

Report of the NARUC Task Force on Transportation

February 2017





January 30, 2017

President Robert Powelson
National Association of Regulatory Utility Commissioners
1101 Vermont Avenue, NW
Suite 200
Washington, DC 20005

Re: Report of the Transportation Task Force

Dear President Powelson:

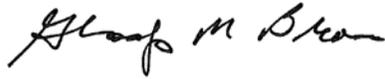
As co-chairs of the Transportation Task Force of the National Association of Utility Regulatory Commissioners, we present to you and members of the Executive Committee the report of the Task Force. On behalf of the members of the Task Force, we thank you, Past-President Kavulla and the Executive Committee for the opportunity to review and assess the role of state commissions in regulating transportation network companies (TNCs) and railroad safety.

One section of the Task Force report provides an overview of state rules and regulatory authority over TNCs, and the other section presents the role of states and federal agencies in regulating rail safety, as well as information on key state railroad safety issues. We hope that the work of the Task Force on Transportation will be available on the NARUC website as a resource for state commissioners, staff and interested stakeholders, especially given the frequency in the turnover of new commissioners and staff.

Although the work of the Task Force and its working groups is now complete, we recommend that the states remain active members of the National Conference of State Transportation Specialists (NCSTS), which addresses state regulation of TNCs, and the Association of State Rail Safety Managers (ASRSM), which addresses railroad safety issues at the state level and has an ongoing working relationship with federal regulatory agencies. Further, the Task Force recommends that NARUC and its members participate in and monitor the work of NCSTS and ASRSM. If topics arise that merit focus by NARUC, the organization should address those issues through panel presentations at NARUC meetings. In this way, NARUC can address key transportation issues when appropriate.

Thank you again for the opportunity to work on transportation issues critical to state commissions.

Sincerely,

A handwritten signature in black ink that reads "Gladys M. Brown". The signature is written in a cursive, flowing style.

Gladys Brown
Chairman,
Pennsylvania Public Utilities Commission

A handwritten signature in blue ink that reads "Ann Rendahl". The signature is written in a cursive, flowing style.

Ann Rendahl
Commissioner,
Washington Utilities and Transportation Commission

Enclosure

cc: NARUC Executive Committee
Members of Task Force on Transportation



National Association of Regulatory

Utility Commissioners

TASK FORCE ON TRANSPORTATION

WORKING GROUP ON MOTOR CARRIERS

FINAL REPORT ON TRANSPORTATION NETWORK

COMPANY REGULATION

PREPARED BY:

THE WORKING GROUP ON MOTOR CARRIERS

FINAL REPORT DATE:

JANUARY 2017

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I. INTRODUCTION AND SCOPE

On January 19, 2016, the Executive Committee of the National Association of Regulatory Utility Commissioners (NARUC) authorized President Travis Kavulla to establish a Presidential Task Force on Transportation.

The Executive Committee established the Task Force due to recent developments in transportation facing NARUC member states, including the recent emergence of Transportation Network Companies (TNCs) as a transportation alternative, as well as the increased frequency of crude oil shipments by rail and related derailments. These developments drove a need for greater understanding of the role of states in regulating these two industries.

The Task Force on Transportation is divided into two working groups: (1) the Working Group on Railroad Safety; and (2) the Working Group on Motor Carriers. The Task Force as a whole reports directly to the NARUC Executive Committee and has a limited duration of no more than two years.

The Executive Committee directed the Task Force's Working Group on Motor Carriers to "focus on compiling best State practices to modify common carrier laws in light of new business models and a trend toward competitive entry ... this Working Group might also consider a paper survey of TNC service issues."¹

As such, the Working Group on Motor Carriers has been meeting at regular intervals for the past year to discuss issues relevant to regulating the TNC industry and gathering best practices from the member states through a detailed paper survey. The result of those meetings and the paper survey are set forth in this Final Report on Transportation Network Company Regulation (Report) which is the end result of a year's worth of research and information gathering on TNC issues. The Working Group on Motor Carriers intends this Report to be a resource for NARUC member states when crafting legislation and/or regulations regarding TNC service and as an educational tool for NARUC members about emerging transportation issues related to TNCs.

II. ACTIVITIES OF THE WORKING GROUP ON MOTOR CARRIERS

Since February 2016, the Working Group on Motor Carriers has coordinated member teleconference meetings and hosted educational sessions at NARUC meetings in an effort to collect best practices related to the state regulation of TNC service. As a result of these meetings and sessions, the Working Group developed a paper survey directed to certain member states regarding TNC service regulatory issues. In the paper survey, the Working Group requested that NARUC member states provide a description of how their state has approached (through regulations or otherwise) certain issues relating to TNC service. Those

¹ NARUC Charter of Task Force on Transportation, January 19, 2016. (See Appendix A)

issues included (1) jurisdictional issues; (2) driver safety; (3) vehicle safety; (3) insurance levels and types; (4) rates; and (5) other miscellaneous issues.

The Working Group identified these issues through multiple collaborative membership discussions focusing on the details of each specific issue. When identifying and developing these issues for inclusion in the paper survey, the Working Group also sought insight from non-member guest speakers, including Ann Wilkinson, Chairman of the Nevada Transportation Authority.

Although the Working Group on Motor Carriers includes a total of sixteen member states, the Working Group determined it would only be appropriate to survey states that regulate TNC service through their respective public utility commissions. Through state outreach, the Working Group quickly discovered that each NARUC member state regulates TNC service very differently. Many states regulate TNCs at the local or municipal level, or through the state departments of transportation, instead of through the state public utility commission. Given that this Report was designed to be an educational guide for state commissions, the Working Group chose to include in its paper survey only those states that regulate TNCs through their state public utility commissions. As a result, the following member states were included in the paper survey: Alabama, Arkansas, California, Colorado, Montana, Nebraska, Nevada, Ohio, Pennsylvania, and Washington.

When circulating the paper survey, the members of the Working Group directed staff from each of these states to provide their respective state regulations related to each issue identified in the survey. After compiling a draft comprehensive state survey on TNC regulation, NARUC staff made the draft survey publically available for review on the Task Force on Transportation resource page of the NARUC website.

At the NARUC 128th Annual Meeting in November 2016, the Working Group presented the draft survey for discussion and comment in a Town Hall format. The Town Hall provided several industry groups and meeting attendees with an opportunity to provide their perspectives on each of the TNC regulatory issues included in the state survey. The Working Group specifically invited TNCs (such as Uber Technologies, Inc. and Lyft Inc.), insurance representatives, and economists to present their views on state regulatory issues regarding TNCs. The following industry and academic representatives provided their perspectives at the Town Hall:

Curtis Scott, Senior Legal Director, Regulatory & Insurance, Uber Technologies, Inc.

Rachelle Celebrezze, Senior Policy Advisor, Lyft Inc.

John G. Clarke, CPCU, Senior Vice-President, Marketing, James River Insurance Company

Michael Farren, PE, Economist from the Mercatus Center at George Mason University

After reviewing the comments provided by member states, industry leaders, and meeting attendees, the Working Group on Motor Carriers produced this final Report detailing the results of the state regulation paper survey regarding TNC regulation.

In the authorizing Charter for the Transportation Task Force, the Executive Committee recommended that the Working Group on Motor Carriers include in its final work product “best practices” for TNC regulation. Although, the Working Group began its research with a goal of developing best practice recommendations, the members quickly realized that each state has unique circumstances that warrant TNC regulations that are tailored to that particular state. As such, the Working Group opted not to pick a “one-size-fits-all” best practice recommendation for each issue, and rather includes in the Report the spectrum of options from each state for how to handle the various TNC regulatory issues.

The Working Group will present this final Report to the NARUC Executive Committee at the NARUC Winter Meeting in February 2017.

III. STATE PERSPECTIVES ON TNC REGULATION

a. General Background

The transportation industry has experienced unprecedented changes in the past several years. A new service that allows customers to use their smart phone to connect with transportation providers who drive their own personal vehicles has taken the country by storm. This new business model - TNCs— has taken advantage of widespread dissatisfaction with other traditional transportation options, gaps in regulation, and new technology to revolutionize the for-hire passenger transportation sector.

Uber Technologies, Inc. and Lyft Inc., the companies at the forefront of this revolution, enter into new markets and push regulators to pass laws to remove the service from the legal gray area it often occupies and into compliance with permanent rules that distinguish the app-based service from traditional taxicab service. So far, these companies have succeeded in their mission in numerous states and cities around the country.

California’s regulations, adopted by the Public Utilities Commission in September 2013, were the first in the country to address TNC service. Seattle became the first *city* to regulate TNCs in March 2014, and its ordinance exemplifies how the regulatory process can play out at the local level. In 2014, Colorado was the first state to *legislatively* address TNCs. By aggressively rolling out their services, TNCs are pushing regulators to adopt laws in shorter and shorter periods of time after they launch in a new market. At the beginning of 2015, only California, Colorado, the

District of Columbia, and Illinois had legislation addressing TNCs. By the end of the year, a total of 29 states² had enacted laws to address this new service.

Although regulators are trying to act quickly to respond to this issue, doing so is complicated because, in most cases, TNC service does not fit squarely within existing state transportation laws and regulatory schemes. As a result, regulators have been forced to rethink how their states and cities regulate transportation carriers. In doing so, some jurisdictions have chosen to apply existing taxi regulations to TNCs by simply redefining those categories to encompass TNCs, while other states have created a distinct and unique set of rules for TNCs that clearly distinguish them from taxi cabs and other existing transportation services.

Regardless of the approach, the discussion surrounding TNCs tends to focus on the same key issues: insurance, rates, and most importantly, safety. We will discuss each of these issues in this Report, as well as many others, and learn about the solutions that different regulators have developed in grappling with this interesting and complex issue. The goal of this Report is to provide state commissions, and any other interested parties, with a better understanding of options available for regulating TNCs so this innovative service can flourish while, at the same time, protections are in place to ensure that the traveling public is safe. As such, this Report includes an explanation of each of the survey state's applicable TNC legislation and/or regulations. This Report also includes a summary of the comments submitted by the TNC industry representatives, insurance industry representatives, and economists studying the transportation industry.

b. TNC Regulatory Issues

i. Jurisdictional Issues

1. Regulating Body

The body that regulates TNC service is different in each state.³ In some states, TNCs are regulated by the public utility commission or the department of transportation, while in others, TNCs are regulated at the local level, instead of on a statewide basis. The following represents the specific jurisdictional approach adopted by each of the survey states.

Alabama

TNCs are currently generally governed by local law in Alabama. However, on May 4, 2016, the Alabama Legislature passed SB 262, which establishes statewide insurance standards for the

² Arizona, Arkansas, California, Colorado, District of Columbia, Georgia, Idaho, Illinois, Indiana, Kentucky, Louisiana, Maine, Maryland, Minnesota, Montana, Nebraska, Nevada, New Mexico, North Carolina, North Dakota, Ohio, Oklahoma, South Carolina, Tennessee, Texas, Utah, Virginia, Wisconsin and Washington.

³ See Appendix B for a chart listing each state and whether the state public utility commission regulates TNCs in that state.

TNC industry. There are no statewide laws or regulations governing any other aspect of the TNC industry.

A number of cities and localities have enacted TNC laws. For example, Birmingham adopted a TNC ordinance in December 2015. Local municipalities have jurisdiction over TNCs operating solely within their police jurisdiction or between contiguous municipalities.

The Alabama Public Service Commission (AL PSC) has jurisdiction over TNCs that operate outside the jurisdiction of the municipalities.

At the AL PSC, TNC service falls within the statutory definition of common carrier. However, to date, no TNC has applied for AL PSC authority. Any application for TNC service would be handled on a case-by-case basis. All motor carriers in Alabama, including TNCs, must demonstrate that the service will be required by the present or future public convenience and necessity and the AL PSC must consider whether the existing transportation service of all kinds is adequate to meet the reasonable public needs.

The AL PSC grants authority based on the geographic area requested by the applicant and whether they are able to demonstrate a need.

Arkansas

The Arkansas Public Service Commission (AR PSC) has jurisdiction over TNCs that operate in the state. Exclusive jurisdiction over the TNCs was given to the AR PSC by the Arkansas State Legislature. The AR PSC developed rules that govern all motor carriers defined as TNCs.

TNCs are not required to demonstrate need or public demand for their services. Currently, TNCs only operate in two cities: Little Rock and Fayetteville, but are not restricted from operating in other cities in Arkansas.

California

The California Public Utilities Commission (CA PUC) has established TNC rules regarding driver safety, vehicle safety, and data reporting. The California Legislature has also adopted statutes regarding insurance, the definition of a personal vehicle, background check procedures, and participation in the California Department of Motor Vehicles' (DMV) employer pull notice program (i.e., checking driving records).

The CA PUC first asserted jurisdiction over TNCs in 2013. In that decision, the CA PUC determined that TNCs are a subset of charter-party carriers (TCP), over which the CA PUC has regulatory authority. The CA PUC relied on Public Utilities (PU) Code §701 to develop "new categories of regulation when a new technology disrupts an existing industry."⁴ Currently, TNCs that contract with TCPs to perform the transportation service are regulated as TNCs, not TCPs.

⁴ Conclusion of Law #5, Commission Decision 13-09-045, 9/19/13.

For the most part, TNCs are regulated as an industry and not on a case-by-case basis. The CA PUC regulates the TNC, but not the drivers. When the CA PUC grants TNC authority, it is statewide authority.

Passenger carriers over which the CA PUC has jurisdiction fall into several categories, the largest being passenger stage corporations (PSCs) and TCPs. PSC applicants are required to demonstrate their proposed service is "required by public convenience and necessity," although this refers more specifically to carriers' financial and organizational capability to operate the proposed service. Pursuant to SB 1840 (2006), state law no longer requires the CA PUC to consider market conditions with respect to PSC applications. Thus, TCPs (including TNCs) are not required to demonstrate a public demand or need.

Colorado

In 2014, the Colorado Legislature passed a statute establishing a regulatory framework for TNCs under the oversight of the Colorado Public Utilities Commission (CO PUC). Thus, the CO PUC has jurisdiction over the regulation of TNCs operating within Colorado. When TNCs began operating in Colorado, the service did not fit squarely within any of the existing motor carrier categories or regulations. The Colorado Legislature passed a bill defining TNC services and how they were to be regulated by the CO PUC.

Determining public demand or need is not a prerequisite for market entry for TNCs. A permit to operate as a TNC is required and the CO PUC must issue a permit if the application fee is paid, proper insurance is filed, and the operations meet the requirements set forth in statute. There are no geographic restrictions on a TNC permit, so permitted TNCs may operate statewide in Colorado.

Montana

In 2015, the Montana Legislature passed SB 396, creating a separate motor carrier class for TNCs (Class E, in § 69-12-340, MCA). Pursuant to SB 396, the Montana Public Service Commission (MT PSC) regulates that class as a whole, however, the MT PSC has limited jurisdiction over the TNCs. See Title 69, Chapter 12, Montana Code Annotated.

TNCs do not need to demonstrate public demand or need to obtain authority to operate in Montana. TNCs apply to the MT PSC for a "Certificate of Compliance." The MT PSC decides whether to grant a Certificate of Compliance upon a determination of whether the TNC is "fit, willing, and able to provide the authorized service," pursuant to § 69-12-415, MCA.

Montana law is silent on the geographic scope of authority. One TNC has received a Certificate of Compliance from the MT PSC with statewide authority.

Nebraska

The Nebraska Public Service Commission (NE PSC) has jurisdiction over TNCs in the state of Nebraska. The Nebraska Legislature passed LB 629 in 2015, granting the NE PSC jurisdiction over TNCs. The NE PSC regulates TNCs as a whole. Unlike other passenger carriers, there is no "need" requirement for TNCs. All TNCs currently authorized in Nebraska requested, and were granted, statewide authority.

Nevada

The Nevada Transportation Authority (NTA) has jurisdiction over TNCs that operate in the state. In 2014, Uber launched operations without regulatory authority. Nevada, through the NTA, commenced litigation and Uber was prohibited from operating statewide because it failed to comply with state laws regulating commercial motor carriers and passenger transportation services. Thereafter, in 2015, the Nevada Legislature passed Assembly Bill No. 176 (AB 176 and AB 175), providing for the NTA's regulation of TNCs, later codified as NRS 706A. Nevada, via the NTA, regulates TNCs as a whole. The application process does not require the TNC to set forth a specific geographic scope of authority.

Ohio

In 2015, the Ohio legislature passed a statute establishing a regulatory framework for TNCs under the oversight of the Public Utilities Commission of Ohio (PUCO). The law went into effect in March 2016. TNCs are regulated as a whole under the provisions of Title 49 and the PUCO is authorized, but not required, to adopt rules in accordance with that Title. Once the TNC fulfills the statutory obligations contained in O.R.C. 4925.02, the PUCO "shall issue" a permit. TNCs are not required to demonstrate that the service is responsive to a public demand or need. Once the PUCO issues a permit, the TNC is able to operate on a statewide basis.

Pennsylvania

The Philadelphia Parking Authority (PPA) has jurisdiction over TNCs in Philadelphia. The PA Public Utility Commission (PA PUC) has jurisdiction over TNCs that operate in the rest of the state.

Originally, TNC service did not fit squarely within any of the existing motor carrier categories in Pennsylvania's regulations. As a temporary measure, the PA PUC granted TNCs who applied for authority an experimental certificate for a 2 year period.

In November 2016, the Governor signed Pennsylvania Legislative Act 164 into law, which granted TNCs the ability to apply to either the PPA or the PA PUC for a license to operate in the Commonwealth.

Washington

In general, Washington regulates TNCs at the local level. For example, in March 2014, Seattle was the first city in the nation to pass an ordinance regulating TNCs. Other cities in Washington have followed Seattle's lead in regulating TNCs. Due to the lack of statewide regulations, there

have been instances of conflicting or overlapping regulations in cities that are near one another or between city and a county in Washington.

In an effort to achieve some continuity with respect to insurance, on May 11, 2015, the Washington Legislature passed SB 550, which established statewide insurance requirements for TNCs. The regulations are administered by the Washington Department of Licensing.

2. Legislative Activity and Relevant Citations

Over the past few years, some states have adopted legislation to regulate TNC service by law. Many states, however, are still in the process of adopting permanent legislation regarding TNC service. The following represents the legislative activity, with legislative citations and references, of each of the survey states.

Alabama

In 2016, Alabama passed SB 262, which governs only the insurance portion of TNC service.

- Title 37, Chapter 3, Code of Alabama, 1975
- Alabama Code § 32-7C-1 et seq. (insurance only statute).
- Alabama Public Service Commission Motor Carrier General Orders Rules and Regulations Pamphlet No. 2003

Arkansas

In 2015, the Arkansas Legislature enacted a statewide regulatory framework for TNC (SB 780 and SB 800). These laws gave the AR PSC the authority to permit and regulate TNCs in Arkansas.

- AR PSC Docket No. 15-052-R
- SB 800 became Arkansas Legislative Acts 1050 of 2015
- SB 780 became Arkansas Legislative Act 1267 of 2015
- The Arkansas TNC laws is codified at Ark. Code § 23-13-701 et seq.
- The Public Service Commission's TNC regulations are at 126.04.16-002 and were effective on 2/19/16.

California

The California Legislature has adopted requirements regarding TNC insurance (AB 2293) and participation in the Department of Motor Vehicles' employer pull notice program (i.e., checking driving records).

- TNC rulemaking proceeding: Rulemaking (R.)12-12-011. Decision 13-09-045 (in this proceeding) established the first set of TNC rules in California. Decision 16-04-041 (adopted 4/21/16) modified the TNC rules.
- Additional requirements for passenger carriers that engage primarily in transporting minors: Decision 97-07-063.
- Passenger Charter-party Carriers' Act: CA Public Utilities Code §5351-5444
- TNC insurance requirements: CA Public Utilities Code §5430-5443
- TNC Employer Pull Notice requirement: CA Public Utilities Code §5444
- Terms of settlement between Uber and CA PUC's Safety and Enforcement Division for Uber TCP service: Accessible at <http://www.cpuc.ca.gov/General.aspx?id=4317>

Colorado

In 2014, the Colorado Legislature passed SB 125 governing TNC operations in the state.

- Colorado Revised Statutes 40-10.1, Part 6
- Code of Colorado Regulations (CCR) 4CCR-723-6

Montana

The 2015, the Montana Legislature changed the laws for Motor Carriers in the State of Montana by passing SB 396, which created a separate motor carrier class for TNCs.

- §69-12-340, MCA - Title 69, Chapter 12, Montana Code Annotated (2015).

Nebraska

In 2015, the Nebraska Legislature passed LB 629 governing TNC operations in the state.

- TNC Act is codified in Chapter 75, Section 324 of the Revised Statutes.
- The NE PSC's TNC regulations are in Title 291, Chapter 3 of the Nebraska Administrative Code.

Nevada

Nevada passed legislation in 2015 to regulate TNCs.

- AB 176 of the 78th (2015) Session of the Nevada Legislature, now codified into the Nevada Revised Statutes at 706A.
- TNC Regulations LCB File No. R029-15, now codified at NAC 706A and amended in 2016.

Ohio

On December 9, 2015, Ohio passed HB 237 to regulate TNCs. HB 237 was signed into law on December 22, 2015, and became effective on March 23, 2016.

- Sub. H.B. 237 as codified in sections 3938.01-3938.04, 4925.01-4925.10 of the Revised Code.

Pennsylvania

Pennsylvania adopted legislation (SB 984) governing TNC operations in November 2016. SB 984 became Act 164 when the Governor of Pennsylvania signed it into law. Act 164 authorizes TNCs to operate under the jurisdiction of the PPA in Philadelphia and under the jurisdiction of the PUC in the remainder of Pennsylvania. Prior to Act 164, the PUC and the PPA regulated TNCs on a case-by-case basis.

- Pennsylvania Act 164: Act of November 4, 2016, P.L. 1222, No. 164 (Session of 2016; No. 2016-164)
- PA PUC Implementation Order of Act 164 of Chapter 26: PA PUC Docket No. L-2016-2574379
- Raiser-PA Experimental Authority proceeding: PA PUC Docket Nos. A-2014-2424608 and A-2014-2416127
- Lyft Experimental Authority proceeding: PA PUC Docket Nos. A-2014-2415047 and A-2014-2415045
- Rulemaking to Eliminate the "Need" Requirement: PA PUC Docket No. L-2015-2507592
- Rulemaking to Change the Vehicle Age/Mileage Limit: PA PUC Docket No. L-2013-2349042
- Experimental Authority for Motor Carriers: 52 Pa. Code §§ 29.352

Washington

In 2015, the Washington Legislature passed SB 5550, which amended the Revised Code of Washington (RCW) to address, on a statewide basis, insurance requirements for TNCs.

- Commercial trans. Providers RCW 46.72, RCW 48, RCW 48.22.030, RCW 48.22.085, RCW 48.22.095, RCW 51.12.020, RCW 51.12.185
- SB 5550 amended the Revised Code of Washington to address, on a statewide level, insurance requirements for TNCs (RCW 48.177).

3. Taxes and Assessments

State licensure fees, taxes, and/or assessments have been imposed on TNCs in certain states to compensate for the cost of legislative and regulatory oversight of TNC service. The following represents the taxes and/or assessments imposed by each of the survey states.

Alabama

There are no TNC specific taxes or assessments in Alabama. All motor carrier applicants pay a one-time application fee of \$100.

Arkansas

TNCs pay an annual permit fee of \$15,000 to the AR PSC. The TNCs have also negotiated fees with airports.

California

All TCPs, including TNCs, are required to remit one-third of one percent of gross intrastate revenues to the CA PUC Transportation Reimbursement Account (PUCTRA fees). Licensing fees are \$1,000 for new permits and \$100 to renew. TNC must renew their licenses every 3 years.

Colorado

TNCs pay an annual fee of \$111,500 to renew their permit. These fees offset the cost of regulating TNCs.

Montana

TNCs pay a \$500 application fee, of which, \$300 is refunded if no hearing occurs.

Nebraska

TNCs pay an annual fee of \$25,000 to the NE PSC on or before January 1st of each year. TNCs can choose to pay either a flat fee or a per-vehicle fee.

Nevada

TNCs pay a regulatory assessment of an amount calculated at a rate of 1 percent of the TNC's intrastate, gross operating revenue. TNCs must provide an annual statement to the NTA of its gross operating revenue derived from the NV intrastate operations of the TNC for each year of operation. (AB 176, sec. 50; and TNC regulations LCB File R029-15, Sec. 20). The assessment regulation was amended in late 2016 (LCB File R136-16) to create a tiered payment structure (which removes the reporting of actual gross operating revenue, and replaces it with a tiered range); aligned the timing of future annual assessment payments to the timing of the state fiscal year (to minimize or eliminate the need for bridge funding when a new fiscal year begins);

and proposed a format for the TNC annual reports to be filed by May 15th of each year under NRS 706A.270.

A 3% excise tax is imposed on the use of a digital network or software application service of a TNC to connect a passenger to a driver for the purpose of providing passenger transportation.

Ohio

The TNC must submit an annual license fee of \$5,000.00. The license is good for one year commencing on the date of issuance.

Pennsylvania

TNCs pay assessments to the PA PUC and the PPA based on reported gross revenues in the relevant jurisdiction.

Washington

Outside of registering with the Department of Licensing for insurance purposes, taxes and assessments for TNCs are assessed at the city level in Washington.

ii. Driver Safety

1. Criminal Background Checks

There is inherently a potential for crime to occur when providing transportation service to the public for compensation. As a result, many states require TNC drivers to complete a criminal background check prior to engaging in TNC service in order to ensure the safety of the traveling public.

Fingerprinting of TNC drivers as a prerequisite to that driver engaging in TNC service is not mandatory in most states. However, fingerprinting of TNC drivers is a topic that has been widely discussed and debated in the transportation arena as a potential added passenger safety protection. The following represents the criminal background check and fingerprinting laws and rules adopted by each of the survey states.

Alabama

There are no TNC specific background check rules at the state level.

Arkansas

In Arkansas, TNCs must conduct, or have a third party conduct, a state and national criminal background check for each applicant that includes searching: (1) a multistate and

multijurisdictional criminal records locator or other similar commercial nationwide database with validation of primary source searches; and (b) the National Sex Offender Registry database. Arkansas does not require the fingerprinting of TNCs drivers at the state level.

An applicant driver is disqualified if he/she has had more than three moving violations or one major violation within the previous three years or has been convicted within the past seven years of driving under the influence of drugs or alcohol, fraud, a sexual offense, using a motor vehicle to commit a felony, or a crime involving property damage, theft, acts of violence, or acts of terror; or is a match in the National Sex Offender Registry database.

California

The CA PUC requires TNCs to conduct criminal background checks prior to allowing a driver on the digital platform. The background checks performed include the national criminal background check including the National Sex Offender Registry database. In conducting the background check, the TNC must use the applicant's social security number and not just the applicant's name.

Any felony criminal conviction within seven years prior to the date of the background check for driving under the influence of drugs or alcohol, fraud, use of a motor vehicle to commit a felony, a violent crime or act of terror, a sexual offense, a crime involving property damage, and/or theft will make the applicant ineligible to be a TNC driver.

The CA PUC does not currently require fingerprinting as part of a background check for TNC drivers. One exception is that all passenger carriers (including TNCs) that engage primarily in transporting unaccompanied minors must undergo a fingerprint background checks. Additionally, as of January 2017, the CA PUC has a proceeding underway to analyze whether additional background check requirements, including fingerprinting should be mandated for all TNC drivers

Colorado

Before permitting an individual to act as a driver in Colorado, a TNC must conduct a national criminal history record check, including a check of the National Sex Offender Registry database. The record check must be repeated at least once every five years while serving as a driver. TNCs have the option of submitting their drivers to a fingerprint based check or using a privately administered check.

Montana

Neither Montana law nor the MT PSC rules require criminal background checks for TNC drivers. Montana does not require the fingerprinting of TNCs drivers.

Nebraska

TNCs must conduct a national criminal history background check which must be at least as comprehensive as a criminal background check performed by the FBI. Fingerprinting is not required. The background check must be performed prior to permitting a person to act as a driver for the TNC. The background check can be performed by a third party.

Nevada

In Nevada, TNCs must require potential drivers to submit an application for employment to the TNC. At the time of application and not less than once every 3 years after, TNCs must conduct or contract with a third party to conduct an investigation of the criminal history of the applicant, which must include: (1) a review of a commercially available database containing criminal records from each state which are validated using a search of the primary source of each record; and (2) a search of a database containing the information available in the sex offender registry maintained by each state. (NRS 706A.160(2)). The provisions of NRS 706A do not require fingerprint or biometric background checks for TNC driver-partners in Nevada.

Ohio

TNCs in Ohio must: (1) conduct a background check on an applicant seeking to become a TNC driver; and (2) obtain and review a driver history report for the person. The background check must include a check of the multi-state/multi-jurisdiction criminal records database, as well as a search of the U.S. Department of Justice's National Sex Offender Registry database. Ohio does not require the fingerprinting of TNC drivers at this time.

Pennsylvania

TNCs must conduct or have a third party conduct a local and national criminal background check for each driver applicant. The background check shall include a multistate or multijurisdictional criminal records locator or other similar commercial nationwide database with primary source search validation and a review of the United States Department of Justice National Sex Offender Registry database. TNCs must disqualify an applicant convicted of certain crimes in accordance with the following:

- (A) An applicant convicted of any of the following within the preceding 7 years:
 - (I) Driving under the influence of drugs or alcohol.
 - (II) A felony conviction involving theft.
 - (III) A felony conviction for fraud.
 - (IV) A felony conviction for a violation of the act of April 14, 1972 (P.L.233, No.64), known as The Controlled Substance, Drug, Device and Cosmetic Act.

- (B) An applicant convicted of any of the following within the preceding 10 years:
 - (I) Use of a motor vehicle to commit a felony.
 - (II) Burglary or robbery.

- (C) An applicant convicted of any of the following at any time:
- (I) A sexual offense under 42 Pa.C.S. § 9799.14(c) or (d) (relating to sexual offenses and tier system) or similar offense under the laws of another jurisdiction or under a former law of this Commonwealth.
 - (II) A crime of violence as defined in 18 Pa.C.S. § 5702 (relating to definitions).
 - (III) An act of terror.

TNCs must conduct criminal background checks one year after engaging a TNC driver and every second year thereafter to verify that a TNC driver continues to be a driver. Pennsylvania does not have any fingerprinting requirements for TNC drivers.

Washington

No criminal background checks are required for TNC drivers at the state level in Washington, nor does Washington have any fingerprinting requirements for TNC drivers at the state level.

2. Driving History Record Check

Many states require TNC drivers to undergo a private or state-administered motor vehicle record check. In addition to driver history checks, certain states have required additional TNC-administered driver checks, including, but not limited to: driver training programs, minimum-age requirements, and medical verifications. The following represents the driver history record check requirements adopted by each of the survey states.

Alabama

There no TNC specific driving history record check rules in Alabama. The general rules applicable to all motor carriers apply to TNCs. Motor carriers may not permit persons convicted of certain motor vehicle related offenses from driving a motor vehicle within 1 year, 3 years, or 10 years of the conviction, depending on the circumstances.

Arkansas

In Arkansas, an applicant driver is disqualified if he/she has had more than three moving violations or one major violation within the previous three years or has been convicted within the past seven years of driving under the influence of drugs or alcohol, fraud, a sexual offense, using a motor vehicle to commit a felony, or a crime involving property damage, theft, acts of violence, or acts of terror.

TNC drivers must possess a valid driver's licenses, proof of registration, proof of liability insurance, and be at least 19 years old.

California

A TNC must check an applicant's driving history record prior to allowing a driver on the platform, and must enroll active drivers in the California DMV's employer pull notice program for notification of changes to a driver's record.

A driver may have (1) no more than 3 points within the preceding 3 years; (2) no "major violations" (reckless driving, hit and run, or driving with a suspended license conviction) within the preceding 3 years; and (3) no driving under the influence conviction within the past 7 years.

TNC drivers must also complete a driver training program. TNC drivers are required to provide proof of both their personal insurance and the commercial insurance in the case of an accident.

Colorado

Before permitting an individual to act as a driver in Colorado, the TNC must obtain and review a driving history research report, which at a minimum includes any moving violations within the United States for the three year period preceding the individual's application. An individual with more than three moving violations, or a major moving violation (including vehicular eluding, reckless driving, and driving under restraint) within the three year period preceding the individual's application, shall not serve as a driver. A TNC must obtain and review a driving history research report for each driver at least once every 12 months.

A TNC shall not permit a person to act as a driver unless the person is at least 21 years of age; has a valid driver's license; is medically qualified to drive as required by rule 6713; and is not disqualified to drive based on the results of the driving history research report required by rule 6711 or the criminal history record check required by rule 6712.

Montana

The MT PSC may audit a TNC, but not more than twice annually. The MT PSC can request, and the TNC must provide, up to 1,000 unique identification numbers corresponding to individual TNC drivers. The MT PSC may then obtain from the TNC copies of records held by the TNC for up to 10 drivers, identified only by identification number.

Nebraska

TNC drivers in Nebraska must pass a motor vehicle record check, which can be performed by a third party. Four or more moving traffic violations or one or more major traffic violations in 3 years prior to the date of the background check disqualifies a person from serving as a driver. Major traffic violations include failure to stop and report or render aid, reckless driving, speeding of more than 35 mph over the limit, and failure to yield to a pedestrian resulting in bodily injury to a pedestrian. Additionally, convictions, guilty pleas or *nolo contendere* to

driving under the influence in previous 7 years in Nebraska or any other state or use of a motor vehicle to commit a felony will disqualify a person from serving as a driver.

TNC drivers must be at least 21 years old, possess a valid driver's license, proof of registration, and proof of automobile liability insurance. Drivers cannot have been convicted, plead guilty or nolo contendere to any offense involving fraud, a crime involving property damage, theft, acts of violence, acts of terror, or be required to register as a sex offender.

Nevada

A record of the driving history of the applicant must be included in the potential driver's initial employment application to the TNC.

A TNC may enter into an agreement with a driver if: (1) in the 3 years immediately preceding the date on which the application is submitted, the applicant has not been found guilty of three or more violations of the motor vehicle laws of Nevada or any traffic ordinance of any city or town, the penalty prescribed for which is a misdemeanor; (2) in the 3 years immediately preceding the date on which the application is submitted, the applicant has not been found guilty of any violation of the motor vehicle laws of Nevada or any traffic ordinance of any city or town, the penalty prescribed for which is a gross misdemeanor or felony; (3) in the 7 years immediately preceding the date on which the application is submitted, the applicant has not been found guilty of any violation of federal, state or local law prohibiting driving or being in actual physical control of a vehicle while under the influence of intoxicating liquor or a controlled substance; (4) in the 7 years immediately preceding the date on which the application is submitted, the applicant has not been found guilty of an act of terrorism, an act of violence, a sexual offense, fraud, theft, damage to property of another or the use of a motor vehicle in the commission of a felony. (NRS 706A.160(f), (g), (h) and (i))

TNC drivers must possess a valid Nevada driver's license unless the applicant meets a certain exemption on Nevada law, proof of registration, proof of insurance, and must be at least 19 years old. A TNC driver shall not be on call for more than 16 cumulative hours within a period of 24 consecutive hours. A TNC driver shall not provide transportation services for more than 12 cumulative hours within a period of 24 consecutive hours.

Ohio

In Ohio, TNCs must obtain and review a driver history report for a potential TNC driver.

TNCs must refuse any applicant that (1) within the past three years, the person has been convicted of, or pleaded guilty to, more than three violations of the laws related to any of the following: physical control of a motor vehicle while under the influence, texting while driving, speeding, street racing, unsafely passing another vehicle, driving left of center, failure to signal, failure to yield the right-of-way to a pedestrian, driving on a sidewalk, or failure to stop for a school bus; (2) within the past three years, the person has been convicted of, or pleaded guilty

to, any serious vehicle-related offense, including a violation of the laws regarding: evading the police in a motor vehicle, driving under a suspended license, operating a motor vehicle without a valid license, or operating a vehicle in willful or wanton disregard of the safety of persons or property; (3) within the past seven years, the person has been convicted of, or pleaded guilty to, any of the following: operating a vehicle under the influence of drugs, alcohol, or a combination of both; the commission of any felony offense while operating, or being a passenger in, a motor vehicle; a theft or fraud offense; a property damage offense; a sex offense; a specified offense of violence; or a specified act of terrorism; (4) a search of the U.S. Department of Justice National Sex Offender Registry database indicates that the person is identified as a sex offender.

TNC drivers must be 19 years or older, possess a valid driver's license, possess a valid certification of motor vehicle registration, and possess automobile liability insurance (unless the TNC provides insurance on behalf of the driver).

Pennsylvania

TNCs must obtain and review a driving history research report for the person from the Pennsylvania Department of Transportation and other relevant sources. A person with more than three moving violations in the three-year period prior to the check, or a major violation in the three-year period prior to the check, may not be a TNC driver.

TNCs must conduct driver history research reports one year after engaging a TNC driver and every second year thereafter to verify that a TNC driver continues to be eligible to be a driver.

TNC drivers must possess a valid driver's license, proof of vehicle registration, proof of the driver's motor vehicle insurance, and be at least 21 years of age.

Washington

No driving history record check is required for TNC drivers at the state level in Washington.

3. Drug or Alcohol Policies

To adequately ensure the safety of the traveling public, most states actively regulating TNC service have enacted "zero-tolerance" drug or alcohol policies for TNC drivers. The following represents the drug or alcohol policies adopted by each survey state for TNC drivers.

Alabama

There are no TNC specific drug or alcohol rules at the state level. All motor carriers are prohibited from allowing persons under the influence of drugs/alcohol to operate a motor vehicle.

Arkansas

TNCs must implement, enforce and maintain a zero-tolerance policy prohibiting drivers from providing TNC service while under the influence of drugs and alcohol.

California

In California, a TNC must have a zero-tolerance policy prohibiting drivers from providing TNC service while under the influence of drugs and alcohol. TNCs websites, mobile applications, and riders' receipts must include notice or information on the TNCs' zero-tolerance policies and the methods to report a suspected driver. TNCs' websites and mobile applications must also include a phone number, or in-app call function, and email address to report a zero-tolerance complaint. Zero-tolerance policies may include the CA PUC's passenger complaint phone number and email address. Finally, promptly after a zero-tolerance complaint is filed, the TNC shall suspend the driver for further investigation.

Colorado

In Colorado, TNCs must establish and enforce a policy prohibiting a driver from providing TNC service while under the influence of any drug or substance that would render the driver incapable of safely operating a vehicle.

Montana

Montana does not require TNCs to have drug or alcohol policies.

Nebraska

TNCs in Nebraska must have zero-tolerance policies regarding drugs and alcohol while the driver is providing service. These policies must be filed with the NE PSC.

Nevada

Effectively, TNCs in Nevada must have a zero-tolerance policy for drugs and alcohol. Specifically, a driver is prohibited from consuming, using or being under the influence of any intoxicating liquor or controlled substance during any period in which the driver is providing or is able to provide transportation services on behalf of the TNC. If the TNC receives a complaint from a passenger who reasonably believes that the driver is/was under the influence of a prohibited substance, the TNC must suspend the driver, and must terminate its agreement with the driver if, following an investigation, the TNC finds that the driver was indeed under the influence of a prohibited substance. (NRS 706A.290).

Ohio

Ohio legislation specifically prohibits all TNC drivers from logging into the TNC's digital network or providing TNC services while under the influence of any amount of alcohol or drug of abuse.

Pennsylvania

In Pennsylvania, TNCs must implement a zero-tolerance policy on the use of drugs or alcohol while a transportation network company driver provides transportation network service. A TNC driver who is the subject of a reasonable passenger complaint alleging a violation of the zero-tolerance policy shall be immediately suspended. The suspension shall last until the time the complaint investigation is complete. The following information shall be provided on a TNC's publicly accessible Internet website: (i) notice of the zero-tolerance policy and (ii) procedures to report a complaint about a TNC driver with whom the passenger was matched and whom the passenger reasonably suspects was under the influence of drugs or alcohol during the course of the ride.

Washington

No drug or alcohol prohibitions exist for TNC drivers at the state level in Washington.

iii. Vehicle Safety

1. Vehicle Inspections

To ensure that the public is traveling in safe vehicles, many state TNC laws and regulations require that vehicles used for TNC service undergo a safety inspection at regular intervals. In addition to vehicle safety inspections, some states have also imposed certain vehicle age and mileage requirements to add an additional layer of vehicle safety. The following represents the vehicle inspection requirements adopted by each of the survey states.

Alabama

There are no TNC specific inspection rules at the state level in Alabama. Inspections are not required of motor carriers in Alabama, but motor carriers must be in compliance with safety rules and are subject to random inspections. There is no age or mileage requirement for motor carriers, as long as vehicles meet safety requirements.

Arkansas

In Arkansas, TNC vehicles must complete an initial state Department of Transportation vehicle safety inspection within 90 days of beginning service. Each inspection must include an inspection of the foot and emergency brakes, suspension and steering, windshield, rear window, other glass, windshield wipers, headlights, tail lights, turn indicator lights, braking lights, front seat adjustment mechanism, doors, horn, speedometer, bumpers, muffler, exhaust, tires, rear view mirrors and safety belts of the vehicle, which ensure the proper functioning of each component. There is no vehicle age or mileage limitation on TNCs.

California

In California, vehicles must be inspected prior to allowing a vehicle to be driven as part of the TNC's service, and every 12 months or 50,000 miles thereafter, whichever occurs first. A facility licensed by the California Bureau of Automotive Repair shall conduct and ensure that each vehicle passes a 19-point vehicle inspection. California has no vehicle age or mileage limitation requirements applicable to TNCs, other than the 50,000 mile inspection.

Colorado

In Colorado, TNC vehicles must pass a 19-point inspection prior to approval for use on a TNC digital network. Periodic inspections at intervals of at least one inspection per year are also required. CO PUC inspectors conduct random vehicle inspections throughout the year. Colorado has no vehicle age or mileage limitations on TNCs.

Montana

Vehicle inspections are not required for TNCs in Montana. Montana has no vehicle age or mileage limitations on TNCs.

Nebraska

In Nebraska, vehicles must have an initial safety inspection prior to use for the TNC. Thereafter, vehicle inspections are performed annually. Nebraska has no vehicle age or mileage limitations on TNCs.

Nevada

In Nevada, a TNC must inspect or cause to be inspected every vehicle used by a driver to provide transportation services before allowing the driver to use the vehicle to provide transportation services. Additional inspections must be conducted not less than once each year thereafter. Each inspection must include an inspection of the foot and emergency brakes, steering, windshield, rear window, other glass, windshield wipers, headlights, tail lights, turn indicator lights, braking lights, front seat adjustment mechanism, doors, horn, speedometer, bumpers, muffler, exhaust, tires, rear view mirrors and safety belts of the vehicle which ensures the proper functioning of each component. (NRS 706A.180).

Nevada has no vehicle age or mileage limitations on TNCs.

Ohio

The Ohio TNC legislation does not require specific vehicle inspections for TNCs. However, statewide automobile safety requirements are applicable to TNCs. Ohio has no vehicle age or mileage limitations on TNCs.

Pennsylvania

In Pennsylvania, TNC vehicles must obtain an annual certificate of inspection under 75 Pa.C.S. Ch. 47 (relating to inspection of vehicles) from an inspection station approved by the Department of Transportation under 67 Pa. Code Ch. 175 (relating to vehicle equipment and

inspection) for each personal vehicle. A valid certificate of inspection shall be maintained in all vehicles. For a vehicle registered outside of Pennsylvania, inspection must be conducted by a facility approved by the Department of Transportation.

TNCs must ensure that its drivers' vehicles remain in continuous compliance with the personal vehicle requirements of Act 164 and PA PUC vehicle standards and are subject to periodic inspections according to Department of Transportation inspection standards. TNCs must keep records of these inspections for at least 3 years.

PA PUC officers may inspect a personal vehicle if there is reason to believe that the vehicle is not in compliance with the PA PUC's vehicle standards to ensure compliance with Act 164's personal vehicle requirements.

No vehicle being used to provide TNC service may be older than 10 model years old or 12 model years if the vehicle is an alternative fuel vehicle as defined in section 2 of the act of November 29, 2004 (P.L.1376, No.178), known as the Alternative Fuels Incentive Act, and has been driven no more than 350,000 miles. Both the PA PUC and the PPA have the authority to adjust or increase this limitation by regulation or order.

Washington

Safety inspections of TNC vehicles are not required at the state level. Washington has no vehicle age or mileage limitations on TNCs at the state level.

2. Trade Dress

In order for the traveling public to adequately identify vehicles providing TNC service, some states require certain markings or displays on vehicles used in TNC service. These markings or displays, known as "trade dress," provide a signal to the passenger that the vehicle has been properly licensed to lawfully provide TNC service. The following represents the trade dress requirements adopted by each of the survey states.

Alabama

There are no TNC specific trade dress rules at the state level in Alabama. However, all motor carrier vehicles must be properly marked.

Arkansas

Arkansas does not have any trade dress requirements for TNCs. However, The TNC app must display for the passenger: (1) a picture of the driver; and (2) the license plate number of the vehicle used.

California

In California, TNC vehicles shall display consistent trade dress (i.e., distinctive signage or display on the vehicle) in the front and rear of the vehicle when providing TNC services that is sufficiently large and color contrasted as to be readable during daylight hours at a distance of at least 50 feet. The trade dress shall be sufficient to allow a passenger, government official, or member of the public to associate a vehicle with a particular TNC (or licensed transportation provider). Acceptable forms of trade dress include, but are not limited to, symbols or signs on vehicle doors, roofs, or grills, or placed in the front and rear windshields. Magnetic or removable trade dress is acceptable. TNCs shall file a photograph of their trade dress with the Safety and Enforcement Division of the CA PUC.

In addition, the TNC app must display for the passenger: 1) a picture of the driver, and 2) a picture of the vehicle the driver is approved to use, including the license plate number to identify the vehicle.

Colorado

In Colorado, a TNC shall require that a driver displays the TNC's marking or decal in or on the personal vehicle while logged in to a TNC's digital network. The TNC shall file with the CO PUC a description and location of vehicle markings that drivers are required to display. Vehicle marking shall be readily visible during daylight hours from the front or passenger side of the vehicle at a distance of 50 feet, but in no case be less than three inches tall.

Montana

Montana does not have any trade dress requirements for TNCs.

Nebraska

Nebraska does not have any trade dress requirements for TNCs.

Nevada

In Nevada, TNC vehicles must have affixed to the lower passenger-side corner of the windshield an inconspicuous, nontransferable decal which identifies the permit number of the TNC with which the vehicle is affiliated. Additionally, while a driver is on call, the driver's vehicle must bear the trade dress of the TNC. (NAC 706A.240).

TNCs must provide a passenger, prior to the passenger entering the vehicle of a TNC driver, with a photo of the driver and the license plate of the driver's vehicle.

Ohio

In Ohio, the TNC must provide: (1) a photograph of the TNC driver and the license plate number of the vehicle on the digital platform; and (2) the name of the TNC must be prominently displayed on the vehicle.

Pennsylvania

In Pennsylvania, all TNC vehicles must display a PUC-approved removable placard or decal provided by the TNC on the automobile at any time the driver is logged on to the digital network or is offering or providing a prearranged ride under Chapter 26 of Act 164. Placards or other markings must be clearly distinguishable to identify that a particular vehicle is associated with a particular TNC and be sufficiently large and color contrasted to be readable during daylight hours at a distance of at least 50 feet.

Washington

Washington does not have any trade dress requirements for TNCs at the state level.

3. Definition of “Personal Vehicle”

A primary distinction between traditional taxicab service and TNC service is the use of personal vehicles. Traditionally, taxicab companies own the vehicles used to provide the service and lease them to the driver. However, the TNC model uniquely allows the driver to use his or her own personal vehicle to provide rides to the public. The following represents the personal vehicle ownership requirements for TNC service in each of the survey states.

Alabama

Alabama state law defines a “personal vehicle” as “[a] vehicle that meets both of the following criteria: (a) is used by a TNC driver to provide a prearranged ride; (b) is owned, leased, or otherwise authorized for use by a TNC driver.” Ala. Code § 32-7C-1.

Arkansas

Arkansas state law defines as a vehicle that is used by a TNC driver in connection with providing a prearranged ride and is (a) owned, leased, or otherwise authorized for use by a TNC driver; and (b) is not a taxicab, limousine, or for-hire vehicle. Ark. Code § 23-13-702.

California

In 2016, the California Legislature adopted AB 2763, which defined “personal vehicles” broadly, as those that are (1) owned; (2) leased; (3) rented for a term that does not exceed 30 days; or (4) otherwise authorized for use by the participating driver. In December 2016, the CA PUC issued a decision implementing that legislation, which went into effect January 1, 2017.

Colorado

Colorado state law defines a personal vehicle as “one that is used by a TNC driver in connection with providing TNC services.” In addition, a personal vehicle must meet certain requirements such as it must have at least four doors and be designed to carry no more than eight passengers, including the driver, have a valid Colorado registration, and pass an annual safety inspection.

Montana

Montana does not have a definition of “personal vehicle” for the purposes of TNC service. However, a TNC may not own, control, operate or manage the vehicles used by TNC drivers, and must not be a taxicab association or a for-hire vehicle owner.

Nebraska

The Neb. Rev. Stat. §75323(7) states that a “personal vehicle” is a passenger car as defined in section 60-345 that a driver owns, leases, or is otherwise authorized to use to provide services on a transportation network company's online-enabled application or platform.

Nevada

In Nevada, a transport vehicle must have no less than 4 doors, cannot be designed to carry more than 7 passengers plus the driver, must not be a tractor, mobile home, recreational vehicle, semitractor, semitrailer, trailer, bus, motorcycle or tow car, and must comply with all federal, state and local laws concerning operation and maintenance of a vehicle. (NRS 706A.180). "Driver" is defined as a natural person who operates a motor vehicle owned, leased or otherwise authorized for use by the person. (NRS 706A.040).

Ohio

In Ohio, a “personal vehicle” means a vehicle to which all of the following apply: (1) the vehicle is used by a TNC driver; (2) the vehicle is owned, leased, or otherwise authorized for use by the transportation network company driver; (3) the vehicle is not a taxicab or other similar vehicle for hire, unless the vehicle is being used to provide TNC services on behalf of a TNC that has been issued a permit under section 4925.02 of the Revised Code; (4) the vehicle is not a chauffeured limousine or a vehicle being operated pursuant to a ridesharing arrangement.

Pennsylvania

Under Act 164, "personal vehicle" is defined as: (1) a vehicle that is used by a TNC driver and is owned, leased or otherwise authorized for use by the TNC driver or (2) a vehicle operated in a shared-expense arrangement where an individual receives reimbursement that does not exceed the actual costs incurred while providing transportation. The term “personal vehicle” does not include:

- (i) a call or demand service or limousine service (as defined under Act 164);

(ii) a paratransit service regulated by the Pennsylvania PA PUC under 52 Pa. Code §§ 29.353 (relating to method of operation in paratransit service), 29.354 (relating to vehicle and equipment requirements: paratransit service) and 29.355 (relating to tariff requirements); or

(iii) a vehicle operated under a ridesharing arrangement or by a ridesharing operator as defined under the act of December 14, 1982 (P.L.1211, No.279), entitled "An act providing for ridesharing arrangements and providing that certain laws shall be inapplicable to ridesharing arrangements."

Washington

In Washington, "personal vehicle" means a vehicle that is used by a commercial transportation services provider driver in connection with providing services for a commercial transportation services provider and that is authorized by the commercial transportation services provider. Since a "personal vehicle" is one that is "authorized" by a commercial transportation provider, and TNCs are commercial transportation providers, TNC vehicles may be owned or leased by the TNC.

iv. Insurance Levels and Types

Requiring TNCs to maintain adequate insurance is paramount to protecting the traveling public. In order to clearly and definitively ensure that TNCs possess adequate insurance coverage, many states have broken down TNC service into specific stages. Each stage of TNC service – from the time the TNC mobile application is opened by a driver – to when a TNC driver has made a passenger match on the mobile application – to when the passenger enters the TNC vehicle – represents a critical and distinctive point of TNC service requiring a corresponding level of insurance coverage. The following represents the insurance coverage requirements for certain stages of TNC service adopted by each of the survey states.

Alabama

In 2016, the Alabama Legislature established insurance levels for TNCs in SB 262.

The legislation provides that when a TNC driver has not opened the TNC app and is not providing TNC service, the vehicle is insured by the driver's personal automobile liability insurance that meets state financial responsibility requirements.

When a TNC driver is logged onto the digital network of a TNC and is available to receive transportation requests, but is not engaged in a prearranged ride, the TNC driver, or TNC on the driver's behalf, must maintain primary automobile liability insurance coverage of \$50,000 for death or bodily injury per person, \$100,000 for death or bodily injury per incident, and \$25,000 for property damage; uninsured/underinsured limits of \$25,000/\$50,000/\$25,000, but can be rejected by named insured. Ala. Code § 32-7C-2.

When a driver is engaged in a “prearranged ride”, the TNC driver, or the TNC on the driver’s behalf, must maintain automobile liability insurance coverage of at least \$1,000,000 for death, bodily injury, and property damage per accident; uninsured/underinsured limits of \$25,000/\$50,000/\$25,000 but can be rejected by named insured. Ala. Code § 32-7C-2. The legislation defines a “prearranged ride” as the provision of transportation by a TNC driver to a TNC rider, beginning when the TNC driver accepts a ride requested by a TNC driver through a digital network controlled by a TNC, continuing while the TNC driver transports the requesting TNC rider, and ending when the last requesting TNC rider departs from the personal vehicle of the TNC driver.

In all stages of TNC service, TNCs must inform drivers of the insurance coverage provided in all stages and that coverage may not be available under a driver’s own policy. TNCs must disclose that the driver must notify any lienholder if he/she is using the vehicle for this purpose. Ala. Code § 32-7C-3.

Arkansas

In 2015, the Arkansas Legislature passed SB 780 and SB 800 setting forth the following insurance requirements for TNCs:

When a TNC driver has not opened the TNC app and is not providing TNC service, the vehicle is insured by the driver’s personal automobile liability insurance that meets state financial responsibility requirements.

When a TNC driver has the app open and is waiting for a match, the TNC driver, or the TNC on the driver’s behalf, must maintain \$50,000/\$100,000/\$25,000 of primary automobile liability insurance coverage. Coverage requirement may be satisfied by driver, the TNC or combination.

While a driver is engaged in TNC services, the TNC driver, or the TNC on the driver’s behalf, must maintain \$1 million of primary liability coverage per incident for death, bodily injury, and property damage.

In all stages of TNC service, a TNC must disclose in writing to TNC drivers, the insurance coverage, including the types of coverage and the limits for each coverage, that the TNC provides while the TNC driver uses a personal vehicle in connection with a TNC's digital network; and that the TNC driver's own automobile insurance policy might not provide any coverage while the TNC driver is logged on to the TNC’s digital network and is available to receive prearranged ride requests or is engaged in a prearranged ride, depending on the terms of the insurance policy.

California

In 2014, the California Legislature passed AB 2293, setting forth the following insurance requirements for TNCs:

When a TNC driver has not opened the TNC app and is not providing TNC service, the vehicle is insured by the driver's personal automobile liability insurance that meets state financial responsibility requirements.

When a TNC driver has the app open and is waiting for a match, the TNC driver, or the TNC on the driver's behalf, must maintain \$50,000/\$100,000/\$30,000 of primary automobile liability insurance coverage, and \$200,000 excess liability (per occurrence).

When a driver has made a match and is driving to pick up the passenger, the TNC driver, or the TNC on the driver's behalf, must maintain \$1 million of primary liability coverage per incident.

When a driver has TNC passengers in the car, The TNC driver, or the TNC on the driver's behalf, must maintain \$1 million of primary liability coverage per incident and \$1 million of uninsured/underinsured motorist coverage per incident.

In all stages of TNC service, TNCs must inform drivers of the insurance coverage and limits of liability. TNCs must also disclose that drivers' personal insurance will not provide collision or comprehensive coverage while drivers provide TNC services.

Colorado

In 2014, the Colorado Legislature passed SB 125 setting forth the following insurance requirements for TNCs:

When a TNC driver has not opened the TNC app and is not providing TNC service, the vehicle is insured by the driver's personal automobile liability insurance that meets state financial responsibility requirements.

When a TNC driver has the app open and is waiting for a match, the TNC driver, or the TNC on the driver's behalf, must maintain minimum coverage of \$50,000 per person per accident; \$100,000 to all persons per accident; and \$30,000 for property damage in any one accident.

When the TNC driver is engaged in a "prearranged ride," a TNC driver, or the TNC on the driver's behalf, must maintain at least \$1 million primary liability insurance coverage per incident. "Prearranged ride" means a period of time that begins when a driver accepts a requested ride through a digital network, continues while the driver transports the rider in a personal vehicle, and ends when the rider departs from the personal vehicle.

In all stages of TNC service, TNCs must inform drivers that coverage may not be available under the driver's own policy. TNCs must disclose that a driver must notify any lienholder that he/she is using the vehicle for this purpose.

The TNC's insurance provider must provide evidence of insurance to the CO PUC by submitting PUC prescribed Form T (\$1M) and Form P (\$50K/\$100K/\$30K).

Montana

In 2015, the Montana Legislature passed SB 396, setting forth the following insurance requirements for TNCs:

When a TNC driver has not opened the TNC app and is not providing TNC service, the vehicle is insured by the driver's personal automobile liability insurance that meets state financial responsibility requirements.

When a TNC driver has the app open and is waiting for a match, the TNC driver, or the TNC on the driver's behalf, must maintain primary motor vehicle liability insurance in the amount of at least \$50,000 for death and bodily injury per person, \$100,000 for death and bodily injury per incident, and \$25,000 for property damage. Also, uninsured/underinsured limits of \$25,000/\$50,000/\$20,000, but can be rejected by named insured.

When a TNC driver is engaged in a prearranged ride, the TNC driver, or the TNC on the driver's behalf, must maintain primary motor vehicle liability insurance of at least \$1,000,000 for death, bodily injury, and property damage per incident, as well as uninsured and underinsured limits of \$25,000/\$50,000/\$20,000, but can be rejected by the named insured.

In all stages of TNC service, TNCs shall disclose in writing to a driver the following before the driver is allowed to accept a request for a prearranged ride on the TNC's digital network: (1) the insurance coverage, including the types of coverage and the limits for each coverage, that the TNC provides while the driver is using a personal vehicle in connection with the TNC's digital network; and (2) that the driver's personal motor vehicle liability insurance policy might not provide any liability or optional coverages while the driver is logged on to the TNC's digital network and is able to receive transportation requests or is engaged in a prearranged ride, depending on its terms.

Nebraska

In 2015, the Nebraska Legislature passed LB 629, setting forth the following insurance requirements for TNCs:

When a TNC driver has not opened the TNC app and is not providing TNC service, the vehicle is insured by the driver's personal automobile liability insurance that meets state financial responsibility requirements.

When a TNC driver has the app open and is waiting for a match, the TNC driver, or the TNC on the driver's behalf, or some combination of the two, must maintain primary minimum coverage

of \$50,000/\$100,000/\$25,000, plus uninsured/underinsured motorist coverage of \$25,000/\$50,000.

While a driver is engaged in TNC services, the TNC driver, or the TNC on the driver's behalf, must maintain primary liability coverage of \$1 million, plus underinsured/uninsured motorist coverage of \$25,000/\$50,000.

In all stages of TNC service, TNCs must inform drivers of the insurance coverage availability, liability limits, and any deductible amounts provided in all stages; and inform driver that personal auto insurance does not provide coverage while on the TNC platform unless an amendment or endorsement is offered. TNCs must disclose that the driver must notify any lienholder if he/she is using the vehicle for this purpose. TNCs must also disclose that the driver is responsible to know the law/regulations governing the services he/she will provide.

Drivers must carry proof of TNC insurance.

TNCs must file a certificate of insurance with the NE PSC.

Nevada

In 2015, the Nevada Legislature passed AB 175, setting forth the following insurance requirements for TNCs:

When a TNC driver has not opened the TNC app and is not providing TNC service, the vehicle is insured by the driver's personal automobile liability insurance that meets state financial responsibility requirements.

When a TNC driver has the app open and is waiting for a match, the TNC driver or the TNC must maintain \$50,000 in bodily injury or death of one person in any one accident; \$100,000 in bodily injury or death of two or more persons in any one accident; \$25,000 for injury to or property destruction in anyone one accident. The TNC may also provide additional coverage, including without limitation coverage for medical payments, uninsured, underinsured motorists, comprehensive and collision. (NRS 690B.470).

While a driver is engaged in TNC services, the TNC driver or the TNC must maintain not less than \$1,500,000 of primary automobile liability insurance for bodily injury or death of one or more persons, or property destruction of others in any one accident. TNC may also provide additional coverage, including without limitation coverage for medical payments, uninsured, underinsured motorists, comprehensive and collision. (NRS 690B.470).

In all stages of TNC service, before connecting a potential passenger to the digital network or software application the TNC must: (1) disclose the insurance coverage and limits of liability the TNC provides for the driver while providing transportation services; (2) notify the potential passenger that the driver's insurance, otherwise required for operating a motor vehicle, may

not provide coverage for providing transportation services (this could also apply to any additional purchased comprehensive or collision insurance); and (3) disclose to the potential passenger if there is lien on the motor vehicle providing the transportation service and that providing the transportation might violate the contract between the lienholder and driver. (NRS 690B.460).

Ohio

In 2015, the Ohio Legislature passed HB 237, setting forth the following insurance requirements for TNCs:

When a TNC driver has not opened the TNC app and is not providing TNC service, the vehicle is insured by the driver's personal automobile liability insurance that meets state financial responsibility requirements.

The statute related to TNCs only requires that coverage is available during the following periods of time: (1) while the driver is logged on to the TNC digital network; (2) while the driver is engaged in TNC services.

While the driver is logged on to the TNC digital network, the TNC driver, or the TNC on the driver's behalf, must maintain primary automobile insurance in the following amounts: (1) at least \$50,000 because of bodily injury to or death of one person in any one accident; (2) at least \$100,000 because of bodily injury or death of two or more persons in any one accident; (3) at least \$25,000 because of injury to property of others in any one accident.

While the driver is engaged in TNC services, the TNC driver, or the TNC on the driver's behalf, must maintain primary automobile insurance shall be maintained in an amount of at least \$1 million dollars because of bodily injury or death of one or more persons or injury to property of others in any one accident.

In all stages of TNC service, the TNC must disclose in writing to the driver both of the following: (1) the insurance coverage, including the types of coverage and limits for each type of coverage, that the TNC provides while the driver uses a personal vehicle in connection with TNC services; (2) that, depending on the terms of the policy, the TNC driver's own personal automobile insurance policy might not provide any coverage while the driver uses a personal vehicle to provide or be available to provide TNC services; (3) that "If the vehicle that you plan to use to provide TNC services for our TNC has a lien against it, you must notify the lienholder that you will be using the vehicle for transportation services that may violate the terms of your contract with the lienholder."

Pennsylvania

In 2016, the Pennsylvania Legislature passed SB 984, setting forth the following insurance requirements for TNCs:

A TNC driver or TNC on the driver's behalf must maintain primary automobile insurance that recognizes that the driver is a TNC driver or otherwise uses a vehicle to transport passengers for compensation and covers the driver when: (i) the driver is logged on to the digital network; and (ii) the driver is engaged in a prearranged ride.

Unless otherwise required by order or regulation of the PA PUC, the following automobile insurance requirements shall apply to the TNC driver or the TNC on the driver's behalf while a participating TNC driver is logged on to the digital network and is available to receive transportation requests but is not engaged in a prearranged ride:

- (i) Primary automobile liability insurance in the amount of at least \$50,000 for death and bodily injury per person, \$100,000 for death and bodily injury per incident and \$25,000 for property damage.
- (ii) First-party medical benefits, including \$25,000 for pedestrians and \$5,000 for a driver.
- (iii) The coverage requirements may be satisfied by any of the following:
 - (A) automobile insurance maintained by the TNC driver;
 - (B) automobile insurance maintained by the TNC; or
 - (C) any combination of clauses (A) and (B).

Unless otherwise required by order or regulation of the PA PUC, the following automobile insurance requirements shall apply while a TNC driver is engaged in a prearranged ride:

- (i) Primary automobile liability insurance that provides at least \$500,000 for death, bodily injury and property damage.
- (ii) First-party medical benefits as required by 75 Pa.C.S. § 1711 (relating to required benefits) on a per-incident basis for incidents involving a TNC driver's operation of a personal vehicle while engaged in a prearranged ride, including \$25,000 for passengers and pedestrians and \$5,000 for a driver.
- (iii) The coverage requirements may be satisfied by any of the following:
 - (A) automobile insurance maintained by the TNC driver;
 - (B) automobile insurance maintained by the TNC; or
 - (C) any combination of clauses (A) and (B).

If insurance maintained by a driver has lapsed or does not provide the required coverage, insurance maintained by a TNC shall provide the coverage required beginning with the first dollar of a claim, and the TNC's insurer shall have the duty to defend such claim. The automobile insurance required for a TNC shall be evidenced by the filing of a certificate of insurance (Form E). The Form E must be filed, with the PA PUC, by the insurance carrier and must be in the form specified by the PA PUC by order or regulation.

Insurance coverage required for dual motor carrier drivers (as defined in Act 164) that are using personal vehicles to provide TNC services shall be the same as the insurance coverage required for taxis. The PA PUC may review and increase the insurance coverage requirements for dual motor carriers and taxis as necessary in the public interest.

Coverage under an automobile insurance policy maintained must be primary and not be dependent on a personal automobile insurer first denying a claim nor shall a personal automobile insurance policy be required to first deny a claim.

The insurance required by Act 164 must be placed with an insurer that has obtained a certificate of authority under section 208 of the act of May 17, 1921 (P.L.789, No.285), known as The Insurance Department Act of 1921, or a surplus lines insurer eligible under section 1605 of the act of May 17, 1921 (P.L.682, No.284), known as The Insurance Company Law of 1921. Insurance satisfying the requirements of Act 164 shall be deemed to satisfy the financial responsibility requirement for a motor vehicle under 75 Pa.C.S. Ch. 17 (relating to financial responsibility).

A TNC driver shall carry proof of insurance coverage when the driver uses a vehicle in connection with a digital network. In the event of an accident, a TNC driver must provide the proof of insurance coverage to the directly interested parties, automobile insurers and investigating police officers under 75 Pa.C.S. § 1786 (relating to required financial responsibility). TNC drivers must also disclose to directly interested parties, automobile insurers and investigating police officers whether the driver was logged on to the digital network or on a prearranged ride at the time of an accident.

The TNC is solely and exclusively responsible to ensure that automobile insurance coverage required to be carried by the TNC driver under Act 164 is in force prior to permitting a TNC driver to provide TNC service.

Washington

In 2015, the Washington Legislature passed SB 5550, setting forth the following insurance requirements for TNCs:

When a TNC driver has not opened the TNC app and is not providing TNC service, the vehicle is insured by the driver's personal automobile liability insurance that meets state financial responsibility requirements.

When a TNC driver has the app open and is waiting for a match, the TNC driver, or the TNC on the driver's behalf, must maintain primary automobile liability insurance coverage in the amounts of \$50,000 per person/ \$100,000 per accident/ \$30,000 for property damage. Uninsured/underinsured coverage must be offered equal to liability limits, but can be rejected by named insured. Personal injury protection coverage must be offered, but can be rejected by the named insured.

After a driver accepts a requested ride, the TNC driver or the TNC must maintain combined single limit liability coverage of \$1,000,000; and underinsured motorist coverage of \$1,000,000. Personal injury protection coverage must be offered, but can be rejected by the named insured.

In all stages of TNC service, TNCs must inform drivers that coverage may not be available under the driver's own policy. TNCs must also disclose that the driver must notify any lienholder if he/she is using the vehicle for this purpose and that use of the vehicle for transportation services may violate the contract between the driver and lienholder.

If the driver is logged in to the digital network or software application of more than one commercial transportation services provider but has not been matched with a passenger, the liability must be divided equally among all of the applicable insurance policies that specifically provide coverage for commercial transportation services.

v. Rates

Another hallmark of TNC service is the "flexible" or "dynamic" pricing model used by these companies. The TNC model differs from the traditional taxicab model, where taxis are bound to file tariffed rates with state public utility commissions and may only charge riders fares consistent with those tariffs. In contrast, the flexible pricing model allows TNCs to charge passengers rates based on the current demand for the TNC service. Thus, during periods of high demand for rides, TNC rates will be higher than during periods of low demand for rides. States vary widely in how they have structured price regulation for TNC service. Some states still require TNCs to charge rates based on a tariff filed with a state public utility commission, similar to taxi tariffs. Other states, permit some form of "flexible pricing" for TNC service, while other states have decided not to impose any requirements or restrictions on pricing related to TNC service.⁵ The following represents the rate requirements of each of the survey states.

Alabama

There are no TNC specific pricing rules at the state level.

Arkansas

The fare structure for TNCs is not regulated in Arkansas. However, prior to booking a ride, passengers must be advised of the fare calculation method, the applicable rates charged, and have the option to receive an estimated fare prior to entering the TNC vehicle.

TNCs must also give passengers an electronic receipt within a reasonable time after the TNC services end that lists: (1) the origin and destination of the trip; (2) the total time and distance of the trip; (3) an itemization of the total fare paid.

California

The CA PUC does not regulate TNC pricing, except that (1) charges must be based on time or distance or a combination thereof; and (2) charges shall not be on an individual-fare basis. (See

⁵ In fact, some of these states have not even imposed restrictions against "surge pricing." "Surge pricing" occurs when a TNC company raises its rates for its service when there is an increase in demand for that service.

CA PUC §5401) TNCs are not required to file tariffs and there are no restrictions on surge pricing.

Decision 16-04-041 permits TNCs to engage in fare-splitting operations, subject to several requirements to report/verify that those operations comply with CA PUC §5401.

Colorado

TNC rates are not regulated in Colorado. TNCs are not required to file tariffs and there are no restrictions on surge pricing.

Montana

TNC rates are not regulated in Montana. TNCs are not required to file tariffs and there are no restrictions on surge pricing.

Nebraska

TNC may offer service for compensation, no charge, or suggested compensation. TNC must file its rates with NE PSC upon initial application and update when any changes are made. Dynamic pricing is allowed, so long as pricing is indicated in the app prior to the passenger requesting the ride, the passenger confirms pricing, and a fare estimate is available, and also as long as there is not a declared state of emergency by the Governor.

Nevada

TNCs are permitted to use flexible pricing in Nevada. The TNC must disclose the rates and method of charging on its website or within its digital network or software application. TNC must also notify NTA in advance of utilizing any new base rates. This is the only amount that can be collected by the driver. Driver can accept a voluntary gratuity. NTA does establish a maximum fare (base rate) that may be charged during an emergency. (NRS 706A.170).

TNC is required to file with the NTA the base rate applicable during an emergency declared by the Governor of Nevada. (NRS 706A.170).

Surge pricing allowed, but before passenger enters the motor vehicle the passenger must be offered the option to receive an estimate of the fare amount. The exception to applicable surge pricing is when the Governor of Nevada declares a state of emergency. TNC's must provide an electronic receipt. Cash transactions to pay the fare are not allowed. (NRS 706A.170).

Ohio

TNC rates are not regulated in Ohio. TNCs are not required to file tariffs and there are no restrictions on surge pricing.

Pennsylvania

Upon the completion of each ride, each TNC shall transmit an electronic receipt to the passenger's e-mail address or account on a digital network documenting: (1) the origination, destination, mileage and time estimated of the trip; (2) the driver's first name; and (3) the total amount paid, if any.

A TNC must file and maintain a tariff with the PA PUC that sets forth the terms and conditions of service, including the basis for its fares and its policies regarding dynamic (or “flexible”) pricing. A TNC may offer TNC service at no charge, suggest a donation or charge a fare. If a fare is charged, a TNC must disclose the fare calculation method prior to providing an arranged ride. The TNC must provide estimates upon request for the cost of a trip. The amount of a donation, charge, fare or other compensation provided or received for TNC service shall not be subject to review or approval by the PA PUC under 66 Pa. C.S. Chapter 13 (relating to rates and distribution systems).

A TNC shall provide notice to potential passengers prior to accepting a ride through its digital network any time dynamic pricing is in effect. When a state of disaster emergency is declared under 35 Pa.C.S. § 7301 (relating to general authority of Governor), a TNC that engages in dynamic pricing shall limit the multiplier by which its base rate is multiplied to the next highest multiple below the three highest multiples set on different days in the 60 days preceding the declaration of emergency. It shall be a violation of the act of October 31, 2006 (P.L.1210, No.133), known as the Price Gouging Act, for a TNC to charge a price that exceeds the limits of Act 164 during a state of disaster emergency.

Washington

TNC rates are not regulated in Washington. TNCs are not required to file tariffs and there are no restrictions on surge pricing.

vi. Miscellaneous Issues

1. Handicap Accessibility

Many states have imposed requirements to ensure that TNC service is accessible to all passengers, including those with disabilities. In these states, TNCs may be required to submit plans for providing reasonable alternative transportation options to accommodate for these passengers. The following represents the handicap accessibility requirements for each of the survey states.

Alabama

There are no TNC specific accessibility rules at the state level in Alabama.

Arkansas

In Arkansas, a TNC must adopt a policy of non-discrimination and notify TNC drivers of its policy. A TNC must comply with all applicable laws regarding nondiscrimination against passengers and must comply with all applicable laws to accommodate service animals. A TNC cannot impose additional charges on a person with a physical disability because of the disability. The TNC is required to provide passengers with the opportunity to indicate whether the passenger requires transportation that is wheelchair accessible. If a TNC cannot provide a wheelchair accessible vehicle, the TNC must direct the passenger to an alternate provider.

California

In California, TNCs must submit a plan “to explain how they plan to ensure that this new form of transportation service does not create a divide between the able and disabled communities.”

Colorado

Colorado does not have any specific requirements for TNCs and handicap accessibility.

Montana

Montana does not have any specific requirements for TNCs and handicap accessibility.

Nebraska

Nebraska does not have any specific requirements for TNCs and handicap accessibility.

Nevada

In Nevada, TNCs are not allowed to impose any additional charge for a driver providing transportation services to a person with a physical disability because of the disability. (NRS 706A.170). The TNC is required to provide passengers with the opportunity to indicate whether the passenger requires transportation that is wheel chair accessible. If the TNC cannot provide the passenger with wheel chair accessible transportation, the TNC must direct the passenger to an alternative transportation provider with wheel chair accessibility, if available. (NRS 706A.190).

Ohio

In Ohio, a TNC shall provide an option on the digital network of the TNC for a potential rider to request a wheelchair-accessible vehicle. If the TNC cannot arrange such a service for a potential rider who requests a wheelchair-accessible vehicle, the TNC shall direct the potential rider to another provider if possible.

Pennsylvania

TNCs under PA PUC jurisdiction:

TNCs must adopt a policy of nondiscrimination regarding individuals with disabilities. The following information shall be provided on the TNC's publicly accessible Internet website: notice of the nondiscrimination policy and (ii) procedures to report a complaint to the PA PUC about a TNC driver's alleged violations.

By November 4, 2017, the digital network used by a TNC to connect drivers and passengers must be accessible to consumers who are blind, visually impaired, deaf and hard of hearing.

TNC drivers must transport a service animal when accompanying a passenger with a disability for no additional charge unless the TNC driver has a documented medical allergy on file with the TNC. Service animals shall be permitted to ride in the passenger compartment of a vehicle. TNC drivers are prohibited from placing a service animal in any part of a vehicle other than the passenger compartment.

TNCs may not impose additional charges for service to an individual with a disability. TNCs must, in an area where wheelchair-accessible service is available, provide passengers with disabilities requiring the use of mobility equipment an opportunity to indicate on its digital network whether they require a wheelchair-accessible vehicle. A TNC or an affiliated entity must, if wheelchair-accessible service is available, facilitate transportation service for passengers who require a wheelchair-accessible vehicle by doing one of the following: (i) connecting the passenger to an available TNC driver or other driver operating a wheelchair-accessible vehicle; or (ii) if connection under s (i) is not available, directing the passenger to an alternative provider with the legal authority and ability to dispatch a wheelchair-accessible vehicle to the passenger.

TNCs under PPA jurisdiction:

By January 1, 2017, the digital network used by a TNC to connect drivers and passengers shall be accessible to customers who are blind, visually impaired, deaf and hard of hearing. Where TNC services are offered, a TNC must take reasonable steps to ensure that the service provided by each transportation network company driver who utilizes the digital network is offered in a nondiscriminatory manner. TNCs may not unlawfully discriminate against a prospective passenger or unlawfully refuse to provide service to a certain class of passengers or certain localities.

All TNCs must adopt a policy of nondiscrimination regarding individuals with disabilities. The following information shall be provided on the TNC's publicly accessible Internet website: (A) notice of the nondiscrimination policy and (B) procedures to report a complaint to the PA PUC or PPA about a TNC driver's alleged violation of this subsection.

TNC drivers must transport a service animal when accompanying a passenger with a disability for no additional charge unless the TNC driver has a documented medical allergy on file with the TNC. TNCs may not impose additional charges for service to an individual with a disability because of those disabilities. TNCs must also provide passengers with disabilities requiring the use of mobility equipment an opportunity to indicate on its digital network whether they

require a wheelchair-accessible vehicle. A TNC or an affiliated entity must facilitate transportation service for passengers who require a wheelchair-accessible vehicle by doing one of the following: (A) connecting the passenger to an available TNC driver or other driver operating a wheelchair-accessible vehicle; or (B) directing the passenger to an alternative provider with the authority and ability to dispatch a wheelchair-accessible vehicle to the passenger.

A combined class, comprised of each TNC operating in the City of Philadelphia, must make an aggregated minimum of 70 wheelchair-accessible vehicles available in the city by June 30, 2017. All TNCs must report to the PPA, by December 31 of each calendar year, the programs and best practices the TNC has implemented to improve the accessibility of service to individuals with disabilities, including the availability and use of wheelchair-accessible vehicles. If, upon review of the report, the PPA concludes that TNCs operating in the City of Philadelphia are not collectively having a positive impact on the availability of wheelchair-accessible transportation services, the PPA may, until December 31, 2022, require the combined class to add up to an aggregated 10 additional wheelchair-accessible vehicles per year.

Washington

Washington does not have any specific requirements for TNCs and handicap accessibility.

2. Autonomous Vehicles

The TNC service landscape is continually innovating and modernizing. As a result, some TNC companies are now offering autonomous (or driverless) vehicle options for their passengers in certain service territories. Many states with autonomous vehicles operating within their borders have looked to their respective departments of transportation for guidance on how to regulate this new type of TNC technology, which specifically impacts the TNC vehicle itself. The U.S. Department of Transportation's National Highway Traffic Safety Administration (NHTSA) has also issued guidance for the safe and rapid deployment of these advanced technologies in its Federal Automated Vehicles Policy.⁶ The following is a summary of the activity occurring in the survey states regarding autonomous vehicles.

Alabama

The Alabama Joint Legislative Committee on Self-Driving Vehicles held its first meeting on January 19, 2017. The Committee sought guidance from Auburn University's College of Engineering on how it should prepare for self-driving cars and the impacts they may have on safety, state budget revenue, and insurance coverage. The Alabama Legislature appropriated nearly \$250,000 to Auburn in 2016 to study autonomous vehicles.

⁶ NHTSA's Federal Automated Vehicles Policy can be found online at <https://one.nhtsa.gov/nhtsa/av/av-policy.html>.

The Committee was established to study what effects self-driving vehicles may have and what legislation may be needed to regulate those effects. They intend to survey legislation pending in other states, review draft legislation from the National Highway Transportation Safety Administration, and solicit industry advice before passing a bill on to the full legislature this year.

Arkansas

In Arkansas, there is no current legislation or commission activity on autonomous vehicles.

California

The CA PUC does not regulate autonomous vehicles and has not developed any autonomous vehicle rules specifically geared towards TNCs. Autonomous vehicles are regulated by the California DMV and all autonomous vehicles being tested on the road must obtain a permit from the DMV, which sets forth basic requirements, such as that a qualified operator must be present in the vehicle and certain reporting requirements.

Colorado

At this time, no autonomous TNC vehicles are operating in Colorado. Thus, neither the Colorado legislature nor the CO PUC has considered any statutory or regulatory changes governing such services.

Montana

In Montana, there is no current legislation or commission activity on autonomous vehicles.

Nebraska

In Nebraska, there is no current legislation or commission activity on autonomous vehicles.

Nevada

On November 21, 2016, the Governor of Nevada introduced AB 69, which authorizes the use of autonomous vehicles to transport persons or property in Nevada in certain circumstances. Existing law requires the Nevada DMV to adopt regulations authorizing the operation of autonomous vehicles on highways within the state. (NRS 482A.100). Existing law also provides certain requirements which must be met before an autonomous vehicle is tested or operated on a highway within Nevada. (NRS 482A.060-482A.080). AB 69 requires the DMV to adopt regulations establishing certain additional requirements for the testing and use of autonomous vehicles on the highways in Nevada. AB 69 further authorizes motor carriers, TNCs and taxicabs to use autonomous vehicles in Nevada.

Ohio

On November 30, 2016, Ohio Governor John Kasich announced a \$15 million investment to turn a 35-mile stretch of a state highway into a testing ground for autonomous vehicles. However, the focus of this initiative will be on piloting autonomous tractor-trailers, and not on autonomous TNCs or passenger vehicles.

Pennsylvania

Innovation is occurring in Pennsylvania with respect to autonomous vehicles. In the Pittsburgh area, Uber is testing autonomous vehicles. In addition, Carnegie Mellon University (CMU) has been a leader in developing smart traffic signals and equipment to allow vehicles to “talk” to each other on the road, in addition to developing its own a self-driving vehicle.

The Pennsylvania legislation regarding TNCs (Act 164) does not specifically address autonomous vehicles. However, the PA PUC has indicated in its Implementation Order of Act 164 of Chapter 26, at PUC Docket No. L-2016-2574379 (December 8, 2016), that TNCs using autonomous vehicles in their operations may apply to the PA PUC for a license under Act 164. When applying for a license with the PA PUC, TNCs must verify that their driverless vehicle operations comply with all applicable Pennsylvania Department of Transportation (PennDOT) regulations. On November 2, 2016, PennDOT issued a draft policy report on autonomous vehicles that it in the process of finalizing.⁷

On January 17, 2016, Pennsylvania, Ohio and Michigan announced the formation of the Smart Belt Coalition, which was created to allow the three states to share information on autonomous vehicles as the technology advances. The Coalition will include the transportation departments and related entities in each state and universities involved in transportation research.

Washington

There is no current legislation regulating autonomous vehicles in Washington. However, in December 2016, the Technology and Transportation Committee of the Washington Legislature gathered information on autonomous vehicles in anticipation of developing state regulations on the issue. The Committee stated that it is examining the regulations already in place in California and Michigan on autonomous vehicles. Issues considered by the Committee include insurance, vehicle certification, passenger responsibilities, drivers’ licensing and vehicle software upgrades for autonomous vehicles.

IV. INDUSTRY PERSPECTIVES ON TNC REGULATION

In addition to gathering the state public utility commission perspective on TNC regulation, it was important for the Working Group to solicit the perspective of those outside of the regulated community on TNC issues. As such, the Working Group invited representatives from the TNC industry, the automobile insurance industry, and academics who study the

⁷ PennDOT’s Final Draft Report of the Autonomous Vehicle Policy Task Force can be found online at <http://www.penndot.gov/ProjectAndPrograms/ResearchandTesting/Pages/Autonomous-Vehicle-Testing.aspx>.

transportation industry to participate in a Town Hall event and provide comments on the results of the state paper survey. The following represents the comments or remarks provided by each of these third parties on the topic of effective TNC regulation.

a. Uber Technologies, Inc.

Curtis Scott, the Senior Legal Director, Regulatory & Insurance at Uber Technologies, Inc. (Uber), presented an industry perspective on TNC issues at the NARUC 128th Annual Meeting in November 2016. In addition to presenting at the NARUC Annual Meeting, Uber submitted comments in response to the Working Group on Motor Carriers paper survey regarding state TNC regulation. Uber has worked collaboratively with the Working Group and has consistently expressed a desire to be a partner with NARUC in exploring and developing best practice recommendations on TNC issues.

In its comments, Uber encourages states to adopt “smart” regulations for TNC service. Uber states that it is no surprise that where policymakers welcome Uber with smart regulation, drivers and riders benefit. Uber explains that key elements of smart regulation are: (1) sensible vehicle standards and background checks to assure riders of their safety; (2) appropriate uniform insurance requirements that ensure every ride is covered; and (3) background check and driver history record check regulations that ensure that drivers get fair access to flexible earnings.

Uber states that the danger lies in regulations that micromanage how these three goals are accomplished. Uber believes that overly-prescriptive regulation can erode competition and go out of date fast, as technology changes. Uber seeks a regulatory environment with forward-thinking regulations that articulate the broad, unchanging principles and will permit TNCs to accomplish them in various ways today, and better, newer ways tomorrow.

Uber also highlights the benefits that TNC service has brought to many areas of the country. Uber states that its innovations have provided responsible, reliable and transparent transportation options to countless riders. Uber states that it gives consumers access to transportation choice, offering them options beyond taxis or driving their own cars. Uber further states that TNC service has opened new mobility options in underserved communities, letting riders in every neighborhood request a ride. Uber asserts that its service complements public transit, helping riders get to subway, train, or bus lines that are hard to reach. Additionally, Uber asserts that TNC service has helped reduce the number of drunk driving accidents. In short, Uber believes that TNC service has helped transform cities and helped its citizenry get where they want to go.

b. Lyft, Inc.

Rachelle Celebrezze, Senior Policy Advisor at Lyft Inc. (Lyft) presented another industry perspective on TNC issues at the NARUC 128th Annual Meeting in November 2016. In its presentation, Lyft focused on the fact TNC service is responding to a demand in the

transportation sector for a variety of options to satisfy the wide ranging needs of the traveling public.

Lyft states that commuters have traditionally had two transportation options – driving a car or taking public transportation. However, according to Lyft, those two options are not sufficiently satisfying peoples’ needs. In particular, Lyft states almost half of Americans lack access to public transit, and for those who do have access, most jobs are out of reach by public transit. As a result, most Americans drive alone. However, Lyft pointed out that 80% of the seats on the road sit empty while so many still lack access to mobility. Lyft states that TNCs fill this gap in a variety of ways, including by providing a safe and reliable transportation option for the “last mile” between riders’ homes and public transportation, thereby expanding consumers’ access to public transportation.

Lyft explains that its service is simple, reliable, cashless, and trusted. Lyft’s service is trusted for several reasons. First, Lyft provides insurance coverage for every ride. From the period when the app is open to when a driver receives a match notification, Lyft provides up to \$50,000/person of bodily injury coverage, up to \$100,000/accident of bodily injury coverage, and up to \$25,000/accident of property damage coverage. From the time of the match notification to when the driver drops off the passenger, Lyft provides up to \$1 million/occurrence of automobile liability and underinsured/uninsured motorist coverage, as well as contingent collision and comprehensive insurance up to \$50,000/accident with a \$2,500 deductible.

Second, Lyft requires TNC drivers to be 21 or older, have at least 1 year of driving history, undergo a criminal background check, and driving record check. Third, Lyft has a zero-tolerance drug and alcohol policy for its drivers. Fourth, Lyft requires vehicles used for TNC service to undergo a 19-point safety inspection. Finally, Lyft also emphasizes the safety that cashless payments, GPS tracking, and two-way ratings provide for both riders and drivers.

c. James River Insurance

John G. Clarke, CPCU, the Senior Vice-President of Marketing at James River Insurance Company (James River) presented a perspective from the insurance industry on issues related to TNC service at the NARUC 128th Annual Meeting in November 2016. James River is a surplus lines insurer that specializes in underwriting coverage for hard-to-place, unusual commercial risks, including TNCs.

James River explained that in 2015, the National Conference of Insurance Legislators (NCOIL), in cooperation with TNCs and insurance companies, adopted a Model Act to Regulate Insurance Requirements for TNCs and TNC Drivers (Model Act).⁸ James River stated the Model Act: (1) mandates minimum coverage limits during the various stages of TNC service; (2) provides that coverage can be satisfied by the TNC, the TNC driver, or a combination; (3) establishes

⁸ See Appendix C for the 2015 Model Act to Regulate Insurance Requirements for TNCs and TNC Drivers.

requirements related to the proof of insurance carried by TNC drivers; and (4) authorizes the use of surplus lines insurers.

James River further explains the insurance coverage recommended by the Model Act for the various stages of TNC service. For stage one, when the TNC driver is logged onto the TNC network and is available to receive transportation requests but is not engaged in a “prearranged ride,” the recommended insurance limit is \$50,000 of death and bodily injury per person, \$100,000 for death and bodily injury per incident, and \$25,000 of property damage. For stage two, while a TNC driver is engaged in a prearranged ride, the recommendation is primary automobile liability insurance that provides at least \$1 million for death, bodily injury and property damage, also known as Combined Single Limit (CSL). The Model Act defines a prearranged ride as the provision of transportation by a TNC driver to a TNC rider (a) beginning when a TNC driver accepts a TNC rider’s request for a ride through a digital network controlled by the TNC; (b) continuing while the TNC driver transports the requesting TNC rider; and (c) ending when the last requesting TNC rider departs from the personal vehicle. For all stages, the Model Act provides that the insurance requirements may be satisfied by the TNC, the TNC driver, or any combination.

In addition, James River points out that TNCs have a very effective feedback loop built into their business model that gives insurers and underwriters a great deal of comfort, and that should give regulators peace of mind as well. James River explains that the TNC feedback loop has two key components. The first is the driver-passenger review process. James River explains that passengers are required to rate TNC drivers after the ride and that drivers who receive unfavorable ratings are removed from the platform. Thus, any unfavorable behavior by TNC drivers is remedied quickly. Second, James River asserts that the TNC industry is highly competitive and well “regulated” by the marketplace. James River explains that bad press or online reviews quickly remedy anything approaching less than excellent business practices. James River states that TNCs are not monopolies today, but that high fees or regulatory hurdles may have the unintended consequence of creating monopolies by diminishing competition and making the industry economics work for only the largest few market leaders.

d. Michael Farren, PE, Economist at Mercatus Center at George Mason University

Michael Farren, PE, Economist from the Mercatus Center at George Mason University presented an economist perspective on issues related to TNC service at the NARUC 128th Annual Meeting in November 2016. In addition to presenting at the NARUC Annual Meeting, Mr. Farren submitted detailed comments in response to the Working Group on Motor Carriers paper survey regarding state TNC regulation.⁹ The following is a summary of those comments broken down into the sections delineated in the paper survey.

i. Jurisdictional Issues

⁹ See Appendix D for the full text of Mr. Farren’s comments.

According to Mr. Farren, the regulatory body for TNCs is not particularly important, so long as the law creating the regulation and the regulation itself conforms to the basic principles that avoid creating government-granted privilege.¹⁰ Mr. Farren does assert that there should be no regulations created on a "case by case" basis, and that all regulations should apply equally to all individuals and business engaging in the regulated activity.¹¹

With respect to whether state commissions should require TNCs to demonstrate whether there is a public demand or need for the service, Mr. Farren explains that transportation services have more in common with standard private market goods and services than public utility-provided services. As a result, Mr. Farren states that there is not sufficient reasoning to regulate them similar to other public utilities. Specifically, Mr. Farren states that there does not seem to be any justifiable reason for requiring that new entrants show sufficient public demand or need for the service they offer before granting permission to do so.¹²

With regard to taxes and assessments, Mr. Farren states that taxes in general should follow the "benefits-received" principle as much as possible. Mr. Farren explains that the benefits-received standard ties the taxes owed by each individual or company to the cost of the public services that person used. Mr. Farren points out that this approach to taxation removes some of the incentive for special interests to lobby for beneficial policies for which others have to pay. In the case of license fees or tax assessments associated with regulations, Mr. Farren explains that the benefits-received principle suggests that appropriate fees are determined by the cost of administering and enforcing the regulations. Mr. Farren cites to Michigan's TNC law as an example of one that employs the benefits-received principle by mandating that the fees collected be used to administer the TNCs regulations and prevents any excess funds from lapsing into the state's General Fund.¹³

ii. Driver Safety

1. Criminal Background Checks

Mr. Farren states that traditionally, the potential of crime occurring in the context of receiving (or providing) transportation services appears to be higher than the average likelihood of being a victim of crime. However, Mr. Farren explains that the higher rate of taxi-related crime seems to be influenced by the relative anonymity of the interaction between driver and passenger. Mr. Farren states that the new technologies used by TNCs mitigate many of the problems that taxi background checks attempted to solve, namely the app that concretely identifies both the rider and the driver, and the GPS that ensures the route of the trip is recorded and that the TNC is aware of the current location of the driver and passenger at all times.¹⁴

2. Driving History Record Check

¹⁰ Farren Comments at 1.

¹¹ *Id.* at 3.

¹² *Id.* at 4.

¹³ *Id.* at 7.

¹⁴ *Id.* at 7-8.

Mr. Farren states that given that insurance requirements are already part of TNC laws, there does not seem to be a great necessity for the government to mandate specific forms of driving history checks. Mr. Farren states that insurance companies have the best information regarding whether a particular driver is likely to be a risk to public safety, and as a result, the truly dangerous drivers will be weeded out by the high insurance costs they would have to pay. Meanwhile, Mr. Farren states that the TNCs themselves have a compelling interest to maintain a strong reputation of safety among their potential customers to avoid losing business, so they are likely to be vigilant—even more so than government regulations—in policing the safety of their service providers.

Lastly, Mr. Farren states that there is evidence that some social groups, such as African-Americans, are targeted by police for driving violations at a higher rate than other social groups. As a result, Mr. Farren points out that there may be a systematic difference in documented driving violations between social groups, which means that legal restrictions on the ability to become a TNC driver based on driving history may unknowingly implement discrimination against that social group.¹⁵

3. Drug or Alcohol Policies

Mr. Farren states that given that driving while intoxicated is already against the law, it is unnecessary to make providing TNC service while intoxicated “doubly illegal.” Mr. Farren further points out that TNCs have little desire to have unsafe drivers associated with their brand and so have a strong incentive to police their drivers’ safety. Thus, Mr. Farren does not believe that it is necessary to statutorily require TNCs to adopt a “zero-tolerance,” given the TNC’s desire to maintain a reputation of safety.¹⁶

4. Fingerprinting

Mr. Farren states that fingerprint checks may inhibit the ability of some social groups to serve as drivers, since there is a higher arrest rate for African-American men, leading to false positives in fingerprint criminal reports. Mr. Farren states that perhaps the most important thing to remember is that regulations always have tradeoffs, and that requiring a specific kind of check that dis-employs one social group may lead to less services provided in low-income areas, since those drivers may tend to serve those areas more than other drivers.¹⁷

iii. Vehicle Safety

1. Vehicle Inspections & Age/Mileage Requirements

Mr. Farren states that the relevant consideration with respect to vehicle safety inspections is whether all vehicles traveling on public thoroughfares are held to the same standard. Mr.

¹⁵ *Id.* at 9.

¹⁶ *Id.*

¹⁷ *Id.* at 10.

Farren explains that if all vehicles are indeed subject to such a requirement, then there is no reason to “doubly” mandate vehicle safety inspection for vehicles providing for-hire services.¹⁸

Mr. Farren does not see the value in imposing vehicle age or mileage requirements on TNCs. Mr. Farren states that if a vehicle is allowed to be used as a private passenger vehicle on public roadways, it should be allowed to be used as a for-hire vehicle as well. Furthermore, Mr. Farren states that vehicle age or mileage requirements may unintentionally exclude demographic groups who are generally less financially well-off, and therefore are more likely to have older vehicles, from employment as TNC drivers.¹⁹

2. Trade Dress

Mr. Farren states that mandating for-hire vehicles to display trade dress can actually cause unintended consequences that *increase* safety risks rather than reduce them. Mr. Farren states that there have been cases of persons getting into a car displaying the trade dress of a for-hire vehicle, but whose driver actually had no affiliation with the company. Mr. Farren states that London infamously has a problem with assaults committed against inebriated passengers in look-alike taxicabs. As such, Mr. Farren states that removing the trade dress requirement for TNCs would force passengers to pay more attention and clearly identify which driver is the person they have contacted.²⁰

iv. Insurance Levels and Types

Mr. Farren states that the risk to public safety does not substantially change between a driver using her vehicle for personal purposes and providing for-hire transportation service. Therefore, Mr. Farren states that the amount of mandated insurance should not be different for those two situations. Mr. Farren asserts that the role for government is to determine the appropriate bond level for a given type of activity in the public space and to require all of those operating in that public space maintain a safety bond equivalent to that level.²¹

v. Rates

Mr. Farren asserts that the government does not have any role in setting prices for TNCs. Mr. Farren argues that policymakers and regulators do not have the necessary information to be able to set prices, because such information is widely distributed and constantly changes. Mr. Farren further asserts that setting prices removes the primary economic signal of how valuable the product is to customers and how relatively scarce it is.

With respect to surge pricing, Mr. Farren states that price flexibility is important to allow demand to adjust to different levels of supply and vice versa. Mr. Farren states that the surge

¹⁸ *Id.*

¹⁹ *Id.* at 12.

²⁰ *Id.* at 11-12.

²¹ *Id.* at 14.

pricing employed by TNCs simply reflects this kind of variability and is an important signal to the market regarding the time-varying scarcity of transportation services and the value that customers place on them.

Mr. Farren acknowledges that there has been some controversy surrounding surge pricing, but states that in reality the practice follows the same concept as variable pricing for airline tickets, hotel accommodations, and gasoline. In fact, Mr. Farren points out that the prices of all goods and services fluctuate over time as production costs shift and the demand for the product fluctuates. Mr. Farren states that the only difference between the different kinds of variable pricing is the time interval over which the fluctuation occurs. Mr. Farren states that modern communication technology simply allows for greater price flexibility according to real-time changes in supply and demand. Mr. Farren asserts that this is actually an asset, not a problem, because it means that greater economic efficiency is possible.²²

vi. Miscellaneous Issues - Handicap Accessibility

Mr. Farren states that mandating TNCs to offer different services (for example, Wheelchair-Accessible Vehicles (WAVs)) for the same price harms companies' incentives to offer services in general. Mr. Farren asserts that laws that disallow a different price based on the differential cost of providing service to disabled persons is likely to actually reduce the availability of service for disabled persons.²³

V. CONCLUSION

Over a relatively short period of time, the transportation industry across the Nation has changed tremendously. Consumers are no longer satisfied with traditional transportation options and want new and innovative technology when using transportation service. TNCs have responded to these customer needs and have successfully created a new type of transportation service using a mobile application to connect passengers with drivers of personal vehicles.

The rapid emergence of TNC service has created the need for state legislatures and regulators alike to respond quickly to the ever-changing transportation landscape. Legislative and regulatory leaders have been called upon to adopt and update transportation laws and regulations to adapt to this innovative technology. While some states may have already adopted legislation or regulations regarding TNC service, others may be in the process of determining the details what laws and rules to apply. This Report will serve as a useful tool for states that are in the process of deciding on the type of legislation or regulation to adopt in response to this new type of transportation service. In this way, state commissions can help one another achieve the common goal of ensuring that all consumers have access to safe, reliable, and affordable transportation options.

²² *Id.* at 14-15.

²³ *Id.* at 16.

Appendix A

CHARTER

for the Creation of a

NARUC Task Force on Transportation

On December 17, 2015, the NARUC Executive Committee approved a motion to permit NARUC President Travis Kavulla to, pursuant to Title I, Section 19 of the *Policies and Procedures of the National Association of Regulatory Utility Commissioners*,²⁴ establish a Presidential Task Force on Transportation. President Kavulla was authorized to proceed with establishing the committee and provide an updated charter for approval January 19, 2016.

Background: NARUC, formed in 1889 as the *National Association of Railroad and Utilities Commissioners*,²⁵ has a long history with transportation issues. Currently, NARUC is participating before the Surface Transportation Board in a proceeding focused on reliable rail deliveries of coal supplies to electric generation plants. NARUC also played an integral role in the passage of the Unified Carrier Registration Act of 2005.²⁶ The recent proliferation of Transportation Network Companies (TNCs), like Uber and Lyft, have created new issues for some NARUC members, resulting in a panel on the topic at the 2014 NARUC annual meeting. Moreover,

²⁴*Policies and Procedures of the National Association of Regulatory Utility Commissioners*, Section 19. Requirements for Formation of Special Committees Affecting Two or More Standing Committees, at page 6, online at: <http://www.naruc.org/About/Proposed-Policies-and-Procedures-Final-November-2013-docx.pdf>.

²⁵Rodgers, Paul. *The NARUC Was There: A History of the National Association of Regulatory Utility Commissioners*. Washington: Association, 1979, at page 54.

²⁶Under this legislation, the so-called Single State Registration System (SSRS) was repealed effective January 2007, and States were no longer allowed to collect SSRS fees. The required UCR Agreement was intended by Congress to replace revenues the States have derived from SSRS and certain other programs, and to provide the sole means for any State to recoup these monies. States that do not participate in the UCR include Arizona, Hawaii, Florida, Maryland, Nevada, New Jersey, Oregon, Vermont, Wyoming, and Washington D.C. See, March 3, 2015 *The Unified Carrier Registration Act of 2005, Informal guidance for Interested Parties*, available on NARUC's website at: <http://www.naruc.org/ncsts/documents/20150303UCRFAQ.pdf>. An organization affiliated with NARUC – the National Conference of State Transportation Specialists – focuses much of its effort on UCR issues.

increasing numbers of NARUC members and member states are interested in monitoring railroad safety issues given the recent increases in crude oil shipments by rail²⁷ and related derailments.²⁸

In October 2015, NARUC conducted an informal survey to determine how many of its members have jurisdictional oversight of transportation issues. The survey garnered 33 responses, which revealed that at least 22 NARUC member Commissions have some level of jurisdiction over transportation matters. Many have jurisdiction over some aspects of railroads, taxis, limo services, and TNCs.

Task Force Goals and Responsibilities: The Task Force on Transportation will assist in managing NARUC's efforts in responding to and educating members about these emerging transportation issues. It will report directly to the NARUC Executive Committee.

As NARUC's members have interests primarily in two areas, there will be two Co-Chairs of this Task Force – one to head up a *Working Group on Motor Carriers* and the other to head up a *Working Group on Railroad Safety*.

²⁷See, e.g., *Assessment of Crude by Rail Safety Issues in Commonwealth of Pennsylvania: Final Report prepared for Commonwealth of Pennsylvania*, (August 2015) at: <http://www.scribd.com/doc/274852355/Assessment-of-Crude-by-Rail-CBR-Safety-Issues-in-Commonwealth-of-Pennsylvania>; *CPUC and Interagency Working Group Release Oil By Rail Report Highlighting Need for Sustainable Funding and Close Coordination to Protect Public Safety*, CA PUC Press Release (June 2014) at <http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M096/K135/96135439.PDF>; *Washington State 2014 Marine and Rail Oil Transportation Study*, (March 2015), at: <https://fortress.wa.gov/ecy/publications/documents/1508010.pdf>; *Train Safety Report: A statewide review of oil train safety issues in Oregon*, Cassandra Porfita (July 2015), at: <http://www.scribd.com/doc/235108487/Train-Safety-Report-7-25-14-Final>; *Minnesota Dept. of Transportation Report on the Improvements to Highway-Rail Grade Crossings and Rail Safety* (December 2014) at: <http://www.dot.state.mn.us/govrel/reports/2014/CBRCrossingStudy-December2014/ReportonHwy-RailXingsandRailSafety-2014.pdf>; *Minnesota's Preparedness for an Oil Transportation Incident* (January 2015) <https://dps.mn.gov/divisions/hsem/planning-preparedness/Documents/mn-preparedness-oil-transportation-incident-report.pdf>; North Dakota Department of Emergency Services to contract Witt O'Brien's, LLC to develop a crude oil response preparedness report (November 2014) at: <http://www.nd.gov/des/news/detail.asp?newsID=162>; and New York's Webpage "State's Actions on Transport of Crude Oil" (Last accessed 1/11/2016) at <http://www.dec.ny.gov/permits/95614.html>.

²⁸See, e.g., NBC News, *Oil Train Spills Hit Record Level in 2014* (January 26, 2015), online at: <http://www.nbcnews.com/news/investigations/oil-train-spills-hit-record-level-2014-n293186> ("American oil trains spilled crude oil more often in 2014 than in any year since the federal government (PHMSA) began collecting data on such incidents in 1975. . . The record number of spills sparked a fireball in Virginia, polluted groundwater in Colorado, and destroyed a building in Pennsylvania, causing at least \$5 million in damages and the loss of 57,000 gallons of crude oil.") See also, NBC News, *North Dakota town evacuated after Oil Train Derailment* (May 6, 2015), online at: <http://www.cbsnews.com/news/north-dakota-town-evacuated-after-oil-train-derailment/>; Ferro, Shane, *US oil train accidents won't go away any time soon* (Business Insider - March 20, 2015); National Geographic, *This Map Shows How U.S. Oil Train Accidents Skyrocketed* (May 1, 2015) online at: <http://www.cbsnews.com/news/north-dakota-town-evacuated-after-oil-train-derailment/>.

The Task Force may set NARUC policy on these issues via resolutions presented to the NARUC Board of Directors. If the Co-Chairs of the Task Force are not members of the Board, any proffered resolution from the Task Force will be moved by the 2nd Vice President for possible discussion and approval.

The Task Force will coordinate sessions at NARUC meetings, organize educational efforts within NARUC, coordinate with NARUC affiliated organizations, including the National Conference on State Transportation Specialists, in collecting best practices on transportation issues, and act as a resource for NARUC leadership on relevant matters. We expect the Task Force to have its first meeting at the upcoming NARUC February meetings in Washington, D.C.

Task Force Duration: 1 year, and not more than 2 years, as required by NARUC policy.

Proposed Co-Chair and Members: The Task Force will have no more than 20 members appointed by the President of NARUC. As noted above, there will be two Co-Chairs of this Task Force – one to head up a Working Group on Motor Carriers and the other to head up a Working Group on Railroad Safety.

Staffing: Staff for the Task Force will be designated by the members of the Task Force. The NARUC staff that will assist the Task Force are Brad Ramsay, Chris Mele, and Brian O'Hara. Any additional staffing will be organized by the Co-Chairs after they consult with the other members.

Proposed Charter: The Presidential *Task Force on Transportation* is chartered for a period of 12 months, as of this 19th day of January 2016 to focus on existing and emerging transportation issues. The Task Force will assist in managing NARUC's efforts in responding to, and educating members about these emerging transportation issues. There will be two Co-Chairs of this Task Force – one to head up a *Working Group on Motor Carriers* and the other to head up a *Working Group on Railroad Safety*.

The Task Force will have no more than 20 members. It will report directly to the NARUC Executive Committee. The Task Force may set NARUC policy on these issues via resolutions presented to the NARUC Board of Directors. If the appointed Co-Chairs of the Task Force are not members of the Board, any proffered resolution from the Task Force will be moved by the 2nd Vice President for possible discussion and approval.

The Task Force will coordinate sessions at NARUC meetings, organize educational efforts within NARUC, collect best practices on transportation issues, and act as a resource for NARUC leadership on relevant matters. We expect the Task Force to have its first meeting at the upcoming NARUC February meetings in Washington, D.C.

Initially the Working Group on Motor Carriers should focus on compiling best State practices to modify common carrier laws in light of new business models and a trend toward competitive entry, commemorating those recommendations in resolutions proposed to the Board; this Working Group might also consider a paper survey of TNC service issues. The Working Group on Railroad Safety might consider generating a précis on state and federal authority over railroad safety and the transportation of crude oil by rail, including the effect of recent state and

federal actions, legislation and regulations, and information on how to participate in State and federal proceedings on railroad safety.

Appendix B

State Utility Commissions Regulate TNCs	State Utility Commissions <u>Do Not</u> Regulate TNCs	
Alabama (PSC shares jurisdiction with localities)	Alaska	Missouri
California	Arizona	New Hampshire
Colorado	Connecticut	New Jersey
Montana	Delaware	New York
Nebraska	District of Columbia	North Carolina
Nevada	Florida	North Dakota
Pennsylvania	Georgia	Oregon
Washington	Idaho	Rhode Island
Arkansas	Illinois	South Carolina
Ohio	Indiana	South Dakota
Louisiana	Iowa	Tennessee
Maryland	Kansas	Texas
New Mexico	Kentucky	Utah
Oklahoma	Maine	Vermont
Hawaii	Massachusetts	Virginia
	Michigan	West Virginia
	Minnesota	Wisconsin
	Mississippi	Wyoming

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6. "Prearranged Ride" means the provision of transportation by a TNC driver to a TNC rider:
 - a. beginning when a TNC driver accepts a TNC rider's request for a ride through a digital network controlled by a Transportation Network Company;
 - b. continuing while the TNC driver transports the requesting TNC rider; and
 - c. ending when the last requesting TNC rider departs from the Personal Vehicle
 7. The term "prearranged ride" does not include transportation provided through any of the following [CITE DEFINITION IN STATE LAW OR MOTOR CARRIER ACT]:
 - a. shared expense carpool or vanpool arrangements
 - b. use of a taxicab, limousine, or other hire vehicle
 - c. a regional transportation
- B. Transportation Network Companies**
1. A transportation network company may not operate without a permit issued under [CITE DEFINITION IN STATE LAW].
 - a. A permit is valid for one (1) year after the date of issuance.
 2. A TNC or a TNC driver is not:
 - a. a common carrier;
 - b. a contract carrier; or
 - c. a motor carrier
 3. The department shall issue a permit to a TNC that satisfies the following requirements:
 - a. establishes a zero tolerance policy for drug and alcohol
 - b. requires compliance with applicable vehicle requirements
 - c. adopts nondiscrimination and accessibility policies
 - d. establishes record maintenance guidelines
 4. Before a TNC allows an individual to act as a TNC driver on the TNC's digital network, the TNC shall:
 - a. require the individual to submit to the TNC an application that includes:
 - i. the individual's name, address, and age;
 - ii. the individual's driver's license;
 - iii. the registration for the personal vehicle that the individual will use to provide prearranged rides;
 - iv. proof of financial responsibility for the personal vehicle described in 4(a)(iii) above of a type and in the amounts required by the TNC; and

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- v. any other information required by the TNC;
 - b. with respect to the individual, conduct, or contract with a third party to conduct:
 - i. a local and national criminal background check; and
 - ii. a search of the national sex offender registry; and
 - iii. obtain a copy of the individual's driving record maintained under [CITE DEFINITION IN STATE LAW]
 - c. A TNC may not knowingly allow to act as a TNC driver on the TNC's digital network an individual:
 - i. who has received judgments for:
 - (1) more than three (3) moving traffic violations in the preceding three (3) years; or
 - (2) at least one (1) violation involving reckless driving or driving on a suspended or revoked license in the preceding three (3) years; or
 - ii. who has been convicted in the preceding seven (7) years of a:
 - (1) felony; or
 - (2) misdemeanor involving:
 - (a) resisting law enforcement;
 - (b) dishonesty;
 - (c) injury to a person;
 - (d) operating while intoxicated;
 - (e) operating a vehicle in a manner that endangers a person;
 - (f) operating a vehicle with a suspended or revoked license; or
 - (g) damage to the property of another person; or
 - iii. who is a match in the state or national sex offender registry;
 - iv. who is unable to provide information required under subsection (b)
5. A TNC shall establish and enforce a zero tolerance policy for drug and alcohol use by TNC drivers during any period when a TNC driver is engaged in, or is logged into the TNC's digital network but is not engaged in, a prearranged ride. The policy must include provisions for:
- a. investigations of alleged policy violations; and
 - b. suspensions of TNC drivers under investigation
6. A TNC must require that a personal vehicle used to provide prearranged rides must comply with all applicable laws and regulations concerning vehicle equipment.

- 155 **C. Financial Responsibility of Transportation Network Companies**
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157 On or before [MONTH, DAY, YEAR] and thereafter, a Transportation Network Company
158 Driver or Transportation Network Company on the driver's behalf shall maintain primary
159 automobile insurance that:
- 160 1. Recognizes that the driver is a Transportation Network Company Driver or otherwise
161 uses a vehicle to transport riders for compensation and covers the driver:
- 162 a. while the driver is logged on to the Transportation Network Company's Digital
163 Network; or
- 164 b. while the driver is engaged in a Prearranged Ride
- 165 2. The following automobile insurance requirements shall apply while a participating
166 Transportation Network Company Driver is logged on to the Transportation
167 Network Company's Digital Network and is available to receive transportation
168 requests but is not engaged in a Prearranged Ride:
- 169 a. Primary automobile liability insurance in the amount of at least \$50,000
170 for death and bodily injury per person, \$100,000 for death and bodily
171 injury per incident, and \$25,000 for property damage.
- 172 *[Drafting note: Reference by statute all other state mandated*
173 *coverages for motor vehicles by state financial responsibility law, UM/*
174 *UIM, Med Pay, NF and/or PIP.]*
- 175 b. The coverage requirements of this subsection 2 may be satisfied by any of
176 the following:
- 177 i. automobile insurance maintained by the Transportation
178 Network Company Driver; or
- 179 ii. automobile insurance maintained by the Transportation
180 Network Company; or
- 181 iii. any combination of subparagraphs (i) and (ii).
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- 183 3. The following automobile insurance requirements shall apply while a
184 Transportation Network Company Driver is engaged in a Prearranged Ride:
- 185 a. Primary automobile liability insurance that provides at least \$1,000,000 for
186 death, bodily injury and property damage;
- 187 *[Drafting note: Reference by statute all other state mandated coverages for*
188 *limousines, e.g., UM/ UIM, Med Pay, NF and/or PIP.]*
- 189 b. The coverage requirements of this subsection 3 may be satisfied by any of the
190 following:
- 191 i. automobile insurance maintained by the Transportation Network
192 Company Driver; or
- 193 ii. automobile insurance maintained by the Transportation Network
194 Company; or
- 195 iii. any combination of subparagraphs (i) and (ii)

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4. If insurance maintained by driver in subsections 2 or 3 has lapsed or does not provide the required coverage, insurance maintained by a Transportation Network Company shall provide the coverage required by Section C beginning with the first dollar of a claim and have the duty to defend such claim.
 5. Coverage under an automobile insurance policy maintained by the Transportation Network Company shall not be dependent on a personal automobile insurer first denying a claim nor shall a personal automobile insurance policy be required to first deny a claim.
 6. Insurance required by this Section C may be placed with an insurer licensed under [CITE STATUTE], or with a surplus lines insurer eligible under [CITE STATUTE] that has a credit rating of no less than "A-" from A.M. Best or "A" from Demotech or similar rating from another rating agency recognized by the department of insurance.
 7. Insurance satisfying the requirements of this Section C shall be deemed to satisfy the financial responsibility requirement for a motor vehicle under [STATE FINANCIAL RESPONSIBILITY STATUTE].
 8. A Transportation Network Company Driver shall carry proof of coverage satisfying sections C.2 and C.3 with him or her at all times during his or her use of a vehicle in connection with a Transportation Network Company's Digital Network. In the event of an accident, a Transportation Network Company Driver shall provide this insurance coverage information to the directly interested parties, automobile insurers and investigating police officers, upon request pursuant to [INSERT ELECTRONIC ID CARD LAW OR CREATE SUCH LAW]. Upon such request, a Transportation Network Company Driver shall also disclose to directly interested parties, automobile insurers, and investigating police officers, whether he or she was logged on to the Transportation Network Company's Digital Network or on a Prearranged Ride at the time of an accident.
- D. Disclosures**
1. The Transportation Network Company shall disclose in writing to Transportation Network Company Drivers the following before they are allowed to accept a request for a Prearranged Ride on the Transportation Network Company's Digital Network:
 - a. the insurance coverage, including the types of coverage and the limits for each coverage, that the Transportation Network Company provides while the Transportation Network Company Driver uses a Personal Vehicle in connection with a Transportation Network Company's Digital Network; and
 - b. that the Transportation Network Company Driver's own automobile insurance policy might not provide any coverage while the driver is logged on to the Transportation Network Company's Digital Network and is
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240 available to receive transportation requests or is engaged in a Prearranged
241 Ride, depending on its terms.

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*[Drafting note: A state should consider appropriate lienholder language to
244 coordinate with the state's existing law.]*

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247

E. Automobile Insurance Provisions

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1. Insurers that write automobile insurance in [INSERT STATE] may exclude any and all
249 coverage afforded under the policy issued to an owner or operator of a Personal
250 Vehicle for any loss or injury that occurs while a Driver is logged on to a
251 Transportation Network Company's Digital Network or while a Driver provides a
252 Prearranged Ride. This right to exclude all coverage may apply to any coverage
253 included in an automobile insurance policy including, but not limited to:

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- a. liability coverage for bodily injury and property damage;

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- b. personal injury protection coverage as defined in [CITE STATUTE];

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- c. uninsured and underinsured motorist coverage;

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- d. medical payments coverage;

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- e. comprehensive physical damage coverage; and

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- f. collision physical damage coverage

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Such exclusions shall apply notwithstanding any requirement under [STATE
263 FINANCIAL RESPONSIBILITY STATUTE]. Nothing in this section implies or requires that
264 a personal automobile insurance policy provide coverage while the driver is logged
265 on to the Transportation Network Company's Digital Network, while the driver is
266 engaged in a Prearranged Ride or while the driver otherwise uses a vehicle to
267 transport riders for compensation.

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Nothing in this Article shall be construed as to require an insurer to use any
270 particular policy language or reference to this section in order to exclude any and all
271 coverage for any loss or injury that occurs while a driver is logged on to a
272 Transportation Network Company's Digital Network or while a Driver provides a
273 Prearranged Ride.

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Nothing shall be deemed to preclude an insurer from providing primary or excess
276 coverage for the Transportation Network Company Driver's vehicle, if it so chose to
277 do so by contract or endorsement.

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2. Automobile insurers that exclude the coverage described in Section C shall have no
280 duty to defend or indemnify any claim expressly excluded thereunder. Nothing in
281 this Article shall be deemed to invalidate or limit an exclusion contained in a policy
282 including any policy in use or approved for use in [STATE] prior to the enactment of
283 this Article that excludes coverage for vehicles used to carry persons or property
284 for a charge or available for hire by the public.

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286 An automobile insurer that defends or indemnifies a claim against a driver that is
287 excluded under the terms of its policy, shall have a right of contribution against
288 other insurers that provide automobile insurance to the same driver in satisfaction
289 of the coverage requirements of Section C at the time of loss.
290

291 3. In a claims coverage investigation, Transportation Network Companies shall
292 immediately provide upon request by directly involved parties or any insurer of the
293 Transportation Network Company Driver if applicable, the precise times that a
294 Transportation Network Company Driver logged on and off of the Transportation
295 Network Company's Digital Network in the twelve-hour period immediately
296 preceding and in the twelve-hour period immediately following the accident.
297 Insurers potentially providing coverage as set forth in Section C shall disclose upon
298 request by any other such insurer involved in the particular claim, the applicable
299 coverages, exclusions and limits provided under any automobile insurance
300 maintained in order to satisfy the requirements of Section C.
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302

Appendix D

Comments on Transportation Network Company Regulations

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The Mercatus Center at George Mason University is the world's premier university source for market-oriented ideas—bridging the gap between academic ideas and real-world problems. The Mercatus Center's "economic toolkit" draws from Nobel laureates Friedrich A. Hayek, Elinor Ostrom, Douglass North, and George Mason University's own James Buchanan and Vernon Smith.

Mercatus scholars conduct their own research regarding which institutions—markets, governments, nonprofits, or combinations of the three—promote the best social outcomes. Our mission is to generate knowledge and understanding of the institutions that affect the freedom to prosper, and to find sustainable solutions that overcome the barriers preventing individuals from living free, prosperous, and peaceful lives.

Introduction

The following document was drafted in response to the Pennsylvania Public Utility Commission's request for comments regarding aspects of Transportation Network Company (TNC) laws and regulations, including:

- Jurisdictional Issues
- Driver Safety
- Vehicle Safety
- Insurance
- Rates/Pricing

The commentary below is part of an ongoing project that will culminate in a peer-reviewed research paper analyzing the current state of TNC regulations (forthcoming).

Comments

1. Jurisdictional Issues

1.1. Regulating Body (PUC, DOT, DMV, Local Government)

The regulatory body for TNCs is not particularly important, so long as the law creating the regulation and the regulation itself conforms to the basic principles that avoid creating government-granted privilege.²⁹ These principles, broadly, are (1) Generality of Application, (2) Avoiding Market Manipulation, and (3) Intellectual Honesty.

Generality of Application is simply a vigilant focus on ensuring that the rule of law is applied equally and that all firms and customers face an even playing field with regard to government policies, regulations, and laws. Selectively applying broad legal rules or allowing the existence of different sets of rules for different companies or social groups incentivizes what economists call “unproductive entrepreneurship” wherein the scarce resources in society are used to chase government-granted privilege rather than actually producing value.³⁰ This means that allowing violations of the principle of Generality of Application encourages enterprising individuals to use their talents to create or protect privileged status, rather than develop the innovations that lead to the long-term increase in human well-being.³¹ Lastly, deviations away from Generality of Application undermine government legitimacy and decrease trust in social institutions, encouraging animosity rather than cooperation.³² This is more problematic than commonly understood because the amazing economic growth that has taken place over the last 200

²⁹ “ At various times and places, these privileges have included (among other things) monopoly status, favorable regulations, subsidies, bailouts, loan guarantees, targeted tax breaks, protection from foreign competition, and noncompetitive contracts. Whatever its guise, government-granted privilege is an extraordinarily destructive force. It misdirects resources, impedes genuine economic progress, breeds corruption, and undermines the legitimacy of both the government and the private sector.” Matthew D. Mitchell, *The Pathology of Privilege: The Economic Consequences of Government Favoritism* (Arlington, Virginia: Mercatus Center at George Mason University, 2015), 1–2, http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2130566.

³⁰ *Ibid.*, 21–22; William J. Baumol, “Entrepreneurship: Productive, Unproductive, and Destructive,” *Journal of Political Economy* 98, no. 5, Part 1 (October 1990): 893–921, doi:10.1086/261712.

³¹ Mitchell, *The Pathology of Privilege*, 23–26.

³² *Ibid.*, 33–36.

years has been in large part due to social institutions which encourage high levels of interpersonal trust, allowing for greater trade and therefore specialization in production.³³

Avoiding Market Manipulation refers to ensuring that laws and regulations do not create arbitrary restrictions on individuals and businesses, but instead that any legal rules are directly tailored to correct specific market failures. The core role of a classically liberal government is to protect the ability of individuals to trade freely, rather than direct their trading in certain directions or to provide special privileges for some individuals or industries.³⁴ By focusing on the specific market failure to be corrected, regulations are more likely to avoid inadvertently tilting the economic playing field in favor of some businesses, thereby disadvantaging others. Such uneven playing fields obviously inhibit competition between businesses, which itself is often the best regulator of corporate behavior as companies strive to please customers.³⁵ Conversely, protection from full and fair competition leads to reduced economic growth because it reduces the incentive for smart investments and efficient use of resources.³⁶ Even in situations where there are only a few major companies in a given market, the simple *threat* of entrance by new rivals motivates existing firms to stay focused on pleasing customers.³⁷ Furthermore, even regulations which are not directly anticompetitive can still inhibit future innovation by forbidding entrepreneurial exploration in the regulated area. In short, regulations that create barriers to entry or which unnecessarily stipulate how business is to be done lead to less competition and decrease long-run economic growth.

Intellectual Honesty is important because it is seldom recognized that government failure—such as regulatory capture and/or the creation of monopoly power via anticompetitive regulations—can be worse than the original market failure that was object of the government action.³⁸ The government’s intervention into the economy will naturally encourage special interest groups to try to manipulate that intervention to their advantage. Even when this result can be avoided, it’s important to realize that while the

³³ Ibid., 36–37; McCloskey also argues that the value system of classical liberalism allowed for the mixing of ideas which led to far faster gains in human well-being than all of previous history. Deirdre N. McCloskey, “How the West (and the Rest) Got Rich,” *Wall Street Journal*, May 20, 2016, sec. Life, <http://www.wsj.com/articles/why-the-west-and-the-rest-got-rich-1463754427>; Deirdre N. McCloskey, *Bourgeois Equality: How Ideas, Not Capital or Institutions, Enriched the World* (Chicago: The University of Chicago Press, 2016).

³⁴ Ezra Taft Benson, *Proper Role of Government* (Salt Lake City, UT: Hawkes Pub., 1995).

³⁵ “Whenever competition is feasible it is, for all its imperfections, superior to regulation as a means of serving the public interest.” Alfred E. Kahn, *The Economics of Regulation: Principles and Institutions* (Cambridge, Mass: MIT Press, 1988).

³⁶ This concept is called “X-inefficiency” by economists. Mitchell, *The Pathology of Privilege*, 17–18; Harvey Leibenstein, “Allocative Efficiency vs. ‘X-Efficiency,’” *The American Economic Review* 56, no. 3 (1966): 392–415.

³⁷ William J. Baumol, John C. Panzar, and Robert D. Willig, “Contestable Markets: An Uprising in the Theory of Industry Structure: Reply,” *The American Economic Review* 73, no. 3 (1983): 491–96.

³⁸ Julian le Grand, “The Theory of Government Failure,” *British Journal of Political Science* 21, no. 4 (1991): 423–42; Gordon Tullock et al., *Government Failure: A Primer in Public Choice* (Washington, DC: Cato Institute, 2002); Susan E. Dudley and Jerry Brito, *Regulation: A Primer*, 2nd ed (Arlington, Va: Mercatus Center at George Mason University, 2012), 17.

intentions of legislators and regulators may be completely beneficent, the actual implementation of legal rules is difficult and is more likely than not to have unforeseen consequences. Conversely, many market failures are self-correcting, especially if there is an entrepreneurial profit opportunity in solving the problem.³⁹ If no such entrepreneurial solution is available, informal social institutions often arise to address the problem.⁴⁰ In summary, changing economic circumstances, social attitudes, or new technologies may diminish or solve the problem altogether, so even if in the short run governmental intervention is warranted, it should be limited, focused on the specific market failure to be addressed, and be of limited duration to avoid freezing the economy in the past.

Complementing this principles-focused approach, a structured process to propose and review regulations can help avoid the problem of unintentionally creating government-granted privilege. Previous Mercatus research⁴¹ has illustrated this process in detail, so I provide only a cursory discussion here.

1) Start with a Blank Slate

Approach rule-making, both for new regulations and for revisions to existing regulations, from a fresh standpoint that is explicitly designed to counter the potential of status quo bias. In essence, the regulatory perspective should avoid falling into the rut of doing things the same old way.

2) Define the Nature of the Problem

Clearly identify the market failure that is the motivation for the regulation and the cause and effect process of how government intervention can alleviate the problem.

3) Identify Alternate Solutions

There may be no need for new regulations if other alternatives, such as economic

³⁹ Adam D. Thierer et al., "How the Internet, the Sharing Economy, and Reputational Feedback Mechanisms Solve the 'Lemons Problem,'" Mercatus Working Paper (Arlington, Virginia: Mercatus Center at George Mason University, May 2015), 11, <https://www.mercatus.org/system/files/Thierer-Lemons-Problem.pdf>; Mark Steckbeck and Peter J. Boettke, "Turning Lemons into Lemonade: Entrepreneurial Solutions to Adverse Selection Problems in E-Commerce," SSRN Scholarly Paper (Rochester, NY: Social Science Research Network, 2004), <https://papers.ssrn.com/abstract=1538369>; Israel M. Kirzner, *Competition and Entrepreneurship* (Chicago: University of Chicago Press, 1973).

⁴⁰ Elinor Ostrom, "Elinor Ostrom - Prize Lecture: Beyond Markets and States: Polycentric Governance of Complex Economic Systems" (The Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel, December 8, 2009), <http://www.tandfonline.com/doi/abs/10.1080/19186444.2010.11658229>; Adam D. Thierer, *Permissionless Innovation: The Continuing Case for Comprehensive Technological Freedom*, Revised and expanded edition (Arlington, Virginia: Mercatus Center George Mason University, 2016), 63–80.

⁴¹ Jerry Ellig, "Ten Principles for Better Regulation," Mercatus Research (Arlington, Virginia: Mercatus Center at George Mason University, 2013), https://www.mercatus.org/system/files/Ellig_10RegPrinciples_v1.pdf; Jerry Ellig, "Ready, Fire, Aim! A Foundational Problem with Regulations," Economic Perspectives (Mercatus Center at George Mason University, November 6, 2015), <https://www.mercatus.org/system/files/Ellig-Ready-Fire-Aim-update-EP.pdf>; Michael D. Farren, Christopher Koopman, and Matthew D. Mitchell, "Rethinking Taxi Regulations: The Case for Fundamental Reform," Mercatus Research (Arlington, Virginia: Mercatus Center at George Mason University, 2016), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2838918.

incentives, offer an equivalent solution. It's also important to consider the "Do Nothing" option because of the possibility of government failure—namely, that the proposed solution might have the potential to create a worse problem than the one it purports to solve.

4) Explicitly Identify the Costs and Benefits of Each Solution

The costs or benefits of a given solution may not be readily apparent and thus a focused inquiry is necessary to fully understand the tradeoffs between each solution. For example, there may be dynamic economic effects of the regulation, as discussed in Section 1.7. Alternately, the creation of the regulation may incentivize rent-seeking activities by special interest groups, which leads to wasted resources.

5) Compare Costs and Benefits

The last step is to compare the costs and benefits of each solution on as equivalent a basis as possible. If quantification of the costs and benefits are not possible, then an explicit and rigorous qualitative comparison is important to ensure that the best solution is selected.

1.2. How did your state determine whether it has jurisdiction over TNCs?

N/A

1.3. Does your state regulate TNCs as a whole, or on a case-by-case basis?

The principle of Generality of Application (see Section 1.1) would argue that there should be no regulations created on a "case by case" basis, but that all regulations would apply equally to all individuals and business engaging in the regulated activity.

1.4. Public Demand or Need

Transportation services are not a public good. Public goods are defined as those goods or services which are non-rival (one person's consumption of the good or service does not diminish another person's ability to consume the same good or service) and non-excludable (the provider of the good or service cannot control who is able to consume the good or service).⁴² The provision of national defense is the textbook example of a security service which is a public good.⁴³ However, transportation services—in particular, personal automobile-related services—are indeed excludable (the provider does have ability to control who consumes the service) and they are rivalrous (the consumption of the service does diminish the ability of others to consume the same service, although this varies depending on the seating capacity of the vehicle).

⁴² "Public Goods: The Concise Encyclopedia of Economics | Library of Economics and Liberty," accessed January 19, 2017, <http://www.econlib.org/library/Enc/PublicGoods.html>.

⁴³ Hal R. Varian, *Intermediate Microeconomics: A Modern Approach*, 6th ed (New York: Norton, 2003), 644.

Similarly, transportation services do not suffer from the same sort of "natural monopoly" characteristics experienced by the services traditionally regarded as public utilities (electricity, natural gas, potable water, sewage, and telecommunications). Natural monopolies occur in industries which experience economies of scale, where the average unit cost of production decreases with higher levels production (this generally occurs in cases where there are large, initial costs to begin production, but relatively small operating costs once the startup costs have been paid).⁴⁴ Industries producing goods and services through these kinds of frameworks naturally tend to have a small number of enterprises that control a substantial portion of the supply and are therefore less susceptible (though not totally immune) to competitive pressure than other goods and services. Construction of the transmission networks for energy, water, and communications are a good example of such large, initial costs.

Paved roadways in public thoroughfares would seemingly represent a similar network to those used by traditional utilities, but there are important differences in the resulting service consumed by customers. For example, the discrete units of energy, water, or communications are nearly indistinguishable from each other. This means that the particular service provider used by a customer is less important because the quality of service does not differ across service providers (barring the occurrence of service outages). For example, it is possible for multiple producers to provide electricity to the transmission grid but from the customers' point of view there is no practical difference between a kilowatt-hour of electricity from one producer versus another.⁴⁵ Conversely, transportation services are fundamentally different than public utilities in that the customers themselves most often provide their own transportation service and that their automobile corresponds to a specialized "transportation unit" which flows across the roadway network and can only be used by the customer herself. Essentially, the customer is both the provider and the consumer of her own transportation service. Public transportation or for-hire drivers do offer transportation services for purchase, but even these are more like a standard private good or service in that the quality of the service changes according to the service provider.

In summary, transportation services have more in common with standard private market goods and services than public utility-provided services. As a result, there does not seem to be sufficient reasoning to regulate them similar to other public utilities. Specifically there does not seem to be any justifiable reason for requiring that new entrants show sufficient public demand or need for the service they offer before granting permission to do so. Certificates of Public Need/Necessity/Convenience are barriers to entry which

⁴⁴ "Monopoly: The Concise Encyclopedia of Economics | Library of Economics and Liberty," accessed January 19, 2017, <http://www.econlib.org/library/Enc/Monopoly.html>.

⁴⁵ This is not to ignore that there may be personal preferences regarding how the service is produced. For example, the customer may prefer electricity generated by renewable sources. However, the unit of energy itself is essentially identical to other units of energy.

manipulate the private market, providing a government-granted privilege to existing firms by keeping out potential rivals.⁴⁶

1.5. Geographic Scope of Authority

The question of the best geographic scope of authority is answered in a similar way to the question of “What is the most appropriate regulating body?” That is, the best authority is the one which will best adhere to the principles and regulatory process which inhibit the creation of government-granted privilege, outlined in Section 1.1.

The broader question of “What is the best jurisdictional level for regulating transportation services?” is an open research question that scholars at the Mercatus Center are currently exploring. What can be said is that there are tradeoffs between localized regulation, in which the distance between special interest groups and political decision makers is small, and centralized regulation, in which there is likely to be more competition between special interest groups from different localities.

When regulations are enacted at the local level those persons who are most directly affected by the regulations have the opportunity to inform policymakers about the likely policy outcomes. The policymakers’ correspondingly better information and understanding of the regulatory effects can result in more nuanced policies that minimize unintended consequences. However, the dominant local special interest group is also less likely to face competition for political influence, meaning that the regulations are more likely to benefit the special interest group rather than the community as a whole. In other words, the potential for some version of regulatory capture is high. Municipal taxi regulations are a good example of this situation occurring.

Conversely, when regulations are enacted at the regional, state, or national level the increasing distance between local special interest groups and political decision makers means that each local group holds less influence over the final policy decision. The larger number of special interest groups competing for influence may also serve to limit each group’s ability to influence policy. This *may* result in less overall government privilege granted by the final regulations, although political “logrolling” is a common response by policymakers to get around such competition.⁴⁷ However, the greater distance between policymakers and the local population means that only those special interests which have the resources to bridge that distance will be able to communicate knowledge about the likely regulatory effects. This means that those persons or groups who are least able to voice their concerns will be the most likely to suffer adverse effects

⁴⁶ Christopher Koopman, Thomas Stratman, and Mohamad Elbarrase, “How State CON Laws Restrict Access to Health Care,” Data Visualization (Arlington, Virginia: Mercatus Center at George Mason University, May 13, 2015), <https://www.mercatus.org/publication/how-state-con-laws-restrict-access-health-care>.

⁴⁷ James M. Buchanan and Gordon Tullock, *The Calculus of Consent: Logical Foundations of Constitutional Democracy*, 19. Nachdr., Ann Arbor Paperbacks (Ann Arbor, Mich: Univ. of Michigan Press, 2008); Tullock et al., *Government Failure*, 29–42.

of the regulation, while those with the most resources will be able to influence the regulations in their desired direction.

In short, the increased competition of enacting regulations at the regional, state, or national level comes at the cost of increased distance between those making the political decisions and those experiencing the regulatory effects, meaning that there is no guarantee that the resulting regulations are less likely to grant privilege to certain special interest groups. It may simply be the case that those who benefit from the regulations change depending on the government authority in charge of deciding the policies.

Studying policymaking done at different levels of government and developing ways to address the privilege-granting problems with each is an open research question, but the preliminary answer seems (to me) to be contained in the original government structure conceived for the United States. Namely, that government's authority to create new legal rules is limited by its own set of rules—the Constitution. If the three principles to limit government-granted privilege that I discussed in Section 1.1 were enshrined into state laws and constitutions, then legal challenges could be mounted against privilege-granting government policies. This would allow greater confidence that local regulations would be constrained from being twisted to serve special interests.

1.6. Legislative Activity

N/A

1.7. State Approach to TNCs (pro-competition or pro-regulation)

The question of whether policymakers' approach toward TNCs—or any new economic innovation—is more restrictive or more laissez-faire is more important than is generally recognized. This is because regulations act as walls that close off innovation in the restricted area, forestalling any associated economic growth.

Research by Dawson and Seater has estimated that federal regulations alone have been responsible for decreasing annual economic growth by 2.2% since 1949.⁴⁸ If the U.S. had instead experienced the corresponding growth, the economy would be over 3.6 times larger than it is today. National GDP would have been \$38.8 trillion higher in 2011, corresponding to an average productivity increase of \$130,000 per person.⁴⁹

This is not to say that all regulations are bad or that economic growth should be valued over all other policy outcomes. The important thing to realize is that every policy or regulation has tradeoffs, and perhaps the biggest tradeoff is the unrealized brighter future

⁴⁸ John W. Dawson and John J. Seater, "Federal Regulation and Aggregate Economic Growth," *Journal of Economic Growth* 18, no. 2 (June 1, 2013): 137–77, doi:10.1007/s10887-013-9088-y.

⁴⁹ *Ibid.*

that is forestalled by overly-restrictive or under-nuanced regulations.

1.8. Taxes and Assessments

Taxes in general should follow the “benefits-received” principle as much as possible.⁵⁰ The benefits-received standard ties the taxes owed by each individual or company to the cost of the public services that person used, similar in spirit to a “fee-for-service”. This approach to taxation removes some of the incentive for special interests to lobby for beneficial policies which others have to pay for, limiting the potential for privilege-granting via “concentrated benefits and distributed costs” identified by economist Mancur Olson.⁵¹

In the case of license fees or tax assessments associated with regulations, the benefits-received principle suggests that appropriate fees are determined by the cost of administering and enforcing properly-focused regulations. Michigan’s recently passed TNC legislation provides an example of this.⁵² It includes clauses that mandate the fees collected be used to administer the regulations and importantly, prevent any excess funds from lapsing into the state’s General Fund. Such an approach prevents policymakers from using regulatory fees to finance government-granted privileges to special interest groups. The TNC legislation recently passed in Pennsylvania stipulates that 66.67% of the special 1.4% ride sales tax goes to finance Philadelphia Public Schools, which runs counter to the benefits-received principle and is an example of special interest privilege-granting.⁵³

2. Driver Safety

2.1. Criminal Background Checks

The potential of crime occurring in the context of receiving (or providing) transportation services appears to be higher than the average likelihood of being a victim of crime. For example, taxi drivers have a long history of being targeted for robberies and assaults and have the highest on-the-job murder rate of any profession.⁵⁴ Similarly, crime against taxi

⁵⁰ Richard A. Musgrave and Alan T. Peacock, eds., *Classics in the Theory of Public Finance*, Transferred to digital print (New York: St. Martin Press [u.a.], 2002), 168–76.

⁵¹ Mancur Olson, *The Logic of Collective Action; Public Goods and the Theory of Groups*, Harvard Economic Studies, v. 124 (Cambridge, Mass: Harvard University Press, 1971).

⁵² Michigan Legislature, “Michigan Legislature - Senate Bill 0392 (2015)” (2016), [http://www.legislature.mi.gov/\(S\(wwbx4mryyqolbwu0oakjydh\)\)/mileg.aspx?page=getObject&objectname=2015-SB-0392](http://www.legislature.mi.gov/(S(wwbx4mryyqolbwu0oakjydh))/mileg.aspx?page=getObject&objectname=2015-SB-0392).

⁵³ Pennsylvania General Assembly, “2016 Act 164,” Pub. L. No. 1222 (2016), <http://www.legis.state.pa.us/cfdocs/legis/li/uconsCheck.cfm?yr=2016&sessInd=0&act=164>.

⁵⁴ Occupational Safety and Health Administration, “Risk Factors and Protective Measures for Taxi and Livery Drivers” (U.S. Department of Labor, 2000), <https://www.osha.gov/OSHAfacts/taxi-livery-drivers.pdf>; Occupational Safety and Health Administration, “Preventing Violence against Taxi and For-Hire Drivers,” OSHA Fact Sheet (U.S. Department of Labor, 2010), <https://www.osha.gov/Publications/taxi-driver-violence-factsheet.pdf>.

passengers has been traditionally used as the reasoning to license taxi drivers.⁵⁵ This is not without cause, as there are tragic examples even in modern history of crimes committed by taxi drivers or by persons impersonating taxi drivers.⁵⁶ Modern taxi driver licenses may have originated in San Francisco, after a government crackdown on the activities of “nighthawks”—for-hire stagecoach drivers (or impersonators driving licensed cabs) who would drive travelers out into the countryside and extort money from them in order to drive them back.⁵⁷

The higher rate of taxi-related crime seems to be influenced by the relative anonymity of the interaction between driver and passenger, which licensing laws have attempted to decrease. This problem is exacerbated when the passenger is a traveler from another region or is incapacitated/intoxicated, and therefore must rely, somewhat blindly, on appropriate service from the driver. As a result, a strong case can be made for taxi licensing requirements, especially those that restrict persons which have a record of criminal activity (assuming that recidivism is more likely with those persons).

However, the new technologies used by TNCs mitigate many of the problems that taxi licensing attempted to solve.⁵⁸ First, the computer applications used by TNCs concretely identify both the driver and the passenger, meaning that the anonymity of the transaction is effectively negated. In addition, because the applications use GPS technology, the route of the trip is recorded and drivers are unable to “long-haul” their passengers to earn a higher fare. Also because of GPS technology, the current location of the driver and passenger is known to the TNC at all times. Lastly, both the passenger and the driver have the ability to instantaneously file a complaint about the other’s behavior to the TNC. Together, these technologies inhibit criminal behavior by limiting the ability to perpetrator to escape notice and punishment.

Such technologies do not fully and completely prevent crime from occurring, but no law or technology can ever achieve such an end. Instead, these technologies ensure that if there is malfeasance on the part of the driver or the passenger, a record of the crime can be obtained and the perpetrator identified for prosecution (or at least permanent

⁵⁵ Donald Anderson, “The Short, Contentious History of the Gurney Cab Company in San Francisco,” *FoundSF*, October 2013, http://www.foundsf.org/index.php?title=The_Short,_Contentious_History_of_the_Gurney_Cab_Company_in_San_Francisco; Heather Smith, “The Secret History of the Taxi Wars,” *Grist*, March 5, 2015, <http://grist.org/business-technology/the-secret-history-of-the-taxi-wars/>.

⁵⁶ Rich Palschi and Graeme Edwards, “Unlicensed Mini Cabs Operating in Wandsworth, London” (Metropolitan Police Service, November 18, 2011), <http://www.popcenter.org/library/awards/goldstein/2011/11-18.pdf>; Transport for London, “Security on the Network: TPH Journey-Related Sexual Offences,” *Transport for London*, 2016, <https://www.tfl.gov.uk/corporate/safety-and-security/security-on-the-network/tph-related-sexual-offences>; “The UK’s Taxi Rape Epidemic,” *Frontpage Mag*, July 17, 2013, <http://www.frontpagemag.com/fpm/197260/uks-taxi-rape-epidemic-soeren-kern>.

⁵⁷ Anderson, “The Short, Contentious History of the Gurney Cab Company in San Francisco”; Smith, “The Secret History of the Taxi Wars.”

⁵⁸ Thierer et al., “How the Internet, the Sharing Economy, and Reputational Feedback Mechanisms Solve the ‘Lemons Problem.’”

exclusion from future service). In short, if a driver or passenger foolishly does commit a criminal act, it is likely to be the only such act that the person will commit. This development represents a major step forward compared to the history of anonymous taxi crime, which has allowed for serial criminal violations.⁵⁹

One last point to consider is that legal restrictions on persons with criminal records serving as TNC drivers may unfairly limit some social groups from job opportunities. For example, the arrest and incarceration rate of African-Americans is higher than the population average.⁶⁰ A law prohibiting someone found guilty a crime within the last 7 years from serving as a TNC driver (as most TNC laws do) prevents that person from an opportunity for gainful employment today. Furthermore, transportation services have a history of being a “job of last resort” for those in dire financial straits.⁶¹ In short, policies that create *legal restrictions* on who can serve as a TNC driver can have a disparate impact on some demographic groups and potentially even increase the potential for those persons to fall into poverty, or, lacking other options, return to crime.

In the absence of legally-mandated restrictions, each TNC would need to develop their own standards for what kind of criminal history they would tolerate in their service providers. These standards might be the same as the current TNC legal requirements, or they might be even stricter. For example, several TNCs have emerged that offer enhanced safety by only using female drivers to provide service to female passengers.⁶²

⁵⁹ There are multiple cases of serial killers and serial rapists using the anonymity, lack of security, and personal proximity of taxi business to select victims. Steven Morris, “Police Accused of Failing to Investigate If Christopher Halliwell Is Serial Killer,” *The Guardian*, September 26, 2016, sec. UK news, <https://www.theguardian.com/uk-news/2016/sep/26/police-accused-failing-investigate-christopher-halliwell-serial-killer>; David Barrett, “100 Victims Could Sue in ‘Black Cab Rapist’ John Worboys Case,” February 28, 2014, sec. News, <http://www.telegraph.co.uk/news/uknews/crime/10667340/100-victims-could-sue-in-black-cab-rapist-john-worboys-case.html>; “Serial Killers Who Drove Cabs or Worked for Car Services,” *Ranker*, accessed January 19, 2017, <http://www.ranker.com/list/taxi-car-driver-serial-killers/jacob-shelton>.

⁶⁰ Brad Heath, “Racial Gap in U.S. Arrest Rates: ‘Staggering Disparity,’” *USA TODAY*, November 18, 2014, <http://www.usatoday.com/story/news/nation/2014/11/18/ferguson-black-arrest-rates/19043207/>; Marc Mauer et al., “Five Myths about Incarceration,” *The Washington Post*, June 13, 2011, https://www.washingtonpost.com/opinions/five-myths-about-incarceration/2011/06/13/AGfIWvYH_story.html?utm_term=.53334c869612; Janice Williams, “White Men Vs. Black Men Prison Statistics 2016: Why Are More African American Males Incarcerated?,” *International Business Times*, October 5, 2016, <http://www.ibtimes.com/white-men-vs-black-men-prison-statistics-2016-why-are-more-african-american-males-2426793>.

⁶¹ “Before the depression, there were 84,000 taxi drivers in the United States. By 1932 that number had gone up to 150,000...” Dana Rubinstein, “Uber, Lyft, and the End of Taxi History,” *Politico*, October 30, 2014, <http://www.politico.com/states/new-york/city-hall/story/2014/10/uber-lyft-and-the-end-of-taxi-history-017042>; “...the depression which followed the outbreak of World War I in the fall of 1914 generated a supply of unemployed men to whom jitney operation was an attractive outlet.” Ross D. Eckert and George W. Hilton, “The Jitneys,” *The Journal of Law & Economics* 15, no. 2 (1972): 293–325.

⁶² Tracey Lien, “Uber ... for Women? Start-Ups Hope to Match Female Passengers with Female Drivers,” *Los Angeles Times*, July 16, 2016, <http://www.latimes.com/business/technology/la-fi-tn-ride-hailing-women-snap-story.html>; Justin Moyer, “A ‘female-Only Uber’ Called Chariot Is Coming to Boston next Week. But Is It Legal?,” *Washington Post*, April 11, 2016, <https://www.washingtonpost.com/news/morning-mix/wp/2016/04/11/a-female-only-uber-called-chariot-is-coming-to-boston-next-week-but-is-it-legal/>.

Alternately, TNCs might allow drivers who had more recent criminal records but who were also able to show evidence that they were not a risk (recommendations by parole officers, etc.). Lastly, some TNCs might actually favor using persons with criminal records as a means to help them re-integrate with society, which is essentially a form of charitable employment (other companies do this in other industries).⁶³ Such an approach might be worrisome using previous taxi-era technology, but the non-anonymity of TNC transportation services and the availability of trip records means that much of the concern for passenger safety is alleviated.

2.2. Driving History Record Check

Given that insurance requirements are already part of TNC laws, there does not seem to be a great necessity for the government to mandate specific forms of driving history checks. Presumably driving history background checks are intended ensure that TNC drivers meet some minimum standard of safety. However, such checks will already be factored into the prices paid by the drivers/TNCs to meet insurance requirements. Insurance companies have the best information regarding whether a particular driver is likely to be a risk to public safety. As a result, the truly dangerous drivers will be weeded out by the high insurance costs they would have to pay.

Meanwhile, the TNCs themselves have a compelling interest to maintain a strong reputation of safety among their potential customers to avoid losing business, so they are likely to be vigilant—even more so than government regulations—in policing the safety of their service providers. The same GPS technology that decreases the likelihood of criminal behavior also provides the TNC information on the speed of the vehicle, which is one of the primary causal factors in traffic accidents.⁶⁴ If a TNC/insurance company wishes to monitor drivers more minutely there is technology available for even finer-grained data collection, such as the severity of braking, acceleration, and turning maneuvers.⁶⁵

Lastly, there is evidence that some social groups, such as African-Americans, are targeted by police for driving violations at a higher rate than other social groups.⁶⁶ As a

⁶³ “Project H.O.P.E. Re-Entry Initiative | USAO-SDAL | Department of Justice,” accessed January 19, 2017, <https://www.justice.gov/usao-sdal/programs/ex-offender-re-entry-initiative>; “The Fortune Society,” *The Fortune Society*, accessed January 19, 2017, <https://fortunesociety.org>; “Jobs for Felons | Ex-Offenders.net,” *Exoffenders*, accessed January 19, 2017, <https://exoffenders.net/employment-jobs-for-felons/>.

⁶⁴ National Highway Traffic Safety Administration, “Speeding,” Traffic Safety Facts 2012 Dat (Washington, D.C.: U.S. Department of Transportation, May 2014), <https://crashstats.nhtsa.dot.gov/Api/Public/Publication/812021>.

⁶⁵ “What Is a Telematics Device?—Allstate,” January 2014, <https://www.allstate.com/tools-and-resources/car-insurance/telematics-device.aspx>; Cherise Threewit, “How Do Those Car Insurance Tracking Devices Work?,” *U.S. News & World Report*, October 24, 2016, http://usnews.rankingsandreviews.com/cars-trucks/best-cars-blog/2016/10/How_Do_Those_Car_Insurance_Tracking_Devices_Work/.

⁶⁶ Kim Soffen, “The Big Question about Why Police Pull over so Many Black Drivers,” *Washington Post*, July 8, 2016, <https://www.washingtonpost.com/news/wonk/wp/2016/07/08/the-big-question-about-why-police-pull-over-so-many-black-drivers/>.

result, there may be a systematic difference in documented driving violations between social groups. This means that legal restrictions on the ability to become a TNC driver based on driving history may unknowingly implement discrimination against such social groups.

2.3. Drug or Alcohol Policy

Because driving while intoxicated is already against the law, it does not seem necessary to make providing transportation service while intoxicated “doubly illegal.”

Similar to the arguments contained in Section 2.2, insurance companies have the best knowledge about a particular driver’s public safety risk and have the motivation to price that risk into the cost of TNC insurance for that particular driver. Such a system would create cost-appropriate barriers to entry for drivers with a history of dangerous driving without needlessly prohibiting other drivers from gainful occupation.

In addition, the TNCs themselves have little desire to have unsafe drivers associated with their brand—customers would find it very easy to shift between Uber and Lyft if one of the two companies developed a reputation for connecting passengers with unsafe drivers. As a result, TNCs have a strong incentive to police their driver’s safety and anything that affects it, such as intoxicants. Given a TNC’s desire to maintain a reputation of safety, it does not seem necessary that a “zero-tolerance” policy needs to be written into law. Furthermore, if a TNC continued to allow a driver to provide transportation services on its network *after* a passenger had reported that driver as being intoxicated or otherwise unsafe, the TNC would likely be putting itself at risk of being sued for negligence. As a result of all these factors, clauses in TNC laws relating to driver intoxication seem superfluous.

2.4. Fingerprinting

The underlying question regarding mandating fingerprint-based criminal background checks is not whether criminal background checks themselves are important, but rather what the consequences of mandating a specific type of background check might be.

There may be other criminal background checks, now or in the future, that use better information than fingerprint-based background checks. For example, mandating specific types and methods of background checks may actually inhibit the development of better background checks in the future (i.e.: mid-ride fingerprint scans, retina scans, or even DNA checks), by removing the incentive to develop better checks than those which are legally mandated.

Perhaps the most important thing to remember is that regulations always have tradeoffs. For example, fingerprint-based criminal history checks may inhibit the ability of some social groups, such as African-American men, to serve as drivers. African-American

men as a group have a higher arrest rate than other groups, which can lead to more false positives in background checks, systematically decreasing the employability of black men as TNC drivers.⁶⁷ In addition, requiring a specific kind of background check that inhibits employment by one social group may lead to less services provided in areas where that social group tends to live, since it would be a natural tendency for those drivers to provide services near their home.⁶⁸ The decreased supply of service caused by government regulations could inadvertently lead to avoidable tragedy in cases where crime victims are prevented from leaving a dangerous situation because they don't have a readily accessible transportation option.

2.5. Other

N/A

3. Vehicle Safety

3.1. Inspections

Many states' TNC laws mandate that vehicles used to provide for-hire services undergo a safety inspection at regular intervals. In general this seems like a good idea. Despite the aggravation that such a requirement creates for drivers, a convincing argument in favor of regular inspections is that because the driver is operating the vehicle in a public space (a public thoroughfare), its operation should be required to meet certain standards of public safety. For example, consider the public safety hazard posed by a vehicle with defective brakes traveling on public roads.

However, the important question is not whether for-hire vehicles should be subject to a regular safety inspection, but whether ALL vehicles should be subject to a regular safety inspection. If all vehicles are indeed subject to such a requirement, then there is no reason to mandate it specifically for vehicles providing for-hire services. Similarly, if it is not a general requirement for all vehicles operating on public roadways, then there does not seem to be a valid reason to impose it only on for-hire vehicles.

There is negligible difference in the degree of risk posed to the public by for-hire vehicle operations compared to vehicle operations conducted for personal business. A convincing argument would have to be made as to why private passenger vehicles used as for-hire vehicles have a systematic higher likelihood of being in disrepair than any other private passenger vehicle. Based on current anecdotal evidence, the converse of this would actually seem to be true—the vehicles used to provide for-hire services seem to be of

⁶⁷ Heath, "Racial Gap in U.S. Arrest Rates."

⁶⁸ Taxi regulators have long struggled with the problem of how to ensure that adequate service is provided in low-income/high-crime areas (a problem partially caused by the taxi supply restrictions that most cities enforce), but recent research suggests that increased supply of transportation services offered by TNC drivers has started offset the imbalance in service. Further easing of driver restrictions would seem likely to lead to further service increases in low-income areas.

generally better quality and are in better repair than the average passenger vehicle using public roads. In addition, TNCs have a vested interest in ensuring that drivers providing service through their platform are using safe and reliable vehicles. Failure to do so would motivate customers to switch to other TNC platforms.

In summary, the important question is whether all vehicles traveling public thoroughfares are held to the same safety inspection standard, regardless of what that standard happens to be. This corresponds to the Generality of Application principle.

3.2. Trade Dress

Requirements that for-hire vehicles must display trade dress seem intended to mitigate concerns related to asymmetric information, in particular the passenger's lack of information as to the quality of the driver and the safety of the ride. Because most municipal and state taxi regulations require that for-hire drivers and vehicles be inspected and licensed in order to operate, this conceivably reduces the risk faced by passengers by filtering out unsafe drivers or vehicles.

Interestingly though, trade dress mandates can actually cause unintended consequences that *increase* risk rather than reduce it. This result can occur because the convenience of the "safety signal" provided by trade dress can be coopted by impersonators who would intend to prey on unsuspecting passengers. For example, there have been some cases of persons getting into a car displaying the trade dress of a TNC, but whose driver actually has no affiliation with the company.⁶⁹ The purpose of the subterfuge in most cases seems to have been to lure unsuspecting passengers into a situation where the driver could extort or assault them, much like the "nighthawks" described in Section 2.1. London has infamously had a problem with assaults committed against intoxicated passengers in unlicensed taxicabs for many years.⁷⁰

⁶⁹ Kristen Mosbrucker, "Sexual Assault Report Involving Possible Fake Uber Driver Downplayed before San Antonio City Council Vote," *San Antonio Business Journal*, December 15, 2016, <http://www.bizjournals.com/sanantonio/news/2016/12/15/sexual-assault-report-involving-possible-fake-uber.html>; John Annese, "Woman Robbed by Fake NYC Uber Driver Who Threatened to Rape Her," *NY Daily News*, June 1, 2016, <http://www.nydailynews.com/new-york/nyc-crime/woman-robbed-fake-nyc-uber-driver-threatened-rape-article-1.2656560>; Michael George, "Woman Says She Was Raped by Fake Lyft Driver in Manhattan," *NBC4 New York*, October 20, 2016, <http://www.nbcnewyork.com/news/local/NYC-Fake-Lyft-Driver-Rapes-Woman-Ride-Share-Rapist-397862291.html>; Paul Walsh, "Police: Fake Uber Driver Tries to Sexually Assault Woman in Woodbury," *Star Tribune*, August 22, 2016, <http://www.startribune.com/police-fake-uber-driver-tries-to-sexually-assault-woman-in-woodbury/390949161/>; Mike Wille, "Fake Uber Driver in Maserati Arrested for Sex Assault," *FOX5 San Diego*, November 16, 2016, <http://fox5sandiego.com/2016/11/16/man-posing-as-uber-arrested-for-sex-assault/>.

⁷⁰ London's problem in part revolves around unlicensed drivers using fake signage to indicate that they are licensed as street-hail taxicabs (in addition to a lack of attentiveness of intoxicated passengers). Palschi and Edwards, "Unlicensed Mini Cabs Operating in Wandsworth, London"; Transport for London, "Security on the Network: TPH Journey-Related Sexual Offences"; "The LPHCA (Licensed Private Hire Car Association) has approached TfL TPH about better signage and supports a national signage solution, as supported by the Law Commission. We do not support plastering cars with signage. We know that people are raped when you put signs

In these situations, the passenger might have relied on identifying the driver with whom she had arranged service by the vehicle's trade dress, rather than use the identifying information provided by the TNC, such as the vehicle's license plate number, the make and model of the vehicle and the photo or name of the driver. If TNC vehicles did *not* display trade dress and instead forced the passenger to more explicitly identify the driver and/or vehicle, it would reduce the ability of the criminally-inclined to prey on the unwary.

There are two examples that help illustrate this issue. The first is a classic economics problem of how to reduce injuries due to traffic accidents. Rather than add seat belts or air bags, the counterintuitive best solution is to install a long metal spike directly in the center of every steering wheel. The purpose of this is to actually *increase* the expected injury if an accident is to occur, which motivates each person to drive much more carefully, thereby reducing the total number of traffic accidents.⁷¹

Hans Monderman, a Dutch traffic engineer, came up with a similar solution to improve safety in crowded city intersections serving a mix of vehicular, bicycle, and pedestrian traffic. Rather than increasing the information available to each traveler and channeling them more efficiently by adding more traffic signals, his concept of "Shared Space" actually *reduces* the available information, deliberately creating uncertainty regarding who has right of way in the intersection.⁷² The intersection as a result is less efficient in terms of traffic flow, but it is correspondingly safer because every driver, bicyclist, and pedestrian has to be fully alert, communicating with other travelers via eye contact, body language, and hand gestures, to move through the intersection.

In much the same way, some passengers will let down their guard at the sight of a vehicle's trade dress and assume that this driver is the person whom they actually contacted to provide a ride. Removing the trade dress would force passengers to abandon this careless approach and clearly identify which driver is the person they have contacted. This is not to say that trade dress on for-hire vehicles is completely a bad

on doors because that has happened. We know that touts use the pre-booked only stickers to say 'I'm a minicab, get in'. We know that they are copied and sold in pubs." Transport for London, "Transport for London (TfL) Response to Transport Committee Request for Specific Information Relating to Taxi and Private Hire Services" (Mayor of London, Greater London Authority), accessed January 17, 2017, https://www.london.gov.uk/sites/default/files/gla_migrate_files_destination/All%20responses%20final_0.pdf.

⁷¹ Stuart Buck, "The Buck Stops Here: Spikes and Steering Wheels," August 26, 2008, <http://stuartbuck.blogspot.com/2008/08/spikes-and-steering-wheels.html>; Eric Crampton, "Offsetting Behaviour: In Which the Masthead Is Explained, and Homage Is Paid unto Tullock," *Offsetting Behaviour*, April 24, 2009, <http://offsettingbehaviour.blogspot.com/2009/04/in-which-masthead-is-explained-and.html>.

⁷² Gary Toth, "Where the Sidewalk Doesn't End: What Shared Space Has to Share," *Project for Public Spaces*, August 17, 2009, <https://www.pps.org/reference/shared-space/>; Tom McNichol, "Roads Gone Wild," *WIRED*, December 1, 2004, <https://www.wired.com/2004/12/traffic/>.

idea—branding is important for other reasons⁷³—but a government mandate to display trade dress can provide camouflage to those who would prey on unsuspecting passengers.

3.3. Vehicle Age or Mileage Requirement

If a vehicle is allowed to be used as a private passenger vehicle on public roadways, it seems reasonable that it should be allowed to be used as a for-hire vehicle as well, since nothing changes about the vehicle when it is used as such. Furthermore, vehicle age or mileage requirements may unintentionally exclude demographic groups who are generally less financially well-off—and therefore are more likely to have older vehicles—from employment as TNC drivers. This could also translate into less service being offered in the areas where those demographic groups tend to live.

3.4. Lease or Own

Regulating whether lessors can use their leased vehicles to provide for-hire services seems to be a governmental overreach into market manipulation. Leasing contracts already govern the interaction between leaser and lessor and the lessor's ability to use the vehicle to provide for-hire services can be addressed in the contract, in just the same way that the contract regulates how the lessor can use the vehicle in other ways. Many state TNC laws require the lessor to obtain the leaser's permission before using the vehicle to provide for-hire service, but such a requirement appears redundant, given that the equivalent terms can be written into the leasing contract. Since such laws make using a leased vehicle to provide for-hire services without official permission by the leaser illegal, they constitute a barrier to entry for service providers (in addition to increasing the larger social problem of over-criminalization).⁷⁴

Although this may seem to be a relatively small issue, providing for-hire transportation services has historically been a refuge of last resort for unemployed workers needing money quickly.⁷⁵ Criminalizing the use of leased vehicles to provide for-hire services without explicit permission adds one more barrier against increasing the supply of for-hire transportation services, providing existing service providers with a measure (albeit small) of monopoly power. Similarly, it unreasonably inhibits a citizen from using the resources at her disposal, preventing a quick response to personal financial hardships, thereby limiting her ability to be self-sufficient.

In answer to the question “May I use my leased vehicle to provide for-hire services?” leasing-related TNC regulations generally mandate the default answer to be “No.” An

⁷³ Matthew Mitchell, “Why Regulations That Require Cabs to Be Painted the Same Color Are Counterproductive,” *Neighborhood Effects*, June 12, 2015, <http://neighborhoodeffects.mercatus.org/2015/06/12/why-regulations-that-require-cabs-to-be-painted-the-same-color-are-counterproductive/>.

⁷⁴ Sanford H. Kadish, “The Crisis of Overcriminalization,” *American Criminal Law Quarterly* 7 (1968): 17–34.

⁷⁵ Eckert and Hilton, “The Jitneys”; Rubinstein, “Uber, Lyft, and the End of Taxi History.”

equivalent means of addressing this issue would be to set a legal default answer of “Yes” by requiring leasers to provide a negation of this particular use of the vehicle, rather than requiring the lessors to acquire an affirmation. In either case, the government is overstepping its bounds by manipulating the contractual arrangements between individuals, rather than allowing those individuals to consciously determine their own inter-personal arrangements.

4. Insurance

4.1. State 0: Driver is using the car as his/her own personal vehicle

See comments on Section 4.5

4.2. Stage 1: Driver has the app open and is waiting for a match

See comments on Section 4.5

4.3. Stage 2: Driver has made a match and is driving to pick up the passenger

See comments on Section 4.5

4.4. Stage 3: Driver has paying passengers in the car

See comments on Section 4.5

4.5. All Stages

The risk profile to public safety does not substantially change between a driver using her vehicle for personal purposes, becoming available for for-hire transportation service, or providing for-hire transportation service. A reasonable question to ask then, is why should the amount of mandated insurance change? The average riskiness of the driver's actions may increase between these situations, but the law does not address the probability of occurrence, only the bond to be held in case of accident. Instead, insurance companies have the best information on the probability of occurrence and they have the incentive to find accurate ways to price different levels of riskiness. As a result, the only role for government is determine the appropriate bond level applicable to a given type of activity occurring in the public space and to require that all those operating in the public space maintain a safety bond equivalent to that level.

5. Rate

5.1. Pricing Structure

Government doesn't have any role in setting prices or minutely regulating interactions between individuals. This can be argued from a philosophic perspective—that the American political experiment is premised on the idea that individuals can govern themselves and do not need paternalistic rulers to moderate their behavior (outside of

equal protection of fundamental human rights).⁷⁶ Alternately, it can be argued from a more pragmatic viewpoint—that policymakers and regulators don't have the necessary information to be able to set prices, because such information is widely distributed and constantly changes.⁷⁷ Even if the assumption were made that sufficient information to accurately determine prices could be collected—at enormous cost—market conditions are constantly changing and would have already shifted to a different configuration. This means that under the very best circumstances centrally-calculated government-proscribed prices would only represent a very expensive estimate of what prices should have been in the *previous* time period.⁷⁸

More importantly, setting prices removes the primary economic signal of how valuable the product is to customers and how relatively scarce it is (i.e.: the costs/difficulties/tradeoffs that producers face). The impressive amount of information contained in the market-determined prices of goods and services is what enables greater economic efficiency and corresponding economic growth, because price signals send clear messages to producers and consumers about how to direct their production and purchasing decisions. High prices incentivize consumers to economize, buying only what is necessary, thereby conserving the associated resources for higher-value uses, while high prices motivate producers to find lower-cost substitutes to meet consumers' restrained demand.

5.2. Tariff

There does not seem to be a need for setting a tariff for transportation services, outside of the standard sales tax that is applied to all other goods and services. As just discussed in Section 5.1, government-proscribed prices cannot contain the information contained in market-determined prices, meaning that economic efficiency and the corresponding growth of the economy is harmed.

That said, a general sales tax applied to all goods and services has proven to be a viable means to fund governmentally-provided public goods. One problem that persists is that a single, equitably-applied sales tax is economically distortionary,⁷⁹ but the advantage of the equality of application is that it avoids the problem of special interest groups lobbying to gain government privileges, e.g., sales tax exclusions or higher sales tax applied to competitors' products. Such privilege-seeking activities represent lost value to the economy because they waste valuable resources that could be applied to productive

⁷⁶ "Declaration of Independence: Primary Documents of American History (Virtual Programs & Services, Library of Congress)," webpage, accessed January 19, 2017, <https://www.loc.gov/rr/program/bib/ourdocs/DeclarInd.html>.

⁷⁷ F. A. Hayek, "The Use of Knowledge in Society," *The American Economic Review* 35, no. 4 (September 1945): 519–30.

⁷⁸ *Ibid.*

⁷⁹ F. P. Ramsey, "A Contribution to the Theory of Taxation," *The Economic Journal* 37, no. 145 (1927): 47–61, doi:10.2307/2222721.

ends, as well as creating additional distortion if they are actually successful.⁸⁰

5.3. Surge Pricing

Price flexibility is important to allow demand to adjust to different levels of supply, and vice versa. The “surge pricing” practiced by transportation network companies simply reflects this kind of variability. It is an important signal to both customers and service providers regarding the time-varying scarcity of transportation services and the value that customers place on them (see Section 5.1).

There has been some controversy surrounding the surge pricing policies practiced by TNCs, but in reality the practice follows the same concept as variable pricing for airline tickets, hotel accommodations, gasoline, etc. In fact, the prices of all goods and services fluctuate over time as production costs shift and the demand for the product fluctuates. The only difference between the different kinds of variable pricing is the time interval over which the fluctuation occurs. Modern communication technology simply allows for greater price flexibility according to real-time changes in supply and demand. This is actually an asset, not a problem, because it means that greater economic efficiency is possible.

5.4. Ridesharing/Fare Splitting

I am not familiar with the reasoning behind why the potential for sharing a TNC ride or splitting the fare is considered an issue in TNC regulations. My hypothesis is that taxi special interests from a bygone era conceived of similar such restrictions on taxis as another way to limit the amount of available service, resulting in either higher prices or to ensure more consistent demand for price-regulated services. Alternately, such taxi restrictions may have been created to protect passengers from cavalier attempts by taxi drivers to pack the cab full with other passengers, inconveniencing the original passenger. It’s also possible that both explanations have an element of truth. Regardless, such interpersonal interactions do not necessitate the intervention of government regulations because there is no market failure. However, there may be a case for enforcement of contract law if one or the other party violates the agreement covering the provision of transportation service.

6. Miscellaneous Issues

6.1. Handicap Accessibility

Mandating that service providers offer different services for the same price (for example, transportation using standard taxi sedans or transportation using more expensive Wheelchair-Accessible Vehicles (WAVs)) harms their incentive to offer services in general, although the specific effect depends on the context of the situation. Importantly,

⁸⁰ Mitchell, *The Pathology of Privilege*, 19–20.

it can lead to service providers engaging in practices (legal or illegal) to deny service to the higher cost customers because the price allowed to be charged cannot compensate the actual cost of providing service. As a result, a law that prohibits charging a different price based on the differential cost of providing service to disabled persons is likely to actually reduce the availability of service for disabled persons. This reduced access to transportation is important because it inhibits disabled persons' employability and access vital services, such as doctor visits. This is an active topic of research and a paper discussing the disabled persons' experience in the sharing economy is forthcoming. The initial conclusions suggest that disabled individuals deserve a specialized market which addresses their own specific needs and that current regulations prevent such a market from emerging.

6.2. Unaccompanied Minors

The idea of disallowing unaccompanied minors from using TNC services seems to be an unusual restriction. Parents/legal guardians are already legally responsible (to a degree) for the well-being of their wards and therefore have the incentive to ensure that any services the minors use is appropriately safe (in addition to the expected level of concern a caregiver would typically have for a child).

In fact, disallowing minors from using TNC services may actually lead to the unintentional consequence of *increasing* the danger faced by minors because it may prevent them from leaving a dangerous situation. In addition, this restriction may harm minor's well-being by inhibiting their access to school, employment or other important services, such as doctor visits.

6.3. Use of TNCs as Delivery Service

Creation of TNC-specific regulations for delivery services seems unwarranted, especially since courier and other delivery services already exist. All delivery services should be regulated the same way, just as all for-hire transportation (which in essence is simply a human being delivery service) should be regulated to the same, minimal, standard. For example, pizza delivery does not seem to be subject to onerous or exacting regulations and there do not seem to be important reasons to change this.

6.4. Driverless Cars

This is another open research topic at the Mercatus Center and I refer to you our research that more specifically addresses this matter.⁸¹

⁸¹ Adam D. Thierer and Ryan Hagemann, "Removing Roadblocks to Intelligent Vehicles and Driverless Cars," Mercatus Working Paper (Arlington, Virginia: Mercatus Center at George Mason University, September 2014), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2496929.

6.5. Enforcement Action

N/A

6.6. Environmental Impact of TNCs

It does not appear that the environmental impact of a private passenger vehicle used to provide for-hire service would be any different than the environmental impact of a non-TNC private passenger vehicle, especially since the driver can change between personal business and for-hire services at a moment's notice. As a result, it seems appropriate that the same environmental-related laws or regulations should apply to both private passenger vehicle operations and to TNC-related operations (which suggests that there isn't any justification for environmental regulations specifically focused on TNC-related operations).

6.7. Are the requirements for TNCs the same or different than the requirements for taxis?

In many states/cities it does appear that the regulatory requirements for taxis are different than those for TNCs. The principle of Generality of Application would suggest that the regulations on each should be the same if they are providing the same service.

An argument can however be made that street-hailed transportation services are sufficiently different to warrant their own regulations because the driver and passenger don't know important information about the other and are not vouchsafed in the same way as transportation services regulated via the TNC platform firm. A solution to this issue might be found in requiring that service providers accepting street hails solve the problems of anonymity and asymmetric information between the driver and passenger. An open-ended requirement such as this allows for innovators to come up with novel ways to address the problem, rather than limiting the solution to a single answer, such as government licensing.



National Association of Regulatory Utility Commissioners

**TASK FORCE ON TRANSPORTATION
WORKING GROUP ON RAILROAD SAFETY**

**REPORT ON STATE AND FEDERAL AUTHORITY
OVER RAILROAD SAFETY AND CURRENT RAILROAD SAFETY ISSUES**

PREPARED BY:

THE WORKING GROUP ON RAILROAD SAFETY

DRAFT DATE:

January 2017

WORKING GROUP ON RAILROAD SAFETY

Commissioners

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I. INTRODUCTION AND SCOPE

On Jan. 19, 2016, the Executive Committee of the National Association of Regulatory Utility Commissioners (NARUC) authorized President Travis Kavulla to establish a Presidential Task Force on Transportation.

The Executive Committee established the Task Force due to recent developments in transportation facing NARUC member states, including regulatory issues arising from the increased number and use of transportation network companies; and increased shipments of crude oil by rail and related derailments. These developments drove a need for greater understanding of the role of states in regulating these two industries. The Task Force on Transportation reports directly to the NARUC Executive Committee and has a limited duration of no more than two years.

The Task Force's Working Group on Railroad Safety was formed to "consider generating a précis on state and federal authority over railroad safety and the transportation of crude oil by rail, including the effect of recent state and federal actions, legislation and regulations, and information on how to participate in State and federal proceedings on railroad safety".¹ This report of the Working Group on Railroad Safety is intended to assist and educate NARUC members about state and federal regulation of railroad safety, as well as emerging transportation issues related to railroad safety, including the transportation of crude oil by rail.

BACKGROUND ON TRANSPORTATION OF CRUDE OIL BY RAIL

Since 2012, the United States and Canada have experienced an exponential increase in crude oil supply from historically non-traditional reserves that were once unknown, unavailable, or cost prohibitive to extract. Advances in extraction technology resulted in growing production in Canada of Canadian Oil Sands and significant investments and expansion in the Bakken Formation of North Dakota and Canada. Due to limited pipeline infrastructure in the region, transportation of crude oil shifted significantly towards use of railroads.²

Although the Association of American Railroads reports that less than 1 percent of all derailments involve crude oil, there are significant concerns regarding risk. The safety of transporting crude oil by railroad received international attention on July 6, 2013, when 63 tank cars from an unattended train derailed near the center of Lac-Mégantic, Quebec, Canada, causing a catastrophic fire and release of crude oil that resulted in 47 fatalities. Recent derailments and incidents involving crude oil unit trains have raised additional questions about the safety of the tank cars used to ship the oil, the impact of such trains on railroad infrastructure, and the properties, characteristics, volatility, and safety of Bakken crude oil and

¹ NARUC Charter of Task Force on Transportation, January 19, 2016. (see Appendix A)

² Quadrennial Energy Review Task Force Secretariat and Energy Policy and Systems Analysis Staff, United States Department of Energy, August 8, 2014.

diluted bitumen from Canadian Oil Sands (dilbit). These questions and concerns have led to significant regulatory reform of the transportation of crude oil at the federal level and increased urgency at the state level to increase public safety given the transportation of hazardous materials by rail.

In 2016, production in the Bakken Fields has slowed and pipelines to transport oil and gas have been built or interconnected with existing pipelines. This has reduced the need for railroad transportation of oil to the Midwest and Gulf Coast. However the lack of crude oil pipeline infrastructure for oil movements to the East and West coasts will result in continued levels of crude oil transportation over railroads. The number of shipments likely will depend on the per-barrel price of domestic and international crude oil,³ as well as investments by refineries and shippers in equipment constructed to process, refine, store, and ship the light, sweet crude oil that is extracted from the Bakken Fields. However, the immense supply of undiscovered oil in the Bakken Formation, estimated at 3.65 billion barrels of crude oil and 148 million barrels of natural gas liquids in the U.S. portion of the reserves,⁴ ensures that the transportation of crude oil by rail will continue, requiring a continued focus on railroad safety.

ACTIVITIES OF THE WORKING GROUP ON RAILROAD SAFETY

Since February 2016, the Working Group on Railroad Safety has coordinated member teleconference meetings and hosted educational sessions at NARUC meetings in an effort to collect best practices related to the regulation of railroad safety, and to learn more about industry practices and stakeholder concerns and roles as they relate to railroad safety. Prior to the formation of the NARUC Task Force, a number of states, including many represented on the Task Force, had prepared comprehensive studies of the impact of increased shipments of crude oil by rail in their states, as well as rail safety and environmental issues resulting from this increase in rail traffic.⁵ Many of these safety issues are identified in this Report.

Working Group members directed state staff to research and analyze railroad safety issues in the following areas and prepare a report that can be used as a resource for NARUC members and state rail safety programs:

- Federal Railroad Administration (FRA) state partnership
- Role of states in rail safety
- State programs, lessons learned, gaps, and best practices
- Safety trends and data collection
- Issues of Significance
 - Advanced notice of hazardous materials being transported
 - Emergency response and contingency plans
 - Crossing safety

³ EIA, This Week in Petroleum, March 2, 2016.

⁴ U.S. Geological Survey Assessment for the Bakken Formation

⁵ A summary of the state reports and their recommendations is included in Appendix B to this Report.

- Trespassing
- Transportation of nuclear waste by rail
- Transportation of critical electric utility equipment
- Positive train control
- Railroad crewing/training
- State inspector training
- State inspector resources
- Railroad bridges
- Risk reduction programs
- Track inspection review
- Ultrasonic testing of track
- Operation Life Saver/Right of Way Access
- Grade crossing collisions and crossing safety implications
- Pending federal rules, studies and reports
- Resources for states
- Hazmat tank car rules and inspection activity

The members of the Working Group on Railroad Safety also directed state staff to work with NARUC staff to develop a railroad safety resource page on the Task Force on Transportation – Rail Safety section of the NARUC website. This web page will include documents, reports, studies, surveys, and guidance documents that would be useful for state rail safety programs.

The Working Group established the following guidelines for documents posted to the NARUC website:

- Document Categories:
 - State – Studies, reports, analysis, legislations, rules and laws associated with the state rail safety programs
 - Federal – Notice of Proposed Rules, progress on federal rail safety issues, legislation, and resources from the Federal Railroad Administration
 - Trending Topics – Emerging rail safety topics and issues
 - Resource Information – Best practices, research, templates, safety trends, and ideas on issues facing the state rail safety programs
- Documents:
 - State studies that have been publicly released
 - Published best practices, informational documents, safety data and opinions
 - Research that is readily available by the public

The draft report was presented for discussion and comment at the NARUC Annual meeting in November 2016. After incorporating comments, the final report of the Working Group on Railroad Safety will be presented to the NARUC Executive Committee at the NARUC Winter Meeting in February 2017.

II. THE ROLE OF THE FEDERAL GOVERNMENT IN RAILROAD REGULATION

RAILROAD REGULATORY HISTORY AND MAJOR DEVELOPMENTS

Economic Regulation

From their inception, railroads were considered common carriers under common law doctrine. A common carrier is one who, “by virtue of its calling and as a regular business, undertakes for hire to transport persons or commodities from place to place, offering their services as public employment.”⁶

In the 1800’s, as railroads expanded and provided faster transportation to all areas of the country, including wide areas of the West, railroad companies grew to become powerful monopolies with control over rates, services, and routes. Railroad company abuses of their economic power led to demands for economic regulation, both at the state and federal level.

Federal economic regulation of the railroad industry in the United States dates back to 1887 and the Act to Regulate Commerce, commonly known as the Interstate Commerce Act.⁷ That Act created the Interstate Commerce Commission (ICC), which was intended to address the monopoly of the railroads, such as discriminatory rates, preferences, charging more for short than long hauls, and pooling agreements.

Many states established regulatory boards and commissions, using the ICC as a model, to address the monopoly power of the railroads, including unjust rates and discrimination, and to ensure good service.⁸ In fact, NARUC was first established in 1889 as the National Association of Railroad and Utility Commissions.⁹

The ICC and state law codified the common carrier obligations of railroads.¹⁰ Under the Interstate Commerce Act, railroads must provide transportation of freight and commodities, including crude oil, upon reasonable request, subject to the requirement that the shipment and the rail or tank cars hauling the freight or commodities meet federal requirements. Despite amendments to the Interstate Commerce Act, this requirement remains in force today. For example, a railroad may not refuse a shipment of crude oil if the tank cars meet federal requirements. As former Deputy FRA Administrator Clifford Eby stated in his testimony before the Surface Transportation Board on the railroads’ request to remove their obligation to ship

⁶ <http://thelawdictionary.org/common-and-private-carriers/>.

⁷ Stone, Richard D. *The Interstate Commerce Commission and the Railroad Industry: A History of Regulatory Policy*, at 6 (1991).

⁸ McGraw, Thomas K. *Prophets of Regulation*, Belknap Press, World, 1986, Chapter 2.

⁹ Rodgers, Paul. *The NARUC Was There: A History of the National Association of Regulatory Utility Commissioners*. Washington: Association, 1979. 54.

¹⁰ *Am. Trucking Ass’ns v. Atchison, Topeka & Santa Fe Ry. Co.*, 387 U.S. 397, 406 (1967); Under 49 U.S.C. § 11101, “[a] rail carrier providing transportation or service subject to the jurisdiction of the Board under this part shall provide the transportation or service on reasonable request.”

hazardous materials, “railroads have a common carrier obligation to transport hazardous materials and cannot refuse to provide this service merely because to do so would be inconvenient or unprofitable.”¹¹

In the ICC Termination Act of 1995 (ICCTA),¹² Congress eliminated the ICC and transferred many of its functions, including enforcement of common carrier obligations, to the Surface Transportation Board, or STB, an independent agency that is organizationally a part of the U.S. Department of Transportation (USDOT). In addition, the ICCTA preempted many aspects of railroad regulation including the ability of a state to economically regulate railroads. This issue will be addressed further in Section II.B., below.

Safety Regulation

The early decades of railroad operations were characterized by the development of a variety of technologies and infrastructure, including different gauges of rails, types of locomotives, braking systems, and switches. As railroads expanded operations after the Civil War and became a primary mode of transportation for industry and travel, the rate of accidents among railroad personnel, especially brakemen increased. , Many accidents were associated with the coupling and uncoupling of railroad cars, and the operation of manually operated brakes (hand brakes). The rise in accidents led to calls for safety legislation, as early as the 1870s. In the 1880s, the number of on-the-job fatalities of railroad workers was second only to those of coal miners. Through that decade, several state legislatures enacted safety laws. ¹³

In response to the number of railroad worker accidents and inconsistent state laws, Congress passed the Safety Appliance Act in 1893 to provide a uniform standard for air brakes and automatic couplers on all trains. This led to a sharp drop in accidents.¹⁴ The Safety Appliance Act was the first of many federal railroad safety laws designed to ensure consistency in regulation across interstate commerce. In 1911, Congress passed the Locomotive Boiler Inspection Act (LBIA), bringing all locomotive steam boilers under Federal regulation. Notably, the worst locomotive boiler explosion in the U.S. occurred in 1912 at a Southern Pacific roundhouse in San Antonio, Texas, with 26 fatalities.¹⁵ Congress enacted other federal uniform economic and safety laws including the Federal Safety Appliance Act, the Railway Labor Act, the Hours of Service Act, the Federal Railroad Safety and Hazardous Materials Transportation Control Act of 1970, the Railway Revitalization and Regulatory Reform Act, and the Staggers Act of 1980.

Because of varying safety regulations across states, Congress established the Federal Railroad Administration (FRA) in 1966, giving the federal government the authority to regulate railroad

¹¹ STB, Ex Parte No. 677 (Sub-No. 1), July 10, 2008.

¹² Pub. L. No. 104-88, 109 Stat. 803 (Dec. 29, 1994).

¹³ https://en.wikipedia.org/wiki/History_of_rail_transport_in_the_United_States.

¹⁴ *Id.*

¹⁵ https://en.wikipedia.org/wiki/List_of_boiler_explosions.

safety nationally to ensure a uniform level of safety across the nation. In the Federal Railroad Safety Act of 1970 (FRSA),¹⁶ Congress delegated to the FRA through powers granted to the Secretary of Transportation authority over “every area of railroad safety” (49 U.S.C. 20103). Similar to the ICCTA, the FRSA preempted much of state authority over railroad safety regulation.

The statute declared that laws related to railroad safety shall be “nationally uniform to the extent practicable,” preempting state laws, rules, and requirements related to railroad safety when the Secretary has issued a rule or order “covering the subject matter of the State requirement.”¹⁷ The FRA’s broad authority has been recognized by the courts, greatly limiting the ability of states to act in addressing railroad safety concerns.

Congress passed the Rail Safety Improvement Act of 2008 (RSIA), which overhauled federal rail safety requirements by directing the FRA, among other things, to promulgate additional new rail safety regulations and guidance in areas such as railroad risk reduction plans, track inspections standards, and highway-rail grade crossing safety.¹⁸

The major provisions of the RSIA include requirements to:¹⁹

- Implement positive train control (PTC) systems by certain railroads on certain lines, specifying the essential elements of mandated PTC systems.²⁰
- Update existing hours of service recordkeeping regulations laws for railroad employees and employees of railroad contractors and subcontractors, and prescribe substantive hours of service regulations for train employees in intercity passenger or commuter service.²¹
- Report (railroads and states) information on grade crossing physical and operating characteristics to the National Crossing Inventory.²²
- Audit by FRA of each Class I railroad at least every two years and all others at least once every five years to ensure that all grade crossing collisions and fatalities are properly reported.²³
- Foster introduction of new technology to provide advance warning to highway users at highway-rail grade crossings. (If the Secretary approves such a new technology, the

¹⁶ (Pub. L. No. 91-458 (now codified, along with other railroad safety statutes, at 49 U.S.C. Chapters 201-213))

¹⁷ (49 U.S.C. 20106).

¹⁸ Preliminary Observations on Federal Rail Safety Oversight and Positive Train Control Implementation, Testimony Before the Committee on Commerce, Science, and Transportation, U.S. Senate. Susan A. Fleming, Director Physical Infrastructure Issues, Wednesday, June 19, 2013

¹⁹ Federal Railroad Administration Overview, Highlights and Summary of the Rail Safety Improvement Act of 2008 (the Act) (Public Law No. 110-432, Division A, enacted Oct. 16, 2008, 122 Stat. 4848-4906) Prepared March 10, 2009.

²⁰ See section 104 on positive train control.

²¹ See section 108(a)-(e), (g) on hours of service.

²² See section 204 on crossing reports.

²³ See section 209 on grade crossing reporting.

Secretary's determination preempts any state law concerning the adequacy of the technology in providing the warning.)²⁴

- Increase the ordinary maximum and aggravated maximum civil penalties per violation for rail safety violations to \$25,000 and \$100,000, respectively.²⁵ and
- Expand the Secretary's authority to issue emergency orders pertaining to emergency situations involving a risk of significant harm to the environment.²⁶

On Dec. 4, 2015, the "Fixing America's Surface Transportation Act of 2015" (FAST Act) was signed into law. The FAST Act requires a number of studies, reports and updates on railroad safety and the transportation of hazardous materials, which have already and will likely lead to more changes in federal statutes, rules and railroad safety practices. The key provisions relevant to railroad safety are addressed in more detail below in Section F.

FEDERAL PREEMPTION OF RAILROAD REGULATION AND LIMITS ON STATE REGULATORY AUTHORITY

Over time, through the passage of statutes adopting uniform safety and economic regulation across the United States, Congress has preempted much of state economic regulation of railroad companies, and much of state regulation of railroad safety.

As discussed above in Section II.A., in the ICC Termination Act of 1995, Congress abolished the Interstate Commerce Commission, transferred its functions to the Surface Transportation Board (STB) and preempted state economic regulation of railroad companies.²⁷ The ICCTA granted the STB exclusive jurisdiction over:

- (1) Transportation by rail carriers, and the remedies provided in with respect to rates, classifications, rules (including car service, interchange, and other operating rules), practices, routes, services, and facilities of such carriers; and
- (2) The construction, acquisition, operation, abandonment, or discontinuance of spurs, industrial, team, switching, or side tracks, or facilities, even if the tracks are located, or intended to be located, entirely in one state.²⁸

The ICCTA also states that "except as otherwise provided in this part, the remedies provided under this part with respect to regulation of rail transportation are exclusive and preempt the remedies provided under Federal or State law."²⁹ This limitation on state action includes state

²⁴ See section 210 on advanced warning devices.

²⁵ See section 302 on civil penalties.

²⁶ See section 304 and authority.

²⁷ Pub. L. No. 104-88, 109 Stat. 803 (Dec. 29, 1994).

²⁸ 49 U.S.C. § 10501(b).

²⁹ *Id.*

and local environmental permit requirements as they apply to railroad operations, including railroad construction projects.³⁰

As to safety regulation, the Federal Railroad Safety Act of 1970 (FRSA) was enacted to establish a nationally uniform approach to railroad safety.³¹ As earlier noted, the FRSA gave the FRA authority over “every area of railroad safety.”³² The statute declared that laws related to railroad safety shall be “nationally uniform to the extent practicable” and preempted state laws, rules, and requirements related to railroad safety when the Secretary has issued a rule or order “covering the subject matter of the state requirement.”³³

The FRSA includes an express preemption provision that sets out the following framework for determining when state requirements related to railroad safety are preempted:

A state may adopt or continue in force a law, regulation, or order related to railroad safety until the Secretary of Transportation (with respect to railroad safety matters), or the Secretary of Homeland Security (with respect to railroad security matters), prescribes a regulation or issues an order covering the subject matter of the state requirement. A state may adopt or continue in force an additional or more stringent law, regulation, or order related to railroad safety when the law, regulation, or order:

- (1) is necessary to eliminate or reduce an essentially local safety hazard;
- (2) is not incompatible with a law, regulation, or order of the United States Government; and
- (3) does not unreasonably burden interstate commerce.³⁴

This framework establishes two levels of inquiry. First, when considering the “subject matter” of a state rule, states must determine whether the FRA has taken affirmative or negative action “covering” that subject matter. Whether FRA has “covered” the subject matter will turn on whether the FRA has occupied the subject matter, in whole or in part, either by issuing a rule or order addressing the topic, or by an agency decision, such as a policy statement or termination of a proposed rulemaking proceeding, determining that for a particular subject matter no rule or restriction is appropriate or necessary as a matter of rail safety.

The Supreme Court has held that the term “covering the subject matter” requires that the federal rule do more than “touch upon” or relate to the subject matter of the state

³⁰ *Auburn v. U.S. Government*, 154 F.3d 1025, 1031 (9th Cir. 1998); see also *CSX Transp., Inc. v. Georgia Public Service Comm’n*, 994 F.Supp. 1573 (N.D.Ga 1996); *Burlington Northern Santa Fe Corp. v. Anderson*, 959 F. Supp. 1288 (D. Mont. 1997); *Georgia Public Service Comm’n v. CSX Transp., Inc.*, 484 S.E. 2nd 799 (Ga. Ct. App. 1997); *In re Burlington Northern Railroad*, 545 N.W.2d 749, 751 (Neb. 1996).

³¹ *National Ass’n of Regulatory Util. Comm’rs v. Coleman*, 399 F.Supp. 1275, 1279 (M. D. Pa. 1975).

³² 49 U.S.C. § 20103.

³³ 49 U.S.C. § 20106.

³⁴ *Id.* Emphasis added.

requirement.³⁵ The Court held that preemption will take effect only if federal regulations “substantially subsume” the subject matter of the relevant state law. If FRA has not so acted and if the state rule does not unduly burden interstate commerce, there is no further inquiry, and the state rule stands until FRA acts to cover the subject matter.

If FRA is found to have acted so as to cover the subject matter of the state rule, the inquiry passes to the second level: The state rule, which must be “an additional or more stringent” one, is enforceable only if it satisfies a three-pronged test: (1) it is necessary to eliminate or reduce an essentially local safety hazard; (2) it is not incompatible with any federal rule; and (3) it does not unreasonably burden interstate commerce. The legislative history of 49 U.S.C. § 20106 makes it clear that the first prong does not contemplate statewide laws or rules; an “essentially local safety hazard” is to be read as one peculiar to a particular locality.³⁶ The House Report includes the only explanation of the term “essentially local safety hazard,” as follows:

“The purposes of this ... provision is to enable the states to respond to local situations not capable of being adequately encompassed within uniform national standards. The states will retain authority to regulate individual local problems where necessary to eliminate or reduce essentially local railroad safety hazards. *Since these local hazards would not be statewide in character there is no intent to permit a state to establish statewide standards superimposed on national standards covering the same subject.*”³⁷

Preemption of State Law under PHMSA Rules, Chapter 51

The Pipeline and Hazardous Materials Safety Administration (PHMSA), formerly the Research and Special Programs Administration, another agency within the USDOT, also has issued regulations under 49 U.S.C. Chapter 51 that cover the subject matter of hazardous materials transportation and inspection of shipments by rail.³⁸ FRA enforces these rules.³⁹

Even though PHMSA’s rules are not issued by FRA, the rules have preemptive effect by statute under 49 U.S.C. § 20106, which is sometimes referred to as Chapter 201. Case law holds that, even though the rules are not issued by FRA, hazardous materials rules concerning railroads are railroad safety rules for purposes of preemption under Chapter 201. For example, in *CSX Transportation, Inc. v. Public Utilities Commission of Ohio*,⁴⁰ the Sixth Circuit Court of Appeals

³⁵ See *CSX Transp., Inc. v. Easterwood*, 507 U.S. 658, 664-65 (1993); see also *Ray v. Atlantic Richfield Co.*, 435 U.S. 151, 178 (1977); *Napier v. Atlantic Coast Line R.R.*, 272 U.S. 605 (1926).

³⁶ H.R. Rep. 1194, 91 Cong. 2d Sess. 4104 (1970), *reprinted in* 1970 U.S.C.C.A.N. 4104, 4116-4117.

³⁷ *Id.*, Emphasis added.

³⁸ Association of State Rail Safety Managers in Partnership with Federal Railroad Administration, State Rail Safety Participation Program, Managers Handbook, revised January 2010, pp. 12, 38-42 (Managers Handbook).

³⁹ See 49 CFR § 1.49(s).

⁴⁰ 901 F.2d 497 (6th Cir. 1990), cert. denied, 498 U.S. 1066 (1991).

held that an Ohio statute authorizing the Public Utilities Commission to adopt and enforce as state requirements the federal rules regulating the intermodal transportation of hazardous materials was preempted by Chapter 201, as were the state rules themselves. The Supreme Court has noted in a different case that Chapter 201's preemption provision is not limited to rules issued under that chapter.⁴¹

Unlike Chapter 201, which generally preempts regulations in an area that the Secretary of Transportation has already regulated, under PHMSA's Chapter 51 rules, states are generally free to develop and enforce their own hazardous materials regulatory scheme as long as the regulation is consistent with federal law and regulations.⁴² With regard to certain subjects (*e.g.*, placarding of hazardous materials shipments), a state or tribal rule is preempted unless it is "substantively the same" as the federal rule. On other subjects, the state or tribal rule is preempted only if compliance with both that rule and the federal rule is not possible or the state or tribal rule is an obstacle to accomplishing the federal rule. PHMSA issues rules under Chapter 51 and is authorized to determine whether a state or tribal requirement is preempted by Chapter 51 and to grant waivers of preemption of such a state or tribal requirement.⁴³

Preemption and Accident Reporting

One area in which states are not preempted is requiring railroads to provide notification of accidents in order to enable the states promptly to launch their own investigations. In addition, states may require railroads to furnish copies of monthly reports railroads file with FRA.⁴⁴ Some states have chosen to forego requiring railroads to file copies of monthly accident reports that are filed with the FRA because of the availability of accident and incident data on FRA's public website. The majority of states participating in the State Rail Safety Participation Program do have a requirements that railroads report accidents immediately by telephone or other means.

THE ROLE, AUTHORITY, AND FOCUS OF THE FEDERAL RAILROAD ADMINISTRATION

The Federal Railroad Administration (FRA) was created by the Department of Transportation Act of 1966.⁴⁵ When created, the FRA's purpose was to promulgate and enforce rail safety regulations, administer railroad assistance programs, conduct research and development in support of improved railroad safety and national rail transportation policy, provide for the rehabilitation of Northeast Corridor rail passenger service, and consolidate government support of rail transportation activities. Today, the FRA is one of ten agencies within the USDOT with a mission to enable the safe, reliable, and efficient movement of people and goods for a strong

⁴¹ *Easterwood*, 507 U.S. at 664, n.4.

⁴² See 49 U.S.C. 5125.

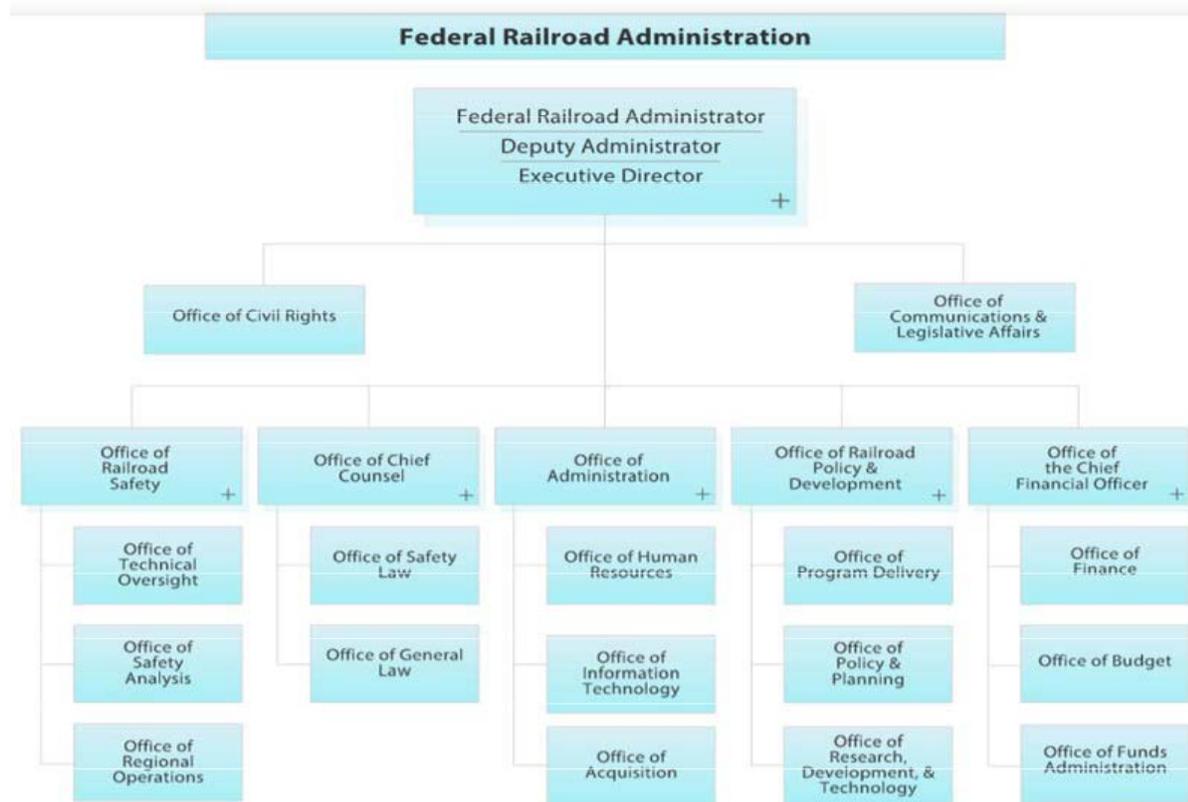
⁴³ 49 U.S.C. § 5125(d) and (e).

⁴⁴ *NARUC v. Coleman*, 542 F. 2d 11 (3d Cir. 1976).

⁴⁵ 49 U.S.C. § 103(3)(e)(1).

America.⁴⁶ It operates through seven divisions under the offices of the Administrator and Deputy Administrator. The FRA’s organizational structure enables it to effectively accomplish its mission: to promote safe, environmentally sound, successful railroad transportation to meet current and future needs of all customers. The agency is headed by two political appointees, the FRA Administrator and Deputy Administrator, who oversee the programs and activities of five offices: Chief Counsel, Policy and Program Development, Safety, Administration and Finance, and Railroad Development. Two offices, Safety and Chief Counsel, work together to plan, develop, and implement the agency’s safety program for the railroad industry.

Figure 1: Organizational overview and structure of the FRA.⁴⁷



NOTE: Any change to this chart requires approval from the Secretary of Transportation.

⁴⁶ <http://www.fra.dot.gov/Page/P0002>.

⁴⁷ Managers Handbook, Association of State Rail Safety Managers in Partnership with Federal Railroad Administration, pages 19-21.

Chief Counsel - The Safety Law Division of the Office of Chief Counsel develops and drafts the agency's safety regulations, assesses civil penalties for violations of the rail safety statutes and FRA safety regulations, and provides other legal support for FRA's safety program. The General Law Division provides legal services to FRA's offices on all legal issues other than safety law, including Freedom of Information Act, Federal Tort Claims Act, and Surface Transportation Board matters.⁴⁸

Policy - The Office of Policy provides support, analysis and recommendations on broad subjects relating to the railroad industry such as: mergers and restructuring, economic regulation, rail economics, financial health, traffic patterns and network analysis, labor-management issues, freight data and operations, intermodalism, environmental issues, and international programs.⁴⁹

Safety - Managing a substantial regulatory agenda and inspection program is the responsibility of the Associate Administrator for Safety and two Deputy Associate Administrators who oversee the activities of two offices: Compliance and Program Implementation and Standards and Program Development. Major program functions of the Office of Safety are Compliance, Regional Administration, Railroad System Oversight and Standards and Program Development.⁵⁰

Administration and Finance - The Office of Administration directs and coordinates the administrative programs and services of the FRA, both in headquarters and in the eight regional offices. It includes the offices of Human Resources, Information Technology and Support Systems, Acquisition and Grants Services, Financial Services, and Budget. It is also responsible for coordinating the implementation of government wide and Department of Transportation management reforms.⁵¹

Railroad Development - The Office of Railroad Development (RDV) is responsible for Federal investment and assistance to the rail industry as well as the development and implementation of Administration policy concerning intercity rail passenger service and high-speed rail. It sponsors research and development activities to advance science and engineering and improve the technology for railroad safety and work. It provides investment opportunities for small freight railroad projects, primarily through the Railroad Rehabilitation and Improvement Financing Program.⁵²

Public Affairs - The Office of Public Affairs works closely with all departments within the agency to develop timely information for release through a variety of print and electronic news outlets

⁴⁸ *Id.*

⁴⁹ *Id.*

⁵⁰ *Id.*

⁵¹ *Id.*

⁵² *Id.*

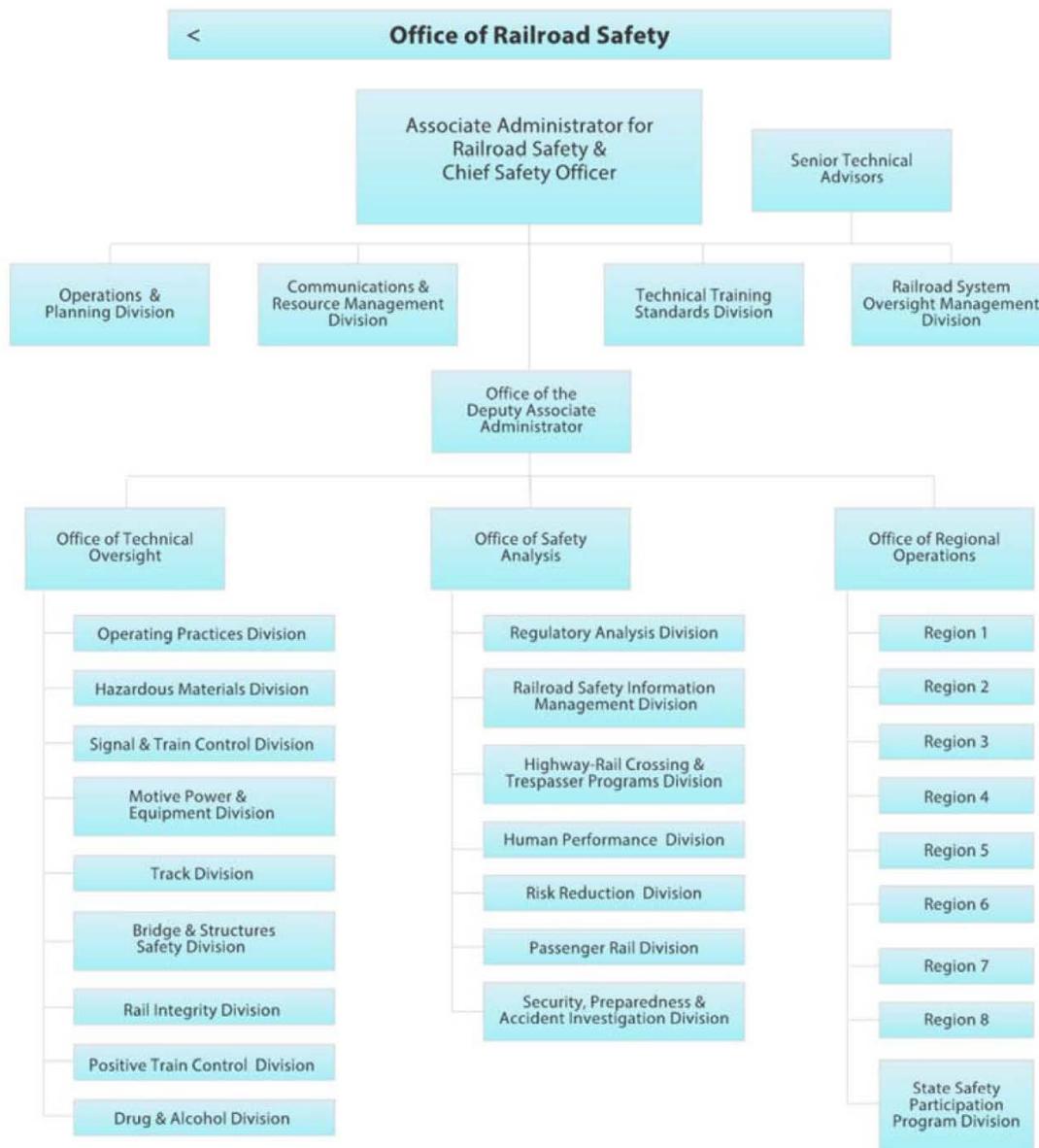
as well as for distribution to the general public. It also works closely with other USDOT offices in support of the Administration's public policy objectives.⁵³

Civil Rights - The Office of Civil Rights provides leadership, policy guidance, support, and coordination to FRA's various offices and external customers to ensure effective and consistent diversity and civil rights programs. The OCR program responsibilities also include processing internal and external complaints, minority interns, special observances, and other operational functions.⁵⁴

⁵³ *Id.*

⁵⁴ *Id.*

Figure 2: FRA Office of Railroad Safety.⁵⁵

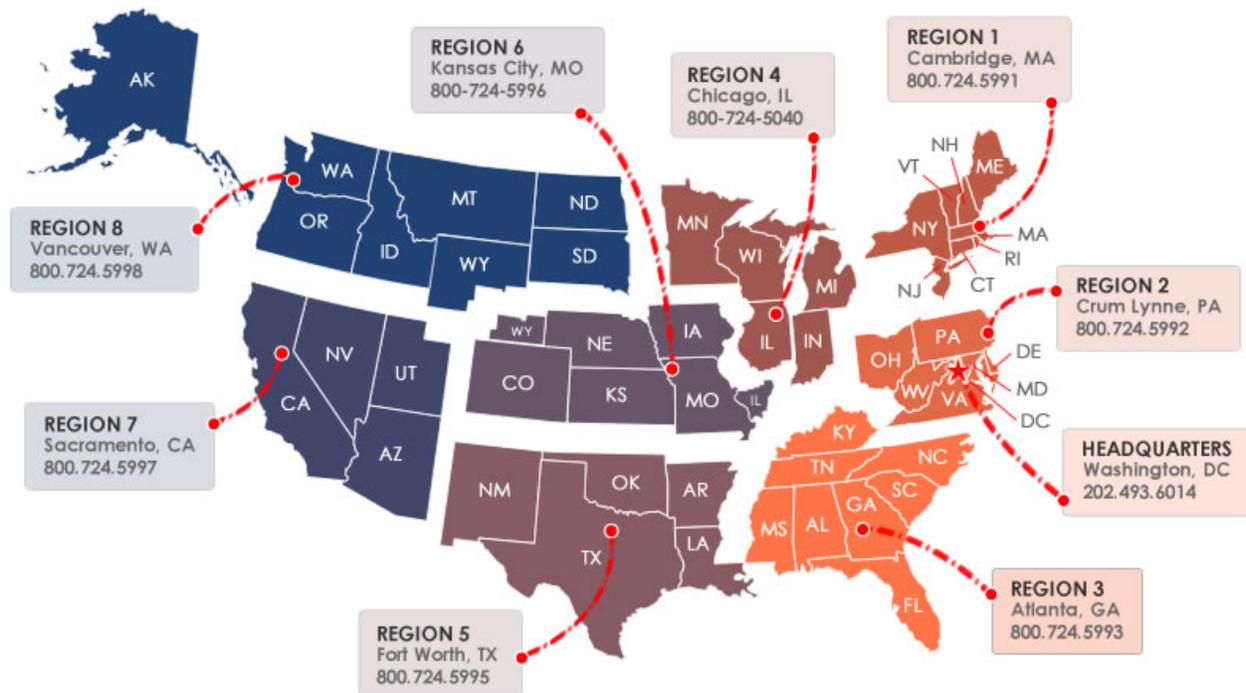


Regional Administrators - The FRA has eight regions and a headquarters office. A map of the FRA regions is included below in Figure 3. The regional administrator (RA) serves as the principal advisor to the Associate Administrator for Safety and represents FRA on all regional rail transportation issues. In this role, the RA is considered the ultimate authority for resolution of railroad safety issues within the region. As the primary regional manager, the RA directs the technical and administrative functions of the regional work force. Regions have two deputy RAs who provide program planning and oversight support. They also supervise the activities of

⁵⁵ *Id.*

specialists and administrative staff. Usually, supervision of technical disciplines is divided among the deputies. Railroad safety specialists serve as the region’s experts in the five technical disciplines: hazardous materials, motive power and equipment, operating practices, signal and train control systems, and track. In this role, they review work and provide technical guidance to FRA and state inspectors. Safety specialists also evaluate candidates for state inspector or state inspector trainee positions. Specialists also review the work of inspectors.⁵⁶

Figure 3: FRA Regional Structure⁵⁷



⁵⁶ *Id.*

⁵⁷ Regional Offices | Federal Railroad Administration. Retrieved January 21, 2017, from <https://www.fra.dot.gov/Page/P0244>

THE STATE RAILROAD SAFETY PARTICIPATION PROGRAM

BACKGROUND:

Congress created the State Rail Safety Participation Program in the Federal Railroad Safety Act of 1970 (FRSA), authorizing states to work in partnership with the FRA to enforce federal railroad safety regulations in an effort to promote and strengthen railroad safety.⁵⁸ As part of the compromise leading to enactment of the FRSA, Congress permitted states, in return for the loss of direct regulatory authority to regulate almost any subject FRA regulates, to participate in investigative activities under federal safety laws through either an annual certification or agreement, and to recommend enforcement action under those laws.⁵⁹ In addition, Congress permitted participating states the authority to seek injunctive relief or impose civil penalties for safety violations when the FRA elects to take no action within a specified period.⁶⁰

By 1975, the FRA adopted rules governing the State Safety Participation Program (SSPP) in 49 CFR, Part 212, which allowed states to enforce track and freight car safety standards. In 1980, Congress broadened state involvement to include the Safety Appliance, Locomotive Inspection, Signal Inspection, and Hours of Service Acts. FRA further revised the State Safety Participation rules in 1992 to permit states to perform rail hazardous materials inspections, allowing states to participate in all five of the federal safety disciplines: Hazardous Materials; Motive Power & Equipment; Operating Practices; Signal & Train Control; and Track.

In 1995, the FRA revised the Grade Crossing Signal System Safety regulations in 49 CFR, Part 234, to authorize both federal and state signal inspectors to ensure that railroads were properly testing, inspecting and maintaining automated warning devices at grade crossings. These devices include flashing lights, gates, bells, and related circuitry.

FRA's rules governing the SSPP explain the basic principles of the program, discuss joint planning of inspection activities, and establish qualification requirements for state inspectors in the five rail safety inspection disciplines of track, signal and train control, motive power and equipment, operating practices, and hazardous materials. Under the SSPP, every state has the opportunity to employ rail safety inspectors in all of the disciplines in which FRA has inspectors and, through its state inspectors, to participate directly in inspection activities and enforcement of the federal railroad safety regulations. States that are not certified participants in the federal program may not cite a railroad or shipper for violations of federal regulations. State inspectors are funded entirely by their respective state governments, and may be given other duties and assignments, as their agencies deem necessary. State programs generally emphasize planned, routine compliance inspections. However, states may undertake additional investigative and surveillance activities consistent with overall program needs and individual state capabilities. Many states work jointly with the FRA on accident and complaint investigations.

⁵⁸ 49 U.S.C. § 20105.

⁵⁹ *Id.*

⁶⁰ 49 U.S.C. § 20113.

CURRENT:

Today, the State Rail Safety Participation Program consists of 31 states, employing over 180 safety inspectors in the five rail safety inspection disciplines. Federally-certified state inspectors constitute 30 percent of the FRA's total inspection force. FRA is resource constrained and estimates that it is only able to inspect about 0.2 percent of railroad operations each year.⁶¹ FRA has recognized the states' assistance in their work: "***State rail inspectors are a force multiplier for the FRA's compliance and enforcement efforts.***"⁶²

Before a state may participate in the program, a state agency must enter into a multi-year agreement with FRA for the exercise of specified authority. This agreement may delegate investigative and surveillance authority regarding all or any part of federal railroad safety laws, for up to a maximum of five safety disciplines.

Training state inspectors is one of FRA's major customer service initiatives. By written agreement, FRA reimburses state travel and subsistence expenses associated with rail safety inspector technical training. The training program helps states to develop rail safety programs and enables qualified state inspectors to maintain technical proficiency. Approximately one-third of the FRA's Office of Safety training budget is allocated to state rail safety programs. In addition, FRA routinely provides on-the-job training to state inspector candidates.⁶³

FRA-certified state inspectors usually conduct planned routine compliance inspections and also may conduct additional investigative and surveillance activities that are consistent with the overall program. In most ways, an FRA-certified state inspector has the same role and authority as a certified federal inspector. In the area of their certification, they may inspect railroads and hazardous materials shippers and issue FRA inspection reports noting defects. They may cite violations of railroad safety regulations using the same forms as FRA inspectors, submit those violation reports for technical and legal review in the same manner, and participate in civil penalty negotiating sessions led by FRA attorneys (or, in the event of litigation, serve as witnesses) just as FRA inspectors do. However, state inspectors have authority only to the extent provided by their respective State statute or charter. For example, state law must specifically authorize its inspectors to go on shipper property in order to conduct hazardous materials inspections of shippers.⁶⁴ Likewise, a state-certified inspector may not conduct inspections in any other state. Moreover, state inspectors do not have authority that exceeds that of FRA inspectors. While both have the authority (depending upon their areas of expertise)

⁶¹ FRA estimate from the Budget Justification for New & Existing State Rail Safety Programs, 2015.

⁶² FRA description of states at the Subcommittee on Surface Transportation and Merchant Marine Infrastructure, Safety and Security, March 6, 2014.

⁶³ Association of State Rail Managers, Program Summary, Participating States.

⁶⁴ Washington state did not allow inspections on private shippers property without an FRA escort until the passage of ESHB 1449 in 2015.

to issue special notices for repair),⁶⁵ requiring railroads to remove a particular freight car or locomotive from service due to safety defects or to reduce the speed of trains over defective track, neither has the explicit authority to stop a train. Only the FRA Administrator, acting through the extraordinary tool of an emergency safety order (49 U.S.C. 20104) has such authority.

States active in rail safety regulation have formed the Association of State Rail Safety Managers (ASRSPM), an FRA-supported state organization committed to safe rail transportation. Under the Articles of Association, the purpose of ASRSPM is to *“support, encourage, develop, and enhance railroad safety, especially through the Federal/State Railroad Safety Programs as established and defined by the Federal Railroad Safety Act of 1970, as amended, and other laws relative to railroad safety.”*⁶⁶

A principle motivation for forming this association was to attain greater uniformity among states in the conduct of rail regulatory activities and to enable states to speak with a collective voice on rail safety topics. The history of federal rail safety regulation supports this idea of uniformity and states have implemented specific policy initiatives with the FRA to ensure that federal and state actions in the rail safety arena are coordinated and seamless.

INFLUENCE AND ROLE OF THE FRA’S RAILROAD SAFETY ADVISORY COMMITTEE

In 1996, the FRA established the Railroad Safety Advisory Committee (RSAC) to develop and issue rail safety rules and regulations through a collaborative process. The RSAC is comprised of stakeholders directly related to railroads such as federal and state entities, railroads, rail labor organizations, trade associations, suppliers, and others that work with FRA to develop solutions to railroad safety and regulatory issues. FRA develops and issues rail safety rules and regulations while involving RSAC members in the rulemaking process. The RSAC recommendations are advisory only and the FRA is not bound by the decisions of the group.

The RSAC works towards agreement on safety issues using facts and data to address any real or perceived safety problems, identifying cost effective solutions based on the agreed-upon facts, and identifying regulatory options where necessary to implement those solutions.⁶⁷

The RSAC operates under the following regulatory philosophy:

“Federal agencies should promulgate only such regulations as are required by law, are necessary to interpret the law, or are made necessary by compelling public need, such as material failures of private markets to protect or improve the health and safety of the public, the environment, or the well-being of the American

⁶⁵ See 49 CFR Part 216.

⁶⁶ The Association of State Rail Safety Program Managers, ARTICLES OF ASSOCIATION, <http://www.railsafety.idaho.gov/Docs/articles%20of%20association.doc>.

⁶⁷ <https://rsac.fra.dot.gov/home.php>.

people. In deciding whether and how to regulate, agencies should assess all costs and benefits of available regulatory alternatives, including the alternative of not regulating. Costs and benefits shall be understood to include both quantifiable measures (to the fullest extent that these can be usefully estimated) and qualitative measures of costs and benefits that are difficult to quantify, but nevertheless essential to consider. Further, in choosing among alternative regulatory approaches, agencies should select those approaches that maximize net benefits (including potential economic, environmental, public health and safety, and other advantages; distributive impacts; and equity), unless a statute requires another regulatory approach.

The resultant rules must be reasonable, clear, effective, and enforceable; impose as small a burden as is practicable; and shall, to the extent feasible, specify performance objectives, rather than specifying the behavior or manner of compliance that regulated entities must adopt.⁶⁸

FEDERAL STUDIES, REPORTS, SURVEYS, AND ACTIONS RELATING TO RAILROAD SAFETY

The landscape of railroad safety and the transportation of crude oil by rail is constantly evolving due to changes in statutes, rules, public policy discussions, lessons learned and the development of new technologies. This section includes a list of current studies, reports, surveys and actions being conducted or set to be conducted at the Federal level. The FAST Act directs FRA, PHMSA and others to conduct a number of studies, reports and updates on railroad safety and the transportation of hazardous materials, which may ultimately lead to changes in statutes, rules and railroad safety practices. These activities are listed below and in Table 1.

Rail Contingency Plan Rules (PHMSA) 49 CFR Parts 130, 171, 173, and 174

[Docket No. PHMSA–2014–0105 (HM–251B)]

- July 29, 2016 - Rulemaking, developed in consultation with the FRA, would revise PHMSA's regulations to expand the applicability of comprehensive oil spill response plans (OSRPs) based on thresholds of liquid petroleum oil that apply to an entire train. The rulemaking would also revise the format and clarify requirements of a comprehensive OSRP and require railroads to share information about high-hazard flammable train operations with state and tribal emergency response organizations (*i.e.*, State Emergency Response Commissions and Tribal Emergency Response Commissions) to improve community preparedness. Lastly, PHMSA is proposing an update to boiling point testing procedures to provide regulatory flexibility and promote enhanced safety in transport through accurate packing group assignment.

⁶⁸ RSAC History and Regulatory Philosophy from website <https://rsac.fra.dot.gov/about.php>.

- The FAST Act required the USDOT Secretary to notify the Committee on Transportation and Infrastructure of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate every 90 days until a final rule is issued.
- FRA filed an Advanced Notice of Proposed Rulemaking (ANPRM) on July 23, 2014.

PHMSA Final Rule Codifying FAST Act Mandates, [Docket No. PHMSA-2016-0011 (HM-251C)]

- Aug. 15, 2016 – PHMSA adopted a final rule codifying in the Hazardous Materials Regulations certain mandates and minimum requirements of the FAST Act. Specifically, the FAST Act mandates a revised phase-out schedule for all DOT Specification 111 tank cars used to transport unrefined petroleum products (*e.g.*, petroleum crude oil), ethanol, and other Class 3 flammable liquids. The FAST Act also requires that each tank car built to meet the DOT Specification 117 and each non-jacketed tank car retrofitted to meet the DOT Specification 117R be equipped with a thermal protection blanket that is at least 1/2-inch thick and meets existing thermal protection standards. Further, the FAST Act mandates minimum top fittings protection requirements for tank cars retrofitted to meet the DOT Specification 117R.
- Phase out of tank cars carrying Class 3 flammable service, including crude oil (1 January 2018; non-jacketed DOT-111 tank cars, 1 March 2018; jacketed DOT-111 tank cars, 1 April 2020; non-jacketed CPC- 1232 tank cars; and 1 May 2025 for jacketed CPC-1232 tank cars);
- Phase out of tank cars carrying ethanol (1 May 2023 for non-jacketed and jacketed DOT 111s; 1 July 2023 for non-jacketed CPC- 1232 tank cars; and 1 May 2025 for jacketed CPC-1232 tank cars);
- Transport of Class 3 flammable liquids in Packing Group I (other than those already specified above have a phase out deadline of 1 May 2025);
- Class 3 flammable liquids in Packing Groups II and III (other than those already covered above) have a phase out deadline of 1 May 2029.

Real Time Emergency Response Information (FAST Act Related)

- Information Sharing for High-Hazard Flammable Trains is incorporated in the Rail Contingency Plan Rulemaking, Docket No. PHMSA–2014–0105 (HM–251B)
- The FAST Act requires that no later than December 4, 2016, USDOT shall issue a rule requiring Class I railroad operators moving hazardous materials to generate real time information for emergency responders. The NPRM was issued within the Contingency Plan rulemaking and allows railroads to keep “proprietary” information along with security sensitive information as confidential.

Emergency Response (FAST Act Related)

- Not a rule but still required under the FAST Act is that the Comptroller General must conduct a study and report on the limitations or weaknesses that exist in the emergency response information carried by train crews transporting hazardous materials.

Thermal Blankets (FAST Act Related)

- This requirement is incorporated in the PHMSA Final Rule Incorporating FAST Act mandates, Docket No. PHMSA-2016-0011 (HM-251C), discussed above.

Modification Reporting (FAST Act Related)

- The industry must provide reports on tank car modification and retrofits with oversight and data collection by the FRA utilizing surveys, shop visits and industry reports.

Crude Oil Characteristics Study (FAST Act Related)

- Requires Sandia National Laboratories to report results from a study on the characteristics of crude oil along with recommendations for regulations and legislation to be reported within 180 days after the completion of the research.
- PHMSA released an ANPRM concerning Crude Oil Volatility on January 10, 2017. Comments will be due within 60 days of the publication of the ANPRM. [Docket No. PHMSA-2016-0077 (HM-251D)]

Hazardous Materials Liability Study (FAST Act Related)

- Section 7310 of the FAST Act requires the Secretary of Transportation to initiate a study of the levels and structure of insurance for railroad carriers transporting hazardous materials.
- By April 2017, the Secretary must submit a report with the results of the study and recommendations for addressing liability issues with rail transportation of hazardous materials to Congress. PHMSA entered into an inter-agency agreement with the USDOT Office of Research and Technology's Volpe National Transportation Systems Center to conduct the study, which is required to examine current and future levels and mechanisms to insure rail carriers transporting all hazardous materials. The study will evaluate: (1) The level and structure of insurance, including self-insurance, available in the private market against the full liability potential for damages arising from an accident or incident involving a train transporting hazardous materials; (2) The level and structure of insurance necessary and appropriate to efficiently allocate risk and financial

responsibility for claims, and to ensure that a railroad carrier transporting hazardous materials can continue to operate despite the risk of an accident or incident; and (3) The potential applicability for a train transporting hazardous materials, of an alternative insurance model, including a secondary liability coverage pool or pools to supplement commercial insurance; and other models administered by the Federal Government.

Electronically Controlled Pneumatic Brakes (FAST Act Related)

- The Transportation Research Board (TRB), part of the National Academies of Sciences, Engineering, and Medicine, has formed a new Committee on the Review of Department of Transportation Testing of Electronically Controlled Pneumatic Brakes. The committee has been formed in response to a request from Congress and with the sponsorship of the FRA.
- DOT's final rule, "Enhanced Tank Car Standards and Operational Controls for High-Hazard Flammable Trains,"⁶⁹ requires unit trains of 70 or more tank cars transporting flammable liquids at speeds in excess of 30 mph to use electronically controlled pneumatic (ECP) brakes by January 1, 2021. Congress called for a reanalysis of the effects of that requirement and called for the Secretary of Transportation to determine whether the ECP brakes requirement is justified, within 24 months of enactment of the FAST Act.
- The TRB committee will review a test and analysis plan prepared by USDOT to evaluate the assumptions that the department has identified in its comparison of the emergency braking performance of railroad tank car ECP brakes to conventional brakes or braking systems, such as distributed power and two-way end of train devices. The key question is whether ECP brakes would reduce the incidence and severity of spills of crude oil or ethanol from derailments compared with the alternative braking systems examined. The TRB committee will also review the conduct of DOT's tests and its reports of test results.

Locomotive Recording Devices, NPRM would amend 49 CFR parts 217, 218, and 229, (RIN 2130-AC51)

- This rulemaking, initiated by FRA, would require the installation of inward- and outward-facing locomotive video cameras on controlling locomotives of trains traveling over 30 mph. The recordings would be used to help determine the cause of railroad accidents in order to prevent the occurrence of accidents, such as that which occurred in Philadelphia, Pennsylvania on [Date]. They would also be used to ensure railroad employee compliance with applicable Federal railroad safety regulations and railroad rules, particularly regulations prohibiting the use of personal electronic devices. This

⁶⁹ [Docket No. PHMSA-2012-0082 (HM-251)]

rulemaking attempts to fulfill NTSB recommendations urging FRA to adopt regulations requiring locomotive-mounted audio and video recording devices. FRA is requesting comments regarding whether audio recording devices should be required. This rulemaking would amend 49 CFR parts 217, 218, and 229.

Track Safety Standards; Improving Rail Integrity, NPRM (RIN 2130-AC53)

- This FRA rulemaking would amend 49 CFR Part 213, Track Safety Standards. Specifically, the rulemaking would amend or add regulations addressing continuous testing of rail defects, rail head wear, inspection records, continuous welded rail, qualified operators, and Class 6-9 rail inspection frequencies. Publication of a final rule is expected in mid-2017.

Advance Notice of Proposed Rulemaking on Obstructive Sleep Apnea, (RIN 2130-AC52)

- March 8, 2016 - The Federal Motor Carrier Safety Administration (FMCSA) and FRA request data and information concerning the prevalence of moderate-to-severe obstructive sleep apnea (among individuals occupying safety sensitive positions in highway and rail transportation, and on its potential consequences for the safety of rail and highway transportation.

Positive Train Control - See Section VI D below on Positive Train Control.

Table 1 - FAST ACT Railroad Safety and Hazardous Materials Provisions

Subtitle C	Safe Transport of Flammable Liquids by Rail ⁷⁰	
Sec. 7101	Authorizations	Authorizes \$22 million annually for hazmat emergency preparedness planning and training grants to States and Indian tribes.
Sec. 7203	Improving the Effectiveness of Planning and Training Grants	Revamps planning and training grants to States and Indian tribes, including emphasis on training public sector employees to respond to hazmat accidents. Grants may be used for tuition, travel, room and board, travel expenses for trainers.
Sec. 7301	Community Safety Grants	The Secretary shall establish a competitive program for making grants to nonprofit organizations for training programs to assist communities to respond to accidents involving transportation of hazmat, including Class 3 flammable liquids by rail.

⁷⁰ Minnesota Senate Committee Services, 2015 FAST Act – Rail-related Provisions

Sec. 7302	Real-time emergency response information	Requires within one year that the Secretary issue regulations that require Class I railroads transporting hazmat to generate accurate, real-time, and electronic train consist information, including the identity, quantity and location of hazmat on a train, the point of origin and destination of the train, any required emergency response information, and an emergency POC designated by the Class I. Requires Class I to enter into an MOU with each applicable fusion center to provide the fusion center with secure and confidential access to the electronic train consist information. Requires fusion centers to provide the electronic train consist information to state and local first responder and law enforcement involved in a response or investigation of an accident. Requires each Class I to provide advanced notification and information on high-hazard flammable trains to each state emergency response commission consistent with EO Docket DOT-OST-2014-0067 to include a reasonable estimate of implicated trains expected to travel each week per county within applicable states, updates, description of Class 3 flammables transported, emergency response information, identification of routes, and POC. Requires State emergency response commissions to provide political subdivisions or public agency responsible for emergency response or law enforcement the information received from Class Is. Establishes security and confidentiality protections.
Sec. 7303	Emergency Response	Comptroller General of the US shall conduct a study to determine whether limitations or weaknesses exist in the emergency response information carried by train crews transporting hazmat. Study due end of 2017.

Sec. 7304	Tank Car Phase-out	<p>Requires All railroad tank cars used to transport Class 3 flammable liquids to meet the DOT-117 or DOT-117R specifications, regardless of train composition. Provides for a phase-out schedule for:</p> <p>(1) tank cars carrying Class 3 flammable service, including crude oil (1 January 2018 for non-jacketed DOT-111 tank cars, 1 March 2018 for jacketed DOT-111 tank cars, 1 April 2020 for non-jacketed CPC- 1232 tank cars, and 1 May 2025 for jacketed CPC-1232 tank cars);</p> <p>(2) for tank cars carrying ethanol (1 May 2023 for non-jacketed and jacketed DOT 111s, 1 July 2023 for non-jacketed CPC- 1232 tank cars, and 1 May 2025 for jacketed CPC-1232 tank cars;</p> <p>(3) for transport of Class 3 flammable liquids in Packing Group I (other than those specified under (1) and (2) the deadline is 1 May 2025; and for</p> <p>(4) Class 3 flammable liquids in Packing Groups II and III (other than those already covered above) the deadline is 1 May 2029.</p> <p>Deadlines for (3) and (4) may be extended by up to 2 years if there is insufficient shop capacity.</p>
Sec. 7305	Thermal blankets	<p>Requires within 6 months that the Secretary issue regulations to require that each tank car built to meet DOT-117 specs and each non-jacketed tank car modified to meet the DOT-117R specs be equipped with an insulating blanket at least ½” thick.</p>
Sec. 7306	Top Fittings	<p>Requires legacy tank car retrofit fittings for pressure relief valves.</p>
Sec. 7307	Oil Spill Response Plans	<p>Requires a progress report within 30 days after enactment and every 90 days thereafter until a final rule based on the ANPR issued on August 1, 2014 is promulgated by USDOT.</p>

Sec. 7308	Modification Reporting	Within 1 year of enactment, the Secretary shall implement a reporting requirement to monitor industry progress toward modifying rail tank used to transport Class 3 flammable liquids by the phase-in deadlines established in sec. 7304 of this act. Specifies requirements for the report.
Sec. 7309	Report on crude oil characteristics	Within 6 months of the completion of the Crude Oil Characteristics Research Sampling Analysis conducted at Sandia National Labs, the DOE Secretary shall submit the results and recommendations for further regulations or legislation to improve the safe transport of crude oil.
Sec. 7310	Hazmat by rail liability study	Within 4 months of enactment, USDOT shall initiate a study on the levels and structure of insurance for railroad carriers transporting hazmat.
Sec. 7311	Electronically Controlled Pneumatic Brakes (ECP)	<p>Requires the Comptroller General to conduct an independent evaluation of ECP brakes. Specifies requirements of that study. Requires report within 18 months.</p> <p>Requires USDOT to conduct testing of ECP brakes with NAS and specifies conditions of that testing framework. Requires within 6 months after receiving results of that testing whether ECP benefits outweigh costs. If ECP brakes are justified, then USDOT published reasons for that determination. If not, then ECP brake system requirements are repealed.</p>

III. THE ROLE OF THE STATES IN RAILROAD SAFETY

STRUCTURES OF STATE RAILROAD SAFETY PROGRAMS

Basic Structure

Thirty-one states have FRA/State Participation programs under Title 49 CFR Part 212. Fifteen of these programs are situated in state Public Service Commissions (PSCs), fourteen in state Departments of Transportation (DOTs), and two in other regulatory agencies.

The question of the appropriate location of the rail safety program is occasionally raised at the state level. To avoid the difficulties of a potential conflict of interest in providing rail service and promoting schedules on one hand, and overseeing safety on the other, many states have determined that the rail safety program should be focused singularly on safety and housed in the PSC and not in the state DOT.

Despite a state's belief in separating the roles of safety and service, railroads have more than once either initiated or supported moving the rail safety program to a state DOT. Such efforts have generally failed.

Regarding State Safety Planning

In Washington State, there were questions regarding the proper number of inspection staff and inspection disciplines. In its initial research on methodology and justification, the Washington Utilities and Transportation Commission (WUTC) had a difficult time finding guidance on the most appropriate percentage of railroad operations inspected annually or the number of inspectors in each discipline, based on risk factors available at the time and the need to plan for long term risks. The WUTC determined that the risks, existing gaps and potential consequences necessitated a higher degree of oversight. In its evaluation, the WUTC used the following basic formula in its analysis (example is limited to hazardous materials inspector but the analysis was applied to all disciplines):

- Hazardous materials inspectors are responsible for ensuring railroad cars hauling hazardous materials meet specific safety requirements, that each car is properly labeled and that all paperwork regarding the hazardous materials is completed and available to comply with federal rules.
- Number of oil trains expected per year
- At the time, 19 oil trains travel through Washington State weekly, or 988 trains per year.
- Each train includes an average of 100 cars. This means that, 98,800 train cars filled with crude oil are transported through the state. The number was expected to triple in the next five years meaning that 296,400 crude oil tank cars could be expected to travel the rails in Washington.
- Number of inspections staff will complete
- Inspecting 10 percent of crude oil tank cars means staff would inspect 29,640 oil tank cars annually.

- Number of staff needed to complete inspections

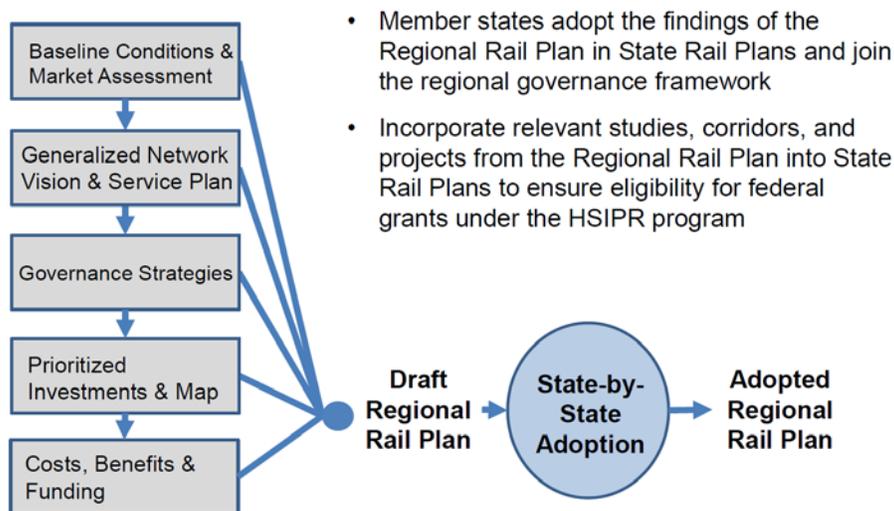
In 2014, staff spent 75 percent of the time on inspections of oil tank cars and the remaining 25 percent on inspections of hazardous materials cars hauling products other than oil (for example, ethanol). During 2014, spending 75 percent of time inspecting oil tank cars equaled 13,506 oil tank cars. It would take 2.2 staff to inspect 29,640 tank cars annually.

The WUTC had 1.0 FTE devoted to hazardous materials inspections. After determining that the workload needed at least another inspector, the WUTC requested, as part of a larger legislative package, the ability to hire the additional inspector. Funding was appropriated during the 2015 legislative session and four inspectors were hired in the various disciplines. Whether revenues and program costs will allow the additional four inspectors that were requested in the legislation to be hired remains a question.

Regional Rail Planning

A regional rail plan is a visioning plan led by the FRA in partnership with regional stakeholders that develop a long-term concept for a high-performance rail network within a region. It is intended to help the region and FRA determine the priorities, studies, and investment needs to advance projects within a multi-state network context. It will also identify the potential institutional arrangements, financial requirements, phasing, planning and development activities needed to achieve the vision and can be a resource to the state in its long term planning.

Elements of a Regional Rail Plan



STATE RAIL INSPECTOR TRAINING AND CERTIFICATION

While the FRA's Office of Railroad Safety oversees multiple aspects regarding rail safety, 31 states currently participate in the State Rail Safety Participation Program with an estimated 180 state inspectors.

One of the key responsibilities of the Office of Railroad Safety is to train and certify state safety inspectors. State inspectors are then trained by the FRA in one of the five safety disciplines: hazardous material, motive power and equipment, operating practices, track, and signal and train control. Although states are responsible for the costs of participating in the Program, the FRA reimburses any training costs once completed.

Though the FRA and a state may agree upon specific parameters of a state's involvement, the general focus is to aid in routine compliance inspections. The five safety disciplines each have specific training standards administered by the FRA allowing for certification of state inspectors.

The Hazardous Materials discipline focuses on the movement of materials such as nuclear waste, chemicals, and petroleum products through the railroad system. An inspector focusing on hazardous materials would be inspecting and investigating proper handling procedures, unloading and loading of hazardous materials, and proper packaging, among other related duties.

The Motive Power and Equipment concentration targets the safety of locomotives, rail cars, and safety appliances such as air brakes for passenger, commuter, and freight trains. This area of expertise ensures locomotives and rail cars meet all applicable safety standards whether they be in active service or in a repair status.

The Operating Practices focus targets the rules and practices of railroad operators to ensure compliance with multiple regulations. An inspector focusing on this discipline might investigate the certification of a locomotive engineer, inspect carrier records to ensure proper drug and alcohol testing, or probe complaints of unsafe working conditions.

The Signal and Train Control discipline focuses on signals and crossing warning systems such as bells and warning lights. An individual in this area would routinely inspect warning systems at crossings; investigate complaints regarding unsafe crossing conditions, and review modifications to any crossings.

Finally, the Track discipline is key to ensuring safety in all operations relative to railroad track. An individual focusing on this discipline would frequently inspect sections of track to ensure they are within the specifications of federal regulations. This individual inspects the rails from both aboard a car and on the ground to identify and record any deficiencies.

RESOURCES

- <https://www.fra.dot.gov/Page/P0014>

- <https://www.fra.dot.gov/Page/P0032>
- <https://www.fra.dot.gov/Page/P0371>
- <https://www.fra.dot.gov/Page/P0372>
- <https://www.fra.dot.gov/Page/P0373>
- <https://www.fra.dot.gov/Page/P0374>
- <https://www.fra.dot.gov/Page/P0377>
- <http://www.ecfr.gov/cgi-bin/text-idx?SID=e2534e718d3ccb6e8c07791bef961361&mc=true&node=pt49.4.212&rgn=div5>

IV. DEVELOPMENTS IN RAILROAD SAFETY AT THE STATE LEVEL

BEST PRACTICES OF STATE RAILROAD SAFETY PROGRAMS

The FRA reports 31 states that have railroad safety programs with a number of these being very active in ensuring railroad safety. Over the years, these states have developed best practices for certain railroad safety issues. This section identifies a few of the best practices identified as potential resources.

California, which has the largest state railroad safety program, has established a number of practices that can be examples for states that either do not have significant resources or experience in railroad safety.

The California State Legislature has made railroad safety a priority since the establishment of the California Railroad Commission in the late 1800s, primarily to regulate rates. On February 9, 1911, the California Legislature passed the Railroad Commission Act that reorganized the Railroad Commission. The name was subsequently changed to the California Public Utilities Commission and included other privately-owned public utilities to the Commission's purview.

The CPUC railroad safety program is one of the most comprehensive railroad safety programs in the nation. The Constitution of California declares that the Public Utilities Code is the highest law in the state, that the Legislature has authority to regulate public utilities under the Public Utilities Code, and that the Constitution's provisions override any conflicting provision of state law which addresses the regulation of public utilities.

The CPUC employs 43 FRA-certified railroad safety inspectors to perform safety inspections and investigations pursuant to the State Participation Program with the FRA. The FRA certifies the CPUC railroad inspectors in five distinct disciplines: operating practices, track, signal, motive power and equipment, and hazardous materials. In addition to enforcing California State Public Utilities Codes and CPUC General Orders, CPUC railroad inspectors also enforce FRA regulations in a state/federal enforcement partnership.

California's best practices are founded on the principles that the railroad safety inspectors are:

Provided Broad Statutory Authority

- Federal Laws: CPUC Rail Safety Inspectors participate in the federal State Safety Participation Program. The CPUC investigators provide enhanced investigative and surveillance capability by having the state agency assume responsibility for compliance investigations and other surveillance activities as a federal partner.
- State Laws: California laws and CPUC General Orders exceed the federal standards. State laws require the CPUC to perform inspections, surveillance, and investigations of the railroads, and advise the Commission on all matters relating to rail safety. Applicable CPUC general orders and public utility codes provide greater specificity in order to

implement the State laws. (A list of legislative authority and CPUC General Orders is included below.)

Empowered

- Risk Management Status Reports: Each inspector possesses the authority and the responsibility for addressing railroad-related safety risks regardless of their discipline or federal certification. CPUC railroad safety inspectors complete Risk Management Status Reports when they discover an identified need to document and remedy risks for which there was no regulation. Once a Risk-Management Status Report is documented, the assigned inspector works with his or her supervisor to mitigate the identified risk. The inspector and supervisor meet with the responsible railroad, shipper or associate entity responsible representative and convey the safety risk associated with the issue. The responsible representative will either remedy the risk, or choose to ignore the identified risk. The CPUC railroad safety inspector performs a follow-up inspection to determine whether the risk was mitigated. If the railroad fails to eliminate or sufficiently mitigate the risk, the CPUC Program Manager will pursue resolution with the responsible railroad officials, and may bring the issue up to the Deputy Director, or to the full Commission, if necessary.
- Operation Lifesaver: CPUC rail safety staff present at Operation Lifesaver events. Operation Lifesaver's mission is to end collisions, deaths and injuries at highway-rail grade crossings and on rail property through a nationwide network of volunteers who work to educate people about rail safety. CPUC railroad safety inspectors and support staff volunteer throughout the state, providing presentations to schools, community organizations, drivers' education classes, bus driving workshops and trucking organizations, as well as educating the public at weekend events such as festivals and safety fairs.

Proactive and Nimble

- Crude oil by Rail: The Program Manager noticed an increase in track construction in and around Bakersfield. He proactively researched construction permits and discovered a railroad was constructing track to lead to and from a yet-to-be-built crude oil transfer facility. He immediately created the Crude Oil Reconnaissance Team, a team of inspectors who specialize in hazardous materials, track, and operating practices. The Crude Oil Reconnaissance Team actively monitors and inspects crude oil rail line rehabilitation projects, including new crude oil facilities, track construction or rehabilitation, bridge and grade crossing upgrades and all railroad transportation systems associated with the transportation of crude oil to ensure that all crude oil facilities and the routes to those facilities comply with federal and state safety laws, in addition to mitigating risks that are not defined in regulations. During 2014-15, the team monitored upgrades to 29 miles of antiquated track in the Bakersfield area to ensure effective improvement competencies, and successfully pursued improvements to public

grade crossings to more effectively alert motorists and pedestrians of oncoming trains carrying crude oil.

- **Railroad Bridge Evaluation Program:** Due to risks of derailments associated with antiquated bridges, the Program Manager proactively identified two inspectors and an engineer from the Risk Assessment Program. In 2014, the Bridge team performed 51 bridge observations, identified 22 general order defects, and created seven Risk Management Status Reports to seek remediation to improve the safety of the state's railroad bridges.
- **Positive Train Control:** The Rail Safety Improvement Act of 2008 (P.L.110-432) required all railroads to install PTC devices in specified areas by December 31, 2015. On October 29, 2015, the U.S. President signed bill that included a three-year extension of PTC implementation. In 2013, the CPUC hired two new inspectors who specialize in positive train control to ensure the qualifying railroads operating in California comply with the federal law. The inspectors who specialize in PTC monitor the installation of and evaluate the effectiveness of positive train control in California.

Team-oriented

- **Focused Inspections.** Focused inspections involve inspectors from a variety of disciplines or multiple inspectors from a single discipline, working together at a specific location or rail facility. Typically, focused inspections are joint efforts between the FRA and CPUC, though Public Utilities Code section 767.5 permits the CPUC to conduct the inspections as the Commission determines to be necessary. Focused inspections allow CPUC railroad safety inspectors to evaluate all aspects of a railroad or facility's operational and maintenance practices and procedures. They also allow for close evaluation of railroad management and labor abilities, technical expertise and experience, and safety culture. If corrective actions are recommended by CPUC railroad safety inspectors, a follow-up inspection is performed to determine progress by the railroad entity in carrying out the recommended actions.

Supported by the Commission for Enforcement

- **CPUC:** The railroad safety inspectors enforce both state and federal rail safety regulations. If a railroad fails to timely correct non-compliance with regulations, penalties may be assessed pursuant to the Railroad Citation Program or a formal Order Instituting an Investigation. Formal proceedings are the CPUC's strongest enforcement mechanism, particularly if the Railroad Operations Safety inspector has already tried to gain compliance through the other normal processes, such as: inspection reports, letters, and meetings with railroad personnel, elevating concerns to middle or upper management, or other regulatory enforcement strategies. Prior to issuing a formal citation or opening an Order Instituting an Investigation, staff provides the railroad all opportunities to rectify the violation or unsafe condition.

- Resolution ROSB-002: The CPUC rail safety inspectors can recommend the assessment of penalties depending on the violation. For violations of federal railroad safety regulations, CPUC railroad safety inspectors make recommendations to the Federal Railroad Administration for the assessment of penalties. Any penalties collected are deposited into the U.S. Treasury. For violations of California state laws and CPUC general orders, CPUC Resolution ROSB-002 provides the Director or Deputy Director of the Safety and Enforcement Division the authority to issue citations to railroad carriers for violation of certain general orders and a Public Utilities Code section. A railroad issued such a citation under ROSB-002 may accept the fine imposed or contest it through a process of appeal.

DISCUSSION OF LESSONS LEARNED IN RAILROAD SAFETY AND SUMMARY OF RELATED SIGNIFICANT DEVELOPMENTS

The FRA-State Safety Participation Program has been one of the most significant development in U.S. rail safety oversight. The combination of federal and federally-certified state inspectors has greatly increased oversight of freight railroad operations and maintenance practices. The fact that state inspectors make up 30 percent of FRA's inspection force shows how important state inspection programs are to railroad safety. The growth of active programs around the country indicates how serious states regard railroad safety. Regardless of the size of a program, there has been an effort to dedicate more resources to railroad safety. Challenges like increased crude oil and intermodal traffic, railroad bridge safety, risk management, employee safety, implementation of Positive Train Control, the newly adopted enhanced tank car regulations, and countless other issues place an enormous burden on state railroad programs where a large majority are already operating without necessary personnel and equipment. Limited resources require strategic deployment, and as such, best practices and lessons learned are invaluable planning tools.

Risk Management - Beyond the Regulations⁷¹

California has a structured program that addresses unregulated risks, recognizing that just because some hazard is not regulated does not mean it is an acceptable risk. The program follows the philosophy in the organizational safety culture literature critiquing a narrow focus on only regulated hazards, *i.e.*, compliance with regulations, and a "hands off" perspective of those hazards that are unregulated.⁷²

In California's program, if a hazard is discovered during any inspection or accident investigation, but there is no non-compliance, staff fills out a report that is entered into a database similarly

⁷¹ See also Risk Reduction Section of the Report, Section VI G.

⁷² See for example, "A blinkered view of the law," in Reason, James, (1997). *Managing the Risks of Organizational Accidents*. Burlington, VT: Ashgate, at 160.

to non-compliant items. The unregulated hazard gets similar treatment to a regulated hazard insofar as there is documentation and follow-up until the hazard is remediated or eliminated. Most such hazards are addressed informally, but staff may bring the item at any time to a CPUC Commissioner's attention in a petition to address the hazard formally if warranted.

Recent Lessons Learned

The 2016 derailment in Mosier, Oregon necessitated the Washington Utilities and Transportation Commission (WUTC) rail safety staff to provide support in track inspection activities along the Washington side of the Columbia River. In the months that followed the derailment, and in working with agency partners, staff noted the following lessons learned:

- Responses to crude oil incidents may require specialized outside resources whose arrival will be delayed.
 - The geography of a remote location is often helpful for impact of the event but makes response and recovery more difficult.
- Derailments will likely require mutual aid and a more robust incident management system than responders would typically employ.
 - Incidents involving the release of hazardous materials moving in unit trains will be larger, in most cases, than what the state or locality has available for response.
- Traditional firefighting strategies and tactics may not be effective against crude oil because it contains flammable gasses.
 - In the case of Mosier, firefighters had to cool off the railcars first with water and then put foam on the fire.
- Air monitoring is necessary in a derailment involving the release of crude oil to check for explosive vapors, benzene, hydrogen sulfide, carbon monoxide, particulate PM 2.5, and organic vapors.
 - Coordination on air monitoring equipment is key and a large event could easily overwhelm available monitors.
- Incident security will continue to be more challenging and potentially more of a barrier for responders.
 - A 100 percent identification security check at the incident command post was implemented due to "imposter" local representation.
 - Protesters used the incident to promote environmental agendas, requiring additional attention to public information and security.
 - Parameters may need to be well established by more law enforcement officers than typically used.
 - Drones are now common and there should be an airspace safety and operations coordinator available.

Further, the PHMSA Crude Oil Rail Emergency Response Roundtable found that it is essential that "Outside federal and state investigative/regulatory agencies that are not part of the initial

operational response (*i.e.*, rescue, control, suppression and recovery), must be knowledgeable in the basic principles of incident management systems and Unified Command to the extent necessary to provide required support to the Incident Commander.⁷³

SUMMARY OF IDENTIFIED GAPS, POTENTIAL AREAS OF IMPROVEMENT AND CHALLENGES AT THE STATE AND FEDERAL LEVEL

In Washington State, the WUTC worked with the Department of Ecology and the Emergency Management Division of the State Military Department to identify recommendations for the safer transportation of crude oil. During that process, the WUTC identified the following state level gaps in railroad safety:

*Railroad Grade Crossings along Oil Routes*⁷⁴

In the course of its work on a study requested by the Legislature, the WUTC conducted a review of all public railroad-highway grade crossings located on the known primary routes of unit trains carrying crude oil in Washington. Generally, a collision at a crossing between a motor vehicle and a train causes far more damage to the vehicle than the train. In a collision, injuries, death and property damage are more likely to occur to a motor vehicle or the person inside rather than to the train. Adding to the safety concerns is the fact that a collision with a substantial vehicle, such as a tractor-trailer or semi-truck, could increase the chance of derailment.

The WUTC reviewed crossings along oil routes to address the potential risk factors of emergency braking prior to impact resulting in derailment, side impact to the train by a motor vehicle and an impact with a semi-truck with a single or double trailer combinations, which can have a loaded gross weight exceeding 40 tons. Many of the crossings involving the heaviest on road vehicles also are likely to be in areas with a higher likelihood of hazardous commodities being carried by the vehicle.

Crossing information is often dated and inconsistent so multiple data sets were used for the evaluation. The WUTC primarily used railroad crossing databases populated by the FRA and the WUTC. There was also a need to use a variety of reference documents to help identify the risk factors for the review.⁷⁵ Those factors included:

- Crossings protected only by passive traffic control devices, such as cross-bucks and/or stop or yield signs.

⁷³ Lessons Learned Roundtable Report, Office of Hazardous Materials Safety, Field Services Support, July 1, 2014.

⁷⁴ See Appendix C

⁷⁵ U.S. Department of Transportation, Federal Highway Administration (USDOT) Railroad-Highway Grade Crossing Handbook, USDOT Guidance on Traffic Control Devices at Highway-Rail Grade Crossings, USDOT Manual on Uniform Traffic Control Devices (MUTCD), and the Washington State Department of Transportation Design Manual.

- Crossings protected only by train-activated flashing lights.
- Crossings with limited sight distance down the tracks in one or both directions and not protected by automatic gates.
- Crossings with a significant grade, or slope, approaching the crossing and not protected by automatic gates.
- Crossings with nearby roadway intersections that may cause traffic to queue over the tracks and that are not protected by automatic gates.
- Roadways that cross the tracks at an acute angle at a crossing not protected by automatic gates.
- More than one mainline track intersects the roadway at a crossing not protected by automatic gates.
- The crossing exposure factor, i.e., the number of trains per day times the number of vehicles using the crossing per day, is at a level that poses a risk.

The result of the evaluation was the identification of several crossings that were at greater risk of incident due to exposure factors and being under protected.

Private Crossings

In Washington, private crossings outside of quiet zones are not regulated for safety by the FRA or the WUTC. The WUTC also identified private crossings over mainline railroad tracks as a safety hazard both for those persons using the crossing to cross the track, but also to railroads, who are not required to blow their horns or whistles at such crossings. Private crossings are not always properly signed, so the driver of the vehicle over the crossing might not know they are approaching a railroad crossing. In addition, the crossing may have an approach grade or slope that may result in a vehicle getting stuck, or high-centered, on the track.

Private Shippers Property

Washington State lacked statutory authority to allow hazardous materials inspectors to conduct inspections of railroad tank cars on a private shippers' property. The WUTC inspector had to be accompanied by an FRA inspector in order to perform an inspection on private shipper property, as there was no independent state authority for the Commission to conduct such inspections. The FRA certification of a state inspector allows state inspectors to conduct inspections without FRA inspectors present if the state has independent statutory authority to enter a private shipper's property.

The inability to conduct the inspections on private shipper's property, without an FRA escort, diminished the value of the state partnership, created logistical problems, and reduced the number of hazardous materials inspections in key areas of increased risk.⁷⁶

⁷⁶ This gap was corrected in 2015 with the passage of ESHB 1449.

State of California Identified a Gap in the Information Railroads Provide the State on Accidents and Injuries

State railroad safety programs are entitled to receive information regarding accidents and injuries,⁷⁷ with a number of states participating in the SSPP requiring telephonic notification. Unlike the FRA however, states receive individual accident reports and have limited access to information that is necessary to determine accident and injury rates, trends and potential risk factors for the railroad operators in the state. The FRA receives this information, allowing it to calculate the rate of accident/injury based on locomotive mile, passenger and freight train miles, number of passengers transported and employee hours.

The limited access to information needed to “normalize the data” to conduct accident analysis, predict trends and dedicate resources to the highest risks areas underutilizes the states’ expertise and investment in ensuring railroad safety.⁷⁸

The Office of Inspector General noted a similar problem in the way the FRA maintains its database in its recent audit of the FRA’s Oversight of Hazardous Materials Shipments:

[I]nspectors do not have ready access to inspection data from other regions because pulling this information from FRA’s system is complicated. Inspectors also frequently do not have accurate information on special permits from PHMSA because the related information in PHMSA’s Web-based portal is outdated and incomplete. These limitations make tracking leaks or recurring compliance problems time consuming and limit the pre-inspection preparation inspectors can do.”⁷⁹

Updates to the Track Inspection Standards

- Currently the FRA can only inspect 0.2% of railroad operations each year.
- Railroad track inspection schedules do not incorporate maintenance standards which would allow for maintenance or repair before the condition exceeding safety standards develops.

Employee Safety

- No clear guidelines for use by railroads and railroad workers detailing when and where Occupational Safety and Health Administration standards are to be applied.
- The national inspection program does not include emphasis on roadway worker activities, or hazard recognition and mitigation.
- No national inspection program that specifically includes roadway worker activities.

⁷⁷ *NARUC v. Coleman*, 542 F. 2d 11 (3d Cir. 1976).

⁷⁸ Oil by Rail Safety in California, Preliminary Findings and Recommendations, 2014. [

⁷⁹ Office of Inspector General Audit, FRA’S OVERSIGHT OF HAZARDOUS MATERIALS SHIPMENTS LACKS COMPREHENSIVE RISK EVALUATION AND FOCUS ON DETERRENCE, February 2016.

V. SIGNIFICANT ISSUES IN RAILROAD SAFETY

ADVANCED NOTICE OF HAZARDOUS MATERIALS TRANSPORTATION

In July 2016, PHMSA released a Notice of Proposed Rulemaking (NPRM) on oil spill contingency plans and information sharing, as directed in the FAST Act.⁸⁰ The NPRM focused on high hazard flammable trains and took a commodity focus based on risk, which is a departure from the FAST Act requirement to include Class I railroads primarily. Under the FAST Act, the USDOT is required to work with the railroads to “establish security and confidentiality protections, including protections from public release of proprietary information or security-sensitive information.” After FRA issued an emergency order in 2015 requiring notification to communities, railroads requested that any information that is provided be considered security sensitive in regards to public disclosure laws. The USDOT’s direction to the industry that railroad information does not qualify for withholding under federal standards on business confidential or security sensitive information was likely one of the driving forces behind the limitations in the FAST Act of how and what information could be shared.

The FAST Act notice requirements call for monthly reporting of aggregated information about volumes of crude oil moving through a jurisdiction on a weekly basis. The information will not include customer information or the timing of train movements, and would give the industry the opportunity to intercede should it determine a request for public records would disclose data that was proprietary or security sensitive.

States face significant difficulties under this provision when working with their own public disclosure laws. States charged with receiving the data, conducting inspections or responding to an incident may potentially violate their state public disclosure laws if they agree to the railroad’s contract terms, or to use the industry mobile tank car apps, to receive the information. In Washington state, some agencies that would benefit greatly from on scene identification of a commodity during a spill, are precluded from obtaining the information as the states’ public disclosure laws would force disclosure of the information the FAST Act deems confidential or security sensitive.

OIL SPILL RESPONSE PLANS

In addition to advanced notice, the NPRM proposed FRA oversee the Oil Spill Response Plans.⁸¹ The Oil Spill Response Plan NPRM is broken down into four key areas (expansion of response plans, requirements of plans, information sharing and alternative testing), with each area

⁸⁰ PHMSA-2014-0105 (HM-251B), 49 CFR Parts 130, 171, 173, and 174.

⁸¹ PHMSA-2014-0105 (HM-251B), 49 CFR Parts 130, 171, 173, and 174.

containing an explanation, justification, potential impact and rationale. A summary of those areas with notes of interest are as follows:

Expansion of Comprehensive Oil Spill Response Plans

Under the NPRM to railroads that transport oil, the industry would be subject to a level of scrutiny and review that is not present today.⁸² The existing oil spill response plans that apply to the railroad industry are broken up into two categories: Basic and Comprehensive. The comprehensive plan only applies to railroads that transport oil with a tank car capacity of 42,000 gallons, which is significantly larger than the DOT-111, CPC 1232 and DOT-117 capacity (approximately 30,000 gallons). The artificially high threshold for the existing oil spill response plans means that the industry is subject only to the Basic Plan, which has no direct approval of planning standards or meaningful regulatory oversight.

Requirements of Comprehensive Oil Spill Response Plans

The requirements of the NPRM would call for a railroad to obtain certification of plan consistently with the National Contingency Plan/Area Plan for minimum compliance including: a) identification of a qualified individual and contact information for each response zone; b) the establishment of response zones, based on geographic route requirements, that ensures the necessary personnel and equipment are available; and c) identification of organizations, personnel, equipment and deployment location capabilities capable of mitigating a worst case discharge.

Under the FAST Act, PHMSA would delegate approval process authority to the FRA with explicit language that the FRA has sole authority over plan approval with consultation allowed by the US Coast Guard and the Environmental Protection Agency. The role of the state under the NPRM is unclear, but in general state railroad safety programs will continue to be a resource during an incident and work in partnership with the FRA on preventative inspections based on risk.

Railroad Information Sharing

Information sharing under the NPRM, unlike in the FAST Act, focused on Class I, II and III railroads that operated High Hazard Flammable Trains. It requires railroads to share aggregated information about volumes of crude oil moving through a jurisdiction distributed monthly. The information, as outlined in the NPRM, will not include customer information, timing of train movements or information the railroads believe is security sensitive or proprietary.

Alternative Testing Methodology

⁸² NPRM expands the Comprehensive Plan to railroads transporting oil in a continuous block of 20 or more tank cars, or a total of 35 tank cars in the entire train.

PHMSA is proposing to incorporate, by reference, industry best practices for testing Class 3 packaging group assignments. The alternative will not replace authorized testing methods but rather be an acceptable alternative for industry to use for compliance.

RAILROAD CROSSING SAFETY

Illinois

The Illinois Commerce Commission (ICC) has the statutory responsibility to improve safety at public highway-rail crossings in the State of Illinois. Currently, there are 7,669 highway-rail grade crossings in Illinois, of which 769 are on state roads, and 6,900 are on local roads. There are 2,681 highway-rail grade-separated crossings (bridges) in the state. Another 3,706 grade crossings are on private property, which are not under the jurisdiction of the state, and there are also 142 private bridge structures. There are also 333 pedestrian grade crossings and 102 pedestrian grade separated crossings (bridges) in Illinois. Nationally, Illinois is second only to Texas in the total number of highway-rail crossings.

Illinois is one of the key transportation hubs in the nation. With approximately 7,400 miles of railroad track, its rail system is the country's second largest, including the largest rail freight hub in Chicago. Illinois has the nation's third largest highway system, with 146,765 miles of highways, streets and roads and 26,667 bridges as of December 2014. Both the rail and highway systems are among the most heavily used in the nation in terms of volume of traffic, with much of the traffic concentrated in the Chicago metropolitan region. There, the urban mass transit system serves an average of more than 665 million passengers a year over an extensive network of bus and rail routes.

The Grade Crossing Protection Fund (GCPF), appropriated to the Illinois Department of Transportation but administered by the ICC, was created by state law to assist local jurisdictions (counties, townships and municipalities) in paying for safety improvements at highway-railroad crossings on local roads and streets only. Assistance from the GCPF cannot be used for safety improvements at highway-rail crossings located on the state road or highway system. Those improvements are paid for by the Illinois Department of Transportation. Beginning with Fiscal Year 2010, each month \$3.25 million in state motor fuel tax receipts is transferred from the Motor Fuel Tax fund to the GCPF. This amount provides the GCPF with \$39 million annually to be used for safety improvements at highway-rail crossings on local roads and streets. The GCPF is typically used to help pay for the following types of projects:

- Warning Device Upgrades: Installation of automatic flashing light signals and gates at public grade crossings currently not equipped with automatic warning devices; installation of automatic flashing light signals and gates at public grade crossings currently equipped only with automatic flashing light signals; signal circuitry improvements at public grade crossings currently equipped only with automatic warning devices;

- Grade Separations - New and Reconstructed: Construction, reconstruction, or repair of bridges carrying a local road or street over railroad tracks (overpass); construction, reconstruction, or repair of bridges carrying railroad tracks over a local road or street (subway);
- Grade Separations - Vertical Clearance Improvements: Lowering the existing highway pavement surface under a railroad bridge to improve vertical clearance for motor vehicles;
- Pedestrian Grade Separations: Construction of a bridge to carry pedestrian and bicycle traffic over or under railroad tracks;
- Interconnects: Upgrading the circuitry at grade crossings where warning signals are connected to the adjacent traffic signals so that the two systems operate in a synchronized manner;
- Highway Approaches: Improvements to the portion of the public roadway directly adjacent to the crossing surface;
- Connecting Roads: Construction of a roadway between a closed crossing and an adjacent open, improved crossing;
- Remote Monitoring Devices: Sensor devices in the circuitry of grade crossing warning devices which immediately alert the railroad to any failures in warning device operations;
- Crossing Closures: Provide an incentive payment to local agencies for the voluntarily closure of public highway-rail grade crossings; and
- Crossing Surface Renewals: Up to \$2 million in assistance annually can be allocated for crossing surface improvements.

The cost of railroad crossing safety improvements varies substantially depending on the nature of the work undertaken. A standard installation of gates with automatic flashing light signals on a two-lane road typically costs approximately \$200,000-\$250,000. Additional costs for road improvements could typically range from \$2,000 to \$100,000 depending on the road type and location. Grade separation structures are very costly. The GCPF has made contributions to pavement lowering (vertical clearance improvements) projects costing between \$35,000 - \$3 million, and new underpass structures costing more than \$50 million. Bridges over railroads can cost from \$600,000 for a rural structure to \$40 million for a multi-lane multi-railroad urban structure. Typically, the ICC authorizes contributions from GCPF that pay up to 60 percent of the cost for grade separation projects and 85 percent to 95 percent for grade crossing improvements, although ICC policy is to allocate no more than \$12 million from the GCPF to any individual project unless unusual circumstances warrant otherwise.

When the numbers of crossing locations needing improvement are multiplied by project costs, the problem of allocating sufficient assistance from the GCPF becomes apparent.

California

There are over 10,000 rail grade crossings (i.e., at-grade crossings or crossings) in California. Grade crossings may be defined as intersections at which trains traverse tracks in the same location, and at the same elevation, as vehicles and/or pedestrians (including wheel chair occupants and cyclists) are legally permitted to cross them. These crossings represent a high degree of risk, particularly to the motorists and pedestrians who traverse them.

The challenges associated with mitigating crossing-related safety risk are multifold and fairly complex. In part, this is due to the three major crossing design criteria: safety, accessibility, and functionality. It can be difficult to design a crossing that maximizes all three elements, especially in areas of high population density. In addition, there are a number of entities responsible for the planning, design, implementation, oversight and use of crossings.

CPUC Rail Crossing Role

The CPUC is the primary entity responsible for regulatory oversight of most grade crossings in the state. The Rail Crossings and Engineering Branch (RCEB) is the CPUC unit most closely associated with these efforts. There are various local, state and federal agencies with whom the CPUC and RCEB staff cooperate in efforts to improve rail crossing safety. Those include cities and transit districts, the California Department of Transportation and three units within the Federal Department of Transportation.

The following are the major categories of crossing safety that are performed by the CPUC:

- Authorization of new crossing construction. (General Order 72-B)
- Standards for warning devices. (General Order 75-D)
- Approval of modifications to existing crossings. (Delegated authority to staff by General Order 88-B)
- Inspections and investigations of crossings categorized as “high-risk.”
- Engineering guidance for safety improvements by responsible railroads or transit agencies. (In part, utilizing the California Manual on Uniform Traffic Control Devices)
- Prioritization studies used by California Department of Transportation for the allocation of state and federal funds totaling approximately \$31 million annually.
- California Environmental Quality Act (CEQA) review of development projects for impact to rail crossings and corridors. (Approximately 300 projects reviewed monthly, with 51 comment letters in 2015)

- Community outreach, including Operation Lifesaver.

Improve Rail Crossing Safety

The CPUC gives precedence to the following safety recommendations, with one being the highest priority:

1. Remove or separate the grade crossing.
2. Provide or improve safety devices such as gates and barriers, and/or channel automobiles toward secondary roads to separate flows of traffic from the railroad tracks.
3. Provide warning devices including signs, pavement striping, flashing lights, and bells.
4. Enhance or refine procedures for railroad operations.

The higher the perceived or actual risk at a given crossing, the more likely that crossing will be considered for priority-one treatment.

Washington

Washington State Grade Crossing Safety

Defect Process and Procedures

WUTC staff routinely inspects public railroad crossings every three years within Washington State. Staff will also immediately inspect a crossing if a complaint is received.

- The Transportation Specialist (specialist) is responsible for issuing an assignment number for an inspection. The specialist must issue an assignment number before staff can issue a defect.
- The specialist will issue one of two types of assignments:
 1. A routine inspection.
 2. An inspection in response to a complaint or referral from a staff member.
- After an assignment number is issued, a copy of the current inventory for the crossing is sent to the inspector for the crossing, and the inspector inspects the crossing.

If the inspector determines a defect is present, the inspector will issue a defect notice to the responsible party which is the official notification of a defect and repairs are required.

- The inspector will take at least one photo of the defect and upload it into the database.
- The inspector will send the defect report to the responsible party within ten calendar days of the inspection.
 - In the case of a dangerous/severe defect notification should be made immediately to the responsible party by telephone and a defect notice should also be sent via email and first class mail.

- The defect notice requires the responsible road authority or railroad to make repairs and return the defect notice form with the correction date.
- If a response is not received from responsible party, the inspector will contact the responsible party and notify them that a response is overdue.
- If defects are not resolved within 30 days from the response due date or 30 days from the commitment date, the Rail Manager will review and if approved, take this information to enforcement staff for issuance of a compliance letter.
- At this point, enforcement staff takes over management of the defect, all communications between the responsible party and staff should be through the enforcement staff assigned.
- Enforcement staff will prepare a compliance letter and require a written response within a specific period of time which is generally, two weeks. The letter will include a statement that the commission may take enforcement action, including penalties, if the outstanding defects are not corrected.

Expectations when a defect is issued:

1. Timeliness of repairs:
 - a. Dangerous/severe conditions – repair within 48 hours

A dangerous or severe condition means the condition of the crossing can easily damage cars, cause accidents or cause cars to swerve to the shoulder or off the road to avoid the problem. An exposed spike can damage a car easily, as can several missing planks or several loose planks. Even if a crossing is only rough, cars slowing for the crossing can cause an accident if there are other factors that distract following drivers. Dangerous or severe conditions are rare.

- b. Routine defects – repair within 30 days.

A routine defect is one that causes noticeable inconvenience. Examples include planks that are beginning to loosen or deteriorate, spikes that are beginning to be exposed, and gaps that are becoming significant. Missing signage and potholes that cannot be avoided without swerving are considered routine defects.

2. Quality of Corrections
 - a. The responsible party must correct defects in a manner that will result in a crossing surface or approach that is convenient and safe for passage and will remain free of such defects for a reasonable period of time.
 - b. Temporary repairs are acceptable to eliminate the danger posed by the most serious defects or when plans have been made for more extensive repairs in the near future. Ideally, the responsible party completes the repairs within 30 days or within the time frame agreed upon between them and WUTC staff. Temporary repairs may be the best immediate solution especially during winter time, but WUTC staff also require a commitment date for the permanent repairs.

3. Records

- a. It is important to maintain records that allow WUTC staff to determine when inspections are performed, what defects were found, when and what repairs the road authority made, and the text of any correspondence. Generally, WUTC staff needs to know, through written documentation what was done, when it was done, and who did it. Staff cannot recommend enforcement actions such as penalty assessments unless sufficient documentation exists.

BLOCKED RAILROAD CROSSINGS

When at grade crossings are blocked by trains parked over or stopped at a crossing, it creates significant inconvenience for local communities where local traffic cannot proceed. It may also create significant safety hazards where emergency vehicles cannot travel to an emergency and where persons crawl over the train to access the other side of the tracks. Cities, towns and states have adopted ordinances and statutes to prohibit trains from blocking crossings. However, courts have found such statutes preempted or unconstitutional.

For example, an Illinois state statute prohibited stopped trains from blocking public highway-rail grade crossings.⁸³ The statute provided that:

It is unlawful for a rail carrier to permit any train, railroad car or engine to obstruct travel at a railroad-highway grade crossing for a period in excess of 10 minutes, except where such train or railroad car is continuously moving or cannot be moved by reason of circumstances over which the rail carrier has no reasonable control.

In January 2008, the Illinois Supreme Court ruled the Illinois statute unconstitutional. The court ruled that the state law and similar local ordinances cannot prevent trains from sitting at grade crossings for long periods because federal law preempts such restrictions, although there is no federal law limiting blockages. Both the Illinois Appellate Court and Supreme Court found the local law and ordinance had overstepped federal authority. The court cited a 1994 federal law as giving the U.S. Secretary of Transportation oversight of train movement.⁸⁴

Since the Illinois Supreme Court ruling, and similar rulings by other courts around the country, states have been awaiting action by the FRA to address the issue. To date, FRA has yet to begin a rulemaking process to address the issue of blocked crossings.

⁸³ 625 ILCS 5/18c-7402(1)(b).

⁸⁴ Docket No. 102462 IN THE SUPREME COURT OF THE STATE OF ILLINOIS EAGLE MARINE INDUSTRIES, INC., et al., Appellees, v. UNION PACIFIC RAILROAD COMPANY, Appellant. Opinion filed January 25, 2008.

TRESPASSING RAILROAD PROPERTY

Hundreds of people are killed and thousands are seriously injured each year in the United States at highway-rail crossings and at other locations along railroad tracks.

Many people are unaware that trains cannot stop quickly to avoid collisions. Others take risky chances by ignoring warning signs and signals, bypassing lowered gates, stopping on tracks, or simply not paying attention when approaching highway-rail crossings. Many people make the fatal mistake of choosing railroad tracks as shortcuts or as places to walk or run for recreation. They do not realize the length of time or the distance it takes for a train to stop until it is too late. Unfortunately, on the average of every 115 minutes somewhere in the United States, there is an incident at a crossing or along a railroad right-of-way.

As the result of cooperative efforts by many state safety partners and stakeholders, the number of collisions at highway-rail grade crossings nationally has been reduced by more than 85 percent since a high of 13,557 incidents in 1978, despite significant increases in both highway and rail traffic. Likewise, the number of persons killed as a result of grade crossing collisions has decreased by 77 percent since a high of 1,115 in 1976. In the most recent 10-year period (2006-2015) the number of collisions at highway-rail grade crossings has been reduced by 30 percent from 2,942 incidents in 2006 to 2,062 in 2015. The number of fatalities as a result of grade crossing collisions has decreased by 24 percent from a high of 369 in 2006 to 282 in 2015. In Illinois, the number of collisions at grade crossings has been reduced by 19 percent from 174 incidents in 2006 to 141 in 2015. The number of fatalities as a result of grade crossing collisions in Illinois remained relatively flat; 25 in 2006 and 31 in 2015 (18 in 2009, 19 in 2011).

However, the number of trespass incidents nationally between 2006 and 2015 decreased just 8 percent (511 in 2006; 468 in 2015); in Illinois trespass incidents ultimately dropped 36 percent (25 in 2006; 16 in 2015), but spiked to 39 in 2008 and 31 in 2010. Further, since 2011 (the first year that FRA began tabulating suicides separate from trespass incidents) trespass-related (not at a crossing) suicide fatalities increased 56 percent nationally (158 in 2011; 247 in 2015) and 47 percent in Illinois (15 in 2011; 22 in 2015).

Efforts in engineering, enforcement and education must continue, with a particular emphasis on trespassers, to save lives.

- **EDUCATION:** Pedestrians must be reminded, and must learn how to be safe at grade crossings. An estimated 94 percent of collisions and 87 percent of fatalities result from risky behavior (walking around/ignoring automatic warning devices), poor judgment or inattention by pedestrians.
- **ENFORCEMENT:** Consistent enforcement by local or state police of traffic safety laws, and a sustained effort by the courts to impose penalties on violators, discourage and deter pedestrians from making poor decisions at grade crossings.
- **ENGINEERING:** Engineering improvements such as installing pedestrian flashing lights and gates, adding traffic dividers that deter pedestrians from walking around lowered gates,

installing fencing to restrict access to railroad right-of-way, or physically separating the highway/sidewalks from the tracks greatly reduce or prevent the potential for train-pedestrian collisions.

RAILROAD TRANSPORTATION OF NUCLEAR WASTE

The U.S. Department of Energy (DOE) National Transportation Stakeholders Forum (NTSF) is the mechanism through which DOE engages at a national level with states, tribes, federal agencies, and other interested stakeholders about the Department's shipments of radioactive waste and materials, including occasional high-visibility shipments that are nonradioactive. The purpose of the NTSF is to bring transparency, openness, and accountability to DOE's offsite transportation activities through collaborations with state and tribal governments. DOE works through existing agreements and networks to ensure federal, state, and tribal government participation is ongoing. The NTSF meetings and webinars are particularly relevant for personnel with responsibilities in packaging and transportation, emergency management, security, inspection and enforcement, and radiation protection.

The NTSF as an organization brings DOE and its transportation partners together to accomplish three main goals:

- Inform states and tribes about ongoing, upcoming, or tentatively planned shipments or shipping campaigns that may have an impact in their jurisdictions.
- Obtain input from states and tribes about concerns, needs, or logistics that is relevant to shipment planning and execution; and
- Identify emerging issues for DOE and its transportation stakeholders that may affect shipment planning, preparedness, and execution, including intergovernmental consultation and cooperation.

The DOE Office of Nuclear Energy (DOE-NE) organized the Rail/Routing Ad Hoc Working Group to resolve issues related to rail shipments of spent nuclear fuel (SNF) from shutdown nuclear reactors. DOE's activities related to selecting routes for SNF shipments dates back decades to the very early days of the former Office of Civilian Radioactive Waste Management (OCRWM) program. As a result, a significant body of work exists on this subject, much of it still relevant today. While DOE's program for managing commercial SNF has undergone significant changes since the cancellation of the OCRWM program in 2009, the positions held by states and Tribes are largely unchanged.

In order to select routes for shipping spent nuclear fuel, the shipping mode from each point of origin must first be determined. In a 1998 study, the USDOT Research and Special Programs Administration analyzed 65 case studies of mode/route combinations and found that the radiation risk was low for both non-incident and accident-related radiation exposures. The study found that "shipment duration is the most significant safety factor" affecting the risk

associated with mode/route combinations because “it affects non-incident radiation exposure levels, and the group most affected ... is transport personnel”.⁸⁵ The study concluded that, because it is difficult to evaluate mode and route factors separately, they “must be considered together for a particular mode/route combination and then compared with mode and route factors for other mode/route combinations”.⁸⁶

Trains are capable of carrying considerably higher payloads than legal weight truck or overweight truck, which means that fewer overall shipments would be needed. There is less routing flexibility with rail transport, however, and transit times may be longer. For sites that lack direct rail access, heavy haul trucks will be needed to transport rail casks from shipping sites to the nearest railhead, at which point casks would be transferred onto railcars for shipment to the repository or consolidated storage facility. Another option would be to ship the spent nuclear fuel casks by barge either directly from the site, when possible, or after heavy hauling the casks to the nearest barge slip. Barges can carry substantially heavier loads than trains or trucks, but have slower transit times and routing constraints.

Most of the nation’s nuclear reactors are located in eastern and midwestern states. Currently spent nuclear fuel is being stored “on-site” at each reactor location. The DOE is responsible for identifying and preparing a national repository site that can accept and store all SNF. The DOE had identified Yucca Mountain, NV, located approximately 100 miles north of Las Vegas, as the proposed national repository and was working on preparing the site to receive SNF shipments. However, that effort was put on hold several years ago. No other permanent repository site has been identified. Regardless, it is quite likely that many states will eventually face SNF shipments by rail.

There are many organizations involved in the transportation and handling of Nuclear Waste. The primary delegates are the Department of Transportation’s (DOT) Pipeline and Hazardous Materials Safety Administration (PHMSA), Department of Energy (DOE) and Federal Railroad Administration (FRA) with contributions from several other organizations like the Nuclear Regulatory Commission (NRC), the Association of American Railroads (AAR), the Department of Homeland Security (DHS), the Transportation Security Administration (TSA), the Federal Emergency Management Agency (FEMA), the Federal Motor Carrier Safety Administration (FMCSA), and several more federal agencies and state law enforcement officials.

PHMSA is responsible for administering the nations program to protect life, property, and the environment from risks inherent in the transportation of hazardous materials, including spent nuclear fuel (SNF), in intrastate and interstate commerce. PHMSA authority comes from the federal hazardous materials transportation safety laws (49 U.S.C. Ch. 51) which established PHMSA’s Hazardous Materials Regulations (HMR). For shipments of SNF, PHMSA also works closely with the NRC.

⁸⁵ RSPA 1998, at vi.

⁸⁶ *Id.*, at 7-1.

FRA enforces the HMR applicable to rail shipment as part of a national safety program covering all aspects of railroad operations. FRA also advises PHMSA on rulemaking involving the rail transportation of hazardous material. Railroad companies are required to conduct their own inspections to ensure these safety standards are being met. Several federal and state safety inspectors monitor the railroad companies' own inspection forces to verify compliance with the federal safety standards.

Because DOE plans to take title of the SNF and high-level radioactive waste (HLRW), it is responsible for ensuring the security of the shipments. DOE also maintains regional emergency management field offices that can dispatch qualified response teams to an incident involving nuclear materials, but first responders are primarily local fire departments and law enforcement agencies.

There are a number of regulations and guidelines available to assist these agencies and railroad companies with the transportation of nuclear waste. The FRA's Safety Compliance Oversight Plan for Rail Transportation of High-Level Radioactive Waste and Spent Nuclear Fuel (SCOP), and the Association of American Railroad (AAR) two safety and security protocols and special operating restrictions, AAR Circular OT-55-1, Recommended Railroad Operating Practices for Transportation of Hazardous Materials and AAR Standard S-2043, Performance Specifications for Trains Used to Carry High-Level Radioactive Material.

2005 U.S. DEPARTMENT OF ENERGY REPORT TO CONGRESS ON NUCLEAR WASTE

Spent Nuclear Fuel (SNF) is fuel that has been withdrawn from a nuclear reactor following irradiation and has undergone at least one year's decay since being used as a source of energy in a power reactor. Further, reprocessing has not separated the constituent elements of SNF.

This fuel includes: (1) intact, non-defective fuel assemblies; (2) failed fuel assemblies in canisters; (3) fuel assemblies in canisters; (4) consolidated fuel rods in canisters; (5) nonfuel components inserted in pressurized water reactor fuel assemblies; (6) fuel channels attached to boiling water reactor fuel assemblies; and (7) non-fuel components and structural parts of assemblies in canisters [42 U.S.C. § 10101(23), 40 CFR 191.02 and DOE Order 5820.2A].

High-Level Radioactive Waste (HLRW) results from the reprocessing of SNF in a commercial or defense facility. It includes liquid waste produced directly in reprocessing and any solid waste derived from the liquid that contains a combination of transuranic waste and fission products in concentrations requiring permanent isolation [42 U.S.C. § 10101(12), 10 CFR Part 72.3 and DOE Order 5820.2A]. HLRW meeting this definition has been shipped by modes other than rail.

SNF and HLRW are required to be transported in casks constructed to Nuclear Regulatory Commission (NRC) requirements. Casks are secured to specially constructed rail cars capable of transporting the heavy load. [Note: It is assumed that the cask car(s) will be surrounded by two buffer cars and accompanied by an escort car. This complement of cars is referred to as the cask consist.] A dedicated train is comprised of the cask consist and multiple locomotives. A

regular or key train will include the cask consist, locomotive(s), along with any number of additional cars potentially containing other regulated hazardous materials, various other general cargo and/or empty rail cars.

Regular trains typically operate at allowable freight track speed, make numerous classification yard entries, and adhere to hazardous materials transportation regulations when transporting any regulated hazardous material, including SNF and HLRW. In 2001, the Association of American Railroads (AAR) issued a Recommended Practice Circular defining any consist containing SNF or HLRW as a Key Train and routes with specified levels of hazardous materials including SNF and HLRW as Key Routes. Key trains are similar to regular trains in length and general operating rules except for the following:

- No consist restriction in excess of current regulatory requirements
- Cask is placed on a flatcar between two buffer cars
- Train has a railcar with escort personnel aboard who monitor/guard the shipment
- A 50 mph speed restriction
- Passing not restricted unless on lower than Class 2 Track
- All cars in the consist are equipped with roller bearings with rules about alarms
- Key Routes have hot bearing detection equipment at minimum intervals and the track must be inspected twice annually for internal flaws and geometry irregularities.

TRANSPORTATION OF CRITICAL ELECTRIC UTILITY EQUIPMENT

The electric industry has established several programs to store, maintain, share and deploy spare transformers and other critical equipment for electric transmission in the event of existing transformers are rendered disabled due to storm, natural disaster, cyber-attack, geomagnetic disturbance or other triggering event. However, transporting such large and heavy equipment often requires special permits and arrangements with railroads, trucking and affected state and local transportation departments. Coordination between the electric, railroad and trucking industries as well as federal, state and local governments is necessary in advance of an emergency event to ensure that transportation barriers such as equipment availability or permitting requirements do not slow the rapid deployment and installation of spare transformers.

These programs include (1) the Spare Transformer Equipment Program, or STEP, initiated and coordinated by the Edison Electric Institute (EEI) in 2006, and that has grown to 56 utility members; (2) SpareConnect, another program established by EEI to create a confidential platform for participating utilities to communicate equipment needs; and (3) Grid Assurance, a critical transmission equipment service company officially launched by six energy companies in May 2016 to own and maintain equipment at secure warehouses and provide logistics support for transporting equipment to requested locations. These programs have been approved by the Federal Energy Regulatory Commission (FERC) for recovery of cost-based subscription fees from member utilities to recover expenses.

To address the issue of transportation logistics for these programs, in particular to ensure that coordination with railroads and specialized heavy haul carriers, and state and local transportation agencies are made in advance, EEI established a Transformer Transportation Working Group. The Working Group, which includes representatives from all parts of the electricity sector, has now been moved within the Electricity Subsector Coordinating Council (ESCC). The ESCC web site describes the organization as follows:

The ESCC serves as the principal liaison between the federal government and the electric power sector, with the mission of coordinating efforts to prepare for, and respond to, national-level disasters or threats to critical infrastructure. The ESCC includes utility CEOs and trade association leaders representing all segments of the industry. Its counterparts include senior Administration officials from the White House, relevant Cabinet agencies, federal law enforcement, and national security organizations.⁸⁷

The Transformer Transportation Working Group, working with industry trade associations and the ESCC, has developed a Transformer Transportation Emergency Support Guide to expedite the deployment of large spare equipment, such as transformers, in emergency situations by rail, roadways and waterways. This Guide is a work in progress, but currently includes a number of significant resources for energy companies needing to rapidly replace transformers or other critical equipment. The Guide identifies processes for arranging transportation needs with federal agencies as well as Class I and short line railroads, specialty rail transportation, and heavy haul freight companies, and includes contact information for these entities. The Task Force plans to focus in 2017 on developing the processes and contacts for state level transportation agencies and organizations, as well as water way transportation. The Guide also includes contingency planning tools for utility CEOs and staff to ensure utilities are prepared in the event of an emergency.

In addition to this work by the energy industry and the ESCC, in February 2016, Congress included several provisions in the FAST Act related to spare transformers and emergency transportation. Section 61004 of the FAST Act includes a provision requiring the Secretary of the Department of Energy to study the creation of a Strategic Transformer Reserve. This study will be done in consultation with FERC, ESCC, The North American Electric Reliability Corporation (NERC), and users and operators of critical infrastructure and military installations. In addition, section 5502 of the FAST Act requires the Secretary of the Department of Transportation to form the Emergency Route Working Group. The purpose of the working group is to “determine best practices for expeditious State approval of special permits for vehicles involved in emergency response and recovery.”⁸⁸

⁸⁷ ESCC web site, at 1.

⁸⁸ 49 U.S.C § 5502 (a)(1).

Significant planning and research has been done nationally to prepare for stockpiling, sharing, deployment and transportation of spare transformers in the event of an electricity emergency. However, more is needed in the area of planning and coordination with state and local transportation agencies, as well as coordination with the entities created under the FAST Act.

Resources:

- 81 Fed. Reg. 57996 (Aug. 24, 2106) Notice of Establishment of the Emergency Route Working Group; Request for Nominations.
- [Fixing America's Surface Transportation Act \(FAST Act\)](#), (P.L. 114-94, 129 Stat. 1312), § 5502, Emergency Route Working Group; § 61004, Strategic Transformer Reserve,
- Spare Transformer Equipment Program, Edison Electric Institute Web site, <http://www.eei.org/issuesandpolicy/transmission/Pages/sparetransformers.aspx>.
- Grid Assurance Corporation, Web site, <http://www.gridassurance.com/>
- Electricity Subsector Coordinating Council web site, <http://www.electricitysubsector.org/ESCCInitiatives.pdf?v=1.3>, at 2, discussing Transformer Transportation Emergency Support Guide.

VI. RESOURCES FOR STATE RAILROAD PROGRAM

REGULATORY FEE OPTIONS FOR RAILROAD SAFETY

State rail safety programs are often funded by fees paid by the railroad industry. Due to the changing nature of railroad transportation and shifts in the market for commodities, including grain, crude oil, and coal, state rail safety programs have reported difficulty in developing and adopting a fee methodology that would ensure that regulatory fees for railroad companies reliably cover the cost to administer state programs.

The following list identifies the methodologies for assessing state regulatory fees on railroads to support rail safety programs.

AL The Alabama PSC collects an inspection and supervision fee from all railroads in the state, based on their annual revenues. However, there is a \$5,000 cap for each company. This fee structure has been in effect since the 1940's.

CA Only freight railroads pay a fee. Of the total fees collected each year, UPRR and BNSF pay about 95 percent and the short line railroads pay the remaining 5 percent (based on gross revenues). Passenger/commuter rail and crossing safety activities are funded by other state accounts. The 95-5 percent split between Class 1 & short line railroads is based on gross intrastate freight revenues. The split between UP and BNSF was agreed to in 1992 by the four Class 1 railroads then operating (SP, UP, ATSF, BN) as to what percentage each would pay of the Class 1 share of the annual fee. The four Class 1s presented their proposal to the CPUC and the Commission adopted their proposal. After the four merged into two railroads, UP pays about 70 percent and BNSF 30 percent of the Class 1 share. The 5 percent short line share is allocated to each short line based on gross revenues. Each May, the CPUC adopts a resolution assessing the fees on each of the regulated utilities based on the budget necessary to fund the next fiscal year's activities. UP's and BNSF's fee is an actual dollar amount and the short lines' fee is a percentage (this does change from year to year) of their gross revenues.

ID Idaho assesses the railroads a fee based upon the gross intrastate operating revenues. The state can assess up to one percent of their gross intrastate operating revenues. The program has not reached the 1 percent cap in its fee setting to date.

IL In Illinois, railroads are assessed fees based on route miles and number of grade crossings. Fees are assessed annually, and are due Feb. 1 (\$37/route mile; \$23/crossing). The Illinois Commerce Commission sends notices out in late December/early January.

MD The Maryland Railroad Safety and Health program is a General Fund program, with a designated source. Each year the projected operating costs for the program are submitted to and collected by the Maryland PSC. The PSC then reimburses the General Fund for actual expenses. Reimbursement costs for operating the program are derived from a portion of the less than two tenths of one percent assessment applied to the utilities and railroads that operate in the State of Maryland.

MS Mississippi collects \$201,000 each year from the railroad companies operating in Mississippi. This amount is split between the affected railroad companies based on track miles. This revenue covers about 40 percent of the Rails Division Budget each year. The remainder is paid out of highway money.

MO Missouri assesses railroads a fee based upon the gross intrastate operating revenues. The state can assess up to three percent of the total gross intrastate operating revenues reported by all railroads from the preceding calendar year. However, assessments are based on the budget necessary to fund the next fiscal year's activities. The following limitations apply:

Railroads with:

- <50 Miles of track – pay minimum of \$100 and Maximum of \$500
- >50 miles but < 100 miles – pay not less than \$1,000
- >100 miles - pay not less than \$5,000

MT In Montana the railroads pay what is called the PSC tax, which all regulated companies pay (e.g., telephone, electric companies). After the Montana legislature approves the program budget, and the amount of intrastate revenues received from all regulated entities is calculated, the railroads pay a percentage.

NV Nevada accrues its expenses in Railroad Safety for a full year, under its budget. At the end of the year, the Nevada PUC collects information on the total tonnage (originating in, terminating in, and traversing Nevada) of the freight carriers operating in Nevada (UPRR and BNSF) and divides the budget by the total tonnage, and calculates the dollar per tonnage. The mill tax assessed to each railroad is simply the product of their individual tonnage figure times the \$/T amount. The PSC sends the railroads the assessment, which they pay. The Nevada PUC is fully reimbursed for 100 percent of every dollar charged to the program

NH New Hampshire does not assess a user fee. Railroads operating in the state pay property tax on right of ways and other owned parcels. These monies go into the general fund. All railroad activities, including the purchase of an ever increasing number of abandoned lines, and the New Hampshire rail bureau are paid for from this fund.

NJ Effective June of 1993, New Jersey established a fee of \$3 per placarded car originating or terminating in the state and all railroads operating in the State are required to annually report that number of placarded cars. Moneys received are to defray the expenses of a "Placarded Rail Freight Car Transporting Hazardous Materials Program" subject to appropriation from the General Fund. A formula for increasing this fee, limited to increases in the CPI-W, was also enacted.

NY The New York State "Rail Safety Fee" was added to the State Transportation Law, as Section 135, in 1991. The annual fee is "in an amount sufficient to raise funds to defray the expenses of the department (DOT) in administering and enforcing its railroad safety and related duties pursuant to the provisions of (the Transportation Law) and the Railroad Law". The fee is assessed against all railroads operating in the State of New York and is based on railroad gross

operating revenues derived or earned from operations within the state in the proceeding calendar year".

OH All public utilities and railroads operating in Ohio pay an annual assessment to the Commission based upon a percentage of that company's intrastate gross earnings from the previous year. The percentage is calculated by dividing the total intrastate gross revenue of all regulated utilities and railroads into the amount of money appropriated to the Commission by the legislature that year.

The Commission also has the statutory authority to assess the costs of an investigation to the regulated company that is the subject of the investigation. The Ohio Commission has used this authority once or twice against a railroad.

PA The Pennsylvania Public Service Commission imposes an annual assessment on jurisdictional utilities, including railroads, based on intra state operational revenues. The assessment factor for a utility industry group is calculated by dividing the amount of the Commission's budget that is allocated to that group by the total intrastate revenues reported by the group. A company's annual assessment amount is determined by applying the assessment factor to the intrastate revenues reported by the individual companies within that utility group.

OR The Rail Safety Section of the Oregon Department of Transportation, which includes state and FRA programs, receives funding from a railroad user fee. The amount needed to operate the program for the upcoming year is estimated and assessed the railroads. The fee for Class I railroads is based on number of miles of track, number of grade crossings and gross operating revenues for the previous year. Short line railroads are assessed based on the prior year's gross operating revenues only. At the end of the year, the amount to be assessed for the next year is modified based on any dollars remaining or a shortage from the previous year.

The Crossing Safety Section uses the same formula as above, except that 50 percent of the cost to operate this program comes from the Grade Crossing Protection Account which is derived from Motor Vehicle Registration fees. ODOT Rail gets \$600,000 a year from this fee, and uses the remainder towards crossing projects and match for federal Section 130 dollars.

SC The Gross Receipts assessment is determined by multiplying the total receipts amount that the RR reported on their Gross Receipt report by a factor of .004455396.

Example: Lancaster & Chester reported gross receipts of \$181,367 and their tax assessment was \$808.00.

TN Tennessee's user fee is assessed against the actual ton miles operated annually by each railroad operating in the state. The fee to be assessed is 4 cents per one thousand ton miles. This fee is effective on payments made on or before July 1, of each year. There is a minimum fee required.

TX 100 percent of the Texas rail safety program is funded by assessment. The Class I contribution is prorated on the basis of gross ton miles.

VA Virginia assesses a "special regulatory revenue tax" on all transmission or transportation companies. The revenue tax is equal to two-tenths of one percent of the gross receipts from business done within the Commonwealth of Virginia. Railroads have an exception which provides that they only pay the estimated expenses incurred by this Commission and the Department of Taxation reasonably attributable to the regulation and assessment for taxation of railroads, including a reasonable margin in the nature of a reserve fund.

WA Class I railroads operating in the State of Washington pay 2.5 percent of gross intrastate revenue. Class III railroads that haul oil as a commodity also pay 2.5 percent of gross intrastate revenue. Remaining Class III railroads in the state pay 1.5 percent of gross intrastate revenues. "Intrastate" is defined as a shipment that originates and terminates within the state.

WV West Virginia assesses a fee based on 1/10 of 1 percent of a railroad's property value as determined by the state tax department and 1/10 of 1% of the railroad's intrastate revenue.

RAILROAD BRIDGE SAFETY

In 2010, the FRA released the Bridge Safety Standards Final Rule which requires all owners of railroad tracks to implement bridge management programs. These programs must include a complete inventory of all railroad bridges, their respective load capacities, and, at a minimum, annual inspections of all bridges. More frequent inspections are required based on other factors such as an extreme weather event, previous repair, or an engineer's recommendation.

While the FRA and state Inspectors often actively look for violations, this would be an overly burdensome task due to the number of railroad bridges throughout the nation. Instead, the FRA relies on track owners developing and maintaining a bridge management program which is then thoroughly reviewed by FRA and state inspectors.

The FAST Act allows state or local officials to request a public version of the latest bridge inspection report for all railroad bridges in their area. This, among other internal changes at the FRA, has shown an increased focus in the area of railroad bridge safety.

Railroad bridges pose potentially significant safety risks. These potential risks include structural integrity deterioration due to age. Many of these bridges are over a hundred years old. In addition, many railroad bridges span large bodies of water, major highways, and/or areas of high population density, and are embedded within crude oil train routes. The FRA only has five railroad bridge inspectors to cover approximately 80,000 railroad bridges in the United States.

Title 49 CFR Part 237 requires railroad track owners to create a bridge management program, perform annual bridge inspections, and calculate load capacities. It also recommends that railroads incorporate provisions for an internal audit to determine whether the inspection

provisions of the program are being followed, and whether the program itself is effectively providing for the continued safety of the subject bridges.

Regulating the enormous number of railroad bridges along with the nearly 800 railroad bridge owners nationally, the FRA relies on track owners to implement and maintain a thorough record of all bridge inspections. Inspectors examine these documents in conjunction with other field investigations to identify areas that need further review or appropriate civil penalty.

A compliant bridge management program will, at a minimum, include the following: (a) an accurate inventory of all railroad bridges; (b) the load capacity for each bridge; (c) a record of design, repair, modification and inspection of each bridge, and (d) a detailed bridge inspection program. Although FRA requires each bridge to be inspected annually, a railroad bridge engineer can determine that a certain structure requires a more frequent or detailed inspection based on weather events, high traffic volume, or condition of the structure itself.

California

One FRA bridge inspector is assigned to California, as well as eleven other states. California has approximately 6,500 railroad bridges. Because of this less than desirable situation, the California Public Utilities Commission (CPUC) began the Railroad Bridge Evaluation Program (RBEP) in an attempt to better comprehend the condition of railroad bridges in California.

The CPUC railroad bridge safety inspectors work in close cooperation with the FRA bridge inspector assigned to California. RBEP initially is focusing inspection efforts on bridges that have been identified as a risk based on the consequence of an accident. The known bridges have been prioritized for observation based on factors such as size, proximity of population density, proximity of seismic faults, passenger routes, hazardous materials routes, and short line tracks. The CPUC RBEP inspection staff will perform independent railroad bridge observations and evaluations on a routine basis. In addition, the CPUC and the FRA have agreed to work in concert to ensure that railroad track owners complete their bridge management programs and will conduct joint railroad bridge observations as often as possible. RBEP has begun to work closely with FRA and railroads to ensure that the inspection and maintenance practices by railroad owners of California's railroad bridges are adequate to ensure safety.

During FY 2015-16, the CPUC rail safety staff performed the following:

- Held a meeting with BNSF bridge officials to discuss the BNSF Structural Asset Management Program. BNSF officials stated that they have three types of progressively more demanding bridge inspector training, BNSF inspects bridges twice per year, BNSF has an earthquake response plan, but does not routinely paint bridges.
- Participated in a Fundamentals of Railway Bridge Engineering and Management seminar taught by the University of Wisconsin, Department of Engineering Professional Development. The seminar covered structure types, safety considerations, constructability, and load capacities.

- Accompanied the FRA bridge inspector on two bridge inspections to initiate a risk inventory.
- Researched other states' approaches to assessing risks associated with railroad bridges.
- Identified newly discovered bridges in an effort to build upon its initial database of California's railroad bridges.
- Improved its interactive map of California's railroad bridges that includes location identifiable by latitude and longitude, as well as by the traditional railroad method of subdivision and milepost.
- Improved its Railroad Bridge Oversight Plan.
- Added completed bridge observation forms to its database in order to:
 - Evaluate and confirm railroad track owner bridge inspections in conjunction with FRA.
 - Assess the frequency and quality of railroad track owner bridge inspection programs.
 - Populate the CPUC railroad bridge database with the ages of bridges and the volume of traffic.
 - Identify which railroad bridges will experience increased traffic due to the increase in crude oil transportation by rail.

During FY 2015-16, the CPUC railroad safety inspectors who specialize in bridges performed the following:

- 122 total bridge observations
- 55 Prioritized bridge inspections
- 2 bridge field activities held jointly with FRA
- 16 General Order Reports identifying defects
- 4 Risk Management Status Reports (inquiries to railroads about bridge safety concerns)
- 1 response to informal complaints

Moving forward, the CPUC staff will use the results of the initial bridge observations to re-prioritize observations for the remaining railroad bridges. The criteria will be adjusted based on information gathered during the initial observation efforts.

RESOURCES

Federal Railroad Administration

- <https://www.fra.dot.gov/eLib/Details/L03491>
- <https://www.fra.dot.gov/eLib/details/L03212>
- <https://www.fra.dot.gov/Page/P0922>

Industry Documents

- <https://www.aar.org/Bridges>

- <https://www.csx.com/index.cfm/library/files/about-us/safety/bridge-resource-guide/>
- <http://www.nscorp.com/content/dam/nscorp/get-to-know-us/about-us/state-fact-sheets/Bridge%20Fact%20Sheets/bridges-fact-sheet.pdf>

CPUC RBEP Staff, draft material for CPUC Rail Operations Safety Branch Annual Railroad Safety Report to the California Legislature for Fiscal Year 2015-16.

TRACK SAFETY, INSPECTIONS AND FUTURE DEVELOPMENT

Background on Federal Track Safety Standards

Railroads are safer today than at any time in our history; however, the FRA continues to strive for an accident-free operating environment. There are approximately 160,000 miles of track in the U.S. which require vigilant inspection, maintenance, repair and replacement by railroads in order to keep freight and passenger trains moving safely. Generally, track conditions today are safer than at any other point in our history. In 1978, there were 4,780 track-caused accidents compared to 669 in 2011—an 86 percent reduction.

The wide range of conditions associated with, and inherent in, track infrastructure can lead to derailments if not effectively managed. Although the number of track-caused accidents has decreased over time, the FRA continues to encourage railroads to achieve further reductions.

Role of the FRA

The primary duty of FRA's federal track safety inspectors, along with certified state inspectors, is to strategically monitor, inspect, and assess track conditions to determine whether a railroad is complying with federal safety standards. The FRA's federal track safety standards generally focus on four main areas:

1. Track Structure: Rails, crossties, special track work (turnouts, bridge lift assemblies), tie plates, and rail fastening systems
2. Track Geometry: Track gage, alignment, elevation, curvature, and track surface
3. Road Bed: Ballast, drainage and vegetation (vegetation cannot obstruct signs and signals or impede wayside duties)
4. Track Inspection: Frequency and quality of a railroad's inspection, special inspections, and recordkeeping

Track Inspection/Speed Requirements

Under FRA regulations, each railroad has primary responsibility to ensure its track meets or exceeds the federal safety standards. This includes railroad inspectors performing track inspections at specified minimum frequencies based on the class of track, the type of track, the annual gross tonnage operated over the track, and whether it carries passenger trains.

According to FRA Regulations:

- Track speed is determined by the class of track.
- Railroads can change the class of track (and thus increase or decrease the track speed) whenever it deems appropriate and without prior notification to, or approval by, the FRA.⁸⁹

POSITIVE TRAIN CONTROL: OVERVIEW, STATUS AND POTENTIAL IMPACT

Positive Train Control (PTC) is a system of integrated technologies capable of preventing collisions, over-speed derailments and unintended train movements. Such systems require active train location detection and tracking capabilities, computer networking technologies, software that accurately calculates braking distances for different types of trains, and a reliable wireless communication network to link all of these operating elements and system components.

Congress passed the Rail Safety Improvement Act of 2008 (RSIA) that established the December 31, 2015, PTC implementation deadline. The RSIA statutorily defined a PTC system as “a system designed to prevent train-to-train collisions, over-speed derailments, incursions into established work zone limits, and the movement of a train through a switch left in the wrong position.”⁹⁰

PTC systems use a combination of digital radio communications, global positioning, and fixed wayside signal systems to send and receive a continuous stream of data about the location, direction, and speed of trains. Systems process this information in real time to aid dispatchers and train crews to safely and efficiently manage train movements through automatic application of brakes whenever a train crew fails to properly operate within specified safety parameters.

The three most widely-used systems are: (1) the Interoperable Electronic Train Management System (I-ETMS), a derivative of BNSF’s original ETMS system, and the predominant system being implemented by the Class I railroads; (2) an updated version of ACSES (known as ACSES-II), modernized to comply with the statutory and regulatory requirements of PTC and being implemented by most of the railroads operating on the Northeast Corridor; and (3) Enhanced Automatic Train Control (E-ATC).

Approximately two months before the December 2015 PTC implementation deadline, the House and Senate overwhelmingly passed the Positive Train Control Enforcement and Implementation Act of 2015 (PTCEI Act) to allow for additional testing and incorporation of the

⁸⁹ Federal Railroad Administration Track Safety Standards [49 CFR Part 213 Track Safety Standards].

⁹⁰ 49 U.S.C. § 20157(i)(5), as amended.

new system. The legislation extended the original statutory deadline for implementing PTC systems to on or after December 31, 2018.

EXAMPLES OF STATE RAILROAD INSPECTION ACTIVITIES

California

The California Public Utilities Commission (CPUC) employs 45 railroad safety employees (including six current vacancies). 43 employees possess expertise in specific disciplines: hazardous materials, motive power and equipment (locomotives and rail cars), railroad operations, signal and train control, track, and bridges.⁹¹ The inspectors also identify and address additional public safety risks associated with railroad systems.

During FY 2014-15, CPUC railroad safety inspectors conducted the following activities:

- Performed 3,392 inspections and follow-up inspections to monitor the railroads' compliance and remedial actions.
- Cited 9,678 federal regulation non-compliant defects.
- Completed 257 CPUC General Order reports that identified 563 defects.
- Cited 4 violations of state regulations.
- Recommended civil penalties for 233 violations of federal regulations.
- Resolved 26 informal safety complaints.

The CPUC can assess civil penalties for serious non-compliant conditions, depending on the egregious nature of the violation. For violations of federal railroad safety regulations, CPUC railroad safety inspectors make recommendations to the FRA for the assessment of penalties. Any penalties collected by FRA are deposited into the U.S. Treasury. For violations of California state laws and CPUC General Orders, CPUC Resolution ROSB-002 provides the CPUC Safety and Enforcement Division Director or Deputy Director the authority to issue citations to railroad carriers for violation of certain General Orders and a California Public Utilities Code section. A railroad issued a citation under ROSB-002 may accept the fine imposed or contest it through a process of appeal. During FY 2014-15, the CPUC began processing four pending citations.

⁹¹ The FRA certifies the inspectors as an expert in each of the disciplines, except for bridges. The CPUC proactively identified bridges as a risk to public safety and employs one track-certified inspector and one well-experienced bridge inspector to focus on bridges.

EXAMPLES OF RISK-REDUCTION INITIATIVES

California

The California Public Utilities Commission's (CPUC) rail safety programs provide several examples of risk reduction initiatives, including:

Risk Management Status Reports

In the course of field work, CPUC railroad safety inspectors sometimes identify items of concern that are either: (1) out of their area(s) of expertise; (2) outside of formal or official reporting and action protocols; or (3) despite prior formal or informal regulatory action, are still safety risks. When this happens, the inspectors complete a Risk Management Status Report (RMSR). For example, via the RMSR process, CPUC achieved the installation of guardrails on a section of track passing under Interstate 5, to prevent damage to the freeway in the event of a derailment. In addition to serving as an important tool for risk management, an RMSR is a means for CPUC railroad safety inspectors to work across disciplines. CPUC railroad safety inspectors have the ability to address any railroad-related safety risks that they detect, regardless of their discipline or federal certification.

Once an RMSR is documented, the assigned inspector works with his or her supervisor to mitigate the risk. The inspector and supervisor meet with the responsible railroad, shipper or associated entity's responsible representative and convey the safety risk linked with the issue, and define a time period in which the risk should be addressed. The CPUC railroad safety inspector performs a follow-up inspection to determine whether the risk was mitigated. If the railroad fails to eliminate or sufficiently mitigate the risk, the CPUC Program Manager will pursue resolution with the responsible railroad officials, and if necessary may bring the issue up to the Deputy Director or to the full Commission for further enforcement action,

During FY 2014-15:

- Nine previous fiscal year RMSRs were closed out (i.e., the recommendations were implemented).
- Seventeen new RMSRs were created. The safety issues were as follows:
 - 2—seeking increased no trespassing signage on railroad property
 - 2—right-of-way protections (fencing)
 - 2—issues related to CPUC General Orders or federal law requirements
 - 2—potential derailment hazards
 - 9—miscellaneous non-regulated safety risks

Four of these new reports were closed; ROSB seeks to resolve the remaining 13 during the next fiscal year.

Near-Miss Reporting and Analysis

California Public Utilities Code Section 7711.1 requires the CPUC to collect and analyze near-miss data for incidents in California occurring at railroad crossings and along the railroad right-of-way. “Near-miss” is defined as including a runaway train or any other uncontrolled train movement that threatens public health and safety. In support of this requirement, the CPUC has developed a process for managing the risks discovered through the collection and analysis of near-miss data. Using near-miss data to identify locations where there are conditions which may pose a greater likelihood of accidents, or have greater consequences in the event of an incident, enables the railroad risk assessment team to improve railroad safety.

To proactively mitigate risks, the CPUC has broadly interpreted the term “near-miss” to include an incident that does not result in the occurrence of an accident, but presents an unintended condition or exposure to a hazard that may have caused an unwanted incident. A negative incident may be preceded by one or more events, making near-miss data useful information for identifying potential threats to public health and safety.

Unfortunately, the data are not systematic or comprehensive. Reporting of most near-miss incidents is voluntary and railroad companies in California do not equally report near-miss information in a standardized format and do not use a uniform threshold for determining what conditions qualify as near-miss incidents. As such, the reported near-miss data may not be useful for comparisons. Nevertheless, because the data may describe conditions that may be leading indicators of accidents and thus describe characteristics that can be addressed, the near-miss data still has considerable accident prevention usefulness.

Source: CPUC Rail Operations Safety Branch, Annual Railroad Safety Report to the California Legislature for Fiscal Year 2014-15.

GRADE CROSSING IMPROVEMENT

Illinois

The Grade Crossing Protection Fund (GCPF), appropriated to the Illinois Department of Transportation but administered by the Illinois Commerce Commission, was created by state law in 1955 to assist local jurisdictions (counties, townships and municipalities) in paying for safety improvements at highway-railroad crossings on local roads and streets only. Assistance from the GCPF cannot be used for safety improvements at highway-rail crossings located on the state road or highway system. Those improvements are paid for by the Illinois Department of Transportation.

In 1955 the amount of GCPF assistance was \$600,000 per year. It has been increased multiple times since then; beginning with Fiscal Year 2010, each month \$3.25 million in state motor fuel tax receipts is transferred from the Motor Fuel Tax (MFT) fund to the Grade Crossing Protection Fund. This amount provides the GCPF with \$39 million annually to be used for safety

improvements at highway-rail crossings on local roads and streets. \$3 million per year from the GCPF is used to help cover administrative costs for the ICC RR Safety Program. The ICC also charges freight railroads that operate in Illinois a tax on gross revenues (.0015) and user fees based on the number of track miles and public crossings (\$45 per route mile; \$28 per crossing). The total amount collected annually, approximately \$1.15 million, is also used to help pay for the ICC RR Safety Program.

The Illinois Department of Transportation (IDOT) also administers a crossing safety improvement program, utilizing federal funds. The amount that IDOT receives (\$10-12 million from the Federal Highway Administration (FHWA) Section 130 Program [23 USC 130(i)]) varies each year; for the current fiscal year IDOT received \$10.747 million. The Section 130 funds are eligible for projects at all public crossings, including roadways, bike trails and pedestrian paths. Fifty percent of a State's apportionment is dedicated for the installation of automatic warning devices at public crossings. The remainder of the funds apportionment can be used for any hazard elimination project, including automatic warning devices. IDOT uses the Section 130 funds for crossings safety improvements at public crossings on the local road system (\$6.448 million in current fiscal year) and the state highway system (\$4.299 million in current fiscal year).

The ICC's Crossing Safety Improvement Program, utilizing the GCPF, and IDOT's crossing safety improvement program, utilizing federal funds, are operated independently. However, there are opportunities when the two programs work together to jointly fund crossing safety improvements.

Table 2: Number of Crossings (FRA @ 2016) and Route Miles (AAR @ 2012) by State.

State	Miles (AAR 2012)	Rank Miles	Priv Hwy AtGrade	Pub Hwy At Grade	Ped At Grade	Total At Grade	Total All Types (FRA)	Rank Xings
Alabama	3,194	21	1,757	2,778	19	4,554	5,270	24
Alaska	506	45	98	174	9	281	329	48
Arizona	1,643	36	406	703	4	1,113	1,391	41
Arkansas	2,698	25	1,237	2,672	8	3,917	4,302	29
California	5,295	3	3,227	5,780	230	9,237	11,159	3
Colorado	2,662	26	1,071	1,696	41	2,808	3,238	34
Connecticut	364	46	262	362	7	631	1,220	43
Delaware	250	48	129	267	2	398	514	47
District of	20	49	7	0	0	7	75	50
Florida	2,900	24	1,223	3,740	55	5,018	5,400	22
Georgia	4,653	7	2,361	5,120	47	7,528	8,557	7
Hawaii	0	51	0	8	0	8	8	51
Idaho	1,623	37	1,076	1,282	18	2,376	2,544	36
Illinois	6,986	2	3,617	7,756	370	11,743	14,592	2
Indiana	4,075	9	1,914	5,661	62	7,637	8,676	6
Iowa	3,869	11	2,476	4,367	75	6,918	7,729	12
Kansas	4,855	6	2,320	5,199	22	7,541	8,047	9
Kentucky	2,608	28	2,120	2,235	144	4,499	5,562	19
Louisiana	2,927	23	2,258	2,755	36	5,049	5,462	21
Maine	1,116	40	833	823	12	1,668	1,903	37
Maryland	758	43	627	629	23	1,279	1,880	38
Massachusetts	973	42	571	830	53	1,454	2,749	35
Michigan	3,542	12	2,250	4,837	104	7,191	8,034	10
Minnesota	4,450	8	2,094	4,312	59	6,465	7,208	13
Mississippi	2,452	29	2,063	2,223	21	4,307	4,683	26
Missouri	3,957	10	2,202	3,382	44	5,628	6,754	15
Montana	3,200	20	1,666	1,420	13	3,099	3,434	32
Nebraska	3,375	15	1,966	2,941	11	4,918	5,279	23
Nevada	1,192	39	243	280	5	528	666	46
New Hamps	344	47	238	324	22	584	751	45
New Jersey	981	41	659	1,544	69	2,272	3,603	31
New Mexico	1,837	34	488	717	26	1,231	1,444	40
New York	3,447	14	2,688	2,671	79	5,438	7,920	11
North Carolina	3,258	18	3,202	3,972	67	7,241	8,358	8
North Dakota	3,330	16	1,172	3,493	16	4,681	4,861	25
Ohio	5,288	4	2,863	5,698	57	8,618	10,872	4
Oklahoma	3,273	17	1,293	3,705	14	5,012	5,483	20
Oregon	2,396	30	2,024	1,789	49	3,862	4,465	28
Pennsylvania	5,151	5	2,680	3,513	151	6,344	9,492	5
Rhode Island	19	50	51	73	25	149	222	49
South Carolina	2,311	31	1,252	2,641	30	3,923	4,490	27
South Dakota	1,753	35	1,098	2,066	6	3,170	3,357	33
Tennessee	2,649	27	1,794	2,756	33	4,583	5,755	17
Texas	10,469	1	4,558	9,060	28	13,646	15,565	1
Utah	1,343	38	539	705	85	1,329	1,575	39
Vermont	590	44	493	366	24	883	1,071	44
Virginia	3,215	19	2,442	1,893	34	4,369	5,792	16
Washington	3,192	22	2,376	2,375	48	4,799	5,580	18
West Virginia	2,226	32	1,773	1,321	41	3,135	3,833	30
Wisconsin	3,449	13	2,113	3,993	117	6,223	6,994	14
Wyoming	1,860	33	665	410	0	1,075	1,309	42
USA Total	138,524		78,535	129,317	2,515	210,367	249,457	

NARUC Task Force on Transportation Railroad Safety Working Group Survey

*Results received by: Alabama, Virginia, Illinois, Missouri, Montana, Nebraska,
 New Hampshire, South Carolina, Washington*

Survey Questions:	Most Responses:	Noteworthy:	Also Mentioned:
What are the top challenges facing the rail safety program in your state?	Staffing and Funding – In the survey and in general discussions these two issues were cited as challenges at the state level.	Access to Data – Data from the FRA and the railroads.	Blocked crossings, lack of cooperation from railroads, education to others about state role, drivers breaking the law at crossings, trespassing
How does your state inspection program receive funding?	Gross Receipts on Intrastate Activity	Grade Crossing Protective Fund or a crossing assessment fee	General fund, Special revenue tax
What was the discussion and rationale behind your state’s decision to join (or not join) the FRA State Rail Safety Participation Program?	Increase Safety – sharing best practices, increasing state authority, increased training	Joined at the Inception of Program	
How does your state decide the number of inspectors it needs for each FRA discipline, and where to focus inspections?	Based on Funding	Based on Relationship with FRA and Based on Activity	
Has your state conducted a state risk assessment? If so, what methodology was used and what were the best resources you found?	No Standardized Analysis Used	Based on risks identified at the state level	
How responsive and useful is the FRA to your inquiries about inspection activities and risk assessments?	FRA is Responsive	Relationship is Better	

What legislation or administrative rules has your state enacted (that have not been preempted by the FRA) to improve rail safety in your state?	None	Blocked Crossings	
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APPENDIX A

MEMORANDUM
On the Creation of a
NARUC Task Force on Transportation

On December 17, 2015, the NARUC Executive Committee approved a motion to permit NARUC President Travis Kavulla to, pursuant to Title I, Section 19 of the *Policies and Procedures of the National Association of Regulatory Utility Commissioners*,⁹² establish a Presidential Task Force on Transportation. President Kavulla was authorized to proceed with establishing the committee and provide an updated charter for approval January 19, 2016.

Background: NARUC, formed in 1889 as the *National Association of Railroad and Utilities Commissioners*,⁹³ has a long history with transportation issues. Currently, NARUC is participating before the Surface Transportation Board in a proceeding focused on reliable rail deliveries of coal supplies to electric generation plants. NARUC also played an integral role in the passage of the Unified Carrier Registration Act of 2005.⁹⁴ The recent proliferation of Transportation Network

⁹²*Policies and Procedures of the National Association of Regulatory Utility Commissioners*, Section 19. Requirements for Formation of Special Committees Affecting Two or More Standing Committees, at page 6, online at: <http://www.naruc.org/About/Proposed-Policies-and-Procedures-Final-November-2013-docx.pdf>.

⁹³Rodgers, Paul. *The NARUC Was There: A History of the National Association of Regulatory Utility Commissioners*. Washington: Association, 1979, at page 54.

⁹⁴Under this legislation, the so-called Single State Registration System (SSRS) was repealed effective January 2007, and States were no longer allowed to collect SSRS fees. The required UCR Agreement was intended by Congress to replace revenues the States have derived from SSRS and certain other programs, and to provide the sole means for any State to recoup these monies. States that do not participate in the UCR include Arizona, Hawaii, Florida, Maryland, Nevada, New Jersey, Oregon, Vermont, Wyoming, and Washington D.C. See, March 3, 2015 *The Unified Carrier Registration Act of 2005, Informal guidance for Interested Parties*, available on NARUC's website at: <http://www.naruc.org/ncsts/documents/20150303UCRFAQ.pdf>. An organization affiliated with NARUC – the National Conference of State Transportation Specialists – focuses much of its effort on UCR issues.

Companies (TNCs), like Uber and Lyft, have created new issues for some NARUC members, resulting in a panel on the topic at the 2014 NARUC annual meeting. Moreover, increasing numbers of NARUC members and member states are interested in monitoring railroad safety issues given the recent increases in crude oil shipments by rail⁹⁵ and related derailments.⁹⁶

In October 2015, NARUC conducted an informal survey to determine how many of its members have jurisdictional oversight of transportation issues. The survey garnered 33

⁹⁵See, e.g., *Assessment of Crude by Rail Safety Issues in Commonwealth of Pennsylvania: Final Report prepared for Commonwealth of Pennsylvania*, (August 2015) at: <http://www.scribd.com/doc/274852355/Assessment-of-Crude-by-Rail-CBR-Safety-Issues-in-Commonwealth-of-Pennsylvania>; *CPUC and Interagency Working Group Release Oil By Rail Report Highlighting Need for Sustainable Funding and Close Coordination to Protect Public Safety*, CA PUC Press Release (June 2014) at <http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M096/K135/96135439.PDF>; *Washington State 2014 Marine and Rail Oil Transportation Study*, (March 2015), at: <https://fortress.wa.gov/ecy/publications/documents/1508010.pdf>; *Train Safety Report: A statewide review of oil train safety issues in Oregon*, Cassandra Porfita (July 2015), at: <http://www.scribd.com/doc/235108487/Train-Safety-Report-7-25-14-Final>; *Minnesota Dept. of Transportation Report on the Improvements to Highway-Rail Grade Crossings and Rail Safety* (December 2014) at: <http://www.dot.state.mn.us/govrel/reports/2014/CBRCrossingStudy-December2014/ReportonHwy-RailXingsandRailSafety-2014.pdf>; *Minnesota's Preparedness for an Oil Transportation Incident* (January 2015) <https://dps.mn.gov/divisions/hsem/planning-preparedness/Documents/mn-preparedness-oil-transportation-incident-report.pdf>; North Dakota Department of Emergency Services to contract Witt O'Brien's, LLC to develop a crude oil response preparedness report (November 2014) at: <http://www.nd.gov/des/news/detail.asp?newsID=162>; and New York's Webpage "State's Actions on Transport of Crude Oil" (Last accessed 1/11/2016) at <http://www.dec.ny.gov/permits/95614.html>.

⁹⁶See, e.g., NBC News, *Oil Train Spills Hit Record Level in 2014* (January 26, 2015), online at: <http://www.nbcnews.com/news/investigations/oil-train-spills-hit-record-level-2014-n293186> ("American oil trains spilled crude oil more often in 2014 than in any year since the federal government (PHMSA) began collecting data on such incidents in 1975. . .The record number of spills sparked a fireball in Virginia, polluted groundwater in Colorado, and destroyed a building in Pennsylvania, causing at least \$5 million in damages and the loss of 57,000 gallons of crude oil.") See also, NBC News, *North Dakota town evacuated after Oil Train Derailment* (May 6, 2015), online at: <http://www.cbsnews.com/news/north-dakota-town-evacuated-after-oil-train-derailment/>; Ferro, Shane, *US oil train accidents won't go away any time soon* (Business Insider - March 20, 2015); National Geographic, *This Map Shows How U.S. Oil Train Accidents Skyrocketed* (May 1, 2015) online at: <http://www.cbsnews.com/news/north-dakota-town-evacuated-after-oil-train-derailment/>.

responses, which revealed that at least 22 NARUC member Commissions have some level of jurisdiction over transportation matters. Many have jurisdiction over some aspects of railroads, taxis, limo services, and TNCs.

Task Force Goals and Responsibilities: The Task Force on Transportation will assist in managing NARUC's efforts in responding to and educating members about these emerging transportation issues. It will report directly to the NARUC Executive Committee.

As NARUC's members have interests primarily in two areas, there will be two Co-Chairs of this Task Force – one to head up a *Working Group on Motor Carriers* and the other to head up a *Working Group on Railroad Safety*.

The Task Force may set NARUC policy on these issues via resolutions presented to the NARUC Board of Directors. If the Co-Chairs of the Task Force are not members of the Board, any proffered resolution from the Task Force will be moved by the 2nd Vice President for possible discussion and approval.

The Task Force will coordinate sessions at NARUC meetings, organize educational efforts within NARUC, coordinate with NARUC affiliated organizations, including the National Conference on State Transportation Specialists, in collecting best practices on transportation issues, and act as a resource for NARUC leadership on relevant matters. We expect the Task Force to have its first meeting at the upcoming NARUC February meetings in Washington, D.C.

Task Force Duration: 1 year, and not more than 2 years, as required by NARUC policy.

Proposed Co-Chair and Members: The Task Force will have no more than 20 members appointed by the President of NARUC. As noted above, there will be two Co-Chairs of this Task Force – one to head up a Working Group on Motor Carriers and the other to head up a Working Group on Railroad Safety.

Staffing: Staff for the Task Force will be designated by the members of the Task Force. The NARUC staff that will assist the Task Force are Brad Ramsay, Chris Mele, and Brian O'Hara. Any additional staffing will be organized by the Co-Chairs after they consult with the other members.

Proposed Charter: The Presidential *Task Force on Transportation* is chartered for a period of 12 months, as of this 19th day of January 2016 to focus on existing and emerging transportation issues. The Task Force will assist in managing NARUC's efforts in responding to, and educating members about these emerging transportation issues. There will be two Co-Chairs of this Task Force – one to head up a *Working Group on Motor Carriers* and the other to head up a *Working Group on Railroad Safety*.

The Task Force will have no more than 20 members. It will report directly to the NARUC Executive Committee. The Task Force may set NARUC policy on these issues via resolutions presented to the NARUC Board of Directors. If the appointed Co-Chairs of the Task Force are not members of the Board, any proffered resolution from the Task Force will be moved by the 2nd Vice President for possible discussion and approval.

The Task Force will coordinate sessions at NARUC meetings, organize educational efforts within NARUC, collect best practices on transportation issues, and act as a resource for NARUC leadership on relevant matters. We expect the Task Force to have its first meeting at the upcoming NARUC February meetings in Washington, D.C.

Initially the Working Group on Motor Carriers should focus on compiling best State practices to modify common carrier laws in light of new business models and a trend toward competitive entry, commemorating those recommendations in resolutions proposed to the Board; this Working Group might also consider a paper survey of TNC service issues. The Working Group on Railroad Safety might consider generating a précis on state and federal authority over railroad safety and the transportation of crude oil by rail, including the effect of recent state and federal actions, legislation and regulations, and information on how to participate in State and federal proceedings on railroad safety.

APPENDIX B - State Railroad Safety Studies

California

The federal government has primary authority over railroad safety. California, however, enforces federal requirements, as well as state specific rules, and state and local agencies have the lead in the areas of emergency planning, preparedness and response. States additionally can help ensure that federal and voluntary industry actions are adequate given the risks posed by oil by rail. In January 2014, the Governor's Office convened a Rail Safety Working Group⁹⁷ to examine safety concerns and recommend actions the state and others should take in response to this emerging risk.⁹⁸

Findings:

⁹⁹

- High hazard areas for derailments are primarily located in the mountains, with at least one such site along every rail route into California. Some high hazard areas are also located in more urban areas, such as in the San Bernardino-Riverside and San Luis Obispo regions.
- Areas of vulnerable natural resources are located throughout the state, including in urban areas. A rail accident almost anywhere in California would place waterways and sensitive ecosystems at risk.
- Emergency hazardous material response teams ("hazmat") in California have generally good coverage of urban areas, but none are located near the high hazard areas in rural Northern California.
- Population centers, schools, and hospitals are frequently located near rail lines.
- Earthquake faults in California are located along rail lines in many areas, especially in urban areas in and around Los Angeles and the Bay Area.

Recommendations:

- Increase the Number of California Public Utilities Commission Rail Inspectors
 - The Legislature should approve the proposal in the Governor's Budget to add seven rail inspectors to the CPUC so that it can carry out additional inspections and enforcement actions related to tank cars, railroad lines, bridges, and

⁹⁷ California Interagency Rail Safety Working Group.

⁹⁸ Oil by Rail Safety in California, Preliminary Findings and Recommendations.

⁹⁹ Oil by Rail Safety in California, Preliminary Findings and Recommendations.

hazardous material shipping requirements necessary to respond to increases in the transport of oil by rail.

- Improve Emergency Preparedness and Response Programs
 - Strengthen all aspects of emergency preparedness and response programs - Expand the Oil Spill Prevention & Response Program to Cover Inland Oil Spills; Provide Additional Funding for Local Emergency Responders; Review & Update of Local, State and Federal Emergency Response Plans; Improve Emergency Response Capabilities; Request Improved Guidance from United States Fire Administration on Resources Needed to Respond to Oil by Rail Incidents; Increase Emergency Response Training
- Request Improved Identifiers on Tank Placards for First Responders
- Request Railroads to Provide Real-Time Shipment Information to Emergency Responders
- Request Railroads Provide More Information to Affected Communities
- Develop and Post Interactive Oil by Rail Map
- Request DOT to Expedite Phase Out of Older, Riskier Tank Cars
- Accelerate Implementation of New Accident Prevention Technology
 - Positive Train Control¹⁰⁰
 - Electronically-Controlled Pneumatic Brakes¹⁰¹
- Update California Public Utilities Commission Incident Reporting Requirements
- Request Railroads Provide the State of California with Broader Accident and Injury Data
- Ensure Compliance with Industry Voluntary Agreement
 - Increased Track Inspections – The voluntary agreement calls for additional internal rail and comprehensive track geometry inspections by the railroads.
 - Braking Systems – The agreement requires better braking systems that will allow train crews to apply emergency brakes from both ends of the train in order to stop trains faster. This end-of-train braking technology has been required for many years on certain trains and railroad grades, but the voluntary agreement goes beyond this by requiring it on crude oil trains regardless of the existing criteria.
 - Use of Rail Traffic Routing Technology – The agreement calls for railroads to use a more sophisticated risk management tool that accounts for multiple risk factors in determining the safest and most secure rail routes for trains with 20 or more cars of crude oil.

¹⁰⁰ Positive Train Control (PTC) systems are integrated command, control, communications, and information systems for controlling train movements.

¹⁰¹ ECP brake technology provides simultaneous and graduated application and release of brakes on all rail cars within a train, resulting in shorter stopping distances.

- Lower Speeds – The agreement provides for lower speed limits (no more than 40 miles per hour) for crude oil trains of more than 20 cars containing older tank cars in federally designated “high-threat-urban areas.”
- Increased Trackside Safety Technology – The agreement calls for railroads to employ wayside wheel bearing detectors every 40 miles along tracks with trains carrying 20 or more crude oil cars.
- Ensure State Agencies Have Adequate Data¹⁰²

Iowa

The Iowa Crude Oil and Biofuels Rail Transportation Study (the Study) was created through an initiative of the Iowa Department of Transportation’s (Iowa DOT) Office of Rail Transportation in cooperation with the Iowa Homeland Security and Emergency Management Department (Iowa HSEMD). These agencies sought to define the characteristics, risks, prevention, and emergency response system status and capabilities for crude oil and biofuels rail transportation in the state, and to measure Iowa’s preparedness, prevention, response, and recovery capabilities in the event that a crude oil or biofuel rail transportation incident were to occur.¹⁰³

Findings:

- At-grade crossing collisions require coordination among state and local government entities to reduce and can be costly and/or difficult to accomplish.
- The state has limited knowledge of shipper mechanical and safety inspection practices and execution for ethanol tank cars loaded at ethanol producers in Iowa.
- Railroad infrastructure investment programs would help the state to reduce risk of derailments
- Many local emergency coordinators are not full-time employees and/or have multiple responsibilities/ assignments often not related to emergency management
- Many counties and municipalities plan along “all-hazards lines” in Iowa and generally do not specifically separate out the risks and vulnerabilities related to crude oil and ethanol transportation
- Local jurisdictions do not have adequate mapping or information gathering capabilities to identify critical infrastructure or vulnerable populations
- Not all local jurisdictions have written evacuation and shelter plans related to a rail

¹⁰² Multiple state agencies need timely and complete data to successfully evaluate and regulate the risks from oil by rail transport.

¹⁰³ Crude Oil and Biofuels Rail Transportation Study, Iowa DOT, 2016

- Railroads do not typically attend Local Emergency Planning Committee (LEPC) meetings.
- Training and readiness information is often difficult to locate and access.
- Crude oil traffic notifications from the railroads to the state have too great a range of traffic volume
- Some counties do not have LEPCs that meet regularly to receive and act on new information.
- Class I railroads are required to share information on changes to Bakken oil train traffic volume with the SERC. They are not required to share the same information for ethanol trains or other trains
- Local and rail industry information sharing on training and best practices is inconsistent across the state.
- Railroads do not have similar methods for measuring the effectiveness or accomplishments of their preparedness programs.
- Many local emergency operations plans do not specifically address rail incidents for crude and ethanol.
- Many local first responders are not trained or equipped to appropriately respond to a large rail incident involving crude oil or ethanol
- Counties rely on Hazmat teams to provide hazardous materials response for a fee, and with varied degrees of capability and availability to respond.
- No individual state department maintains a centralized listing of response equipment and contacts.
- First responders need real-time electronic access to cargo manifest data.
- First responders may not have correct railroad information because of inaccurate GIS databases.
- Railroad notification during an incident is inconsistent.
- State has limited information on a railroads ability to respond or pay for an incident.

Recommendations:

- Grade crossing ranking based on risk related to hazardous materials
- State should increase funding for at-grade crossing projects
- State should hire a FRA certified motive power and equipment (MP&E) inspector to inspect ethanol facilities on an annual basis.
- State should refine tank car inspection program bases on its first year of inspections.
- State should consider annual discussion with railroads regarding infrastructure projects.
- State should develop a “public investment inventory”¹⁰⁴ to share with railroads
- State should increase funding and seek grants on high safety benefit-cost ratio improvements¹⁰⁵

¹⁰⁴ Project improvements supported with public funds.

¹⁰⁵ Removal of rail joints in bridges, bridge approaches, and crossings; and installation of asset-protection devices

- County officials should prioritize full time emergency manager in each county.
- Update and expand local and regional Incident Management Standard Operating Guidelines/Procedures to include oil and ethanol by rail.
- Counties should identify vulnerable infrastructure and vulnerable populations located near rail lines.
 - Development of local evacuation and sheltering plans.
 - LEPC's should seek attendance by railroads and shippers to meetings.
 - Assist counties in enhancing LEPC membership and best practices.
 - Development of an incident response planning committee on rail to develop guidance and work with LEPCs.
 - Development of a web portal for training, grants and other resources.
 - Request FRA amend crude oil reporting from 25% change in volume to 10% change.
 - Work with USDOT on information ethanol and other high-hazard flammable commodities.
 - First responders should request commodity information from railroads.
- Development of a web portal for information sharing, lessons learned and training opportunities.
- Annual reports by railroads, state and related organizations on preparedness programs.
- Development of a local incident response standard operating procedure.
- Coordinated efforts on response training.
- Focus group on ways to improve training, preparedness and response.
- Study to determine amount of foam available on a regional basis.
- State should strategically place foam and application tools around the state.
- Develop a unified database of response resources.
- Update list of private response contractors in the state.
- Promote the use of the railroads "AskRail" mobile application.
- State should update the railroad GIS database
- Develop a standardized method of contacting railroads
- State should request railroads to report annually on their recovery program.

Minnesota

In 2014, as part of a comprehensive bill on railroad and pipeline safety, the Minnesota Legislature directed the Department of Public Safety (DPS) to prepare a report on incident preparedness in both the public and private sectors related to transportation of oil by rail or pipeline.¹⁰⁶

¹⁰⁶ Department of Public Safety, Minnesota's Preparedness for an Oil Transportation Incident January 15, 2015

Recommendations:

- Increase awareness about oil transportation incidents, and develop additional capacity.
- Awareness-level training for fire departments and other responders
- Developing online resources for the public and first responders
- Developing guidance for first responders and local governments on responding to an oil incident, including assessment and evacuation protocols
- Connect funding for training and equipment to regional coordination.
- Develop a process for organizations to apply for training or equipment funding available in the Railroad and Pipeline Safety Account.
- Delay significant changes to the Railroad and Pipeline Safety Account and related allocations.
- Develop a state-level program approach to assess hazardous materials preparedness.
- Develop a program evaluation process and framework for hazardous materials incident preparedness.
- Enhance existing databases (or develop new databases) to provide more comprehensive information about response resources across the state.
- Establish Standards for Pipeline Preparedness and Response
- Allow the state to examine rail and pipeline preparedness efforts.
- State adopt response standards, including timelines, for pipeline companies that are similar in scope and content to the response standards applicable to railroads.
- Developed a position regarding the appropriate response times for pipeline companies.

Montana

The Public Service Commission conducted a qualitative risk assessment of its program and the necessary deployment of resources by analyzing the legal background of railroad safety inspection programs, the scope of Commission authority in that effort, along with the risks associated with the transportation of crude oil and accident history for the state. Through that evaluation and analysis there were recommendations specific to the program on the best use of resources moving forward.

<http://psc.mt.gov/Docs/ElectronicDocuments/pdfFiles/N20151184RiskAssessmentActionPlanFinal.pdf>

Pennsylvania

The Commonwealth of Pennsylvania asked the University of Delaware to look at the current level of risk and advise as to how to reduce the risk of a CBR incident in the Commonwealth. This report presents the results of this assessment. This assessment addresses three major areas of CBR safety in the Commonwealth:

- Derailment Risk
- Tank Car Breach/Rupture Risk

- Regulatory Oversight¹⁰⁷

Recommendations for Railroads

1. Routes carrying oil should be tested at least 3 times a year (defect rate no greater than .04 to .06 failures per mile)
2. Geometry Car track inspections at least four times per year
3. Vision-based joint bar inspection system at least once per year.
4. Railroads hauling oil should adopt the BNSF Railway voluntary speed reduction to 35 mph for crude oil trains through cities with a population greater than 100,000 people
5. Railroads hauling oil should be equipped with Wild Impact Load Detector (WILD) units.
6. Any WILD measurement that exceeds 120 Kips should require the train to be stopped and the wheel inspected.
7. Railroads should equip all routes with Hot Box Detectors to monitor oil train movements, with a maximum spacing of 25 miles between Hot Box detectors
8. Oil routes should have at least one Acoustic Bearing Detector installed
9. Yards and sidings should be inspected by Railroad inspectors at an interval one level higher than the assigned FRA track class (i.e., yards that are FRA Class 1 should be inspected at the FRA Class 2 level)
10. Railroads should equip trains with Electronically Controlled Pneumatic (ECP), or in the absence of ECP brakes use two-way end-of-train devices or Distributed Power to improve braking performance
11. Class I railroads should complete their initial route analysis of High-hazard flammable train routes as soon as possible

Recommendations for the Commonwealth

1. Work with Class I railroads on route analysis
2. Coordinated inspections by both Pennsylvania Public Utility Commission (PUC) track inspectors and Federal Railroad Administration track inspectors to inspect major CBR routes within the state, focusing on track, equipment, hazmat, and operating practices. Prioritize inspections on mainline turnouts, sidings, and yards that have significant CBR volumes, including track owned by railroads and track owned by refineries
3. Coordinate with FRA to perform annual inspections of all routes carrying CBR trains in Pennsylvania using the FRA's T-18 Gage Restraint Measurement System test vehicle; testing should include both GRMS and conventional track geometry

¹⁰⁷ Assessment of Crude by Rail (CBR) Safety Issues in Commonwealth of Pennsylvania, 2015

measurements

4. Fill existing vacancies for Pennsylvania PUC track inspectors, and assess whether additional inspectors are required.
5. Pennsylvania Emergency Management Agency (PEMA) should work with Class I railroads in the state to implement information-sharing technology tools and make those tools available to emergency responders located along CBR routes
6. PEMA should work with the Class I railroads to hold a full-scale emergency response exercise involving emergency responders from communities along heavy oil train routes
7. PEMA should work with all communities along all routes carrying CBR trains to ensure that the communities have appropriate emergency response plans
8. PEMA should work with the Class I railroads to obtain an inventory of emergency response resources along all routes carrying CBR trains to include locations for the staging of emergency response equipment

Secondary Recommendations

1. In addition to conventional Track Geometry Car tests, all routes carrying CBR trains in Pennsylvania should be inspected by Autonomous Track Geometry Measurement (ATGM) and/or Vehicle Track Interaction (VTI) measurement systems
2. Class I railroads operating in Pennsylvania should verify that they have an adequate number of Hot Wheel Detectors on oil train routes, particularly on routes with terrain where wheels could be more prone to overheating (such as steeply graded routes)
3. Routes carrying CBR trains in Pennsylvania should be equipped with at least one Track Defect Detector (such as a Lateral Load Measurement System) to monitor loaded oil train cars

Recommendations for the Commonwealth:

1. Ensure that the Class I railroads owning track in Pennsylvania equip routes with Positive Train Control technology, in accordance with federally mandated implemented schedules
2. Direct the State of Pennsylvania track inspectors to focus attention on the conditions of turnouts on major CBR routes in the state
3. Direct State of Pennsylvania track inspectors to work with FRA inspectors to develop a coordinated inspection program for all yards and sidings that handle a significant number of CBR cars
4. Actively work with federal regulators on the development of national Minimum Characteristics Standards for all Crude By Rail shipments, with defined target characteristics

5. Direct the PUC to work with the FRA and Class I railroads to ensure that railroads are maintaining a Bridge Safety Management Program in accordance with the Code of Federal Regulations
6. Actively work with federal regulators and the railroad industry to support increasing tank car thermal protection standards to 800 minutes for a pool fire

Washington

The Governor's 2014 budget provided one-time funding for Ecology to conduct a Marine and Rail Oil Transportation Study. The objective of the study was to analyze the risks to public health and safety, and the environmental impacts associated with the transport of oil in Washington state.¹⁰⁸

Preliminary Report Recommendations

- Consider funding options to adequately fund Washington's Spill Prevention, Preparedness, and Response Program.
- Modify the railroad regulatory fee structure. It should allow the Utilities and Transportation Commission (UTC) to fund additional inspector positions, including Federal Railroad Administration certified inspectors with increased pay that is competitive with comparable private-sector and federal inspectors. As part of this, the certified inspectors will increase inspections in the areas of track, hazardous materials, operating practices, motive power and equipment, and crossing signals.
- Amend statutory authority to allow UTC inspectors to enter a private shipper's property to conduct hazardous material inspections related to rail operations. This proposal can be performed within current resources.
- Ensure permanent ongoing funding for three Ecology planners. This would allow Ecology to develop new and maintain existing geographic response plans for inland and marine areas at risk from oil spills.
- Enhance and provide for a continuous supply of oil spill response equipment and local first responder firefighting equipment. Ecology should develop a grant program for firefighting equipment, working with local responders to develop rules for the administration of the program. On-going funding and staffing should be provided to administer the program, maintain existing equipment and provide periodic training to first responders.
- Mandate the State Emergency Response Commission to modify regulatory authority requiring Local Emergency Planning Committees to submit hazardous materials plans and updates on a four-year cycle basis for compliance reviews. Plan updates will address new hazards not covered in previous plan.
- Amend statute to allow designated 'first-class cities' to opt-in to the UTC's railroad crossing inspection and enforcement program. The Legislature should also give the UTC jurisdiction to require first class cities to inform the UTC when crossings are opened or closed.

¹⁰⁸ Washington State 2014 Marine and Rail Oil Transportation Study, March 2015

- Provide funding for the UTC to conduct railroad and road authority diagnostic reviews of high risk crossings. Amend statutory authority and provide funding to give UTC jurisdiction over private road crossings on the primary railroad routes, including those over which crude oil are transported. This would allow the UTC to establish minimum safety standards, including appropriate safety signage.
- Modify the definition of ‘facility’ in statute to include moving trains carrying oil as cargo. Direct Ecology to develop regulations requiring rail oil spill contingency plans and participation in drills. Other related legislative amendments include require railroads to submit advance notice to the state on the volume and characteristics of oil being transferred by rail facilities; extend the concept of Best Achievable Protection as a regulatory standard to all facilities handling oil and modify definition of oil and ensure it captures all types of oil.
- Modify statutory authority to extend financial responsibility requirements to rail and mobile facilities, and enable Ecology to modify the regulations on financial responsibility requirements. Issuing Certificates of Financial Responsibility ensure that those transporting oil can pay for cleanup costs and damages resulting from oil spills.
- Direct Ecology and state fire marshal’s office to analyze the continued need for geographic hazardous materials response teams, their composition, how they should be equipped and trained, where they should be located, funding mechanisms, and how they will mutually assist statewide. Part of this analysis should include development of a startup and recurring cost estimates for such teams.

Final Study Recommendations

- Stabilization of crude oil before shipping it by rail.
- The final study includes a list of 43 findings and recommendations. The recommendations are a mix of risk mitigation steps at the federal and state levels addressing rail, marine, facility, emergency and spill response.
- The recommendations include direction on improving infrastructure, facility design, industry operational processes and practices, expanding sensitive area protections, emergency and spill response equipment caching, personnel training, and planning improvements.

New York

Action items for the state to pursue at the federal, state, local, and industry level to increase its incident prevention and response capabilities in the event of a marine or rail incident involving the transportation of crude oil.¹⁰⁹

Recommendations

- USDOT should finalize new and retrofitted tank car regulations immediately

¹⁰⁹ Transporting Crude Oil in New York State: A Review of Incident Prevention and Response Capacity, 2014

- USDOT should strengthen voluntary tank car design and operations safety measures put forward by the industry and codify them in regulations.
- The United Nations¹¹⁰ should recommend new classifications based on crude oil characteristics to enable appropriate packaging and transmission of information on the qualities of oil being transported
- USDOT should update regulations requiring railroads to develop route-specific contingency plans for lines that carry crude oil
- USDOT should increase matched funding available to states through the Hazardous Materials Emergency Preparedness Grant Program
- U.S. Coast Guard, Environmental Protection Agency (EPA), and National Oceanic and Atmospheric Administration (NOAA) should quickly update environmental and contingency response plans
- USDOT should subject industrial facility railroads to the same standards and inspection protocols as the rest of the general railroad network
- USCG should establish a civilian Contingency Planning position in New York State to provide organizational continuity and support state emergency preparedness and response efforts
- USCG should update Vessel Response Plans for tankers and tugs carrying crude oil in New York State to ensure response protocols address the risks associated with transporting crude oil
- USDHS should update the list of authorized equipment eligible for grant funding to include crude oil firefighting equipment
- The state should hire additional railroad inspectors
- Partner with federal, local, and industry partners to increase the number, frequency, and variety of preparedness training opportunities and drills
- Work with industry and federal partners to establish a mechanism for obtaining more complete information on the volume and characteristics of oil being transported and stored in the state
- Establish a one-stop web portal that provides access to emergency points of contact, training, grants, and other preparedness resources
- Partner with federal, industry, and local response organizations to develop a geographically-tiered equipment network to ensure timely responses in underserved areas
- Develop a comprehensive database of available emergency response equipment to support the timely and effective response to crude oil incidents

¹¹⁰ The United Nations assigns hazardous material identifiers.

- Work with the EPA and the USCG, which maintains Area Contingency Plans, to develop Geographic Response Plans that serve as both a planning response document and spill response tool
- Develop state regulations that require placing oil containment booms around waterborne transfer facilities and only allow transfer operations at locations that meet state regulatory requirements or have USCG approval
- Enact legislation to improve rail incident reporting and ensure railroad reporting compliance
- Develop more effective plume modeling capabilities
- The State should review federal, state, and local statutes, regulations, and policies to ensure efficient planning and application; assess where emergency plans overlap; and recommend changes, while also ensuring that all plans are current, comprehensive, and maintained
- Urge the American Petroleum Institute and member oil companies to reduce the volatility of Bakken crude before loading it into a tank car Class I railroads should implement a Web-based information access system to provide real-time information on hazardous materials
- The AAR should work with API to clarify and expand community engagement requirements, particularly in regard to voluntary measures undertaken by railroads Class I railroads should conclude their computer model-based route risk analysis as soon as possible and update it regularly

APPENDIX C



At-Risk Crossings - Priority Ranking Associated With Oil By Rail Legislative Study

Legislative Edition

December 2015

The Utilities and Transportation Commission (commission) provided input and technical expertise on the *2014 Marine and Rail Oil Transportation Study*, as was directed in the 2014 Supplemental Operating Budget, regarding the transportation of volatile crude oil within Washington state. On June 11, 2014, Governor Inslee issued Directive 14-06 which asked the commission, in part, for risks along rail lines and to identify, prioritize and estimate costs to mitigate those risks.



Cross buck and stop sign at 48th Avenue NW, Snohomish County (#1)

One specific area of risk that commission staff identified is public railroad-highway grade crossings along oil routes. As a result of its review, commission staff identified 347 public grade crossings along routes used by BNSF Railway Company (BNSF) and Union Pacific Railroad (UP) to transport crude oil across the state.

Commission staff's analysis of these crossings relied on information contained in commission and the Federal Railroad Administration (FRA) databases, along with reference documents, site visits, and other research tools. Staff reviewed each crossing for a variety of elements that may indicate that a particular crossing was at a higher risk than another crossing for an incident involving crude oil. In particular, staff looked at the following risk factors:

- Crossings protected only by passive traffic control devices, such as cross bucks and/or stop or yield signs.
- Crossings protected only by train-activated flashing lights.
- Crossings with limited sight distance down the tracks, in one or both directions, and not protected by automatic gates.
- Crossings with a significant grade or slope approaching the crossing and not protected by automatic gates.
- Crossings with nearby roadway intersections that may cause traffic to queue over the tracks and not protected by automatic gates.
- Roadways that cross the tracks at an acute angle at a crossing not protected by automatic gates.
- More than one mainline track intersects the roadway at a crossing not protected by automatic gates.
- The crossing exposure factor (i.e., the number of trains per day times the average number of vehicles using the crossing per day) is at a level that poses a higher risk. The number of vehicles using a crossing each day is called "Average Daily Traffic" or ADT.



South approach Port Kelley Road, Walla Walla Co.

APPENDIX D - State Rail Safety Participation Program Reports

1998-0521. Oklahoma RR Xing Task Force Final Report.

<http://www.occeweb.com/TR/RRTaskForceFinalRpt.pdf>

2002-0501. Wyoming Admin Code Rail-Highway Crossings

<http://www.dot.state.wy.us/files/live/sites/wydot/files/shared/Planning/Chapter%2001%20-%20Rail-Highway%20Crossings.pdf>

2006-0101. Arizona Guide to the Commission Process.

<http://mcdot.maricopa.gov/downloads/technical/railroad.pdf>

2006-0101. Iowa DOT Cost Benefit Analysis Section 130 Selection Process.

http://www.iowadot.gov/iowarail/assistance/130/130SelectionProcess_final.pdf

2007-1101. Arizona Rail Safety and Security Guide

<http://www.azcc.gov/divisions/safety/forms/azrailsafetysecurityguide.pdf>

2009-9999. Ohio RDC Hwy Safety Improvement Program Report 2009.

<http://www.multimodalways.org/docs/govts/states/OH/OHexec/ODOT/ORDC/ORDC%20Commissioners%20Packets/ORDC%20Retreat%20Handouts%2010-19-2009/ORDC%20Hwy%20Safety%20Improvement%20Program%20Report%202009.pdf>

2009-9999. Michigan DOT Guidelines for Grade Crossings

http://www.michigan.gov/documents/mdot/MDOT-RailSafetyBlueBook_332455_7.pdf

2010-0701. Washington State Grade Crossing Chapter 1350.

<http://www.wsdot.wa.gov/publications/manuals/fulltext/m22-01/1350.pdf>

2012-0101. Florida Rail Handbook.

<http://www.dot.state.fl.us/rail/publications/handbook.pdf>

2012-9999. South Carolina Target Zero Railroad Crossings Chapter.

<http://www.sctargetzeroplan.org/img/pdf/Railroad-Crossings.pdf>

2013-0101. Vermont Rail Program Organization

<http://leg.state.vt.us/reports/2013ExternalReports/292515.pdf>

2013-1002. Illinois GCPF Resource Guide.

<https://www.icc.illinois.gov/railroad/>

2013-9999. Georgia DOT Railroad Crossing Brochure.

<http://www.dot.ga.gov/PartnerSmart/Public/Documents/publications/Brochures/RailroadCrossingBrochure.pdf>

2014-0630. Indiana Rail Crossing Closure Procedures FY 2015.

http://www.in.gov/indot/files/Rail_CrossingClosureProcedures_FY2015.pdf

2014-1201. Minnesota Improvements to Hwy-Rail Xings and Rail Safety.

<http://www.dot.state.mn.us/govrel/reports/2014/CBRCrossingStudy-December2014/ReportonHwy-RailXingsandRailSafety-2014.pdf>

2015-0106. Penn DOT Grade Crossing Manual.

https://www.dot.state.pa.us/public/pubsforms/Publications/PUB_371.pdf

0401. Wisconsin Railroad Enforcement Guide.

[http://ocr.wi.gov/Resources/Documents/Wisconsin%20Railroad%20Enforcement%20Guide%20\(2015\).pdf](http://ocr.wi.gov/Resources/Documents/Wisconsin%20Railroad%20Enforcement%20Guide%20(2015).pdf)

2015-0324. Illinois Grade Crossing Enforcement Manual.

<https://www.icc.illinois.gov/railroad/>

2015-0406-Calif Grade Crossings Maintenance Summary FY2014-15.

<http://www.cpuc.ca.gov/General.aspx?id=2891>

2015-0708. Georgia Duty of Railroads to Maintain Crossings.

<http://mydocs.dot.ga.gov/info/gdotpubs/Publications/6865-10.pdf>

2015-0801. Texas DOT Rail Highway Operations Manual

<http://onlinemanuals.txdot.gov/txdotmanuals/rho/index.htm>

2015-1201. Oklahoma Rail Programs.

<http://www.okladot.state.ok.us/rail/pdfs/RailWeb.pdf>

2015-9999. Missouri DOT Crossing Application Form.

<http://www.modot.org/othertransportation/rail/documents/CrossingApplicationForm.pdf>

2015-9999. Ohio PUC Rail Stats 2015

http://www.puco.ohio.gov/puco/assets/File/Rail_Stats_2015.pdf

2016-0115. Montana Railroad Safety program Review.

http://leg.mt.gov/content/Committees/Interim/2015-2016/Energy-and-Telecommunications/Meetings/Jan-2016/railroad_safety-program-review.pdf

2016-0115. New Mexico Admin Code Railroad Crossings.

<http://164.64.110.239/nmac/parts/title18/18.014.0002.htm>

2016-0401. Illinois Crossing Safety Improvement Program FY2017-21.

<https://www.icc.illinois.gov/reports/report.aspx?rt=20>

2016-0526. Indiana FY17 Railroad Grade Crossing Fund.

https://www.in.gov/indot/files/RRGCF_FY17_Guidelines.pdf

2016-0801. Caltrans Grade Separation Guide.

http://www.dot.ca.gov/hq/rail/guide_sect_190.htm

2016-0801. Calif HRCSA Guidelines 2016 Program (Highway-Railroad Crossing Safety Account)

http://www.catc.ca.gov/programs/HRCSA/HRCSA_Guidelines_2016_Program.pdf

2016-0901. Utah Admin Code Rail Crossings

<http://www.rules.utah.gov/publicat/code/r930/r930-005.htm>

2016-0913. Iowa DOT 2018 Signal Program.

http://www.iowadot.gov/iowarail/pdfs/2018signalprogram_Sept%202016CommissionWorkshop.pdf

2016-9999. AL DOT Rail Highway Safety Section Brochure.

<https://www.dot.state.al.us/tpmpweb/mp/pdf/Rail/ALDOT%20Rail%20Highway%20Safety%20Section%20Brochure.pdf>

2016-9999. Idaho Admin Code.

<http://itd.idaho.gov/manuals/Manual%20Production/Traffic/850RR.pdf>

2016-9999. Nebraska Rail Admin Code.

<http://www.transportation.nebraska.gov/rpt/pdfs/415NAC4-7Rail%20Xings.pdf>

2016-9999. Oregon DOT Rail Crossing Handout.

https://www.oregon.gov/ODOT/RAIL/docs/Crossing_Safety/RailCrossingHandout_Final.pdf

UDOT Pedestrian Grade Crossing Manual:

<https://www.udot.utah.gov/main/uconowner.gf?n=12635319754536158>

UDOT Manual: Preempting Traffic Signals Near Railroad Crossings in Utah

<https://www.udot.utah.gov/main/uconowner.gf?n=29256830125849243>

FHWA State Action Plans

“The 10 States (Alabama, California, Florida, Georgia, Illinois, Indiana, Iowa, Louisiana, Ohio and Texas) with the highest number of grade crossing collisions on average during calendar years

2006, 2007 and 2008 were required to develop a State highway-rail grade crossing action plans as required under 49 CFR 234.11. The requirements of the action plans are described under 49 CFR 234.11(c)(2).

The plans can be found at.
<http://safety.fhwa.dot.gov/xings/>

APPENDIX E



State Involvement in Rail Safety



Tehachapi Loop, east of Bakersfield, CA

Paul W. King, PhD
Safety and Enforcement Division
California Public Utilities Commission
July 24, 2016, Nashville NARUC meeting



APPENDIX F - FRA/State Rail Safety Participation Programs

The following is a list of the FRA/State programs and their organizations. Some detail was available regarding the unit each program resided in within the organization. Following this list is a list of non-participating states.

Public Utility/Service Commissions:

ALABAMA

Railway Safety Administrator
Alabama Public Service Commission

ARIZONA

Railroad Safety Supervisor
Arizona Corporation Commission

CALIFORNIA

Program Manager, Railroad Operations & Safety Branch, Safety & Enforcement Division
California Public Utilities Commission

IDAHO

Program Manager, Pipeline/Railroad Safety
Idaho Public Utilities Commission

ILLINOIS

Railroad Safety Program Administrator
Illinois Commerce Commission

MONTANA

Transportation Unit Supervisor
Montana Public Service Commission

NEBRASKA

Executive Director
Nebraska Public Service Commission

NEVADA

Supervisor, Rail Safety
Nevada Public Utilities Commission

NEW MEXICO

Staff Manager, Transportation Division, Investigation Unit
New Mexico Public Regulation Commission

NORTH DAKOTA

Program Manager, Rail Safety Program
North Dakota Public Service Commission

OHIO

Rail Inspector Supervisor
Transportation Division
Ohio Public Utilities Commission

PENNSYLVANIA

Rail Safety Manager
Pennsylvania Public Utility Commission

VIRGINIA

Manager, Railroad Safety
Virginia State Corporation Commission

WASHINGTON

Deputy Assistant Director, Transportation Safety
Washington Utilities & Transportation Commission

WEST VIRGINIA

Manager - Railroad Safety Section, Transportation Enforcement Division
Public Service Commission of West Virginia

Departments of Transportation:

FLORIDA

Rail Safety Inspection Program Manager
Florida Department of Transportation

IOWA

Director, Office of Rail Transportation
Iowa Department of Transportation

MAINE

Transportation Manager – Rail, State-FRA Track Safety Inspector
Maine Department of Transportation

MINNESOTA

Manager, Railroad Administration Section
Minnesota Department of Transportation

MISSISSIPPI
Program Manager
Mississippi Department of Transportation

MISSOURI
Railroad Operations Manager, Multimodal Operations Division-Rail Section
Missouri Department of Transportation

NEW HAMPSHIRE
Track Inspector, Bureau of Rail & Transit
New Hampshire Department of Transportation

NEW JERSEY
Manager Bureau of Multimodal Grants and Programs
New Jersey Department of Transportation

NEW YORK
State Participation Coordinator, Rail Safety Bureau
New York State Department of Transportation

NORTH CAROLINA
Railroad & Rail Transit Safety Oversight Program Manager, Rail Division
North Carolina Department of Transportation

OREGON
Manager, Railroad Safety, Rail Division
Oregon Department of Transportation

TENNESSEE
Rail Safety Manager
Tennessee Department of Transportation

TEXAS
Program Manager, Rail Division
Texas Department of Transportation

UTAH
Program Manager
Utah Department of Transportation

Other State Rail Safety Programs:

MARYLAND

Chief Inspector, Division Labor & Industry Railroad Safety & Health Safety Inspection Unit
Department of Labor, Licensing and Regulation

SOUTH CAROLINA

Assistant Manager, Gas Regulation
Office of Regulatory Staff, State of South Carolina

States without FRA/State Participation Programs:

ALASKA
ARKANSAS
COLORADO
CONNECTICUT
DELAWARE
GEORGIA
HAWAII
INDIANA
KANSAS
KENTUCKY
LOUISIANA
MASSACHUSETTS
MICHIGAN
OKLAHOMA
RHODE ISLAND
SOUTH DAKOTA
VERMONT
WISCONSIN
WYOMING

APPENDIX G

RELEVANT CALIFORNIA STATE LAWS AND CPUC GENERAL ORDERS

Authority Summarized Requirements CPUC-General Orders

PU Code Sec. 309.7 (a) The Safety and Enforcement Division of the CPUC (SED) is responsible for inspection, surveillance, and investigation of the rights-of-way, facilities, equipment, and operations of railroads and public mass transit guideways, and for enforcing state and federal laws, regulations, orders, and directives relating to transportation of persons or commodities, or both, of any nature or description by rail.

SED shall advise the commission on all matters relating to rail safety, and shall propose to the commission rules, regulations, orders, and other measures necessary to reduce the dangers caused by unsafe conditions on the railroads of the state.

PU Code Sec. 309.7 (b) SED shall exercise all powers of investigation granted to the commission, including rights to enter upon land or facilities, inspect books and records, and compel testimony.

The commission shall employ sufficient federally certified inspectors to ensure at the time of inspection that railroad locomotives and equipment and facilities located in class I railroad yards in California are inspected not less frequently than every 180 days, and all main and branch line tracks are inspected not less frequently than every 12 months.

GO 22-B: Requires railroad to report accidents to CPUC. Requires accident investigations on all incidents occurring on railroad property.

PU Code Sec. 309.7 (c) SED shall, with delegated CPUC attorneys, enforce safety laws, rules, regulations, and orders, and to collect fines and penalties resulting from the violation of any safety rule or regulation. Resolution ROSB-002 established a civil penalty citation program for enforcing compliance with safety requirements for railroad carriers

PU Code Sec. 309.7 (d) (d) The activities of the consumer protection and safety division that relate to safe operation of common carriers by rail, other than those relating to grade crossing protection, shall also be supported by the fees paid by railroad corporations.

PU Code Sec. 315 The commission shall investigate the cause of all accidents occurring within this State upon the property of any public utility or directly or indirectly arising from or connected with its maintenance or operation, resulting in loss of life or injury to person or property and requiring, in the judgment of the commission, investigation by it, and may make such order or recommendation with respect thereto as in its judgment seems just and reasonable.

GO 22-B (above).

PU Code Sec. 421 (a)-(d) The commission shall annually determine a fee and is permitted to expend funds for specified purposes.

(g) The commission shall hire four additional operating practices inspectors who shall become federally certified.

PU Code Sec. 761 Whenever the commission finds that rules, practices, equipment, appliances, facilities, or service of any public utility are unjust, unreasonable, unsafe, improper, inadequate, or insufficient, the commission shall fix the rules.

GO 27-B Filing and posting of railroad timetables and changes.

PU Code Sec. 765.5 (a) The purpose of this section is to provide that the commission takes all appropriate action necessary to ensure the safe operation of railroads in this state.

(b) The commission shall dedicate sufficient resources necessary to adequately carry out the State Participation Program for the regulation of rail transportation of hazardous materials as authorized by the Hazardous Material Transportation Uniform Safety Act of 1990 (P.L. 101-615).

(c) On or before July 1, 1992, the commission shall hire a minimum of six additional rail inspectors who are or shall become federally certified, consisting of three additional motive power and equipment inspectors, two signal inspectors, and one operating practices inspector, for the purpose of enforcing compliance by railroads operating in this state with state and federal safety regulations.

(d) On or before July 1, 1992, the commission shall establish, by regulation, a minimum inspection standard to ensure, at the time of inspection, that railroad locomotives, equipment, and facilities located in class I railroad yards in California will be inspected not less frequently than every 120 days, and inspection of all branch and main line track not less frequently than every 12 months.

(e) Commencing July 1, 2008, in addition to the minimum inspections undertaken pursuant to subdivision (d), the commission shall conduct focused inspections of railroad yards and track, either in coordination with the Federal Railroad Administration, or as the commission determines to be necessary. The focused inspection program shall target railroad yards and track that pose the greatest safety risk, based on inspection data, accident history, and rail traffic density.

PU Code Sec. 768. The commission may, after a hearing, require every public utility to construct, maintain, and operate its line, plant, system, equipment, apparatus, tracks, and premises in a manner so as to promote and safeguard the health and safety of its employees, passengers, customers, and the public. The commission may prescribe, among other things, the installation, use, maintenance, and operation of appropriate safety or other devices or

appliances, including interlocking and other protective devices at grade crossings or junctions and block or other systems of signaling. The commission may establish uniform or other standards of construction and equipment, and require the performance of any other act which the health or safety of its employees, passengers, customers, or the public may demand. GO 26-D: Establishes minimum clearances between railroad tracks, parallel tracks, side clearances, overhead clearances, freight car clearances, and clearances for obstructions, motor vehicles, and warning devices to prevent injuries and fatalities to rail employees by providing a minimum standards for overhead and side clearance on the railroad tracks.

GO 72-B: Formulates uniform standards for grade crossing construction to increase public safety.

GO 75-D: Establishes uniform standards for warning devices for at-grade crossings to reduce hazards associated with persons traversing at-grade crossings.

GO 118-A: Provides standards for the construction, reconstruction, and maintenance of walkways adjacent to railroad tracks to provide a safe area for train crews to work.

GO 126: Establishes requirements for the contents of First-Aid kits provided by common carrier railroads.

PU Code Sec. 7661 SED shall investigate any incident that results in a notification to CEMA...and shall report its findings concerning the cause or causes to the commission.

PU Code Sec. 7662 Requires a railroad to place appropriate signage to notify an engineer of an approaching grade crossing and establishes standards for the posting of signage and flags, milepost markers, and permanent speed signs.

PU Code Sec. 7665.2 By July 1, 2007, requires every operator of rail facilities to provide a risk assessment to the commission and the agency for each rail facility in the state that is under its ownership, operation, or control, and prescribes the elements of the risk assessment.

PU Code Sec 7665.4 (f) Requires the rail operators to develop an infrastructure protection program, and requires the CPUC to review the infrastructure protection program submitted by a rail operator. Permits the CPUC to conduct inspections to facilitate the review, and permits the CPUC to order a rail operator to improve, modify, or change its program to comply with the requirements of this article.

(g) Permits the CPUC to fine a rail operator for failure to comply with the requirements of this section or an order of the commission pursuant to this section.

PU Code Sec. 7665.6 Requires every rail operator to secure all facilities that handle or store hazardous materials; store hazardous materials only in secure facilities; ensure that the cabs of occupied locomotives are secured from hijacking, sabotage, or terrorism; and, secure remote-control devices.

Precludes every rail operator from leaving locomotive equipment running while unattended or unlocked, from using remote control locomotives to move hazardous materials over a public crossing, unless under specified circumstances.

GO 161: Establishes safety standards for the rail transportation of hazardous materials.

PU Code Sec. 7665.8 Requires every rail operator to provide communications capability to timely alert law enforcement officers, bridge tenders, and rail workers of the local or national threat level for the rail industry, i.e. sabotage, terrorism, or other crimes.

PU Code Sec. 7673 Requires every railroad that transports hazardous materials to provide a system map showing mileposts, stations, terminals, junction points, road crossings, and location of pipelines in its rights of way.

PU Code Sec. 7711 Requires the CPUC to provide annual report to the Legislature on hazardous sites. Requires the CPUC to identify local safety hazards on California railroads, and to report on recent California railroad accident history. Specifically, the CPUC is to list all derailment accident sites in the state on which accidents have occurred within at least the past five years, and indicate whether the accidents occurred at or near sites that the CPUC has determined to pose a local safety hazard.

PU Code Sec 7711.1 Requires the CPUC to collect and analyze near-miss data.

APPENDIX H

Crude Oil by Train
 Public Grade Crossing Risk Analysis
 Criteria to Identify Higher Risk Crossings
 July 2014

UTC staff has identified a number of crossings in Washington State over which railroads will move trains that include tank cars filled with Bakken crude oil. Union Pacific has 48 crossings on its fairly limited route from the Idaho border to Pasco. There are 106 BNSF crossings on the route from the Idaho border in the East, down along the Columbia River through the Gorge and ending at Vancouver, Washington. There are an additional 164 BNSF crossings from Vancouver up I-5, and 21 crossings on the branch lines from I-5 to refineries at Anacortes and Cherry Point near Ferndale.

A collision at a crossing between a vehicle and a train usually causes much more damage for the vehicle than the train. The train is much larger, weighs much more and is designed in such a way that even during a collision, the train usually stays on the track. The vehicle, however, is smaller, weighs less and does not travel on a track. In the vast majority of the cases, the vehicle loses to the train. However, anytime a train experiences a collision, there is a risk the impact of the collision will cause the train to derail; that is, leave the tracks. In most of the crude oil rail accidents to date, the damage resulted from a derailment. A derailment becomes increasingly more likely when the vehicle is a large truck or piece of farm equipment using the crossing. For this reason, the amount of commercial truck traffic that goes over a crossing plays a significant role in identifying at-risk crossings.

Staff will look at these two sections of routes separately, since each has its own characteristics. For example, the Columbia River Gorge route travels through less populated areas, with less road traffic, than the I-5 route. However, regardless of which route staff is analyzing, staff will use the following criteria to identify potentially hazardous public grade crossings.

	Criteria to identify crossing as higher risk	Reason crossing may be higher risk
1.	Crossings protected by passive signals only <ul style="list-style-type: none"> • These are crossings with stop signs, yield signs or cross bucks only 	Even though these crossings generally have low average annual daily traffic (AADT) counts and therefore low exposure, they do leave all decision-making in the hands of the motorist. In most cases, sight distances are good, meaning motorists can see a fair distance down the tracks in both directions. That can be a curse as motorists may be tempted to “beat the train.”

	Criteria to identify crossing as higher risk	Reason crossing may be higher risk
		Train speeds are notoriously difficult to judge, particularly when the train is coming at you head-on.
2.	Crossings with limited sight distance	Limited sight distance means a motorist stopped at a crossing is not able to see down the tracks in both directions to a distance recommended by the Railroad-Highway Grade Crossing Handbook.
3.	Crossings with a significant grade on the approach	Crossings with a significant grade offer limited head-on sight distance to an approaching vehicle. In addition, a commercial truck can high-center and become stuck on crossings with significant grades.
4.	Crossings protected by active flashing lights only	<p>These crossings are a step up from passively protected crossings but can have negative characteristics.</p> <ul style="list-style-type: none"> • Even though lights flash, the decision to cross the tracks or not remains with the motorist. State law requires a motorist to stop when the lights are flashing but may proceed across the crossing when he or she perceives it to be safe. • Flashing lights are not fail safe. They do not work if the power fails. At a crossing equipped with flashing lights, a motorist may not stop at all if the lights are not flashing. If a train is approaching but the lights are not working, that presents a clear danger. These crossings are equipped with batteries that will keep the lights working for a limited period of time after a power failure.
5.	Certain crossings protected by active flashing lights and gates	Lights and gates remain the safest of all crossings. For crossings protected by signals and gates, the gates are activated by a train approaching the crossing. On the train's approach, the gates are lowered, blocking traffic from crossing the tracks while a train is on its way or actually in the crossing. Automatic gates mitigate the hazards at a crossing to the extent that the crossing poses no greater risk than any other crossing. Certain characteristics (such as old technology, geometrics, topography, or lack

	Criteria to identify crossing as higher risk	Reason crossing may be higher risk
		<p>of supplemental safety devices) may make even those crossings riskier than others. These include:</p> <ul style="list-style-type: none"> • Eight inch lens instead of the standard twelve-inch lens. Smaller lenses are less visible. • Incandescent bulbs instead of LED. Incandescent bulbs are dimmer and less reliable than LED bulbs. • Multiple Mainline tracks. Motorist may see one train clear and drive around gates. Another train may be coming on the other track in the same or opposite direction. • Multiple Highway Lanes. Gates have a physical length limit, making it difficult to appropriately cover all lanes of traffic. Shorter gates on multiple lane highways are easier to drive around. • Highway intersection in close proximity to rail crossing. Traffic may back up over the tracks if traffic signals are not properly preempted by activation of crossing signals. • High percentage commercial truck traffic. Trucks take longer to clear tracks, they are longer and cause longer queues, and they may damage signal equipment or track surfaces. Additionally, collisions with a commercial truck are much more hazardous to a train than those with a passenger vehicle. • Quiet Zones. A quiet zone is a location where train engineers are prohibited from activating a train horn or other audible warning when approaching a crossing or crossings.
6.	Crossings with an acute angle	When the railroad tracks cross highway at an acute angle, a motorist's sight down the tracks is limited, impairing the ability to see a train approaching. .
7.	Exposure Factor	The exposure factor comes from guidelines developed by USDOT at the federal level and

	Criteria to identify crossing as higher risk	Reason crossing may be higher risk
		WSDOT at the state level. It is the product of the number of trains per day and the average daily vehicle traffic (AADT). The exposure factor determines whether to allow crossings with passive warning, flashing lights or gates; or whether the crossing should be grade separated or closed.
8.	Crossings with a relatively high number of accidents	A crossing with a high number of accidents may be more likely to have an accident in the future.
9.	Crossings with a relatively high number of near misses	A crossing where the railroad has documented a high number of near misses (incidents where an accident almost occurred) may be more likely to have an accident in the future.

APPENDIX I - State and Federal Crossing Studies

CALTRAC Guidelines for 4 Quad Gates. “The purpose of these guidelines is to provide guidance for implementation and configuration of four quadrant gates at highway-rail grade crossings as authorized under PUC General Order No. 75-C. These Guidelines for the Use of Four Quadrant Gates are applicable to all modes of rail including freight, passenger, commuter, light rail, and streetcars.” <http://docs.cpuc.ca.gov/PUBLISHED/Graphics/5326.PDF>

TCRP Research Second Train Warning Projects. “This TCRP digest summarizes the results of two demonstration projects concerning second train coming warning signs for light rail transit systems. The demonstrations were conducted at the Maryland Mass Transit Administration (MTA) and the Los Angeles County Metropolitan Transportation Authority (LACMTA), and were administered by the Federal Transit Administration with funding through TCRP Project A-5A, “Active Train Coming/Second Train Coming Sign Demonstration Project.” The MTA report was prepared by Sabra, Wang, & Associates, Inc. The LACMTA report was prepared by PB Farradyne.” http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_rrd_51.pdf

FRA 4 Quad Gate Effectiveness School Street. “Under sponsorship from the U.S. Department of Transportation Federal Railroad Administration, Office of Research and Development, the John A. Volpe National Transportation Systems Center performed an evaluation of the four-quadrant gate/obstruction detection system at the School Street crossing in Groton, CT. The primary objectives of this evaluation were to assess the safety benefits and to document the operational performance provided by this non-standard technology. Highway-railroad grade crossing risk mitigation research in the United States has historically focused on the safety benefits of active warning devices, such as flashing lights, bells, and dual crossing gates. In addition, clear agreement has predominated within the research community that grade separation or closure provides the highest level of risk treatment. As the economic and societal costs of these treatments have increased, however, research has been increasingly concentrated on technologies that provide many of the same benefits without the obtrusiveness of grade separation or closure.” <https://www.fra.dot.gov/Elib/Document/407>

Iowa Low Cost Safety Improvements. A review of three low cost improvements that can be installed at highway-rail crossings: Channelizers for Lane Guidance at Railroad Crossings; Medians at Railroad Crossings; and Stop Signs at Railroad Crossings. Contact information, cost data and potential crash reduction factors are provided for the three treatments.

http://publications.iowa.gov/19241/1/IADOT_InTrans_Best_Practices_Low_Cost_Safety_Improvements_Iowa_Local_Roads_2008.pdf

FRA North Carolina Sealed Corridor Phase I, II, and III Assessment. “The Federal Railroad Administration (FRA) tasked the John A. Volpe National Transportation Systems Center to document the further success of the North Carolina DOT “Sealed Corridor” project through Phases I, II, and III. The Sealed Corridor is the section of the designated Southeast High Speed Rail (SEHSR) Corridor that runs through North Carolina. The Sealed Corridor program aims at improving or consolidating every highway- rail grade crossing, both public and private, along the Charlotte to Raleigh rail route in North Carolina. The research on the Sealed Corridor assessed the progress made at the 189 crossings that have been treated with improved warning devices or closed between Charlotte and Raleigh, from March 1995 through September 2004. Two approaches were used to describe benefits in terms of lives saved: a fatal crash analysis to derive lives saved, and prediction of lives saved based on the reduction of risk at the treated crossings. Both methods estimated that more than 19 lives have been saved as a result of the 189 improvements implemented through December 2004. Analysis also shows that the resulting reduction in accidents, due to the crossing improvements, is sustainable through 2010, when anticipated exposure and train speeds along the corridor will be increased.”
<https://www.fra.dot.gov/eLib/Details/L01512>

FRA Low Cost Device Report. Under direction of the Federal Railroad Administration’s Office of Research and Development, the U.S. Department of Transportation’s Research and Innovative Technology Administration’s John A. Volpe National Transportation Systems Center conducted a technology assessment of low-cost active warning devices for application at passive highway-rail grade crossings. The objective of this research was to present an objective assessment of the available low- cost warning device technologies and recommend a migration path that would facilitate implementation in the United States.
<https://www.fra.dot.gov/eLib/details/L01326>

Gent Iowa Wayside Horn Study. “Traditionally, locomotive engineers begin sounding the train horn approximately ¼ mile from the crossing to warn motorists and pedestrians approaching the intersection. To be heard over this distance, the train horn must be very loud. This combination of loud horns and the length along the tracks that the horn is sounded creates a large area adversely impacted by the horn noise. In urban areas, this area likely includes many nearby residents. The automated horn system provides a similar audible warning to motorists and pedestrians by using two stationary horns mounted at the crossing. Each horn directs its sound toward the approaching roadway. The horn system is activated using the same track signal circuitry as the gate arms and bells located at the crossing. Once the horn is activated, a strobe light begins flashing to inform the locomotive engineer that the horn is working. The purpose of this research was twofold: 1) to determine the effectiveness of the automated horn

system in reducing the annoyance level for nearby residents; and 2) to determine the overall safety at the crossings with the new automated horn warning system. The research included collecting horn volume data to develop noise level contour maps, using before-and-after surveys to document opinions of nearby residents and motorists and a survey of locomotive engineers to document their perception of the new systems.”

<http://www.ctre.iastate.edu/pubs/midcon/Gent.pdf>

FRA North Carolina Sealed Corridor Private Crossings. “The U.S. Department of Transportation’s (USDOT) Federal Railroad Administration tasked the USDOT Research and Innovative Technology Administration’s John A. Volpe National Transportation Systems Center to document the success of the safety improvements at private highway-rail grade crossings along the Charlotte to Raleigh portion of the Southeast High-Speed Rail (SEHSR) Corridor. This set of safety improvements, implemented during Phase IV of North Carolina Department of Transportation’s (NCDOT) Sealed Corridor project, targeted the private crossings along that segment of the SEHSR corridor.

The Sealed Corridor program aimed at improving or consolidating every highway-rail grade crossing, public and private, along the Charlotte to Raleigh rail route. The research on the Sealed Corridor private crossings, conducted from October 2008 to February 2010, assessed the progress made at the 44 crossings between Charlotte and Raleigh that have been treated with improved warning devices or closed from 1990 through 2008. Two approaches were used to describe benefits in terms of lives saved: a fatal crash analysis to derive estimated lives saved and prediction of lives saved based on the reduction of risk at the treated crossings. Both methods estimated that over 1.5 lives have been potentially saved at private crossings as a result of the 44 improvements implemented through 2008. Analysis also shows that the resulting reduction in incidents, as a result of the crossing improvements, is sustainable through 2010, when anticipated exposure and train speeds along the corridor will increase.” <https://www.fra.dot.gov/Elib/Document/2187>

FRA Use of Traffic Channelization Devices. “Traffic channelization devices have found new application at highway-rail grade crossings with active warning devices. Numerous studies conducted at locations where they have been installed show positive changes in unsafe driver behavior as a result of the treatments. When meeting certain requirements, traffic channelization devices and median barriers are an approved supplemental safety measure for the establishment of quiet zones. Traffic channelization devices are low cost and this makes them an attractive option for improving safety at highway-rail grade crossings.”

<https://www.fra.dot.gov/eLib/details/L03585>

UTCA-Lindly Driver Reaction at Crossings. “The Alabama Department of Transportation desires to make highway/rail crossings in Alabama as safe as practicable. Accordingly, it initiated Federal Aid Project HPPF-AL49(900) to determine whether DOT crossing number 728478C where US 231 crosses the Gulf & Ohio Railways track in Troy, Alabama would be safer and if driver behavior would be modified when a StopGate™ stop arm developed by Quixote Transportation Safety was installed at the crossing. Personnel from the University Transportation Center for Alabama (UTCA) were employed to help in two areas of the project: to analyze driver behavior characteristics based on digital images provided by Quixote and to document crashes and/or near misses at the crossing from data provided by the Gulf and Ohio railroad. Unfortunately, the digital images of driver reactions at the crossing supplied by a third party vendor were unusable for the analysis. Additionally, the Gulf & Ohio does not keep near miss records for the Shortline Railroad that includes this crossing. Without useful data, UTCA could not reach statistically verifiable conclusions. A limited amount of observations after the gates installation led to the following observation. The only violations that were observed occurred after flashing lights began but before full deployment of the gates; no vehicles drove around the gates, and there were no violations after the gates were locked in place. Rather than to attempt to draw firm conclusions from inadequate data, the UTCA team recommended instead to use the lessons learned from this installation to better prepare for future projects.” http://ntl.bts.gov/lib/44000/44600/44647/HPPF-AL49900UTCA_08401_Final_Report.pdf

FRA Radar Vehicle Detection System. “The Wavetronix Matrix Radar was adapted for use at four-quadrant gate railroad crossings for the purpose of influencing exit gate behavior upon the detection of vehicles, as an alternative to buried inductive loops. Two radar devices were utilized, operating collaboratively, in order to realize a fully redundant system. Performance variables including vehicle size and location, vehicle occlusion, and radar positioning were evaluated, along with sensitivity to rain, snow, and other environmental conditions. Recommendations for utilization of the radars in conjunction with popular crossing warning system controllers are provided. Also included is a means for detecting vehicles that are stopped, stored, or deliberately placed in the crossing island, and rapidly communicating that information across cellular, PTC, ITCS, and ACSES, and other data networks.”

<https://www.fra.dot.gov/Elib/Document/2799>

Texas TTI Integrated Prioritization Model. “This two-year research project developed a prioritization system for highway-rail at-grade crossings that addressed the following major concerns: (1) warrants to identify low-volume, passive crossings with risk factors; (2) a broader priority index that considers more variables than the original index; (3) warranting thresholds that remain valid with changes in data; and (4) a prioritization methodology capable of properly

prioritizing the warranted passive crossings over high- volumes active crossings. The prioritization system combines a revised priority index based on a newly developed crash prediction equation, warrants for active warning devices at passive crossings, and a passive crossing prioritization index based on Utility Theory principles. The warranting threshold are defined in terms of cumulative percentiles rather than fixed numbers to ensure reliability as data changes. The warrants and prioritization indices were integrated into a systematic prioritization methodology capable of a generating priority list that assigns top priorities to crossings with risk factors in spite of low volumes. The deliverables will facilitate highway-rail crossing management in Texas and ensure proper consideration of low-volume crossings when applying funding mechanisms such as Section 130 funds.”

<http://d2dtl5nnpfr0r.cloudfront.net/tti.tamu.edu/documents/0-6642-1.pdf>

NCUTCD Examples of Second Train Coming Signs. “Presentation of overview of options for Second Train Coming Warning Devices. This is part of the Second Train Coming Initiative pursued by a task force under the NCUTCD. The signs are divided into passive and active warning devices and are compiled from all over the world.” No HTTP Link available.

Michigan DOT Timing Issues for Interconnected HRGX. “The coordination of highway-railroad grade crossing warning signals with nearby traffic signals is of vital importance due to potential safety consequences. Interconnections between traffic signals in close proximity to railroad crossings provide an important safety function by allowing the railroad warning system to preempt the normal traffic signal operation and provide special phasing to clear vehicles queued over the railroad tracks, prohibit others from joining the queue, and maintaining traffic flow for non-conflicting traffic movements. In Michigan, there are approximately 200 interconnected highway- railroad grade crossings that are all under regulatory control of the Michigan Department of Transportation. The MUTCD provides guidance concerning the use of preemption where the signalized intersection is within 200 feet of a railroad crossing. There is however, minimal guidance for locations where intersections are more than 200 feet beyond the railroad crossings. Some of these locations experience queuing problems due to high traffic volumes. The purpose of this research was to compile and review literature and current practices related to interconnected traffic signals and preemption in order to determine solutions for providing safe and efficient timings for the traffic signals and nearby highway-railroad grade crossing warning signals.”

https://www.michigan.gov/documents/mdot/MDOT_RC-1578_412334_7.pdf

Florida CUTR Coordinated Preemption. “This research project investigated the potential for using advanced features of traffic signal system software platforms (ATMS.now), prevalent in Florida, to alleviate safety and mobility problems at highway-railroad at-grade crossings and adjacent arterials. Pre-preemption phasing was developed in this study to provide “extra” green

time to the movements blocked by a train before the train's arrival at the crossing in order to (1) mitigate congestion on the arterials near railways and (2) reduce the conflicts of train-vehicle and/or vehicle-vehicle adjacent to at-grade crossings. This study explored the technologies for implementing key functions of a pre-preemption system, including train detection, train arrival prediction, and pre-preemption control algorithms, and the capabilities of ATMS.now system. VISSIM-based simulation models were developed in this study based on three control sections along two railway corridors (FEC and CSX) in Broward County, Florida, to test the proposed pre-preemption strategies. A series of comparisons before-after implementing pre-preemption strategies was conducted to validate the effectiveness of pre-preemption strategies." http://www.dot.state.fl.us/research-center/Completed_Proj/Summary_TE/FDOT-BDK85-977-44-rpt.pdf

Florida NCTR Incorrect Turns at Highway-Rail Intersections. "A number of injuries and fatal collisions have occurred at certain highway-rail grade crossings that are located immediately adjacent to highway intersections, driveways or interstate ramps. Some guide signage, pavement markings, and other traffic control devices present near or at the crossings in the past may have confused drivers and caused them to turn onto the railroad tracks, rather than at the nearby intersections, driveways or ramps. This research found the major contributing causes of incorrect turns onto railroad tracks includes (1) confusing signs and pavement markings near highway-rail crossings, (2) darkness and low visibility near or at highway-rail crossings, (3) following turn instructions from a GPS device onto railroad tracks, (4) skewed highway-rail grade crossings, and (5) driver distraction. Based on the findings from intensive literature review, historical crash data analysis, and field observations, a set of practical countermeasures was developed to prevent incorrect turns onto railroad tracks. The major recommended treatments for upstream of a highway-rail grade crossing include advance direction signage and striping. The recommended downstream treatments also consist of guide signs and striping. For the critical zone, treatments such as striping or dynamic envelope pavement markings, pavement gate markings, bollards, and illumination are recommended. Adequate illumination is essential for reducing the number of rail-vehicle crashes and stuck vehicle incidents due to incorrect turns at night. Finally, this research developed a simple and effective method to help quantify potential drivers that experience confusion or hesitation when they approach a highway-rail grade crossing. It provided a cost-effective method to evaluate the effectiveness of any implemented treatments to prevent incorrect turns onto railroad tracks." <http://www.nctr.usf.edu/wp-content/uploads/2013/12/77950.pdf>

Illinois Center Transportation Field Evaluation of Smart Sensors. "The performance of a microwave radar system for vehicle detection at a railroad grade crossing with quadrant gates was evaluated in adverse weather conditions: rain (light and torrential), snow (light and heavy),

dense fog, and wind. The first part of this report compares the results of the modified system setup in adverse weather conditions with those from good weather conditions (as presented in Volume 3 of this study). Then, the results of a re-modified system setup were compared to the results for the modified system setup in good and adverse weather conditions. The re-modification was in response to increased detection errors in adverse weather conditions. With the modified setup, system performance was sensitive to the adverse weather conditions. In torrential rain, false calls increased to 24.82%–27.08% (e.g., May 28 and June 1) when there was some traffic on the crossing. However, when there was torrential rain but only one vehicle (e.g., May 31) or no traffic flow (e.g., June 10), the radar units generated 15 false calls on each of those 2 days. For all heavy snow datasets combined, missed calls by a single radar unit and by the two radar units working as a combined unit (i.e., system wide) represented 13.51% and 11.66% of the loop calls, respectively. The most severe snow effects were found during freezing rain/ice. In dense fog, false calls increased to 11.58%, and all false calls were generated when the gates were moving or in the down position. Wind did not affect system performance, and the errors were similar to those in good weather conditions. With the re-modified setup, the frequency of errors in heavy rain and heavy snow conditions was reduced and system performance was similar to the good weather, light rain, and light snow conditions. In heavy rain, false calls in the re-modified setup were reduced to 2.6% compared with 30.5% in the modified setup. This reduction was the result of a significant decrease in the false calls generated without objects in the crossing. The re-modified setup eliminated the system wide missed calls in heavy snow. The re-modified setup also reduced the false calls to less than 1% in good weather, light rain, and light snow conditions and practically had no missed, stuck-on, or dropped calls. Results indicate that re-modifications improved the performance of detection system.” <https://apps.ict.illinois.edu/projects/getfile.asp?id=3382>

Iowa Crossing Consolidation Formula. The goal of this project was to provide an objective methodology to support public agencies and railroads in making

decisions related to consolidation of at-grade rail-highway crossings. The project team developed a weighted-index method and accompanying Microsoft Excel spreadsheet based tool to help evaluate and prioritize all public highway-rail grade crossings systematically from a possible consolidation impact perspective. Factors identified by stakeholders as critical were traffic volume, heavy-truck traffic volume, proximity to emergency medical services, proximity to schools, road system, and out-of-distance travel. Given the inherent differences between urban and rural locations, factors were considered, and weighted, differently, based on crossing location. Application of a weighted-index method allowed for all factors of interest to be included and for these factors to be ranked independently, as well as weighted according to stakeholder priorities, to create a single index. If priorities change, this approach also allows for factors and weights to be adjusted. The prioritization generated by this approach may be used to convey the need and opportunity for crossing consolidation to

decision makers and stakeholders. It may also be used to quickly investigate the feasibility of a possible consolidation. Independently computed crossing risk and relative impact of consolidation may be integrated and compared to develop the most appropriate treatment strategies or alternatives for a highway-rail grade crossing. A crossing with limited- or low-consolidation impact but a high safety risk may be a prime candidate for consolidation. Similarly, a crossing with potentially high-consolidation impact as well as high risk may be an excellent candidate for crossing improvements or grade separation. The results of the highway-rail grade crossing prioritization represent a consistent and quantitative, yet preliminary, assessment. The results may serve as the foundation for more rigorous or detailed analysis and feasibility studies. Other pertinent site-specific factors, such as safety, maintenance costs, economic impacts, and location-specific access and characteristics should be considered. http://lib.dr.iastate.edu/cgi/viewcontent.cgi?article=1102&context=intrans_reports

Washington State Short Line Study. “The recently completed State Rail Plan for the state of Washington identified several key issues facing the state’s rail system. Among these key issues are abandonment, port access and competitive needs of the ports and local production regions, as well as intermodal connectivity. Nearly 2000 miles of rail line had been abandoned in Washington State before the late 1990’s, and another 70 have been abandoned since. Many of these miles included were a result of the Class I railroads stepping away from their less profitable lines. These same actions by the Class I railroads also generated opportunity for the creation of many of the state’s short-line railroads on branch and light density lines. The rail system grew smaller during the 1980s and 1990s, and many of the state short lines were not upgraded to meet the standards and conditions required for modern freight rail load limits (286,000 pounds per car). Further investment is needed should the state or owner seek new or improved operations. This study found that more than 55 percent (740 miles) of all short line miles within Washington are not able to efficiently handle 286,000 pound rail cars. Overcoming this deficiency and bringing the state’s short line system to Class II operating status could require infrastructure investments of approximately \$610 million. This need exceeds the current funding support offered by the state, even if considered over a 20 year horizon with private industry and/or local jurisdictions providing significant match. Three short line case studies in this report help identify the societal benefits associated with a functioning short line system within the state’s dynamic transportation network. These case studies, along with information about the attributes that contribute to the success or failure of investments in load centers, illustrate the benefits of state investment in the short line railroad system.”

<http://www.wsdot.wa.gov/publications/fulltext/LegReports/ShortlineRailStudyFinalReport.pdf>

APPENDIX J

Resources - Blocked Crossing Cases

Michigan Court Case Ruling Case 98-73615. CSX Transportation, Inc., Plaintiff, v. City of Plymouth and Jennifer M. Granholm, Attorney General of the State of Michigan. Court finds that the state statute regarding crossing blockage is preempted by the Federal Railroad Safety Act, 49 U.S.C. § 20101, et. seq., and the Interstate Commerce Commission Termination Act ("ICCTA"), 49 U.S.C. § 10101, et. seq., and is unconstitutionally violative of the Commerce Clause. U.S. CONST. ART. I § 8, cl. 3. Accordingly, Plaintiff's motion for summary judgment is GRANTED, and Defendants' cross-motions for summary judgment are DENIED. Plaintiff's motion to strike the Brickey Affidavit is DENIED, and its motion to strike the Attorney General's jury demand is DENIED AS MOOT. <http://www.plainsite.org/dockets/22fc8yvwzk/michigan-eastern-district-court/csx-transp-inc-v-city-of-plymouth/>

Congressman Dingell FRA. U.S. Congressman John Dingell (D-MI) introduced H.R. 432, the "Railroad Crossing Delay Safety Assurance Act," on February 6, 2002. "The legislation stipulates that, if the Secretary of Transportation has not issued regulations to address the problem of trains blocking traffic at highway-rail grade crossings before August 1, 2002, a state or local government may enact a law or regulation to address such problem to ensure public safety. Rep. Dingell's action came after a federal district judge declared unconstitutional a Michigan State law (see 2000-

0412) saying that a train could not block a grade crossing for more than five minutes. According to the judge's decision, local governments would no longer be able to fine railroads for delaying traffic by blocking grade crossings. Other states have similar laws prohibiting trains from blocking crossings and imposing fines on railroads that violate the law. The bill was referred to the House Committee on Transportation and Infrastructure."

<https://www.govtrack.us/congress/bills/107/hr432>

ILCS 7402 Blockage Rule. Portion of Illinois Compiled Statutes dealing with blocked crossings.

<http://www.ilga.gov/legislation/ilcs/fulltext.asp?DocName=062500050K18c-7402>

FRA Reauthorization Issues – Dingell Blockage. Congressional Research Service Issue Brief for Congress on "Federal Railroad Safety Program and Reauthorization Issues." Analysis of issues pertaining to FRA's proposed reauthorization including a discussion of Congressman Dingell's HR 432 on page 13. http://www.bletdc.org/legislation/facts/fed_rail_safety.pdf

FRA Blocked Crossings Emergency Response. Report by the Federal Railroad Administration (FRA) on the Impact of Blocked Highway/Rail Grade Crossings on Emergency Response Services, in response to Section 9004 of Public Law 109-59. The report examines the causes, solutions, and examples of projects that reduce the impact of blocked crossings. The study was conducted in consultation with State and local government officials, including transportation planners and emergency responders. These groups and others provided significant input into the report, particularly with respect to real-world approaches to resolving blocked crossing problems.
<http://www.fra.dot.gov/eLib/Details/L04943>

IL Supreme Court Decision Blocked Crossings. Illinois Supreme Court reversed a ruling of an appellate court finding that Illinois law was valid in regard to crossing blockage (625 ILCS 5/18c-7402 (1) (b)). <http://caselaw.findlaw.com/il-supreme-court/1131526.html>

FRA Fact Sheet Blocked Crossings. Short document prepared by FRA summarizing the role of the FRA, railroads and states in regards to blocked crossings. The FRA does not regulate crossing blockage. FRA encourages railroads to be “good neighbors” and minimize community disruption due to blocking crossings. No HTTP Link available.

FRA 6th Compilation of State Laws Crossing Blockage. Chapter 3 of the compilation of state laws from 2013 covers state laws regarding crossing blockage all of which are invalid.
<http://www.fra.dot.gov/eLib/Details/L04989>

Chicago Office of Emergency Management. The City of Chicago’s Office of Emergency Management and Communications maintains a list of 33 crossings that if blocked by rail traffic for greater than 10 minutes notification must be made to the Office of Emergency Management. Communication from Chicago Department of transportation

– No HTTP Link available.

APPENDIX K - Trespassing Reports

Savage Trespassing on the Railroad. “Greater than half of all the fatal injuries on United States railroads are sustained by trespassers. The paper provides a statistical analysis of the demographics of trespassers, the activities they were engaged in, and the causes of injury. It also analyzes trends over time. The paper finds that the risks of injury and death are particularly acute for males in their 20s and 30s. The annual casualty count has remained relatively stable in recent decades because growing affluence, which tends to reduce risk-taking behavior, has been balanced by increases in railroad activity and the size of the population.” <http://faculty.wcas.northwestern.edu/~ipsavage/211-manuscript.pdf>

FRA Trespasser Demographics Report. Results of a 2008 survey of trespass fatalities conducted by Bruce George / Cadle Creek Consulting for the FRA. “Survey forms, one for each 2002-2004 trespass fatality, were mailed to the chief medical examiner (CME) or coroner in whose jurisdiction the incident was reported to have occurred. Forms for 1,524 fatalities were sent to 471 jurisdictions. Subsequently, 279 jurisdictions (59 percent) returned 1,056 reports (69 percent). Of the forms returned, 935 contained some useful information (at least gender), but only 740 provided usable address information. As less than half of the forms were returned with usable address information, the market analysis must be carefully assessed. We have learned from the returned forms that trespassers who die are, on average, 38 years old and most often Caucasian males. Approximately two-thirds were under the influence of alcohol and/or drugs. There is considerable regional variation. The gender split is 13 percent female, and 16 percent have Hispanic ethnicities. Trespasser fatalities are racially diverse, i.e., 78 percent White, 16 percent Black, 5 percent Native American, and 1 percent Asian.” <https://www.fra.dot.gov/eLib/Details/L02669>

CP Rail Law Managing Risk. A presentation made to the Operation Lifesaver International Conference in 2010. Focus of presentation is on managing risk by identifying assets, threats to those assets and consequences to the assets of disruption. <https://oli.org/documents/LawEnforcementpresentation.pdf>

FRA Trespass Prevention Strategies. “ Under the Rail Safety Improvement Act of 2008 (RSIA), the U.S. Department of Transportation (DOT) has developed model railroad trespassing, vandalism, and highway-rail grade crossing warning device violation prevention strategies to assist State and local governments, and railroads. DOT, through the Federal Railroad Administration (FRA), consulted with the Association of American Railroads and others to develop these strategies, which fall under three broad categories:

1) expanding educational outreach, 2) energizing enforcement, and 3) fostering engineering and sight improvements. <https://www.fra.dot.gov/Elib/Document/2824>

FRA Trespass Detection Performance Guidelines. “The U.S. Department of Transportation’s John A. Volpe National Transportation Systems Center, under the direction of the Federal Railroad Administration, conducted a 3-year demonstration of an automated prototype railroad infrastructure security system on a railroad bridge in the town of Pittsford, NY [1]. The main objective was to demonstrate a stand-alone, video- based trespass monitoring and deterrent system for railroad infrastructure applications using commercial off-the-shelf technology. The final report, entitled “Railroad Infrastructure Trespassing Detection Systems Research in Pittsford, New York,” details the project location, system technology and operation, system costs, results, potential benefits, and lessons learned. The results indicate this interactive system could serve as a model or prototype railroad infrastructure security system for other railroad rights-of- way or bridges deemed prone to intrusion. Additionally, the authors’ recommendation to develop performance guidelines for this type of system is contained in this document.” <https://www.fra.dot.gov/eLib/Details/L01306>

FRA Community Trespassing Prevention Guide. Guide developed by FRA to help communities address trespass through implementation of “long-term trespass prevention strategies through community problem solving partnerships.” <https://www.fra.dot.gov/eLib/Details/L02620>

NJ Safety Along Railroads. Development of a short-term action plan to address pedestrian safety along railroads in New Jersey. “Pedestrian safety is a top priority in the State of New Jersey. There are multiple programs that focus on improving pedestrian conditions and removing barriers that inhibit safe walking and bicycling along and across New Jersey’s roadways. The need to move toward a more comprehensive approach to pedestrian safety, including rail crossings and corridors, was underscored in early October when a 13-year-old boy in Garfield was fatally struck at a NJ TRANSIT roadway crossing. This incident occurred less than 24 hours after two teens in Wayne were struck and killed by a train while trespassing along a rail corridor.” <http://www.state.nj.us/transportation/commuter/pedsafety/pdf/NJSafetyalongRailroads000.pdf>

Transport Canada Trespass Counter Measures. “The purpose of the Rail Trespassing Occurrences and Countermeasure Strategies study was to conduct an analysis of trespassing occurrences, and to identify and evaluate the effectiveness of potential countermeasures in providing safety benefits. The work was divided into three distinct phases: 1) Problem definition, scoping, and countermeasure pilot demonstration plan development; 2) Trespassing countermeasures pilot demonstration and evaluation; and 3) Quantitative evaluation of trespassing countermeasures demonstration and recommendations. A perpendicular “point” crossing in an urban environment was identified

as the focus of the pilot demonstration study, and trespass prevention through right-of-way protection was the countermeasure assessed. A known trespass location in the City of Mississauga was selected to host the pilot demonstration project. Installing high-security right-of-way protection at the pilot demonstration site resulted in a statistically significant reduction in trespassing activity. The number of average daily trespassing incidents was reduced by 90%, while area pedestrian traffic remained relatively stable. The report presents the findings of all three study phases, as well as a series of recommendations for trespass prevention strategies at other locations using similar right-of-way protection installations.”
<https://trid.trb.org/view.aspx?id=1226690>

FRA Ped Safety at or Near Passenger Stations. Section 201 of the Rail Safety Improvement Act of 2008 directed “the FRA to provide guidance to railroads concerning pedestrian safety that addresses four specific pedestrian safety areas: providing audible warning of approaching trains to pedestrians at railroad passenger stations; using signs, signals, or other visual devices to warn pedestrians of approaching trains; installing infrastructure at pedestrian crossings to improve the safety of pedestrians crossing railroad tracks; and installing fences to prohibit access to railroad tracks.”
<https://www.fra.dot.gov/eLib/details/L03533>

FRA 2012 Right of Way Fatality Prevention Workshop. Second in a series of three workshops that FRA has held to gather together experts on right-of-way safety issues.

“Based on the success of the 2008 Trespasser Workshop, FRA and FTA sponsored this follow-on workshop. The keynote speech by FRA Administrator, Mr. Joseph C. Szabo, was followed by 23 technical presentations in the areas of Pedestrian Safety, Hazard Management, Design Technology and Infrastructure, Community Outreach, Enforcement, and Intentional Deaths/Acts. Workshop attendees broke into working groups charged with developing prioritized recommended actions for their respective topics; they developed more than 90 ideas which covered new or expanded initiatives, strategies, and research projects. Each group then defined three to five top recommended actions for its respective topic area. This resulted in the identification of 23 high-priority recommended actions.”

https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/2012ROWFTPWorkshop415131.p_df

Metaxatos Ped Safety at Grade Crossings in Illinois. “Federal reporting shows a relatively constant number of pedestrian and bicycle fatalities at highway-rail and pathway-rail grade crossings over the past 10 years. This is in contrast to a marked decrease in train-vehicle collisions at highway-rail crossings. Although engineering solutions and education and enforcements initiatives have been proposed and implemented, little is known about their effectiveness to mitigate such incidents. This study reports on findings from the literature, discussions with professionals in the public and private sectors involved in safety

at rail grade crossings, and pedestrian/non- motorized user behavior and attitudes toward safety at such crossings. The study highlights the multitude of factors related to pedestrian safety in this context and provides an informed discussion for stakeholders to advance safety initiatives.” <https://apps.ict.illinois.edu/projects/getfile.asp?id=3083>

FRA Trespasser Demographics Report. “This report was prepared by North American Management (NAM) at the direction of the Federal Railroad Administration (FRA) for the purpose of more accurately identifying the types of persons who trespass on railroad rights-of-way, and ultimately reducing the number of trespassing casualties, which contribute significantly to the total annual railroad-related deaths and injuries in the United States. This report is an extension of a March 2008 report produced by Cadle Creek Consulting titled, “Rail Trespasser Fatalities, Developing Demographic Profiles” (2008 Report). The current report was generated as part of FRA’s continuing efforts to reduce trespassing on railroad rights-of-way and associated fatalities and injuries.”

<https://www.fra.dot.gov/Elib/Document/3315>

Utah DOT Ped Grade Crossing Manual. “Recent years have witnessed a significant expansion in light rail transit and commuter rail systems along the Wasatch Front and in the Salt Lake Valley. This expansion has resulted in increased pedestrian exposure to rail activity. Consequently there has been a greater interest in pedestrian control at grade crossings. This manual identifies some of the risk factors associated with pedestrian grade crossings and summarizes applicable best practices and mandatory controls that address these risk factors. This manual also presents a standard evaluation and implementation procedure intended to improve consistent application of devices to support pedestrian safety at grade crossings throughout the state.”

<https://www.udot.utah.gov/main/uconowner.gf?n=12635319754536158>

Savage Fatal Train-Ped Collisions in Metro Chicago. “This paper analyses the 338 pedestrian fatalities on mainline railroads that occurred in the Chicago metropolitan area between 2004 and 2012. On average there was one such fatality every ten days, and they comprised the vast majority (84%) of all deaths on the railroad. Almost half (47%) of the pedestrian fatalities are apparent suicides. Non-suicidal fatalities at stations and crossings represent 21% of the total, while the remaining 32% are non- suicidal incidents at other places along the right of way. The decedents are predominantly male (72%) and of working age (83% between the ages of 18 and 65). There are very few minors or senior citizens. Chicago has harsh winters, so incidents are much more common during the warmer months. There does not seem to be any pattern to how fatalities are distributed across the days of the week, but they are concentrated during peak travel times of day, with an additional spike late at night. A spatial analysis shows that while there is a general randomness in incident location, there are some common patterns, and also some notable outliers or “hot spots.” The frequency of fatalities at stations and crossings and from trespassing in different municipalities within the region is strongly related to the density of public access points to the right of way.

Consequently, grade separation is effective in reducing fatalities. But fatalities of these types do not increase with train volume suggesting that pedestrians may exercise more care around busier lines.” <http://faculty.wcas.northwestern.edu/~ipsavage/rail.html>

FRA Trespass Prevention Palm Beach Florida. “The United States Department of Transportation’s (U.S. DOT) Research and Innovative Technology Administration’s John A. Volpe National Transportation Systems Center (Volpe Center), under the direction of the U.S. DOT Federal Railroad Administration’s (FRA) Office of Research and Development (R&D), conducted a Trespass Prevention Research Study (TPRS) in the city of West Palm Beach, FL. The main objective of this research was to demonstrate potential benefits, including best practices and lessons learned, of implementation and evaluation of trespass prevention strategies following FRA’s and Transport Canada’s existing trespassing prevention guidance on the rail network in West Palm Beach, FL, and all of its rights-of-way.

This report documents the results of the implementation of the guidance discussed in this study. The results of the trespass prevention strategies will be analyzed to help determine areas of potential risk, develop solutions to prevent and minimize risk exposure, and implement successful countermeasures in the future. The ultimate objective of the research is to aid in the development of national recommendations or guidelines to reduce trespass-related incidents and fatalities.” <http://ntl.bts.gov/lib/52000/52100/52164/DOT-VNTSC-FRA-14-02.pdf>

FRA Countermeasures to Mitigate Intentional Deaths. “Trespassing is the leading cause of rail-related fatalities in the United States. A large proportion of these trespasser fatalities are from intentional acts (i.e., suicides). With a lack of systematic research and evaluation of the countermeasures that are currently in place as well as those that have been proposed, it is difficult for railroad carriers and communities that seek to select appropriate countermeasures that are likely to be effective at mitigating suicides. This report discusses the current information available on trespasser fatalities and the implementation of countermeasures in use internationally to prevent suicides on the railroad right-of-way. The paper presents a discussion of each countermeasure according to various intervention points along the path to complete suicide on the railroad right-of-way. These intervention points include: preventing individuals from reaching a suicidal state, making the railroad environment appear to be a less viable means for attempting suicide, deterring access to the right-of-way, avoiding collisions with trespassers and pedestrians, reducing the lethality of a train-person collision, and improving the quality of data and reporting standards. Each of these intervention points provides an opportunity for a countermeasure to potentially divert the individual from the path towards a suicidal act.”

<https://www.fra.dot.gov/Elib/Document/14240>

Canada Trespass Problem Solving Guide. “The cause(s) of trespassing on railway property varies in each community. Effective long-term solutions to trespassing problems can be realized by identifying the underlying cause(s) of trespassing at a specific problem location and implementing an effective tailor-made response. To assist communities in identifying and addressing the underlying cause(s) of trespassing, the Community, Analysis, Response and Evaluation (C.A.R.E.) problem-solving model was developed. C.A.R.E. provides a step-by-step method of identifying, analyzing and effectively addressing trespassing issues in a community. The C.A.R.E. problem-solving process may be used to help solve existing trespassing problems or in cases where a potential risk of trespassing is identified as a result of re-zoning or the planned construction of shopping malls, schools, restaurants, parks or other points of interest adjacent to railway operations.

http://www.proximityissues.ca/asset/image/reference/guidelines/ol_trespassing_guide_en.pdf

TCRP Report 175 Ped Crossings on Public Transit. “There is a natural interaction between pedestrians and public transit rail services. Rail transit services provide a high-capacity travel option for trips between major origin-destination pairs in an urban area, allowing pedestrians to travel to many more places than otherwise feasible on foot. Improving pedestrian access to rail transit stations obviously benefits the pedestrian by providing a safer and more usable route. Improving pedestrian access also benefits rail transit by resulting in a more attractive service and improved consistency at crossings. To compile the guidance from other existing resources into one document and to supplement that guidance with observations of existing pedestrian rail treatments, TCRP Report 175: Guidebook on Pedestrian Crossings of Public Transit Rail Services (Guidebook) was developed under TCRP Project A-38. The Guidebook discusses issues associated with pedestrian crossing of public transit rail services and provides examples of treatments in use. Included within the Guidebook are summaries of rail transit service options, safety and accessibility issues related to pedestrians and rail crossings, and methods of selecting appropriate treatments for a given crossing. http://www.tcrponline.org/PDFDocuments/tcrp_rpt_175.pdf

Metaxatos Ped-Bike Chicago Transit Authority Crossings. “In the last ten years, contrary to a decrease in the number of train-vehicle collisions at highway-rail grade crossings, the number of pedestrian and bicycle fatalities at highway-rail grade crossings has remained relatively constant. The objective of this study was to contribute to the still limited research on pedestrian safety at rail grade crossings by expanding the scope of a previous study (Metaxatos and Sriraj, 2013) to include rail grade crossings operated by the Chicago Transit Authority (CTA), but did not examine CTA standards, efforts and record on grade crossing safety. It should be noted that the findings were not corroborated with observations of CTA safety policies and practices at rail grade crossings. The study was divided into three components: (a) a literature review; (b) identification survey locations; and (c) survey of

non-motorized users and analysis of pedestrian attitudes.” <https://utc.uic.edu/wp-content/uploads/Ped-Bike-CTA-NURail-Final-Report.pdf>

FRA 2015 ROW Fatality and Trespass Prevention Workshop. “Based on the successful 2008[1] and 2012 ROW Fatality and Trespass Prevention Workshops[2], the U.S. Department of Transportation (US DOT) Federal Railroad Administration (FRA) sponsored a third ROW Fatality and Trespass Prevention Workshop from August 4-6, 2015 in Charlotte, NC. The workshop’s program was presented by rail experts and safety professionals who shared their ideas on key issues, best practices, technical developments, human behavior, law enforcement, and public education and awareness outreach methods and techniques related to trespass prevention. The participants represented Federal, State, and local governments, freight and passenger railroads, transit agencies, labor unions, academia, non-profit organizations, and consultants. Other nations were represented including the UK and Canada. The workshop concluded with the development of 24 high priority recommended actions across five topic areas.” <https://www.fra.dot.gov/Elib/Document/15550>

Metaxatos Ped Safety at Rail Grade Crossings. “Contrary to the declining number of fatalities due to train-vehicle collisions at highway-rail grade crossings, the number of pedestrian and bicycle fatalities at highway- and pathway-rail grade crossings has increased in the last dozen years. While engineering solutions and education and enforcements initiatives have been proposed and implemented, little is known as to their effectiveness to mitigate such incidents. This paper reports on findings from the literature and discussions with professionals in the public and private sectors involved in safety at rail grade crossings. Major areas found in need for improvement include (a) advancing consistent standards for warning devices and treatments; (b) advancing consistent approaches for managing non-motorist risk; and (c) continuing commitment to education, engineering, enforcement, and evaluation efforts by enabling stakeholders to provide adequate resources. The paper highlights the multitude of factors related to pedestrian safety in this context, and provides an informed discussion for researchers and practitioners involved in advancing safety initiatives.” [http://link.springer.com/article/10.1007/s40864-016-0030-](http://link.springer.com/article/10.1007/s40864-016-0030-4)

[4](#)

2016-0301. FRA Law Enforcement Strategies. On behalf of the FRA, “the Volpe Center has investigated law enforcement methods that have successfully prevented trespassing along the railroad right of way. The types of law enforcement strategies currently being used and procedures followed in the field are documented, along with any findings on the effectiveness of these approaches. The end result of this effort is to produce a compilation of available procedures, best practices, data sources and findings to inform effective law enforcement rail trespass prevention programs.”

<http://www.dupagerailsafety.org/uploads/3/4/3/1/34313736/trespassingriskfactors.pdf>

2016-0506. Havarneanu Review of Literature in Prevention of Railroad Trespass and Suicide.

“This review covers a central aspect in railway safety which is the prevention of suicides and trespassing accidents. The paper attempts to answer the following research question: ‘What measures are available to reduce railway suicide and trespass, and what is the evidence for their effectiveness?’ The review is based on 139 relevant publications, ranging from 1978 to 2014. The analysis aimed to identify the past and current trend in the prevention practice by looking both quantitatively and qualitatively at the recommended measures. According to the results, there has been a constant focus on suicide prevention, and only relatively recent interest in trespass countermeasures. The content analysis revealed 19 main preventative categories which include more than 100 specific measures. We identified 16 common categories against railway suicide and trespass, and 3 categories of specific measures to prevent suicide. There are only 22 studies which provide empirical support for the effectiveness of measures. Actual combinations of measures are barely evaluated, but several challenges emerge from the literature. The discussion focuses on the need for a unified approach to suicide and trespass prevention, and on the importance to consider the effect mechanism of the measures in order to design better interventions.”

<http://www.sciencedirect.com/science/article/pii/S0001457515001414>

2016-0921. CSC Integrations Situational Awareness and Identification System White Paper.

“CSC Integrations is in the final stages of development of the first-ever suicide, criminal, terrorism, and accident identification and prevention system that uses an array of advanced security control technologies, custom video analytics, and a deep learning artificial intelligence engine to identify behavioral patterns that are consistent with persons or vehicles that approach railroad tracks or grade crossings with ill intent and/or identifies a person or vehicle in a dangerous, yet unintended situation.

The Situational Awareness and Identification System (referred to herein as SAAIS) is a multi-faceted detection, analysis, and early warning system that is deployed adjacent to grade crossings and along railroad track right of ways, whereas the system identifies behavioral patterns that are consistent with known patterns of behavior that show intent to commit suicide, criminal acts, or terrorism. SAAIS further identifies when vehicles are stopped, stalled, and/or stuck on at-grade rail crossings or tracks, thereby allowing advanced early warning to oncoming trains prior to a collision. This paper will summarize the SAAIS system, provide a basic overview of its interface, identify the types of applications that it is used in, and the overall implementations of the system on an active railroad environment.”

<http://www.cscintegrations.com/saais>

APPENDIX L - Track Compliance

UFC 4-860-03, 13 FEBRUARY 2008, UNIFIED FACILITIES CRITERIA (UFC), RAILROAD TRACK MAINTENANCE & SAFETY STANDARDS

UFC 4-860-03 unifies the Army/Air Force Handbook of Railroad Track Standards with the Navy's Railroad Trackage Field Assessment Manual into one Department of Defense UFC manual.

- Consolidation of DOD railroad track standards into one single document.
- Consolidation of both railroad track maintenance standards and safety standards into a singular technical manual.

FRA Track and Rail and Infrastructure Integrity Compliance Manual

FRA RR 11-18 | September 2011, Effect of Missing Or Broken Fasteners on Gage Restraint of Concrete Ties

A concrete tie rail fastener provides gage restraint by holding down the base of the rail with tie clips and by holding the sides in place with insulators pressing against the base of the rail. Missing or broken fasteners can reduce the track's gage strength. This study that missing or broken field side clips were found to have less effect on gage restraint than missing or broken gage side clips. However, missing field side insulators had a greater effect on gage restraint than missing gage side insulators. Gage side clips appeared to play a bigger role than field side clips in preventing gage widening as a result of rail roll. In contrast, field side insulators had a bigger role than gage side insulators in resisting gage widening because of rail translation.

Federal Railroad Administration Track Safety Standards Fact Sheet

Under FRA regulations, each railroad has primary responsibility to ensure its track meets or exceeds the federal safety standards. This includes railroad inspectors performing track inspections at specified minimum frequencies based on the class of track, the type of track, the annual gross tonnage operated over the track, and whether it carries passenger trains.

DEPARTMENT OF TRANSPORTATION Federal Railroad Administration, 49 CFR Part 213 [Docket No. FRA-2011-0058, Notice No. 2] RIN 2130-AC28

Track Safety Standards; Improving Rail Integrity

EVALUATION OF RAIL TEST FREQUENCIES USING RISK ANALYSIS, D.Y. Jeong, J.E. Gordon, Volpe National Transportation Systems Center, U.S Department of Transportation

Rail failures, or broken rails, generally occur from fatigue cracks or defects that form and grow in the rail steel as a result of cyclic forces caused by the repeated passage of trains over the rails. Moreover, a broken rail may cause a train to derail. The primary means of controlling the risk of rail failures is rail testing. Rail testing is the continuous search of rail to find defects, in order to allow time for remedial actions to occur prior to rail failures.

APPENDIX M - Positive Train Control

Federal Railroad Administration Status Update on Positive Train Control Implementation, August 2016 - ¹ <http://www.fra.dot.gov/eLib/details/L18325>

2013-0619. GAO Rail Safety PTC Program. “This statement discusses GAO’s preliminary observations about 1) how FRA oversees rail safety, 2) challenges to rail safety, and 3) PTC implementation by the U.S. rail industry. GAO examined FRA’s overall rail safety framework and interviewed state rail safety officials and officials from FRA; selected Class I, II, and III railroads; and Amtrak on rail safety and PTC implementation.” <http://www.gao.gov/products/GAO-13-679T>

2015-0917. SCAX PTC Safety Plan. “This document is the Southern California Regional Rail Authority (SCRRA) Positive Train Control Safety Plan (PTCSP) for the SCRRA Positive Train Control system implemented on Metrolink’s service territory. This PTCSP provides the appropriate information and safety analysis to gain System Certification for SCRRA’s implementation of the Interoperable Electronic Train Management System (I- ETMS) as a vital overlay PTC system as defined in 49 CFR §236.1015 (e)(2). It describes the Safety Assurance Concepts employed and the results of all Safety Assurance activities in connection with the PTC implementation. The outcome is a PTC system that is certifiable as safe by the Federal Railroad Administration (FRA). The underlying system is a vital signaling system operated through centralized supervisory control using a Computer Aided Dispatch (CAD) system. The Wabtec Railway Electronics Interoperable Electronic Train Management System (I- ETMS®) is used as the core technology and functionality for the SCRRA PTC system. The PTC system has been developed in compliance with requirements and standards defined in response to Rail Safety Improvement Act of 2008 (RSIA08) [3] and through the Interoperable Train Control (“ITC”) industry effort and AAR Specifications. The operating description for I-ETMS is provided in the PTCSP, which has received Type Approval from the FRA. The SCRRA implementation of I-ETMS is compliant with the description of the system in the PTCSP in all respects.”

<https://www.federalregister.gov/documents/2015/10/08/2015-25573/positive-train-control-safety-plan-for-the-southern-california-regional-rail-authority>

APPENDIX N - Crewing

2012-0701. Cognitive and Collaborative Demands of Freight Conductor Activities. “This report presents the results of a cognitive task analysis (CTA) that examined the cognitive and collaborative demands placed on conductors, as well as the knowledge and skills that experienced conductors have developed that enable them to operate trains safely and efficiently. A secondary aim of the CTA was to understand the implications of the Rail Safety Improvement Act (RSIA) of 2008 regarding the role of the freight conductor, specifically the mandate for conductor certification and implementation of positive train control (PTC). Data was collected through a combination of field observations, phone interviews, and onsite focus group sessions with experienced conductors, locomotive engineers, trainers, and training managers. A primary finding is that conductors and locomotive engineers operate as a joint cognitive system (Woods and Hollnagel, 2006). They not only work together to monitor the operating environment outside the locomotive, they also collaborate in planning activities, problem solving, and identifying and mitigating potential risk. Although the present CTA does not directly address the issue of how new technologies, such as PTC, are likely to impact the role of conductors in the future, the CTA results do identify multiple ways in which conductors contribute to safe and efficient train operation. As new PTC technologies are introduced, it will be important to assess their impact on the various functions conductors perform in support of safe and efficient train operation, as specified in this report. The CTA also uncovered a variety of knowledge and skills that distinguish experienced conductors from less experienced ones. These findings suggest an opportunity to potentially accelerate building conductor expertise through more systematic training opportunities (both on the job and in locomotive cab simulators). The report concludes with open questions and future research needs as yet uncovered by the CTA.”

<https://www.fra.dot.gov/eLib/details/L04331>

2016-0204. Penn House of Reps Testimony Crew Size. Testimony presented before the Pennsylvania House of Representatives regarding train crew size.

http://www.legis.state.pa.us/WU01/LI/TR/Transcripts/2016_0005T.pdf

2016-0218. FRA Regulatory Impact Analysis Train Crew Staffing. “This Regulatory Impact Analysis presents estimates of the costs likely to occur over the first 10 years of the proposed rule as well as a breakeven analysis that details the reductions in relevant railroad accidents and incidents that will be necessary for the final rule to breakeven over the same timeframe. An extensive description of non-quantifiable benefits is also presented. Informed by its analysis of the economic effects of this proposed rule, FRA believes that this proposed rule will result in positive net benefits. The proposed rule will help ensure that train crew staffing does not result in inappropriate levels of safety risks to railroad employees, the general public, and the environment, while allowing technology innovations to advance industry efficiency and effectiveness without compromising safety.

The proposal contains minimum requirements for roles and responsibilities of second train crew members on certain operations and promotes safe and effective teamwork. The analysis includes estimates of compliance costs associated with the addition of a second crew member to certain trains in existing and new operations. It also includes information submission costs and in some cases mitigation implementation costs, such as installation of new technologies to compensate for the reduction in crew size, associated with a request for special approval to operate with less than two crew members. Other recent and concurrent initiatives to address railroad accidents and incidents including implementation of positive train control systems and conductor certification standards, and implementation of programs to address fatigue and electronic device distraction, among others could be used to mitigate the risk associated with the train operations impacted by the rule now and in the future.” <http://www.regulations.gov/document?D=FRA-2014-0033-0002>

2016-0316. Fed Register FRA Train Crew Staffing NPRM. “FRA proposes regulations establishing minimum requirements for the size of train crew staffs depending on the type of operation. A minimum requirement of two crewmembers is proposed for all railroad operations, with exceptions proposed for those operations that FRA believes do not pose significant safety risks to railroad employees, the general public, and the environment by using fewer than two- person crews. This proposed rule would also establish minimum requirements for the roles and responsibilities of the second train crewmember on a moving train, and promote safe and effective teamwork. Additionally, FRA co-proposes two different options for situations where a railroad wants to continue an existing operation with a one-person train crew or start up an operation with less than two crewmembers. Under both co-proposal options, a railroad that wants to continue an existing operation or start a new operation with less than a two-person train crew would be required to describe the operation and provide safety-related information to FRA; however, proposed Option 1 includes an FRA review and approval period lasting up to 90 days while Option 2 proposes permitting such operations to initiate or continue without a mandatory FRA review and approval waiting period or while such review is taking place. For start-up freight operations with less than two crewmembers, proposed Option 2 also requires a statement signed by the railroad officer in charge of the operation certifying a safety hazard analysis of the operation has been completed and that the operation provides an appropriate level of safety.” See Docket FRA 2014-0033 for more information at:<http://www.regulations.gov/searchResults?rpp=25&po=0&s=fra%2B2014-0033&fp=true&ns=true>

2016-0615. Oliver Wyman Assessment of European Railways Crew Safety. “In Oliver Wyman’s experience, safe train operations have more to do with what is in front of a locomotive, rather than what it is pulling. Most European railroads have used single- person crews on freight trains for decades, predating advanced train control technology. They use single-

person crews despite the fact that Europe has twice the train density, far more passengers sharing the network with freight, and far more control transactions per route-kilometer – and yet suffers no reduction in crew-related safety.”

[https://www.aar.org/Documents/Oliver%20Wyman,%20Assessment%20of%20European%20Railways%20\(June%202016\)\[1\].pdf](https://www.aar.org/Documents/Oliver%20Wyman,%20Assessment%20of%20European%20Railways%20(June%202016)[1].pdf)

APPENDIX O - Crude by Rail Documents.

2013-0514. Enhancing Railroad Hazardous. Presentation by Kevin Blackwell of FRA on hazardous material routing and related haz mat rules. [http://energy.gov/sites/prod/files/em/Blackwell NTSF 2011.pdf](http://energy.gov/sites/prod/files/em/Blackwell%20NTSF%202011.pdf)

2014-0504. CRS Crude Oil Shipments by Rail. Report prepared by the Congressional Research Service discussing recent trends and implications of crude oil transport by rail. “The rapid expansion of North American oil production has led to significant challenges in transporting crudes efficiently and safely to domestic markets—principally refineries— using the nation’s legacy pipeline infrastructure. In the face of continued uncertainty about the prospects for additional pipeline capacity, and as a quicker, more flexible alternative to new pipeline projects, North American crude oil producers are increasingly turning to rail as a means of transporting crude supplies to U.S. markets. According to rail industry officials, U.S. freight railroads are estimated to have carried 434,000 carloads of crude oil in 2013 (roughly equivalent to 300 million barrels), compared to 9,500 carloads in 2008. In 2014, 650,000 carloads of crude oil are expected to be carried. Crude imports by rail from Canada have increased more than 20-fold since 2011.

The amount of oil transported by rail may also be influenced by a tight market for U.S.- built tankers.” <http://www.fas.org/sgp/crs/misc/R43390.pdf>

2015-0301. Washington State Analysis of Risks. “Significant changes in the transportation of crude oil are occurring in Washington State. In particular, transportation methods and oil types have been changing. Historically, 90% of crude oil bound for refineries was delivered by tank ship. In 2014, pipeline and rail delivery made up more than 30% of the oil imports, while vessel delivery was reduced to less than 70%. The properties of some of the oils being transported also raise planning and response concerns. This report contains the results of the Marine and Rail Oil Transportation Study authorized by the Legislature in April 2014. The objective of the study was to analyze the risks to public health and safety and to the environment associated with the transport of oil in Washington. In the study, the Washington State Emergency Management Division, surveyed local and tribal planning and fire districts on the readiness of local jurisdictions to respond to an oil-by-rail incident. The Washington State Utilities and Transportation Commission reviewed safety records of almost 350 rail crossings. The Washington State Department of Ecology reviewed oil spill prevention and readiness measures in place at the federal and state levels. The January 2015 Salish Sea workshop was conducted, focusing on oil spill risk in the geographic region of the Salish Sea. Comments from hundreds of people were collected through information-gathering workshops, government-to-government meetings with tribes and tribal organizations, and meetings with communities across the state. This report contains 43 findings and recommendations for legislative, regulatory, or voluntary actions. The recommendations propose ways to maximize public

safety and protect the environment, tribal treaty rights, and the state's natural and economic resources. The report also identifies gaps in information which future studies should address. Seven of the appendices in the report contain detailed information on oil transport by rail, facilities and vessels, spill planning and response, properties of oil, and the fate of oil when spilled." <https://fortress.wa.gov/ecy/publications/documents/1508010.pdf>

2015-0503. Trains Drones for Crude Oil Inspection. Article from the June 2015 edition of *Trains* magazine discussing use of drones (Unmanned Aerial Systems or Vehicles – UAS or UAV) to conduct track and right-of-way inspections. <http://trn.trains.com/issues/2015/june-2015>

Crude Oil Route Track Examination (CORTEX) Program.

2015-0803. Pennsylvania Crude by Rail Analysis. "As the volume of Crude By Rail (CBR) shipments have increased over the past several years, the Commonwealth of Pennsylvania has become increasingly concerned about the risks of a CBR incident occurring on a rail line that goes through populated areas within the state. This is particularly important for the Commonwealth since large volumes of CBR are shipped through the state by two major Class 1 railroads, Norfolk Southern (NS) and CSX Transportation (CSX). While the recent actions taken by the railroad industry and the Department of Transportation have been of great value, there is still concern about the level of risk present on these rail lines. Because of the concern about the level of risk present on these rail lines, the Commonwealth of Pennsylvania asked the University of Delaware to look at the current level of risk and advise as to how to reduce the risk of a CBR incident in the Commonwealth. This report presents the results of this assessment. This assessment addresses three major areas of CBR safety in the Commonwealth: Derailment Risk; Tank Car Breach/Rupture Risk; and Regulatory Oversight. This assessment also addresses the effect of proposed new Department of Transportation and industry standards for tank car design and train operations and operating systems to include speed reduction, use of Electronically Controlled Pneumatic (ECP) Brakes and Positive Train Control (PTC)." <https://www.scribd.com/doc/274852355/Assessment-of-Crude-by-Rail-CBR-Safety-Issues-in-Commonwealth-of-Pennsylvania#>

2015-1201. Oliver Wyman Canada Oil by Rail Analysis. "Canadian crude oil and related products are transported primarily by pipelines and railways. As the volume of crude oil carried by rail has increased in recent years, some industry analysts have raised questions about the relative safety of different modes of transport for crude oil. Some of these analyses have presented an incomplete picture, leading to unwarranted conclusions about the overall safety of one mode compared to another. To provide a balanced perspective on this issue, this paper briefly reviews recent statistical data on pipeline and rail crude oil spills – both the number of incidents and the volume spilled. Based on this data, it is our contention that, with

current regulation and investment, both rail and pipeline have comparable safety records and are safe means of transporting crude oil.”

http://www.railcan.ca/assets/images/news/rac/Oliver_Wyman_RAC_Dec_2015.pdf

2015-9999. Ten Questions on Crude-by-Rail Risks. “Over the past 18 months, the transportation of crude oil by rail has been increasingly in the spotlight, due to more than a half-dozen incidents involving cars carrying Bakken crude. Much is being done to improve the safety profile of crude oil transport: Regulators in the US and Canada have issued or will soon issue comprehensive new safety rules; railroads have introduced new operating practices; and design standards for new tank cars are being updated. In addition, the North Dakota Industrial Commission (NDIC) recently issued new regulations, effective April 1, 2015, that will require additional processing steps to reduce the volatility of North Dakota crude oil. In the midst of these rapid changes, senior executives and boards of oil companies have realized the need to better understand the evolving risks they face when shipping crude oil by rail – be they operational, strategic, financial, or reputational. To that end, Oliver Wyman believes that there are ten questions that oil company decision makers must ask and answer surrounding the transport of crude oil by rail. While not all of the issues addressed by these questions are within shipper control, understanding them is critical to illuminate potential operational, financial, and reputational risks and liabilities.”
<http://www.oliverwyman.com/content/dam/oliver-wyman/global/en/2015/feb/ten-questions-on-crude-by-rail-risks.pdf>

APPENDIX P - Funding-Programming Documents.

2002-0701. ITRE Safety Program Report 2002. “The state-operated rail safety inspection programs serve as adjuncts to the program operated by the Federal Railroad Administration (FRA). The purpose of this study is to complete a benefit cost study of state rail safety inspection programs, which currently are in operation in 30 states. More specifically, this study determined the costs to the individual states, and the total cost to states, of operating the state programs, and estimated the costs to the federal government if the FRA were to directly operate those safety inspection programs. These costs are considered the benefits the FRA receives from the existence of the state-operated safety inspection programs. The study also provides information that is not integral in identifying FRA benefits, but is useful for other analysis, such as information on costs and staffing that is reported by the five inspection disciplines, and state inspection productivity data.”
<http://www.s4prc.org/sites/default/files/media/Report%20--%20State%20Safety%20Programs.pdf>

2005-1010. VADOT State Rail Agency Survey. Survey of state agencies responsible for state rail safety improvement programs. “The Department of Rail and Public Transportation conducted a survey over the past six weeks to solicit and compile input from other states as to how public rail programs at the state level are structured, the governance of that structure and the funding conduits of which rail related programs and projects are funded. Including the District of Columbia and Puerto Rico, 52 surveys were sent with 41 responses received by the close of the comment period. The survey report is presented in two parts, a narrative detailing the information compiled, and a matrix outlining the state information in consideration of structure, governance, and funding. Resulting from the compilation of this information, based on prior knowledge and discussions, the Department of Rail and Public Transportation has given consideration to indicate several states as, “Model to Consider.” These states through their structure, governance, or funding mechanisms possess qualities, all or in part, of what could be considered for incorporation in the Rail Commission’s evaluation and ultimate final recommendation.” No HTTP Link Available.

APPENDIX Q - International Issue Documents.

Please note that the HTTP links provided take you to the main link for the referenced organization: Reduction of Suicides and Trespasses on Railway Property (RestRail), Global Level Crossing Symposium 2014 (GLXS), UN-ECE Group of Experts, European Level Crossing Forum (ELCF), and International Level Crossing Awareness Day (ILCAD). The documents provided are representative samples of the work of each organization.

2012-0719. Restrail Evaluation of Trespass Prevention Methods. This document describes the method that is used in the evaluation of preventative measures targeted to reduce railway suicides and trespassing accidents in the RESTRAIL project. The purpose of the evaluation is to identify measures that can effectively reduce suicides and trespassing accidents that are cost effective, and have no shortcomings that could significantly impede implementation. <http://www.restrail.eu/spip.php?article2>

2014-0806. GLXS 2014 Proceedings-Technical Papers. Collection of 35 technical papers presented at the 13th Global Level Crossing and Trespass prevention Symposium held at the University of Illinois August 3rd through the 8th, 2014. <http://railtec.illinois.edu/GLXS/presentations.php>

2015-0129. UN-ECE Level Xing Group of Experts 4th Meeting. Collection of presentations made to the United Nations (UN) Economic Committee for Europe (ECE) Inland Transport Committee's Working Party on Road Traffic Safety's Group of Experts on Improving Safety at Level Crossings. The presentations are from the 4th of 8 meetings of the Working Group held through September 2016. The purpose of the Working Group is to "provide an international discussion platform for increasing safety at the interface of road and rail systems, by bringing together specialists from the public and private sectors, as well as academia and independent research. A "Safe System" approach will be adopted by taking into consideration the five key elements (5E's) typically used in level crossing safety: Engagement, Education, Engineering, Enforcement and Economics." Topics include: NCHRP Report 755 – Cost of Crossing Collisions (USA-FRA); Review and Analysis of the Economic Costs of Level Crossing Accidents Poland); Safety Data Review (UK); Good Practices to Improve Level Crossing Safety (Finland); Legislation and Legal Arrangements at level Crossings; Human Factors at level Crossings – The Birth of a Toolbox; Enforcement Sub-Group Report; and, Safe System Process Model. http://www.unece.org/trans/roadsafe/eg_level_crossings_04.html

2015-1203. ELCF Antwerp All Presentations. Collection of presentations made to the European Level Crossing Forum at their meeting of December 3, 2015 held at Antwerp, Belgium. Topics include: Infrabel-Belgium: Rail-Road Interface Action Plan; ProRail- Netherlands: Unprotected Level Crossings in the Netherlands; Feedback on Speed Cameras and Red Light Cameras at Level Crossings (France); Trespassing in the Czech Republic; Safety on level Crossings

Neighboring to Road Crossings (Poland); Anti- Trespassing Measures in Poland; and Infrabel-Belgium: Signalization Level Crossings in Belgium.

<http://www.erscharter.eu/en/content/european-level-crossing-forum>

2015-1204. ILCAD All Presentations. Collection of presentations made to the organizers of International Level Crossing Awareness Day at their meeting held December 4, 2015 at Antwerp, Belgium. Topics include: Infrabel-Belgium: Raising Awareness About the Dangers of Level Crossings; ILCAD Program of the Slovak Republic; and, ILCAD Program of Latvia; ILCAD 2015 and 2016 Summary. <http://www.ilcad.org/ILCAD-2017,399.html>

APPENDIX R - Research Issue Documents

2013-9999. NCHRP Report 755 Cost of Hwy-Rail Crashes. “NCHRP Report 755: Comprehensive Costs of Highway-Rail Grade Crossing Crashes presents a process for estimating the costs of highway-rail grade crossing crashes. A spreadsheet tool to facilitate use of this cost estimation process was also developed and may be down-loaded at <http://www.trb.org/main/Blurbs/169061.aspx>.

Departments of transportation (DOTs) and other public agencies use such estimates in making decisions about investments to install safety devices or reconstruction to provide grade separation of the road and rail line. The report will be helpful to officials of such agencies who must identify and assess the merits of investments proposed to enhance safety at grade crossings.” http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_755.pdf

2014-1223. RFP Notice Grade Separation Prioritization. “While safety continues to be a high priority in the development of road-rail grade separation projects, state and local decision makers need additional, robust criteria when prioritizing these projects for funding and construction. This situation is particularly acute along a rail corridor that is experiencing a significant increase in the number of train movements, or where the operating speed or train length has increased. For instance, the increasing use of rail to transport energy products such as crude oil, or the addition of passenger rail operations, has caused train movements to increase dramatically in several regions of the United States. A more comprehensive set of criteria that balance economic and social benefits and costs could facilitate a more thorough analysis for prioritizing grade crossing separation projects along rail corridors experiencing increasing train movements or changing operating conditions. In times of fiscal constraint, there is a need for a more precise, objective way to evaluate the merits of proposed grade separation projects. The objectives of this research are to develop: (1) a prioritization procedure for transportation practitioners to rank road-rail grade separations within specific rail corridors; and (2) a communication toolkit to inform and convey to stakeholders and decision makers the relative objective merits of individual road-rail separation projects within corridors.” <http://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=3890>

2014-0501. NCRRP Research Results Digest 1. “This report presents a potential strategic plan and research agenda for the National Cooperative Rail Research Program (NCRRP) should the program continue beyond currently available funding. NCRRP is one of a number of active rail research programs, including work of the Federal Railroad Administration (FRA), the Association of American Railroads (AAR), individual railroads, their suppliers, and research institutions. While other rail research programs have been addressing technology, materials, and safety

issues, NCRRP has focused on matters of policy, economics, and institutions. This report assumes that the focus going forward would continue to be primarily in these areas. That focus should not be interpreted to diminish the value of other rail research.”
https://www.nap.edu/login.php?action=guest&record_id=22391

2015-9999. TCRP Report Light Rail Ped Xings. “TCRP Report 175: Guidebook on Pedestrian Crossings of Public Transit Rail Services presents a wide array of engineering treatments to improve pedestrian safety for three types of public transit rail services: light rail, commuter rail, and streetcar. The Guidebook is a resource that addresses key pedestrian safety issues associated with public transit rail services; presents pedestrian crossing issues associated with the National Environmental Policy Act of 1969 and the Americans with Disabilities Act; summarizes readily available decision flowcharts used to make decisions regarding pedestrian treatments at rail crossings; presents information for 34 pedestrian treatments used at rail crossings, grouped into eight appropriate categories; and includes four case studies that examine specific decisions with respect to pedestrian- rail crossings. The Guidebook is supplemented by a final research report, TCRP Web-Only Document 63: Treatments Used at Pedestrian Crossings of Public Transit Rail Services (available on the TRB website). This report presents the methods and results from the detailed literature review, data analysis, industry survey, interviews, and site visits. The research deliverables will be useful to transit agencies that provide light rail, commuter rail, and streetcar services; local departments of transportation; and urban planners seeking to improve the safety of pedestrians who use transit services, as well as others crossing public transit rails who are not transit patrons.”
http://www.tcrponline.org/PDFDocuments/tcrp_rpt_175.pdf

2016-0105. 2016 IDEA Program Review. This annual report presents a summary of progress on investigations conducted as part of the Rail Safety Innovations Deserving Exploratory Analysis (Rail Safety IDEA) program sponsored by the Federal Railroad Administration and overseen by the Transportation Safety IDEA Program Committee. Rail Safety IDEA is one of three IDEA programs managed by the Transportation Research Board (TRB) to improve railroad safety and performance. The Federal Railroad Administration is interested in proposals that will improve safety and performance in railroad systems, including in the following areas: security, environmental impact; human factors; rolling stock and components; track and structures; track/train interaction; grade crossings; hazardous materials transportation; train occupant protection; trespass prevention; signaling and train control systems; and employee safety.
http://onlinepubs.trb.org/onlinepubs/IDEA/rail_safety_idea_Annual2016.pdf

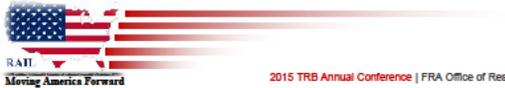
APPENDIX S - Emerging Trends in Railroad Safety

F E D E R A L R A I L R O A D A D M I N I S T R A T I O N



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