



An Assessment of Rail Safety Governance in Washington State

FINAL REPORT

Prepared for:

Washington State Joint Transportation Committee

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CPCS Ref: 20203
January 4, 2021

www.cpcstrans.com

Project name

Findings from the National Transportation Safety Board's investigation* into the December 18, 2017 derailment of a southbound Amtrak Cascades passenger train near DuPont, Washington indicated an opportunity to further define the roles and responsibilities of organizations involved in the safe operation and oversight of passenger rail in Washington State.

Accordingly, the Washington State Legislature has commissioned an **Assessment of Rail Safety Governance in Washington State** study.

The stated objective of the assignment is to provide recommendations to the legislature on improving rail safety governance in Washington State, by class of rail (freight, intercity, commuter, and transit) where applicable.

Acknowledgements

The CPCS Team acknowledges and is thankful for the input of the Washington State Joint Transportation Commission (JTC) staff, stakeholders consulted, and experts interviewed as part of the study.

Opinions and limitations

Unless otherwise indicated, the analysis and opinions herein are those of the authors and do not necessarily reflect the views of the JTC, Working Group members or other stakeholders.

This study is not an audit of any organization. CPCS makes efforts to validate information obtained from third parties but does not independently verify all statements and opinions made. This report considers applicable legislation but does not rise to the standard of a legal opinion on any issue.

Use of report statement

This report is intended for the sole use by the Washington State Joint Transportation Committee and may not be relied on by any third party.

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**Source: National Transportation Safety Board. 2019. Amtrak Passenger Train 501 Derailment, DuPont, Washington, December 18, 2017. NTSB/RAR-19/01. Washington, DC.*

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Acronyms / abbreviations

ADA	Americans with Disabilities Act
APTA	American Public Transportation Association
Amtrak	National Railroad Passenger Corporation
BNSF	BNSF Railway
CFR	Code of Federal Regulations
CPCS	CPCS Transcom Inc.
DOE	Washington Department of Ecology
EPA	Environmental Protection Agency
FAA	US Federal Aviation Administration
FHWA	Federal Highway Administration
FMSIB	Freight Mobility Strategic Investment Board
FRA	Federal Railroad Administration
FSAA	The U.S. Federal Aviation Administration
FRSA	Federal Railroad Safety Act
FTA	Federal Transit Administration
GCPF	Grade Crossing Protective Fund Grant Program
HB	House Bill
HSGT	High-speed ground transportation
IPR	Intercity Passenger Rail
JTC	Joint Transportation Committee
King County	King County Metro Transit Department
LRT	Light Rail Transit
MAP-21	Moving Ahead for Progress in the 21 st Century Act
MOU	Memorandum of understanding
MUTCD	Manual on Uniform Traffic Control Devices
NCHRP	National Cooperative Highway Research Program
NDT	National Transit Database
NOI	Notice of Inquiry
NPRM	Notice of proposed rulemaking
ODOT	Oregon Department of Transportation
ONRSR	Office of the National Rail Safety Regulator (Australia)
ORR	Office of the Rail Regulator (UK)
OSHA	Occupational Safety and Health Act
PDP	Point Defiance Bypass
PHMSA	Pipeline and Hazardous Materials Safety Administration
PMP	Project Management Plan
PRIIA	Passenger Rail Investment and Improvement Act
PTASP	Public Transportation Agency Safety Plan
PTC	Positive Train Control
PUCO	Public Utilities Commission of Ohio

RAIRS	Railroad Accident Incident Reporting System
RCW	Revised Code of Washington
RRP	Risk Reduction Program
RSAC	Railroad Safety Advisory Committee
RSIA	Rail Safety Improvement Act
RSIS	Railroad Safety Information System
SHRP	Strategic Highway Research Program
SMS	Safety Management System
Sound Transit	Central Puget Sound Regional Transit Authority
SSMP	System Safety Management Program
SSOA	State Safety Oversight Agencies
SSOP	State Safety Oversight Program
SSPP	State Safety Participation Program or System Safety Program Plans
SSP	System Safety Program
STB	Surface Transportation Board
TIH	Toxic by Inhalation materials and others
TOC	Train Operating Companies
UP	Union Pacific Railroad
USC	United States Code
USDOT	U.S. Department of Transportation
WAC	Washington Administrative Code
WSDOT	Washington Department of Transportation
WUTC	Washington State Utilities and Transportation Commission

Glossary

Term	Definition
Accident	An unplanned and/or undesired event that leads to a loss, including “injury, illness, or death; damage to or loss of a system, equipment, or property; or damage to the environment.” FRA and FTA have different definitions.
Class I railroad	Railroads with annual operating revenues in excess of \$505 million in 2019. ¹ There are seven in the U.S., including two in Washington State (BNSF and UP).
Class II railroad	Railroads with annual operating revenues in excess of \$40 million in 2019.
Class III railroad	Railroads with annual operating revenues less than \$40 million in 2019.
Commuter rail	A mode of transit service (also called metropolitan rail, regional rail, or suburban rail) characterized by an electric or diesel propelled railway for urban passenger train service consisting of local short distance travel operating between a central city and adjacent suburbs... ² It traditionally operates on the general system of railroad transportation.
Fixed guideway	A public transportation facility that is using a separate, dedicated corridor entirely separated from intersecting road or pedestrian traffic.
Freight rail	Freight operation constitutes the movement of goods and cargo in purpose-built freight rolling stock (e.g., boxcars, flatcars), which are typically, but not necessarily, hauled by diesel-powered locomotives. ³
Grade crossing	An intersection of a roadway and a rail right-of-way that cross each other at the same level (at grade). For street-running operations, each street intersection is considered a grade crossing.
Grade separation	A vertical separation of intersecting facilities (road, rail, etc.) by the provision of crossing structures.
High-speed ground transportation	High-speed rail as well as other forms of ground-based high-speed transportation systems, such as maglev and hyperloop.
Host railroad	A term used to describe the railroad that has effective operating control over a segment of track. ⁴
Intercity passenger rail	Rail passenger transportation that is not commuter rail service – generally covers longer distances than commuter rail trains. ⁵
Light rail	A mode of transit service operating passenger rail cars singly (or in short, usually two-car or three-car, trains) on fixed rails in right-of-way that is often separated from other traffic for part or much of the way. Light rail vehicles are typically driven electrically with power being drawn from an overhead electric line via a trolley or a pantograph; driven by an operator on board the vehicle; and may have high platform loading, low level boarding using steps or level boarding with a low-floor vehicle. Passenger stations or stops are usually farther apart than the normal spacing for streetcar systems.
Positive train control	Advanced communication-based and processor-based train control technologies that can automatically stop the trains to prevent accidents.

¹ Revenue thresholds for Class I, II and III rail carriers are defined by the Surface Transportation Board.

² American Public Transportation Association (APTA) 2019.

³ Federal Railroad Administration (FRA).

⁴ 49 CFR Part 236.

⁵ 49 U.S. Code (USC) § 24102.

Rail commissioning	The pre-requisite activities needed to begin a new rail service, including the certification process to ensure that safety-critical systems are functioning as intended, both individually and together.
Rail-highway grade crossing	A location where one or more railroad tracks cross a public highway, road, or street or a private roadway, and includes sidewalks and pathways at or associated with the crossing.
Revenue service	The operation of a transit vehicle during the period which passengers can board and ride on the vehicle. Revenue service includes the carriage of passengers who do not pay a cash fare for a specific trip as well as those who do pay a cash fare; the meaning of the phrase does not relate specifically to the collection of revenue.
Short line	A railroad that is not Class I.
State of good repair	A condition sufficient for capital assets to operate at a full level of performance. This means that asset: <ol style="list-style-type: none"> 1. Is able to perform its designed function 2. Does not pose a known safety risk 3. Has met or recovered lifecycle investments
State Safety Oversight Program	A Federal Transit Administration-administered program that provides federal funds to states with rail transit systems in their jurisdiction to carry out safety oversight services identified under 49 USC Section 5329(e).
Switching and terminal railroad	A railroad that handles rail cars between shipper facilities and larger rail carriers (other short lines or Class I railroad) within a defined terminal area.
Safety management systems	An ongoing process for a rail transport operator that identifies hazards/risks and details how they are managed and monitored with the goal of ensuring safety and preventing accidents.
Streetcar rail	A type of light rail service where nearly the entire route is in streets or other roadways. Single-vehicle trains are most common with frequent in-street stops. They normally are used for shorter trips in central or higher density areas. Passenger stops are closer together than the station spacing on light rail systems.
System Safety Program Plan	A program plan, required under 49 CFR Part 270, that requires passenger rail operations to “systematically evaluate railroad safety hazards and the resulting risks on their system and manages those risks to reduce the number and rates of railroad accidents, incidents, injuries, and fatalities.”

Executive summary

Project background and objective

Findings from the National Transportation Safety Board's investigation into the December 18, 2017, derailment of a southbound Amtrak Cascades passenger train near DuPont, Washington indicated an opportunity to further define the roles and responsibilities of organizations involved in the safe operation and safety oversight of passenger rail in Washington State.⁶

Accordingly, the Washington State Legislature commissioned an Assessment of Rail Safety Governance in Washington State study. The objective of this study is to provide recommendations to the legislature on improving rail safety governance in the state by class of rail (freight, intercity passenger, commuter, and transit, where applicable).

The objective of this study is to provide recommendations to the Washington State Legislature on improving rail safety governance in the state, by class of rail (freight, intercity passenger, commuter and transit) where applicable.

We have reframed this objective as a set of four key questions (KQ) to be addressed in this study:

- **KQ1:** What are the roles of federal, state, regional, and local agencies in the State of Washington for rail safety oversight and governance? What other stakeholder agencies, related to rail safety, exist in Washington State?
- **KQ2:** What can be learned from rail safety governance practices in other states and countries?
- **KQ3:** What are the gaps and inconsistencies in the state statutory law and administrative rules germane to rail safety oversight?
- **KQ4:** How can Washington's rail safety governance be improved?

We provide a brief overview of the Washington State rail system prior to addressing these KQs.

Methodology and limitations

The recommendations in this report were prepared through a literature review of rail safety legislation, regulations, and practices applicable to Washington State, a jurisdictional scan of effective practices and lessons learned, and consultations with a sampling of stakeholders involved in rail safety in Washington State. Appendix A lists the stakeholders we consulted. The Federal Railroad Administration was invited to participate in this study but declined to participate.

While this document references legal text, including legislation and regulations, it is intended to provide an informed overview of the rail safety regulatory system in Washington State and draw out possible practical implications to assess potential improvements. It is not a legal opinion on any issue. In addition, the information contained in this document may contain facts and opinions expressed by the stakeholders we have consulted. While efforts have been made to validate this

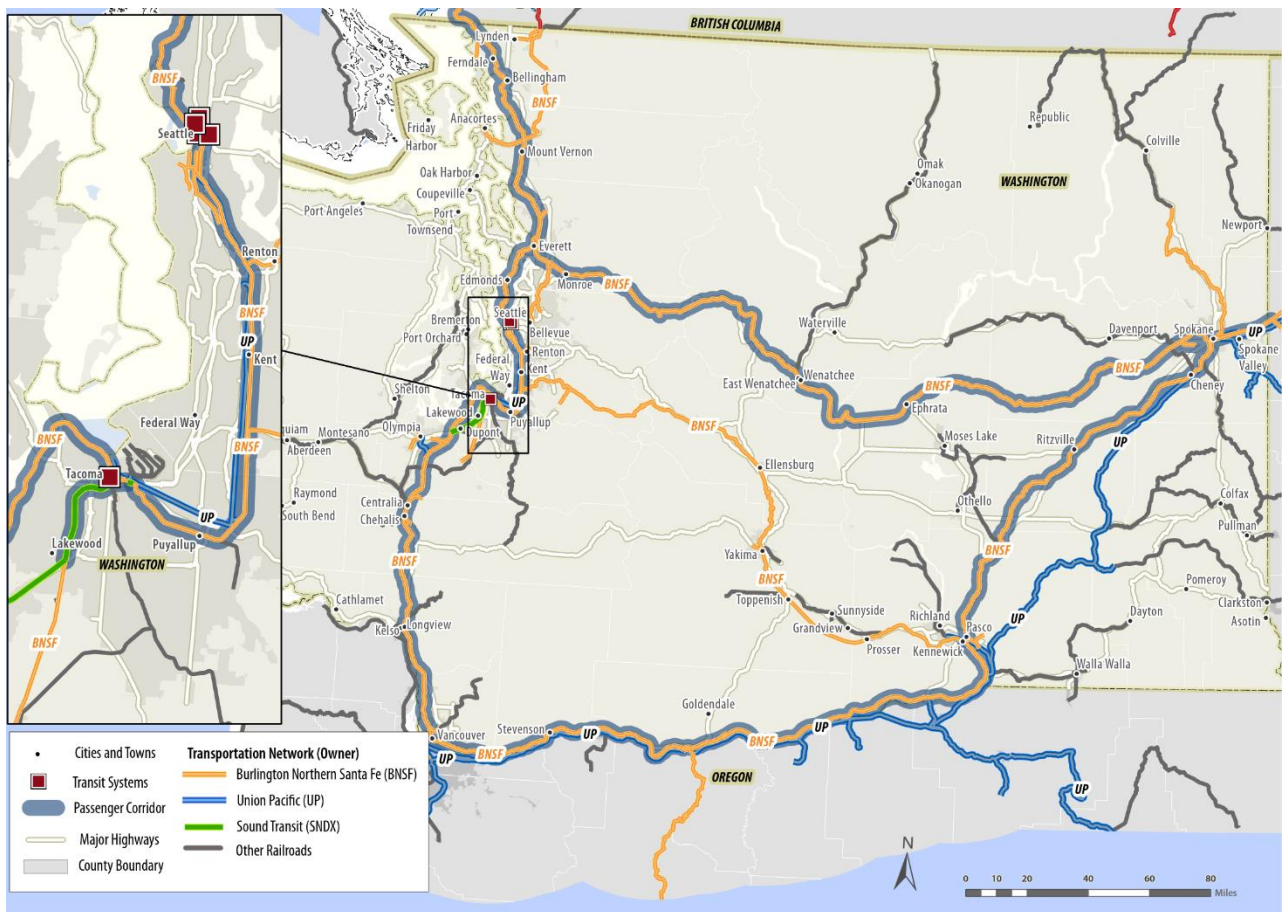
⁶ National Transportation Safety Board. 2019. Amtrak Passenger Train 501 Derailment, DuPont, Washington, December 18, 2017. NTSB/RAR-19/01. Washington, DC.

information, such as through reference to literature, CPCS cannot warrant the accuracy of stakeholder-provided data.

Washington State rail system overview

The rail system in Washington State includes over 3,000 miles of track supporting passenger, commuter, freight, and transit operations (Figure ES-1).

Figure ES-1: Washington State rail system



Source: CPCS based on Oakridge National Labs rail network data.

The rail system in Washington State has evolved over the past 10 years and is expected to continue to grow in the future. In particular, there are recent/ongoing studies involving major expansions of the intercity passenger rail network, including the examination of an interstate/international high-speed ground transportation system between Vancouver, British Columbia, and Portland.

High-speed ground transportation (HSGT) systems

The term “high-speed ground transportation system” generally encompasses high-speed rail as well as other forms of surface high-speed transportation systems, such as maglev and hyperloop systems.

KQ1: What are the roles of federal, state, regional, and local agencies in the State of Washington for rail safety oversight and governance? What other stakeholder agencies, related to rail safety, exist in Washington State?

There are different regulatory frameworks for **railroads** (intercity passenger, freight, and commuter) and **transit** (including light rail, streetcars, and monorails) (see Figure ES-2). Federally, a railroad means “any form of non-highway ground transportation that runs on rails or electromagnetic guideways, including commuter [...] and high-speed ground transportation systems” but excluding “transit operations in an urban area that are not connected to the general railroad system of transportation.”⁷ The most important distinction between these frameworks is that laws, regulations, and orders applicable to **railroads** (but not **transit**) “shall be nationally uniform to the extent practicable,” which generally pre-empts state and local regulations unless certain conditions are met.

*In the U.S., there are different regulatory frameworks for **railroads** (including intercity passenger, freight, and commuter) and **transit** (including light rail, streetcars, and monorails).*

Figure ES-2: Key differences between railroad and transit regulatory frameworks

	Railroads	Transit
Primary federal regulator	Federal Railroad Administration (FRA)	Federal Transit Administration (FTA)
Primary state-level regulator	Washington Utilities and Transportation Commission (WUTC)	Washington Department of Transportation, State Safety Oversight Agency (WSDOT SSOA)
Nature of federal laws and regulations	<ul style="list-style-type: none"> Require nationally uniform railroad laws, regulations, and orders “to the extent practicable,” which generally pre-empts state and local regulations. Set out prescriptive requirements that railroads must follow in areas including reporting, engineering, employee safety and training, operational safety, and system safety. 	<ul style="list-style-type: none"> Set out minimum standards for state safety oversight, as well as reporting, system safety management and selected other areas (e.g., drug and alcohol testing) by transit agencies; however, these are less prescriptive than railroad standards. They in effect require transit agencies to manage risks and provide discretion to how those risks are managed.
Federal-state relationship	<ul style="list-style-type: none"> Under 49 CFR Part 212, State Safety Participation Program (SSPP), states cooperate with the FRA’s oversight program typically in supporting routine inspections. 	<ul style="list-style-type: none"> Under 49 CFR Part 674, the FTA delegates most day-to-day safety oversight activities to the SSOA. The FTA has oversight authority, however, including the ability to withhold FTA funding.

Source: CPCS.

The Federal Railroad Administration (FRA) is the primary federal agency charged with oversight of railroad safety in the U.S. The FRA, using mechanisms such as data submission requirements, inspections, and civil penalties, provides oversight to railroads under its jurisdiction directly. Under 49 CFR Part 212 (State Safety Participation Program (SSPP)), it also cooperates with state agencies, including the Washington Utilities and Transportation Commission (WUTC), which supplement FRA

⁷ 49 U.S. Code § 20102

oversight with FRA-trained inspectors. The WUTC has additional roles including the approval of grade crossings and administering other state laws related to railroad safety.

Unlike in some other states where the department of transportation is both a railroad safety regulator and a funding agency, this model is **not** used in Washington State. With respect to railroads, WSDOT provides capital and operating funding for the Palouse River and Coulee City Rail System (a short line freight railroad) and the Amtrak Cascades Service. In this role, it administers contracts with providers and ensures that they are meeting financial, service, and other contractual provisions. However, WSDOT is **neither** an operator nor a regulator of **railroad** safety. However, there is a group within WSDOT that has regulatory authority over **transit** safety, known as the WSDOT State Safety Oversight Agency (WSDOT SSOA). These roles are further described in Chapter 5.

In Washington State, the WUTC has the authority to administer laws related to railroad safety. WSDOT provides capital and operating funding for rail services.

KQ2: What can be learned from rail safety governance practices in other states and countries?

Rail safety governance models generally evolve gradually within the broader legal context in which they operate, such as the division of powers between different levels of government. This is the case in the U.S. and other jurisdictions globally. In addition, there are differences across jurisdictions in system types and operating environments. Data collection methodologies also make direct comparisons difficult. As a result, the purpose of the scan was to identify effective practices and lessons learned that could help address issues identified in Washington State, rather than benchmarking one model against another.

We have scanned for effective practices in 12 jurisdictions, including through a literature review and consultations with experts in other jurisdictions. The outcome was a menu of 10 practices and lessons learned, categorized under four broad themes, that could be adopted or tailored to the Washington State context (Figure ES-3). These findings were considered in developing recommendations. There are also potential trends impacting rail safety governance that were considered in developing the recommendations.

Figure ES-3: Themes and examples of effective practices and lessons learned

Themes	Examples
Alternative institutional structures for rail safety oversight at the state level	<ul style="list-style-type: none"> • Developing new standards for high-speed rail and programs for related safety improvements • Combining railroad and transit regulatory oversight organizations
Additional requirements and resources for system safety programs	<ul style="list-style-type: none"> • Increasing oversight of change management processes • Strengthening the dialog with industry participants for system safety plans • Specifying coordination requirements within emergency response plans • Ensuring sufficient regulatory resources to oversee management system implementation at regulated entities
Practices for regulator data collection	<ul style="list-style-type: none"> • Hazardous material transportation data gathering, visualization, dissemination, and planning • Requiring additional inspection data submittals from railways to inform planning
Mechanisms to improve communication and collaboration with stakeholders	<ul style="list-style-type: none"> • Practices to improve coordination with local municipalities concerning grade crossings and other planning issues • Improving public reporting by regulators

Source: CPCS.

Trends that could impact rail safety in the future

There are a number of trends that have implications for the rail safety governance model in Washington State going forward:

- There is expected growth in rail systems, including potentially new system types and freight rail traffic.

Potential implications:

1. *Funding models for regulators need to appropriately scale with the magnitude of operations, including systems in development.*
2. *There are gaps in standards in the U.S. for higher-speed/high-speed rail, which would need to be addressed when appropriate.*
3. *There are often opportunities for risks posed by hazards to be mitigated during design and implementation; this is a further argument for regulators to have a role in oversight at the implementation/commissioning stage.*

- There is likely to be a continued increase in automation in the rail industry. The most commonly known form is automated train operations, but there are also other forms of automation, such as track inspection.

Potential implications:

4. *Human involvement in many circumstances is unlikely to be completely replaced by automated systems, as human intervention may still be needed to resolve more complex problems.¹ Regulators will require increased knowledge in the field of human factors and how humans interact with systems/environments in performing processes and tasks.*
5. *The data generated by automated inspection systems potentially presents new opportunities for regulators to support risk-based planning of oversight. This will require consistent data collection from rail systems and the ability to conduct independent data analysis.*
6. *There may be paradigm shifts in federal standards in the future, such as changes to standards applicable to track inspection, as these systems evolve.*

We have considered some of these implications, notably item 1 (Recommendations 13/14) and item 3 (Recommendation 3) directly in the recommendations. Other implications will need to be considered during the implementation of recommendations, or in the future, such as if an HSGT system were implemented.

Source: ¹Tretten and Karim. 2019. Human capital: the human factor in heavy haul railway. Presentation to the International Heavy Haul Association Annual Conference, 2019.

KQ3: What are the gaps and inconsistencies in the state statutory law and administrative rules germane to rail safety oversight? KQ4: How can Washington's rail safety governance be improved?

At least three indicators from our analysis and stakeholder feedback suggest that the rail safety governance model is appropriate and working well (Figure ES-4). However, there are caveats to these indicators, as well as other gaps that could be addressed.

Figure ES-4: Washington State governance model strengths and weaknesses and/or caveats

Indicator	Caveats
<p>By certain metrics, rail safety performance has been improving over the last 10 years in Washington State.</p>	<ul style="list-style-type: none"> • This improvement is not consistent across all metrics; grade crossing and trespassing incidents remain persistent. • Safety metrics do not capture the full range of economic, social, and environmental impacts resulting from rail safety incidents, particularly for low-likelihood but high-consequence events, such as the derailment in DuPont, Washington. • Intentional (planned) changes in systems can often be the time when accidents occur, the potential for which is not captured by accidents measures, a lagging measure.
<p>Having separate organizations responsible for overall transportation system policy and funding (i.e., WSDOT) and safety oversight (i.e., WUTC) is generally viewed by Washington rail stakeholders as an effective governance practice to avoid the potential for conflict between roles of safety oversight and funding.</p>	<ul style="list-style-type: none"> • Agency roles do not appear to be universally understood by all stakeholders with roles to play in rail safety.
<p>Of the states surveyed, railroad inspector staffing at the WUTC exceeds that of several states.</p>	<ul style="list-style-type: none"> • The WUTC has a larger FRA inspection program than some states, however additional resources are required to administer any future mandates.

Source: CPCS analysis.

In particular, the current **railroad** safety oversight model under which safety regulatory functions are separated from WSDOT and the WUTC is appropriate but could be further strengthened by:

- Strengthening the role of the WUTC in overseeing system safety of operators across the project lifecycle, including the commissioning of new infrastructure (see box below), in cooperation with the FRA.
- Improving awareness of the roles of stakeholders involved in rail safety, (oversight bodies, operators, and other stakeholders), engaging all rail stakeholders in regular conversation, and increasing communication of the state of rail safety.
- Continuing to focus on addressing the safety of at-grade crossings, which remains a persistent issue.

We make 15 recommendations to address these findings (Figure ES-5), including:

- Ensuring the WUTC has oversight authority over the commissioning process for new state-funded or intrastate rail infrastructure (Recommendation 7).

Oversight of system commissioning

A significant gap identified is the absence of a formally defined process for railroad and transit regulators to be involved in the commissioning process for new or materially changed infrastructure. Often, intentional (planned) changes in complex systems such as railways are factors in accidents.¹ While stakeholders have opined that regulators are not *responsible* for safety, there is an opportunity for them to promote safety in the systems they oversee by introducing new mechanisms to ensure operator accountability.

Source: ¹ Leveson, N.G. 2011. Engineering a Safer World: Systems Thinking Applied to Safety. The MIT Press.

- Establishing an ongoing rail safety forum to provide an opportunity for information sharing amongst stakeholders involved in rail safety (Recommendation 3).
- Acting to prioritize and provide resources to improve safety at grade crossings (Recommendation 12).

To ensure these recommendations are successfully implemented, the WUTC needs to have the appropriate financial resources to carry out these additional functions (Recommendations 13 and 14).

Most of the recommendations are applicable to **railroads**. However, Recommendation 7 (related to oversight of commissioning), Recommendation 10 (related to safety reporting) and Recommendation 14 (related to ensuring adequate resources) are also applicable to the oversight of transit systems. In addition, to best leverage the specialized rail safety oversight expertise in the state, we suggest that there be exploration of cooperation opportunities between the WUTC and WSDOT's State Safety Oversight Agency for transit (Recommendation 2).

Conclusion

The railroad environment in Washington State has evolved significantly over the past 10 years. It continues to evolve, with the potential for new types and quantities of hazardous materials being transported, new rail system types, and increases in automation (including at the road-rail interface). This creates ongoing and new opportunities and risks to the rail industry, its workers, and the public. In this context, Washington State's primary railroad safety regulator, the WUTC, has been asked to evolve from an operational regulator, (approving grade crossings and supporting routine federal inspectors using existing federal regulations), to an organization responsible for implementing new policy to strengthen railroad safety in the state.

This report recognizes and reinforces that the WUTC should be the focal point for railroad safety oversight and promotion within the state. However, despite significant efforts at engagement and transparency, it does not have the necessary policy resources to underpin this role. There is limited value to new regulation if it cannot be enforced or detracts from existing inspection functions. Further, it is critical that regulators have the necessary oversight and information channels with operators and other stakeholders, to ensure that stakeholders are aware of their roles and are appropriately managing risks. These channels also allow for information gathering on evolving trends, which can be used to inform policy and advise the legislature if additional action is required.

Thus, the overarching theme from our recommendations is ensuring that the WUTC (and WSDOT SSOA, as appropriate) has the necessary resources to carry out its role. While regulators cannot ensure safety, they can help ensure operators and other stakeholders are aware of their roles, compliant with regulations, and managing risks appropriately.

Figure ES-5: Summary of recommendations

Finding	Recommendations
<p>A. The current model for rail safety oversight in Washington State is appropriate but could be further strengthened.</p> <ul style="list-style-type: none"> i. The separation of railroad safety regulatory oversight from funding functions is a net strength of the Washington Safety oversight model ii. There are synergies to ensuring cooperation between state-level oversight agencies involved in railroads and transit despite system differences, and regulatory differences at the federal level. 	<p>Recommendation 1:</p> <p>1.1 The legislature should continue WUTC as the regulator of railroad safety and strengthen its role, as appropriate, in providing railroad safety oversight.</p> <p>1.2 The legislature, after further consultation with the WUTC to ensure consistency across its regulatory roles, should elevate the importance of promoting safety and security of the public and employees, and protection of the environment, by explicitly noting these priorities within the WUTC’s rail safety oversight mandate.</p> <p>Recommendation 2:</p> <p>2.1 The WUTC and WSDOT SSOA, in consultation with agencies that are regulated by both the FRA and FTA (e.g., Sound Transit), should explore opportunities for collaboration and sharing of best practices.</p> <p>2.2 The WUTC and WSDOT SSOA should report to the legislature whether there are opportunities for joint initiatives to be funded by the legislature, such as auditor training, development of system safety guidelines, etc. through annual reporting.</p>
<p>B. Despite the strength of the regulatory model, there isn’t universal understanding of the role of organizations involved in railroad safety in Washington State.</p>	<p>Recommendation 3: The legislature should provide the WUTC direction and resources to convene a forum with stakeholders involved in rail safety.</p> <p>Recommendation 4: The legislature should direct the WUTC to make reasonable efforts to engage with municipalities in Washington State on a collective basis through relevant associations.</p>
<p>C. There is the opportunity to strengthen the regulator’s role in the oversight of system safety across project lifecycles, including:</p> <ul style="list-style-type: none"> i. Ensuring that system safety plans are adapted to local contexts ii. Improving oversight of the implementation of new infrastructure iii. Strengthening the process for certifying operating personnel in the case of joint operations iv. Addressing other ambiguities regarding roles and responsibilities in the Washington Administrative Code (WAC) v. Review regulatory fee legislation to ensure sufficient resources align with expenses (see recommendation 13 and 14) 	<p>Recommendation 5: With input from the WUTC, the legislature should ensure the WUTC has authority to oversee all aspects of railroad safety, including the system safety practices of railroad companies (i.e., the oversight of programs made under 49 CFR Part 270 [System Safety Program – Passenger] and 271 [Risk Reduction Program – Freight]), in cooperation with the FRA.</p> <p>Recommendation 6: The WUTC should work with the FRA to ensure its State Safety Participation agreement encompasses oversight of the provisions of 49 CFR Part 270 and Part 271.</p> <p>Recommendation 7: The legislature should grant the WUTC authority to oversee the process by which new and materially changed railroad operations in the state are implemented, which would apply at minimum to any state-funded passenger service.</p> <p>Recommendation 8: The legislature should direct the WUTC to establish a focus group to explore with relevant host and tenant railroads operating in the state existing information sharing practices between host and tenant railroads and opportunities for greater minimum standards for these practices.</p> <p>Recommendation 9: The legislature should direct the WUTC to review and amend the WAC, in particular WAC 480-62-310, to clarify which party is responsible for reporting accidents.</p>

Finding	Recommendations
<p>D. There is an opportunity to strengthen the communication of the state of rail safety in Washington State.</p>	<p>Recommendation 10:</p> <p>10.1 The legislature should require the WUTC (for railroads) to produce an annual state of rail safety report, including a profile of annual crash statistics in Washington State, details of accidents and their investigation, inspection activities performed, and enforcement action taken. A similar report for transit systems is already required under RCW 81.104.115(9).</p> <p>10.2 We would recommend that these reports on the state of safety for railroads and transit presented to the committee identified in Recommendation 2, be forwarded to appropriate government officials, and be publicly published.</p> <p>Recommendation 11: The legislature should direct the WUTC and WSDOT to:</p> <p>11.1 Explore with Transport Canada and/or the Transportation Safety Board of Canada (TSB), and Oregon Department of Transportation the possibility of receiving reciprocal notification of incidents in a reasonable timeline involving multi-jurisdictional state-funded services.</p> <p>11.2 Have the WUTC compile and analyze information regarding the safety performance of passenger rail service inclusive of information from neighboring jurisdictions and national datasets, and share this information with WSDOT.</p>
<p>E. Grade crossing accidents remain persistent, despite efforts to address, and stakeholders are concerned about blocked crossings.</p>	<p>Recommendation 12: The legislature should ensure that appropriate state agencies can take action to support the implementation of low-cost solutions to improve crossing safety, address blocked crossings and promote reduced trespassing, including those attributed to suicides.</p> <p>12.1 To the extent budgets allow, the legislature should provide additional funding to promote wider implementation of grade crossing safety improvements, trespass prevention, and low-cost mitigations to address blocked crossings.</p> <p>12.2 To the extent budgets allow, the legislature should provide additional funding to enable the WUTC to conduct and/or support research into the effectiveness of novel at-grade crossing warning systems.</p> <p>12.3 The legislature should grant the authority to the WUTC to expand the criteria for project selection of the Grade Crossing Protective Fund Program to encompass low-cost solutions to monitor and address blocked crossings where applicants can demonstrate a related safety concern, including blocking of emergency response vehicles.</p> <p>12.4 The legislature should direct the WUTC and WSDOT to develop a focus group to review the 2017 study on Prioritization of Prominent Road-Rail Conflicts in Washington State, recommend improvements to ensure it can be used to prioritize high-safety risk crossings for improvement, and determine what funding and governance structure would be required to undertake this initiative.</p> <p>12.5 State agencies should be working through state associations, continue to raise the importance of blocked crossings to communities, and encourage federal action to monitor and address the issue.</p>

Finding	Recommendations
<p>F. Enable other recommendations by ensuring sufficient resources for implementation</p> <ul style="list-style-type: none"> ➤ Ensure that regulatory agencies have sufficient funding to carry out their mandate ➤ Strengthen Washington State’s position as a leader in rail safety by leveraging the capability of higher-education institutes 	<p>Recommendation 13: Based on the recommendations that the legislature determines it should implement, it should review the fee cap level set in consultation with the WUTC to ensure the adequacy of resources to carry out the recommendations.</p> <p>Recommendation 14:</p> <p>14.1 The legislature should appropriate funding to the WUTC and WSDOT SSOA to oversee project implementation, based on the number and complexity of state-funded passenger rail systems in development.</p> <p>14.2 WSDOT SSOA should coordinate with the FTA about best practices in providing oversight to systems in development, including whether there is an opportunity for the FTA to consider systems in development as part of their funding allocation model for State Safety Oversight.</p> <p>Recommendation 15: The legislature should provide funding to establish a rail research program or research program focus area to strengthen rail safety research.</p>

Source: CPCS.

1 Introduction

1.1 The study

The Washington State Legislature has commissioned a study to analyze and generate recommendations for rail safety governance in Washington State. The primary impetus for this study was the December 18, 2017, Amtrak Cascades derailment near DuPont, Washington that killed three passengers and injured 57 passengers and crew.

This study is being carried out under the authority of the contract signed between the Washington Joint Transportation Committee (JTC) and CPCS Transcom Inc. (CPCS) on June 26, 2020, for the Project “Assessment of Rail Safety Governance in Washington State.”

1.2 Study objectives

The objective of this study is to provide recommendations to the Washington State Legislature on improving rail safety governance in the state by class of rail (freight, intercity passenger, commuter, and transit where applicable). To achieve this objective, CPCS has:

- Examined and detailed the existing rail safety governance roles and responsibilities of federal, state, regional, and local agencies in Washington State
 - Identified rail safety governance practices from other similar jurisdictions
 - Consulted with federal, state, regional, and local agencies to gain insight into the existing rail safety governance practices in Washington State and to hear directly from them on how rail safety governance can be improved in the state
 - Provided the JTC and the Washington State Legislature with recommendations for implementation and improvement of rail safety governance in the state.
- The objective of this study is to provide recommendations to the Washington State Legislature on improving rail safety governance in the state by class of rail (freight, intercity passenger, commuter and transit where applicable).*

We have reframed this objective as a set of Key Questions (KQ) to be addressed in the study (see box) – the findings from which are documented in this report.

Key questions (KQ)

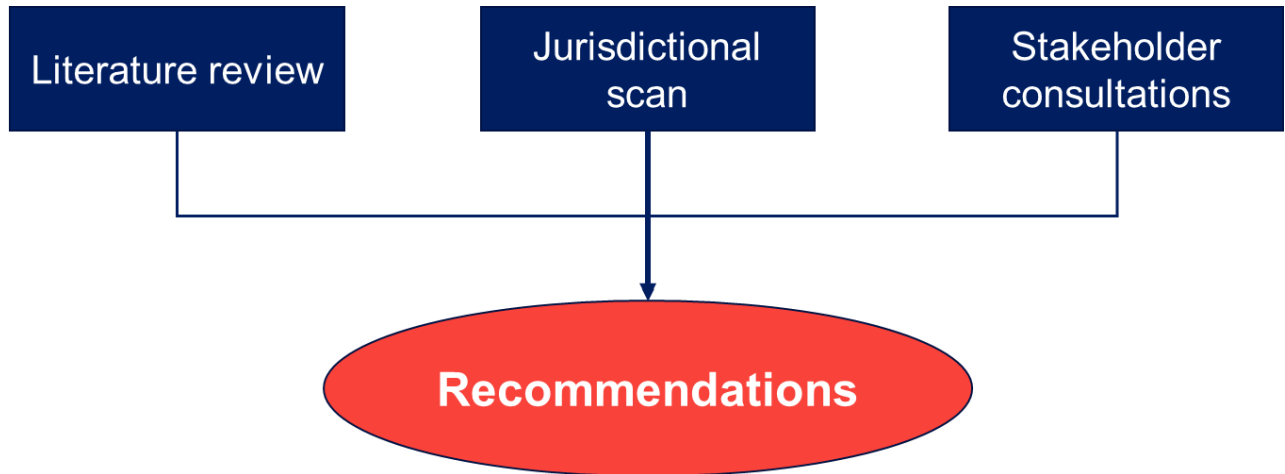
- KQ1:** What are the roles of federal, state, regional, and local agencies in the State of Washington for rail safety oversight and governance? What other stakeholder agencies, related to rail safety, exist in Washington State? (Chapters 4 and 5)
- KQ2:** What can be learned from rail safety governance practices in other states and countries? (Chapter 6)
- KQ3:** What are the gaps and inconsistencies in the state statutory law and administrative rules germane to rail safety oversight? (Chapter 7)
- KQ4:** How can Washington's rail safety governance be improved? (Chapter 7)

1.3 Methodology and limitations

1.3.1 Methodology

The recommendations in this report were prepared through a literature review of rail safety legislation, regulation, and practices applicable to Washington State; a jurisdictional scan of effective practices and lessons learned, and consultations with a sampling of stakeholders involved in rail safety (Figure 1-1). Appendix A lists the stakeholders we consulted. The Federal Railroad Administration was invited to participate in this study but declined to participate.

Figure 1-1: Study methodology



Source: CPCS.

1.3.2 Limitations

While this document references legal text, including legislation and regulations, it is intended to provide an informed overview of the rail safety regulatory system in Washington State, drawing out where possible practical implications to assess possible improvements. Definitions of certain terminology may be generalized. It is not intended to provide a legal opinion on any particular issue. In addition, due to the federal pre-emption clause in 49 USC Section 20106, there is the risk that any additional state regulation of railroads may be subject to legal challenge (see Chapter 4).

This study provides a policy research report and is not an audit of any organization. CPCS makes efforts to validate information obtained from third parties but does not independently verify all statements and opinions made. This report considers applicable legislation but does not rise to the standard of a legal opinion on any issue.

2 Washington State rail system

Key takeaways

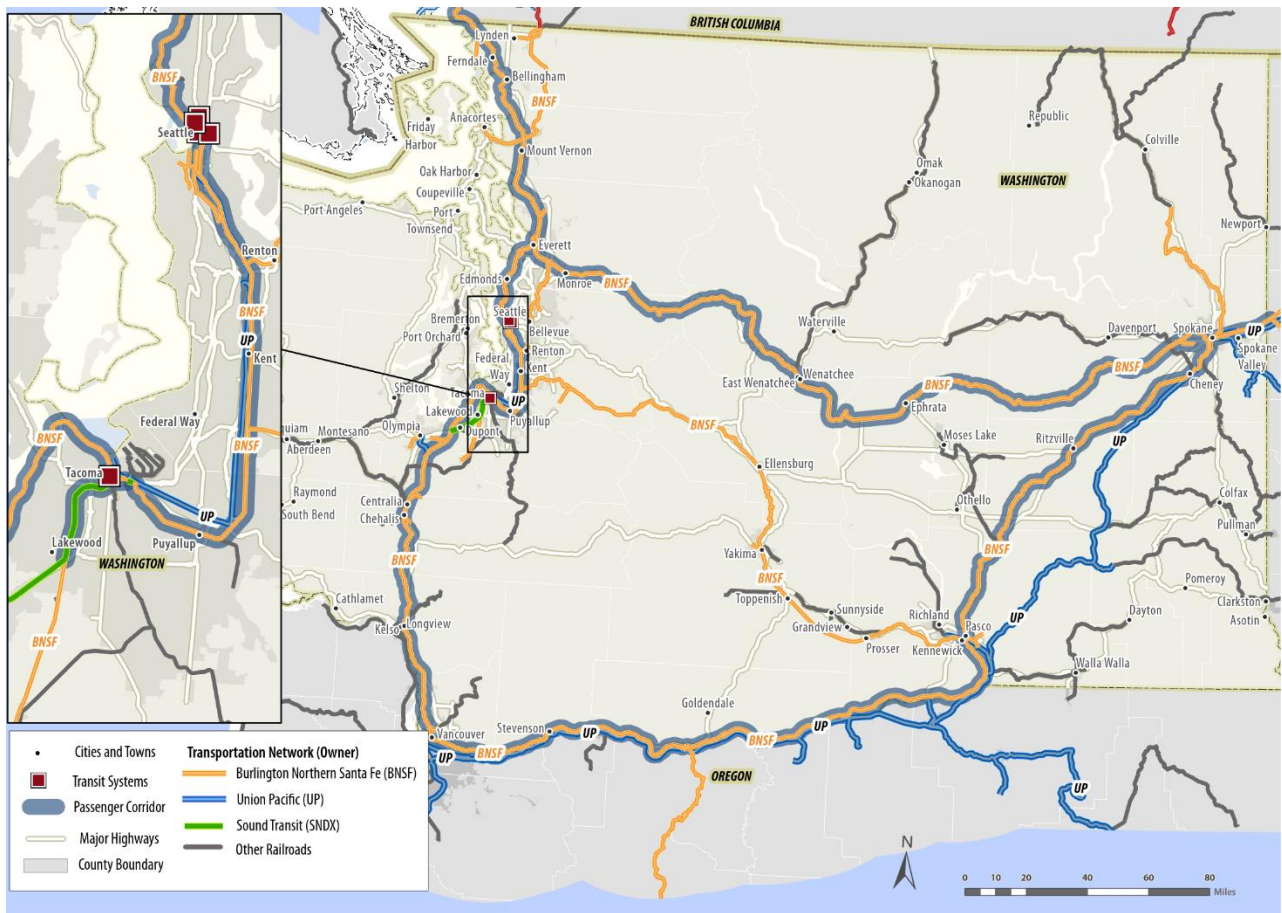
- The rail system in Washington State comprises over 3,000 miles of track supporting intercity passenger, commuter, freight, and transit operations. There are also studies under way to assess the potential for ultra-high-speed ground transportation systems (e.g., high-speed rail).
- There are several passenger rail services in Washington:
 - **Intercity passenger:** Amtrak operates three intercity passenger rail services in Washington State, including two long-distance services (Empire Builder and Coast Starlight) and one state-supported route (Cascades). The Cascades operates on 300 miles of track in Washington State and runs between Eugene, Oregon, and Vancouver, British Columbia, Canada, with 12 stops in Washington.
 - **Commuter rail:** The Central Puget Sound Regional Transit Authority (Sound Transit) operates two commuter rail routes (North and South routes)
 - **Transit:** There are five transit systems in Washington, including light-rail, street car, and monorail services. These services do **not** intermingle on the same tracks with freight or other passenger services and are regulated separately from other passenger and freight services.
- Washington State's freight railroad system is comprised of two Class I and 27 short line railroads (non-Class I) that operate on more than 3,000 miles of track.

2.1 Overview

Railway history in Washington State dates back to the 1850s when the Cascade Portage Railway began operation of six miles of rail track between Hamilton Island and Stevenson, Washington. Since then, the rail system in Washington State has grown to over 3,000 miles of track supporting passenger, commuter, freight, and transit operations (Figure 2-1).⁸

⁸ Washington Department of Transportation. 2019. Draft Washington State Rail System Plan. Olympia, WA.

Figure 2-1: Rail system in Washington State



Source: CPCS based on Oakridge National Labs rail network data.

2.2 Passenger rail

2.2.1 Types of passenger rail

There are different types of passenger rail systems operating in Washington State. Each of these systems operates in different operating contexts and has different regulatory frameworks:

- Passenger train services operating on the general system of railroad transportation, including intercity passenger (Figure 2-2) and commuter (Figure 2-3), commingle with freight transportation services (e.g., BNSF and UP) on the general system of railroad transport (i.e., the interstate rail network). They operate within a semi-exclusive right-of-way (i.e., their corridor is dedicated to rail,⁹ but they interface with road vehicles at grade crossings). Federally, they are regulated by the Federal Railroad Administration (FRA).
- Transit systems, such as streetcars (Figure 2-4), light rail systems (Figure 2-5), and monorails (not shown), do not interface with other rail types.¹⁰ They operate in mixed traffic (streetcars),

⁹ For clarity, the corridors may not be fully enclosed with fencing for example, so it is still possible for a person to access the corridor.

¹⁰ There are instances, outside of Washington State, where light rail vehicles operate over the general system of railroad transportation, but they are generally time-separated from other services (i.e., passenger trains during the day and freight trains overnight).

semi-exclusive rights-of-way (light rail), or dedicated guideways (monorail). Federally, they are regulated by the Federal Transit Administration (FTA).

Examples of passenger train service types operating on the general system of railroad transportation in Washington State

Figure 2-2: Intercity passenger



Source: SounderBruce/Wikipedia/CC BY-SA 4.0.

Figure 2-3: Commuter rail



Source: ItsDaDoc/Wikipedia/CC BY-SA 4.0.

Examples of transit systems types in Washington State

Figure 2-4: Streetcars



Source: SounderBruce/Wikipedia/CC BY-SA 4.0.

Figure 2-5: Light rail vehicle



Source: Atomic Taco/Wikipedia/CC BY-SA 2.0.

2.2.2 Long-distance and intercity passenger rail operators

The National Railroad Passenger Corporation (Amtrak) is a federally chartered corporation (the federal government as the majority stockholder) providing long-distance and intercity passenger service to Washington State since 1971. In Washington, Amtrak handled a total of approximately 1.3 million boardings and alightings in the fiscal year 2018, serving 19 stations. Amtrak operates three different services in the state that link Washington cities with destinations in the Midwest and along the Pacific Coast.

- **Empire Builder Route:** The Empire Builder runs one east/west train per day between Chicago and Seattle/Portland with 11 stations in Washington State. The train route between

Spokane and Seattle is 326 miles while the route between Spokane and Portland is 376 miles. As the two routes move east, they become one train traveling to Chicago on an additional 1,879 miles. Routes to both Seattle and Portland travel on the BNSF track.¹¹

- **Coast Starlight Route:** The Coast Starlight runs over 177 miles of track in Washington on a route that runs trains between Los Angeles and Seattle, serving six stations in Washington State. The route runs on the same track as the Amtrak Cascades route.
- **Cascades Route:** The Amtrak Cascades route is sponsored by the Washington Department of Transportation (WSDOT) and the Oregon Department of Transportation (ODOT). In particular, WSDOT and ODOT are responsible for reporting, budgeting, performance tracking, grant administration and management, and local, regional, state, and national coordination in their respective states. Amtrak Cascades operates on 300 miles of track in Washington State and runs between Eugene, Oregon and Vancouver, British Columbia with 12 stops in Washington. In the state, the route operates on track owned by BNSF and Sound Transit, depending on the location.¹² The section owned by Sound Transit is the Lakewood Subdivision; otherwise, this service operates on the BNSF-owned track. Amtrak is contracted to provide the operating and maintenance crews for this route. The December 2017 passenger train derailment in Dupont, Washington was operating on the Amtrak Cascades Route on the Sound Transit-owned track (Lakewood Subdivision).

2.2.3 Commuter rail

Central Puget Sound Regional Transit Authority (Sound Transit) is a public agency in Washington that operates the only commuter rail system in Washington State, the Sounder commuter rail service. Sounder has two routes: 1) North: 35 miles of track operating between Everett and Seattle, and 2) South: 48 miles of track operating between Lakewood and Seattle. The Sounder is operated by BNSF crew and trainmen on mostly BNSF-owned track. The relevant track Sound Transit owns is the Lakewood Subdivision, or the “Point Defiance Bypass.”

2.2.4 Transit

Sound Transit

In addition to offering commuter service, Sound Transit owns and operates two separate light rail transit (LRT) lines, which are considered rapid transit. It does not operate heavy rail lines:

- **Link Light Rail Line:** This LRT travels between the University of Washington and SeaTac with 14 stops along the route.
- **Tacoma Link:** This LRT provides free transportation along a 1.6-mile track in Tacoma, Washington with six stops along the route.

Other passenger rail operators

King County Metro Transit Department operates two streetcar lines in Seattle:

- **South Lake Union Streetcar:** Opened in 2007, the South Lake Union Streetcar is a 1.3-mile service that connects the South Lake Union neighborhood to downtown Seattle with seven different stops.

¹¹ Amtrak. 2019. Host Railroad Report Card. Washington, DC.

¹² Washington Department of Transportation. 2020. How We Manage the Trains. Olympia, WA.

- **First Hill Streetcar:** Opened in 2016, the First Hill Streetcar consists of 2.5 miles of track with 10 stops in Seattle. This service connects riders with the Sounder, Amtrak Cascades service, and Link Light Rail.

City of Seattle Monorail: The City owns and operates the Seattle Monorail line, a historic mile-long service that was the first commercial monorail line in the U.S. It runs between downtown Seattle and the Seattle Center.

2.3 Freight rail

Washington State's freight railroad system is comprised of two Class I¹³ and 27 short line railroads (non-Class-I railroads) that operate on more than 3,300 miles of track.¹⁴

2.3.1 Class I

Class I railroads are the largest freight railroads in the U.S. Two Class I railroads operate in Washington State:

- **BNSF Railway (BNSF):** In Washington State, BNSF employs 4,000 workers and owns and operates over 1,300 miles of railroad track. Its track handles nearly 1.9 million car loadings per year at 12 different rail yards and three intermodal facilities.¹⁵
- **Union Pacific Railroad (UP):** UP owns and operates over 500 miles of track in Washington State that handle approximately 500,000 carloads per year.¹⁶ It employs 300 workers and supports 2,700 jobs in the state.

2.3.2 Short lines

Short lines¹⁷ freight rail presence in Washington State consists of 27 short lines – seven of which are switching and terminal railroads¹⁸ – that operate on more than 1,300 miles of track. Similar to Class I freight railroads, short lines possess their own safety policies and procedures. However, they rely heavily on access to capital resources via federal and state funding programs to adequately address their existing and future safety needs. As a result, the short line railroad community in Washington State has long suffered from deferred maintenance on their rail lines and track. Subsequently, a large portion of short lines in the state do not meet state guidelines for efficient operations based upon future capacity and the velocity criterion.¹⁹

2.4 Other potential rail lines and operators

The rail system in Washington State has evolved over the past 10 years and is expected to continue to grow in the future. In particular, there are two recent/ongoing studies involving major expansions of the intercity passenger rail network, including the examination of an interstate/international high-speed ground transportation system between Vancouver, British Columbia, and Portland.

¹³ Railroads with annual revenues in excess of \$505 million in 2019.

Source: Association of American Railroads (AAR). Railroads 101. <https://www.aar.org/wp-content/uploads/2020/08/AAR-Railroad-101-Freight-Railroads-Fact-Sheet.pdf>

¹⁴ Washington Department of Transportation. 2019. Draft Washington State Rail System Plan. Olympia, WA.

¹⁵ BNSF Railway. 2019. BNSF Railway in Washington. Fort Worth, TX.

¹⁶ Union Pacific Railroad. 2019. Union Pacific in Washington. Omaha, NE.

¹⁷ We have defined a short line as any non-Class I railroad.

¹⁸ Switching and terminal railroads handle rail cars between shipper facilities and larger rail carriers (other short lines or Class I railroad) within a defined terminal area.

¹⁹ Washington Department of Transportation. 2015. Washington State Short Line Rail Inventory and Needs Assessment. Olympia, WA.

2.4.1 Intercity passenger rail system between Seattle and Spokane

The JTC conducted a study – completed in June of 2020²⁰ – regarding the feasibility of an east-west intercity passenger rail route between Seattle and Spokane. The study concluded that this proposed passenger service is technically feasible and could generate ridership above or comparable to other Amtrak Supported Services in Washington State, despite some anticipated long journey times.

2.4.2 Ultra high-speed ground transportation between Vancouver, Seattle, and Portland

WSDOT is currently studying the feasibility of an ultra-high-speed ground transportation corridor connecting Vancouver, Seattle, and Portland. As part of its study, WSDOT is exploring what the governance structure should be for administering, operating, and maintaining this intrastate, multinational rail service. The governance study was completed in December 2020.²¹

2.4.3 Continued growth of the transit system

There is expected to be significant growth in the transit and commuter rail system. Sound Transit, for example,

. . . is undertaking the most ambitious transit system expansion anywhere in the country. New light rail, bus rapid transit (BRT) and commuter rail stations are scheduled to open in 2021, 2022, 2023, 2024, 2030, 2031, 2035, 2036, 2039 and 2041.²²

²⁰ Washington State Joint Transportation Committee. 2020. Feasibility of an East-West Intercity Passenger Rail System for Washington State. Olympia, WA.

²¹ Washington Department of Transportation. 2020. Ultra-High-Speed Ground Transportation Study Overview. Olympia, WA.

²² Sound Transit. History of voter-approved plans. <https://www.soundtransit.org/system-expansion/building-system/history-voter-approved-plans>

3

Washington State rail safety record

Key takeaways

- This chapter examines the safety performance of the Washington State rail system.
- Between 2010 and 2019, over 900 railroad safety incidents occurred in Washington State – leading to 1,841 casualties (deaths, injuries or illnesses). There has been a 14% decrease in the total number of railroad safety incidents in Washington between 2010 and 2019, while the total number of casualties has declined by 26%.
 - However, railroad crossing and trespassing incidents have been persistent over this period, including trespassers using trains as a means for suicide.
 - Human factors and trespassing have been predominantly cited as the cause of incidents involving casualties over this period.
- Between 2010 and 2019, there has been a decrease in the number of transit safety events per year (from 39 to 33) and injuries (from 44 to 34), and an increase in fatalities (from 0 to 1), despite significant service expansions.
 - However, the numbers of incidents, fatalities, and injuries have fluctuated from year-to-year.
- While these metrics provide an important factual basis for this study, it is acknowledged that they do not capture the full range of economic, social, and environmental impacts resulting from rail safety incidents, particularly low-likelihood but high-consequence events and individuals who use trains as a means of suicide. Intentional (planned) changes are also often when accidents can occur.

3.1 Railroads

Between 2010 and 2019, over 900 rail safety incidents occurred in Washington State, leading to 1,841 casualties (deaths, injuries or illnesses).²³ There has been a 14% decrease in the total number of railroad safety incidents over the past 10 years. The total number of casualties across Washington has also declined by about 26% over the same period.

Rail traffic has generally been increasing over the same period:

- Between 2012 and 2018, annual **freight** ton-miles carried by rail to and from Washington increased by 23% from 55,000 million ton-miles to 68,000 million ton-miles. This growth is expected to continue and to potentially increase the state's rail freight ton-miles to about 80,000 million by 2040.²⁴ Amtrak's long-distance **passenger** train operations (Empire Builder and Coast Starlight), along with the Cascades corridor, had a ridership of more than 1.6 million passengers in 2019. Amtrak's ridership in Washington has increased by about 2% since 2018 but has overall declined by an average of 5.5% over the past decade.²⁵

²³ Casualties are reportable deaths, injuries, or illnesses arising from railroads' operations. Source: FRA Guide for Preparing Accident/Incident Reports, 2018.

²⁴ Freight Analysis Framework Data Tabulation Tool (FAF4), Accessed October 2020.

²⁵ Washington Department of Transportation. 2019. Draft Washington State Rail System Plan. Olympia, WA. and Amtrak. Accessed August 2020. State Facts Sheet. Washington, DC.

- The Sounder **commuter** trains also operate on 82 miles of BNSF tracks between Seattle and Tacoma, as well as on an additional 21 miles of tracks owned by Sound Transit between Tacoma and Nisqually. In 2015, Sounder trains completed 7,165 trips between the three counties of Snohomish, Pierce, and King. Sounder trips increased by 3% in 2019 over 2015 to about 7,370.²⁶

3.1.1 By category of incident

The primary categories of safety incidents reported by railroads are presented in Figure 3-1. For each type of incident, railroads are required to report casualties and details of incidents leading to fatalities, nonfatal injuries of all types, and occupational illnesses.²⁷

In 2019, 152 rail safety incidents occurred in Washington, leading to 20 deaths and 58 injuries (Figure 3-1). About half of all deaths were attributed to suicide.²⁸ The railroad incidents involving fatalities in 2019 were due to trespassing or roadway-railroad crossing incidents. Two of the rail equipment, six of the rail crossing, and six of the trespassing incidents, which occurred in 2019 were related to Amtrak operations.²⁹

Figure 3-1: Primary categories of railroad safety incidents, 2019

Cause of Incident	Number of Incidents		Fatalities		Injuries	
	Number	Percentage	Number	Percentage	Number	Percentage
Highway-rail grade crossing incidents	43	28%	8	30%	11	19%
Rail equipment accidents	52	34%	0	0	2	3%
Trespassing incidents	29	19%	20	70%	9	16%
Other types of accidents*	28	19%	0	0	36	62%
Total	152	100%	28	100%	58	100%

Notes: *includes non-trespassers on railroad property and occupational illnesses. Source: CPCS analysis of Federal Railroad Administration Rail Safety Data (2019).

The graphs in Figure 3-2, Figure 3-3, and Figure 3-4 below illustrate the railroad equipment, crossing, and trespassing incidents in Washington State and across the U.S. The number of incidents in these graphs is normalized to 100% in 2010 to highlight the change in the number of accidents between 2010 and 2019. These do not factor relative levels of rail activity in Washington State versus the rest of the U.S. These are indicative of areas meriting further examination and are not conclusive of the relative rail safety in Washington State.

As Figure 3-2 shows, Washington’s railroad equipment incidents have decreased by 28% since 2010. Meanwhile, there has been a 1.3% increase in the average railroad equipment incidents for all U.S. states. According to the U.S. Bureau of Transportation Statistics, rail carload and intermodal

²⁶ Sounder Transit Service planning and ridership documents, 2015-2019.

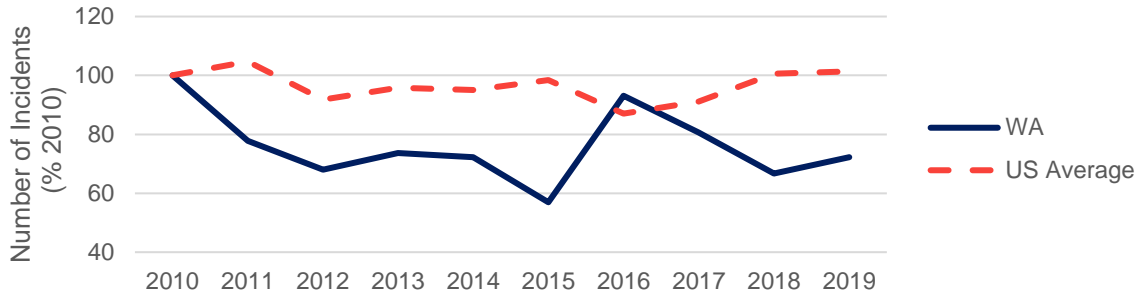
²⁷ FRA. 2020. Accident Data, Reporting, and Investigations. Washington, DC.

²⁸ Based on analysis by the WUTC.

²⁹ FRA requires railroads to report accidents and incidents on a monthly basis. Railroads are also required to submit an immediate notification to the FRA, in case of accidents of various types. FRA’s requirement from railroads to report safety incidents are codified under Title 49 Code of Federal Regulations (CFR) - Part 225 on railroad accidents/incidents, reports classification, and investigations. This helps FRA enforce its safety regulation responsibilities, and track railroad safety trends to develop hazard elimination strategies. Railroad reports to the FRA are submitted through the National Response Center.

traffic have declined or been largely flat across from 2010 to 2019. Conversely, the data presented above suggests that rail traffic in Washington State has been growing. This could partially explain the above-average increases in Washington State.

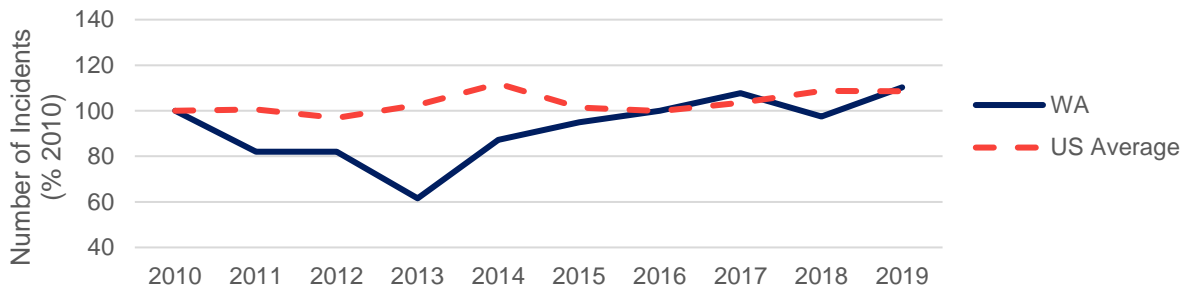
Figure 3-2: Railroad equipment incident trends



Source: FRA Safety Data, 2010–2019.

As Figure 3-3 presents, Washington’s roadway-railroad crossing accidents have increased by approximately 10% since 2010. Across the U.S., average crossing incidents saw an 8.5% increase between 2010 and 2019.

Figure 3-3: Railroad crossing accident trends

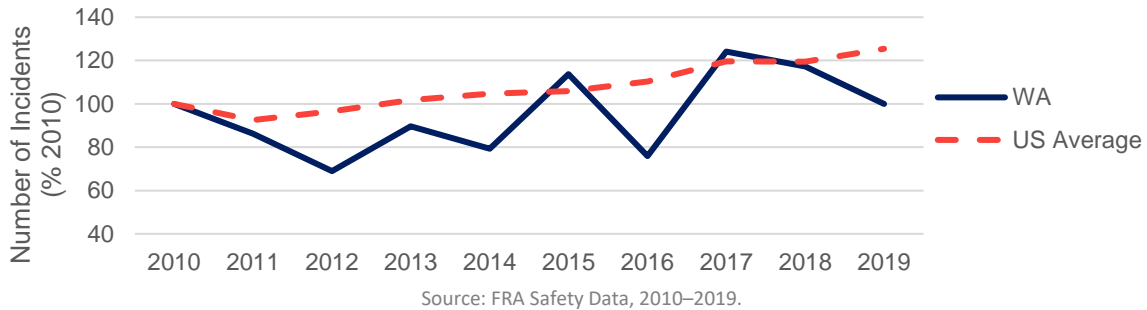


Source: FRA Safety Data, 2010–2019.

As Figure 3-4 shows, over the past 10 years, rail trespassing incidents in Washington have generally been lower than the average nationwide numbers. Nationwide, trespassing incidents have increased by 25% on average, while the number of trespassing incidents in Washington has declined or been flat between 2010 and 2019.³⁰

³⁰ Rail trespassing databases show reported incidents that have led to injuries or fatalities. Recent research has shown that the actual number of trespassing events can be recorded using various sensor technologies to monitor trespassing severity at the corridor level. NCDOT& FHWA, Rail Corridor Trespass Severity Assessment, February 2019, [Institute for Transportation Research and Education \(ITRE\), North Carolina State University](#).

Figure 3-4: Railroad trespassing incident trends



3.1.2 By cause of incident

The primary cause of rail-related accident injuries and deaths in Washington are human factors, trespassing, environmental³¹ and equipment accidents, and objects on rail tracks (Figure 3-5).

- Railroad incidents caused by railroad employees are categorized as “Human Factor” incidents. If a railroad employee is identified (by the railroad) as attributed to an accident, an Employee Human Factor Form should be submitted to the FRA.³²
- Trespassing incidents mostly occur when pedestrians walk across or along a railroad track at points that are not designated pedestrian or road crossings. In about half of all fatal cases, the trespasser intentionally put him/herself in front of the train as a means of suicide. These incidents often (more than 94% of the time) lead to fatalities or serious injuries.³³ Despite the generally steady number of trespassing casualties in Washington between 2010, 2015, and 2019, the trespassing accidents remain the leading cause of rail-related fatalities.³⁴

Railroad accidents in which a train “strikes a bumping post or a foreign object on the track right-of-way” are flagged as an “Object Fouling Track” type of accident. Foreign objects include vehicles at a location other than a roadway-railroad crossing, any equipment, and any unusual objects such as livestock or objects left to vandalize the tracks.³⁵

³¹ Environmental conditions that may cause rail accidents include accumulation of snow, ice, mud, gravel, coal, sand, etc. on tracks, and extreme weather conditions such as tornados, floods, dense fogs, and extreme wind velocities. Source: FRA, Guide for Preparing Accident/Incident Reports, 2018.

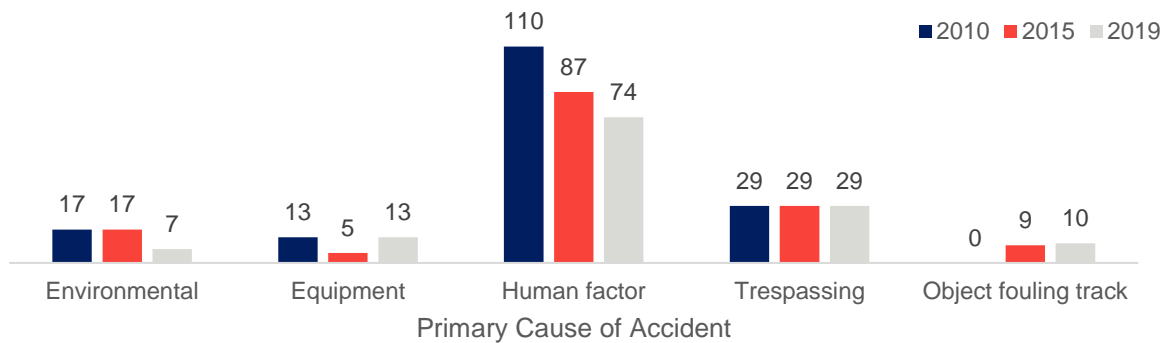
³² In line with the requirements codified under 49 CFR Part 225.12: Rail Equipment Accident/Incident Reports.

³³ FRA, Highway-Rail Grade Crossing Safety and Trespass Prevention Program Website, accessed August 2020.

³⁴ John Frittelli, Trespassing: The Leading Cause of Rail-Related Fatalities, 2018, CRS Insight.

³⁵ FRA, Guide for Preparing Accident/Incident Reports, 2018.

Figure 3-5: Rail casualties causes in Washington State, number of incidents involving fatalities or injuries, 2010-2019

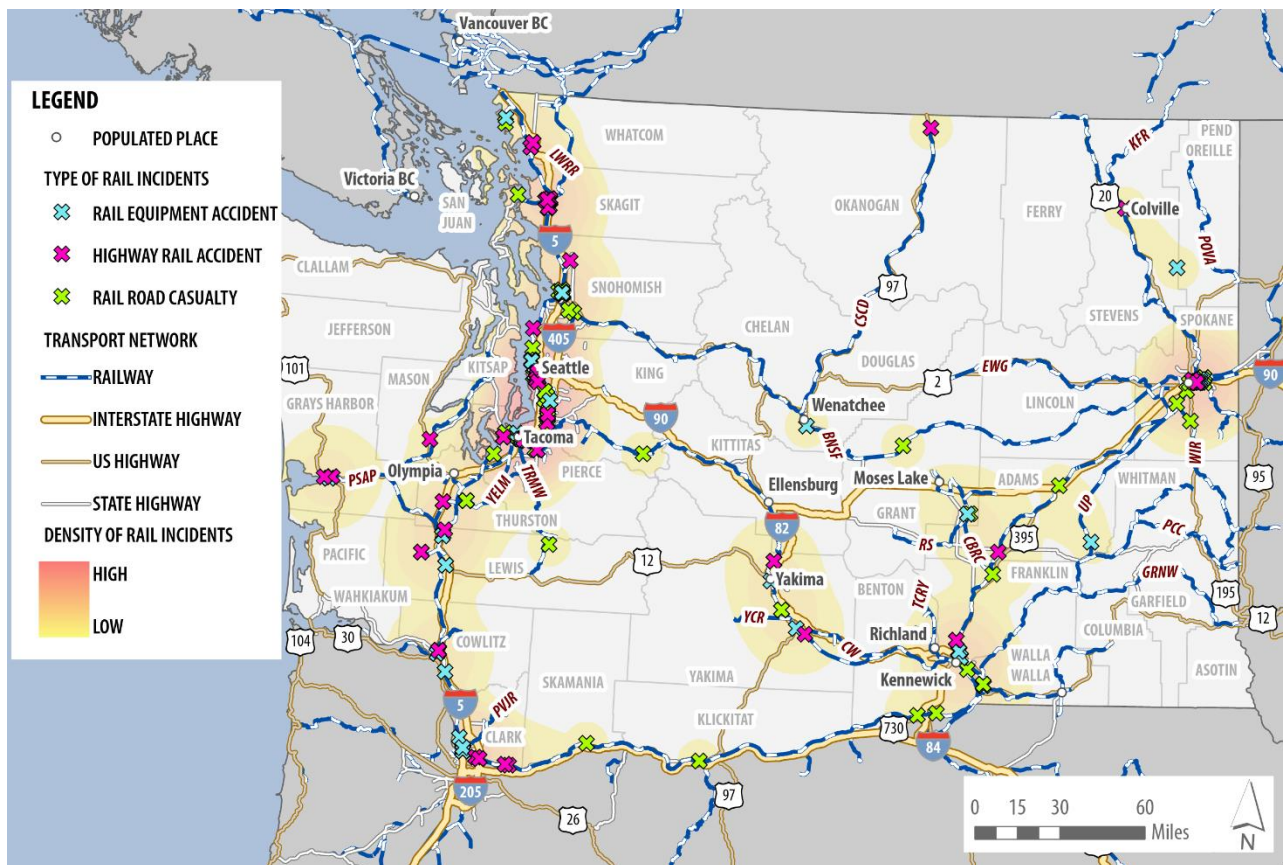


Source: CPCS analysis of Federal Railroad Administration Rail Safety Data (2015-2019).

3.1.3 By location of Incident

Figure 3-6 illustrates the rail safety hotspots in Washington in 2019. While rail equipment incidents are scattered across the state, highway-rail crossing accidents are clustered in areas with a higher density of population and, in particular, in and around Seattle, Tacoma, Spokane, and Kennewick.

Figure 3-6: Washington State rail incident hot spots in 2019



Note: Railroad casualty refers to an accident involving injuries and/or fatalities. Source: FRA Safety Data, 2019.

3.2 Transit

FTA's National Transit Database (NTD) is the repository of financial, operating, and asset condition of transit systems across the U.S. Transit operators that apply and receive financial support through the FTA Urbanized Area Formula³⁶ or Rural Formula³⁷ funding programs are required to submit annual reports to the FTA, in alignment with the NTD's uniform categories. More than 63 rail transit operators across the U.S. report to the FTA every year.

In Washington State, the King County Department of Transportation – Metro Transit Division, Seattle Center Monorail Transit, and Sound Transit submit yearly reports of light rail and streetcar operations and safety events to the FTA.³⁸

Between 2010 and 2019, 260 rail transit safety accidents (major and minor) occurred in Washington leading to nine fatalities, 259 injuries, and six serious injuries. The majority of the victims were people waiting for the trains or boarding/leaving the transit vehicles on the station platforms, specifically on the light rail service.

The graphs in Figure 3-7 summarize the trends in annual passenger miles traveled as well as the transit safety events, injuries, and fatalities for Washington and the U.S. The annual transit safety-related data are normalized to 100% in 2010 for comparison with the U.S. averages. Unlike in the rest of the U.S., however, ridership has been increasing.

Between 2010 and 2019, there has been a decrease in the number of transit safety events per year (from 39 to 33) and injuries (from 44 to 34), and an increase in fatalities (from 0 to 1) (Figure 3-7). During this period, as a result of infrastructure and service expansions,³⁹ both light rail and streetcar passenger miles traveled have more than tripled – from 57 million light-rail passenger miles in 2010 to 161 million in 2019 and from 630,000 streetcar passenger miles in 2011 to 2.7 million in 2019. Transit revenue vehicle miles have also increased by more than 33% for light rail operations and nearly 350% for streetcar operations in Washington.⁴⁰ However, the increases in ridership and service levels do not fully explain the increase in events and injuries, particularly in the years immediately following service expansion (see footnote 35).

³⁶ 49 USC § 5307

³⁷ 49 USC § 5311

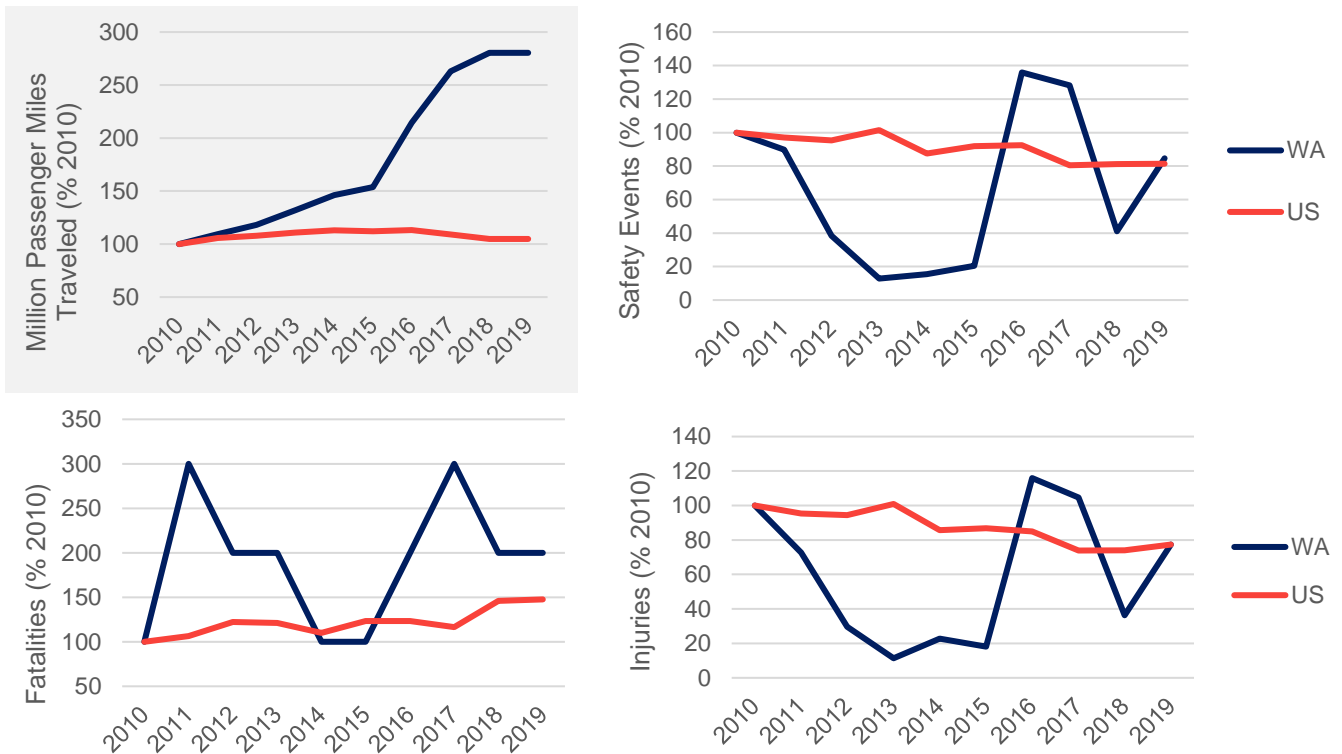
³⁸ FTA Website, About the NTD, accessed August 2020.

³⁹ In 2015, about 40 miles of light rail and five miles of streetcar systems operated in Seattle. By 2019, Kings County DOT's Metro Transit Division added the First Hill line, doubling the number of streetcar system operating miles. In the meantime, the Central Puget Sound Regional Transit Authority completed several light rail system expansion projects in and around Seattle, including a 3.5-mile extension of the Central Link Line 1, and a 1.6-mile extension of the Link South 200th Line. In addition to the rail line expansions, the Central Puget Sound Regional Transit Authority introduced several new bus routes to the transit system to connect more users to the light rail network and increase ridership.

Source: Link Light Rail Program, Progress Report, 2019. <https://www.soundtransit.org/sites/default/files/documents/august-2019-link-progress-report.pdf>

⁴⁰ FTA, National Transit Database, 2010-2019.

Figure 3-7: Transit safety events, fatalities, and injuries in Washington compared to average nationwide



Source: FTA, National Transit Database, 2010-2019.

4 Overview of laws governing rail safety

Key takeaways

- This chapter summarizes key requirements governing intercity passenger, freight, commuter, and transit safety at the federal, state, and local levels in Washington State.
- There is a different regulatory framework for **railroads** (intercity passenger, freight, and commuter) and **transit** (including light rail, street cars, and monorails).
- Federal-level rail safety-related requirements are written into Title 49 of the Code of Federal Regulations. For railroads, federal law requires nationally uniform railroad laws, regulations, and orders related to railroad safety and security “to the extent practicable,” which generally pre-empts state and local regulations, except those meeting certain conditions.
- State requirements related to rail in Washington are included in the Revised Code of Washington, under Titles 81, 47, 49, 80, and 90, as well as the Washington Administrative Code.
- Federal requirements related to railroads include prescriptive standards that railroads must follow and relate to areas including reporting, engineering, employee safety and training, operational safety, and system safety.
- Federal requirements related to transit are less prescriptive in terms of the technical operations of transit systems and include requirements setting out the responsibilities of states to provide oversight on a day-to-day basis.

4.1 Federal rail safety laws and regulations

There are different regulatory frameworks for **railroads** (which include existing freight, intercity passenger and commuter railroads, as well as novel high-speed ground transportation systems), and **transit systems**.⁴¹ Therefore, the overview of the federal rail safety regulations presented in this chapter is categorized into two sections: railroad safety regulations and transit system safety regulations.

⁴¹ The definition of railroads is found at 49 USC § 20102, which excludes “transit operations in an urban area that are not connected to the general railroad system of transportation.”

4.1.1 Federal railroad safety regulations

For all railroads engaged in transportation-related activities, federal law generally pre-empts state and local attempts to regulate railroad operations and safety. Section 20106 of Title 49 U.S. Code (USC) deals with the pre-emption of state law by the federal regulation. The paragraph requires nationally uniform railroad laws, regulations, and orders related to railroad safety and security, “to the extent practicable.” This paragraph, however, also allows states to implement more stringent state laws, regulations, and orders than those at the federal level to “eliminate or reduce an essentially local safety or security hazard” provided that they are “not incompatible with a law, regulation, or order of the United States Government” and the state law or regulation “does not unreasonably burden interstate commerce.”⁴²

Federal law requires nationally uniform railroad laws, regulations, and orders related to railroad safety and security “to the extent practicable,” which generally pre-empts state and local regulations, except those meeting certain conditions.

Federal-level, rail-related legislation is written primarily into Title 49 of the Code of Federal Regulations (CFR) for transportation-related issues. Title 49 CFR stemmed from an effort to streamline transportation-related laws and regulations (including Title 45 CFR) by Public Law 103-272 of 1994.

Federal Railroad Safety Act

The Federal Railroad Safety Act (FRSA) of 1970 was enacted by Congress “to promote safety in every area of railroad operation and reduce railroad-related accidents and incidents.”⁴³ FRSA authorizes the Secretary of Transportation to “prescribe regulations and issue orders for every area of railroad safety supplementing laws and regulations in effect on October 16, 1970” and for the “investigative and surveillance activities necessary to enforce the safety regulations.”⁴⁴

The relevant FRSA regulations on rail safety issued by the Secretary of Transportation, acting through the Federal Railroad Administration (FRA), are codified at CFR Title 49 Chapter II, VI, VII, and VIII. Chapter II parts of particular importance to rail safety are:

- Rail safety enforcement: Part 209 – railroad safety enforcement procedures ([§ 209.1 – 209.501](#)), Part 210 – railroad noise emission compliance regulations ([§ 210.1 – 210.33](#)), Part 212 – safety participation regulations (Subpart B on state/federal roles [§ 212.101 – 212.115](#) and Subpart C on state inspection personnel [§ 212.201 – 212.235](#)),⁴⁵ and Part 211 – rules of practice (Subpart E – miscellaneous safety-related proceedings and inquiries [§ 211.51 – 211.61](#));
- Rail infrastructure engineering safety regulations: Part 213 – track safety standards ([§§ 213.1 – 213.369](#)), Part 215 – railroad freight car safety standards ([§ 215.1 – 215.305](#)), Part 237 – bridge safety standards ([§ 237.1 – 237.155](#));

⁴² 49 USC §20106

⁴³ 49 USC § 20101

⁴⁴ 49 USC § 20103(a)

⁴⁵ Discussed further in Chapter 5.

- Rail equipment and appliances: Part 216 – railroad track, locomotive, and equipment ([§ 216.1 – 216.27](#)), Part 229 – railroad locomotive safety standards ([§ 229.1 – 229.319](#)), Part 221 – rear end marking devices ([§ 221.1 – 221.17](#)), Part 223 – safety glazing standards ([§ 223.1 – 223.17](#)) for passenger, commuter, and freight trains, Part 224 – reflectorization of rail freight rolling stock ([§ 224.1 – 224.111](#)), Part 231 – railroad safety appliance standards ([§ 231.1 – 231.35](#)), Part 232 – brake system safety standards for freight and other non-passenger trains and equipment, and end-of-train devices ([§ 232.1 – 232.613](#)), Part 233 – signal systems reporting requirements ([§ 233.1 – 233.13](#));
- Operational safety regulations: Part 214 – railroad workplace safety ([§ 214.1 – 214.533](#)), Part 217 – railroad operating rules ([§ 217.1 – 217.13](#)), Part 218 – railroad operating practices ([§ 218.1 – 217.109](#)), Part 219 – control of alcohol and drug use ([§ 219.1 – 219.1007](#)), Part 225 – railroad accidents/incidents: reports classification, and investigations ([§ 225.1 – 225.41](#)), Part 244 – regulations on safety integration plans governing railroad consolidations, mergers, and acquisitions of control ([§ 244.1 – 244.21](#)), and Part 270 – system safety program ([§ 270.1 – 270.305](#));
- Workforce-related safety regulations: Part 228 – passenger train employee hours of service; recordkeeping and reporting; sleeping quarters ([§ 228.1 – 228.413](#)), Part 240 – qualification and certification of locomotive engineers ([§ 240.1 – 240.411](#)), Part 243 – training, qualification, and oversight for safety-related railroad employees ([§ 243.1 – 243.209](#)),
- Grade crossing-related regulations: Part 222 – use of locomotive horns at public highway-rail grade crossings ([§ 222.1 – 222.59](#)); Part 234 – grade crossing safety ([§ 234.1 – 234.415](#)); and Part 236 – rules, standards, and instructions governing the installation, inspection, maintenance, and repair of signal and train control systems, devices, and appliances ([§ 236.0 – 236.1049](#)).

[49 CFR Chapter VII](#) includes regulations related to the organization and functioning of Amtrak and the process for requesting and receiving data from Amtrak as required by the Freedom of Information Act. Meanwhile, Chapter VIII indicates the administrative rules and procedures of the National Transportation Safety Board. In particular, Part 840 focuses on rules pertaining to railroad accidents and the Board’s investigation procedures ([§ 840.1 – 840.6](#)).

FRSA regulations related to passenger railroad operations are codified under CFR Title 49 - Chapter II. Parts specific to passenger services safety are:

- Part 200 – informal rules of practice for passenger service ([§ 200.1 – 200.13](#))
- Part 238 – passenger equipment safety standards ([§ 238.1 – 238.753](#))
- Part 239 – passenger train emergency preparedness ([§ 239.1 – 239.303](#))

Some of the above-mentioned parts and paragraphs of Title 49 CFR are described in more detail in the following sections.

Amendment to the FRSA

In 2007, an amendment to the FRSA established employee-protection standards to enable the employees of a “railroad carrier engaged in interstate or foreign commerce, a contractor or a subcontractor of such a railroad carrier, or an officer or employee of such a railroad carrier” to report a violation of “any Federal law, rule, or regulation relating to railroad safety [...] or abuse of Federal grants or other public funds intended to be used for railroad safety or security” to an investigatory body, such as the federal law enforcement agencies, Congress, Department of Transportation, and

National Transportation Safety Board. The amendment does not alter the pre-emption analysis of state law claims.⁴⁶

Federal Safety Appliance Act

The Federal Safety Appliance Act (FSAA) was enacted by Congress in 1893 to promote the safety of employees and travelers on the railroads. The original FSAA and its amendments provide a detailed description of devices that railroads are required to install to ensure safety. The FSAA resulted in a sharp decline in rail accidents by making air brakes and automatic couplers mandatory.⁴⁷

Rail Safety Improvement Act

After multiple fatal rail incidents around the U.S., including two incidents that involved commuter trains in California, the U.S. Congress passed the Rail Safety Improvement Act (RSIA) in 2008 to address the underlying causes of these incidents. Title II of the RSIA on Highway-Rail Grade Crossing and Pedestrian Safety and Trespasser Prevention includes the following:⁴⁸

- Improvements to sight distance at highway-rail grade crossings
- Updating the national crossing inventory through periodic reporting of crossing information by the states to the Secretary of Transportation
- Establishing and funding of a program to “improve awareness along railroad ROW and at highway-rail grade crossings” (Operation Lifesaver)
- Making and distributing grants and other financial support programs to assist the states in specific projects that aim to improve crossing safety
- Incident reporting through FRA audits of Class I (at least once every two years) and non-class I (at least once every five years) railroads
- Fostering new rail and highway traffic control technology applications that mitigate crossing collisions and improve overall safety at highway-rail grade crossings.

RSIA also required Positive Train Control (PTC) systems to be “fully implemented ... on Class I railroads’ main lines that transport poison- or toxic-by-inhalation hazardous materials and any main lines with regularly scheduled intercity or commuter rail passenger service.”⁴⁹ PTC systems are advanced communication-based and processor-based train control technologies that can automatically stop the trains to prevent accidents. PTC is particularly effective in preventing train-to-train collisions, over-speed derailments, incursions into established work zone limits, and movements of trains through a misaligned route.⁵⁰

The initial deadline for full PTC implementation was December 31, 2015. Since then, Congress has extended the deadline to December 31, 2018, and later to December 31, 2020. FRA is responsible for oversight, guidance, and coordination of PTC implementation on all applicable railroads.⁵¹ According to the FRA, as of August 12, 2020, 98.8% of all PTC-mandated route miles have PTC

⁴⁶ 49 USC §20109

⁴⁷ 49 USC §20302

⁴⁸ Public Law 110–432—Rail Safety Improvement Act of 2008.

⁴⁹ RSIA, Division A – Rail Safety, Section 104, 2008.

⁵⁰ FRA, Overview of Positive Train Control (PTC), June 2020.

⁵¹ Ibid.

systems on their track.⁵² Additionally, PTC systems have been fully implemented on all rail lines in Washington State where required by law.⁵³

Manual on Uniform Traffic Control Devices

Issued by the Federal Highway Administration (FHWA), the Manual on Uniform Traffic Control Devices (MUTCD) is “the national standard for all traffic control devices installed on any street, highway, or bicycle trail open to public travel.”⁵⁴ MUTCD includes provisions as to how multi-directional traffic is being dealt with when flows are inhibited in any way, including at grade crossings.

While FHWA publishes and updates the MUTCD standards, the state and local highway agencies are responsible for assuring implementation on all public roads. Non-compliance with the MUTCD can result in the loss of federal funds and an increase in tort liability.⁵⁵ However, there is no clear consensus as to the interpretation of the applicability of the MUTCD to railroads at crossings. Currently, the FRA is taking steps to clarify MUTCD requirements of railroads at road-rail grade crossings.⁵⁶

Occupational Safety and Health Act

The Occupational Safety and Health Act (OSHA) establishes standards and regulations under 29 CFR Part 1910 to ensure the health and safety of all railroad employees. OSHA regulations are preempted by other federal or state statutes or regulations that exercise authority over employee working conditions. FRA’s policy statement on OSHA delineates occasions in which FRA’s regulations take precedence over OSHA’s.⁵⁷

OSHA’s regulations “concerning working surfaces deal with such matters as ladders, stairways, platforms, scaffolds, and floor openings” in railroad offices, shops, and other fixed workplaces. OSHA’s regulations “do not apply to:

1. Design of locomotives and other rolling equipment used on a railroad;
2. Inspection pits in the locomotive or car repair facilities;
3. Ladders, platforms, and other surfaces on signal masts, catenary systems, railroad bridges, turntables, and similar structures or to walkways beside the tracks in yards or along the right-of-way.”

These areas are considered part of the operating environment and therefore regulated by the FRA.⁵⁸

⁵² FRA, Second Quarter 2020 Positive Train Control Implementation Status Update, August 2020.

⁵³ WSDOT, State Rail Plan, August 2020.

⁵⁴ FHWA, Manual on Uniform Traffic Control Devices 2009 edition.

⁵⁵ FHWA, Manual on Uniform Traffic Control Devices, Frequently Asked Questions, March 2020.

⁵⁶ The current language of MUTCD regarding railroad’s obligation to ensure compliance with its provisions is not binding. Therefore, especially in matters that relate to temporary traffic control at grade crossings, railroads can act at their sole discretion. This has been validated through FRA remarks on applicability of the MUTCD to railroads at AASHTO Council on Rail Transportation held in Washington, DC on February 18-21, 2020.

⁵⁷ National Academies of Sciences, Engineering, and Medicine 2015. Railroad Legal Issues and Resources. Washington, DC: The National Academies Press. <https://doi.org/10.17226/22093>.

⁵⁸ FRA OSHA 1978 Policy Statement - 49 CFR Part 221 - Railroad Occupational Safety and Health Standards; Termination.

Common carrier status for railroads

§ 11101 of Title 49 USC defines the obligations of a common carrier to provide transportation to any party when requested. For freight railroads, this includes transportation of hazardous materials. In return, the railroads are allowed to use the powers of eminent domain and are granted some protection against state regulation.⁵⁹ Railroads with a common carrier status are required to handle and transport hazardous materials.

The U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration (PHMSA) regulates the transport of hazardous materials through Title 49 CFR, Subchapter C on Hazardous Materials Regulations. PHMSA's oversight roles and responsibilities are further outlined in Section 5.3.1.

New rail line application and certification requirements

New rail lines, rail service extensions, and persons other than a rail carrier who “acquire a railroad line or acquire or operate an extended or additional railroad line” are required to seek Surface Transportation Board (STB) certification to comply with the federal regulatory process.⁶⁰ This process generally includes an environmental review, as prescribed by the National Environmental Policy Act (NEPA). Decisions regarding new rail service are governed under [49 USC § 10901](#) and [§ 10902](#), and [49 CFR Part 1150](#).⁶¹

Passenger Rail Investment and Improvement Act

The Passenger Rail Investment and Improvement Act (PRIIA) of 2008 deals mostly with Amtrak performance, appropriations for rail-related projects, and several research grants and studies. It requires states to develop state rail plans. Before PRIIA, states had no statutory role in planning and implementation for intercity passenger rail outside of occasional FRA grants.⁶² Through the passage of this act, states are given an explicit role to oversee rail planning and implementation.

4.1.2 Federal transit system safety regulations

Federal **railroad** requirements are more prescriptive than transit requirements (see box on the next page) in that they cover specific requirements for assets and the workforce that regulated entities (railroads) must follow. By comparison, **transit** requirements generally set out an approach for how the industry is to be regulated and specify some plan and process-related standards but leave agencies with greater discretion in terms of how specifically those requirements are carried out. In addition, unlike for railroads, there is no federal pre-emption clause applicable to transit (though stakeholders indicated the desirability of ensuring alignment with federal requirements).

Unlike for railroads, there is no federal pre-emption clause applicable to transit (though stakeholders indicated the desirability of ensuring alignment with federal requirements).

49 CFR - Chapter VI covers the Federal Transit Administration (FTA) functions and procedures, while transit-related safety regulations are covered in 49 CFR - Chapter II. Transit safety regulations are codified in the following parts, including:

⁵⁹ 49 USC §11101

⁶⁰ 49 USC § 10901

⁶¹ Subpart A – Applications Under 49 USC 10901

⁶² H.R.6003 - Passenger Rail Investment and Improvement Act of 2008. www.Congress.gov.

- Part 630 – National Transit Database ([§ 630.1 – 630.11](#))
- Part 655 – prevention of alcohol misuse and prohibited drug use in transit operations ([§ 655.1 – 655.83](#))
- Part 670 – public transportation safety program ([§ 670.1 – 670.31](#))
- Part 672 – public transportation safety certification training program ([§ 672.1 – 672.31](#))
- Part 673 – public transportation agency safety plans ([§ 673.1 – 673.31](#))⁶³
- Part 674 – state safety oversight ([§ 674.1 – 674.41](#)).⁶⁴

Following the box (on the next page), some of these requirements are described further below.

⁶³ In early 2020, the FTA issued a Notice of Enforcement Discretion which has the effect of extending the compliance deadline for this rule until December 31, 2020.

FTA. Safety Rulemaking. <https://www.transit.dot.gov/regulations-and-guidance/safety/safety-rulemaking>
Accessed October 28, 2020.

⁶⁴ FTA's final rule of the State Safety Oversight (SSO) replaced 49 CFR Part 659 in 2016.

Prescriptiveness of requirements - overview

One dimension in developing an oversight model is the extent to which the rules and standards are prescriptive (i.e., the extent to which the requirements are highly detailed and provide limited discretion or the extent to which they provide some discretion to the regulated entity in terms of how the objective of the standard is realized). In terms of prescriptiveness, this could be determined by the extent to which the requirement focuses on the characteristics of assets or the workforce (e.g., the condition of the track) versus a process (e.g., the requirements for carrying out inspections).

For example, in a highly prescriptive standard related to grade crossings, the standards could specify that a regulated entity is required to have lights and bells at an at-grade crossing, a certain distance from the track, a specific decibel level, etc. In a less prescriptive standard, it could specify that a transit agency is required to have a process for identifying hazards for at-grade crossings and designing and implementing mitigation actions accordingly, but not specify what physical system characteristics are required.

As noted above, requirements can also apply to processes; and process-related standards can also be somewhat prescriptive. For example, railroads are required to follow 49 CFR Part 213 – Track Safety Standards, which specify the inspection frequency based on the traffic over the track. A much less prescriptive standard could be that the railway must have a documented process for performing track inspections but leave it at the discretion of the railways as to how that is performed.

There are also performance-based regulatory requirements that “focus on desired, measurable outcomes, rather than required product features or prescriptive processes, techniques or procedures.”

Any rule or standard is a “proxy for some real goal” – in this case, ensuring safety. For example, though the specific moment in time when a rail will crack cannot be detected, the condition of the rail can be observed and measured through various inspection techniques. The results from these inspections, combined with formulated standards, can help to determine the likelihood that safety might be compromised. If the rail exhibits certain cracking, for example, it can be assumed that there is a higher likelihood that the rail will break and thus be taken out of service. However, inspecting and gathering data on the condition of the rail is not a perfect proxy for safety. For example, it could have been that rail would have lasted until the next scheduled replacement – the standard resulted in a “false positive” (and in some sense, resources were “wasted”). Alternatively, had the inspection not revealed a crack and the rail failed, then there would be a “false negative” – which would create costs as well. The important point is that, whatever standard is used, it is never perfect.

In terms of prescriptiveness, less prescriptive standards have the benefit of being more comprehensive but may be less actionable for regulators. For example, if the standard at the limit were to indicate that a regulated entity should “be safe,” it is in certainly comprehensive terms that the coverage of all of the hazards should be considered. Also, given the limited detail, it would be easy to apply this standard across all entities. However, the actionability of such a requirement on the part of an inspector for the regulator would be limited, as it is more difficult to measure what “being safe” means in the absence of more specific requirements.

By contrast, more prescriptive regulations can be more actionable, though they are less comprehensive. For example, if the standards specify that the width between rails must be within a certain tolerance, having an inspector verifying it would be a straightforward thing to do. However, the width of the track is only one element of the safety of a rail system, so the requirement is less comprehensive and more of a proxy for a safety standard as compared to a requirement to “be safe.” This is precisely aligned with the overall goal. A more prescriptive standard may also not necessarily be applicable or appropriate across all systems.

*Source: Coleman, J. 2012. The regulation of transportation: On safety regulations and proxies.

Public Transportation Agency Safety Plan

FTA's final rule for Public Transportation Agency Safety Plans published in 2018 is authorized by the Moving Ahead for Progress in the 21st Century Act (MAP-21) to ensure public transportation system safety nationwide. As a requirement for receiving federal funding allocation under [Chapter 53 of Title 49 USC](#), the states and operators of public transportation systems have to develop a plan based on the Safety Management System (SMS) approach. SMS is a collaborative safety management approach guided by the FTA and includes the following steps:

1. "Defined safety roles and responsibilities;
2. Strong executive safety leadership;
3. Formal safety accountabilities and communication;
4. Effective policies and procedures; and
5. Active employee involvement.⁶⁵

Operators of public transportation systems are responsible for drafting and implementing safety plans certified by states. Also, the state or transit agencies are required to coordinate and "make the safety performance targets available to states and Metropolitan Planning Organizations to aid in the planning process." The states are responsible for drafting and certifying a Public Transportation Agency Safety Plan on behalf of small transit operators unless the transit operator notifies the state that it will develop the plan.⁶⁶ (Through consultations, we understand that all operators in Washington State have elected to develop their own plans.)

Public Transportation Safety Certification Training Program

In 2018, FTA published its final rule for the Public Transportation Safety Certification Program to set the minimum requirements for training:

- Federal and state employees and contractors who conduct safety audits and inspection of transit systems
- Transit agency employees and contractors who are responsible for safety oversight.

The program's training requirements align with the provisions in Public Transportation Safety Certification (49 CFR Part 672), Public Transportation Safety Program (49 CFR Part 670), and the State Safety Oversight (49 CFR Part 674).

State Safety Oversight Program

FTA's State Safety Oversight Program (SSO) is administered by eligible states⁶⁷ to ensure safe rail transit operations. Federal regulation requires each state to designate a State Safety Oversight Agency (SSOA) responsible for regulating rail transit safety.⁶⁸ As required by subsection (e)(4) of the 49 USC § 5329, SSOAs have the authority to "review, approve, oversee and enforce

⁶⁵ FTA's Definition of Safety Management System, Online, accessed August 2020. <https://cms7.fta.dot.gov/01-what-safety-management-system-sms>

⁶⁶ 49 USC § 673.11(b), (c), and (d)

⁶⁷ States with a rail fixed guideway public transportation system in their jurisdiction, as defined in 49 USC § 674.7.

⁶⁸ 49 USC § 5329(e)

implementation of transit agency safety plans; to conduct triennial safety audits, and to provide annual safety status reports to the FTA and others.”

By law, states are required to seek FTA’s certification on their SSO programs.⁶⁹ The FTA will also oversee the implementation and has the authority to audit the SSOAs. As of March 18, 2019, all 31 eligible states in the U.S. have received SSOA certification.⁷⁰

4.2 State rail safety laws and regulations

4.2.1 Revised Code of Washington

The Revised Code of Washington (RCW) is a compilation of the general laws of Washington State.⁷¹ The RCW provides an organized collection of the text of individual statutes. A combination of these statutes provides the regulatory rail safety authority for state organizations, including regulatory authority and guidance for grade crossing safety, inspection of safety appliances, hazardous material safety inspections, speed regulation, track and equipment rules and penalties, and responsibilities of the state versus the federal government.

Railroad

Washington State’s rail safety-related regulations are primarily codified under RCW [Title 81](#) – Transportation, which also encompasses general railroad and transportation matters. The creation, structure, and duties of the Washington Utilities and Transportation Commission (UTC) are codified under RCW [Title 80](#).

In addition, regulations under RCW [Title 47](#) on public highways and transportation define the responsibilities of the State’s Department of Transportation in freight railroad safety planning and multimodal transportation programs; chapters of RCW [Title 49](#) focus on labor regulations – particularly the requirements of the Washington Industrial Safety And Health Act.

RCW [Title 90](#) on water rights and environment includes regulations pertaining to the transportation of oil and hazardous substances, including requirements for a “contingency plan for the containment and cleanup of oil spills.” Administered by the Department of Ecology, contingency plans assure oil spill preparedness and prevention and support spillage response programs. Contingency planning rules apply to (a) railroads hauling crude oil, and (b) railroads hauling other types of oil in bulk.⁷² House Bill (HB) 1136 was passed in 2017 to exempt Class III⁷³ railroads from these requirements if “they do not haul bulk crude oil or bulk refined petroleum products used for fuel.”⁷⁴

⁶⁹ Public Law 112 - 141 - Moving Ahead for Progress in the 21st Century Act.

⁷⁰ APTA. MAP-21 Moving Ahead for Progress in the 21st Century: A Guide to Transit-Related Provisions, p. 16.

⁷¹ Washington State Legislature Website, Revised Code of Washington (RCW), December 2019.

⁷² HB 1136 Bill Analysis, Washington State House of Representatives - Environment Committee, 2017.

⁷³ A Class III railroad is a railroad with annual revenues of less than \$40 million in 2019, according to the Surface Transportation Board.

⁷⁴ HB 1136 Bill Analysis, Washington State House of Representatives - Environment Committee, 2017.

Applicability of requirements across railroad types

Most safety requirements applicable to railroads are written to be universally applicable across railroad types (Class I, II, and III) or passenger operators. Where there are differences in the requirements, they are usually differentiated by the type of operation. For example, 49 CFR Part 213 – Track Safety Standards, has different requirements by *class of track*, which in turn is dictated by the maximum operating speed. Some notable exceptions include:

- Federally, the requirements of 49 CFR Part 270 – System Safety Program (described in Section 5.6.1) is applicable only to certain passenger rail operations. A parallel requirement for freight railroads under 49 CFR Part 271 – Risk Reduction Program is only universally applicable to Class I railroads, unless they are determined to have an “inadequate safety performance.”
- At the state level, under certain conditions, Class III railroads are excluded from meeting certain requirements, including the spill contingency plan requirements and minimum crew size requirements.

Appendix B provides a list of the RCW titles and chapters relevant to rail safety in Washington.

Transit

RCW 81.104.115 designates WSDOT as Washington State’s SSOA under federal requirements (see Section 4.1.2).⁷⁵ The Seattle Center Monorail, Seattle Streetcar, and Sound Transit Tacoma Link and Central Link light rail lines operate under the agency’s safety standards. The following RCWs establish the legal basis for the SSO program in Washington:

- RCW 35 and 35A – § 21.228, § 21.300, and § 57.170 focus on safety program planning and security and emergency preparedness plan of cities and towns for rail fixed guideway public transportation system
- RCW 36 – Provides the definitions and roles of the County Public Transportation Authority with provisions related to transit safety codified under § 57.120
- RCW 81 – In particular, Chapter 104 regulations specify the role of the Washington Department of Transportation as the SSOA. Also, Chapter 112 focuses on regional transit authorities and specifies the requirements for safety programming and security and emergency preparedness planning.

4.2.2 Washington Administrative Code (WAC)

Washington Administrative Code “codifies the regulations” issued by executive agencies under the authority of statutes. Two relevant regulations applicable to **railroad** safety in Washington are:

- WAC 480-60 – Railroad Company Clearance Rules, which covers the required clearance around track and walkways
- WAC 480-62 – Railroad Company Operations Rules, which cover general and procedural rules; safety rules (including worker safety, track safety, hazardous material transport, grade crossings, on-track equipment, and crew transportation); reporting requirements; Grade Crossing Protective Fund; and a section adopting various regulations by reference.

⁷⁵ 49 USC § 5329

These are administered by the Washington State Utilities and Transportation Commission (WUTC, see Chapter 5).

The WUTC is also in the process of promulgating rules to implement House Bill (HB) 1841, which sets out requirements for railroads (except Class III railroads with maximum speeds less than 25 miles per hour) to operate with crews consisting of no less than two people.⁷⁶ However, we understand that these provisions are being challenged in court.

In addition, for transit systems, WAC 468-550 incorporates Safety Oversight of Rail Fixed Guideway Systems Rules, which implements RCW 81.104.115 and related federal requirements.

4.2.3 Washington State modifications to MUTCD

The Title 47 RCW on traffic control devices requires the adoption of uniform standards for traffic control devices installed along the road system, including road-rail crossings, by the State DOT. WSDOT adopts the national MUTCD guidelines with modifications of specific requirements related to rail operations including:⁷⁷

- Raised pavement markers to supplement or substitute other markings
- Flagger stations and procedures
- Traffic control devices according to road traffic volumes
- Light rail transit signals.

WUTC adopts the MUTCD without modifications in WAC 480-62-999.

⁷⁶ HB 1841 and consultations.

⁷⁷ RCW 47.36.

5

Roles of organizations involved in rail safety

Key takeaways

- The Federal Railroad Administration (FRA) is the federal agency charged with oversight of rail safety in the U.S. FRA's regulatory jurisdiction spans over the general system of railroad transportation. The Federal Transit Administration (FTA) is the federal agency charged with overseeing transit systems within urban areas.
- The FRA, using oversight mechanisms, such as data submission requirements and inspections, provides direct oversight to railroads under its jurisdiction. Under 49 CFR Part 212, it also cooperates with state agencies (the Washington Utilities and Transportation Commission), which supplement FRA oversight with FRA-trained inspectors.
 - For railroads, the Washington State Department of Transportation is a funding agency and does not have a **regulatory** oversight role with respect to rail safety. However, it does have contractual agreements with infrastructure and service providers (e.g., Amtrak and Sound Transit).
- The FTA, by comparison, generally delegates day-to-day safety oversight of transit operations to State Safety Oversight Agencies (SSOA) required under 49 CFR 674. In Washington State, the Washington Department of Transportation is the designated SSOA.
- 49 CFR Part 270 requires commuter and intercity passenger railroad operators (passenger railroads) to develop and implement a System Safety Program (SSP), "a structured program with proactive processes and procedures, developed and implemented by passenger rail operation." The State of Washington will be required by 49 CFR Part 270 to participate in the development of an SSP, to the extent that the state's involvement (in this example, the procurement of the rail equipment) affects railroad safety. The State of Washington will not be responsible for submitting an independent SSP plan for a state-supported route. Instead, Amtrak will have to incorporate that state-supported route on its national system into an SSP plan.

5.1 Federal rail safety regulatory agencies

The two primary agencies with responsibilities for rail safety at the federal level are the Federal Railroad Administration (for railroads) and the Federal Transit Administration (for transit).

5.1.1 Federal Railroad Administration - Railroads

Mandate

The Federal Railroad Administration (FRA), an operating agency of the U.S. Department of Transportation, is charged with oversight of railroad safety in the U.S. In particular, it develops and enforces regulations established by Title 49 CFR Chapter II related to the safe operation of railroads (see Chapter 4). Additionally, the FRA's mandate includes developing, promoting, and supporting the development of the rail sector in the U.S.

FRA also assists other agencies with the enforcement of some laws in the context of rail operations. Examples include labor regulations, noise emissions, as regulated by the Environmental Protection Agency (EPA) through the Noise Control Act, and accessibility, as required by the Department of

Justice through the Americans with Disabilities Act (ADA). In both cases, other agencies develop standards and regulations and the FRA develops in-kind regulations to enforce these standards and regulations for railroads under the jurisdiction of the FRA.

Scope

FRA's regulatory jurisdiction spans over the interstate railway network and does not include rapid transit systems that operate in urban areas and are not connected to the general railroad system of transportation (general system).⁷⁸ Urban transit railways (e.g., light rail and subway systems) are under the jurisdiction of the Federal Transit Administration (FTA). Jurisdiction over passenger commuter rail lines tends to overlap between the FRA and the FTA, where they are subject to FRA safety and operating requirements and FTA funding requirements. Appendix A to 49 CFR 209 delineates the line between the FTA and the FRA.

The FRA is the federal agency charged with oversight of rail safety in the U.S. FRA's regulatory jurisdiction spans over the general system of railroad transportation. Urban transit railways (e.g., light rail and subway systems) are under the jurisdiction of the FTA.

Specifically, the FRA oversees, trains, and executes rail infrastructure inspection, including track, bridges, tunnels, rolling stock, train control (e.g., PTC implementation), communications systems, and grade crossings.

Authorities

FRA can amend the CFR through its rule-making process. Once a potential rule is identified, the agency may issue a notice of inquiry (NOI) to gather comments from stakeholders, followed by a notice of proposed rulemaking (NPRM). After a mandatory comment period, an amended NPRM may be issued to gather further comments before a rule is adopted.⁷⁹

Additionally, via the Railroad Safety Advisory Committee (RSAC),⁸⁰ the FRA can develop new regulatory standards through a collaborative process with all rail stakeholders working together to improve safety regulatory issues in the U.S. The FRA consults with the RSAC when developing regulatory programs, seeking advice on emerging issues, changing statutory requirements, and identifying non-regulatory alternatives for the improvement of rail safety.

Inspections

The FRA is the primary federal oversight body for rail infrastructure inspections nationwide. It employs nearly 400 federal safety inspectors who specialize in one of six technical disciplines:

- Grade crossings
- Hazardous materials
- Motive power and equipment
- Operating practices

⁷⁸ FRA. Accessed August 2020. Safety Jurisdiction for Tourist Railroads. Washington, DC.

⁷⁹ Office of the Federal Register. 2010. Federal Register 101. Washington, DC.

⁸⁰ FRA. Accessed August 2020. Railroad Safety Advisory Committee (RSAC), About RSAC. Washington, DC.

- Signal and train control
- Track infrastructure

Through the FRA's State Safety Participation Program (SSPP, 49 CFR Part 212), the FRA trains, certifies, and delegates to qualifying state agencies the authority to enforce federal railroad safety laws. Thirty-one states employing nearly 200 safety inspectors currently participate. State programs generally emphasize compliance inspections; however, some undertake investigative and surveillance activities depending on state needs and capabilities. As the only Washington State agency that inspects rail infrastructure and safety-related rail items in the state, the Washington State Utilities and Transportation Commission (WUTC) employs FRA-certified and trained inspectors. More information on the communication and cooperation between the FRA and WUTC regarding inspections can be found in Section 5.4.1.

Through the FRA's State Safety Participation Program (SSPP, 49 CFR Part 212), the FRA trains, certifies, and delegates to qualifying state agencies the authority to enforce federal railroad safety laws. The WUTC employs FRA-certified and trained inspectors.

Regarding grade crossings, the FRA – under 49 CFR Part 234 – authorizes both federal and state signal inspectors to ensure that railroads were properly testing, inspecting, and maintaining automated warning devices at grade crossings.

Operating personnel certification

Under 49 CFR Parts 240 and 242 (applicable to locomotive engineers and conductors, respectively) the FRA prescribes minimum federal safety standards for the eligibility, training, testing, certification, and monitoring of operating personnel. The FRA requires railroads to have a formal program for certifying operating personnel, which must include a formal process for training prospective conductors and a determination that each person is fit to serve as a conductor before permitting them to do so.⁸¹ These parts also set out minimum requirements in the case of joint operations (see Section 7.3.1 for further discussion).

Reporting/audits

As required in 49 CFR Part 225, all railroad carriers must provide a monthly report to the FRA indicating any highway-rail grade crossing, rail equipment, and death/injury/occupational illness accidents and incidents. In return, the FRA is expected to provide guidance to carriers for preparing the monthly accident/incident reports. Subsequently, the FRA audits the reporting process to compile high-level data on nationwide Part 225 violations and other reporting defects.

In addition, the FRA is required to audit all Class I railroads and Amtrak every two years in compliance with the Rail Safety Improvement Act of 2008.⁸² Subsequently, the FRA is mandated to audit all Class II, III, and other non-Class I railroads on their reporting compliance every five years. Generally, the FRA conducts these audits frequently on Class I railroads but does not audit other railroads as frequently as required, per a 2017 audit of the FRA by the Department of Transportation Office of the Inspector General.⁸³

⁸¹ FRA. 2019. Conductor Certification. Washington, DC.

⁸² U.S. Department of Transportation Office of Inspector General. 2017. Audit Report: ST2017045. Washington, DC.

⁸³ U.S. Department of Transportation Office of Inspector General. 2017. Audit Report: ST2017045. Washington, DC.

The FRA's Safety Information Management Division utilizes its Railroad Accident Incident Reporting System (RAIRS) and Railroad Safety Information System (RSIS) to accurately collect and manage the incoming monthly reporting data.

Enforcement

If a railroad is not meeting the rail safety requirements set forth by the FRA, the FRA may impose:

- Civil penalties of at least \$892 and not more than \$29,192 per violation, except penalties assessed against individuals for willful violations, and where a grossly negligent violation or a pattern of repeated violations has created an imminent hazard or direct cause of death or injury to persons, a penalty not to exceed \$116,766 per violation may be assessed⁸⁴
- Imprisonment for not more than two years for any person who knowingly and willingly falsely reported any mandated safety reporting requirements⁸⁵
- A fine of not more than \$2,500 to a railroad that neglects to report to the FRA an accident or incident resulting in injury or death to an individual or damage to equipment or a roadbed no later than 30 days after the end of each month⁸⁶

Guidance: FRA New Start Passenger Rail Program

The FRA runs its New Start Passenger Rail Program to provide guidance and support to new passenger railroads. The program:

- Assists with the development of regulatory compliance programs
- Provides support for system safety and hazard analysis;
- Provides support for passenger rail equipment
- Provides coordination between FTA, state oversight, railroad management, and other stakeholders.

The program lasts for a period of three to five years, during which an FRA team works with the railroad on a safety checklist and discusses all relevant legislation and requirements that apply to the new service.

It is not a formal certification process for operations or rolling stock. However, the FRA works with the new railroad to ensure that it complies with all regulations and requirements (e.g., track and vehicle maintenance plans). While the FRA may provide input on best practices, it is ultimately up to the railroad to decide how to deal with some issues (e.g., trespassing).

The FRA's New Start Passenger Rail Program provides guidance and support to new passenger railroads. It is not a formal certification process for operations or rolling stock.

FRA safety-related funding

The FRA provides funding through multiple programs to promote the safe operations of railroads, which includes:

⁸⁴ 49 CFR Part 225.29

⁸⁵ 49 USC § 21311

⁸⁶ 49 USC § 20901

- Personnel and administrative expenses and the cost of rail safety inspectors and their inspection work
- Information management and new technology (e.g., PTC)
- Safety education and outreach
- Cost of capital projects that fix track infrastructure, or overall improve the safety of passenger and freight rail
- Cost to repair, replace, or rehabilitate qualified railroad assets to reduce the state of good repair backlog and improve rail performance

Figure 5-1 indicates rail safety-related funding (in \$ thousands) appropriated to and provided by the FRA.^{87,88}

Figure 5-1: FRA selected safety-related funding programs (in \$ thousands)

Account Name	FY2018	FY2019	FY2020
Safety & Operations ⁸⁹	\$209,500	\$221,698	\$224,198
Consolidated Rail Infrastructure and Safety Improvements (CRISI) Grant Program ⁹⁰	\$218,430	\$255,000	\$325,000
Federal-State Partnership for State of Good Repair Grant Program ⁹¹	\$272,250	\$396,000	\$291,423

Source: CPCS based on FRA-reported budgeting.

FRA railroad safety office reorganization

In July of 2020, the FRA completed a reorganization of its Office of Railroad Safety. One key component of the reorganization is the establishment of Safety Management Teams (SMTs) for each Class I, short line, and commuter railroad who will serve as the primary FRA point of contact for each Class I or group of railroads in order to enhance safety or resolve safety issues.

In addition, the FRA rearranged its inspector workforce and safety specialists under their respective FRA headquarters staff director so that each employee has a single technical authority to guide regulatory oversight. Lastly, the FRA also created an office to address new technology and another to be the liaison with labor organizations and rail industry associations.

⁸⁷ FRA. 2020. Budget Estimates Fiscal Year 2021. Washington, DC.

⁸⁸ FRA. 2020. Federal-State Partnership for State of Good Repair Grant Program. Washington, DC.

⁸⁹ The FRA Safety & Operations budget is used for personnel and administrative expenses, the cost of rail safety inspectors and their inspection work, information management, new technology, safety education, and outreach.

⁹⁰ CRISI provides funding for capital projects that will improve passenger and freight rail transportation systems in terms of safety, efficiency, or reliability.

⁹¹ The Federal-State Partnership for State of Good Repair Grant Program provides funding for eligible capital projects within the U.S. to repair, replace, or rehabilitate qualified railroad assets to reduce the state of good repair backlog and improve intercity passenger rail performance.

5.1.2 Federal Transit Administration - Transit

Mandate

The U.S. Federal Transit Administration (FTA) works under the U.S. DOT to administer transit grant programs as well as the regulatory rulemaking process for transit safety.

FTA appoints a committee, known as the Transit Advisory Committee for Safety (TRACS), to “support [the] FTA in performing its duties and responsibilities” concerning the Public Transportation Safety Program. The committee is “comprised of approximately 29 voting members deemed to reflect various perspectives of transit safety” including transit agencies and employee unions, among others.

Scope

As mentioned in Section 5.1, the FTA’s regulatory jurisdiction over rail safety governance includes rail transit agency subway, light rail, monorail, and streetcar systems, among others.

Authorities

The FTA has the authority to provide direct oversight to transit agencies; for example, it can issue general directives that apply to the entire transit industry or a subset of the industry if the agency determines that unsafe conditions or practices exist. However, it generally delegates day-to-day safety oversight responsibility to State Safety Oversight Agencies (SSOAs).

State Safety Oversight Agencies

The FTA – via 49 CFR Part 674 – oversees and mandates states with rail transit systems to adopt and implement a State Safety Oversight Agency Program (SSOA). The FTA provides federal funds through the State Safety Oversight (SSO) Formula Grant Program for eligible states to utilize to create and maintain their SSOA. The FTA Administrator must approve and certify each state’s SSOA to ensure compliance with the Moving Ahead for Progress in the 21st Century Act (MAP-21) change to 49 USC Section 5329(e).

The SSOA is responsible for overseeing rail fixed guideway systems (either in development or existing) within their respective state and the rail transit agency’s execution of its Public Transportation Agency Safety Plan and any related safety reviews of the fixed guideway public transportation system. The standard must describe the process by which the SSOA will receive and evaluate all material submitted under the signature of the rail transit agency’s accountable executive and must establish a procedure whereby the rail transit agency will notify the SSOA before the rail transit agency conducts an internal review of any aspect of the safety of its rail fixed guideway public transportation system.

An SSOA must include the following elements:

- Explicitly acknowledge the state’s responsibility for overseeing the safety of the rail fixed guideway public transportation systems within the state
- Demonstrate the state’s ability to adopt and enforce federal and relevant state laws for safety in rail fixed guideway public transportation systems
- Establish an SSOA, by state law, in accordance with the requirements of 49 USC 5329(e) and 49 CFR 674.11
- Demonstrate that the state has determined an appropriate staffing level for the SSOA commensurate with the number, size, and complexity of the rail fixed guideway public transportation systems in the state. It must also show that the state has consulted with the Administrator for that purpose.
- Demonstrate that the employees and other personnel of the SSOA responsible for safety oversight are qualified to perform their functions, based on appropriate training, including substantial progress toward the completion of the Public Transportation Safety Certification Training Program.
- Demonstrate that by law the state prohibits any public transportation agency in the state from providing funds to the SSOA

In Washington, the SSOA is the Washington State Department of Transportation.

Compliance

FTA compliance assessments are outlined in 49 CFR Part 670.11. The FTA may conduct investigations, inspections, audits, and examinations in addition to testing the equipment, facilities, rolling stock, and operations of public transportation systems operated by a recipient of federal funds. The FTA has to provide the public transportation system with written notices that include the information requested and reasons for each request.

Inspections

In general, the FTA relies primarily on the SSOA to perform safety inspections of public transportation agencies. The regulations that define the role of the SSOAs (49 CFR Part 674) do require the personnel at the SSOA to be trained in accordance with the Public Transportation Safety

Certification Training Program (49 CFR 672).⁹² The Transportation Safety Institute of the U.S. DOT administers courses in transit (rail/bus) safety for oversight agency personnel.⁹³

Enforcement

MAP-21 expanded the enforcement tools available to the FTA's authority under the Public Transportation Safety Program, which includes the following:

- Require more frequent oversight of a recipient by an SSOA
- Impose requirements for more frequent reporting by a recipient
- Require that a recipient expend federal financial assistance for correcting safety deficiencies identified by the FTA or an SSOA
- Order a recipient to develop and carry out a corrective action plan
- Withhold federal financial assistance in whole or in part as deemed appropriate by the FTA
- Make reports and issue safety directives and safety advisories

The FTA can also identify specific uses for funds or withhold funds to:

- Direct a recipient to redirect specific funds to correct safety deficiencies
- Withhold funds from a recipient if the FTA has evidence that the recipient has engaged in conduct that violates the Public Transportation Safety Program or any regulation or directive issued under those laws for which the FTA exercises enforcement authority for safety

Additionally, the FTA may issue an advisory to one or more recipients upon determining that an unsafe condition exists within a public transportation system. The advisory recommends corrective actions, inspections, conditions, limitations, or other actions to resolve or mitigate the unsafe condition.

The FTA also has the authority to issue financial penalties to a transit agency or state based on safety violations at a transit agency or due to a state not implementing a certified state safety oversight program.

Under the Public Transportation Safety Program (49 CFR part 670), the FTA can direct a recipient of federal funds to "correct safety violations identified by the [FTA] Administrator or a State Safety Oversight Agency before such funds are used for any other purpose." The FTA Administrator can also withhold up to 25% of a recipient's grant from the urbanized area formula grant (FTA's largest single grant program under MAP-21)⁹⁴ if the "Administrator has evidence that the recipient has engaged in a pattern or practice of serious safety violations, or has otherwise refused to comply with the Public Transportation Safety Program [...] or any regulation or directive issued under those laws for which the Administrator exercises enforcement authority for safety."

The FTA can impose financial penalties on states with non-existent or non-compliant safety oversight programs. More specifically, in 49 CFR Part 674.19, the FTA has three penalty options:

⁹² FTA Office of Transit Safety and Oversight. 2017. 49 CFR Part 674 Certification Toolkit, version 2.0. Washington, DC.

⁹³ Public Transportation Safety Certification Transit Program (PTSCTP) Certificate. <https://www.transportation.gov/transportation-safety-institute>

⁹⁴ APTA. MAP-21 Moving Ahead for Progress in the 21st Century: A Guide to Transit-Related Provisions, p. 3.

1. Withhold SSO grant funds from the state
2. Withhold not more than 5% of the 49 USC § 5307 Urbanized Area Formula Program funds [the largest federal formula grant for transit investments] for use in the state or urbanized area in the state until the SSO program can be certified
3. Require all of the rail fixed guideway public transportation systems governed by the SSO program to spend up to 100% of their federal funding under 49 CFR Chapter 53 for “safety-related improvements” on their systems until the SSO program can be certified

When determining whether to impose financial penalties and the nature and amount of the penalties, the FTA shall consider the extent and circumstance of the non-compliance, the operating budgets of the SSOA, and the rail transit agency that will be affected by the financial penalty and such other matters as justice may require. If the state does not establish an approved SSO program within three years (from April 15, 2016), the FTA will be prohibited from obligating federal financial assistance (under 49 CFR Part 5338) to any entity in the state that is otherwise eligible to receive federal financial assistance.

FTA safety-related funding

The FAST Act authorized funding of FTA formula funds for rail transit projects through 2020, which can be used for commuter rail projects and operations, including:

- Urbanized Area Formula Grants: 5307
- Rural Areas: 5311
- Rural Transportation Assistance Program: 5311 (b)(3)
- Tribal Transit Formula Grants: 5311(c)(2)(b)
- State of Good Repair: 5337

Role of the American Public Transportation Association

The American Public Transportation Association (APTA), in its capacity as the association representing public transportation providers, has an important role in the FTA rulemaking process. Throughout recent history, APTA guidelines and standards have been the basis for the development and implementation of transit safety plans, procedures, and standards.

In the 1980s, the Urban Mass Transit Administration (predecessor to the FTA) partnered with APTA to create a national program for the development of System Safety Programs to ensure that all new transit systems could be designed and built using the best safety practices. This program has since expanded to include commuter rail and bus transportation. Later, in 2001, the APTA Manual for the Development of Rail Transit System Safety Program Plans (SSPP) was referenced in 49 CFR Part 659. States used the APTA SSPP manual as the basis for their oversight of rail transit agencies. Rail transit agencies followed the APTA SSPP format to develop their System Safety Program Plans.

Prior to the passage of MAP-21 and during the FTA safety rulemaking process, APTA worked with the FTA to ensure that public transportation agencies and comments were considered by the FTA

before the implementation of any final rules. APTA developed a Safety Management System manual that guides public transportation agencies.⁹⁵

5.2 State agencies

5.2.1 Washington State Department of Transportation (WSDOT)

The Washington State Department of Transportation (WSDOT) has two primary roles concerning rail safety – a funding agency for rail services in the state and the SSOA for the State of Washington. Our understanding is WSDOT has no regulatory authority over railroad safety. At the state level, the regulatory authority concerning railroad safety has been delegated to the Washington Utilities and Transportation Commission, in part to ensure division between funding responsibilities and safety oversight responsibilities.

Role as a transportation funding agency

WSDOT's role as a transportation funding agency is split between two programs:⁹⁶

- **Rail Operations Program:** WSDOT's rail operations program administers the funding and operation of the state-sponsored Amtrak Cascades rail service and the Palouse River and Coulee City Rail System. Also, the program evaluates trends, issues, and needs of Washington State's freight rail system and prioritizes funding for the associated rail network.
- **Rail Capital Program:** WSDOT's rail capital program provides support, planning, and coordination for passenger and freight rail improvements in the state. The program receives regular state funding and federal grants to administer for capital projects that support intercity passenger rail service growth, travel time savings, and schedule reliability. The funding may include the acquisition of passenger rail equipment and track improvements, among other investments. The rail capital program also funds infrastructure investments on the state-owned short line rail network. Additionally, the program funds and oversees grant and loan programs that support rail infrastructure projects across the state.

According to WSDOT's 2019-2021 Biennium Budget,⁹⁷ the Rail Operating Program – responsible for operational support for Washington State's passenger and freight rail networks – will receive \$33.9 million for the Rail Passenger subprogram, which includes rail safety projects for passenger routes, and \$70 million for the Rail Freight subprogram, which includes rail safety projects for freight routes.

Role as State Safety Oversight Agency (SSOA) – Transit

RCW 81.104.115 establishes WSDOT as the state safety oversight agency for rail transit agencies, as required by 49 CFR Part 674. WSDOT administers this through its State Safety Oversight Program (SSOP), which publishes a Washington State Rail Safety Oversight Program Standard report annually as required by 49 CFR Part 674.98. The document establishes policies, procedures, requirements, and responsibilities for rail public transportation systems to help ensure safety and compliance with federal and state laws.

⁹⁵ American Public Transportation Association. 2016. Safety Management System Manual, Public Passenger Transportation Systems. Washington, DC.

⁹⁶ Washington Department of Transportation. 2019. Draft Washington State Rail System Plan. Olympia, WA.

⁹⁷ Washington Department of Transportation. 2020. 2019 Supplemental Budget for 2017-19 and 2019-21 Enacted Budget. Olympia, WA.

⁹⁸ Washington Department of Transportation. 2018. Rail Fixed Guideway Public Transportation System Safety Report. Olympia, WA.

WSDOT additionally serves as a public educator and resource for general rail safety guidelines through its “Stay Back from the Tracks” and “Rules to Remember” safety campaigns.⁹⁹

5.2.2 Washington Utilities and Transportation Commission

The Washington Utilities and Transportation Commission (WUTC) is the state’s regulatory body in charge of ensuring safe, accessible, reliable, and reasonably priced transportation services.

Title 80 RCW defines WUTC’s membership and structure and indicates its duties as:

- “Regulate in the public interest, as provided by the public service laws, all persons engaging in the transportation of persons or property within this state for compensation;
- Regulate in the public interest, as provided by the public service laws, the rates, services, facilities, and practices of all persons engaging within this state in the business of supplying any utility service or commodity to the public for compensation;
- Make rules and regulations necessary to carry out its other powers and duties.”¹⁰⁰

The WUTC’s role with respect to rail safety is outlined below.

Inspections

The WUTC – through its Rail Safety section – is responsible for ensuring public safety through its monitoring of operations of over 25 railroad companies in Washington State. The Rail Safety section employs FRA-certified and non-FRA certified rail inspectors (11 in total) that – under state authority – inspect aspects of rail infrastructure including signals, track locomotives and rail cars, grade crossings, walkways, sanitation, operating practices, and hazardous materials handling in accordance with Chapters 480-60 through 66, WAC. WUTC Rail Safety inspectors utilize work plans to provide a data-driven guide for inspection activities to ensure all railroads are inspected appropriately over time, with a focus on crude oil and high priority locations.

Additionally, Rail Safety program staff evaluate, investigate, and recommend to the WUTC whether filed petitions by rail stakeholders pertaining to grade crossing installation, closure, or modifications, and close clearances should be approved.

Also, the WUTC monitors and responds to complaints regarding railroad employee safety and conducts inspections when warranted. Along with the Washington State Department of Labor and Industries, the WUTC conducts periodic investigations of railroad employee safety issues through an interagency agreement. In addition, the WUTC responds to and investigates railroad safety complaints from local governments, the public, and others regarding conditions at crossings, train horn noise, blocked crossings, etc. WUTC staff also investigate fatality accidents within Washington State, often partnering with the FRA or other agencies.

Reporting/safety data collection

The WUTC requires all railroad companies operating in Washington State to report to the Washington Emergency Operations Centers any accidents or incidents involving the release of hazardous materials, injury of any person involved in a railroad-highway crossing or trespassing

⁹⁹ Washington Department of Transportation. 2020. Train Safety. Olympia, WA.

¹⁰⁰ RCW § 80.01.040.

accident that needs medical attention, death of any person, or property damage exceeding a \$50,000 cost to the property.¹⁰¹

Grade crossings

If any entity (public or private) is seeking to construct, change, or close a grade crossing in Washington State, they must receive approval from the WUTC. (Note: WUTC jurisdiction does not apply to first class cities, per RCW 81.53.240). Petitioners bear the burden of proof before the WUTC that public safety requires the proposed crossing action. The WUTC’s decision to approve or deny this is based on merit and factual analysis rather than engineering examination. If the two participating parties are not in alignment, an administrative hearing is conducted. WUTC staff also play a role in evaluating and providing feedback on quiet zone proposals initiated by road authorities.

Funding

WUTC receives funding to conduct its oversight activities from regulatory fees from the railroads it oversees.

WUTC also administers the Grade Crossing Protective Fund Grant Program (GCPF), which funds projects in Washington State to eliminate or mitigate public safety hazards involving railroad crossings and rights-of-way.¹⁰² The GCPF provides grants directly to railroad companies, local governments, and other eligible agencies. We understand that the legislature appropriates approximately \$500,000 bi-annually to this program, outside of the WUTC’s regulatory fees.

Education

The WUTC Rail Safety section provides education and technical assistance to railroads, local governments, the public, and others in how to more safely operate on and around railroad tracks and trains. WUTC is also an active partner with Operation Lifesaver, Inc. (OLI), housing the Washington program (WAOL). OLI focuses on preventing collisions, injuries, and fatalities on and around railroad tracks and highway-rail grade crossings, with the support of public education programs in states across the U.S.

WUTC actively supports OLI’s mission by housing the WAOL state coordinator role within the Rail Safety section. A large part of WAOL’s work centers around education at schools and community events, often targeted to high-accident areas of the state. WAOL also uses social media, geofencing, programmatic advertising, and other innovative methods to communicate the rail safety message to all audiences. WSDOT is a key partner in the program by financially supporting efforts and playing an active role on the executive board and through other events.

5.3 Other agencies and programs with relevance to rail safety

5.3.1 Federal

National Transportation Safety Board

Under 49 CFR Part 1131, the National Transportation Safety Board (NTSB) is responsible for investigating railroad accidents that resulted in fatalities or significant property damage. The NTSB has no authority to regulate railroads. Rather, it makes recommendations and provides guidance to federal, state, non-profit companies as well as private businesses either involved or had a role to

¹⁰¹ Washington Utilities Commission. 2020. Railroad Company Accident Reporting. Olympia, WA.

¹⁰² Washington Utilities Commission. 2020. Grade Crossing Protection Fund Grants. Olympia, WA.

play in the probable cause of the accident the NTSB investigated. The goal of its guidance is to prevent future accidents and maximize public safety.

Pipeline and Hazardous Materials Administration

As mentioned in Chapter 3, the U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration (PHMSA) regulates the transport of hazardous materials through Title 49 CFR, Subchapter C on Hazardous Materials Regulations. Federal law requires rail customers to properly disclose and label hazmat shipments, to ensure that appropriate railcars are used, and to assist emergency responders in case of an accident. The train crew must have a document that reflects the hazmat contents of specific railcars and the current position of each rail car containing hazardous materials on the train.

Notification of hazardous materials transported by rail must be in accordance with the routing requirements outlined in 49 CFR Part 172.820. A rail carrier must identify a point of contact for routing issues that may arise with the movement of covered materials (TIH – Toxic by Inhalation materials and others) and provide contact information to the state and/or regional coordination authorities, and state, local, and tribal officials in jurisdictions that may be affected by a rail carrier’s routing decisions within the area encompassed by the carrier’s rail system.

Passenger trains may also operate on the same tracks as freight trains transporting hazardous materials. Many trains carrying hazardous materials – also referred to as “key trains” – are limited to 50 mph.¹⁰³

Surface Transportation Board

The Surface Transportation Board (STB) is an independent economic regulatory agency affiliated with the USDOT. It has jurisdiction over railroad service and rate issues in addition to new and existing rail restructuring transactions, such as new railroads, mergers, line sales and construction, and line abandonments.

Federal Highway Administration (Section 130 Funding)

The Federal Highway Administration (FHWA) provides funds for the elimination of hazards at highway-rail crossings through its Section 130 program. These funds are appropriated to states by formula. Fifty percent of eligible funds is dedicated to the installation of protective devices at highway-rail crossings – with the remainder devoted to any elimination of hazards at crossings. WSDOT administers the Section 130 program in Washington.

5.3.2 State

Some of the other state agencies involved in rail safety include the Department of Ecology and Department of Labor and Industries.

Washington Department of Ecology

The Washington Department of Ecology (DOE) oversees the environmental regulatory compliance for railroads operating in Washington State, especially pertaining to hazardous materials transportation. It administers the DOE Spills Program, which was created to provide regulatory guidance to achieve a zero spills goal in the state.

¹⁰³ American Association of Railroads. 2011. United States Hazardous Materials Instructions for Rail. Washington, DC.

ECY requires railroads that carry oil to adopt an Oil Spill Contingency Plan (Chapter 173-186 WAC), which includes how to make notifications, and possessing the appropriate equipment and trained personnel to respond to oil spills that occur.¹⁰⁴ Railroads are expected to report the amount of crude oil they carry to the DOE. Generally, this requirement applies to Class I railroads in Washington State (BNSF Railway Co. and Union Pacific Railroad). Subsequently, the DOE provides guidance and mandates certain requirements to railroads carrying hazardous materials on their operations manuals.¹⁰⁵

Also, DOE is heavily involved in the environmental review/impact process for proposed rail lines and facilities and collects and reports certain air emissions that railroads and locomotives emit.

Washington Department of Labor and Industries (L&I)

Washington State’s occupational health and safety regulator also has an important oversight role with respect to railroad safety:

L&I is a diverse state agency dedicated to the safety and health of Washington’s work force. In that role, through its Division of Occupational Safety and Health (DOSH), L&I develops and enforces safety and health rules by inspecting worksites for unsafe working conditions.... The Washington Industrial Safety and Health Act gives broad jurisdiction to L&I to regulate and enforce employee occupational health and safety matters. In this capacity, L&I has authority over walkways and clearances in private rail yards and plants, which include logging railroad yards, mill yards, and sorting yards. L&I also has authority over railroad walkways outside of rail yards and the sanitation of stationary facilities such as offices, crew rooms and other buildings on railroad property.¹⁰⁶

In essence, whereas the WUTC regulates the operation of mobile equipment and related infrastructure (such as rolling stock and track), L&I regulates the safety of fixed facilities, such as shops. Their roles are therefore complementary.

5.4 Existing agency coordination efforts

5.4.1 Railroad

FRA-WUTC coordination

49 CFR Part 212 – State Safety Participation Program (SSPP) regulations set out a formal framework for the participation by states in the safety oversight of railroads governed by federal requirements. The requirements set out that “[t]he principal role of the State Safety Participation Program in the national railroad safety effort is to provide an enhanced investigative and surveillance capability through assumption, by participating State agencies, of responsibility for planned routine compliance inspections” but that the FRA “encourages” further state participation.¹⁰⁷ As mentioned in Section 5.2.2, the WUTC employs FRA-certified inspectors responsible for performing inspections on signal and train control equipment, track, motive power and equipment, hazardous materials, grade crossings, and operating practices.

Under the SSPP, the WUTC works with the FRA to conduct routine compliance inspections and enhance the FRA’s investigative and surveillance capability. WUTC inspectors are permitted to participate in the SSPP under RCW 81.04.540. Additionally, the FRA permits the WUTC to delegate specific individual investigators to act on behalf of the FRA to perform particular investigative

¹⁰⁴ WAC Title 73 Chapter 173-186.

¹⁰⁵ Washington Department of Ecology. 2020. Operations Manual Requirements. Olympia, WA.

¹⁰⁶ WUTC. 2016. Railroad Employee Safety Issues, Laws, and Regulations Relevant to the Consolidation of Rail Employee Safety and Regulatory Functions in the Utilities and Transportation Commission,

¹⁰⁷ 49 CFR Part 212.101

functions to which they are assigned and qualified for. Ultimately, state inspections and investigations must be authorized under state law, and WUTC inspection reports are shared with the FRA.

WSDOT-WUTC coordination

The WUTC shares its inspection records with WSDOT monthly regarding any rail system under the control or ownership of WSDOT.

In addition, the WUTC partners with WSDOT on determining pertinent projects for FHWA Section 130 funding and other general grade crossing funding mechanisms. Lastly, WSDOT is an active partner with WUTC's Operation Lifesaver program with complementing safety initiatives ("Stay Back from the Tracks" and "Rules to Remember").

5.4.2 Transit

FTA-WSDOT SSOA coordination

As previously mentioned, WSDOT is the formal State Safety Oversight Agency (SSOA) under 49 CFR Part 674. Through the SSOA, WSDOT works alongside the FTA to administer FTA formula grant funds for transit-related capital improvements and rail transit safety projects. As the SSOA, WSDOT is responsible for overseeing the Washington State rail transit agency's Public Transportation Agency Safety Plans and internal reviews of any aspects of its safety plans. Subsequently, WSDOT reports any identified issues related to Washington State's rail transit agencies to the FTA, which determines an enforcement action.

5.5 Roles and responsibilities of operators

This section describes some of the key system safety responsibilities of rail organizations.

5.5.1 Railroads

As will be discussed in Section 5.6.1, a formal System Safety Program (SSP) plan is not yet a requirement for passenger operations in the U.S. To the extent that a railroad has been designated to prepare and implement an SSP for a passenger operation, that railroad will eventually need to prepare and submit such a plan to the FRA. Other railroads that support the operation of a passenger operation are expected to participate in the preparation and implementation of that plan.

In addition, as highlighted in Chapter 4, railroads are required to follow prescriptive technical and process standards. These include developing and filing operating rules (49 CFR Part 217) and certifying locomotive engineers and conductors who are qualified to operate (49 CFR Parts 240 and 242). There are also several infrastructure-, equipment-, and workforce-related requirements that railroads must follow.

Requirements for qualification of operating employees in joint territory

Under 49 CFR Parts 240 and 242, the tenant and railroad "controlling the conduct of joint operations" (colloquially referred to as a "host railroad") are required to certify that operating employees (locomotive engineers and conductors) are qualified to operate over the joint operations territory. Provisions in both parts give the host railroad discretion to accept the certification issued by the other railroad, under certain conditions.

5.5.2 Transit

Under 49 CFR Part 673, transit agencies in receipt of federal funding are expected to be required to develop a Public Transportation Agency Safety Plan (PTASP).¹⁰⁸ Under 49 CFR Part 673.11, the PTASP must include documentation of the Safety Management System (SMS) implementation (see below). Some of the rationales for safety management systems were the recognition by regulators that following existing regulatory standards alone may not be sufficient for ensuring the safe operations of complex technical systems and that there is an opportunity to promote “organizational safety.”

In the case of transit, SMS will be required to include:

- Safety Management Policy, including policies concerning assuring the safety, roles, and responsibilities for safety within an organization and processes for reporting safety concerns to senior management
- Safety Risk Management, including processes for hazard identification, risk assessment, and mitigation
- Safety Assurance, including processes for monitoring and measurement, change management, and continuous improvement
- Safety Promotion, including requirements for training and communication¹⁰⁹

What is a safety management system?

Though the definition and contents of a safety management system (SMS) vary by jurisdiction, the Canadian SMS Regulations define it as:

a formal framework for integrating safety into day-to-day railway operations and includes safety goals and performance targets, risk assessments, responsibilities and authorities, rules and procedures, and monitoring and evaluation processes.

The U.S. Federal Aviation Administration (FAA) has put a finer point on the basis for SMS, which is “SMS is all about safety decision-making throughout the organization.”

As a practical example of the importance of management systems (supported by technology platforms, as appropriate), a team member recalled a situation in which a new computerized track inspection management system was put in place at a railroad. It was discovered thereafter that a specific section of track was not being regularly inspected because of the location of the grade crossings where the inspector would access tracks led to a regular gap in inspections. It was not until the management practice changed that this was discovered.

Quote sources: Canadian Railway Safety Act; FAA, Safety Management System Basis Key Points. <https://www.faa.gov/about/initiatives/sms/explained/basis/>.

¹⁰⁸ The FTA has issued a Notice of Enforcement Discretion, which “effectively extend[s] the PTASP compliance deadline from July 20, 2020 to December 31, 2020.”

FTA. Public Transportation Agency Safety Plans. <https://www.transit.dot.gov/PTASP>

¹⁰⁹ 49 CFR Part 673.21

5.6 Important regulatory rulemakings effecting rail safety governance

5.6.1 49 CFR Part 270 – System Safety Program (SSP)

Overview

This section on 49 CFR Part 270 focuses on the development of System Safety Programs (SSP) by passenger-carrying railroads. It was mandated by Congress in the Rail Safety Improvement Act of 2008 (RISA), ss. 103 and 109, Public Law 110-432.

The regulation requires commuter and intercity passenger rail operators (passenger rail operations) to develop and implement an SSP, “a structured program with proactive processes and procedures, developed and implemented by passenger rail operation,” intended to “identify then mitigate or eliminate hazards and the resulting risks on the rail operation system.” In developing the SSP, passenger rail operations must work collectively with their employees to “identify hazards and to jointly determine what, if any action to take to mitigate or eliminate the resulting risks.”

Definitions: hazards, accidents and risk

The FRA defines *hazard* as “... any real or potential condition (as identified in a risk-based hazard analysis) that can cause injury, illness, or death; damage to or loss of a system, equipment, or property; or damage to the environment.”

In the context of railroads, an example of a hazard is a situation in which a train has exceeded the limits of its authority, either by traveling at a speed exceeding the track limit or going beyond a stop signal – leading to an unsafe condition. A *hazard* is not an accident itself, but it could lead to an accident if other conditions are met (e.g., a curve or another train being present). An *accident* is the undesired or unplanned event that leads to the losses described in the FRA definition of a hazard. These include “injury, illness, or death; damage to or loss of a system, equipment, or property; or damage to the environment.”

At a high level, the purpose of a risk-based management program is in part to identify these hazards, classify them according to their risk (a function of the likelihood and consequence), and take steps to mitigate them.

Sources: CPCS based on 49 CFR Part 270 rulemaking and Leveson (2011), op. cit.

Organization

49 CFR Part 270 has four subparts:

- The first, Subpart A or 49 CFR Parts 270.1-7, discusses the general criteria and requirements of rail operation. The subpart includes the purpose and scope, explains how regulations will be applied, and identifies specific definitions as well as penalties and responsibility for noncompliance.
- The second, Subpart B or 49 CFR Parts 270.101-107, includes criteria and requirements necessary for the development of system safety programs by passenger rail operators. It also includes provisions that limit the discovery and admission as evidence certain information related to the SSPs, as well as consultation requirements by the passenger rail operations.
- The third, Subpart C or 49 CFR Parts 270.201 and 203, provides requirements for review, approval, and retention of System Safety Program Plans. This section discusses filing and approval requirements as well as retention of the SSP by rail operations.

- The last, Subpart D or 49 CFR Parts 270.301-305, provides requirements and guidance on System Safety Program Internal Assessments and External Auditing. Within Subpart D, the FRA included three appendices as part of the regulations. These appendices are provided to help guide passenger rail operations in the development of SSPs.

Appendix A provides a schedule of Civil Penalties, Appendix B provides guidance on the SSP consultation process with labor groups and employees, and Appendix C provides procedures for the submission of SSP plans and statements from directly affected employees.

In addition to providing definitions, Subpart A explicitly notes that the regulation does **not** prohibit passenger rail operations from developing more stringent standards: “[t]his part prescribes minimum Federal safety standards for the preparation, adoption, and implementation of railroad safety programs [...] [and] does not restrict railroads [passenger rail operations] from adopting and enforcing additional or more stringent requirements not inconsistent with this part.”¹¹⁰

Subpart B also includes legal protections for information developed as a direct result of establishing the railroad’s SSP plan, which does not allow such information to be discoverable in litigation. The provisions are intended to encompass the integration of a Confidential Close Call Reporting System (C³RS). C³RS is an FRA-sponsored voluntary program designed to improve the safety of railroad operations by allowing railroad employees to confidentially report unsafe events that are either currently not required to be reported or are underreported.¹¹¹

SSP requirements

Subpart B requires each passenger rail operation to establish and fully implement an SSP that “systematically evaluates [passenger rail operation] safety hazards on its system and manages the resulting risks to reduce the number and rates of railroad accidents, incidents, injuries, and fatalities.” To carry this out, passenger rail operations must develop and implement an approximately 20-element plan (SSP plan) including:¹¹²

- **System safety program policy** statement “that endorses the passenger rail operation’s system safety program.”
- **System safety program goals**, including a “statement defining the goals for the passenger rail operation’s system safety program.”
- **Rail system description**, including, beyond the technical characteristics of the system, the “[i]dentification of] the persons that enter into a contractual relationship with the passenger rail operation” and “relationships and responsibilities between the passenger rail operation and: Host railroads, contractor operators, shared track/corridor operators, and persons providing or utilizing significant safety-related services...”
- **Management and organizational structure**
- **System safety program implementation process**
- **Maintenance, repair, and inspection program**
- **Rules compliance and procedures review**

¹¹⁰ 49 CFR Part 270.1(b)

¹¹¹ <https://www.fra.dot.gov/c3rs>

¹¹² The list that follows is an excerpt from 49 CFR Part 270.103. For clarity, the details of each requirement have generally been omitted for brevity.

- **System safety program employee/contractor training**
- **Emergency management**
- **Workplace safety**
- **Public safety outreach program**
- **Accident/incident reporting and investigation**
- **Safety data acquisition**
- **Contract procurement requirements**
- **Risk-based hazard management program** and **risk-based hazard analysis** “designed to proactively identify hazards and mitigate or eliminate the resulting risks from those hazards” as further described in the box below.
- **Technology analysis and implementation plan**
- **Safety assurance, including change management, configuration management, safety certification practices**
- **Safety culture**, including a “statement that describes how the passenger rail operation measures the success of its safety culture,” that is “[the] shared values, actions, and behaviors that demonstrate a commitment to safety over competing goals and demands.”

The boxes below describe some of these elements in more detail.

Required elements of the risk-based hazard management program

The passenger rail operation's risk-based hazard management program must contain the following eight elements:

1. The passenger rail operation shall establish the processes or procedures that will be used in the risk-based hazard analysis to identify the hazards of the operation's system. This will be the passenger rail operation's opportunity to consider any new or novel techniques or methods that best suit the rail operations to identify hazards.
2. The passenger rail operation must establish the processes or procedures that will be used in the risk-based hazard analysis that will analyze the identified hazards and, therefore, support the risk-based hazard management program.
3. The passenger rail operation must establish the methods that will be used in the risk-based hazard analysis to determine the severity and frequency of hazards and to determine the corresponding risk. Once the railroad has identified the hazards, it will determine the corresponding risk.
4. The passenger rail operation must establish the methods that will be used in the risk-methods that will be used in the risk-based hazard analysis to identify the actions that mitigate or eliminate hazards and corresponding risks.
5. The passenger rail operation must establish the process that will be used in the risk-based hazard analysis to set goals for the risk-based hazard management program and identify how performance against the goals will be reported.
6. The passenger rail operation must establish a process to make decisions that affect the safety of the rail system relative to the risk-based hazard management program.
7. The passenger rail operation must establish the methods that will be used in the risk-based hazard analysis to support continuous safety improvement throughout the life of the rail system. Consistent with the overall SSP, the railroad will implement methods as part of the risk-based hazard management program that will support continuous safety improvement.
8. The passenger rail operation must establish the methods that will be used in the risk-based hazard analysis to maintain records of identified hazards and risk and mitigation or elimination of the identified hazards and risk throughout the life of the rail system.

The FRA clearly states that a risk-based hazard analysis is "not a one-time event." It indicates that passenger rail operations "operate in a dynamic environment and certain changes in that environment may expose new hazards and risks that a previous risk-based hazard analysis did not address."

Elements of safety culture

The FRA identifies 10 elements that "support a strong safety culture on a railroad." These elements are: "(1) having leadership that is clearly committed to safety; (2) practicing continuous learning; (3) making decisions that demonstrate that safety is prioritized over competing demands; (4) having clearly defined reporting systems and accountability; (5) promoting a safety conscious work environment; (6) making employees feel personally responsible for safety; (7) fostering open and effective communication across the railroad; (8) fostering mutual trust between employees and the railroad; (9) responding to safety concerns in a fair and consistent manner; and (10) having training and other resources available to support safety." Ultimately, the FRA states that it expects a passenger rail operation to demonstrate that improvements in the measured aspects of safety culture will reliably lead to reductions in accidents, injuries, and fatalities.

Implementation history and future timelines

The requirements of 49 CFR Part 270 have gone through several iterations over the past five years (Figure 5-2), which had the effect of changing the implementation timelines as well as changing the responsibilities of state sponsors of intercity passenger rail services, among other changes:

Original 2016 final rule: The FRA originally published a final rule on the implementation of 49 CFR Part 270 on August 12, 2016 (“2016 final rule”). 49 CFR§270.3(a) of the 2016 final rule stated that the rule applies to:

- (1) *Railroads* that operate intercity or commuter passenger train service on the general railroad system of transportation; and
- (2) *Railroads* that provide commuter or other short-haul rail passenger train service in a metropolitan or suburban area (as described in 49 U.S.C. 20102(2)), including public authorities operating passenger train service [emphasis added by CPCS to railroads].

The definition of what constitutes a “railroad” is provided in §270.5 and states “[a] person or organization that provides railroad transportation, whether directly or by contracting out the operation of the railroad to another person.”

These provisions indicate that the FRA intended the rule to apply to providers of IPR service, including “state sponsors” of IPR service. After this, the FRA received four petitions for reconsideration of the final rule. These petitions were received from labor organizations, and state and local transportation departments and authorities.

Multiple stays of the regulation: Since the regulation was published within six months of a presidential election, the FRA published a stay of the regulation requirements on February 10, 2017, consistent with the new Administration’s guidance issued on January 20, 2017. The FRA extended the stay of the regulation to May 22, 2017, June 5, 2017, December 4, 2017, December 4, 2018, and then to September 4, 2019. The FRA decided to postpone the regulation one last time “to further allow FRA time to review any comments on an additional notice of proposed rulemaking NPRM” on the regulation published on June 12, 2019. The FRA published a final rule on August 30, 2019, that provided additional time before 49 CFR Part 270 was to become effective and stayed the regulations until March 4, 2020 (“2019 final rule”).

2019 NPRM reconsidering multiple states’ position on the 2016 final rule: The NPRM that the FRA published on June 12, 2019 (“2019 NPRM”), discusses several areas that affect a state’s responsibilities if they either fund, operate, or own railroad infrastructure or operations. As part of the 2019 FRA NPRM, the FRA responded to the petitions discussed above from both labor unions as well

Figure 5-2: 49 CFR Part 270 rulemaking key dates



Source: CPCS based on FRA rulemaking. Note, not all dates are shown for clarity.

as States. The FRA states that “the vast majority of State providers of IPR [intercity passenger rail] service would fall under Amtrak’s SSP.” They further claimed that “this is because most States contract with Amtrak to provide IPR service...”

However, the FRA stated in the 2019 FRA NPRM that it “disagrees with the State Petitions that applying the SSP final rule to state sponsors of IPR service goes beyond FRA’s statutory authority.” The FRA references the statutory mandate and language found in RSIA which provides “each railroad carrier that is a Class I railroad, a railroad carrier that has inadequate safety performance (as determined by the Secretary), or a railroad carrier that provides intercity rail passenger or commuter rail passenger transportation ...” According to 49 USC 20156(a)(1), a “railroad carrier” is defined as “a person providing railroad transportation.” In the 2019 NPRM, the FRA states that state sponsors of IPR service meet the definition of a person providing railroad transportation.

2020 final rule: On March 4, 2020, the FRA published a final rule titled System Safety Program and Risk Reduction Program (“2020 final rule”). In the 2020 final rule, the FRA reconsidered the definition of what constitutes a “railroad” for the purposes of Part 270 and decided, after considering several comments received from states on the NPRM, to clarify the application of the rule’s requirements to each “passenger rail operation” as opposed to each “railroad.” According to the FRA, the definition for “passenger rail operation,” means “an intercity, commuter, or other short-haul passenger rail service.”

In 2020 final rule, the FRA reconsidered the definition of what constitutes a “railroad” for the purposes of Part 270 and decided [...] to clarify the application of the rule’s requirements to each “passenger rail operation” as opposed to each “railroad.”

The definition for “passenger rail operation,” means “an intercity, commuter, or other short-haul passenger rail service.”

In addition, while it is the FRA’s position that “all persons providing IPR or commuter (or other short-haul) rail passenger transportation share responsibility for ensuring compliance with [49 CFR Part 270]”, it allows for a passenger rail operation “to designate a person as responsible for compliance with.” These revised requirements are found in §270.7:

- (1) *All persons providing intercity rail passenger or commuter (or other short-haul) rail passenger service share responsibility for ensuring compliance with this part. Nothing in this paragraph (c), however, shall restrict the ability to provide for an appropriate designation of responsibility for compliance with this part [emphasis added by CPCS].*
- (2) (i) Any passenger rail operation subject to this part may designate a person as responsible for compliance with this part by including a designation of responsibility in the SSP plan. This designation must be included in the SSP plan’s statement describing the passenger rail operation’s management and organizational structure...
 - (ii) A passenger rail operation subject to this part may notify FRA of a designation of responsibility before submitting an SSP plan by first submitting a designation of responsibility notice to the Associate Administrator for Railroad Safety and Chief Safety Officer...

In its explanation of the changes made to §270.7, “FRA emphasizes that it is FRA’s policy to hold a *designated entity* responsible for compliance with this part [emphasis added by CPCS].” Further, in approving SSP plans:

FRA will consider how a designation of responsibility for SSP compliance is consistent with the holistic, system-wide nature of safety management systems. FRA believes that the systemic nature of SSP requires a single entity to have overall responsibility for the entire SSP to ensure that the SSP

is properly implemented throughout the passenger rail operation's entire system by the potentially various entities responsible for separate aspects of the system's safety. FRA therefore expects that a designation will identify only a single entity with overall responsibility for SSP compliance as opposed to designating SSP responsibility piecemeal to multiple entities.

Including a designation provision in an SSP plan will not, however, relieve the passenger rail operation of responsibility for ensuring that host railroads and other persons that provide or utilize significant safety-related services appropriately support and participate in an SSP...

Ultimately, our understanding of the 2020 final rule is that states can have the contractor write the SSP plan for submission to the FRA, provided the SSP identifies the state as part of the organization that funds the passenger rail operation. The FRA clarified that it does not require other entities to develop, submit, and implement an independent SSP plan to the FRA. It states, as an example, "a non-operating entity must participate in (and be identified in) the SSP process to the extent that entity owns infrastructure or equipment that will be utilized by the passenger rail operation. But that non-operating entity will not file the SSP plan for the passenger rail operation unless otherwise agreed amongst the entities involved in the passenger rail operation."

Oversight of SSPs

Subpart C provides for internal assessments of the SSP by the passenger rail operation and external audits by the FRA or "FRA designee."¹¹³ In a March 2020 presentation for discussion purposes, the FRA indicated that it is planning to:

- [Provide] SSP Development Assistance*
 - Sample SSP plans*¹¹⁴
- [Develop a] process for electronic plan submittal review
 - Consistent process for FRA reviewing plans
- [Develop an] Internal Assessment review process
- [Develop an] External Audits (Focused and Full) process

This would also include hiring staff "[depending] on FRA policies and budgets."¹¹⁵

2020 final rule – key dates going forward

According to the 2020 final rule, the rule effective date is **May 4, 2020** and the latest date for filing an SSP plan is **March 4, 2021**. Subsequently, the FRA has 90 days to review and approve the SSP plan, after which there are 36 months allowed for implementation.

Impacts on Washington State

With regard to the provision of passenger services: Washington State, via WSDOT, is involved in a passenger rail operation by sponsoring a state-supported route (Cascades) on Amtrak's national system. In turn, according to PRIIA Section 209, WSDOT, by procuring rolling stock, leases that equipment to Amtrak for use on that route. WSDOT itself does not operate any part of the service, including providing any maintenance services to the equipment.

¹¹³ § 270.301

¹¹⁴ As of March 2020, the FRA noted that items marked with a (*) are "[d]elayed due to internal policy changes – working through them and hope to have out soon."

¹¹⁵ FRA – Passenger Division, Office of Safety. 2020. System Safety Program Part 270 Regulation. Presentation to APTA Tele-Conference, March 25, 2020. For discussion purposes only.

While §270.7(c)(1) states that “all persons providing intercity rail passenger or commuter (or other short-haul) rail passenger service share responsibility for ensuring compliance with this part...”, our understanding through the analysis in the rulemaking process and consultations with stakeholders is that Amtrak is incorporating this state-supported route on its national system into an SSP plan. Accordingly, under such circumstances, WSDOT is **not** responsible for submitting an **independent** SSP plan for that route. That said, WSDOT is required to participate in the development of the SSP, to the extent that its involvement (in this example, the procurement of the rail equipment) affects railroad safety. Thus, the entity preparing the SSP plan (Amtrak) must coordinate with the WSDOT on the equipment’s safety to file a compliant SSP plan incorporating the state-supported route.

*Our understanding is WSDOT is **not** responsible for submitting an independent SSP plan for the Cascades route.*

In the 2019 NPRM, there was the concept of a “designator” found in §270.5(c)(1), that is: “any person subject to this part [a designator] may designate another person as responsible for compliance with this part by including a designation of responsibility in the SSP plan.” In the 2020 final rule, the FRA indicated that it:

is not adopting the sentence in §270.5(c)(1) proposed in the [2019 NPRM] that would have stated that a designator (designating entity) was not relieved of responsibility for compliance with this part. As the State Comments explained, this statement rendered the proposed designation provision of little comfort...

By comparison, in the 2020 final rule “a passenger rail operation [...] may designate a person as responsible for compliance...” However, a passenger rail operation refers to a “service” and not a “person.” We understand from discussions with stakeholders that Amtrak is in the process of developing an SSP that will be applicable to services in Washington State, but it has not reviewed the details of any documents. WSDOT may wish to consider, if not already completed:

- Negotiating with Amtrak inclusion in its agreements provisions that specify that Amtrak is the designated entity to develop the SSP plan and that such designation is to be noted in its plan, and/or
- Jointly with Amtrak, notifying the FRA under §270.5(c)(2)(ii) of a designation of responsibility.

With regard to the oversight of SSP implementation, it is not clear yet how the WUTC will be involved in oversight as part of its SSPP. We make several recommendations to proactively strengthen this oversight (see Section 6.2.2). As discussed earlier in this section, the FRA makes provisions for external audits of the SSPP be carried out by its “designee.”

5.6.2 49 CFR Part 271 – Risk Reduction Program (RRP)

While the *primary* focus of this study is on passenger services, it is worth noting that there is a parallel program to the SSP applicable to:

- (1) Class I railroads;
- (2) Railroads determined to have inadequate safety performance...; and
- (3) Railroads that voluntarily comply with the requirements of this part...¹¹⁶

¹¹⁶ § 271.3

While the requirements of the RRP differ from the SSP, many of the same principles apply to these programs. FRA rulemaking has aimed to maintain consistency where possible.

5.7 Summary of regulatory frameworks

5.7.1 Railroads

Figure 5-3 summarizes key dimensions of the regulatory framework in Washington State for railroads. The FRA and WUTC are the primary regulatory oversight bodies. In the context of rail safety, WSDOT is a founder of transportation infrastructure and service and would be viewed as a state providing IPR. It has responsibilities as a non-operating entity.

Figure 5-3: Summary of key dimensions of the railroad regulatory framework

Functions	Key elements
Regulatory organizations	<ul style="list-style-type: none"> • Primary: FRA (federal) and WUTC (state)
Key roles and responsibilities	<ul style="list-style-type: none"> • Limited funding for installation of, and improvements to infrastructure • Inspections and audits • Safety data collection • Safety enforcement • Agency and stakeholder coordination
Mechanisms to set requirements	<ul style="list-style-type: none"> • FRA employs a Railroad Safety Advisory Committee (RSAC) to recommend and implement new rail safety regulations • Both the FRA and WUTC have regulatory rule-making power to institute new rail safety rules
Requirements concerning the design of new lines	<ul style="list-style-type: none"> • The STB has authority over approving new rail lines via 49 CFR Parts 1150 and 1302, and 49 CFR 10901 and 10902 • FRA provides guidance for new passenger rail lines known as the “New Start Regulations Checklist,” but there is not a formal certification process. (49 CFR Part 270 does mandate passenger rail operations to develop a certification process.)
Requirements concerning certification of new rail lines	<ul style="list-style-type: none"> • The FRA New Start Rail Program is a non-mandatory program that the FRA offers to ensure that new passenger railroads meet all the safety operating requirements. While a new railroad must meet all operating requirements at the start of service, this FRA program does not provide certification to ensure that these standards have been met. • The FRA does not directly certify operators (conductors and locomotive engineers) but has requirements for railroads to carry this certification out under 49 CFR Parts 240 and 242. 49 CFR Part 240, the FRA generally requires “[a] railroad that is responsible for controlling the conduct of joint operations with another railroad” to certify that a locomotive engineer is qualified to operate on the territory.
Types of inspections and audits conducted	<ul style="list-style-type: none"> • FRA oversees, trains, and, with WUTC, executes rail infrastructure inspection of track, bridges, tunnels, rolling stock, train control, communication systems, and grade crossings • FRA is required to audit Class I railroads every two years and all other railroads every five years

Functions	Key elements
	<ul style="list-style-type: none"> • WUTC employs 11 FRA-certified inspectors who inspect rail track, crossings, walkways, motive power and equipment, signal and train control, operating practices, and hazardous materials handling • FRA certifies rail infrastructure inspectors under 49 CFR Part 212 for the WUTC to utilize for inspection • WUTC evaluates, investigates, and approves or denies petitions from railroads or other agencies pertaining to rail grade crossing changes and close clearances
Safety incident investigation	<ul style="list-style-type: none"> • NTSB is the primary investigator of railroad accidents that result in fatalities or significant property damage where they review the event and make recommendations for improvement • FRA also conducts Factual Investigation Reports on accidents that provide a detailed narrative describing the event, including a determination of the probable cause • WUTC investigates fatal accidents within the state, often partnering with the FRA during such investigations
Safety data collection	<ul style="list-style-type: none"> • As required in 49 CFR Part 225, all railroad carriers must provide a monthly report to the FRA indicating any highway-rail grade crossing, rail equipment, and death/injury/occupational illness accidents and incidents. In return, the FRA is expected to provide guidance to carriers for preparing the monthly accident/incident reports. • WUTC requires all railroad companies in the state to report any accidents/incidents connected to the operations of the railroad, involving the release of hazardous materials, injury of any person involved in a railroad-highway crossing accident that needs medical attention, death of any person, or property damage exceeding \$50,000 cost to the property
Enforcement and penalties	<ul style="list-style-type: none"> • FRA may impose civil penalties ranging from \$892 to \$29,192 and/or imprisonment for up to two years for any violations of FRA safety requirements • The WUTC may impose administrative penalties ranging from \$100 to \$1,000 per violation of its regulations
Budget	<ul style="list-style-type: none"> • FRA administers nearly \$840 million/year in funding related to rail safety, much of which is dispersed to states on a formula basis • WSDOT oversees approximately \$109 million in rail capital improvement funding for the State of Washington • WUTC receives funding from regulated entities through regulatory fees. The WUTC has 11 FRA-certified inspectors. The WUTC also administers the Grade Crossing Protective Fund, which funds projects in Washington State that eliminate or mitigate public safety hazards involving railroad crossings and rights-of-way

Source: CPCS based on various sources.

5.7.2 Transit

Figure 5-4 summarizes key dimensions of the regulatory framework in Washington State for transit.

Figure 5-4: Summary of key dimensions of the transit regulatory framework

Functions	Key elements
Regulatory organizations	<ul style="list-style-type: none"> • Primary: FTA and WSDOT; some FRA overlap
Key roles and responsibilities	<ul style="list-style-type: none"> • Funding for new and improvements to infrastructure (funding and approval) • Inspections/audits • Safety data collection • Safety enforcement • Agency and stakeholder coordination
Mechanisms to set requirements	<ul style="list-style-type: none"> • FTA appoints a Transit Advisory Committee for Safety to support the FTA in performing its duties and responsibilities concerning the Public Transportation Safety • FTA has regulatory rule-making power to institute new rail safety rules
Requirements concerning the design of new lines	<ul style="list-style-type: none"> • FTA often provides funding for new rail transit projects and requires certain safety requirements to be met before disbursement of funds • Unlike for railroads, there are no regulatory prescriptive design requirements for design of new infrastructure, though industry guidelines from organizations such as APTA exist
Requirements concerning certification	<ul style="list-style-type: none"> • 49 CFR Part 673.27(c)¹¹⁷ sets out requirements that an SMS contain processes for management of change, but regulator involvement in those processes is not specified
Types of inspections and audits conducted	<ul style="list-style-type: none"> • FTA generally delegates safety inspection of public transportation agencies to the SSOA – 49 CFR Part 672 requires personnel at the SSOA to be trained in accordance with the Public Transportation Safety Certification Program • FTA may conduct inspections, audits, examinations, and tests of rail transit equipment, facilities, rolling stock, and operations, especially transit agencies receiving federal funding • WSDOT SSOA must formally approve system safety program plans (SSPP), and SMS (once Part 673 is in force). WSDOT SSOA approves internal agency audit procedures and is to receive a copy of its final report. The SSOA must conduct an on-site external audit at least once every three years.
Safety incident investigation	<ul style="list-style-type: none"> • NTSB is the primary investigator of railroad accidents that result in fatalities or significant property damage where it provides a holistic view of the event and makes recommendations for improvement • WSDOT SSOA may, under RCW 81.104.115, conduct an independent investigation

¹¹⁷ In early 2020, the FTA issued a Notice of Enforcement Discretion which has the effect of extending the compliance deadline for this rule until December 31, 2020.
 FTA. Safety Rulemaking. <https://www.transit.dot.gov/regulations-and-guidance/safety/safety-rulemaking>
 Accessed October 28, 2020.

<p>Safety data collection</p>	<ul style="list-style-type: none"> • FTA’s National Transit Database (NTD) is the repository of financial, operating, asset condition and safety of transit systems across the U.S. Transit operators that apply and receive financial support through the Urbanized Area Formula or Rural Formula funding programs are required to submit annual reports to the FTA. • The WSDOT SSOA also requires agencies to submit accident notifications based on the minimum criteria set out by the FTA – plus some additional requirements
<p>Enforcement and penalties</p>	<ul style="list-style-type: none"> • If a safety requirement is not met by a transit agency/operator, the FTA may withhold federal funds in whole or part, require more oversight by the SSOA, impose requirements for more frequent reporting, order a recipient to develop and carry out a corrective action plan, or direct the recipient to redirect certain funds to correct safety deficiencies • FTA can also impose financial penalties or issue an advisory to the public determining that a certain agency/operator is deemed unsafe at the moment
<p>Funding</p>	<ul style="list-style-type: none"> • FTA provides yearly formula grants to SSOAs for oversight; SSOAs must be financially independent from the systems that they oversee. It was noted in consultations that this formula is based on track-miles within the state. • FTA also administers and provides yearly formula funds for commuter rail projects and operations, including Urbanized Area Formula Grants, Rural Areas, Rural Transportation Assistance, Tribal Transit Formula Grants, and State of Good Repair

Source: CPCS based on various sources, including FTA Safety Rulemaking website, WSDOT “Rail Safety Oversight Program Standard” (2018 edition).

6 Lessons learned from other jurisdictions

Key takeaways

- We have identified 12 jurisdictions in the U.S. and globally to scan for **evidence of effective practices** and other **lessons learned**. Our scan focuses on issues identified in the initial stages of the study, including:
 - Effective practices in the commissioning of new rail infrastructure and systems, including the roles and responsibilities of entities
 - Practices for ongoing communication between oversight agencies and regulated entities
 - Practices for ensuring clarity in the roles and responsibilities of host and tenant railways
 - Practices for enhancing safety at grade crossings and reducing trespassing occurrences
 - Practices related to the safety of hazardous material transport
- The outcome of the scan was a menu of 10 practices and lessons learned that could be adopted or tailored to the Washington State context. Themes from these findings include:
 - Alternative institutional structures for the oversight of railroads and transit at the state level, as well as additional standards and programs for the implementation and oversight of higher-speed rail systems.
 - More prescriptive standards/guidelines for organizational and system safety requirements, such as change management and emergency response planning and ensuring that regulators have sufficient resources to oversee those requirements.
 - Practices to increase data collection by regulators from regulated entities (and other sources) and to assist in planning oversight activities. This includes leveraging the data collected by novel forms of inspection systems used by regulated entities (namely railroads) and collecting and analyzing data on hazardous materials transport.
 - Mechanisms for communication and collaborative efforts with a broader range of stakeholders involved in rail safety, including municipalities.
- As rail safety governance models generally evolve gradually within the broader legal context in which they operate, there is rarely a universal best practice. Also, not all findings are necessarily feasible to implement at the state level, due to issues such as federal pre-emption. Accordingly, we have used these findings to provide guidance and inspiration in developing our own recommendations in Chapter 7. Other findings noted may nonetheless provide a repository of knowledge for stakeholders involved in rail safety.

6.1 Jurisdictions scanned

We identified 12 candidate jurisdictions to scan for evidence of effective practices for rail systems with at least the same complexity as those in Washington State (Figure 6-1). These jurisdictions were selected based on a combination of location scans in which there is a similar mix of different rail types (freight, intercity passenger, commuter, and transit), stakeholder feedback, and team member experience. In particular, the team aimed to identify locations where there may be effective practices that relate to issues identified in Washington State during the initial phases of the study, including:

- Effective practices in the commissioning of new rail infrastructure and systems, including the roles and responsibilities of state entities
- Practices for ongoing communication between oversight agencies and regulated entities
- Practices for ensuring clarity in the roles and responsibilities of host and tenant railways
- Practices for enhancing safety at grade crossings and reducing trespassing occurrences
- Practices related to the safety of hazardous material transport

We have organized our findings thematically based on these categories, as well as other findings related to oversight program effectiveness. The complete methodology for identifying jurisdictions is described in Appendix D. Figure 6-2 summarizes the program administrator (funding body) and regulatory bodies in each state.

Figure 6-1: Description of rail systems

Jurisdiction	Number of systems/lines (Size in track-miles)			Role of the state (province) in funding
	Freight	Commuter	Transit	
Washington	30 (3,032)	2 (83)	5 (499)	<ul style="list-style-type: none"> • WSDOT administers grant and loan programs to support freight rail projects • Local Transit Authorities operating under Public Transportation Benefit Areas (PTBAs) secure transit funds primarily coming from local sales taxes, property taxes, and motor vehicle excise taxes
California	25 (6,903)	8 (1,615)	7 (851)	<ul style="list-style-type: none"> • California State Transportation Agency (CalSTA) is the state agency in charge of funding transit and rail projects. The state is responsible for 100% of the intercity passenger systems operating costs • California High-Speed Rail Authority (HSRA) also secures funds from both state and federal sources for passenger rail operations • The CPUC allocates Section 130 funds
Florida	15 (3,046)	6 (2,234)	5 (148)	<ul style="list-style-type: none"> • Joint Rail Participation funding agreements between FDOT and railroad support rail safety and capacity improvements • FDOT guides the state's rail freight and passenger public investments
Oregon	20 (2,781)	3 (*)	5 (142)	<ul style="list-style-type: none"> • ODOT sponsors the Amtrak intercity operations in collaboration with neighboring states. • DOT also allocates Section 130 funds as prioritized in the Oregon Rail Crossing Action Plan
Illinois	49 (9,748)	12 (578)	8 (265)	<ul style="list-style-type: none"> • IDOT has statutory responsibility for planning, constructing, operating, and maintaining the passenger rail, public transportation, and freight rail systems • IDOT's Office of Intermodal Project Implementation coordinates all rail activities
Michigan	28 (4,080)	8 (883)	1 (7)	<ul style="list-style-type: none"> • MDOT provides capital and operating assistance for the passenger rail system • MDOT also allocates Section 130 funds
Ohio	41 (6,463)	3 (*)	3 (77)	<ul style="list-style-type: none"> • The ORDC administers state's rail financial support programs and allocates Section 130 funds to crossing projects

Jurisdiction	Number of systems/lines (Size in track-miles)			Role of the state (province) in funding
	Freight	Commuter	Transit	
North Carolina	22 (3,249)	6 (*)	2 (44)	<ul style="list-style-type: none"> Primary responsibility for coordinating all rail funding programs in North Carolina lies within the NCDOT's Rail Division
Texas	52 (14,506)	4 (114)	5 (274)	<ul style="list-style-type: none"> The Rail Division of TXDOT administers all rail project funds and implements rail-related policies TxDOT's Public Transportation Division administers transit grant programs, including FTA grants
New York	37 (4,664)	3 (746)	3 (824)	<ul style="list-style-type: none"> NYSDOT allocates the Passenger and Freight Rail Assistance Program grants to projects
BC (Canada)	✓	✓	✓	<ul style="list-style-type: none"> Funding for intercity passenger rail in Canada is provided federally. There is also a small federal program for grade crossing improvements.
UK	✓	✓	✓	<ul style="list-style-type: none"> Not applicable
Australia	✓	✓	✓	<ul style="list-style-type: none"> Our understanding is that most transportation funding for passenger services is funded at the state level in Australia

Notes: For commuter and transit systems, the number provided in the table provides the number of lines/routes. *The commuter rail track-mile not distinguishable from Amtrak Intercity operation. Source: CPCS review of state rail plans and FTA's National Transit Database, 2019.

Figure 6-2: Key regulatory institutions

Jurisdiction	Primary state-level program administration	Regulatory authority for railroads	Regulatory authority for transit
Washington	WSDOT	WUTC	WSDOT (SSOA)
California	CalSTA	California Public Utility Commission (CPUC)	California Public Utility Commission (CPUC)
Florida	FDOT	FDOT	FDOT
Oregon	ODOT	ODOT	ODOT
Illinois	IDOT	Illinois Commerce Commission (ICC)	IDOT
Michigan	MDOT	MDOT	MDOT
Ohio	Ohio Rail Development Commission (ORDC)	Public Utilities Commission of Ohio (PUCO)	ODOT
North Carolina	NCDOT	NC Utilities Commission	NCDOT
Texas	TxDOT	TxDOT	TxDOT
New York	NYSDOT	NYSDOT, Rail Safety Bureau, Inspection Section	New York Public Transportation Safety Board
BC/Canada	Ministry of Transportation and Infrastructure and TransLink*	Transport Canada and Technical Safety BC**	Technical Safety BC
UK	Not applicable	Office of Rail and Road	Office of Rail and Road
Australia	Varies by state	Office of the National Rail Safety Regulator	Office of the National Rail Safety Regulator

Note: *Currently, the only commuter rail operation in BC is in Metro Vancouver, delivered by TransLink. **Transport Canada regulates federally regulated railways whereas Technical Safety BC regulates provincially regulated railways. Source: State DOT Websites; FTA, State Safety Oversight Program, Accessed September 2020.

6.2 Potential effective practices from other jurisdictions

6.2.1 Effective practices in the commissioning of new rail infrastructure and systems, including the roles and responsibilities of state entities, and communication/coordination mechanisms

Developing new standards for high-speed rail and programs for related safety improvements – California and Illinois

California established a High-Speed Rail Authority (the California High-Speed Rail Authority) to develop the new high-speed rail system in the state. The authority developed safety plans for the new rail system, which include provisions for installing a signaling system that is Positive Train Control (PTC) compliant, an early warning system for earthquakes, management of rail intersections with roads through grade separation, or installation of quad gates and other aspects. In addition, the Railroad Operations and Safety Branch (ROSB) of the California Public Utilities Commission (CPUC) is responsible for developing and adopting regulations specific to High-Speed Rail (HSR), which involve some that go above and beyond those of the Federal Railroad Administration (FRA). One new set of regulations involves the 25 kV AC electrification system that the new HSR line will use.

Also, if a higher-speed operation (80-125 mph) that still permits grade crossing was implemented, other practices in the U.S. can be referred to for assessing and improving at-grade crossings (see box).

Crossing assessments for higher-speed rail: Illinois practice

Illinois High-Speed Rail is a 284-mile higher-speed rail line upgrade project from Chicago to St. Louis with a \$1.95 billion overall budget, coordinated by Illinois DOT (IDOT) and regulated by the Illinois Commerce Commission; \$194 million of this budget is designated for grade crossing, fencing, and overhead bridge work. Union Pacific is the owner and dispatcher, while Amtrak is the service provider.

As part of program development, IDOT conducted grade crossing and line safety analysis using field diagnostic teams. In addition to IDOT, these teams also included members from municipalities and counties, the Illinois Commerce Commission, the FRA, Union Pacific, and Amtrak. During the analysis, the Illinois Commerce Commission required a number of grade crossing upgrades and installation of fencing along key sections of the corridor.

The Illinois program's budget provided for identifying crossings for closure and approaching local counties and municipalities with incentive funding to voluntarily close grade crossings. A total of 38 grade crossings were closed as a result, and a further 213 grade crossings were upgraded. Pedestrian treatments were added to 80 crossings. Grade crossing upgrades include:

- 4-quadrant gates: this includes two entrance gates and two exit gates. This configuration prevents drivers from going around gates, as is more common with 2-quadrant gates
- pedestrian gates and escape swing gates where needed
- vehicle detection systems through inductive loops and tie-in into the signaling system. Vehicle presence detectors open exit gates if vehicles are detected in the crossing
- increased warning time to account for higher-speed trains
- improved roadway approaches to improve sightline profiles
- traffic signal interconnections with the signaling system
- new signs and pavement markers

Source: Previous CPCS research compiled from multiple sources.

Summary

- Some other jurisdictions in the U.S., including California and Illinois, have developed additional regulatory standards or funding programs related to the implementation of higher-speed ground transportation systems. These programs include upgrading or closing crossings to permit higher-speed operations.

Increasing oversight of change management processes – autonomous trains – Australia

Introduction and overview: This section describes Australia's regulatory environment for the commissioning of new rail infrastructure and systems. In part, it draws from the commissioning of Rio Tinto's AutoHaul, the first automated heavy-haul freight railway in the world, as a mini-case study for illustration.¹¹⁸

In Australia, the Office of the National Rail Safety Regulator (ONRSR) regulates railway safety. Rail safety regulations in Australia had historically been delivered by state and territorial governments.

¹¹⁸ Smith, K. 2019. Rise of the machines: Rio Tinto breaks new ground with AutoHaul.

However, the Council of Australian Governments (COAG) committed to a reform of rail safety regulation and the creation of a single national rail safety regulator, ONRSR.

The Government of the State of South Australia was the first to pass the Rail Safety National Law (RSNL) in 2012. The RSNL established the ONRSR as the body responsible for rail safety regulation. Since then, all other states and territories have passed laws that establish the RSNL as the rail safety law in that state or territory, thereby establishing the ONRSR as the rail safety regulator in that state or territory.¹¹⁹

Accreditation requirements, including roles and responsibilities: The ONRSR requires organizations subject to the RSNL as either a Rail Infrastructure Manager (RIM) or Rail Transport Operator (RTO) to be accredited by ONRSR. Accreditation involves demonstrating that the applicant has a safety management system and change management process (see box) that addresses the key requirements of the RSNL. An applicant must also demonstrate that it has the financial capability or public risk insurance arrangements to meet reasonable potential accident liabilities.

The RSNL sets out the roles and responsibilities for RTOs, RIMs, and rail operators (see box, page 80). Given these base requirements for each role, the legislation assigns a shared responsibility for rail safety, with the “level and nature of responsibility [...] has for rail safety [being] dependent on the nature of the risk to rail safety that the person creates from the carrying out of an activity (or the making of a decision), and the capacity that person has to control, eliminate or mitigate those risks.” It further elaborates, under section 50(3), that these organizations, along with the regulator and public, should “(a) participate in or be able to participate in; and (b) be consulted on; and (c) be involved in the formulation and implementation of, measures to manage risks to safety associated with railway operations.” We note that this includes the regulator, ONRSR, and the public.

While some ambiguity does remain, it does set out responsibilities as well as the principle of collaboration. The ONRSR also notes that it is guided by the principle of “which party has the greatest ability to influence and direct the relevant railway operation (i.e., the management of rail infrastructure, or the operation or movement of rolling stock)” in determining who has effective control and management.

In addition to the ONRSR’s regulatory function, there is the Rail Industry Safety & Standards Board (RISSB). RISSB operates by bringing the industry together to debate, review, and identify needs for new standards and guidelines. Based on our discussions with experts, it is perceived by the rail operators to be a very healthy and useful body to

Change management

Accidents often occur following significant changes in operations. They can also occur when assumptions made during design are no longer accurate when a system is put into operation. In the case of the derailment in DuPont, the related NTSB report noted that the risk assessment had assumed that PTC was in place, but this was not the case when the system was put into operation. Accidents can also occur when system safety control degrades (unknowingly) over time; system safety authors, such as Sydney Dekker, have called this “drift into failure.”

Change management refers to the management systems put in place to identify changes that require attention, the roles and responsibilities for assessing the significance of those changes, and the processes (such as risk assessments), to identify and mitigate hazards created by those changes. We note, however, that the legal requirements for change management practices found in 49 CFR Part 270 and 49 CFR Part 673 are less prescriptive in terms of requirements than those observed in Australia.

Source: CPCS, based on sources noted.

¹¹⁹ The South Australian parliament controls the RSNL legislation and each state has some regulations of its own that amend some aspects slightly, e.g., drug and alcohol testing requirements, some fines and penalties, etc.

industry. Rail operators are involved in the committees that draft overriding codes of practice that serve as guidelines for the standards applied by each rail operator.

Change management practices: The regulatory model for new construction in Australia is less prescriptive than the model in the U.S. or Canada, being based on the European model known as CENELEC 50126/8/9. However, the ONRSR sets out its guidelines for major projects in an accessible document.¹²⁰ Overall, the accredited railway has to demonstrate it is managing risk “so far as is reasonably practical,” and with regard to its internal company standards and for material changes. Key expectations of the ONRSR in these guidelines include, among other factors:

- An independent safety assessment (ISA),¹²¹ including a final report and open communication between the project team, ISA team, and OSRNR
- A human factors plan that considers cognitive ergonomics – the study of how humans interact with systems/environments in performing processes and tasks

The railway has to put forward its safety case for review and approval. Rail Safety National Law National Regulations 2012, Part 9, sets out 12 specific situations in which the operator must notify the regulator and the timeline for that notification. These can include the construction of a new track, for example.

Team members discussed the process with selected Australian railways. As general learning, rail operators contacted stressed the need to involve the regulator at an early stage of a project that will be outside of the norm. In addition, the change management process has often been as complex as implementing the change and has needed the involvement of regulators. For both the prior state-based regulator and the national regulator, the Australian railways interviewed have taken the approach of involving them early and openly in significant changes, including describing how the railway will manage safety outcomes in the project design phase and agreeing to the points in project progression when regulators will need to review and approve the material. In essence, some railways considered the regulator more as a partner throughout the process.

¹²⁰ ONRSR. Major Project Guidelines. <https://www.onrsr.com.au/publications/major-projects-guideline>

¹²¹ Our understanding is the ISA is a body outside of the chain of command associated with the project implementation itself which is required to assess and report on safety.

Australia's Rail Safety National Law (RSNL) – duties of rail transport operators

- (1) A rail transport operator must ensure, insofar as is reasonably practicable, the safety of the operator's railway operations.
- (2) Without limiting subsection (1), a rail transport operator must ensure, insofar as is reasonably practicable—
 - (a) that safe systems for the carrying out of the operator's railway operations are developed and implemented; and
 - (b) that each rail safety worker who is to perform rail safety work in relation to the operator's railway operations—
 - (i) is of sufficient good health and fitness to carry out that work safely; and
 - (ii) is competent to undertake that work; and
 - (c) that rail safety workers do not carry out rail safety work in relation to the operator's railway operations, and are not on duty, while impaired by alcohol or a drug; and
 - (d) that rail safety workers who perform rail safety work in relation to the operator's railway operations do not carry out rail safety work while impaired by fatigue or if they may become so impaired; and
 - (e) the provision of adequate facilities for the safety of persons at any railway premises under the control or management of the operator; and
 - (f) the provision of—
 - (i) such information and instruction to, and training and supervision of, rail safety workers as are necessary to enable those workers to perform rail safety work in relation to the operator's railway operations in a way that is safe; and
 - (ii) such information to rail transport operators and other persons on railway premises under the control or management of the operator as is necessary to enable those persons to ensure their safety.
- (3) Without limiting subsection (1), a rail infrastructure manager must ensure, insofar as is reasonably practicable—
 - (a) the provision or maintenance of rail infrastructure that is safe; and
 - (b) that any design, construction, commissioning, use, installation, modification, maintenance, repair or decommissioning of the manager's rail infrastructure is done or carried out in a way that ensures the safety of railway operations; and
 - (c) that systems and procedures for the scheduling, control and monitoring of railway operations are established and maintained so as to ensure the safety of the manager's railway operations; and
 - (d) that communications systems and procedures are established and maintained so as to ensure the safety of the manager's railway operations.
- (4) Without limiting subsection (1), a rolling stock operator must ensure, insofar as is reasonably practicable—
 - (a) the provision or maintenance of rolling stock that is safe; and
 - (b) that any design, construction, commissioning, use, modification, maintenance, repair or decommissioning of the operator's rolling stock is done or carried out in a way that ensures safety; and
 - (c) compliance with the rules and procedures for the scheduling, control and monitoring of rolling stock that has been established by a rail infrastructure manager in relation to the use of the manager's rail infrastructure by the rolling stock operator; and
 - (d) that equipment, procedures and systems are established and maintained so as to minimize risks to the safety of the operator's railway operations; and
 - (e) that arrangements are made for ensuring safety in connection with the use, operation and maintenance of the operator's rolling stock; and
 - (f) that communications systems and procedures are established and maintained so as to ensure the safety of the operator's railway operations.
- (5) This section applies to a person (other than a rail transport operator) who carries out railway operations in the same way as it applies to a rail transport operator, but does not apply if the person carries out those operations as a rail safety worker or an employee.

Source: RSNL

In the case of AutoHaul, Rio Tinto had to effectively gain a new accreditation for operation. This involved setting up an internal independent safety authority and an ongoing risk management process to assure the regulator of the internal layers of governance. Further, this involved setting up internal tests and acceptance criteria that would need to be passed before moving to the next step.

Our understanding is that the regulator required that Automated Train Protection (ATP, similar to PTC) be in place before converting to autonomous trains, so ATP implementation was part of the process to achieve the accreditation as a railway with autonomous train operations. (We note that state regulators in Washington would not have this level of authority.) In the end, there was no need to alter any of the mandatory or advisory Australian standards or regulations to implement AutoHaul. However, there was a significant redrafting of company rules and procedures required, and the regulator had to be provided all of those draft documents for review and approval.

Summary

- Australian rail safety regulation has detailed requirements for the roles and responsibilities of industry participants and stakeholders as part of its accreditation requirements.
- It also has more prescriptive requirements for change management, including situations in which operators must notify the regulator. It also includes guidelines for practices that operators should follow when making changes, including the need to establish an independent technical authority related to major projects and consider human factors in design.
 - Change management refers to the management systems put in place to identify changes that require attention, the roles and responsibilities for assessing the significance of those changes, and the processes (such as risk assessments) to identify and mitigate hazards created by those changes.

6.2.2 Practices for ensuring clarity in the roles and responsibilities of host and tenant railways

Strengthening dialog with industry participants for system safety plans – United Kingdom (U.K.)

Introduction to the U.K. industry context: In 1994, the U.K privatized its rail industry to improve industry efficiency. The below describes a former U.K. rail industry structure. The separation of train operations (tenant railroad) from the infrastructure owner (host) was the norm:

- **Train Operating Companies (TOCs)** – private companies, responsible for operating a seven-year geographical franchise, cross-subsidizing profitable, and non-profitable service. The company that received the franchise was the one requiring the smallest subsidy. TOCs purchased capacity for use from the Infrastructure Manager (see below) and leased rolling stock from rolling stock companies. This type of franchising resulted in competition for the market (multiple candidates competing for the right to operate a certain set of services).
- **Open-Access TOCs** – in addition to franchised TOCs, open-access operators could operate on a certain number of high-demand lines, allowing for competition in the market (multiple companies competing for passengers).
- **Rail freight train operators** – two received British Rail freight assets.
- **Infrastructure Manager (IM)** – a corporate entity (Railtrack), listed on the stock market, that managed rail infrastructure and a few stations and which was responsible for managing infrastructure maintenance.

- **Infrastructure maintenance companies** – responsible for performing maintenance on the network, divided into 13 geographical areas. There was no centralized entity responsible for managing maintenance on the already under-maintained network.
- **Office of the Rail Regulator (ORR)** – an economic regulator which could set passenger train fares charged to consumers and infrastructure charges, levied on operators.
- **Health & Safety Executive (HSE)** – an agency responsible for regulating workplace safety in the U.K., which, in addition to other mandates, was responsible for rail safety regulation. In its function, it is similar to the North American Occupational Safety and Health Administration (OSHA).

After three high-profile fatal train crashes, the industry was restructured:

- **The Infrastructure Manager (IM)**, originally a private company called Railtrack, became the central focal point in managing infrastructure maintenance across the entire network. The newly reorganized entity (now called Network Rail) became a government-owned (rather than stock market-listed) corporation. While the actual maintenance was still largely contracted out, the responsibility for maintenance stayed with the IM.
- The rail regulator, the ORR, assumed additional responsibilities, including those for rail safety regulation.
- **Rail Safety and Standards Board (RSSB)** was established. It is a not-for-profit corporation and is owned by rail industry stakeholders, including Network Rail, infrastructure managers, train operating companies, and rolling stock companies. The RSSB defines common rail technical standards and operating procedures. It is similar in its function to the North American AREMA.
- Rail Accident Investigation Branch, a British government agency that independently investigates rail accidents in the U.K. and the Channel Tunnel, had its mandate redefined. Its goal was now to determine the accident cause – not to determine fault. In its function, it is similar to the U.S.' National Transportation Safety Board (NTSB).
- The Railway Industry Health and Safety Advisory Committee (RIHSAC) is a collaborative committee that reviews and discusses proposed changes to safety regulations. It is comprised of the regulator (ORR) and industry associations.

Some of the lessons learned from this experience included:

- Importance of a robust exchange of information on safety issues between multiple parties
- Importance of a centralized point of contact for safety issues and the ability to track issues
- Collaborative facilities (e.g., roundtables and committees) to openly discuss safety regulations that contribute to improved safety
- Determining cause without assigning fault/blame of an incident makes parties more cooperative in investigations

Many of these are features of the current industry landscape in the U.S. (e.g., the existence of the NTSB as an independent safety investigator intended to determine probable cause rather than fault). However, it also highlights the importance of a centralized authority to track safety issues, as well as the importance of communication amongst different parties involved in operations and rail safety.

Extensive guidance in collaboration with industry: In the context of this complex structure, the Railways and Other Guided Transport Systems (Safety) Regulations 2006 (ROGS) is the central

legislation for rail safety. Under ROGS, “... nobody¹²² is allowed to run vehicles or manage infrastructure unless [the ORR has] awarded them the appropriate safety certificate (for transport undertakings) or authorization (infrastructure managers).¹²³” These and others are defined as follows:

- **Transport undertakings** – Any person or organization that operates a vehicle in relation to any infrastructure [e.g., a TOC]
- **Infrastructure managers** – Any person or organization responsible for developing and maintaining infrastructure or for managing and operating a station. Also, a person or organization that manages or uses that infrastructure or station or allows it to be used for the operation of a vehicle.
- **Transport operator** – any transport undertaking or infrastructure manager
- **An 'entity in charge of maintenance' (ECM)** – any person or organization that is responsible for the safe maintenance of a vehicle and is registered as an ECM in the national vehicle register. This can include people or organizations such as transport undertakings, infrastructure managers, a keeper (usually the owner of a rail vehicle), or a maintenance organization.¹²⁴

To receive a certificate/authorization,¹²⁵ prospective railways must provide to the ORR “evidence that [the company’s] safety management system is designed to meet the requirements of ROGS [which includes]”:

- Safety policy statements
- Safety targets
- Procedures for meeting standards
- Risk assessments and controlling new risks
- Training and skills
- Managing safety-related information
- Responding to accidents and near misses
- Emergency planning
- Internal auditing

While elements of the FRA’s System Safety Program Plan required under 49 CFR Part 270 or the FTA’s required Public Transportation Agency Safety Plan (including SMS) under 49 CFR Part 673 are similar, the level of guidance and structure that the ORR provides to regulated entities is extremely high:

- The ORR issues a “Guide to ROGS,” which outlines the steps required to receive a safety certificate/authorization, as well as “Assessment criteria for mainline railway safety certificate and safety authorization applications,” which sets out in detail the requirements that are required for safety certifications/authorizations.

¹²² There are some exceptions, such as heritage railways.

¹²³ ORR. Guide to ROGS.

¹²⁴ ORR. ROGS. <https://www.orr.gov.uk/guidance-compliance/rail/health-safety/laws/rogs>

¹²⁵ We have kept the original British spelling in this section.

- As part of the process to have an SMS approved, prospective regulated entities must circulate their proposed plan to affected parties (other rail operators), which have 28 days to formally comment on the plan.
- In addition to the upfront approval of the SMS, the ORR, working with industry stakeholders through an RM3 Governance Board, has developed a Risk Management Maturity Model (RM3) that “provides criteria for measuring management capability against five maturity levels across 26 criteria” (see box for elaboration). Regulations can often only set out minimum standards for the content and implementation of SMS – measured in terms of a binary outcome (i.e., an element of a plan exists or does not exist). The purpose of the RM3 is to provide a tool to facilitate discussion between the regulator and industry participants beyond this binary view in terms of five levels measuring the maturity of implementation of the element of the SMS (from “ad hoc” [level 1] to “excellence” [level 5]).

The U.K. ORR’s Risk Management Maturity Model

A key tool used in ORR’s monitoring and reporting activity is its Risk Management Maturity Model (RM3), which assesses the effectiveness of how health and safety risks are managed in organizations. Developed as a tool for inspectors assessing duty holders’ safety management systems against regulatory requirements, the model provides organizations with a means of evaluating the management arrangements required by regulations and helps guide ORR in determining how well an organization’s SMS can deliver on risk control. Significantly, it is ORR’s philosophy that the criteria in RM3 apply to health and safety management systems and that occupational health issues should be considered alongside safety issues when looking for excellence in risk management.

RM3 looks at the areas of policy, monitoring, audit and review, planning and implementing, securing cooperation and confidence, and organizing for control and communication. It uses a five-point scale to assess performance and identify areas for improvement:

- level 1 “ad hoc”
- level 2 “managed”
- level 3 “standardized”
- level 4 “predictable”
- level 5 “excellence”

The ORR notes that the “RM3 is not an audit or compliance tool. It is a model to structure discussions about evidence and where to go next, either internally in organizations or between inspectors and the organizations we regulate.” In effect, it is intended to promote organizational safety beyond compliance with regulations.

Source: ORR (March 2011). Railway Management Maturity Model (RM3) (Version 1.02). A new version was published in 2019.

Summary

- The regulator in the U.K. has developed more detailed guidelines for auditing safety management systems, in part based on the concept of a process maturity model. This approach is intended to facilitate a dialog with regulated entities to encourage them to go beyond minimum requirements for these types of organizational safety plans.

6.2.3 Practices for enhancing safety at grade crossings and reducing trespassing occurrences

Railway-Highway Crossings (Section 130) Program – The U.S.

The Railway-Highway Crossings (Section 130) program, administered by the Federal Highway Administration (FHWA), focuses on the hazards at grade crossings and provides states with funds to decrease accidents and eliminate fatalities and injuries at grade crossings. Section 130 program funds are provided through the Highway Safety Improvement Program (HSIP) and apportioned to all U.S. states by formula.¹²⁶ The states are required to spend at least half of their Section 130 funds on the installation of protective devices at crossings with a high risk of safety incidents. The remaining funds can be spent on any hazard elimination project, including protective devices and hazards posed by blocked crossings.¹²⁷

States have flexibility in their approach to identify and prioritize crossing safety improvement projects. In Washington State, WSDOT's Local Program (LP) staff identify and prioritize the Section 130 crossing projects. At the state level, WSDOT monitors and administers Section 130 funding allocation, while WUTC Rail Safety staff inspect crossings on project completion. More details on the Section 130 program, common elements are included in a State Action Plan, and Washington State's approach to utilizing the Section 130 program funds are presented in Appendix E.

In addition, recommendations to the Joint Transportation Committee (JTC) of the Washington State Legislature regarding rail crossing project prioritization are presented below. While this study mostly considers conflicts at grade crossings from a holistic standpoint, including mobility impacts, it additionally discusses safety and community impacts with the ranking criteria.

A data-driven approach to evaluate and prioritize crossings in Washington State

Directed by the Second Engrossed Substitute House Bill 1299 – Section 204, the Joint Transportation Committee (JTC) of the Washington State Legislature conducted a study in 2017 to “identify prominent road-rail conflicts, recommend a corridor-based prioritization process for addressing the impacts of projected increases in rail traffic, and identify areas of state public policy interest...” The prioritization framework presented in this study included the following steps:

- A preliminary screening process of the 4,171 total crossings statewide
- Filtering out inactive, grade-separated, and private crossings
- Filtering the remaining crossings based on a scoring system that used railroad classification, current and future train and vehicle volumes, and existing safety features
- Ranking the resulting crossing locations based on a weighted scoring system that focused on improved mobility, while reflecting on the safety and community impacts

This prioritization framework can assist the state and local authorities in better understanding the crossing safety investment impacts.

Source: JTC, Prioritization of Prominent Road-Rail Conflicts in Washington State, 2017.

¹²⁶ Mandated by 23 CFR § 130 - Railway-highway crossings.

¹²⁷ 23 CFR § 130(h)

Other states and local agencies are also implementing data-driven approaches to improve the efficiency of project prioritization processes and ensure the effectiveness of their implemented crossing safety projects. Noteworthy practices from other states are summarized below:

Field Inspection of Section 130 Prioritized Crossings – California

In California, Section 130 funding is provided to the state's Department of Transportation (Caltrans), but the California Public Utilities Commission (CPUC) is responsible for selecting the roadway-railroad crossing improvement projects that will receive the funds. CPUC uses a two-phase methodology selecting the projects:

- **Phase 1:** crossing data analysis to identify and prioritize the projects
- **Phase 2:** conducting a visual audit of the priority crossing locations

The diagnostic review process starts with a preparation meeting to review any relevant locational information. Next, a Field Diagnostic Team consisting of representatives from the CPUC staff, Local Program (LP) staff, railroads, and Caltrans travels to specific crossing locations and conducts a vehicle and pedestrian safety field review. When all the crossing diagnostic reviews are completed and reports are submitted to CPUC, the Commission selects the priority crossing projects and submits the project specifications and a final priority list to Caltrans for funding approval.

Empowering and Educating the Communities Regarding Crossings Safety Issues – North Carolina

Operation Lifesaver (OLI) is a non-profit public education organization focusing on rail safety awareness and eliminating fatalities and injuries associated with rail operations. In North Carolina, the OLI program and the state DOT work together to perform and demonstrate a mock train/personal vehicle crash at a grade crossing. Following the demonstration of the dangers at railroad crossings, NCDOT started a campaign called BeRailSafe aimed at educating various age groups about the risks of being on and around railroad tracks.¹²⁸

Further, through consultations, we understand that the NCDOT makes efforts to incorporate material from the BeRailSafe program into training for emergency responders and driver training, as well as to promote this material to municipalities as well.

The NCDOT's BeRailSafe campaign is an example of an OLI educational program targeted at various community groups. Rail safety tips, outreach campaign information, and first responder training programs are offered on the BeRailSafe website – making it easy to find the right material for each group. Many other states have created OLI campaigns tailored to their specific community needs; generally, educating the public (including the drivers, pedestrians, and emergency responders) about behaviors that may lead to rail safety accidents is an effective way to help reduce such incidents.

¹²⁸ NCDOT, BeRailSafe Web Page, accessed September 2020: <https://www.ncbytrain.org/berailsafe/default.aspx>

Increased Protection at Pedestrian/Cyclist Trail-Railroad Crossings – Connecticut & New Jersey

Automatic gates are active protection devices installed at roadway-railroad crossings to close the road when a train approaches.¹²⁹ In 2013, Connecticut DOT added a hinge gate skirt to an existing pedestrian gate to safely accommodate pedestrians and bicyclists using an urban trail crossing a railroad. This decision was made due to a change in the land use ordinance next to the crossing that led to attracting more pedestrian and bicyclist activity. The lower position of the gate skirt was intended to deter the pedestrians from going under a gate. It also benefits the visually impaired people to detect the closed gate. Later in 2017, three pedestrians were hit by trains at a crossing in New Jersey when crossing the rail tracks while the gates were down. To address this issue, New Jersey DOT decided to implement the lessons learned in Connecticut and install a hinge pedestrian gate skirt at that crossing.



Source: New Jersey Department of Transportation, 2017.

According to a 2013 study by the FRA, the gate skirts can decrease descending gate and horizontal gate violations by 78% and 54%, respectively.¹³⁰ Installation of the gate skirt at the New Jersey crossing has resulted in a decline in the number of violations at the crossing and brought the pedestrian fatalities down to zero.¹³¹

Grade crossing project prioritization – Ohio

Ohio is fourth in the country in terms of total number of public roadway-railroad crossings. Of the 5,737 at-grade public roadway-railroad crossings in Ohio, about 60% are equipped with lights and gates, 32% have passive systems such as crossbucks, and 10% have flashing lights. Over the past five years, the state has experienced fluctuations in the number of crossing safety incidents. The crossing accident trends showed that the majority of fatal incidents occurred at crossings with active warning devices (82% in 2017). In particular, the relatively high frequency of accidents at gated crossings created frustration among transportation authorities across states. Moreover, the share of gated grade crossings from the total crossing accidents increased by about five percent between 2016 and 2017.¹³²

To address this issue, the Ohio Rail Development Commission (ORDC) expanded its formula-based crossing improvement program (under Section 130) to include projects at crossings that already have some type of safety equipment. In Ohio, ORDC and the Public Utilities Commission of Ohio (PUCO) are responsible for highway-railroad grade crossing safety programs. ORDC administers federal and state funds for roadway-railroad grade crossing improvements on behalf of ODOT, while PUCO is in charge

¹²⁹ Operation Lifesaver, Devices at Crossings, accessed September 2020. <https://oli.org/safety-near-trains/track-safety-basics/rail-signs-and-signals/devices-crossing>

¹³⁰ FRA, Effect of Gate Skirts on Pedestrian Behavior at a Highway-Rail Grade Crossing Final Report, 2013.

¹³¹ FHWA, Interview with Steve Schapiro and Todd Hirt from NJDOT, 2019.

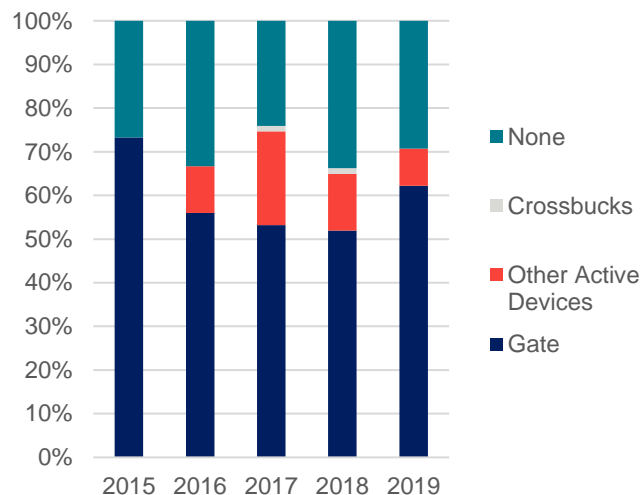
¹³² ODOT, Ohio State Rail Plan 2019.

of rail regulatory oversight and safety inspection of crossings. The crossing improvement program is based on periodic identification of the most hazardous crossings by PUCO.¹³³

Of the 24 grade crossing safety projects funded by ORDC’s formula-based crossing improvement program in the fiscal year 2018, nine crossings already had safety equipment. However, they were ranked high in terms of safety hazards and therefore qualified for funding under the new initiative.¹³⁴

As Figure 6-3 shows, the percentage of roadway-rail grade crossing accidents at gated locations decreased slightly by the end of 2018. However, the number of accidents went back up for gated crossings in 2019. As a result of this continuing trend and other safety-related issues identified by the rail stakeholders across Ohio, ORDC completed 51 crossing safety projects in 2019.¹³⁵

Figure 6-3: Percentage of accidents at roadway-rail grade crossings by warning device type, Ohio



Source: Federal Railroad Administration Safety Database.

Processes to increase emergency response coordination and local municipality participation and engagement – Oregon

To ensure that all areas of Oregon are represented and local municipalities engaged, Oregon administers the Oregon Transportation Commission (OTC).¹³⁶ The OTC is a five-member board appointed by the Governor, where each member represents a certain region of the state and is ultimately responsible for:

- Establishing transportation policy and overseeing federal and state transportation funds distribution
- *Playing a significant role in providing education to the public and its local municipalities regarding transportation safety, including rail grade crossings and other rail-related safety matters [emphasis added by CPCS]*
- Ensuring coordination between state and local municipalities regarding emergency response planning and communication
- Acting as the adopting state body for all elements of the state’s long-range transportation plan, including the Oregon Transportation Plan, modal and topic plans, and state facility plans
- Overseeing the implementation of the Oregon Transportation Plan

As subsets of the OTC, Oregon has 12 Area Commissions on Transportation (ACT), which are local advisory bodies chartered by the OTC and represent certain areas of the state.¹³⁷ ACTs further

¹³³ <https://rail.transportation.org/wp-content/uploads/sites/30/2019/09/Formula-Research-Final-Report.pdf>

¹³⁴ ODOT, Ohio State Rail Plan 2019.

¹³⁵ ORDC, Grade Crossing Safety Project Map: <https://rail.ohio.gov/wps/portal/gov/ordc/railroad-crossings/resources/safety-project-map>

¹³⁶ <https://www.oregon.gov/odot/Planning/Documents/Oregon%20State%20Rail%20Plan%202020.pdf>

¹³⁷ https://www.oregon.gov/odot/Get-Involved/Pages/Area_Commissions.aspx

ensure that all local municipalities are represented in Oregon. Each ACT works directly with local municipalities, the Oregon League of Cities, and the Association of Oregon Counties to address broad rail safety issues and prioritize State Transportation Improvement Program¹³⁸ (STIP) funding for their represented areas. Additionally, they ensure that state emergency response and rail safety tools are communicated to their municipalities.

Collaborative industry-municipality-led effort to develop land-use planning guidelines near railways – Canada

In Canada, federal associations for municipalities and railways (the Federation of Canadian Municipalities [FCM] and Railway Association of Canada [RAC],¹³⁹ respectively) have been undertaking a collaborative effort to develop guidelines for planning for residential development and other sensitive land uses around railways over the past approximately 20 years.

The FCM-RAC Proximity Initiative was created with the signing of the first Memorandum of Understanding (MOU) between the FCM and the RAC in May 2002. The MOU listed the following objectives:

- Clarify the roles of the parties and develop a broad framework to guide the industry and municipal governments in the management of proximity issues and dispute resolution
- Improve communications between railways and communities supported by consistent guidelines for land use and proximity issues
- Develop communication tools aimed at increasing awareness and building a better understanding of proximity issues as well as complaint and dispute resolution processes. This has culminated in a document known as [Guidelines for New Development in Proximity to Railway Operations \(Proximity Guidelines\)](#) published in 2013, which built upon an earlier 2003 version.

The MOU was renewed in 2007, and an open-ended MOU was signed in 2009. In 2016, the MOU was updated to include specifications for engaging with provincial governments. The Proximity Initiative Steering Committee and three working groups have a membership with equal representation from railways and municipalities that includes senior railway representatives, councilors, and mayors representing communities from across Canada, as well as members from Transport Canada and the Canadian Transportation Agency who participate as observers.

The Proximity Initiative has an annual outreach program to promote the program and the guidelines through presentations and participation at conferences across Canada, including municipal associations, urban planning associations, urban planning schools, industry associations, municipal councils, local government associations, transportation associations, development and real estate groups, and provincial land use ministries.

¹³⁸ <https://www.oregon.gov/odot/STIP/Pages/index.aspx>

¹³⁹ The equivalent to the RAC in the U.S. is the Association of American Railways.

In Canada, federal associations for municipalities and railways (the Federation of Canadian Municipalities [FCM] and Railway Association of Canada [RAC], respectively) have been undertaking a collaborative effort to develop guidelines for planning for residential development and other sensitive land uses around railways over the past approximately 20 years.

Accomplishments to date include developing a dispute resolution model included in the Canadian Transportation Agency's *Guidelines for the Resolution of Complaints over Railway Noise and Vibration*¹⁴⁰ and developing and publishing the first FCM-RAC proximity guidelines in 2004. These initial guidelines were reviewed and revised to include conversion and infill projects. They were launched in 2013 as the present Guidelines.

The new MOU includes the creation of a Proximity Government Relations Committee to encourage and foster provincial legislation specifically relating to land use planning in proximity to railway operations. While there is increased interest and activity by municipalities in adopting the Guidelines, given the numerous municipalities spread across Canada, the FCM and RAC believe it would be more productive for the provinces to adopt the recommended mitigation measures into their land use acts to ensure consistency and best practices as municipal land use planning and zoning must incorporate provincial legislation.

The Proximity Guidelines are not binding on land-use planning authorities, unless they formally adopt them as part of their laws/bylaws. Thus, one measure of the effectiveness of the Proximity Initiative, at least as it relates as an initiative to promote communication land use planning best practices, could be the adoption of the Proximity Guidelines by land-use planning authorities (e.g., provincial and municipal governments).

There has been some uptake by municipal and provincial planning authorities, but adoption is far from universal across Canada. In 2017 (when CPCS last conducted a comprehensive review), 57 municipal governments in Canada had adopted all or parts of the FCM-RAC Guidelines. Another 10 municipalities were reviewing the Guidelines, and 123 others had sought railway commenting for setbacks and safety barriers as potential conditions of approval. CPCS is aware that the governments of New Brunswick, Saskatchewan, and Ontario have adopted elements of the Proximity Guidelines in their provincial planning acts.

In part as a result of the current uptake, an independent panel commissioned to review Canada's rail safety legislation (the 2017-2018 Railway Safety Act Review Panel) recommended that:

...the federal government provides leadership in addressing incompatible land use around rail operations by driving a substantive dialogue between all jurisdictions and stakeholders, with a view to developing a solution to land use near rail operations on a national scale.

¹⁴⁰ Canadian Transportation Agency. *Guidelines for the Resolution of Complaints over Railway Noise and Vibration*. <https://otc-cta.gc.ca/eng/publication/guidelines-resolution-complaints-over-railway-noise-and-vibration>.

Summary

Several practices from other jurisdictions were identified with the intent of improving awareness of rail safety issues across the jurisdiction, including coordination with municipalities:

- **California:** CPUC undertakes additional field reviews in the prioritization of crossing improvements, which has the value of helping promote a better understanding of safety hazards based on observations of actual user behavior.
- **North Carolina:** NCDOT seeks to promote safety around grade crossings to municipalities, as well as encouraging additional training material to be included in training material for drivers and other emergency responders.
- **Oregon:** The State of Oregon has created the Oregon Transportation Commission (OTC), a five-member board appointed by the Governor where each member represents a certain region of the state and is ultimately responsible for: (1) Establishing transportation policy and overseeing federal and state transportation funds distribution; (2) Playing a significant role in providing education to the public and its local municipalities regarding transportation safety, including rail grade crossings and other rail-related safety matters.
- **Canada:** Associations representing municipalities and railways joined together to develop guidelines for land-use planning around railways, known as proximity guidelines. Legislative review panels have recommended greater leadership by Canada's safety regulator in this initiative.

6.2.4 Practices related to the safety of hazardous material transport

Hazardous material transportation data gathering, visualization, dissemination, and planning input – North Dakota

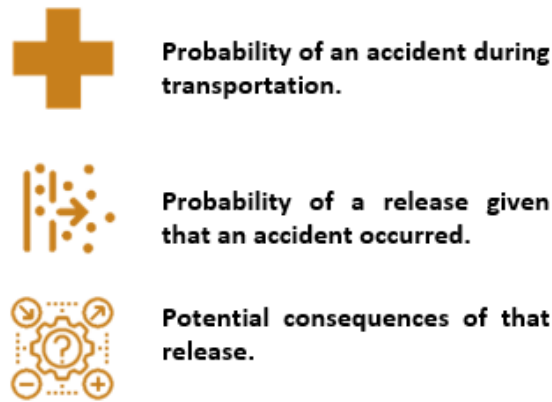
Hazardous materials (hazmat) commodities are key inputs and outputs of some of the biggest U.S. industries, including oil and gas, agriculture, and biofuel production. The widespread nature of these industries means that hazmat shipping activity touches every part of the country, but the hazmat flows relevant to each state or local community vary based on their location and access to various transportation options.

In 2019, the North Dakota Department of Emergency Services (NDDDES) completed a Hazardous Materials Commodity Flow Study to better understand what is traveling in, out, and through communities across the state, and its risks – so that it and other federal, state, regional and local emergency responders have the information to prepare and assist vulnerable communities accordingly.

The transportation modes covered in this study included road, rail, and pipeline in addition to hazmat facilities, which included the origins, destinations, and transfer points along the supply chain.¹⁴¹ In addition to transportation and business establishment databases, consultations with public and private sector organizations were carried and provided additional information to supplement data, validate assumptions and analysis, and identify key issues and nuances which influence hazmat routing and risk factors (Figure 6-4). Risk measures were calculated based on the risk factors below for each mode of transportation (including rail), focusing on the impacts on three major areas: population, environmental, and critical infrastructure.

¹⁴¹ This study completed by CPCS, relied on data of location, condition, performance and points of modal connectivity of the transportation infrastructure network that move hazmat. These data was then used to assign and visualize hazmat commodity flows. Relevant data on transportation network infrastructure can be organized by mode and facilities.

Figure 6-4: Hazmat risk factors

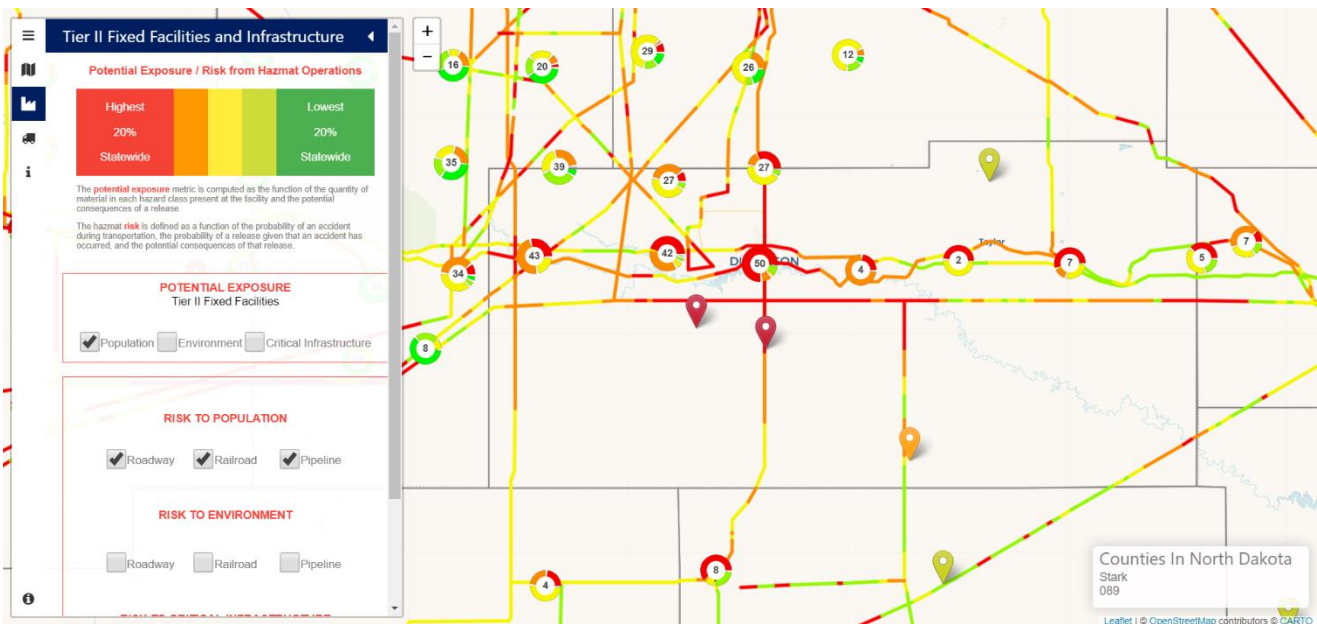


Source: CPCS, ND Hazmat Commodity Flow Study, 2019.

Based on the data collected and analyzed, the project team developed an interactive web mapping application. This tool provided a user-friendly way for NDDDES and all key stakeholders in North Dakota, including the NDDOT, the North Dakota State Emergency Response Commission (SERC), the Local Emergency Planning Committee (LEPC), and communities in the state to reach a common understanding of the hazmat traveling on the transportation system (Figure 6-5).

Case studies were developed to walk the interactive web mapping tool users through how to find information on the interactive mapping tool. Examples of questions that users might have about hazmat storage and movement in North Dakota were discussed and answered. Additionally, the state’s LEPCs were provided with training sessions in which the project team presented the study approach and results, county-specific hazmat risk snapshots, and the recommended next steps to identify vulnerabilities and advance information sharing and emergency response.

Figure 6-5: All Modal Population Hazmat Risk



Source: CPCS, ND Hazmat Commodity Flow Study, 2019.

Canada's data collection regarding dangerous goods (hazardous materials transport)

Canada's federal Transportation Information Regulations require Class I railway carriers to submit to the Minister of Transport waybill information, including "in the case of the transportation of dangerous goods, the UN number assigned to the goods by the United Nations Committee of Experts on the Transport of Dangerous Goods or the hazardous materials commodity code assigned to the goods by the United States Bureau of Explosives."

In turn, a directorate within Transport Canada uses this information to carry out supply chain studies of classes of hazardous material transport, as well as geographic-based studies, to inform its risk-based planning of hazmat transport oversight.

Summary

- The issue of hazardous material risk assessment and planning goes beyond rail safety. In Washington State, for example, the State Emergency Response Commission (SERC), in collaboration with the Washington Military Department Emergency Management Division, Department of Ecology, Washington State Patrol, and 43 Local Emergency Planning Committees (LEPCs), conducts hazard identification and risk assessment activities for local jurisdictions. Backed by comprehensive, relevant laws, the SERC provides training and supporting material to the LEPCs. Meanwhile, the LEPCs are responsible for developing and maintaining emergency management plans.* With respect to rail safety, we understand that the WUTC does receive information related to crude oil movements from the Department of Ecology (DOE), to inform geographic areas to focus on during inspections. Sometimes this is called a "risk-based" planning approach.
- Some states have gathered comprehensive data regarding hazardous material movements and created visualizations for stakeholders (e.g., North Dakota). In Canada, railways are required to submit information on *all* classes of hazardous material movements to regulators, which in turn use that to inform safety oversight planning.

*Source: Washington Military Department, Emergency Management Division, accessed September 2020.

6.2.5 Other findings related to the oversight program approach

Combining railroad and transit regulatory oversight organizations

In Washington State, at the state level, railroads are regulated by the WUTC and transit agencies by WSDOT. However, in some of the jurisdictions consulted, the same organization regulates both (e.g., the New York Passenger Transportation Board, California Public Utilities Commission, North Carolina Department of Transportation, and Technical Safety BC).¹⁴² In consultations with regulatory experts, it was noted that in part due to the relatively small size of state-level transit and railroad safety regulators, there are potential synergies with knowledge sharing by having these entities within one organization.

¹⁴² Provincially regulated railways only.

Summary

- Multiple regulators (e.g., NCDOT, California Public Utilities Commission, Technical Safety BC) combine regulatory oversight of railroads and transit, in part to best leverage the collective expertise from both transit and railroad regulatory programs.

Ensuring sufficient regulatory resources during safety management system implementation – Canada

Introduction to the Canadian rail safety oversight regime: In Canada, sections of the Canadian constitution have the effect of dividing railroads into those under federal jurisdiction (including railways that cross provincial or international boundaries, namely Class 1 railroads) and provincial jurisdiction (including intra-provincial railroads and most transit systems). Oversight of federally regulated railroads is the responsibility of Transport Canada, which administers the *Railways Safety Act* (RSA). Oversight of provincially regulated railroads is the responsibility of provinces.

To promote uniform standards across Canada, provinces incorporate by reference federal law/regulations/standards within their railroad safety laws. Also, most provinces have entered into agreements with Transport Canada to carry out inspections on the behalf of the provinces. A notable exception to this practice is in the province of British Columbia, as it has set up a delegated-administrative authority (Technical Safety BC: “Technical Safety BC is an independent, self-funded organization that oversees the safe installation and operation of technical systems and equipment across the province...¹⁴³”)

This approach differs from the U.S./Washington State context, where the state can supplement federal rules and inspections (via 49 CFR Part 212). Nonetheless, there is the possibility of learning from certain elements of the Canadian rail safety oversight structure.

Introduction to elements of Transport Canada’s (TC) oversight responsibility: On the infrastructure side, TC’s regime is generally rooted in the FRA’s with multiple local differences in terms of organizational structure, oversight budget, and strategic direction. TC is, for example, a smaller entity than the FRA, yet tasked with overseeing Class 1 and shortline railroads. This has arguably encouraged additional innovation in terms of how it approaches rail safety oversight.

Safety management systems: Transport Canada was an early adopter of the Safety Management System philosophy, whereby railways are required to prove that they have instilled a system of documentation and measurement of their risk mitigation measures. TC’s most recent focus in the oversight of design, construction, and commissioning focuses on:

- Training, qualification, and Quality Assurance
- Ensuring approval of the work and work methods by professional engineers
- Ensuring that railway standards are modernized to embrace current technology

While Transport Canada was an early adopter of the SMS methodology, reports have highlighted the importance of sufficiently trained auditors to promote the effectiveness of these systems by regulated entities.

¹⁴³ Technical Safety BC: Who we are and what we do. <https://www.technicalafetybc.ca/about>

➤ Risk-based inspection regimes

Despite being an early adopter of the SMS methodology, there were earlier critiques that TC did not have the necessary resources to implement the requirements. In 2013, the Auditor General of Canada found¹⁴⁴:

Although federal railways were required 12 years ago to implement safety management systems for managing their safety risks and complying with safety requirements, Transport Canada has yet to establish an audit approach that provides a minimum level of assurance that federal railways have done so. While it has done a few audits (41 in the fiscal year 2018-2019¹⁴⁵) of those systems, most of the audits it did were too narrowly focused and provided assurance on only a few aspects of SMSs....

The guidance and tools provided to inspectors for assessing federal railways' safety management systems are missing many key elements. For example, they contain few requirements to help inspectors plan, conduct and conclude on audits and inspections, and for following up on findings. This makes it difficult for Transport Canada to ensure that its inspections and audits are effective in determining whether railways are taking corrective actions where necessary. Lastly, Transport Canada does not have a quality assurance plan to continuously improve its oversight of rail safety.

Transport Canada has defined the skills its inspectors need to conduct inspections and SMS audits. However, the Department has not assessed whether its current workforce has the required skills. Furthermore, many inspectors and their managers have not received timely training on the skills needed to do audits of SMSs. This is important if the Department is to implement an effective and sustainable SMS oversight approach.

These concerns, which Transport Canada has been addressing, highlight the need for sufficiently trained resources to develop and implement audit practices.

Summary

- A lesson learned from the scan of Canada's rail safety regulatory approach is that regulators must be given sufficient resources to promote the maturity of system safety plans. While Transport Canada was an early adopter, there have been several findings indicating that it did not have sufficient resources (e.g., appropriately trained auditors) to carry out audits effectively.

Additional data submittals from railways to inform planning – Transport Canada

Our understanding is that the regulatory philosophy taken in Canada recognizes that railways have a better knowledge of how their assets should be managed to optimize operational and safety requirements. Hence, Transport Canada's approach is structured around key elements and processes that can ensure that inspection/maintenance requirements work in tandem to achieve safe rail operations and ensure that railways are responsible to design, implement, and continuously improve such processes and procedures.

In addition, rather than imposing "one size fits all" maintenance thresholds for classes of tracks, Transport Canada is currently assessing a paradigm shift in which railways will gradually have increased flexibility to design thresholds tailored to their operational requirements. They will, however, be responsible for the safety of their operations. The box below highlights this and other trends impacting rail safety in Washington State in the future.

¹⁴⁴ Auditor General of Canada. 2013 Fall Report of the Auditor General of Canada.

¹⁴⁵ Transport Canada website: <https://tc.canada.ca/en/rail-transportation/rail-safety-canada/compliance-enforcement>

Trends that could impact rail safety in the future

There are a number of trends that have implications for the rail safety governance model in Washington State going forward:

- There is expected growth in rail systems, including potentially new system types and freight rail traffic.
Implications:
 1. *Funding models for regulators need to appropriately scale with the magnitude of operations, including systems in development.*
 2. *There are gaps in standards in the U.S. for higher-speed/high-speed rail, which would need to be addressed when appropriate.*
 3. *There are often opportunities for risks posed by hazards to be mitigated during design and implementation, a further argument for regulators to have a role in oversight at the implementation stage.*
- There is likely to be a continued increase in automation in the rail industry. The most commonly known form is automated train operations, but there are also other forms of automation, such as track inspection.
Implications:
 4. *Human involvement will not be completely replaced by automated systems, as it may be needed to resolve more complex problems.¹ Regulators will require increased knowledge in the field of human factors – the study of how humans interact with systems/environments in performing processes and tasks.*
 5. *The data generated by automated inspection systems potentially presents new opportunities for regulators to support risk-based planning of oversight. This will require consistent data collection from rail systems and the ability to conduct independent data analysis.*
 6. *There may be paradigm shifts in federal standards in the future, such as changes to standards applicable to track inspection, as these systems evolve.*

We have considered some of these implications, notably item 1 (Recommendations 13/14) and 3 (Recommendation 3) directly in the recommendations. Other implications will need to be considered during the implementation of recommendations or in the future, such as if a HSGT system were implemented.

Source: ¹ Tretten and Karim. 2019. Human capital: the human factor in heavy haul railway. Presentation to the International Heavy Haul Association Annual Conference, 2019.

Given the FRA has authority for track safety under 49 CFR Part 213, the ability of Washington State to directly impact track and other standards in this regard is small. WUTC inspectors are aware that changes are occurring in how track inspection and maintenance may be performed in the future, which in turn could impact the standards by which inspections are carried out.

However, the additional data collected by digital track (and other components) inspection system also creates opportunities for regulators to assist in their planning and oversight activities. These inspection activities include track geometry vehicles (to measure the compliance of track with standards), rail flaw detection, etc. In Canada, Class I and II railways are required to submit the following information on an annual basis:

- (a) a summary of proficiency tests, including
 - (i) the rules set out in operating rules that were covered by the proficiency tests,
 - (ii) the number of passes for each rule, and
 - (iii) the number of fails for each rule;

- (b) the number of locomotives set off en route for mechanical reasons and, for each set-off, the month in which the set-off occurred and the mechanical reason for the set-off;
- (c) the number of cars set off en route for mechanical reasons and, for each set-off, the month in which the set-off occurred and the mechanical reason for the set-off;
- (d) the number of train pull-aparts caused by a broken knuckle or a broken drawbar, and, for each pull-apart, the month in which the pull-apart occurred and the name of the subdivision where the pull-apart occurred;
- (e) the number of broken or cracked wheels found on a train in a yard or a repair facility, and, for each broken or cracked wheel, the month in which the wheel was found and the cause of the break or crack;
- (f) the number of deviations from the track geometry standards set out in the *Rules Respecting Track Safety*,¹⁴⁶ and, for each deviation, the name of the subdivision where the deviation was detected;
- (g) the number of deviations from the defective rail standards set out in the *Rules Respecting Track Safety* that were detected using rail flaw testing activities, and, for each deviation, the name of the subdivision where the deviation was detected;
- (h) the number of in-service rail failures and in-service joint pull-apart for each subdivision;
- (i) the total tonnage, in million gross tons, transported on each segment of track, and the name of the subdivision where the segment is located;
- (j) information related to every malfunction of an automated warning system, wayside inspection system, or wayside signal system for which a trouble ticket was issued
- (k) for each subdivision, the number of culverts that required continued monitoring at the end of the reporting period;
- (l) for each subdivision, the number of bridges with temporary slow orders at the end of the reporting period;
- (m) the results of all electronic geometry inspections...
- (n) the results of all rail flaw inspections...¹⁴⁷

Information of this nature could help the regulators plan their inspections, including assessing geographically where they should plan their resources or observing if there are any trends concerning the areas mentioned. Railroad stakeholders noted that such data would need to be protected from disclosure for security concerns.

Both the WUTC (railroad) and WSDOT SSOA (transit) require the submission of accident reports by rail systems under their jurisdiction, based on the minimum criteria set out in Figure 6-6.

Figure 6-6: Accident notification criteria for railroads and transit systems to state safety regulators

Railroads (WUTC)	Transit (WSDOT SSOA)
<ul style="list-style-type: none"> Release of hazardous material (i.e., materials that are corrosive, flammable, explosive, reactive with other materials, or toxic) Death of any person 	<ul style="list-style-type: none"> A fatality at the scene; or where an individual is confirmed dead within 30 calendar days of a transit-related incident One or more persons suffering serious injuries. Substantial property damage resulting from a collision involving a rail transit vehicle

¹⁴⁶ This rule is similar to 49 CFR Part 213.

¹⁴⁷ Canada's Transportation Information Regulations, Section 12.6.

Railroads (WUTC)	Transit (WSDOT SSOA)
<ul style="list-style-type: none"> • Injury to any person involved in a railroad-highway crossing accident that requires medical treatment in addition to first aid • Property damage, amounting to \$50,000 or more to property • Railroads must also copy the WUTC on any incident reports submitted to the FRA or USDOT (related to hazmat releases). The criteria for submittal to these organizations are more exhaustive. • Note: Under WAC 480-62-310, the “[a]ccidents involving joint railroad company operations must be reported by the railroad company that controls the track and directs the movement of trains where the accident has occurred.” 	<ul style="list-style-type: none"> • Any derailment of a rail transit vehicle • A collision with a person or object resulting in serious injury or fatality • Evacuation due to life safety reasons • A runaway train • Fires resulting in a serious injury or fatality • Any collision in a grade crossing or intersection involving a revenue or non-revenue Regional Transit Authority (RTA) vehicle • Controlled vehicle • A derailment (mainline or yard) • Any collision on an RTA exclusive right of way • Any collision between an RTA revenue vehicle and an RTA revenue or non-revenue vehicle • Any incident for which NTSB or FTA must be notified
<p>Source: WUTC. Railroad Company Accident reporting and review of WAC 480-62-310.</p>	<p>Source: WSDOT SSOA. Washington State Rail Safety Oversight Program Standard: 2018</p>

Source: CPCS based on the sources noted above.

Summary

- The additional data collected by digital track (and other components) inspection system also creates opportunities for regulators to assist in their planning and oversight activities. These inspection activities include track geometry vehicles (to measure the compliance of track with standards), rail flaw detection, etc. In Canada, Class I and II railways are required to submit data from their certification and inspection programs (e.g., track inspection results), in addition to accident reports.

Specifying coordination requirements within emergency response plans – Australia

The NTSB report related to the DuPont derailment notes challenges with the emergency response following the derailment, including coordination of an adjacent defense facility. 49 CFR Part 270 does require that operators develop a System Safety Program (SSP) plan inclusive of an emergency management component:

Emergency management. Each SSP plan shall contain a statement that describes the processes used to manage emergencies that may arise within the passenger rail operation's system including, but not limited to, the processes to comply with applicable emergency equipment standards in part 238 of this chapter and the passenger train emergency preparedness requirements in part 239 of this chapter.

We have observed that the requirements under the RSNL National Regulations 2012 in Australia include additional prescriptivity that could potentially address this issue in the future. There are specific requirements that the Rail Transit Operator must address, including “any government agency with emergency management functions concerning the area to which the plan relates.”

Summary

- Australian rail safety regulations require rail operators to consult with “any government agency with emergency management functions with respect to the area to which the plan relates.”

Public reporting by regulator – California and British Columbia

Public reporting on the state of rail safety is an element of rail safety governance to ensure the accountability of the regulatory body to the legislature and public-at-large. While the Washington UTC has been open in answering questions and posts material to its website (e.g., safety incidents in the state), there is potentially an opportunity to strengthen the accessibility of information on the state of rail safety and regulatory activities. Some examples noted in the jurisdictional scan:

- Technical Safety BC puts out an annual “State of Rail Safety” report, which compiles statistics on rail incidents for railways under its jurisdiction, compliance initiatives, findings (e.g., pass/fail), and other initiatives for the year. It also puts out an annual report with biographies of its board members and names on its advisory panels, as well as audited financial statements.
- The California Public Utilities Commission puts out annual railroad safety reports to the legislature, which details similar information on activities.¹⁴⁸

Summary

Public reporting on the state of rail safety is an element of rail safety governance to ensure accountability of the regulatory body to the legislature and public-at-large. Some examples noted in the jurisdictional scan of more comprehensive reports on the state of rail safety include:

- Technical Safety British Columbia puts out an annual “State of Rail Safety” report, which compiles statistics on rail incidents for railways under its jurisdiction, compliance initiatives, findings (e.g., pass/fail), and other initiatives for the year. It also puts out an annual report with biographies of its board members and names on its advisory panels, as well as audited financial statements.
- The California Public Utilities Commission puts out annual railroad safety reports to the legislature, which details similar information on activities.

Size of railroad regulatory organization – the U.S.

Based on data compiled from multiple sources, Figure 6-7 shows the size of state-level railroad oversight staff relative to the size of the rail network.¹⁴⁹ We used rail miles as a factor to normalize the inspection staff across jurisdictions, as it likely is the most relevant driver for inspection areas including track, signals, and grade crossings.¹⁵⁰ Inspection staff are the staff members who observe operations and infrastructure to check compliance with regulations, such as track being constructed within a certain

¹⁴⁸See, e.g., in 2019:

[https://www.cpuc.ca.gov/uploadedFiles/CPUCWebsite/Content/News_Room/NewsUpdates/2019/ARSR%20to%20the%20CSL%20\(11-30-19\).RSD-F.pdf](https://www.cpuc.ca.gov/uploadedFiles/CPUCWebsite/Content/News_Room/NewsUpdates/2019/ARSR%20to%20the%20CSL%20(11-30-19).RSD-F.pdf)

¹⁴⁹ This table includes only state oversight staff (i.e., does not include FRA staff). In addition, because of the multiple data collection approaches, the number of FTE may sometimes include supervisory staff, whereas other figures may not.

¹⁵⁰ To elaborate, assuming that oversight staff wish to carry out inspections on a certain proportion of the network every year, the number of resources required would be likely be somewhat proportional to the size of the network. There are other disciplines (e.g., operating practices, for example) which may be more appropriately driven by train-miles.

tolerance. Overall, Washington has larger inspection staff than other jurisdictions for which data was available, though it is smaller than California's.

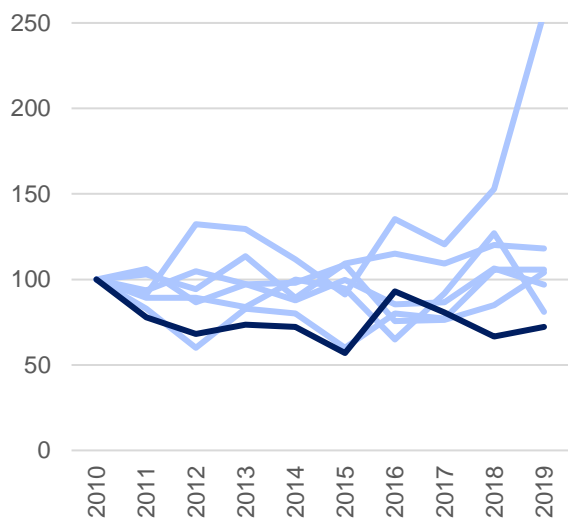
Figure 6-7: Railroad Regulator Size

State	Number of State Oversight Staff* (FTE)	Rail Miles (2017)	Inspectors per 1,000 rail miles
Washington UTC	10	3,032	3.3
California	40	4,828	8.3
Florida	8	2,851	2.8
Oregon	11	2,382	4.6
Illinois	10	7,151	1.4
North Carolina	4	3,161	1.3
Texas	15	10,506	1.4

Note: *In some cases, may or may not include supervisory staff. Source: CPCS compiled based on consultations and other sources. Rail miles from AAR, <https://www.aar.org/wp-content/uploads/2019/05/AAR-State-Rankings-2017.pdf>

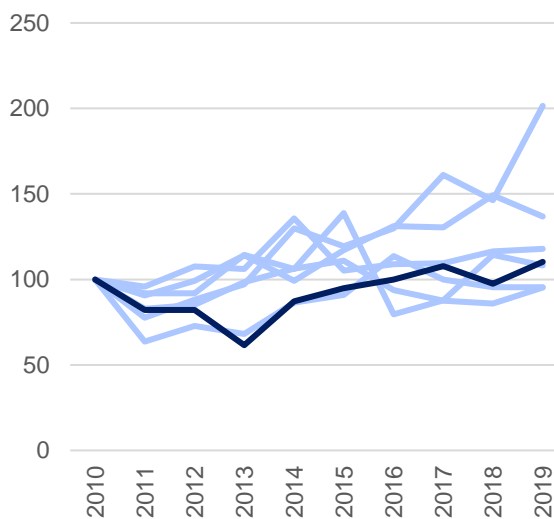
However, based on a trend analysis of two accident categories equipment (Figure 6-8) and crossings (Figure 6-9), there is no clear correlation between the number of inspectors and accident outcomes. With one exception, accident outcomes for all states are clustered, and the variation year-over-year appears larger than any difference in outcomes across states.¹⁵¹ In addition, the increase in the state with the largest upward inflection may reflect a new/increase in service, as this factor is not captured in this trend analysis. It is not possible to conclude that more inspectors leads to improved safety outcomes.

Figure 6-8: Equipment accidents across states (2010 = 100) = Washington in dark blue



Source: CPCS analysis of FRA Accident Data.

Figure 6-9: Crossing accidents across states (2010 = 100) - Washington in dark blue



Source: CPCS analysis of FRA Accident Data.

¹⁵¹ Given this result, we declined to identify any specific state (other than Washington), as there would be limited value in comparing individual correlations. The purpose of this study was not to opine on the safety performance of any other state.

This result suggests that there may be limited value to having more inspectors, given that Washington State has 10. However, to ensure at minimum at least one full-time inspector is qualified across all inspection disciplines, including track, motive power and equipment, operating practices, hazardous materials, signals and train control, and grade crossings, at least six inspectors are required. Thus, to ensure that the WUTC can address issues holistically, fewer inspectors is not desirable either.

Summary

- The Washington UTC has approximately 3.3 staff per 1,000 rail miles, as compared to a range of 1.3-8.3 for other jurisdictions for which data is available.

Other considerations in rail safety governance

Mark Winfield is a Canadian academic who has written extensively on effective practices in the governance of safety-critical industries including railways, technical systems such as elevators, and water treatment.^{152, 153} In particular, his research focuses on critical assessments of the effectiveness of alternative program delivery models for public safety oversight bodies, as contrasted against “direct delivery” (i.e., directly implemented through a government department). To complete these assessments, he has developed criteria for comparing/contrasting delivery models based on performance and governance/accountability/democratic values. While many of these criteria are values-based, they are defended through a comprehensive literature review of government and academic literature.

The two categories of criteria he has developed are:

- Performance – criteria measuring the safety performance of the systems governed, as observed through empirical data (e.g. accident data, etc.).

¹⁵² Winfield, M.S. and Benevides, H.J. 2001. Drinking Water Protection in Ontario: A Comparison of Direct and Alternative Delivery Models (Draft). Issue Paper Prepared for Part II of the Walkerton Inquiry.

¹⁵³ Winfield, M.S. 2015. Public safety in private hands revisited: The case of Ontario’s Technical Standards and Safety Authority. Canadian Public Administration, Volume 58, No. 3.

- Governance, accountability and democratic values – criteria intended to ensure that an entity is actually capable of carrying out the mandate it has been assigned, and to provide for the identification and resolution of problems, ideally before they reach the stage at which actual harm to the public interest occurs. . . “while “ensuring that the authoritative and coercive powers of the state are not abused or misused.”¹⁵⁴

Within each of these categories, Winfield et al. have established a number of specific criteria (see box). They provide a helpful framework with which to discuss the strengths and weaknesses of the existing model.

Strengths of the current railroad governance model include the ability to avoid conflicts of interest, by separating the roles of the WUTC (safety oversight) from WSDOT (funding). The current funding model (based primarily on regulatory fee), is also to some degree a strength, to the extent it is in some sense a predictable source of funding.

However, because of the jurisdictional considerations and because the WUTC is a separate operational agency from WSDOT, it increases the need for sufficient resources available for interagency and intergovernmental coordination of policies and activities. In addition, until recently, the WUTC role has been primarily to operationalize existing policies, notably to support the FRA in inspections of railroads primarily through adopted federal regulations. However, more recently it has been tasked with designing and implementing additional state-level policy (such as regulations related to crew size and transportation, etc.), which in turn requires greater policy coordination with stakeholders. While it makes active efforts to engage with stakeholders, it does not presently have the resources to convene certain features that would be present in a policy-focused organization, such as a stakeholder committee.

Governance model criteria

- The degree to which the model provides for the technical and policy capacity to carry out assigned functions
- The adequacy and security of the funding base provided by the model
- The performance of the model relative to the past performance of direct delivery...
- The ability of the model to deal with the need for . . . interagency and intergovernmental coordination of policies and activities
- The ability of the model to provide for policy learning on basis of operational experience
- Cost-effectiveness
- A clear assignment of responsibility for functions
- Potential for conflict of interest
- A clear, single point of accountability
- Responsiveness
- Control/oversight mechanisms

Source: Winfield, M.S. and Benevides, H.J. 2001. Drinking Water Protection in Ontario: A Comparison of Direct and Alternative Delivery Models (Draft). Issue Paper Prepared for Part II of the Walkerton Inquiry.

6.3 Lessons from other jurisdictions

Figure 6-10 summarizes findings from the jurisdictional scan, including potential effective practices and lessons learned. These were considered in the development of recommendations.

¹⁵⁴ Winfield, M.S. and Benevides, H.J. 2001. Drinking Water Protection in Ontario: A Comparison of Direct and Alternative Delivery Models (Draft). Issue Paper Prepared for Part II of the Walkerton Inquiry

Figure 6-10: Opportunities from the jurisdictional scan

Description	
<p>1. Developing new standards for high-speed rail and programs for related safety improvements</p>	<ul style="list-style-type: none"> Some other jurisdictions in the U.S., including California and Illinois, have developed additional regulatory standards or funding programs related to the implementation of higher-speed ground transportation systems. These programs include upgrading or closing crossings to permit higher-speed operations.
<p>2. Increasing oversight of change management processes</p>	<ul style="list-style-type: none"> For example, Australian rail safety regulation has detailed requirements for the roles and responsibilities of industry participants and stakeholders as part of its accreditation requirements. It also has more prescriptive requirements for change management, including situations in which operators must notify the regulator. It also has guidelines for practices that operators should follow when making changes, including the need to establish an independent technical authority related to major projects and consider human factors in design. Change management refers to the management systems put in place to identify changes that require attention, the roles and responsibilities for assessing the significance of those changes, and the processes (such as risk assessments) to identify and mitigate hazards created by those changes.
<p>3. Strengthening dialog with industry participants for system safety plans</p>	<ul style="list-style-type: none"> For example, the regulator in the U.K. has developed more detailed guidelines for auditing safety management systems, in part based on the concept of a process maturity model. This approach is intended to facilitate a dialog with regulated entities to encourage them to go beyond minimum requirements for these types of organizational safety plans.
<p>4. Practices to improve coordination with local municipalities concerning grade crossings and other planning issues</p>	<p>Several practices from other jurisdictions were identified with the intent of improving awareness of rail safety issues across the jurisdiction, including coordination with municipalities:</p> <ul style="list-style-type: none"> California: CPUC undertakes additional field reviews in the prioritization of crossing improvements, which can help promote a better understanding of safety hazards based on observations of actual user behavior. North Carolina: NCDOT seeks to promote safety around grade crossings to municipalities and encourages additional training material to be included in training material for drivers and other emergency responders. Oregon: The State of Oregon has created the Oregon Transportation Commission (OTC), a five-member board appointed by the Governor in which each member represents a certain region of the state. It is ultimately responsible for: (1) Establishing transportation policy and overseeing federal and state transportation funds distribution; (2) Playing a significant role in providing education to the public and its local municipalities regarding transportation safety, including rail grade crossings and other rail-related safety matters. Canada: Associations representing municipalities and railways joined together to develop guidelines for land-use planning around railways, known as proximity guidelines. Legislative review panels have recommended greater leadership by Canada’s safety regulator in this initiative.

Description	
5. Hazardous material transportation data gathering, visualization, dissemination, and planning	<ul style="list-style-type: none"> Some states have comprehensive gathered data regarding hazardous material movements, and created visualizations for stakeholders (e.g., North Dakota). In Canada, railways are required to submit information on <i>all</i> classes of hazardous material movements to regulators, which in turn use that to inform safety oversight planning.
6. Ensuring sufficient regulatory resources to oversee management system implementation at regulated entities	<ul style="list-style-type: none"> A lesson learned from the scan of Canada’s rail safety regulatory approach is that regulators must be given sufficient resources to promote the maturity of system safety plans. While Transport Canada was an early adopter, there have been several findings that it did not have sufficient resources (e.g., appropriately trained auditors) to carry out audits effectively.
7. Specifying coordination requirements within emergency response plans	<ul style="list-style-type: none"> Australian rail safety regulations require that rail operators must consult with “any government agency with emergency management functions with respect to the area to which the plan relates.”
8. Requiring additional inspection data submittals from railways to inform planning	<ul style="list-style-type: none"> The additional data collected by digital track (and other components) inspection system also create opportunities for regulators to assist in their planning and oversight activities. These inspection activities include track geometry vehicles (to measure the compliance of track with standards), rail flaw detection, etc. In Canada, Class I and II railways are required to submit data from their certification and inspection programs (e.g., track inspection results), in addition to accident reports.
9. Improving public reporting by regulator	<p>Public reporting of the state of rail safety is an element of rail safety governance used to ensure accountability of the regulatory body to the legislature and public-at-large. Some examples noted in the jurisdictional scan of more comprehensive reports on the state of rail safety include:</p> <ul style="list-style-type: none"> Technical Safety British Columbia puts out an annual “State of Rail Safety” report, which compiles statistics on rail incidents for railways under its jurisdiction, compliance initiatives, findings (e.g., pass/fail), and other initiatives for the year. It also publishes an annual report with biographies of its board members and names on its advisory panels, as well as audited financial statements. The California Public Utilities Commission puts out annual railroad safety reports to the legislature, which details similar information on activities.¹⁵⁵
10. Combining railroad and transit regulatory oversight organizations	<ul style="list-style-type: none"> Multiple regulators (e.g., NCDOT, California Public Utilities Commission, and Technical Safety BC) combine regulatory oversight of railroads and transit, in part to best leverage the collective expertise from both transit and railroad regulatory programs.

Source: CPCS based on multiple sources.

Finally, we found through the jurisdictional scan of six other states that staffing levels at the Washington UTC, normalized by track-miles in the state (3.3 FTE per rail mile), exceed the levels of four other states in the scan (one state has 2.8 FTE, two states had 1.4 FTE, and a fourth had 1.3 FTE per rail mile). They are, however, not as high as Oregon (4.6 FTE per rail mile) and California (8.3 FTE per rail mile). On average, the six other states averaged 3.3 FTE per rail mile, the same as Washington. Implementing additional initiatives in Washington will require increased staffing levels with appropriate skills.

¹⁵⁵E.g., 2019: [https://www.cpuc.ca.gov/uploadedFiles/CPUCWebsite/Content/News_Room/NewsUpdates/2019/ARSR%20to%20the%20CSL%20\(11-30-19\).RSD-F.pdf](https://www.cpuc.ca.gov/uploadedFiles/CPUCWebsite/Content/News_Room/NewsUpdates/2019/ARSR%20to%20the%20CSL%20(11-30-19).RSD-F.pdf)

7 Findings and recommendations

Key takeaways

- This chapter provides our findings with respect to gaps, inconsistencies, and other opportunities to strength rail safety governance in Washington State. We then make recommendations for the legislature’s consideration.
- The recommendations encompass strengthening the rail safety oversight model with respect to railroads, overseen primarily by the Washington Utilities & Transportation Commission (WUTC) at the state level, and transit systems, overseen primarily by the Washington State Department of Transportation State Safety Oversight Agency (WSDOT SSOA).
- Overall, the current railroad safety oversight model under which safety regulatory functions are separated from WSDOT in the WUTC is appropriate. However, it could be further strengthened by:
 - Improving awareness of the roles of stakeholders involved in rail safety, including oversight bodies, operators, and other stakeholders
 - Strengthening the role of regulators in overseeing system safety of operators across the project lifecycle
 - Improving communication of the state of rail safety in Washington State
 - Continuing to focus on addressing safety of at-grade crossings
- We make 15 recommendations to address these findings, including recommendations to ensure there are appropriate resources for implementation.
- Our recommendations focus on improving the oversight model for **railroads** and, in particular, passenger rail. However, we believe there is an opportunity to align the state’s approach to oversight across railroads and transit systems by combining these functions within the WUTC, in part to best leverage the specialized expertise needed to oversee rail systems.

7.1 The current model for rail safety oversight in Washington State is appropriate but could be further strengthened

7.1.1 The separation of railroad safety regulatory functions from funding is a net strength of the Washington Safety oversight model

In the State of Washington, WSDOT delivers rail services by sponsoring third parties to provide infrastructure (e.g., Sound Transit) and passenger train services (e.g., Amtrak), whereas the WUTC provides safety oversight to train services in cooperation with the Federal Railroad Administration.

The separation of the roles of the WUTC and WSDOT is overall a net strength of the institutional model in Washington State. This separation can help avoid conflicts of mandates, such as aiming to

complete projects quicker to enable mobility (within the mandate of a funding body) versus ensuring safety as paramount (within the mandate of a regulatory body). It can also help ensure fairness and the perception of fairness in dealing with regulated entities. Some stakeholders have also opined that the WUTC, as a smaller organization focused on safety, is better positioned to provide safety oversight.

Recommendation 1:

- 1.1 The legislature should continue WUTC as the regulator of railroad safety and strengthen its role, as appropriate, in providing railroad safety oversight.**
- 1.2 The legislature, after further consultation with the WUTC to ensure consistency across its regulatory roles, should elevate the importance of promoting safety and security of the public and employees, and protection of the environment, by explicitly noting these priorities within the WUTC’s rail safety oversight mandate.**

With regard to Recommendation 1.2, stakeholders observed that the WUTC’s mandate references “public interest” but does not explicitly reference promoting safety and security. Such a provision is a feature of other safety regulators and would reinforce the importance of promoting safety and security in the WUTC’s role. However, it is important to consider the provision carefully within the broader WUTC mandate, given the vital importance rail plays in transporting goods and passengers economically, safely, and with lower impact to the environment than other modes of transportation.¹⁵⁶

We have also identified other opportunities to strengthen the governance of rail safety in Washington State.

7.1.2 There are synergies to ensuring cooperation between state-level oversight agencies involved in railroads and transit despite system differences, and regulatory differences at the federal level

Unlike most of the other findings in this chapter which are primarily issues and gaps, the following section is intended to raise an opportunity to strengthen the oversight/regulation of rail safety in Washington State: suggesting collaboration between the State Safety Oversight Agency (SSOA) for transit (currently within WSDOT) and the WUTC.

Recommendation 2:

- 2.1 The WUTC and WSDOT SSOA, in consultation with agencies that are regulated by both the FRA and FTA (e.g., Sound Transit), should explore opportunities for collaboration and sharing of best practices.**
- 2.2 The WUTC and WSDOT SSOA should report to the legislature whether there are opportunities for joint initiatives to be funded by the legislature, such as auditor training, development of system safety guidelines, etc. through annual reporting.**

¹⁵⁶ Texas A&M Transportation Institute. 2017. A Model Comparison of Domestic Freight Transportation Effects on the General Public, 2001-2014.

Despite (1) some differences in the types of hazards posed by railroads and transit systems, (2) infrastructure tolerances and operating practices, and (3) federal regulatory structures, the principles by which railroad companies and transit agencies manage safety should be similar. Federal regulation recognizes this need to manage safety through 49 CFR Parts 270 and 271 (railroads), as well as 49 CFR Parts 673 (transit), which require most rail systems to have some form of system safety plan implementing safety management systems (SMS).¹⁵⁷ While plan requirements differ by type of rail system, they follow similar principles. For example, there are rail systems, such as Sound Transit, that are subject to both FRA and FTA regulations for SSPs and SMSs. Despite the difference in regulatory requirements for the plans, they need to manage safety using a holistic approach.

In part as both the WUTC's rail program and WSDOT SSOA's programs are relatively small, we considered the trade-offs of combining rail and transit safety oversight into a single organization (i.e. the WUTC). The potential benefits of such a combined organization could include:

- Creating a central point of contact within the state to discuss any matter related to rail safety and promoting a consistent approach to regulation to the extent possible, given the different regulatory structures that exist for railroads and transit
- Leveraging the relative expertise of the SSOA (which has traditionally been responsible for auditing safety management systems) with the expertise of the WUTC (which has inspectors who have been traditionally focused on infrastructure and operating practices) to improve oversight (see box)
- Enabling additional cross-pollination of best practices within the organization
- Separating transit safety oversight activities from WSDOT's role in providing transit funding and sitting on the board of Sound Transit

However, in part based on further discussions with stakeholders about this option, several challenges were noted:

- Because of the difference in regulatory approach taken between railroads and transit, there is a different regulatory culture that exists with respect to oversight activities. These approaches are not mutually exclusive but there would need to be efforts to bridge the cultural differences that exist.
- Other FTA funding to WSDOT and transit systems is dependent on the continued certification of the SSOA. There would need to be a high degree of mutual trust and confidence that oversight authority could be transferred to the WUTC to ensure the continued sustainability of FTA funding.
- Staff members at both organizations would need to work on the shift in responsibilities, including ensuring continued FTA certification of the SSOA program, detracting from both organizations core responsibilities. There may also be other unexpected administrative hurdles to

How hazards differ and cross-industry expertise

For example, the risk of a derailment of a train carrying hazardous material is only applicable to freight railroads, whereas the risk of a transit vehicle door opening between stations is only applicable to transit. Yet, both types of systems need process to identify hazards and manage their risks. Regulations concerning system safety plans are about how companies manage safety in their organization.

To that end, we have noted in our consultations that, because of the relative novelty of SMS in the U.S. rail industry, experts are being drawn from the aviation industry. These experts can in turn provide insights in how these systems can be structured and implemented, though they cannot provide necessarily all of the domain expertise. This highlights how cross-modal expertise can be leveraged and applied.

¹⁵⁷ The term SMS is only used in the regulation of transit systems, but there are similarities across railroads and transit system regulations.

combining railroad and transit regulatory functions

In our view, these challenges could likely be overcome and may likely be resolved in the future. For example, with respect to the first bullet, 49 CFR Part 270 starts the process of adopting system safety principles for railroads, which would start to bridge some of the culture difference.

However, moving the oversight of transit from the SSOA to the WUTC has clear immediate costs but uncertain benefits. In terms of costs, staff time and effort at both organizations will be required to implement the change, including ensuring continued certification by the FTA, which would draw from its existing oversight activities. In terms of benefits, the jurisdictional scan identified some opinions suggesting a combined organization would have value, but this organization had been structured in this fashion from the inception of the SSOA and has a smaller transit footprint. In addition, there are ongoing incentives for WSDOT ensure the continued functioning of the SSOA, as the program requirements are FTA-regulated. Thus, we do not believe there is sufficient evidence of clear benefits on which to base a recommendation to move the transit functions from WSDOT to the WUTC.

Ultimately, the value from a combined organization could instead be partially realized if there was cross-pollination of the approaches taken between railroads and transit. Thus, our view is that the first step would be for the WUTC and WSDOT to explore collaboration opportunities. We acknowledge that encouraging collaboration is not as actionable for the legislature as a recommendation regarding the authority of an organization. The legislature could revisit the possibility of moving transit safety oversight (currently the WSDOT SSOA) authority to the WUTC in the medium-term (two to five years), however.

7.2 Despite the strength of the regulatory model, there isn't universal understanding of the role of organizations involved in railroad safety in Washington State

While the separation of **railroad** oversight functions with the WUTC is a net strength, the institutional arrangement with respect to rail safety oversight was not universally understood by all stakeholders.¹⁵⁸ We understood this as manifesting in two ways:

- **We understand that there is the perception that WSDOT is an oversight entity for railroads** (or even that it operates trains), even though its primary role is to sponsor railroad services.
- **There is not a universal and clear understanding of the role of the WUTC:** We have noted during our engagement that some industry stakeholders had a limited understanding of the role of the WUTC.¹⁵⁹ Another stakeholder noted that there isn't a consistent understanding of the role of the WUTC in approving grade crossing changes by certain stakeholders, including some municipalities in Washington.

While we did not speak with as many stakeholders involved in transit safety, the roles and responsibilities concerning the oversight of transit systems appeared to be clearer to stakeholders (see box).

¹⁵⁸ We noted that there appears to be good information flows between the WUTC and WSDOT of inspection findings on WSDOT owned-/sponsored services, based on stakeholder feedback.

¹⁵⁹ One stakeholder noted that they were not aware of the specific roles of the State of Washington in overseeing railroads. Another stakeholder consulted indicated a general awareness of the role of the WUTC but did not indicate specific roles.

One reason why there is less awareness of the role of state agencies in providing oversight is that the primary oversight responsibility of regulating railroads in the U.S. rests with the FRA – with states regulating specific areas¹⁶⁰ and supporting the FRA in carrying out inspections (through 49 CFR Part 212). Nonetheless, there are potential opportunities to strengthen the awareness of the role of the State of Washington in providing oversight of rail safety, specifically the role of the WUTC.

Roles with respect to transit safety oversight

Concerning transit, a stakeholder has opined that the overall delineation of responsibilities between the federal government (FTA) and Washington State is clearer than with respect to FRA-regulated railroads: there are some reporting requirements for transit agencies to the FTA, but the WSDOT SSOA is understood as the primary agency providing oversight on a day-to-day basis.

One solution put forward by stakeholders is a rail safety committee, possibly chaired by the WUTC. We believe that such a committee, which we term a forum, could help supplement existing engagement and coordination activities undertaken by the WUTC, and help promote a clearer understanding of the roles of stakeholders involved in rail safety.

Initially, this committee would be an information-sharing forum between the WUTC and stakeholders, as well as amongst stakeholders. It would also serve as a transparent engagement platform for stakeholders to raise new or ongoing concerns. Reflecting this primary mandate as an information sharing platform, our recommendation would be to title the committee as a rail safety forum. Potential membership would include regulators, operators, labor, and municipal representatives.

As relationships further develop and specific issues emerge, specific focus groups could be convened to discuss specific issues, such as:

- The interface between railroads and communities, which could include discussing best practices related to improving at-grade crossings, land-use planning, etc.
- Roles and responsibilities and practices associated with existing and proposed passenger rail initiatives
- Occupational health and safety issues

Actions taken in response to these discussions could be flagged in annual reporting, which could also include any further resources required by the WUTC.

¹⁶⁰ In the case of Washington, these areas include (1) crew transport; (2) at-grade crossings; (3) minimum crew size requirements; and (4) walkways for operating.

Recommendation 3: The legislature should provide the WUTC direction and resources to convene an ongoing forum with stakeholders involved in rail safety.

Beyond ensuring that the WUTC has the necessary resources to convene such a forum (see Recommendations 13 and 14), there is a need to ensure that other state agencies that collaborate on rail safety, including the Department of Ecology, and Labor and Industries, have the necessary resources to dedicate to rail safety oversight and participate in this forum. While the environmental and occupational health and safety issues related to railroads are not necessarily unique to the industry, it is an extremely complex regulatory environment that requires focused attention.

In addition, in order to supplement the WUTC’s engagement with municipalities as part of its regular duties, we see merit to the WUTC exploring relationships with the Association of Washington Cities (AWC) and the Washington State Association of Counties (WSAC) as a way to better communicate the WUTC’s role in approving grade crossings and other rail safety issues. Though a small subset of municipalities may be part of the forum recommended above, it is neither possible to include all on the committee nor engage with over 280 municipalities in Washington State. Similar to Canada, where the Railway Association of Canada and Federation of Canadian Municipalities have a “Proximity Initiative,” we see an opportunity for the WUTC to explore developing a relationship with the AWC and WSAC.

The possibility of protection from public disclosure for complainants

As an initial agenda item, the WUTC should consider exploring with stakeholders opportunities to strengthen protections from disclosure for persons who report rail safety and security concerns. In principle, minimizing potential disincentives for persons who report safety concerns has merit in encouraging reporting, thus providing regulators with a better understanding of potential issues. However, beyond the complexities associated with laws around public disclosure, there are a number of considerations that would need to be explored, including:

- What information/issues do stakeholders wish to have protected?
- How to ensure the information actionable to the WUTC?
- How to ensure fairness for the regulated entity in responding to the allegations?

Recommendation 4: The legislature should direct the WUTC to make reasonable efforts to engage with municipalities in Washington State on a collective basis through relevant associations.

However, the AWC does not currently have any policy positions on rail safety. Thus, the first step for implementation would be to explore with the AWC and WSAC whether there is an opportunity to connect with municipalities on a collective basis. For example, the AWC holds an annual conference, which could be a forum for the WUTC to introduce its role, present updates on rail safety issues (e.g., Recommendation 10), and solicit feedback on its program. While there is potential merit to a more formal joint program, we see the first step is starting to build direct relationships with municipalities.

Importance of engagement with rail workers

Workers in the rail industry are important stakeholders with respect to rail safety. In addition to the specific hazards presented by rail operations (e.g., collisions, derailments, etc.) the rail industry works in demanding physical conditions, including outdoors, on uneven terrain and in remote areas, which present occupational health and safety issues common to many industries.

In addition, continued advances in automation will have impacts on the work rail workers do. From the perspective of safety, specifically, greater automation *might* create opportunities for safer and more specialized work. However, it also creates requirements for new skillsets.¹ Automation will change the way workers will interact with technological systems. For example, there is the increasing risk of boredom/fatigue in highly automated workplaces, but then workers may be required to solve a physical task or complex problem when an automated system fails or provides an unexpected result.

Particularly given the expected evolution of technologies in the rail industry, rail workers are important stakeholders to be consulted, ideally through a potential rail safety committee. As discussed in Chapter 6, it will also be increasingly important that regulators have an awareness of human factors, including leveraging the capacity of other expertise, such as L&I.

Source: ¹ Tretten and Karim. 2019. Human capital: the human factor in heavy haul railway. Presentation to the International Heavy Haul Association Annual Conference, 2019.

7.3 There is the opportunity to strengthen regulator's role in oversight of system safety across project lifecycles

As described in Chapter 6, our benchmarking indicates that the WUTC's oversight resources, normalized to the size of the railroad system in Washington State, exceed the number employed by four of the six states surveyed, but less than two other states. In addition, in consultations the WUTC pointed to several ways its role regarding rail safety governance has been strengthened in recent years, including:

- In 2015, it expanded its inspection staff from four to 10 inspectors
- In 2016, it obtained the authority to independently inspect private shipper facilities
- Increasing the number of inspections, targeting higher-risk areas such as passenger and crude oil routes. It receives information on hazardous material movements from the Department of Ecology.
- Adding inspectors to the new FRA inspection-related sixth discipline, grade crossings
- Stronger and new partnerships with key organizations, including the Department of Labor and Industries
- Actively leading the Washington Operation Lifesaver program with assistance from WSDOT
- Additional regulatory authority with respect to crew sizes and crew transportation¹⁶¹

Despite these strengths and recent improvements, we understand that the WUTC was not actively involved in oversight of the Point Defiance Bypass project. In addition, while the WUTC has more resources than four of the six states surveyed, it is still not a significant number given the vast size of the rail network in Washington State. They have also been granted additional authorities (e.g. with respect to crew sizes), without additional implementation resources.

¹⁶¹ As discussed in Chapter 5, crew size provisions are currently being challenged in court.

Given (1) the findings by the NTSB related to the DuPont derailment that there should have been greater state-level oversight of the commissioning process,¹⁶² (2) the implementation by the FRA of system-safety program plan requirements, and (3) the likely evolution of railway technology, it should be ensured that the WUTC has sufficient authority and resources (funding to provide trained resources) to enable them to fully participate in safety oversight across the entire project lifecycle (including design and implementation). In particular, this would encompass ensuring the WUTC has authority to audit system safety program plans made under 49 CFR Part 270 (Section 7.3.1), provide them a role in the implementation of new infrastructure and systems (Section 7.3.2), and potentially strengthen minimum requirements for crew certification in the case of joint operations (Section 7.3.3). We have also noted some minor but important ambiguities to be addressed in the Washington Administrative Code (Section 7.3.4).

To enable these recommendations, ensuring that the WUTC has sufficient resources to carry out this expanded mandate (Section 7.6) is needed. In the box below, we cite the WUTC interpretation of its mandate (direct quote) and add, in *blue italics*, how this mandate would be expanded based on the recommendations in this report (except for Recommendation 2).

¹⁶² E.g., Finding 22: "Washington State Department of Transportation should have provided greater oversight of Central Puget Sound Regional Transit Authority's safety certification process."

Existing roles of the WUTC with respect to rail safety (direct quote) and proposed changes (in *blue italics*)

The commission’s Rail Safety Program serves the public and railroad employees by implementing engineering, education, and compliance programs that reduce deaths, injuries, and property damage on or around railroads. The program:

- Oversees rail operations *and rail company safety practices* – Our inspectors review, in cooperation with the Federal Railroad Administration, all aspects of rail operations that have been found to be the principal causes of accidents: crossing signals, hazardous materials, operating practices, and track. *We also support the FRA in auditing system safety program plans.*
- *Oversees rail infrastructure commissioning – We ensure that companies implementing new state-funded infrastructure follow their defined commissioning process.*
- Protects railroad crossings – We inspect intersections where rail meets road, called grade crossings, to make sure they are designed and maintained in a way that promotes safe crossings. We also investigate accidents and authorize improvements including construction and widening of public crossings, installation of signals, and gates and closures.
- Resolves complaints – We work with citizens, local governments, and companies to resolve complaints received. Examples of complaints include: bad crossing surfaces, drivers avoiding crossing gates, train noise levels (Quiet Zones), train speeds, and railroad trespassing. *We also proactively meet with municipalities to discuss opportunities to strengthen rail safety at the rail-community interface.*
- Ensures employee safety – We enforce railroad employee safety regulations. Our interagency agreement with the Department of Labor and Industries avoids duplication of effort.
- Funds rail safety projects – We fund projects to improve public safety at crossings and limit pedestrian access to railroad rights-of-way through the Grade Crossing Protective Fund, *including projects that address blocked crossings.*
- Promotes public awareness – We are a partner in the national Operation Lifesaver Program to educate the public and promote railroad grade crossing safety. *We also compile and publish an annual report on the state of rail safety in Washington State.*
- Support and promote research – We support research on new innovative ways to improve safety at grade crossings and reduce trespassing.

Adapted from: WUTC. About the Rail Safety Program.
<https://www.utc.wa.gov/publicSafety/railSafety/Pages/aboutRailSafetyProgram.aspx>

7.3.1 Ensuring that system safety plans are adapted to local contexts

The FRA and FTA, as well as regulators around the world, have recognized that safety cannot be managed solely by relying on prescriptive standards, such as requirements that track must be maintained within certain tolerances. To this end, all jurisdictions discussed in this report require railroads to develop a system safety program plan (SSP) or safety management system (SMS). In the U.S., these requirements are set out federally at 49 CFR Part 270 (passenger rail), 49 CFR Part 271 (other railroads), and Part 673 (transit). This section further discusses those requirements applicable to passenger rail and other railroads (i.e., Parts 270 and 271).

However, the existence of such a plan is not sufficient to ensure safety. Several findings from this and previous studies point to this:

- An internal review carried out for Sound Transit found several deficiencies in the implementation of its System Safety Management Plan (SSMP). In particular, while “Sound Transit requires

modification of their agency-wide SSMP to reflect 'project-specific plans, management structure, responsibility, and authority, schedules, activities and tasks necessary to integrate safety and security into each phase of a specific (transit) project' ...[a] project-specific SSMP was not prepared for the PDB [Point Defiance Bypass] project.¹⁶³

- The NTSB report of the DuPont Derailment found that "Washington State Department of Transportation should have provided greater oversight of Central Puget Sound Regional Transit Authority's safety certification process."¹⁶⁴
- Regulators worldwide that have implemented similar organizational safety requirements have implemented much more prescriptive requirements for what the SSP/SMS is required to contain. For example, Australia regulations have a list of 12 situations in which a regulator is required to be notified of a change.¹⁶⁵

Thus, we see an opportunity to strengthen the oversight over system safety/organizational safety practices at railroads operating in Washington State. The NTSB finding indicates that "[WSDOT] should have provided greater oversight..." Our understanding is that in the State of Washington, it is the intent that the WUTC is responsible for providing oversight of railroads; however, it is unclear whether they have the authority to audit system safety plans (SSPs) made under 49 CFR Part 270 (applicable to passenger or commuter railroads) or Risk Reduction Program (RRP) made under 49 CFR Part 271 (applicable to other railroads as defined under Part 271.3).¹⁶⁶

For example, the existing State Safety Participation Program (49 CFR Part 212) does not make explicit reference to SSPs, though its principles include "... to provide an enhanced investigative and surveillance capability through assumption, by participating State agencies, of responsibility for planned routine compliance inspections. *The FRA encourages further State contributions to the national railroad safety program consistent with overall program needs, individual State capabilities, and the willingness of the States to undertake additional investigative and surveillance activities* [emphasis added by CPCS]."¹⁶⁷

¹⁶³ L&H Consulting Group. 2019. Sound Transit Point Defiance Bypass Project Incident Review: Final Report.

¹⁶⁴ NTSB. 2019. Amtrak Passenger Train 501 Derailment DuPont, Washington, December 18, 2017. Accident Report NTSB/RAR-19/01 PB2019-100807.

¹⁶⁵ Rail Safety National Law National Regulations 2012, Section 9.

¹⁶⁶ RCW 81.04.550 provides that:

The [WUTC] shall administer the railroad safety provisions of [Title 81] to the fullest extent allowed under 49 U.S.C. Sec. 20106 and state law.

However, we are unclear whether the WUTC would have the necessary resources (to be discussed in Section 7.6) or authority to oversee SSPs (such as those created under 49 CFR Part 270). Under RCW 81.04.540 s. 3:

For the purpose of participating with the United States Department of Transportation in investigation and inspection activities necessary to enforce federal railroad safety regulations, the commission has regulatory jurisdiction over the safety practices for railroad *equipment, facilities, rolling stock, and operations in the state* [emphasis added by CPCS].

This provision does not, for example, specifically reference the practices of railroad companies.

¹⁶⁷ 49 CFR Part 212.101(b).

Recommendation 5: With input from the WUTC, the legislature should ensure the WUTC has the authority to oversee all aspects of railroad safety, including the system safety practices of railroad companies (i.e., the oversight of programs made under 49 CFR Part 270 [System Safety Program – Passenger] and 271 [Risk Reduction Program – Freight]) in cooperation with the FRA.

Recommendation 6: The WUTC should work with the FRA to ensure its State Safety Participation Program agreement encompasses oversight of the provisions of 49 CFR Part 270 and Part 271.

For clarity, our understanding is that the FRA has sole approval authority over SSP plans (Part 270.201) or RRP plans (Part 271.301). However, there are two ways that the WUTC could explore influencing the content and implementation of these plans:

- Under Part 270.201(a)(2) and Part 271.307(b), the WUTC could request the “risk-based hazard analysis [conducted by a passenger rail operation]” and “RRP plans”, respectively; review the plans with primary view of ensuring that they have identified, analyzed and mitigated risks applicable in the Washington State context;¹⁶⁸ and draft a letter with their findings to railroads and the FRA.
- The WUTC could explore with the FRA whether there would be a willingness by FRA to allow the WUTC to participate and/or lead an audit of SSPs and RRP of railroads in the state. Part 270.301 specifically contemplates the potential for an FRA’s “designee” to carry out an audit.

We acknowledge that the WUTC would not have any direct regulatory control or enforcement capabilities. However, our view is that there is value to the WUTC to participate in this activity – in part as the WUTC may help ensure that system safety plans are appropriately tailored for operations in Washington. As a particular example, the NTSB report on the DuPont derailment notes challenges with emergency response,¹⁶⁹ and commentary from legislators during an early presentation of this study have noted that there was limited coordination with municipalities. Undertaking these additional functions would require auditors and experts knowledgeable in risk assessments and railroad operations, and would be subject to FRA cooperation.

Also, there still appears to be uncertainty as to how the FRA will promote and enforce the adoption of the SSPs made under Part 270. The FRA declined to speak with us as part of this study, but a 2020 presentation noted that the FRA would provide “Assistance documents,” “Conduct external outreach,” and “Hire Staff.” These functions, however, are “[d]ependent on FRA policies and budgets.¹⁷⁰” As a result, there appears to be an opportunity to support the FRA to ensure the full adoption of the SSP in Washington State, particularly given the unique institutional arrangements that exist.

Given that oversight of system safety plans would expand the role of the WUTC, we anticipate that there would need to be additional resources to carry out this function. As discussed in Chapter 6, one of the critiques in the Canadian context was that while the regulator implemented safety management system

¹⁶⁸ For example, labor stakeholders indicated to CPCS that they have raised incidents and risks to regulators associated with tunnels, high-mountain passes and winter conditions, contextual factors which arguably occur in combination more frequently in Washington State than many other parts of the U.S.

¹⁶⁹ Findings from the NTSB (number 50-53) pertained primarily to using similar channels for radio communication.

¹⁷⁰ FRA – Passenger Division, Office of Safety. 2020. Final Rule for 49 CFR Part 270 System Safety Program. Presentation to APTA, March 25, 2020.

requirements, it did not ensure sufficient resources to promote the adoption of these requirements by management systems.

7.3.2 Improving oversight of the implementation of new infrastructure

Based on the documents reviewed and the team's knowledge, the implementation arrangement for the PDB was unique in North America, in which a commuter railroad (Sound Transit) constructed, owned, and operated track for tenant railroads but did not operate its trains over the segment. In essence, Sound Transit became a host railroad – despite having only the experience being a tenant railroad and without being a tenant on its own track. This type of institutional separation is less common in North America.

In addition, as already discussed, the NTSB report related to the DuPont derailment notes that WSDOT (rather than the WUTC) “should have provided greater oversight of Central Puget Sound Regional Transit Authority’s safety certification process.” Based on further clarification with the NTSB, part of the rationale for this finding was that the NTSB’s understanding is that the WUTC’s existing mandate is to support the FRA in inspections of systems that are already operational. However, WSDOT’s view is that it is a funding agency and that its oversight is primarily limited to ensuring that entities it funds to comply with *contractual* responsibilities. For example, it may contractually specify that railroads it sponsors are required to comply with applicable regulations, but it relies on reports from the FRA/WUTC to make that determination. It argues that this mechanism ensures that by having a separation between regulatory and funding roles it is not viewed as unfairly penalizing railroads.

Additionally, while the FRA does provide guidance on hazard analysis as part of its grant process, it does not review or approve the hazard analysis:

The FRA Passenger Division reviewed and provided guidance on the project’s elected System and Hazard Management Process (Sound Transit’s System Safety Program Plan for Design and Construction) contained in the Safety and Security Plan / Note: The process was approved as a grant deliverable but FRA does not review or approve the railroad/project’s hazards analysis... [emphasis in original]¹⁷¹

In the case of the PDB activation, there did not appear to be outside review of the reasonableness of the hazard analysis undertaken for the project, nor was there confirmation that the process was followed. In the case of the PDB, an external report for Sound Transit of the incident found that while Sound Transit had an Executive Action Group (EAG) with responsibility for “rail activation safety and security oversight and policy direction,”¹⁷² the process for using this committee was not followed:

Finding: The Sound Transit safety and security certification approval process were not followed for the PDBP.

Finding: The Project Certificate of Conformance was not signed by the Sound Transit CEO.¹⁷³

There is an opportunity for the State of Washington to provide greater oversight of the implementation and certification of new railroad infrastructure, including:

¹⁷¹ FRA. 2018. FRA Safety Oversight of Grant Projects (Panel 2). July 10-11, 2018 NTSB Public Hearing

¹⁷² This is similar to the Independent Safety Assessment concept raised in Working Paper 2.

¹⁷³ L&H Consulting Group. 2019. Sound Transit Point Defiance Bypass Project Incident Review: Final Report.

Recommendation 7: The legislature should grant the WUTC authority to oversee the process by which new and materially changed railroad operations in the state are implemented, which would apply at minimum to any state-funded passenger service.¹⁷⁴

The purpose of this oversight would be to ensure that a reasonable *process* was set out for commissioning **and that process was followed.**

7.3.3 Strengthening the process for certifying operating personnel in the case of joint operations

Under 49 CFR Parts 240 and 242, federal requirements define the responsibilities of host railroads (the railroads controlling the conduct of joint operations) in the case of joint operations. In the context of a review of the PDB, a review for Sound Transit (the host railroad) explained the following:

FRA regulations obligate Sound Transit, as the host railroad, to ensure that any tenant railroad's operating personnel are certified and qualified to operate on the host territory. Though Sound Transit may rely on the certification issued by the tenant railroad, Sound Transit is required, as the host railroad, to independently determine that the operating personnel are qualified.¹⁷⁵ Acceptance of a tenant railroad's list of qualified personnel is not sufficient.¹⁷⁶

However, the same review found that such a transmittal of the list of operating personnel and associated acceptance did not take place: "objective evidence of Amtrak staff training and qualification was not provided to or reviewed by Sound Transit." To address this, the following recommendations were made:

...Sound Transit should annually receive the training and qualification records of all operating personnel for the Lakewood Subdivision, along with the list of qualified personnel.

...Sound Transit has the responsibility to ensure that the tenant railroad operating personnel are properly trained and qualified for the Lakewood Subdivision. Sound Transit should evaluate the training program of each railroad in the Lakewood Subdivision to ensure the sufficiency of the training.¹⁷⁷

The existing federal provisions do not specify these requirements in any detail, such as what is a reasonable timeline for the host railroad to request and review the list of qualified personnel, what steps it must take to ensure the training program is sufficient, etc.

Given the unique situation in Washington State in which a commuter railroad that does not otherwise own track infrastructure is in a position of acting as host railroad:

¹⁷⁴ We understand that the WSDOT SSOA is already involved in the implementation process and working to become more involved in design reviews.

¹⁷⁵ L&H Consulting Group (2019) citing 49 CFR Parts 240.299(c) and 242.301(b).

¹⁷⁶ L&H Consulting Group. 2019. Sound Transit Point Defiance Bypass Project Incident Review: Final Report.

¹⁷⁷ L&H Consulting Group. 2019. Sound Transit Point Defiance Bypass Project Incident Review: Final Report.

Recommendation 8: The legislature should direct the WUTC to establish a focus group to explore with relevant host and tenant railroads operating in the state existing information sharing practices between host and tenant railroads and opportunities for greater minimum standards for these practices.

7.3.4 Addressing other ambiguities regarding roles and responsibilities in the Washington Administrative Code (WAC)

In our review of relevant rail safety legislation in Washington State, we have noted one instance in which there was an opportunity to improve the clarity of the roles and responsibilities of parties involved in rail safety. Under WAC 480-62-310, “[a]ccidents involving joint railroad company operations must be reported by the railroad company that *controls the track and directs the movement of trains where the accident has occurred* [emphasis added by CPCS].” In our view, the inclusion of both “control the track” and “directs the movement of trains where the accident has occurred” creates ambiguity in the definition of the responsible party (i.e., is it the infrastructure owner or dispatcher?):

Recommendation 9: The legislature should direct the WUTC to review and amend the WAC, in particular WAC 480-62-310, to clarify which party is responsible for reporting accidents.

7.4 There is an opportunity to strengthen communication of the state of rail safety in Washington State

7.4.1 Public reporting of the state of rail safety appears to be a gap

There is an opportunity to strengthen how rail safety information is analyzed, compiled and published to develop regular portraits of the state of rail safety in Washington, accessible to the legislature, state agencies, public and industry audiences. While there are a number of federal and state databases for accident information, for example, these databases can be challenging to access, may not include any trend analysis, and are published without commentary. By comparison, there are examples from other jurisdictions (e.g. Canada,¹⁷⁸ BC and California) that publish accessible documentation on an annual basis that conveys this information. In essence, while safety data exists, it is not always accessible as **information**, such as trend analysis, watchlists, etc., to a broader array of informed stakeholders.

In addition, ensuring oversight of regulatory agencies through reporting mechanisms is one way to ensure the accountability of regulatory bodies. Publishing data is a necessary, but not sufficient, condition for ensuring transparency.

*In essence, while safety data exists, it is not always accessible as **information** to a broader array of informed stakeholders.*

Recommendation 10:

10.1 The legislature should direct the WUTC (for railroads) to produce an annual state of rail safety report, including a profile of annual crash statistics in Washington State, details of accidents and their investigation, inspection activities

¹⁷⁸ For example, the Transportation Safety Board of Canada provides annual statistics across a variety of metrics. <https://www.tsb.gc.ca/eng/stats/rail/2019/sser-ssro-2019.html>

performed, and enforcement action is taken. A similar report for transit systems is already required under RCW 81.104.115(9).

- 10.2 We would recommend that these reports on the state of safety for railroads and transit presented to the forum identified in Recommendation 2 be forwarded to appropriate government officials, and be publicly published in a centralized manager.**

Again, implementing such recommendation will require additional trained analytical resources.

To maximize the audience for this report, the legislature could consider having it presented on an annual basis during a committee meeting. In addition, the WUTC could consider presenting to or forwarding to other stakeholders involved in rail safety, such as offering to present at the AWC's annual conference, etc.

7.4.2 Leveraging the available accident data from neighboring jurisdictions and national datasets

Washington State has a particular interest in ensuring the safety of the state-funded Cascades service, which runs into Oregon and British Columbia, Canada. There is potentially information from these neighboring jurisdictions and national datasets that can help enhance oversight of this service and potentially future higher-speed services.

Recommendation 11: The legislature should direct the WUTC and WSDOT to:

- 11.1 Explore with Transport Canada¹⁷⁹ and/or the Transportation Safety Board of Canada (TSB),¹⁸⁰ and Oregon Department of Transportation the possibility of receiving reciprocal notification of incidents in a reasonable timeline involving multi-jurisdictional, state-funded services.**
- 11.2 Have the WUTC compile and analyze information regarding the safety performance of passenger rail service inclusive of information from neighboring jurisdictions and national datasets, and share this information with WSDOT.**

Even if Recommendation 11.1 is not feasible (it is dependent on agreement from other jurisdictions), both FRA¹⁸¹ and TSB¹⁸² data are published periodically, as reported by carriers. To this end, carrying out Recommendation 11.2 would ensure that the WUTC would have all available information to help it plan its inspection activities in the state.¹⁸³ The information could in turn be shared with WSDOT to help it ensure that contractors are carrying out their appropriate contractual responsibilities.

¹⁷⁹ Transport Canada is the federal regulator for rail safety in Canada.

¹⁸⁰ The Transportation Safety Board of Canada "is an independent agency that advances transportation safety by investigating occurrences in the air, marine, pipeline and rail modes of transportation." It maintains and publishes a Rail Occurrence Database System (RODS) to which rail carriers must report accidents and incidents. It is similar to the NTSB in that it investigates accidents/incidents on a "no blame" basis. It is not a regulator of rail safety.

¹⁸¹ Link: <https://railroads.dot.gov/accident-and-incident-reporting/overview-reports/accident-data-reported-railroads>

¹⁸² Links: <https://www.tsb.gc.ca/eng/stats/rail/data-1.html>; <https://www.bst-tsb.gc.ca/eng/stats/rail/data-5.html>

¹⁸³ It is important to note that the reporting requirements in the U.S. and Canada differ, so it may not be possible to carry out a statistical analysis.

7.5 Grade crossing accidents remain persistent, despite efforts to address, and stakeholders are concerned about blocked crossings

Grade crossing accidents remain persistent in Washington State, as described in Section 3. The FRA is in the process of promulgating rules which will require all states to develop state highway-rail grade crossing action plans to prioritize crossings for improvements as specified in 49 CFR Part 234.11.

Also, some stakeholders have raised the issue of blocked railroad crossings, which has implications for safety (such as potentially a contributing factor to trespassing occurrences), mobility, quality of life, and emergency response. A 2017 study for the JTC studying prominent road-rail conflicts in Washington State¹⁸⁴ found that over 66% of the top 50 conflict crossings were proximate to emergency response centers,¹⁸⁵ which could contribute to delays in providing emergency response services. Thus, grade crossings are an important issue to continue to monitor and address.

There are several challenges in addressing these issues, however:

- **The number of crossings to be addressed relative to available resources:** There are over 4,000 at-grade crossings in Washington State. The 2017 study cited above notes that “[existing programs in Washington State] have a finite amount of money and are unable to address all of the identified needs related to crossing safety.” There are two existing programs in Washington State, the Grade Crossing Protective Fund Program (administered by the WUTC) and Section 130 funds (administered by WSDOT). Based on information provided by the WUTC, they receive approximately \$500,000 bi-annually, which may not even fully cover the cost of upgrading an active warning system, such as lights, gates and bells, at one crossing.
- **Limitations on jurisdictional authority:** While WAC 480-62-220 indicates that “[r]ailroad companies must not block a grade crossing for more than ten consecutive minutes, if reasonably possible,” the WUTC has stated that “[the] regulation is unenforceable due to several federal court rulings.¹⁸⁶”

Despite these challenges, given the slightly higher than average increase in at-grade crossing accidents and the expected continued increase in rail traffic, the issue merits continued attention. In addition, while regulating blocked crossings is outside of state authority and significantly relates to mobility, there are potentially low-cost (non-grade separation improvements) solutions that could be considered to address blocked crossings where there is a safety consideration at play (including evidence of trespassing or emergency response zones bisected). Depending on the nature of the crossing issue, strategies to be considered could include static signage of possible detours, intelligent transportation systems such as

Blocked crossings

A blocked crossing can have different definitions depending on the context. For stakeholders, it is an all-encompassing term referring to when a train impedes the movement of road vehicles, including emergency vehicles, at a designated at-grade crossing. It is essentially a synonym for road-rail conflicts.

Blocked crossings can occur due to the standard operations of a railroad, including trains proceeding at speed over a mainline, switching activity at a yard that blocks a crossing, and trains parked on a siding. Recently, the public has complained¹ that the duration of blocked crossings has increased as railroads’ operating models evolve.

Source¹ : For example, the Iowa DOT: “Blocked crossing complaints have increased in recent years as railroads are striving to reduce operating costs by increasing train lengths causing crossings to be blocked for a longer time period. In some cases, trains need to stop due to disabled equipment, switching operations, safety protocols, etc.”

¹⁸⁴ Transpogroup et al. 2017. Prioritization of Prominent Road-Rail Conflicts in Washington State.

¹⁸⁵ We were not able to identify the specific criteria used for proximity. However, this is likely a reasonable indicator that there might be a rail line that bifurcates the emergency response area.

¹⁸⁶ WUTC. Blocked Crossings.

variable message signs and predictive systems to suggest new routes in real time (e.g., commercial systems such as Trainfo), crossing closures, and working with railroads voluntarily to explore alternative locations to park trains.

In addition, new technologies such as infrastructure-to-vehicle communication systems could change warning devices in the future. We believe that there is a need to ensure that the WUTC has an appropriate budget so that it can study and possibly test possible technologies to reduce grade crossing and trespassing occurrences and stay current with new technologies.

Recommendation 12: The legislature should ensure that appropriate state agencies can take action to support the implementation of low-cost solutions to improve crossing safety, address blocked crossings and promote reduced trespassing, including those attributed to suicides.

- 12.1 To the extent budgets allow, the legislature should provide additional funding to promote wider implementation of grade crossing safety improvements, trespass prevention, and low-cost mitigations to address blocked crossings.**
- 12.2 To the extent budgets allow, the legislature should provide additional funding to enable the WUTC to conduct and/or support research into the effectiveness of novel at-grade crossing warning systems.**
- 12.3 The legislature should grant the authority to the WUTC to expand the criteria for project selection of the Grade Crossing Protective Fund Program to encompass low-cost solutions to monitor and address blocked crossings where applicants can demonstrate a related safety concern, including blocking of emergency response vehicles.**
- 12.4 The legislature should direct the WUTC and WSDOT to develop a focus group to review the 2017 study on Prioritization of Prominent Road-Rail Conflicts in Washington State, recommend improvements to ensure it can be used to prioritize high-safety risk crossings for improvement, and determine what funding and governance structure would be required to undertake this initiative.**
- 12.5 State agencies should be working through state associations, continue to raise the importance of blocked crossings to communities, and encourage federal action to monitor and address the issue.**

One stakeholder has noted that there is the potential to increase transparency in project selection. We have noted that funding projects related to at-grade crossings had criteria attached. As such, there is potentially an opportunity to improve reporting post-project selection.

Finally, one stakeholder has identified a need for increased education programs in particular for school-aged children, local businesses, etc. We understand that the WUTC makes a number of efforts in this regard, including by supporting Operation Lifesaver. Given the breadth of rail activity, we acknowledge in the above recommendations that there are opportunities to modestly expand resources to even further expand messaging.

Overall, increasing resources for safety improvements at grade crossings was advocated or supported by a wide range of stakeholder groups consulted.

7.6 Enable other recommendations by ensuring sufficient resources for implementation

7.6.1 Ensure that regulatory agencies have sufficient funding to carry out their mandate

Even prior to this report, the role of the WUTC had been evolving from administering specific rail safety oversight programs (e.g., approval of grade crossing and participation in oversight activities with the FRA), to implementing a broader array of rail safety policy initiatives. The WUTC has noted that recent legislation has resulted in unfunded mandates (such as regulations pertaining to oversight of crew transportation). As such, WUTC is planning to submit a decision package to the legislature for resources to implement Safe Train Crew Size Bill, HB 1841. We have not seen the details of this report, but it appears that some additional resources are required absent of any recommendations.

In addition, if the other recommendations of this report are implemented, it would expand the role of the WUTC to encompass oversight of system safety practices. Accordingly, for the implementation of those recommendations to be successful, additional staffing resources at the WUTC are likely required. In other jurisdictions outside of the U.S. where safety management system regulations have been implemented, there have been critiques that the regulatory staffing did not allow for the successful promotion of these requirements. Specifically, it has been claimed that there are not sufficient resources with the appropriate skillset (audit background) to carry out these requirements.

Thus, based on the recommendations above, we anticipate a need for additional resources to undertake the coordination functions for a forum; to support oversight of system safety plans and certification of new infrastructure; to undertake additional data analysis and reporting.

The WUTC is funded through regulatory fees whose maximum is set out by statute:

...railroad companies [...] shall each pay to the commission a fee of up to two and one-half percent of its intrastate gross operating revenue. However, a class three railroad that does not haul crude oil must pay a fee equal to one and one-half percent of its intrastate gross operating revenue...¹⁸⁷

Through WAC 480-62-300, the WUTC sets these fees at the maximum established by statute, as a proportion of revenue:

(4) **Regulatory fees.** The railroad company regulatory fee for Class I railroads and companies that haul crude oil is set by statute at two and one-half percent of gross intrastate operating revenue. The regulatory fee for all other railroad companies shall be set at one and one-half percent of gross intrastate operating revenue.

(a) The maximum regulatory fee is assessed each year unless the commission issues an order establishing the regulatory fee at an amount less than the statutory maximum.

(b) The minimum regulatory fee that a railroad company must pay is twenty dollars.

(c) The twenty-dollar minimum regulatory fee is waived for any railroad company with less than one thousand three hundred dollars in gross intrastate operating revenue.

(d) The commission does not grant extensions for payment of regulatory fees.

(e) If a company does not pay its regulatory fee by May 1st, the commission will assess an automatic late fee of two percent of the amount due, plus one percent interest for each month the fee remains unpaid.¹⁸⁸

¹⁸⁷ RCW 81.24.010

¹⁸⁸ WAC 480-62-300

It is beyond the scope of this analysis to carry out a detailed assessment of the funding requirements for the recommendations above, but we note that the statute (RCW 81.24.010) does not provide any flexibility to account for the cost recovery of regulatory functions. This may be a non-issue if the fee, as a proportion of revenue, is set higher than the needs of the WUTC.

Recommendation 13: Based on the recommendations that the legislature determines it should implement, it should review the fee cap level set in consultation with the WUTC to ensure the adequacy of resources to carry out the recommendations.

We have also noted in discussions with stakeholders that the passenger rail system in Washington State (including transit and possibly intercity passenger) is being expanded. The existing funding mechanism for **railroad** oversight is based on a proportion of revenues, and the funding allocated from the FTA to fund state transit **oversight** is based on track-miles in the state (relative to overall track-miles). If a system is in development, revenues and track-miles do not currently exist, so this approach may not be reflecting the cost of oversight of project development activities (e.g., certification).

One approach could be to grant further authority to regulators to develop a more flexible fee schedule based on cost drivers. The regulator in British Columbia, for example, which uses a regulatory fee-based model, has a separate charge of approximately \$70,000 (CA\$88,900) for “Commuter Rail in Development” – in addition to annual charges for existing operations. The full fee schedule is provided in Figure 7-1. Our understanding is the intent of such a fee model is (1) to align regulatory fees with the costs of carrying out oversight activities and (2) to provide a degree of predictability as to the revenues that the regulator can expect to receive.

Figure 7-1: Technical Safety BC Rail Fee Schedule

TECHNICAL SAFETY BC FEE SCHEDULE: RAILWAYS			
DESCRIPTION	Effective January 1, 2020	UNITS	GST
Applications			
Review of Application for Certification of a New Railway:			
Commuter Passenger Rail	\$ 11,000	per carrier	Yes
Common Carrier Railways	\$ 11,000	per carrier	Yes
Industrial Railways	\$ 5,300	per carrier	Yes
Sidings and Spurs	\$ 5,300	per carrier	Yes
Re-Certification or Change of Name (does not apply to new ownership)	\$ 188	per carrier	Yes
Assessment Services			
Industrial Railways			
Hazard Risk Assessment - Base Fee			
High	\$ 6,100	per carrier	Yes
Medium	\$ 4,800	per carrier	Yes
Low	\$ 4,200	per carrier	Yes
Plus: Variable Fee based on Annual # of Cars Moved			
High	\$ 0.419	per car	Yes
Medium	\$ 0.171	per car	Yes
Low	\$ 0.063	per car	Yes
Sidings and Spurs			
Hazard Risk Assessment - Base Fee			
High	\$ 4,000	per carrier	Yes
Medium	\$ 2,300	per carrier	Yes
Low	\$ 1,400	per carrier	Yes
Plus: Variable Fee based on Annual # of Cars Moved			
High	\$ 0.419	per car	Yes
Medium	\$ 0.171	per car	Yes
Low	\$ 0.063	per car	Yes

Common Carriers Group I			
Hazard Risk Assessment - Base Fee			
High	\$ 38,800	per carrier	Yes
Medium	\$ 31,100	per carrier	Yes
Low	\$ 23,300	per carrier	Yes
Plus: Variable Fee based on Annual # of Cars Moved			
High	\$ 0.063	per car	Yes
Medium	\$ 0.031	per car	Yes
Low	\$ 0.016	per car	Yes
Common Carriers Group II			
Hazard Risk Assessment - Base Fee			
High	\$ 6,100	per carrier	Yes
Medium	\$ 5,300	per carrier	Yes
Low	\$ 4,400	per carrier	Yes
Plus: Variable Fee based on Annual # of Cars Moved			
High	\$ 0.419	per car	Yes
Medium	\$ 0.171	per car	Yes
Low	\$ 0.063	per car	Yes
Common Carrier Group I & II - when handling passengers			
	\$ 0.077	per passenger	Yes
Commuter Passenger Rail Operators - Group I			
Base Fee			
	\$ 62,100	per carrier	Yes
Plus: Variable Fee based on Annual # of Passengers			
	\$ 0.047	per 100 passengers	Yes
Commuter Passenger Rail Operators - Group II			
Base Fee			
	\$ 31,100	per carrier	Yes
Plus: Variable Fee based on Annual # of Passengers			
	\$ 0.047	per 100 passengers	Yes
Commuter Rail in Development			
	\$ 88,800	per carrier	Yes
Hourly Rates			
Professional Services Rate			
	\$ 225	per hour	Yes
Overtime working hours Saturdays & Sundays inclusive (except holidays) and Monday to Friday inclusive, 4:30 p.m. to 8:00 a.m., per hour			
	\$ 341	per hour	Yes
Holiday working hours, per hour			
	\$ 454	per hour	Yes
Plus expenses incurred, where applicable			

Source: Technical Safety BC. Fee Schedule.

In the Washington State context, there are at least two challenges with this model:

- **For railroads**, the existing fee appears to have been structured based on intrastate revenues to avoid being perceived as impeding interstate commerce.
- **For transit**, under RCW 81.104.115, “[the WSDOT SSOA] must be financially and legally independent from any public transportation agency that the department is obliged to oversee.” Thus, it would be unclear whether accepting even a small fee from transit agencies would be legally acceptable. Further, transit agencies also receive government support.

In this context:

Recommendation 14:

- 14.1 The legislature should appropriate funding to the WUTC and WSDOT SSOA to oversee project implementation, based on the number and complexity of state-funded passenger rail systems in development.**

14.2 WSDOT SSOA should coordinate with the FTA about best practices in providing oversight to systems in development, including whether there is an opportunity for the FTA to consider systems in development as part of its funding allocation model for State Safety Oversight.

The staffing levels, and accordingly resources, would depend on the size and complexity of the projects in development. We anticipate the needs could potentially be conveyed to government officials through Recommendation 10.

7.6.2 Strengthen Washington State’s position as a leader in rail safety by leveraging the capability of higher-education institutes

We believe there is merit for Washington State to further explore providing funding to develop a new research center or expand existing transportation research centers (e.g., Washington State Transportation Center [TRAC]) to research rail safety issues. We see it strengthening the governance of rail safety in at least three ways:

- It could help address newer research areas in the context of rail safety in the U.S. where there is room for further exploration (e.g., organizational safety practices related to the implementation of SMS) or areas that are particularly of interest in the Pacific Northwest (e.g., ground hazards and seismic concerns).
- In turn, it could help ensure that state and federal regulators are being influenced by the best available research and raise the profile of Washington State as a leader in this area.
- A research program could serve as a way to train people before entering into the industry. Consultations with stakeholders suggests that oversight agencies *and* transit agencies are forced to hire staff members out of the aviation industry to assist in the implementation of safety management systems.

Recommendation 15: The legislature should provide funding to establish a rail research program or research program focus area to strengthen rail safety research.

Further to the first bullet above, the intent would not be to reinvent the research being carried out by existing rail research programs in the U.S. One of the largest in the U.S. (if not largest) is the National University Rail Center (NURail) based at the University of Illinois at Urbana-Champaign, a consortium of seven Midwest and East Coast universities funded by the U.S. Department of Transportation. NURail’s research program covers infrastructure, systems, planning, risk assessments, and other issues. In Canada, the Canadian Rail Research Laboratory (CaRRL), based at the University of Alberta in Edmonton, emphasizes research into geotechnical issues and related risk assessments. CaRRL is funded by multiple levels of government and industry, including receiving \$390,000 (CA\$500,000) over five years from a provincial government’s innovation agency. There are also other professors and chairs that focus on rail research issues.

7.7 Other Issues

7.7.1 Standards for higher-speed ground transportation systems

Our understanding is that there is an opportunity to strengthen standards for higher-speed and high-speed rail standards for operations above 80 mph. Given the state’s interest in potentially developing such systems working with neighboring jurisdictions, the legislature may need to grant authority to the WUTC to develop and/or adopt standards to oversee such high-speed rail or high-speed ground

transportation systems. Given the governance model for this system is being studied, we have not offered a specific recommendation at this time. This would certainly need to be considered in the future, however.

7.8 Summary of findings and recommendations

Overall, Washington State, through the WUTC, exceeds the minimum participation level in the oversight of railroads relative to other states. **In addition, the separation of railroad safety oversight and funding within two separate entities (WUTC and WSDOT) is a net strength of the oversight approach in Washington State.**

However, this regulatory model does not appear to be universally understood by all stakeholders involved in railroad safety. In addition, Washington State has different forms of separation between host and tenant railroads than what is commonly seen in the U.S. (i.e., a commuter railroad that is partially a host rather than a tenant railroad). Though this separation between host and tenant railroads is the norm rather than the exception in other jurisdictions globally, the latter typically have stronger practices for licensing/accreditation prior to operations, defining roles and responsibilities, and change management than observed in the U.S. **There is an opportunity to ensure that regulators in Washington State have the authority and resources to oversee system safety plans, including a role in the implementation of new infrastructure.**

A significant gap identified is the absence of a formally defined process for railroad and transit regulators to be involved in the commissioning process for new or materially changed infrastructure. Often, intentional (planned) changes in complex systems such as railways are factors in accidents.¹ While stakeholders have opined that regulators are not *responsible* for safety, there is an opportunity for them to promote safety in the systems they oversee by introducing new mechanisms to ensure operator accountability.

Source: CPCS, based on sources noted.

¹ Leveson, N.G. 2011. *Engineering a Safer World: Systems Thinking Applied to Safety*. The MIT Press.

In addition to operations, grade crossing and trespassing accidents remain a persistent issue in Washington State (as with other states and countries), though Washington State has had some success in reducing trespassing accidents. Stakeholders have also expressed concerns about blocked crossings and related safety issues, such as emergency response. While addressing blocked crossings through regulation of railroads is likely outside the jurisdiction of the state, **there may be opportunities to fund low-cost improvements to grade crossings to address blocked crossings (additional signage, intelligent transportation systems, working with railroads voluntarily to address a specific issue, etc.) that could also promote safety.**

Finally, because many of these recommendations increase the scope of the WUTC's authority, a review of funding sources to ensure the WUTC can carry out its regulatory functions and implement these recommendations would likely be needed.

The full list of findings, including strengths, weaknesses, and other opportunities for improvement, and recommendations is found below (Figure 7-2).

Figure 7-2: Summary of recommendations

Finding	Recommendations
<p>G. The current model for rail safety oversight in Washington State is appropriate but could be further strengthened.</p> <ul style="list-style-type: none"> i. The separation of railroad safety regulatory oversight from funding functions is a net strength of the Washington Safety oversight model ii. There are synergies to ensuring cooperation between state-level oversight agencies involved in railroads and transit despite system differences, and regulatory differences at the federal level. 	<p>Recommendation 1:</p> <p>1.1 The legislature should continue WUTC as the regulator of railroad safety and strengthen its role, as appropriate, in providing railroad safety oversight.</p> <p>1.2 The legislature, after further consultation with the WUTC to ensure consistency across its regulatory roles, should elevate the importance of promoting safety and security of the public and employees, and protection of the environment, by explicitly noting these priorities within the WUTC’s rail safety oversight mandate.</p> <p>Recommendation 2:</p> <p>2.1 The WUTC and WSDOT SSOA, in consultation with agencies that are regulated by both the FRA and FTA (e.g., Sound Transit), should explore opportunities for collaboration and sharing of best practices.</p> <p>2.2 The WUTC and WSDOT SSOA should report to the legislature whether there are opportunities for joint initiatives to be funded by the legislature, such as auditor training, development of system safety guidelines, etc. through annual reporting.</p>
<p>H. Despite the strength of the regulatory model, there isn’t universal understanding of the role of organizations involved in railroad safety in Washington State.</p>	<p>Recommendation 3: The legislature should provide the WUTC direction and resources to convene a forum with stakeholders involved in rail safety.</p> <p>Recommendation 4: The legislature should direct the WUTC to make reasonable efforts to engage with municipalities in Washington State on a collective basis through relevant associations.</p>

Finding	Recommendations
<p>I. There is the opportunity to strengthen the regulator’s role in the oversight of system safety across project lifecycles, including:</p> <ul style="list-style-type: none"> i. Ensuring that system safety plans are adapted to local contexts ii. Improving oversight of the implementation of new infrastructure iii. Strengthening the process for certifying operating personnel in the case of joint operations iv. Addressing other ambiguities regarding roles and responsibilities in the Washington Administrative Code (WAC) v. Reviewing regulatory fee legislation to ensure sufficient resources align with expenses (see recommendation 13 and 14) 	<p>Recommendation 5: With input from the WUTC, the legislature should ensure the WUTC has authority to oversee all aspects of railroad safety, including the system safety practices of railroad companies (i.e., the oversight of programs made under 49 CFR Part 270 [System Safety Program – Passenger] and 271 [Risk Reduction Program – Freight]), in cooperation with the FRA.</p> <p>Recommendation 6: The WUTC should work with the FRA to ensure its State Safety Participation Program agreement encompasses oversight of the provisions of 49 CFR Part 270 and Part 271.</p> <p>Recommendation 7: The legislature should grant the WUTC authority to oversee the process by which new and materially changed railroad operations in the state are implemented, which would apply at minimum to any state-funded passenger service.</p> <p>Recommendation 8: The legislature should direct the WUTC to establish a focus group to explore with relevant host and tenant railroads operating in the state existing information sharing practices between host and tenant railroads and opportunities for greater minimum standards for these practices.</p> <p>Recommendation 9: The legislature should direct the WUTC to review and amend the WAC, in particular WAC 480-62-310, to clarify which party is responsible for reporting accidents.</p>
<p>J. There is an opportunity to strengthen the communication of the state of rail safety in Washington State.</p>	<p>Recommendation 10:</p> <p>10.1 The legislature should require the WUTC (for railroads) to produce an annual state of rail safety report, including a profile of annual crash statistics in Washington State, details of accidents and their investigation, inspection activities performed, and enforcement action taken. A similar report for transit systems is already required under RCW 81.104.115(9).</p> <p>10.2 We would recommend that these reports on the state of safety for railroads and transit be presented to the committee identified in Recommendation 2, be forwarded to appropriate government officials, and be publicly published.</p> <p>Recommendation 11: The legislature should direct the WUTC and WSDOT to:</p> <p>11.1 Explore with Transport Canada and/or the Transportation Safety Board of Canada (TSB), and Oregon Department of Transportation the possibility of receiving reciprocal notification of incidents in a reasonable timeline involving multi-jurisdictional state-funded services.</p> <p>11.2 Have the WUTC compile and analyze information regarding the safety performance of passenger rail service inclusive of information from neighboring jurisdictions and national datasets, and share this information with WSDOT.</p>

Finding	Recommendations
<p>K. Grade crossing accidents remain persistent, despite efforts to address the issue, and stakeholders are concerned about blocked crossings.</p>	<p>Recommendation 12: The legislature should ensure that appropriate state agencies can take action to support the implementation of low-cost solutions to improve crossing safety, address blocked crossings and promote reduced trespassing, including those attributed to suicides.</p> <p>12.1 To the extent budgets allow, the legislature should provide additional funding to promote wider implementation of grade crossing safety improvements, trespass prevention, and low-cost mitigations to address blocked crossings.</p> <p>12.2 To the extent budgets allow, the legislature should provide additional funding to enable the WUTC to conduct and/or support research into the effectiveness of novel at-grade crossing warning systems.</p> <p>12.3 The legislature should grant the authority to the WUTC to expand the criteria for project selection of the Grade Crossing Protective Fund Program to encompass low-cost solutions to monitor and address blocked crossings where applicants can demonstrate a related safety concern, including blocking of emergency response vehicles.</p> <p>12.4 The legislature should direct the WUTC and WSDOT to develop a focus group to review the 2017 study on Prioritization of Prominent Road-Rail Conflicts in Washington State, recommend improvements to ensure it can be used to prioritize high-safety risk crossings for improvement, and determine what funding and governance structure would be required to undertake this initiative.</p> <p>12.5 State agencies should be working through state associations, continue to raise the importance of blocked crossings to communities, and encourage federal action to monitor and address the issue.</p>
<p>L. Enable other recommendations by ensuring sufficient resources for implementation</p> <ul style="list-style-type: none"> ➤ Ensure that regulatory agencies have sufficient funding to carry out their mandate ➤ Strengthen Washington State’s position as a leader in rail safety by leveraging the capability of higher-education institutes 	<p>Recommendation 13: Based on the recommendations that the legislature determines it should implement, it should review the fee cap level set in consultation with the WUTC to ensure the adequacy of resources to carry out the recommendations.</p> <p>Recommendation 14:</p> <p>14.1 The legislature should appropriate funding to the WUTC and WSDOT SSOA to oversee project implementation, based on the number and complexity of state-funded passenger rail systems in development.</p> <p>14.2 WSDOT SSOA should coordinate with the FTA about best practices in providing oversight to systems in development, including whether there is an opportunity for the FTA to consider systems in development as part of their funding allocation model for State Safety Oversight.</p> <p>Recommendation 15: The legislature should provide funding to establish a rail research program or research program focus area to strengthen rail safety research.</p>

Source: CPCS.

Appendix A List of stakeholders consulted

Stakeholders consulted
Amtrak
Association of Washington Cities
BNSF Railway
Brotherhood of Locomotive Engineers and Trainmen - Washington State Legislative Board, IBT-Rail Conference
Central Puget Sound Regional Transit Authority (Sound Transit)
City of Kent
City of Lakewood
National Transportation Safety Board
Portland-Vancouver Junction Railroad
Transportation Division, Sheet Metal, Air, Rail, & Transportation Union
Washington State Department of Transportation, Rail, Freight, and Ports Division
Washington State Department of Transportation, State Safety Oversight Agency
Washington Utilities & Transportation Commission

Appendix B List of laws applicable to rail safety

Selected federal railroad-related regulations

Section of 49 CFR	Scope
Part 212	State Safety Participation
Part 212.107 Part 212.109 Part 212.201	Certification Joint planning of inspections State inspector qualifications
Part 217	Railroad Operating Rules
Part 217.7 Part 217.9 Part 217.11	Filing and recordkeeping Program of operational tests, inspections, and recordkeeping Program of instruction on operating rules, recordkeeping, and electronic recordkeeping
Part 225	Railroad Accidents/Incidents
Part 225.6 Part 225.11 Part 225.23 Part 225.25	Consolidated reporting Reporting of accidents/incidents Joint operations Recordkeeping
Part 229	Railroad Locomotive Safety Standards
Parts 229.21-229.33 Parts 229.41-229.141	Inspections and testing Safety requirements
Part 236	Rules, Standards and Instructions Governing the Installation, Inspection, Maintenance, and Repair of Signal and Train Control Systems, Devices and Appliances
Parts 236.1001-236.1049	Positive train control
Part 238	Passenger Equipment Safety Standards
Part 238.111(a) Part 238.111 (b)	Pre-revenue service acceptance testing plan for equipment previously used in the U.S. Passenger equipment that has not been used in the U.S.
Part 240	Qualification/Certification of Locomotive Engineers
Part 240.123 Part 240.129 Part 240.233 Part 240.229 Part 240.231	Initial and continuing education Monitoring the operational performance of certified engineers Official certification Joint operations territory requirements Other requirements for locomotive engineers
Part 242	Qualification/Certification of Conductors
Part 242.301	Territorial qualification and joint operation
Part 243	Qualification/Oversight of Safety-Related Rail Employees
Parts 243.101-243.113 Parts 243.201-243.209	Program components and approval Program implementation and oversight requirements

Selected Washington State laws applicable to rail safety

Title 81 RCW: Transportation	
Chapter 28: Common Carriers in General	
§ 81.28.290	UTC’s responsibility for investigation of accidents that may occur upon the lines of any common carrier resulting in loss of life, to any passenger or employee
Chapter 29: Common Carriers – Limitation on Liability	
§ 81.29.040	Specification of penalty for violations by common carriers
Chapter 36: Railroads – Corporate Powers and Duties	
§ 81.36.030 – 130	Rights of entry at intersections and connections with other roads or canals or for building extensions and branch lines
Chapter 40: Railroads – Employee Requirements and Regulations	
§ 81.40.010	Condition for a safety review of the crew requirements by the UTC
Chapter 44: Common Carriers – Equipment	
§ 81.44.010	Order for improved equipment and facilities to promote the security or convenience of the public or employees
§ 81.44.020	Correction of unsafe or defective conditions of equipment, facilities, tracks, bridges, or other structures of any common carrier
§ 81.44.040	Requirements for streetcars to be equipped with appliances and machinery necessary for the safe operation
§ 81.44.070	Duties of inspector of safety appliances
§ 81.44.130	Railroads and street railroads’ requirements to adjust, fill, block, and securely guard all frogs, switches, and guard rails
§ 81.44.170	Hazardous materials inspections by the Commission employees
§ 81.44.180	WUTC’s role in collecting and incorporating rail-related data from the Department of Ecology as required under RCW 90.56
Chapter 48: Railroads – Operating Requirements and Regulations	
§ 81.48.030	WUTC’s right for regulating the train speeds within cities and towns and at grade crossings
§ 81.48.040	WUTC’s right to change train speed limits as conditions change
§ 81.48.060	Penalty for railroads and their employees for violation of duty endangering safety
Chapter 53: Railroads – Crossings	
§ 81.53.020	Grade separation required where practicable
§ 81.53.261 – 295	Requirements for crossing signals and warning devices installation and maintenance
§ 81.53.400 – 900	Requirements for traffic control devices during construction, repair, etc. of crossing or overpass
Chapter 61: Railroads – Crew Transportation	
§ 81.61.020	Standards for safe maintenance and operation of passenger-carrying vehicles
§ 81.61.040	WUTC’s right for inspection of railroad crew vehicles
§ 81.61.070	WUTC’s right to collect data from railroads regarding safety complaints, accidents, regulatory violations, fines, and corrective actions
Chapter 104: High Capacity Transportation Systems	
§ 81.104.010	Local jurisdictions’ role in coordination and responsibility for high capacity transportation policy development, program planning, and implementation
§ 81.104.020	State policy roles in transit are expanded to include other high capacity transportation development

§ 81.104.030, 040, 050	The requirement of transit agencies participating in joint regional policy committees to seek voter approval within their service boundaries of a high capacity transportation system plan, financing plan, and expansion plan
§ 81.104.060, 070	State's planning and implementation role in high capacity transportation development
§ 81.104.104, 110	Regional high capacity transportation plan requirements for coordination with cities, counties, and other transportation systems as well as system plan oversight
§ 81.104.115	Role of the Department of Transportation as the state safety oversight agency
§ 81.104.120	WUTC's responsibility for maintaining safety for passenger rail service operating on freight rail lines
Chapter 112: Regional Transit Authorities	
§ 81.112.090	WUTC's jurisdiction over operators of high capacity transportation services
§ 81.112.180	The requirement for the regional transit authorities that owns or operates a rail fixed guideway public transportation to submit a system safety program plan, and system security and emergency preparedness plan before starting operation
§ 81.112.190	The requirement for light-rail facility signing
Title 47 RCW: Public Highways and Transportation	
Chapter 6, 6A: Statewide Transportation and Freight Mobility Planning	
§ 47.06.040, 045, 080, 090, and 110 – 140	Requirements for statewide multimodal transportation, freight mobility, freight rail, intercity passenger rail, public transportation, high capacity transportation, and regional transportation planning.
Chapter 36: Traffic Control Devices	
§ 47.36.050	Responsibilities for installation of traffic devices on railroad crossings
§ 47.36.053	Responsibilities for maintenance of traffic devices on railroad crossings
§ 47.36.080	Responsibilities for installation of signs at railroad crossings
Chapter 66: Multimodal Transportation Programs	
§ 47.66.070	Creation of multimodal transportation account for funding based on appropriation
§ 47.66.110	Creation of transit coordination grant program to encourage joint transit planning and coordination
Chapter 76: Rail Freight Service	
§ 47.76.200 – 220	Definition and requirements for state freight rail program and state rail plan
§ 47.76.230	The role of DOT and WUTC regarding railroad safety issues
Title 49: Labor Regulations	
§ 49.17	Washington industrial safety and health act
Title 80: Public Utilities	
Chapter 1: Utilities and Transportation Commission	
§ 80.01.010 – 300	WUTC creation, duties, and jurisdiction
Title 90: Water Rights – Environment	
Chapter 56: Oil and Hazardous Substance Spill Prevention and Response	
§ 90.56.210	Contingency plan requirements for railroads transporting oil in bulk

Source: CPCS Review of RCW, Washington State Legislature, Accessed August 2020.

Appendix C FRA New Start Regulations Checklist

CFR	Description
49 CFR 210	Railroad noise emission compliance regulations
49 CFR 213	Track inspection minimum standards and qualification requirements for personnel
49 CFR 214	Minimum requirements for staff and contractors working on the right-of-way and qualification requirements for personnel
49 CFR 217	Railroad operating rules
49 CFR 218	Railroad operating practices
49 CFR 219	Control of alcohol and drug use
49 CFR 220	Railroad communications
49 CFR 221	Minimum requirements governing highly visible marking devices for the trailing end of the rear car of all passenger trains
49 CFR 222	Use of locomotive horns at public highway-rail grade crossings
49 CFR 223	Safety glazing standards – locomotives and passenger cars
49 CFR 225	Railroad accidents/incidents: Reports classification, and investigations
49 CFR 227	Occupational noise exposure
49 CFR 228	Hours of service of railroad employees; recordkeeping and reporting; sleeping quarters
49 CFR 229	Railroad locomotive safety standards
49 CFR 231	Railroad safety appliance standards
49 CFR 233	Signal systems reporting requirements
49 CFR 234	Grade crossing safety
49 CFR 236	Installation, inspection, maintenance, and repair of signal and train control systems, devices, and appliances (including positive train control)
49 CFR 237	Bridge safety standards
49 CFR 238	Passenger equipment safety standards
49 CFR 239	Passenger train emergency preparedness
49 CFR 240	Qualification and certification of locomotive engineers
49 CFR 242	Qualification and certification of conductors
49 CFR 243	Training, qualification, and oversight for safety-related railroad employees
49 CFR 270	System Safety Program Plan-SSPP. FRA requests all new passenger railroads to participate in the APTA/FRA SSPP audit program
49 CFR 37	Transportation services for individuals with disabilities (ADA)
49 CFR 38	Americans with Disabilities Act (ADA) accessibility specifications for vehicles

Source: FRA

Appendix D Approach for selecting jurisdictions to be scanned

Purpose and approach to jurisdictional scan

Purpose

The purpose of the jurisdictional scan is to identify lessons learned and effective practices from other states (and countries) that may apply to Washington State. This appendix outlines our strategy for shortlisting jurisdictions to explore and profile within this study.

Approach

Rail safety governance models generally evolve gradually within the broader legal context in which they operate, such as the division of powers between different levels of government. This is the case in the U.S. In addition, differences in system types and operating environments, as well as data collection methodologies that differ globally, make a comparison of the overall effectiveness of regulatory models difficult from an empirical standpoint.

As a result, the purpose of the jurisdictional scan is to identify specific effective practices that may address issues raised in Washington, rather than to seek to compare the effectiveness of an entire regulatory model from another jurisdiction, as perfect comparisons can rarely be made.

In this context, we intended for the jurisdiction scan to provide descriptions of specific practices used in other jurisdictions with appropriate context added (i.e. mini-case studies), rather than conducting an in-depth summary of the entire regulatory framework in another jurisdiction.

Need for focusing the scan

Given the number of states with railways and the possibility of exploring international jurisdictions, it is not possible to take in-depth looks at the governance approaches in all jurisdictions within the scope of the study. As a result, there is a need to sample jurisdictions to identify effective practices. While sampling risks omitting certain effective practices, in general, searching 5-10 jurisdictions tends to identify most of the salient practices of note, particularly if consideration is given to ensuring diversity in the list.

Use of shortlisted jurisdiction

We used the 5-10 shortlisted jurisdictions to scan for evidence of effective practices and consult with a subset of those jurisdictions. If we find no evidence that may be useful, we will omit it from our discussion. However, if during the scan, we identify practices that may be relevant to Washington State, even if not from a jurisdiction already identified, we will plan to document.

Accordingly, the purpose of the shortlist was to prioritize the initial search, rather than being a rigid framework.

Issues to explore in the scan

We focused on exploring the following issues in the jurisdictional scan, though not necessarily in all jurisdictions:

- Effective practices in the commissioning of new rail infrastructure and systems, including the roles and responsibilities of state entities
- Practices for ongoing communication between oversight agencies and regulated entities
- Practices for ensuring clarity in the roles and responsibilities of host and tenant railways
- Practices for enhancing safety at grade crossings and reducing trespassing occurrences
- Practices related to the safety of hazardous material transport

Approach to shortlisting

Our approach to shortlisting was primarily bottom-up; that is, we identified 5-10 jurisdictions that may offer lessons learned to Washington, starting with a blank sheet a paper.¹⁸⁹ The base unit of analysis is generally a state-level organization.

Information sources

We considered the following information in developing a shortlist of areas to focus on:

1. **Scans of locations in the U.S. (or internationally)** in which it is known that a mix of freight, intercity passenger, commuter, and transit services operate; and in particular locations where new services have been introduced or are planned
2. **Inputs from stakeholders consulted during the study**
3. **Team member expertise:** We have drawn from the expertise of team members, who are based throughout the U.S. and internationally, to inform the identification of locations

We used these information sources, combined with the following principles, to identify locations to scan.

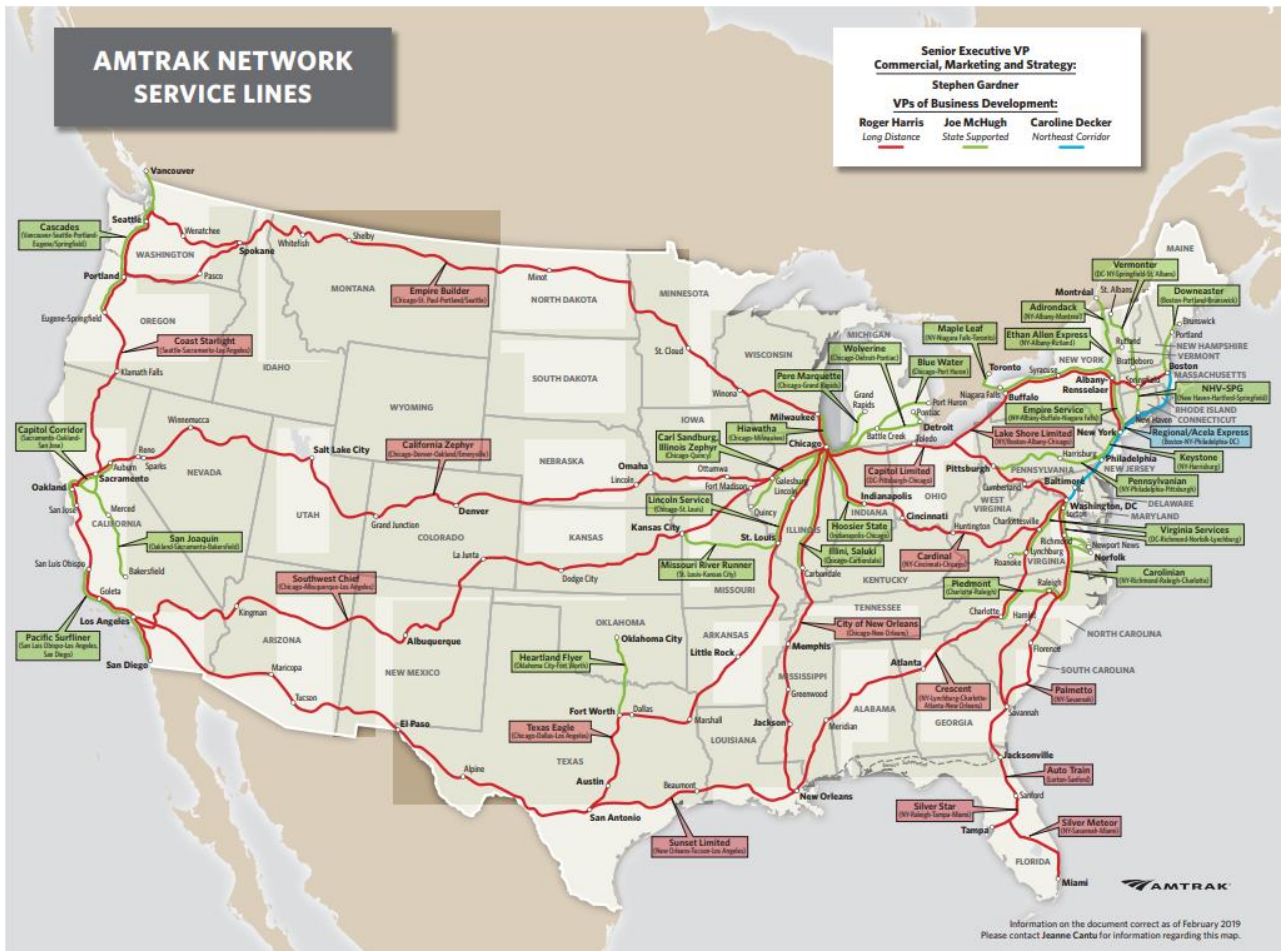
Principles for selecting shortlisted jurisdictions

We used the following principles in establishing jurisdictions to scan:

- I. **A broad mix of system types operating:** Washington State has a mix of freight, passenger, commuter, and transit systems, including interactions between these system types. Most of the other jurisdictions selected should have a level of complexity that is similar to Washington State in this regard. In particular, unless there is an additional rationale to consider a jurisdiction, the jurisdiction should ideally have a state-supported Amtrak service (Figure D-1).

¹⁸⁹ This compares to a top down approach, in which a master list of the universe of possible jurisdictions is filtered down into 5-10 jurisdictions.

Figure D-1: Amtrak state supported and other long distance services



Source: Amtrak, 2019

- II. **Locations where there have been significant investments in passenger rail, particularly intercity:** Figure D-2 shows federal investments in passenger rail in the U.S., which are clustered in the Pacific Northwest (Washington and Oregon), California, the U.S. Midwest, U.S. South and Northeast Corridor. Also, there have been private-sector investments in rail in Florida.

Figure D-2: Federal investment in high-speed rail



Source: FRA, 2016

- III. **Considering locations where non-regulatory considerations (e.g., funding grade crossing improvements) have been implemented.**
- IV. **Considering jurisdictions in geographic proximity:** In part to ensure that activities are potentially harmonized with adjacent jurisdictions, consideration was given to including practices in Oregon and British Columbia, Canada.
- V. **Considering international jurisdictions:** While regulatory models in other international jurisdictions cannot be adopted in the U.S. in their entirety, other jurisdictions have had to develop strategies to address issues raised in this study (e.g., the roles and responsibilities of host railroads and tenants, etc.)

Jurisdictions to initially scan

We explored whether there are effective practices in the following 12 jurisdictions (Figure D-3). We do not plan to consult with all 12 jurisdictions, however, depending on the outcome of an initial scan.

Figure D-3: Jurisdictions to initially scan

Location	Rationale
California	<ul style="list-style-type: none"> • Significant rail infrastructure • High-profile rail crashes, resulting in thorough safety reviews • New HSR project in the works
Florida	<ul style="list-style-type: none"> • New rail service recently introduced • Legislature-mandated rail safety governance study recently conducted
Oregon	<ul style="list-style-type: none"> • In the interest in understanding how neighboring jurisdictions manage rail safety, we anticipate that there is merit in scanning Oregon
Illinois	<ul style="list-style-type: none"> • Illinois (Chicago) has one of the most complex rail networks in the U.S. • Stakeholder recommendation
Michigan	<ul style="list-style-type: none"> • Stakeholder recommendation
Ohio	<ul style="list-style-type: none"> • CPCS has in-depth knowledge of the regulatory framework in Ohio, and some of the challenges and opportunities that exist
North Carolina	<ul style="list-style-type: none"> • Rail program in the works • Stakeholder recommendation
Texas	<ul style="list-style-type: none"> • Stakeholder recommendation • HSR project planning underway
New York	<ul style="list-style-type: none"> • Stakeholder recommendation
BC/Canada	<ul style="list-style-type: none"> • In the interest in understanding how neighboring jurisdictions manage rail safety, we anticipate that there is merit in scanning BC. There is also potential literature from previous rail safety reviews that merit scanning.
U.K.	<ul style="list-style-type: none"> • Most railways in the U.K. operate in a vertically separated industry structure, in which train operating companies and network managers are separate companies. While, unlike in the U.S., they are regulated by one entity, the Office of Rail and Road, there may be some lessons learned in terms of how they ensure clarity of the roles and responsibilities of different entities. • Other broader EU literature may be considered to the extent informative.
Australia	<ul style="list-style-type: none"> • The Office of the National Rail Safety Regulator recently accredited autonomous long-haul freight operations.

Source: CPCS

Other literature explored

Other literature that we explored included:

- Literature related to past safety issues into rail and other transportation systems, which often provide a deeper exploration of governance issues. Some specific examples include:
 - Other NTSB investigations, including related to Metro-North for example
 - Literature related to the certification of the Boeing 737 Max. As this study is motivated by weaknesses observed in the commissioning process of the PDB, exploring parallels in this literature may be valuable.
- Literature related to effective practices in safety governance. Professor Mark Winfield of York University has written extensively on effective governance of safety-critical industries, including railways and water treatment. This literature is a good source of guiding principles in structuring governance structures.
- Given the high degree of emphasis placed on safety culture in Japan, we will also seek to explore whether there are any lessons learned that could be sourced from this jurisdiction.

We did not develop case studies in any of these areas but scan at a high-level for lessons learned.

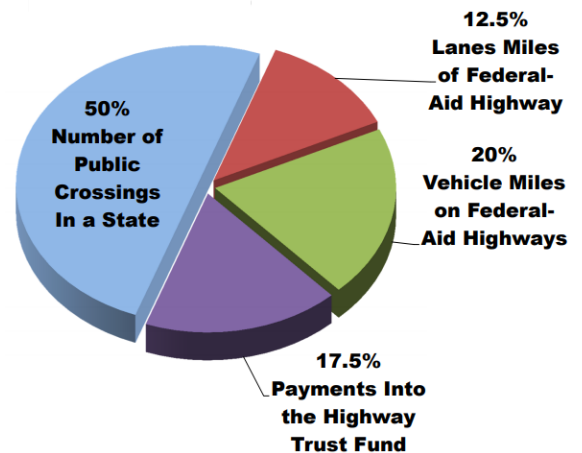
Appendix E Railway-Highway Crossings (Section 130) Program

About the program

The Railway-Highway Crossings (Section 130) program¹⁹⁰ focuses on the hazards at grade crossings and provides the states with funds to decrease accidents and eliminate fatalities and injuries at grade crossings. Section 130 program was established in the late 1980s, apportioning funds from the Highway Safety Improvement Program (HSIP)¹⁹¹ to the states by formula.

The figure on the right shows the factors included in the states' HSIP funding formulas. A minimum of 0.5 percent has to be apportioned to each state. Also, as required by 23 USC 130(f), the projects funded under Section 130 are at 90 percent federal share.

Factors included in states' funding distribution formula



Source: FHWA, Section 130 Program Overview, 2017.

In 2016, the newly enacted Fixing America's Surface Transportation (FAST) Act continued the HSIP and increased the annual set-aside amount for the Section 130 program to about \$250 million.¹⁹² Previously, the Moving Ahead for Progress in the 21st Century Act (MAP-21), signed into law in 2012, increased Section 130's annual set-aside from \$160 million to \$220 million. The 2020 Section 130 set-aside amount is \$245 million.

The following projects at public crossings are eligible for the program's funds:

- Installation of protective devices at crossings (50 percent of a state's apportionment);
- Any hazard elimination project, including protective devices and hazards posed by blocked crossings (the rest of the state's apportionment).

States can also use their Section 130 apportionments to provide local agencies with incentives for closing public crossings or to pay the required local agency share for matching the project costs funded by the state agencies.¹⁹³

The 23 CFR 130(e) indicates that the first crossing safety improvement solution investigated should be closure or consolidation of nearby crossings. Such projects affect the vehicle, pedestrian, and even emergency response accessibility. Therefore, the majority of Section 130 projects' focus is on adding protective devices at crossings that demonstrate a need for safety enhancement.

¹⁹⁰ Mandated by 23 CFR § 130 - Railway-highway crossings.

¹⁹¹ The HSIP is a federal funding program that targets road safety issues to achieve a significant reduction in traffic fatalities and injuries. For more information see: <https://safety.fhwa.dot.gov/hsip/about.cfm>

¹⁹² The FAST Act was signed into law on December 2015. <https://www.fhwa.dot.gov/fastact/>

¹⁹³ 23 CFR § 130(h)

Annual Section 130 reports

Per the requirements of 23 CFR 130, states develop and maintain an inventory of all railroad crossings. This inventory helps identify the railroad crossings that may require safety enhancement projects and should include an implementation schedule (list of projects) that at least ensures all grade crossings are equipped with signs. A maximum of 2 percent of the state's Section 130 apportionment can be used to fund the collection and analysis of crossing data.¹⁹⁴

In addition to data collection and analysis, the states are also required to submit a Section 130 report to FHWA along with their annual HSIP submission. This report summarizes the state's progress towards implementing Section 130 projects and the impacts of those projects on improving crossing safety.¹⁹⁵

State Action Plan

The Rail Safety Improvement Act (RSIA) of 2008 included a rule requiring 10 states with the highest number of crossing safety incidents between 2006 and 2008 to develop and submit a State Highway-Rail Grade Crossing Action Plans (SAP) to FRA. The 10 states were Alabama, California, Florida, Georgia, Illinois, Indiana, Iowa, Louisiana, Ohio, and Texas. The SAPs developed by the above states were five-year plans that identified "solutions for improving safety at crossings," and were due to the FRA by August 2011.¹⁹⁶

While the states were allowed flexibility in developing their SAPs, the submitted documents had the following common elements:

- Grade crossing data analysis
- Stakeholder outreach and engagement
- Focus on crossing safety issues in general, in addition to the crossings with the highest number of crashes
- Established strategies with specified responsible parties, timelines, and evaluation metrics¹⁹⁷

A SAP report is intended to work as a mechanism that ensures data-driven crossing safety improvement strategy development and implementation.

In 2013, following a highway-rail grade crossing accident in Miriam, Nevada,¹⁹⁸ the National Transportation Safety Board (NTSB) issued recommendations to the FHWA and FRA to develop a SAP template that can be used by all the states. And later, in November 2019, the FRA proposed a rule (in response to the 2016 FAST Act mandate¹⁹⁹) requiring the remaining 40 states to develop and implement SAPs. Additionally, the 10 states that developed SAP under RSIA have to update their reports and submit them to the FRA.²⁰⁰

¹⁹⁴ 23 CFR 130

¹⁹⁵ 23 CFR 130(g)

¹⁹⁶ 49 CFR § 234.11

¹⁹⁷ FHWA, Highway-Railway Grade Crossing Action Plan and Project Prioritization, November 2016.

¹⁹⁸ In June 2011, an Amtrak train collided with a truck, resulting in six fatalities and nearly 30 injuries.

<https://www.nts.gov/investigations/AccidentReports/Pages/HAR1203.aspx>

¹⁹⁹ Section 11401

²⁰⁰ FRA, State Action Plans for Highway-Rail Crossing Safety, 2015.

Washington State crossing safety program

In Washington State, the DOT's Local Program (LP) staff are responsible for using available data sources to identify crossings that show a high risk of safety incidents. Factors used to indicate the level of risk include:

- Crossing crash history and trends
- Vehicle and train volumes
- Existence and geometry of pedestrian/cyclist paths at or near crossings
- Road and railroad geometry and sight distance

The LP staff review the identified crossings and their potential safety improvement projects according to the Section 130 eligibility requirements and submit funding applications for the eligible projects to WSDOT.²⁰¹ LP staff notifies the railroads during the project development stage to obtain relevant data.

WSDOT's Local Programs Director will then prioritize all the submissions and select the final projects. Washington State's 2020 Section 130 apportionment is about \$11 million. All funded projects require a 10 percent local match.²⁰²

Upon the allocation of funds and completion of the proposed crossing safety designs, the LP staff prepare and submit an agreement²⁰³ and a petition for the installation of protection devices to the Utilities and Transportation Commission (UTC).²⁰⁴ After UTC's approval, the railroads have to sign the agreement and petition documents and return it to the LP staff. In the meantime, the local agency and the railroad coordinate the construction authorization process, which will allow the railroads to start the project.

Local transportation agencies are responsible for all stages of the project, from construction authorization to project completion. Railroads should submit the notice of project completion to the local agency and the UTC. WSDOT rail safety officers will also visit the project site for final inspection and project closure.²⁰⁵

²⁰¹ WSDOT, Railway-Highway Crossings Program: Call for Projects, accessed September 2020.

<https://wsdot.wa.gov/localprograms/traffic/railway-crossings-program>

²⁰² Ibid.

²⁰³ As instructed in Chapter 32 of WSDOT's Local Agency Guidelines: <https://www.wsdot.wa.gov/publications/manuals/fulltext/M36-63/Laq32.pdf>

²⁰⁴ Required under RCW §81.53.261.

²⁰⁵ WSDOT, Local Agency Guidelines, June 2020.



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