

2019 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 program oversees these agencies' efforts to track, mitigate, and eliminate hazards in their systems.

The program publishes this report annually to fulfill state and federal reporting requirements in [RCW 81.104.115](#) and [49 CFR Part 674](#).¹

INTRODUCTION

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 fixed guideway public transportation that is not on rail, such as ferry service.

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

The 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 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)

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.

RAIL FIXED GUIDEWAY PUBLIC TRANSPORTATION SYSTEMS IN WASHINGTON

SOUND TRANSIT

Link Light Rail

The Link Light Rail system is owned and operated by Sound Transit.

- Accidents and incidents in 2019: 17
- Open corrective action plans in 2019: 17

System Description

Sound Transit owns Link Light Rail. Sound Transit contracts with King County Metro for operations and maintenance of Link Light Rail under an intergovernmental agreement. As the owner of the system, Sound Transit has fiscal and performance oversight for 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 April 2021. The extension will add 10 stations and 40 cars to the system.

- **East Link: East to Redmond**
Sound Transit plans to open East Link in July 2023. The extension will add more than 200 cars.
- **South to Kent, Des Moines, Federal Way, and the Tacoma Dome**
With this extension, Link Light Rail will connect with Tacoma Link.

Sound Transit expects Link Light Rail to grow to more than 112 miles of track by 2040. The annual budget for the system is \$3.7 billion

Tacoma Link

- Accidents and incidents in 2019: 3
- Open corrective action plans in 2019: 3

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

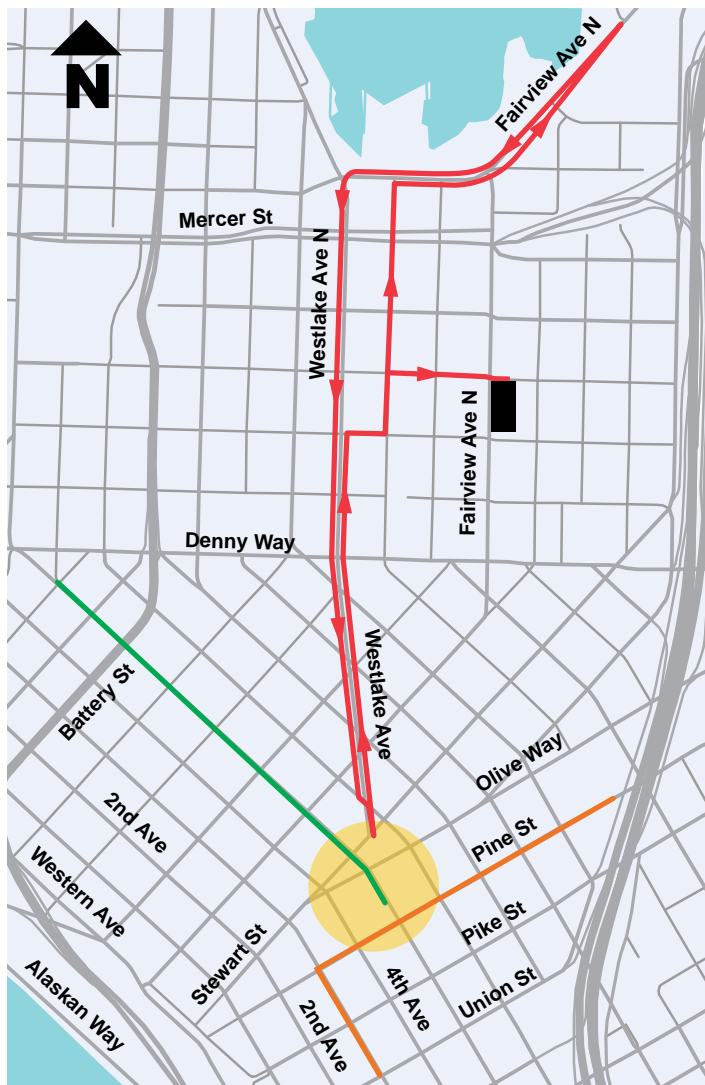
- Accidents and incidents in 2019: 6
- Open corrective action plans in 2019: 23

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

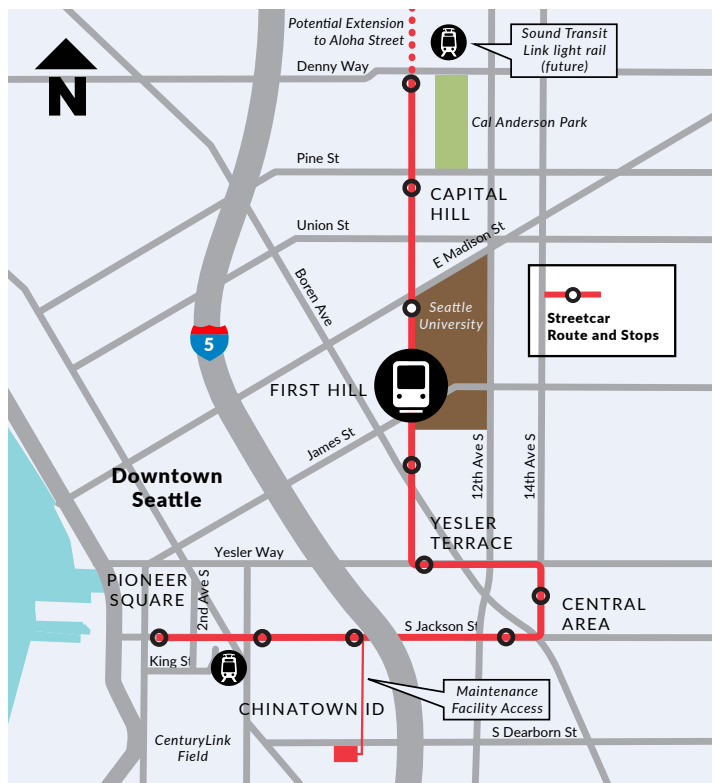
- **The First Hill Streetcar**
A 2.5-mile-long, 10-stop line connecting Pioneer Square and Capitol Hill via Chinatown, Little Saigon, Yesler Terrace, and First Hill. The line opened to the public in January 2016.

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 2019: 0
- Open corrective action plans in 2019: 17

System Description

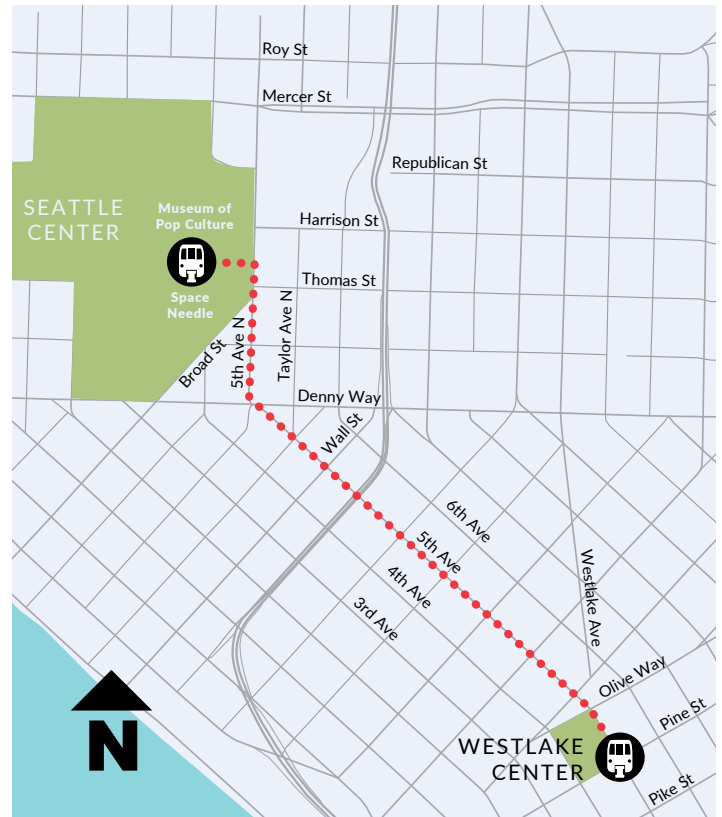
The City of Seattle owns the Seattle Center Monorail. Seattle Monorail Services has operated and maintained the monorail under contract since 1994. Seattle Monorail Services is a private corporation owned by RailSafe Inc., and is responsible for all aspects of its obligations under the concession agreement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



2019 STATE SAFETY OVERSIGHT PROGRAM UPDATES

In addition to day-to-day oversight responsibilities, the State Safety Oversight Program issued four triennial safety audits in March 2019. The program issued a combined 15 findings to the state's two rail transit agencies. Each agency has since responded and, as a result, the program has closed most of the findings.

In September 2019, the FTA conducted its triennial audit of the program. The onsite portion of the audit was successful, and the program looks forward to receiving the draft of FTA's report once it is available.

Throughout 2019, program staff continued to work with rail transit agency staff regarding the preparation of their public transportation agency safety plan. This work included reviewing FTA guidance about:

- Four components of safety management systems
- 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 2019, the program devoted 4,300 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 – Interim State Safety Oversight Program manager
- Transit safety oversight specialists
- FTA compliance officer
- Legal counsel
- 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 the 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 agency conducts an investigation on the program's behalf using approved investigation procedures. The program may also choose to conduct its own investigation in addition or complimentary to the agency's investigation.

The 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 program must adopt a final investigation report.

For any accidents or incidents, the program ensures that 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 program and the 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	2017	2018	2019	2017	2018	2019	2017	2018	2019	2017	2018	2019
13	10	17	2	1	3	3	6	6	0	0	0	18	17	26

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	2017	2018	2019	2017	2018	2019	2017	2018	2019	2017	2018	2019
Fatality	2	0	0	0	0	0	0	0	0	0	0	0	2	0	0
Serious injury	3	3	2	0	0	0	0	0	0	0	0	0	3	3	2
Collision	13	9	16	2	1	2	3	6	6	0	0	0	18	17	24
Runaway train†	--	0	0	--	0	0	--	0	0	--	0	0	--	0	0
Evacuation	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Derailment	1	0	0	1	0	1	0	0	0	0	0	0	0	0	1
Property damage	2	1	14	0	0	2	0	0	0	0	0	0	2	1	16

* 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	2017	2018	2019	2017	2018	2019	2017	2018	2019	2017	2018	2019
11	4	17	4	2	3	11	1	23	6	5	17	32	12	60

‡ 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.

2019 accidents and incidents detail: Sound Transit, Link Light Rail

Count	Date	Type	Location	Collision with	Fatalities	Injuries	Property damage	Derailment	Probable cause	Description
1	January 3	Collision	Right-of-way: grade crossing	Personally operated vehicle	0	0	Significant	No	Action of motorist	Personally operated vehicle attempted illegal left turn in front of train.
2	February 19	Collision	Transit station	Personally operated vehicle	0	0	Significant	No	Action of motorist	Collision between two personally operated vehicles caused one personally operated vehicle to strike a train servicing a transit station.
3	February 28	Collision	Right-of-way: not at grade crossing	Fixed object	0	0	Significant	No	Operating rule violation/ human factors	Train made contact with a tire in the track.
4	March 26	Collision	Right-of-way: grade crossing	Personally operated vehicle	0	0	Significant	No	Action of motorist	Personally operated vehicle attempted left turn on red light in front of train.
5	March 13	Collision	Right-of-way: grade crossing	Personally operated vehicle	0	0	Significant	No	Action of motorist	Personally operated vehicle ran red light and struck train.
6	April 9	Collision	Right-of-way: grade crossing	Personally operated vehicle	0	0	Significant	No	Action of motorist	Personally operated vehicle turned into path of train at left-turn-prohibited signal.
7	April 18	Collision	Right-of-way: grade crossing	Personally operated vehicle	0	0	Significant	No	Action of motorist	Personally operated vehicle attempted left turn on red light in front of train.
8	May 7	Collision	Right-of-way: grade crossing	Personally operated vehicle	0	0	Significant	No	Action of motorist	Police vehicle with emergency lights activated made left turn ahead of the train across track against red turn light. Second police vehicle with lights activated attempted same left turn as train was entering intersection.
9	June 3	Collision	Right-of-way: grade crossing	Personally operated vehicle	0	0	Significant	No	Action of motorist	Personally operated vehicle attempted left turn on red light in front of train.
10	July 12	Collision	Non-revenue facility	Rail transit vehicle/rail passenger train – not in revenue service	0	0	Not significant	No	Other	Minor collision between two light rail vehicles in train yard.
11	July 27	Collision	Transit station	Person	0	1	Not significant	No	Pedestrian actions	Person fell from station platform into trackway as train neared platform. The front of the train made contact with the person. Person injured and transported to hospital.
12	July 29	Collision	Right-of-way: grade crossing	Personally operated vehicle	0	1	Significant	No	Action of motorist	Personally operated vehicle attempted illegal left turn in front of train. Vehicle driver injured and transported to hospital.
13	September 7	Collision	Grade crossing at track switch	Personally operated with fixed object	0	0	Significant	No	Other	Collision between two personally operated vehicles blocked tracks near station platform. No transit vehicles involved. Track switch damaged.

2019 accidents and incidents detail: Sound Transit, Link Light Rail (continued)

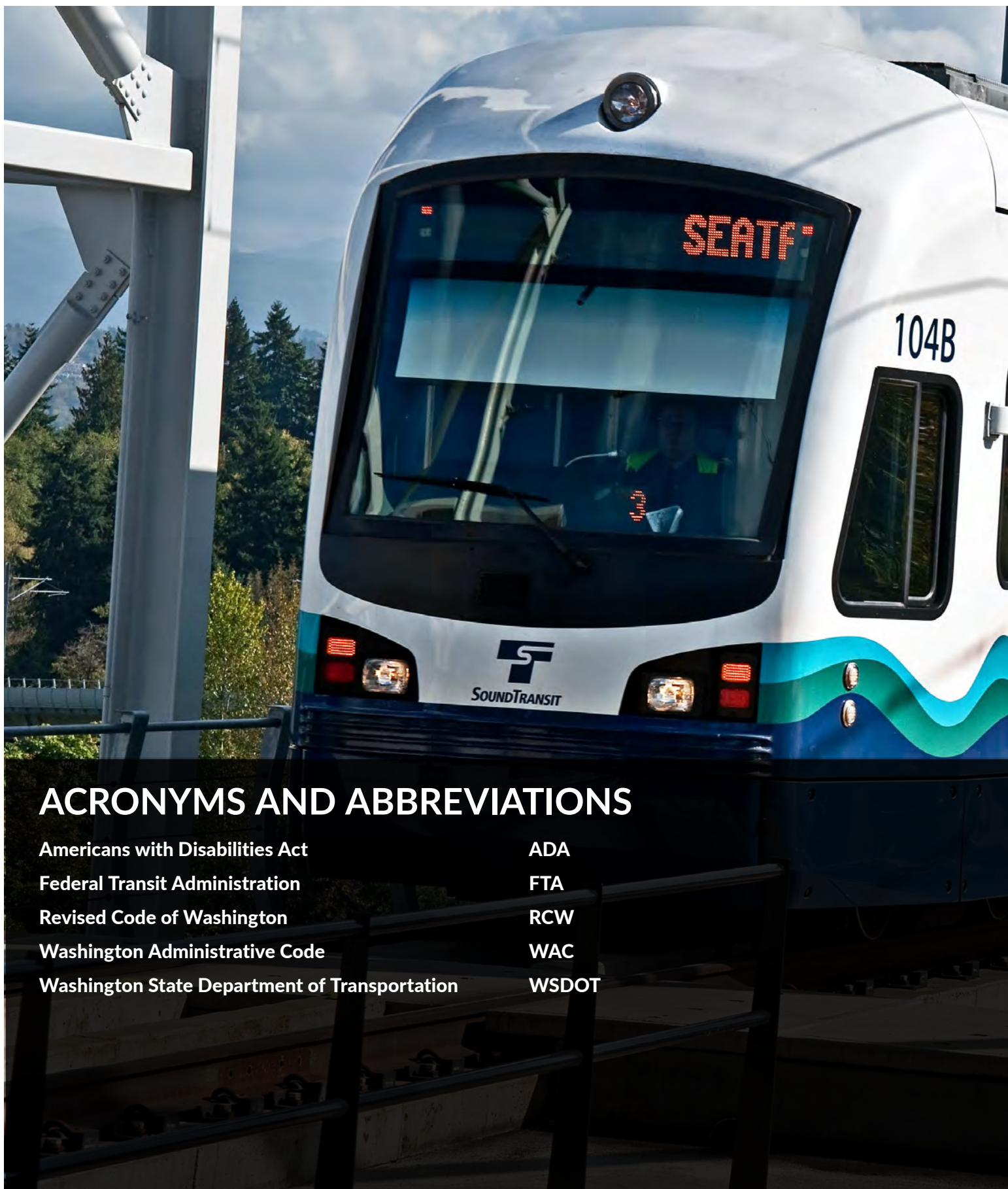
Count	Date	Type	Location	Collision with	Fatalities	Injuries	Property damage	Derailment	Probable cause	Description
14	September 27	Collision	Right-of-way: grade crossing	Personally operated vehicle	0	0	Significant	No	Action of motorist	Personally operated vehicle attempted illegal left turn across the path of the train.
15	September 20	Collision	Right-of-way: grade crossing	Personally operated vehicle	0	0	Significant	No	Action of motorist	Personally operated vehicle attempted illegal left turn in front of train.
16	October 23	Evacuation	Transit station	N/A	0	0	N/A	No	Equipment failure	Belt in air handler caught and rubbed, creating smoke and triggering fire alarm.
17	December 24	Collision	Right-of-way: grade crossing	Personally operated vehicle	0	0	Significant	No	Action of motorist	Personally operated vehicle attempted illegal left turn as train was entering intersection.

2019 accidents and incidents detail: Sound Transit, Tacoma Link

Count	Date	Type	Location	Collision with	Fatalities	Injuries	Property damage	Derailment	Probable cause	Description
1	May 4	Collision	Right-of-way: grade crossing	Personally operated vehicle	0	0	Significant	No	Action of motorist	Personally operated vehicle attempted left turn on red light in front of train.
2	September 9	Derailment	Right-of-way: track way	N/A	0	0	Not significant	Yes	Operating Rule violation/human factors	During inspection in yard track, operator did not observe misaligned track, causing derailment.
3	December 3	Collision	Right-of-way: grade crossing	Personally operated vehicle	0	0	Significant	No	Action of motorist	Personally operated vehicle attempted left turn on red light in front of train.

2019 accidents and incidents detail: City of Seattle, Seattle Streetcar

Count	Date	Type	Location	Collision with	Fatalities	Injuries	Property damage	Derailment	Probable cause	Description
1	April 4	Collision	Right of way: track way	Personally operated vehicle	0	0	Not significant	No	Action of motorist	Personally operated vehicle disobeyed traffic signs and attempted illegal right turn in front of streetcar.
2	May 6	Collision	Right of way: track way	Personally operated vehicle	0	0	Not significant	No	Action of motorist	Personally operated vehicle entered the streetcar's dynamic envelope making contact.
3	May 9	Collision	Right of way: track way	Personally operated vehicle	0	0	Not significant	No	Operating rule violation/human factors	Streetcar operator proceeded through intersection when the streetcar's dynamic envelope was not clear of traffic.
4	May 14	Collision	Right of way: track way	Personally operated vehicle	0	0	Not significant	No	Action of motorist	Personally operated vehicle disobeyed traffic signs and attempted illegal right turn in front of streetcar.
5	June 10	Collision	Right of way: track way	Personally operated vehicle	0	0	Not significant	No	Action of motorist	Personally operated vehicle disobeyed traffic signs and attempted illegal right turn in front of streetcar.
6	December 14	Collision	Right of way: track way	Object	0	0	Not significant	No	Action of pedestrian	Individual on skateboard entered crosswalk against signal crosswalk indication. Skateboard made contact with streetcar. Pedestrian did not make contact.



ACRONYMS AND ABBREVIATIONS

Americans with Disabilities Act

ADA

Federal Transit Administration

FTA

Revised Code of Washington

RCW

Washington Administrative Code

WAC

Washington State Department of Transportation

WSDOT



WEBSITES FEATURED

RCW 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://www.wsdot.wa.gov/sites/default/files/2014/09/23/PTProgramStandard-WashingtonStateRailSafetyOversight-2018.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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