | Total | | | |
|-----------------|-----------------|------|------|------|-------------|------|------|------|-------------------|------|------|------|-------------------------|------|------|------|-------|------|------|------|
| | Link Light Rail | | | | Tacoma Link | | | | Seattle Streetcar | | | | Seattle Center Monorail | | | | | | | |
| | 2017 | 2018 | 2019 | 2020 | 2017 | 2018 | 2019 | 2020 | 2017 | 2018 | 2019 | 2020 | 2017 | 2018 | 2019 | 2020 | 2017 | 2018 | 2019 | 2020 |
| Fatality | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 |
| Serious injury | 3 | 3 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 3 | 2 | 2 |
| Collision | 13 | 9 | 16 | 5 | 2 | 1 | 2 | 0 | 3 | 6 | 6 | 0 | 0 | 0 | 0 | 0 | 18 | 17 | 24 | 5 |
| Runaway train† | -- | 0 | 0 | 0 | -- | 0 | 0 | 0 | -- | 0 | 0 | 0 | -- | 0 | 0 | 0 | -- | 0 | 0 | 0 |
| Evacuation | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 |
| Derailment | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| Property damage | 2 | 1 | 14 | 3 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 16 | 3 |

* A single accident or incident may meet a number of thresholds. As an example, a collision may cause property damage that disrupts operations and result in an injury.

† The FTA did not require tracking of “runaway train” until certifying the State Safety Oversight Program as compliant with 49 CFR Part 674 and 673 in July 2018.

Corrective action plans‡

| Sound Transit | | | | | | | | City of Seattle | | | | | | | | Total | | | |
|-----------------|------|------|------|-------------|------|------|------|-------------------|------|------|------|-------------------------|------|------|------|-------|------|------|------|
| Link Light Rail | | | | Tacoma Link | | | | Seattle Streetcar | | | | Seattle Center Monorail | | | | | | | |
| 2017 | 2018 | 2019 | 2020 | 2017 | 2018 | 2019 | 2020 | 2017 | 2018 | 2019 | 2020 | 2017 | 2018 | 2019 | 2020 | 2017 | 2018 | 2019 | 2020 |
| 11 | 4 | 17 | 12 | 4 | 2 | 3 | 0 | 11 | 1 | 23 | 3 | 6 | 5 | 17 | 10 | 32 | 12 | 60 | 25 |

‡ Because some corrective action plans require the mitigation and planning of multiple parties over an extended period, the State Safety Oversight Program may track corrective action plans over a number of reporting periods before they are resolved. Additionally, accident and incident totals may not match annual corrective action plan totals because not all accidents and incidents necessitate a corrective action.

2020 accidents and incidents detail: Sound Transit, Link Light Rail

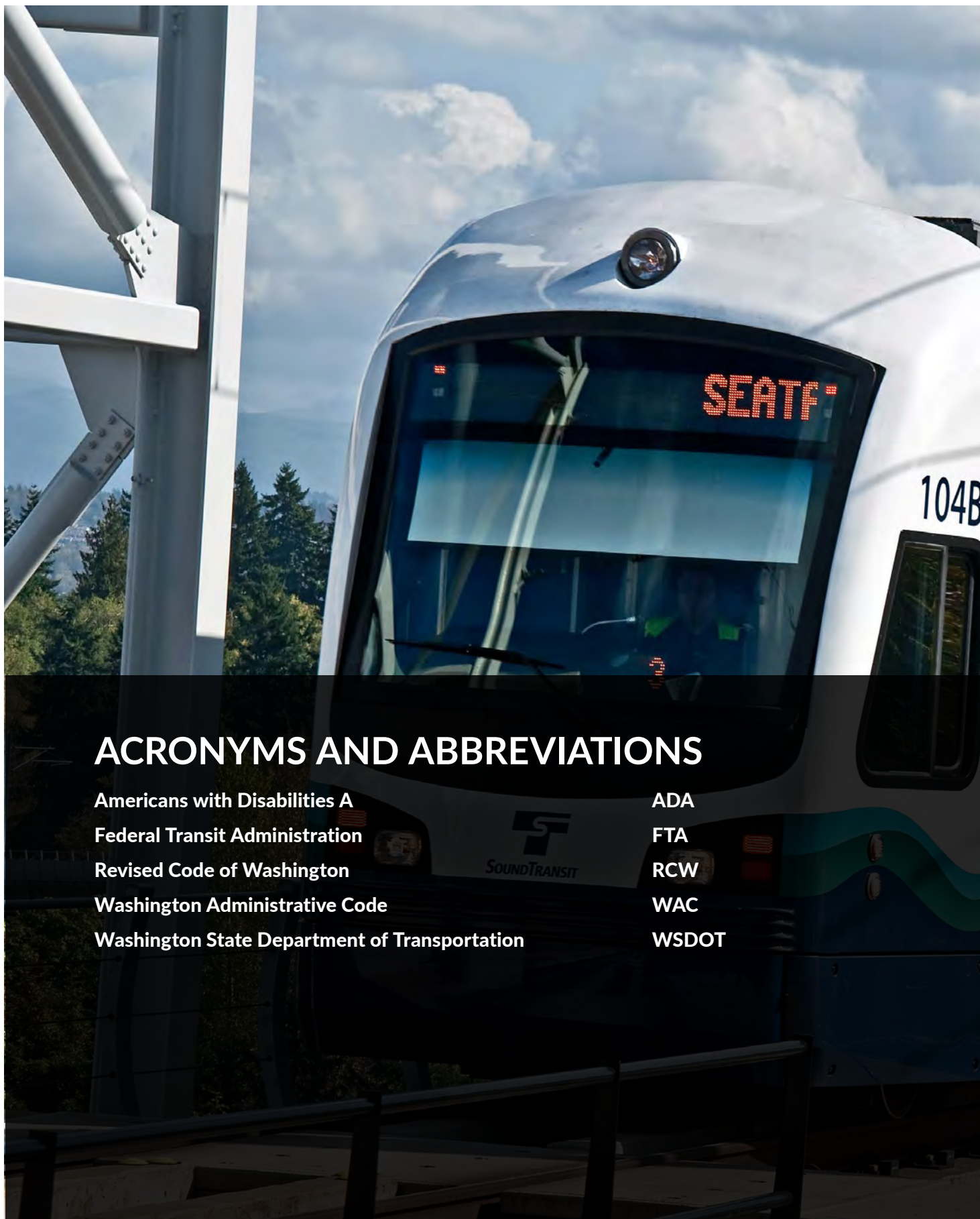
| Count | Date | Type | Location | Collision with | Fatalities | Injuries | Property damage | Derailment | Probable cause | Description | Response |
|-------|-------------|-----------------------------------|---|-----------------------------|------------|----------------------------------|-----------------|------------|---|---|--|
| 1 | February 25 | Other | Revenue facility: transit station | N/A | 0 | 0 | Not significant | No | Evacuation for life safety reasons | Transit security evacuated station per Seattle Police Department for shots fired. Shots were fired off-property. Police swept station and cleared it for normal operation. | Based on feedback from the State Safety Oversight Program, Sound Transit and King County Metro worked to improve their notification procedures to better align with Washington State Rail Safety Oversight Program Standard requirements. |
| 2 | March 4 | Railroad-grade crossing collision | Right-of-way: grade crossing | Personally-operated vehicle | 0 | 0 | Significant | No | Action of motorist | Personally-operated vehicle attempted illegal left turn. Train made contact with vehicle causing minor damage to train. Vehicle made secondary contact with train causing significant damage to train and minor damage to vehicle. | Sound Transit required all light-rail operators to participate in retraining for defensive train operations. The training also emphasized safer operations on the Martin Luther King corridor, where this accident occurred. ² |
| 3 | May 20 | Railroad grade crossing collision | Right-of-way: grade crossing | Person | 0 | 1 pedestrian, serious | Not significant | No | Operator failed to recognize the hazard that was posed by the pedestrian and pedestrian actions | Pedestrian was outside of the pedestrian cage and intruding into dynamic envelope of train. Train operator failed to operate defensively and did not slow down or attempt emergency braking until after point of collision. Pedestrian was pinned between the cage and train. Pedestrian transported to hospital with serious injury. | Sound Transit and King County Metro recommended enacting speed reductions through grade crossings along the Martin Luther King corridor, where this accident occurred. Sound Transit also performed a review of all pedestrian grade crossings on the system to determine if there is adequate protection for pedestrians and bicyclists. The operator involved in this accident received retraining for defensive train operations. The training also emphasized safer operations on the Martin Luther King corridor. |
| 4 | August 25 | Other | Right-of-way/ Revenue facility: transit station | N/A | 0 | 2 transit employees, non-serious | Not significant | No | Operating rule violation/human factors | Station evacuated as a precaution (and due to error in report of specific location) due to runaway road-rail vehicle. | Sound Transit reviewed and accepted an independent contractor's proposed solutions to prevent similar incidents. Solutions included: <ul style="list-style-type: none"> • Training for work zone set up and maintenance. • Meetings to review the incident, root causes and corrective actions. • Operator requirements for road-rail vehicles. • Field audits of work zone set-ups and track-access permits. |
| 5 | November 7 | Railroad-grade crossing collision | Right-of-way: grade crossing | Personally-operated vehicle | 0 | 0 | Significant | No | Action of motorist | Personally-operated vehicle attempted illegal left turn and train made contact with vehicle. Minor damage to train. Significant damage to vehicle. | Sound Transit and King County Metro recommended enacting speed reductions through grade crossings along the Martin Luther King corridor, where this accident occurred. ³ |

² As of publication, Sound Transit is collaborating with Seattle Department of Transportation to adjust signals and traffic lights.

³ Ibid.

| Count | Date | Type | Location | Collision with | Fatalities | Injuries | Property damage | Derailment | Probable cause | Description | Response |
|-------|-------------|---------------------------------------|------------------------------------|-----------------------------|------------|-----------------------|-----------------|------------|--------------------|--|---|
| 6 | November 11 | Non-railroad-grade crossing collision | Right-of-way: not a grade crossing | Person | 0 | 1 pedestrian, serious | Not significant | No | Pedestrian actions | Pedestrian was leaning on right rail with their back to the train. Train made contact with pedestrian. Pedestrian transported for medical attention. | King County recommended that Sound Transit evaluate the lighting along the SODO Busway, where this accident occurred. Improved lighting might make pedestrians more visible. |
| 7 | December 23 | Railroad-grade crossing collision | Right-of-way: grade crossing | Personally-operated vehicle | 0 | 0 | Significant | No | Action of motorist | Personally-operated vehicle made an illegal left and stopped in right-of-way as train approached. Front of train made contact with vehicle. Vehicle was towed. | Sound Transit and King County Metro recommended enacting speed reductions through grade crossings along the Martin Luther King corridor, where this accident occurred. ⁴ |

⁴ Ibid.



ACRONYMS AND ABBREVIATIONS

Americans with Disabilities A

Federal Transit Administration

Revised Code of Washington

Washington Administrative Code

Washington State Department of Transportation

ADA

FTA

RCW

WAC

WSDOT



WEBSITES FEATURED

CW 81.104.115: app.leg.wa.gov/RCW/default.aspx?cite=81.104.115

49 CFR Part 674: www.gpo.gov/fdsys/granule/CFR-2016-title49-vol7/CFR-2016-title49-vol7-part674

Washington State Rail Safety Oversight Program Standard:

<https://wsdot.wa.gov/publications/manuals/fulltext/M3138/Rail-Safety-Oversight-Program-Standard.pdf>

[WashingtonStateRailSafetyOversightProgramStandard2018edition.pdf](#)

49 CFR Part 659: www.gpo.gov/fdsys/granule/CFR-2012-title49-vol7/CFR-2012-title49-vol7-part659/content-detail.html

WAC 468-550: app.leg.wa.gov/wac/default.aspx?cite=468-550&full=true

49 CFR Part 673: www.govinfo.gov/content/pkg/FR-2016-02-05/pdf/2016-02017.pdf

MORE INFORMATION

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