

2017 Rail Fixed Guideway Public Transportation System Safety Report

WSDOT STATE SAFETY OVERSIGHT PROGRAM



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INTRODUCTION

WSDOT's State Safety Oversight program (SSO) is required to publish the *Rail Fixed Guideway Public Transportation System Safety Report* annually. This is the first such annual report. This report fulfills the state and federal reporting requirements outlined in [RCW 81.104.115](#) and [49 CFR Part 674](#), respectively.

The *Rail Fixed Guideway Public Transportation System Safety Report* presents data and narratives relevant to the work of SSO during 2017. The report also details SSO's ongoing effort to implement new safety regulations for rail transit agencies (RTA) and their rail fixed guideway public transportation systems (RFGPTS) in accordance with federal regulations.

About WSDOT's State Safety Oversight Program

SSO is responsible for ensuring that RTAs implement RFGPTS safety programs in Washington state. The program also ensures that all hazards are being addressed through mitigation or elimination.

RFGPTS are defined by the Federal Transit Administration (FTA) as any fixed guideway system that uses rail, are operated for public transportation, are within the jurisdiction of a State, and are not subject to the jurisdiction of the Federal Railroad Administration. This includes systems still in the engineering or construction phases. More specifically, RFGPTS include rapid rail, heavy rail, light rail, monorail, trolley, inclined plane, funicular, and automated guideway. RFGPTS exclude Amtrak passenger rail and fixed guideway public transportation that is not on rail, such as ferry service (49 CFR Part 674).

To carry out its work, SSO publishes the [Washington State Rail Safety Oversight Program Standard](#) to establish the specific safety requirements placed on RFGPTS in the state. SSO ensures RTA compliance with the program standard, federal code and design, WAC, and RCW through plan reviews, inspections, investigations and audits.

SSO has safety oversight over the following RTAs and their RFGPTS:

- Sound Transit (RTA)
 - Link Light Rail (RFGPTS)
 - Tacoma Link (RFGPTS)
- City of Seattle (RTA)
 - Seattle Streetcar (RFGPTS)
 - Seattle Center Monorail (RFGPTS)

SSO is federally accountable to FTA. The state SSO submits an annual report to FTA summarizing accident data, internal audits, corrective action plans, safety plan updates and approvals, and any audits that it has conducted on RFGPTS. In addition, letters of approval for and updates to safety plans, accident investigation procedures, and the program standard are sent to FTA for review and comment.

State Safety Oversight Program Updates

SSO was originally established in 1997 under RCW 81.104.115 in accordance with 49 CFR Part 659. These regulations are further facilitated by [WAC 468-550](#).

[49 CFR Part 659](#) has since been replaced by 49 CFR Part 674 under [MAP-21](#), and further amended under [FAST Act](#). Issued in 2016, the new regulation expands the scope of SSO to include the design and construction phases of projects in addition to SSO's existing oversight of operations. It also requires SSO to be more involved in the investigation of accidents and hazards at RFGPTS.

SSO is required to be in full compliance with the new regulation by April 15, 2019, and is on track to meet this deadline.

During 2017, SSO took steps to comply with the new regulation, including:

- Revising the program standard
- Developing and circulating new rules to implement program changes, which include:
 - Financial penalties for noncompliance
 - The authority to suspend service, require the modification of service, or the removal of equipment for failure to mitigate hazardous conditions

- Special provisions relevant to how SSO's oversight responsibilities will be shared with another state's safety oversight program if a RFGPTS were to cross state lines
- Developing and implementing new policies and procedures
- Holding quarterly hazard management meetings with RTAs
- Providing technical assistance to RTAs relevant to the new regulation
- Attending the FTA Transit Safety and Oversight's SSO Program Annual Workshop
- Participating in the Transit Safety Institute training program
- Attending onsite, RTA-specific trainings
- Property damage to rail transit vehicles, non-rail transit vehicles, other rail transit property or facilities and non-transit property that equals or exceeds \$25,000
- An evacuation due to life safety reasons
- A collision at a grade crossing (RGX)
- A main-line derailment
- A collision with an individual on a rail right of way (ROW)
- A collision between a rail transit vehicle and a second rail transit vehicle, or a rail transit non-revenue vehicle

If an event meets reporting thresholds, SSO may choose to conduct its own investigation, or elect to have the RFGPTS' RTA conduct an investigation on its behalf using previously approved investigation procedures. SSO has approved investigation procedures for all RTAs.

In addition, SSO's role in every investigation is to ensure that all available evidence is collected and analyzed, SSO has access to the evidence, and the investigation examines probable root causes and causal factors. Once complete, SSO must adopt a final investigation report.

For all events, SSO ensures that the hazards and deficiencies that caused the event are eliminated or adequately mitigated. In some cases, elimination and mitigation may require the development of a new corrective action plan (CAP). The CAP is tracked by the SSO and the RTA until resolution is reached.

State Safety Oversight Program Investigations and Corrective Action Plans

During 2017, SSO used 49 CFR Part 659¹ reporting thresholds for investigations. Under 49 CFR Part 659, SSO was required to conduct an investigation of events involving RFGPTS that meet the following reporting thresholds:

- A fatality at the scene, or where an individual is confirmed dead within 30 days of a rail transit-related incident
- Injuries requiring immediate medical attention away from the scene for two or more individuals

¹ Once WSDOT is certified under 49 CFR Part 674, SSO's responsibilities will be expanded beyond 49 CFR Part 659 to include a new event category called "accidents." SSO will be required investigate accidents involving RFGPTS. Accidents are events that meet certain reporting thresholds, including:

- A loss of life
- A report of a serious injury to a person
- A collision involving a rail transit vehicle
- A runaway train
- An evacuation for life safety reasons
- Any derailment of a rail transit vehicle, at any location, at any time, whatever the cause

Future editions of the Rail Fixed Guideway Public Transportation System Safety Report will use the new regulation's reporting thresholds described above.

2017 Total Events Meeting Reporting Thresholds					
	Sound Transit		City of Seattle		Total
	Link Light Rail	Tacoma Link	Seattle Streetcar	Seattle Center Monorail	
Events	13	2	3	0	18

2017 Events Rollup*					
Event Type	Sound Transit		City of Seattle		Total
	Link Light Rail	Tacoma Link	Seattle Streetcar	Seattle Center Monorail	
Fatalities	2	0	0	0	2
Injuries	3	0	0	0	3
Property Damage > \$25,000	2	0	0	0	2
Evacuation	0	0	0	0	0
RGX Collision	11	2	3	0	16
Derailment	1	1	0	0	2
Collision with Individual	4	0	0	0	4
Collision with Rail Transit Vehicle	0	0	0	0	0

*Note: A single event may meet a number of reporting thresholds, and may be reported in several event types. As an example, an RGX collision may cause more than \$25,000 of property damage and result in an injury or fatality.

2017 Tracked Corrective Action Plans†					
	Sound Transit		City of Seattle		Total
	Link Light Rail	Tacoma Link	Seattle Streetcar	Seattle Center Monorail	
CAPs	11	4	11	6	32

†Note: Because some events require mitigation over an extended period of time, CAPs may be tracked over a number of reporting periods before they are resolved. As such, annual event totals may not match annual CAP totals.

2017 Events Detail: Sound Transit, Link Light Rail

Date	Type	Event Location	Collision With	Fatalities	Injuries	Property Damage	Derailment	Probable Cause	Description
1/23/2017	Non-RGX Collision	Trackway	Individual	1 (member of the public)	None	< \$25,000	No	Actions of pedestrian	Pedestrian crossed against pedestrian traffic signals, resulting in a fatality.
1/27/2017	RGX Collision	Trackway	Automobile	None	None	< \$25,000	No	Actions of motorist	Motorist made an illegal left turn into an approaching light rail vehicle.
2/21/2017	RGX Collision	Trackway	Automobile	None	1 (member of the public)	> \$25,000	Yes	Actions of motorist	Motorists crossed RGX while driving on the wrong side of the road at speed, resulting in a main-line derailment.
4/17/2017	RGX Collision	Trackway	Individual	None	1 (member of the public)	< \$25,000	No	Actions of pedestrian	Pedestrian crossed without looking in the direction of the approaching light rail vehicle.
4/24/2017	RGX Collision	Trackway	Automobile	None	None	< \$25,000	No	Actions of motorist	Motorist made an illegal left turn into an approaching light rail vehicle.
5/12/2017	RGX Collision	Trackway	Automobile	None	None	< \$25,000	No	Actions of motorist	Motorist made an illegal left turn into an approaching light rail vehicle.
5/24/2017	RGX Collision	Trackway	Automobile	None	None	< \$25,000	No	Actions of motorist	Motorist made an illegal left turn into an approaching light rail vehicle.
6/1/2017	RGX Collision	Trackway	Individual	None	None	< \$25,000	No	Actions of pedestrian	Bicyclists with headphones failed to hear horns from the light rail vehicle.
7/1/2017	RGX Collision	Trackway	Automobile	None	None	< \$25,000	No	Actions of motorist	Motorist made an illegal left turn into an approaching light rail vehicle.
8/27/2017	RGX Collision	Trackway	Automobile	None	None	< \$25,000	No	Actions of motorist	Motorist made an illegal left turn into an approaching light rail vehicle.
9/15/2017	RGX Collision	Trackway	Automobile	1 (member of the public)	None	> \$25,000	No	Actions of motorist	Motorist made an illegal left turn into an approaching light rail vehicle, resulting in a fatality.
12/16/2017	Non-RGX Collision	Revenue facility	Individual	None	1 (member of the public)	< \$25,000	No	Actions of pedestrian	Pedestrian crossed against horns from the light rail vehicle, resulting in an injury.
12/25/2017	RGX Collision	Trackway	Automobile	None	None	< \$25,000	No	Actions of motorist	Motorist made an illegal left turn into an approaching light rail vehicle.

2017 Events Detail: Sound Transit, Tacoma Link

Date	Type	Event Location	Collision With	Fatalities	Injuries	Property Damage	Derailment	Probable Cause	Description
6/23/2017	RGX Collision	Trackway	Automobile	None	None	< \$25,000	No	Actions of motorist	Motorist misjudged the clearance between vehicles.
9/7/2017	RGX Collision	Trackway	Automobile	None	None	< \$25,000	Yes	Actions of motorist	Motorist failed to stop on a red traffic signal, resulting in a main-line derailment.

2017 Events Detail: City of Seattle, Seattle Streetcar

Date	Type	Event Location	Collision With	Fatalities	Injuries	Property Damage	Derailment	Probable Cause	Description
4/8/2017	RGX Collision	Trackway	Automobile	None	None	< \$25,000	No	Actions of motorist	Motorist made an illegal right turn.
5/26/2017	RGX Collision	Trackway	Automobile	None	None	< \$25,000	No	Actions of motorist	Motorist made a turn into approaching streetcar.
10/5/2017	RGX Collision	Trackway	Automobile	None	None	< \$25,000	No	Actions of motorist	Motorist made an illegal right turn.

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.

- 2017 events meeting reporting thresholds: 13
- 2017 CAPs: 11

Vehicles

The Link Light Rail fleet consists of 62, 95-foot-long light rail vehicles manufactured by Kinkisharyo. The cars draw traction power from 1,500 volts DC. Each car seats 74 passengers.

INITIAL SEGMENT

Opened

July 2009

Route

The Initial Segment consists of 13.9 miles of double-tracked line between the north end of the Downtown Seattle Transit Tunnel (Pine Street Stub tunnel ventilation structure) and the intersection of South 154th Street and State Route 518, connecting the cities of Seattle, Tukwila and SeaTac.

The Initial Segment alignment consisted of approximately 4.4 miles of aerial structures, 2.4 miles of tunnels and 7.0 of at-grade ROW.

The Initial Segment includes 12 stations:

- Westlake Station
- University Street Station
- Pioneer Square Station
- International District/Chinatown Station
- Stadium Station
- SoDo Station
- Beacon Hill Station
- Mount Baker Station
- Columbia City Station
- Othello Station
- Rainier Beach Station
- Tukwila International Blvd. Station



AIRPORT LINK EXTENSION

Opened

December 2009

Route

The Airport Link Extension consists of 1.7 miles of elevated and at-grade double track that travels south from the Tukwila International Boulevard Station (southern terminus of the Initial Segment) on an elevated structure, crossing over State Route 518, and transitions to at-grade north of the South 160th Street Bridge. The alignment continues south in the median of the re-aligned North Airport Expressway, crosses over South 170th Street and continues on an elevated structure to the site of the light rail station near the main terminal/garage of the SeaTac International Airport. The SeaTac Airport Station directly connects pedestrians to the airport ticketing concourse via a covered, pedestrian-only walkway, and to SeaTac's City Center via a pedestrian overpass.

The Airport Link Extension includes one station, SeaTac Airport Station.

UNIVERSITY LINK EXTENSION

Opened

March 2016

Route

The University Link Extension consists of 3.15 miles of underground double track through twin tunnels from Pine Street Stub (the northern terminus of the Initial Segment) beneath the Capitol Hill District and Lake Washington Ship Canal to the University of Washington's Husky Stadium.

The University Link Extension includes two stations, University of Washington Station and Capitol Hill Station.

SOUTH 200TH LINK EXTENSION

Opened

September 2016

Route

The South 200th Link Extension consists of 1.6 miles of elevated, double-tracked guideway that travels from the SeaTac Airport Station (the southern terminus of the Airport Extension) in an aerial configuration along the west side of International Boulevard, turns southwest to cross South 188th Street, and continues in an aerial configuration along the east side of 28th Avenue South.

The South 200th Street Extension includes one station, Angle Lake Station.

Tacoma Link

The Tacoma Link system is owned and operated by Sound Transit.

- 2017 events meeting reporting thresholds: 2
- 2017 CAPs: 4

Opened

August 2003

Route

The Tacoma Link system operates on a 1.6-mile-long line that begins at the Tacoma Link Operations and Maintenance Facility at McKinley Street on East 25th Street. This single-track segment turns north onto Pacific Avenue. At South 21st Street, the line becomes double tracked. At Hood Street, near South 17th Street, the alignment shifts from Pacific Avenue to Commerce Street. Double tracking continues on Commerce Street to South 9th Street with the line reverting to single track for the final block from South 9th to South 8th Street, the site of Theater District station.

The track of the entire alignment is embedded in the street. The trackway is in dedicated lanes for most of the route and in mixed traffic along the remainder. The line crosses 11 traffic signal controlled intersections and four pedestrian signal-controlled crossings.

The Tacoma Link system includes six stations.

Vehicles

The Tacoma Link fleet consists of three 66-foot-long articulated rail cars manufactured by Škoda and supplied by Inekon. The cars draw their power from 750 volt DC overhead wires. Each car has a maximum capacity of 56 passengers.



CITY OF SEATTLE

Seattle Streetcar

The Seattle Streetcar system, which includes the Seattle South Lake Union and First Hill Streetcar lines, is owned, constructed and equipped by the City of Seattle. King County Metro is responsible for the operation and maintenance of both lines.

- 2017 events meeting reporting thresholds: 3
- 2017 CAPs: 11

South Lake Union Streetcar

Opened

December 2007

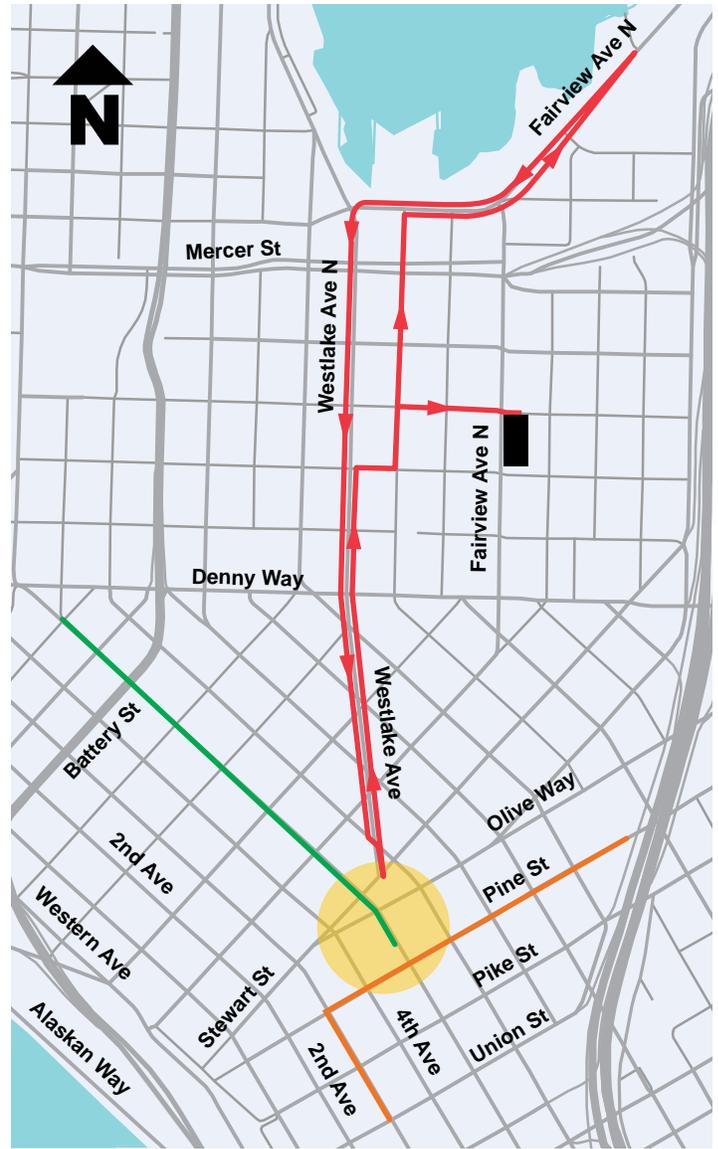
Route

The South Lake Union Streetcar operates on a 1.3-mile-long line between Westlake Avenue and Olive Way on the south, and Fairview Avenue North and Ward Street on the north through the South Lake Union neighborhood.

The South Lake Union Streetcar system includes 11 stations.

Vehicles

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



First Hill Streetcar

Opened

January 2016

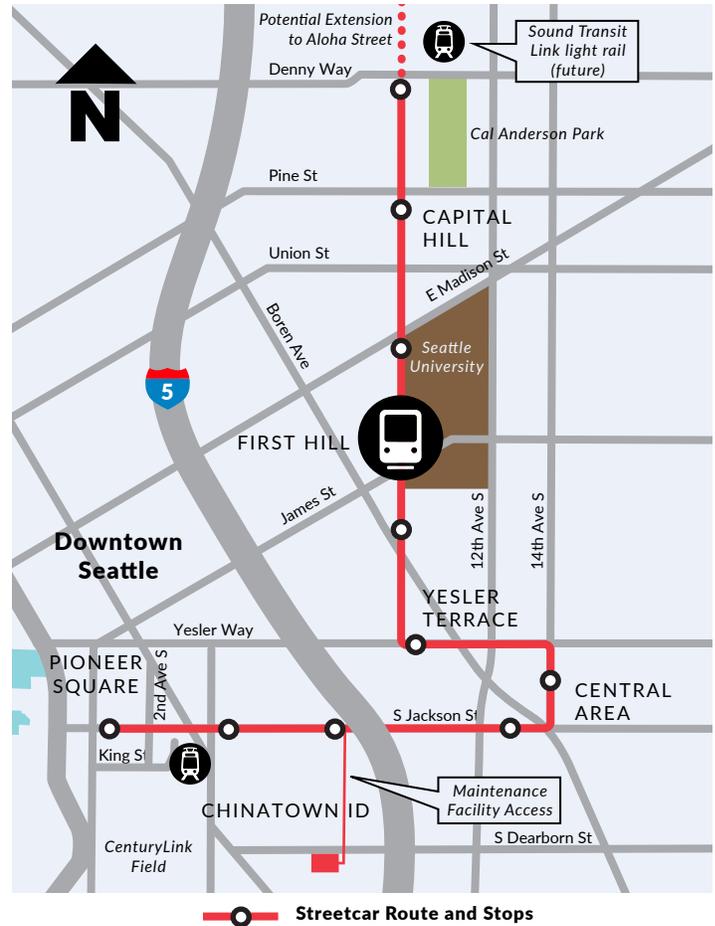
Route

The First Hill Streetcar operates on a 2.5-mile-long line begins at South Jackson Street and Occidental Avenue in Pioneer Square. The line continues east on South Jackson Street, turning north on 14th Avenue South. The line again turns north onto Broadway, terminating near the Capitol Hill light rail station at Broadway and Denny Way.

The First Hill Streetcar system includes 10 stations.

Vehicles

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



Seattle Center Monorail

The Seattle Center Monorail is owned by the City of Seattle and is operated by Seattle Monorail Services.

- 2017 events meeting reporting thresholds: 0
- 2017 CAPs: 6

Opened

March 1962

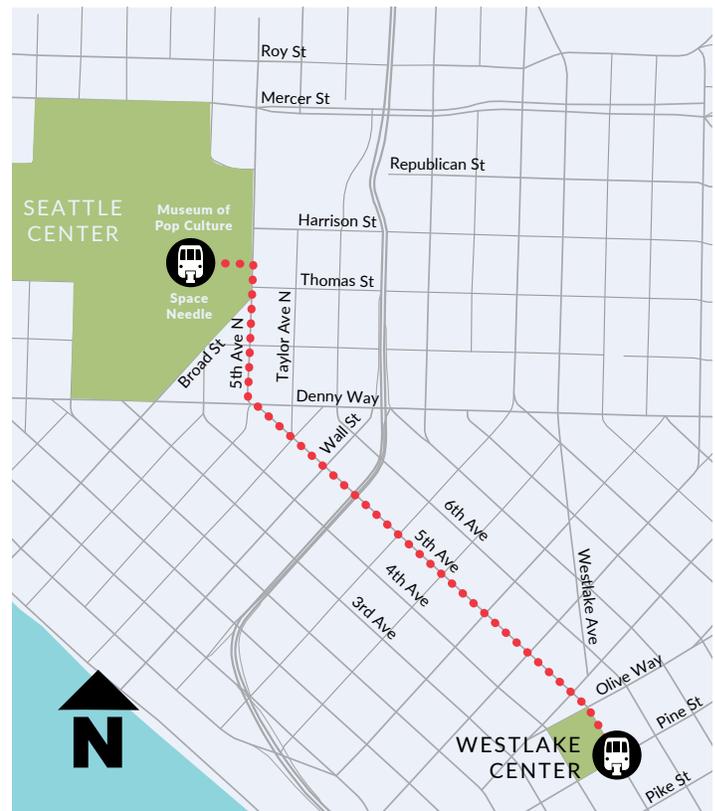
Route

The Seattle Center Monorail operates on a one-mile-long elevated monorail line along Fifth Avenue between Seattle Center in Lower Queen Anne and Westlake Center in Downtown.

The Seattle Center Monorail system includes two stations.

Vehicles

The Seattle Center Monorail consists of two 120-foot-long trains constructed by Alweg in 1961. The system is powered electrically by 700 volts DC. Each train has 124 passenger seats and additional room for standing passengers.



ACRONYMS AND ABBREVIATIONS

Americans with Disabilities Act	ADA
Code of Federal Regulations	CFR
Corrective Action Plan	CAP
Federal Transit Administration	FTA
Fixing America's Surface Transportation Act	FAST Act
Moving Ahead for Progress in the 21st Century Act	MAP-21
Rail Fixed Guideway Public Transportation System	RFGPTS
Rail Transit Agency	RTA
Railroad Grade Crossing	RGX
Revised Code of Washington	RCW
Right of Way	ROW
State Safety Oversight Program	SSO
Washington Administrative Code	WAC
Washington State Department of Transportation	WSDOT

WEBSITES FEATURED

In order of appearance.

RCW 81.104.115

<http://app.leg.wa.gov/RCW/default.aspx?cite=81.104.115>

49 CFR Part 674

<https://www.gpo.gov/fdsys/granule/CFR-2016-title49-vol7/CFR-2016-title49-vol7-part674>

Washington State Rail Safety Oversight Program

<http://www.wsdot.wa.gov/NR/rdonlyres/1A985C8B-2C3D-4E38-8D0E-F8DB9773EBC2/0/WashingtonStateRailSafetyOversightProgramStandard2018edition.pdf>

WAC 468-550

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

49 CFR Part 659

<https://www.gpo.gov/fdsys/granule/CFR-2012-title49-vol7/CFR-2012-title49-vol7-part659/content-detail.html>

MAP-21

<https://www.fhwa.dot.gov/map21/>

FAST Act

<https://www.fhwa.dot.gov/fastact/>



MORE INFORMATION

Mike Flood

**Washington State
Department of Transportation**

(206) 464-1291

FloodM@wsdot.wa.gov

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