DOT-FTA-MA-90-5006-02-01
DOT-VNTSC-FTA-02-04

U.S. Department
of Transportation

Federal Transit
Administration

State Safety Oversight Program

Office of Safety and Security

http://www.transit-safety.volpe.dot.gov

Annual Report for 2000

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. AGENCY USE ONLY (Leave blank)	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED
	February 2002	Final Report March 2001-December 2001

4. TITLE AND SUBTITLE
State Safety Oversight Program Annual Report for 2000

5. FUNDING NUMBERS
TM20A/U2169

6. AUTHOR(S)
Robert J. Adduci, Annabelle Boyd, and James E. Caton

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
U.S. Department of Transportation
Research and Special Programs Administration
Volpe National Transportation Systems Center
55 Broadway, Kendall Square
Cambridge, MA 02142-1093

8. PERFORMING ORGANIZATION REPORT NUMBER
DOT-VNTSC-FTA-02-04

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)
U.S. Department of Transportation
Federal Transit Administration
Office of Program Management,
Office of Safety and Security
400 7th St. SW
Washington, DC 20590

10. SPONSORING/MONITORING AGENCY REPORT NUMBER
DOT-FTA-MA-90-5006-02-01

11. SUPPLEMENTARY NOTES

12a. DISTRIBUTION/AVAILABILITY STATEMENT

This document is available to the public through the National Technical Information Service, Springfield, Virginia 22161.

12b. DISTRIBUTION CODE

13. ABSTRACT (Maximum 200 words)

The Federal Transit Administration's (FTA) State Safety Oversight Rule (49 CFR Part 659) requires oversight for all rail transit agencies in revenue operation after January 1, 1997. This report summarizes activities performed to implement the State Safety Oversight Program during Calendar Year 2000. This report is a compilation and analysis of rail fixed guideway system accident and crime statistics. Information provided by State Oversight Agencies documenting the safety and security performance of the rail transit industry in 2000 is presented, including a discussion of the probable causes of accidents and unacceptable hazardous conditions.

14. SUBJECT TERMS
State safety oversight; safety; security; annual report; data; planning; design and construction project development phases; rail transit industry performance

15. NUMBER OF PAGES
76

16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT
Unclassified	Unclassified	Unclassified	

Acknowledgements

The *State Safety Oversight Program Annual Report for 2000* represents the cooperative efforts of many people. For their guidance and technical direction, the authors give special thanks to Mr. Hiram J. Walker of the Federal Transit Administration's (FTA) Office of Program Management, Mr. Harry Saporta, Mr. Jerry Fisher, Mr. Roy Field, and Mr. Frank McCarron of FTA's Office of Safety and Security; the State Safety Oversight Agencies, who implement the State Safety Oversight Program and provide the data, procedures, and policies upon which this report is largely based; the American Public Transportation Association, FTA's National Transit Database Program, the Transportation Research Board, and the National Transportation Safety Board, who all provided additional data to support state reports and analysis. Finally, the authors wish to thank Mr. James Harrison, Mr. Robert Adduci, and Mr. Jerry Powers of the Volpe National Transportation Systems Center for their invaluable contributions of statistical data, insights, and suggestions. Their combined efforts greatly improved the content of this report.

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Preface

A primary objective of the Federal Transit Administration's (FTA) State Safety Oversight Program has been to create a nationwide infrastructure to provide effective safety and security monitoring and evaluation for rail transit. Information presented in the *State Safety Oversight Program Annual Report for 2000* demonstrates the success of this program in not only requiring and documenting the activities performed by rail transit agencies to address safety and security issues, but also in promoting an operating culture more attuned to safety and security concerns.

Safety requirements for FTA's State Safety Oversight Rule (49 CFR Part 659) went into effect January 1, 1997. Approaching the Rule's 5-year anniversary, rail transit safety oversight in the United States has been transformed.

In 1997, there were 6 designated state agencies overseeing the operations of 12 rail transit systems. By the end of 2000, there were 22 designated oversight agencies implementing Part 659 requirements for 35 rail transit systems. In anticipation of "New Start" Systems initiating revenue service in the next 5 years, 6 additional states have designated oversight agencies, bringing the total as of this report to 28 State Safety Oversight Agencies (SOAs).

Accomplishments of the Program since its inception include the following:

- Development of system safety programs and system safety program plans (SSPPs) at 36 rail fixed guideway systems (RFGS) which meet minimum requirements specified by the SOAs and FTA, including operational provisions for hazard analysis, internal safety audit programs, and formal determination of probable cause resulting from accident investigations.

- Development of system security programs and system security program plans (Security Plans) at 35 RFGS which address the security of passengers and employees, and clearly identify transit agency responsibilities for security.

- Development and approval of investigation procedures at 36 RFGS which ensure collection and evaluation of evidence sufficient to support probable cause determinations and the development of corrective actions.

    - Performance of over 500 investigations using these procedures.
    - Development, approval, and implementation of 396 corrective action plans to address determinations of probable cause resulting from these investigations.

- Implementation of hazard analysis programs at 35 RFGS sufficient to support identification, reporting, and resolution of unacceptable hazardous conditions during transit operations.

    - Investigation and resolution of more than 100 unacceptable hazardous conditions.

- SOAs conduct of more than 40 Three-Year Safety Reviews at the rail transit agencies within their jurisdiction to assess implementation of system safety and security program and to make determinations regarding the efficacy of the programs.

    - Development, approval, and implementation of over 700 corrective actions to address findings from State Three-Year Safety Reviews.

- Implementation of internal safety audit programs at 36 RFGS, resulting in almost 1,000 corrective action plans developed and implemented to address rail transit findings.

- For the first time, collection and analysis of probable cause data from rail transit agencies regarding accidents and unacceptable hazardous conditions.

The State Safety Oversight Program emphasizes use of a *systems approach* to address safety and security, promoting application of management and engineering principles to identify and resolve safety hazards and security vulnerabilities. Through ongoing implementation of system safety and security programs, monitored by SOAs, the rail transit industry is now performing formalized assessments to balance hazards and controls, which ultimately can ensure the maximum protection for passengers, employees, others, system property, and the environment within the limits of available resources.

Ultimately, establishing and evaluating baseline measures for safety and security performance supports oversight and industry activities to develop programs that:

- Establish and assure compliance with rail transit agency safety and security strategies, objectives, and standards.
- Foster early integration of safety, security, reliability, maintainability, and quality assurance into rail transit operations.
- Improve methodologies for risk identification and assessment, and provide recommendations for risk mitigation and acceptance.
- Provide investigation, analysis, and recommendations for critical safety and security decisions.
- Sponsor the innovation and rapid transfer of safety, security, reliability, maintainability, and quality assurance technologies, processes, and techniques to improve system performance.

Executive Summary

The Calendar Year (CY) 2000 was one of accomplishments and challenges for the State Safety Oversight Program. Analysis of data reported by rail transit agencies and State safety oversight agencies for 2000 indicates:

Service

- Combined, the rail transit agencies affected by 49 CFR Part 659 provide approximately 10 million daily unlinked passenger trips, accounting for 30 percent of all trips taken on public transportation.

- This level of ridership is the highest ever for rail transit, and marks a 5 percent increase from a decade ago.

- Further growth in ridership is expected throughout the decade as the substantial increases in Federal funding under the Transportation Equity Act for the 21st Century are translated into operational service. Since January 1, 2000, 10 rail transit agencies have initiated major projects into revenue service. By the end of 2003, 15 more agencies will bring projects online. By 2010, more than 40 major rail transit projects will have been initiated into revenue service. Combined, these projects will reflect a national investment in excess of $30 billion.

- Since 1991, annual passenger miles have more than doubled for light rail service and the number of light rail operations has increased from 14 to 20.

- Prompted by major ridership gains in New York and Washington, D.C., heavy rail transit has experienced a 30 percent increase in passenger miles over the same 10-year period.

- Since 1997, 346 rail grade crossings have been introduced into revenue service on light rail extension and new start projects. The vast majority of these grade crossings are protected or traffic-controlled.

Safety

- In CY 2000, rail transit agencies reported 3,192 incidents that met the 49 CFR Part 659.5 definition of ***accident***. This total represents an increase of approximately 22 percent over CY 1999 totals (2,627). These 3,192 incidents resulted in 102 fatalities and 3,371 injuries.

- Of the 102 reported fatalities, 61 were the result of suicides and trespassing incidents. The remaining 41 fatalities represent a 5 percent increase when compared to 1999.

- The 3,371 injuries attributable to FTA reportable accidents in CY 2000 represent an increase of roughly 20 percent when compared to CY 1999 totals (2,839). When compared to 1999, injuries resulting from:

    - Collisions decreased by 47 percent.
    - Rail Grade Crossing incidents declined roughly 43 percent.
    - 72 percent of injuries from Rail Grade Crossing incidents occurred at traffic-controlled crossings.

- Fires decreased by 1/3.
- Other reportable incidents rose by 22 percent (reflecting improved reporting of "single-person injuries" such as passenger slips, trips, and falls resulting from clarifications made during FTA's SSO Audit Program).

- In CY 2000, there was a reduction in reportable collisions and rail grade crossings, while reported fires, derailments, and single-person accidents all increased over CY 1999 totals.

- With only 41 fatalities and approximately 3,000 injuries requiring hospitalization attributed to operations that provide 2.89 billion unlinked passenger trips, ***rail transit remained the safest mode of transportation in 2000.***

Causal Data

- For the total 3,192 reported incidents, the number of reported accidents for which the probable cause was determined to be an "other vehicle" rose from a 23 percent share of probable causes in CY 1999 to a 35 percent share in CY 2000. Also of note, the category of cause "pedestrian" was determined as the probable cause in 11 percent of CY 2000 accidents, up from 2 percent in CY 1999. However, accidents in which "rule violation" was determined as the cause decreased over the same period, from 22 percent in CY 1999 to 6 percent in CY 2000. Other key findings include:

  - 82 percent of light rail collisions were caused by either pedestrians or other vehicles.
  - 47 percent of the heavy rail collisions were caused by actions of a passenger.
  - Operating rule and procedure violations were identified as the probable cause in approximately 10 percent of the total number of collisions and derailments (all modes combined).

Other SSO Program Activity

- In 2000, eight states conducted Three-Year Safety Reviews. These reviews resulted in findings that required RFGS to submit a total of 310 corrective action plans (CAPs). Of the 310 submitted CAPs, 308 were approved for implementation by the SOA.

- In addition to the findings from the Three-Year Safety Reviews conducted at the RFGS, 10 RFGS submitted corrective actions for SOA approval as the result of internal safety audits. These corrective actions numbered 497, with 330 being approved for implementation. Of the 497 CAPs submitted, 151 remain open.

Security

Rail transit agencies reported the following:

- Violent crimes for 2000 decreased by 3 percent from 1999 totals.
- Property crimes increased 1 percent over the same period.
- Quality of life crimes increased by 35 percent (reflecting improved consistency in reporting as a result of FTA's Transit Security Audit Program).

Introduction

The *State Safety Oversight Program Annual Report for 2000* has been prepared by FTA's Office of Safety and Security to document the activities and performance of State Safety Oversight Agencies, and the rail fixed guideway systems within their jurisdictions, for the calendar year 2000. Results from this report assist these organizations in developing management structures and work programs to effectively plan, implement and evaluate safety and security-related programs for passenger service.

The *State Safety Oversight Program Annual Report* is an evolving document. Last year's inaugural edition followed an encyclopedic approach, providing a baseline of information on various aspects of the programs developed and implemented by FTA, State Safety Oversight Agencies, and rail transit systems to address both 49 CFR Part 659 requirements and basic safety and security performance levels. This second edition streamlines the initial approach, focusing exclusively on following State Safety Oversight Program elements:

- Overview of Requirements;
- State Safety Oversight Community;
- Rail Transit Industry Service and Safety Measures for 2000;
- Principal Safety Findings from 2000 Annual Reports; and
- Rail Transit Industry Security Measures for 2000.

Safety and Security Community

This report uses the following acronyms to refer to key participants in the State Safety Oversight Program:

- DOT - *United States Department of Transportation*
- FTA - *Federal Transit Administration*
- SOA - *State Safety Oversight Agency* designated to implement 49 CFR Part 659 requirements (also referred to as Oversight Agency)
- RFGS - *Rail Fixed Guideway System* as defined in 49 CFR Part 659.5 (also referred to as rail transit agency or rail agency)
- NTSB - *National Transportation Safety Board*
- NTD - *National Transit Database*
- APTA - *American Public Transportation Association*

Information Sources

Information presented in this report comes from three sources:

- **2000 National Transit Database Safety and Security Reports**. Over the last decade, rail transit systems reported first safety – then later security – data directly to FTA. *All rail transit agencies receiving direct federal financial assistance under FTA's formula grant program must report this data annually to retain eligibility for federal funds.* This information is collected on Form 405 of the National Transit Database Reporting System. Safety incidents that meet the following definition must be reported:

    - Involve property damage exceeding $1,000;
    - Require medical treatment of a passenger or an employee, either on-site or in a hospital; and

- Result in a fatality within 30 days.

Security incidents are reported according definitions developed by the Federal Bureau of Investigation (FBI) for the Uniform Crime Reporting System.

- **2000 Annual Reports**. FTA's State Safety Oversight Rule (49 CFR Part 659.45) requires that, by March 15 of each year, SOAs must submit to FTA an annual report summarizing oversight activities for the preceding 12 months, including a description of the most common probable causal factors of accidents and unacceptable hazardous conditions. In 1999, in response to congressional concern and NTSB recommendations, FTA developed an *Annual Reporting Template* to facilitate the collection of causal data in a format that could be quantified at year's end. 1999 was the first year for collecting causal data in this format under the State Safety Oversight Program. (Prior to 1999, causal data collected in the annual report was descriptive in nature and not quantifiable.) FTA continued this approach in 2000: SOAs made Annual Report submissions using FTA's *Annual Reporting Template for 2000* (see Appendix A).

- **2000 Audit Program**. The State Safety Oversight Audit Program provides FTA with the opportunity to identify the requirements of Part 659 that have been most difficult for SOAs to implement. Further, it supports communication with the states that results in the greater sharing of technical information, the solicitation of best practices, and the development of activities that promote an increased coordination between all stakeholders responsible for ensuring that system safety and security objectives are being identified and met each year.

Use of Information Presented in this Report

The information contained in this report supports national and local efforts to monitor and continually improve transit safety and security. Application of NTD and Annual Report data enables FTA, SOAs, and RFGS to quantify the reasons for transit accidents, leading to the identification of safety and security deficiencies and their ultimate resolution. In this way, all involved parties can more effectively work toward the goal of eliminating transit-related deaths, injuries, and property damage.

The State Safety Oversight Rule affects many different types of rail transit operations, including heavy rail, light rail, trolleys, cable cars, inclined planes, and automated guideways. Every attempt has been made to standardize safety and security performance measures across a series of service indicators to support industry-based assessments of aggregate data. However, the range of operating requirements and the importance of local operating conditions limit the utility of individual agency comparisons to the industry baselines and averages contained in this report. SOAs and RFGS are advised to use caution in their application of these measures.

Chapter 1.
State Safety Oversight Overview

In response to congressional concern regarding the potential for catastrophic accidents and security incidents on rail transit systems, the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) added Section 28 to the Federal Transit Act (codified at 49 U.S.C. Section 5330). This section required FTA to issue a Rule creating the first state-managed oversight program for rail transit safety and security.

FTA published "Rail Fixed Guideway Systems; State Safety Oversight" on December 27, 1995 (codified at 49 CFR Part 659), subsequently referred to as the State Safety Oversight Rule or Part 659. This Rule sets forth FTA's requirements to improve the safety and security of RFGS. Only those states with RFGS meeting the following definition must comply with FTA's State Safety Oversight Rule:

> "Any light, heavy or rapid rail system, monorail, inclined plane, funicular, trolley, or automated guideway that is included in FTA's calculation of fixed guideway route miles or receives funding under FTA's formula program for urbanized areas and is not regulated by the Federal Railroad Administration (FRA)." (§659.5)

Rule Requirements

FTA's Final Rule for State Safety Oversight requires each state with an RFGS operating within its borders to designate an Oversight Agency with sufficient legal authority to comply with the minimum requirements established in Part 659. Specifying the exact details of how the Oversight Agency operates is beyond the scope of Part 659, and is left for each Oversight Agency to determine. FTA does not require a single approach to establishing the legal, financial, or procedural mechanisms used to provide oversight.

FTA's State Safety Oversight Audit Program outlines seven distinct functions that must be performed for compliance:

- Oversight Agency Designation and Authority (§659.21);
- Oversight Agency Program Management (§659.47, §659.23, §659.31, and §659.45);
- System Safety/Security Program Standard Preparation and Adoption and RFGS System Safety/Security Program Plan Review and Approval Process (§659.31 and §659.33);
- Accident/Unacceptable Hazardous Conditions Investigations and Corrective Actions (§659.39, §659.41, and §659.43);
- Three-Year Safety Reviews (§659.37);
- Requiring and Reviewing RFGS Internal Safety Audit Process Reporting (§659.35); and
- Oversight Agency Certification and Reporting to FTA (§659.45 and §659.49).

The requirements are further sub-divided into the following:

- The obligation of the *state* to designate the Oversight Agency.

- The authorities and responsibilities of the *Oversight Agency* in developing the requirements and programs necessary to comply with FTA's State Safety Oversight Program.

- The role of the *rail transit system* in complying with the program developed by the Oversight Agency.

The State

The primary responsibility of the state is to designate an Oversight Agency (or Agencies) to oversee the safety of the rail transit systems operating within its borders. When the rail system operates only within a single state, that entity must be an agency of the state; when it operates in more than one state, the affected states may designate a single entity to oversee that system. In neither case may the state designate the rail transit system as the Oversight Agency.

The Oversight Agency

The designated State Oversight Agency is required by Part 659 to perform seven distinct functions. These activities constitute the core of FTA's State Safety Oversight Rule. The Oversight Agency must:

- **Develop a System Safety Program Standard (Program Standard)**. This written document defines the relationship between the Oversight Agency and the rail transit system and guides the rail transit system in developing its System Safety Program Plan (SSPP).

    - The Program Standard must, at a minimum, comply with APTA's Manual for the Development of Rail Transit System Safety Program Plans (APTA Manual) and include specific provisions addressing the personal security of passengers and employees.

- **Require, review and approve, and monitor the implementation of an SSPP that complies with the Oversight Agency's Program Standard at each rail transit system.** By January 1, 1997, the Oversight Agency must review and approve, in writing, the rail transit system's SSPP. The security provisions of the SSPP, however, do not have to be approved initially by the Oversight Agency until January 1, 1998. After the initial approvals, the Oversight Agency must review, as necessary, the rail transit system's SSPP and determine whether it should be updated.

- **Require each rail transit system to report the occurrence of accidents and unacceptable hazardous conditions within a period of time specified by the Oversight Agency**. The Oversight Agency must investigate such events in accordance with established procedures. The Oversight Agency may conduct its own investigation, use a contractor to conduct an investigation, or review and approve the investigation conducted by the rail transit system or the NTSB, or use a combination of these methods.

- **Require the rail transit system to implement a Corrective Action Plan.** The Oversight Agency must require the rail transit system to minimize, control, correct, or eliminate hazardous conditions identified during investigations, in accordance with a Corrective Action Plan drafted by the rail transit system and approved by the Oversight Agency.

- **Conduct on-site visits at each rail transit system at a minimum of every 3 years to perform a formal Safety Review**. In a Safety Review, the Oversight Agency must assess whether the rail transit system's actual safety and security practices and procedures comply with its SSPP. Once this Review is completed, the Oversight Agency must prepare a report containing its findings and recommendations, an analysis of the efficacy of the rail transit system's SSPP, and a determination of whether the SSPP should be updated.

- **Require the rail transit system to conduct safety audits according to the Internal Safety Audit Process detailed in the APTA Manual (Checklist Number 9)**. In addition, the Oversight Agency must require the rail transit system to compile and submit an Annual Audit Report for review.

- **Report to FTA**. The Oversight Agency must submit three kinds of reports to FTA: an Initial Submission, an Annual Submission, and a Periodic Submission.

The Rail Transit System

While the requirements in Part 659 are directed at the states and the Oversight Agencies, the rail transit agencies play an important role in the State Safety Oversight Program.

To comply with Part 659, the Oversight Agency must require each rail transit system within its jurisdiction to perform the following activities (at a minimum):

- Develop an SSPP that complies with the Oversight Agency's Program Standard.

- Classify hazardous conditions according to the **APTA Manual Hazard Resolution Matrix**.

- Report, within the time frame specified by the Oversight Agency, any accident or unacceptable hazardous condition.

- Obtain the Oversight Agency's approval of a Corrective Action Plan and then implement the Plan so as to minimize, control, correct, or eliminate the particular unacceptable hazardous condition.

- Conduct safety audits that comply with the **Internal Safety Audit Process, APTA Manual (Checklist Number 9)**.

- Draft and submit to the Oversight Agency a report summarizing the results of the safety audit process.

Graphical Representation

Figure 1 depicts the relationship between FTA, the state, and the RFGS as each element of Part 659 is implemented, and serves as a guide when documenting the procedures necessary to carry out rule requirements.

STATE SAFETY OVERSIGHT GUIDE

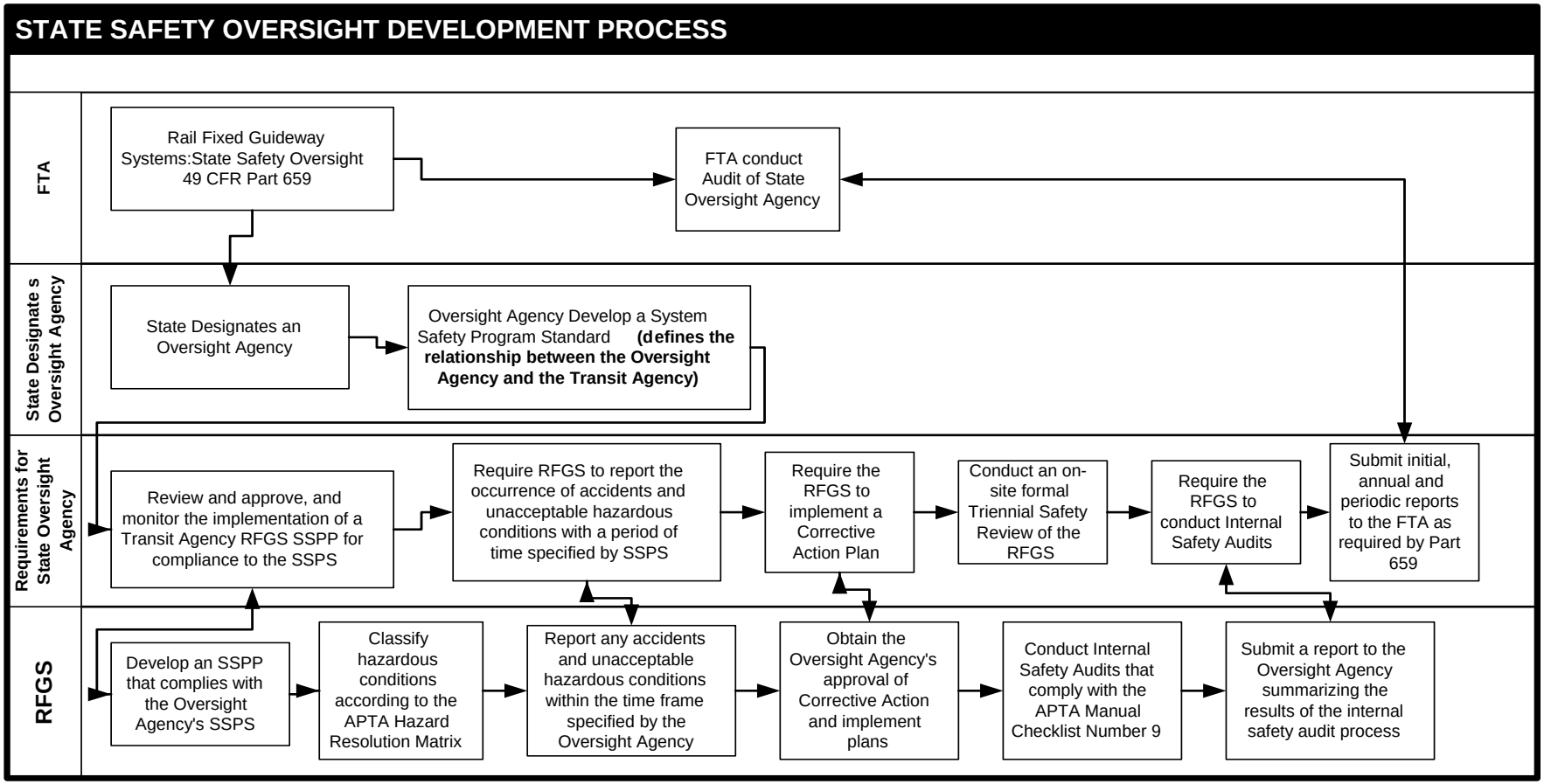


Figure 1. SSO Program Development Process

State Safety Oversight Community

In 2000, 22 SOAs had been designated to implement Part 659 requirements for a total of 35 RFGS (See Table 1). Combined, these 35 rail transit agencies operated:

- 12 heavy rail systems; and
- 33 light rail systems (including automated guideways, inclined planes, trolleys, and cable cars).

Six of the Oversight Agencies had previous experience with the provision of safety oversight. The remaining 16 Agencies were created to implement Part 659 requirements.

Table 1. States and RFGS Affected by Part 659 – by FTA Region

SSO Affected Community CY 2000					
FTA Region	**State**	**SOA**	**Agency**	**RFGS**	**Mode**
1	MA	DTE	Department of Telecommunication & Energy	Massachusetts Bay Transit Authority	HR LR
2	NJ	NJDOT	New Jersey Department of Transportation	Hudson-Bergen Light Rail System	LR
				New Jersey Transit	LR
	NY	PTSB	Public Transportation Safety Board	New York City Transit	HR
				Niagara Frontier Transit Authority	LR
	NJ/PA	DRPA	Delaware River Port Authority	Port Authority Transit Corporation	HR
3	DC	TOC	Tri-State Oversight Committee	Washington Metropolitan Area Transit Authority	HR
	MD	MDOT	Maryland Department of Transportation	Maryland Transit Authority	HR, LR
	PA	PennDOT	Pennsylvania Department of Transportation	Southeastern Pennsylvania Transit Authority	HR, LR
				Port Authority of Allegheny County	LR, IP
				Cambria County Transit Authority	IP
4	FL	FDOT	Florida Department of Transportation	Metro-Dade Transit Authority	HR, AG
				Jacksonville Transportation Authority	AG
	GA	GDOT	Georgia Department of Transportation	Metropolitan Atlanta Rapid Transit Authority	HR
	TN	TDOT	Tennessee Department of Transportation	Chattanooga Area Rapid Transit Authority	IP
				Memphis Area Transit Authority	LR
5	IL	RTA	Regional Transit Authority	Chicago Transit Authority	HR
	MI	CIS	Michigan Department of Consumer & Industry Services	Detroit People Mover	AG
	OH	ODOT	Ohio Department of Transportation	Greater Cleveland Regional Transit Authority	HR, LR
	WI	WisDOT	Wisconsin Department of Transportation	Kenosha Transit	LR
6	LA	LADOTD	Louisiana Department of Transportation and Development	New Orleans Regional Transit Authority	LR
	TX	TxDOT	Texas Department of Transportation	Galveston Island Transit	LR
				Dallas Rapid Transit	LR
7	MO	MCRS	Missouri Motor Carrier and Rail Safety	Bi-State Development Agency	LR
8	CO	CPUC	Colorado Public Utilities Commission	Denver Regional Transit District	LR
	UT	UDOT	Utah Department of Transportation	Utah Transit Authority	LR
9	CA	CPUC	California Public Utilities Commission	Bay Area Rapid Transit	HR
				Los Angeles County Metropolitan Transportation Authority	HR, LR
				San Francisco Municipal Railway	LR, CC
				San Diego Trolley, Inc.	LR
				Sacramento Regional Transit District	LR
				Santa Clara Valley Transit Authority	LR
10	OR	ODOT	Oregon Department of Transportation	Portland Tri-Met	LR
	WA	WDOT	Washington Department of Transportation	King County Metro	LR
				Seattle Center Monorail	AG

SOAs have a variety of legal authorities, including safety responsibilities that exceed FTA minimum requirements. The majority of SOAs are divisions of state Departments of Transportation or Public Utilities Commissions, empowered by enabling legislation or gubernatorial order to implement Part 659 regulations (see Table 2). Table 3 presents the states and the number of RFGS within their jurisdictions.

Ten states have designated at least 1 full-time equivalent to the implementation of 49 CFR Part 659 requirements; 12 states have designated less than .5 FTA. The level of resources varies according to the number and operations of the RFGS overseen.

Table 4 presents the allocation of personnel to implement 49 CFR Part 659 requirements.

Table 2.Categorization of Designated Oversight Agencies

Agencies Designated by States 2000 Reporting Year	Number
Department of Transportation	12
Utilities Commission or Regulator	3
State Economic Development Department	2
Regional or County Transportation Authority	1
Multi-state Oversight Committee	1
Consumer Industry & Services	1
Transportation Safety Board	1
Port Authority	1
Total	**22**

Table 3. Number of RFGS in Affected States

Number of RFGS within State Jurisdiction 2000 Reporting Year			
1 RFGS	**2 RFGS**	**3 RFGS**	**6 RFGS**
CO, DC, GA, IL, LA, MA, MD, MI, MO, OH, OR, UT, VA, WI	FL, NJ, NY, TN, TX, WA	PA	CA
14	**6**	**1**	**1**

Table 4. Oversight Agency Resources Allocated to State Safety Oversight

SOA Resource Allocation	No. States	Avg. FTE per State
Total – States	22	1.4
States with more than 1 RFGS	8	2.3
States with 1 RFGS	14	.9

Note: There were total of 12 States that designated less than .5 FTE

Between the publishing dates for FTA's *Annual Report for 1999* and this report, there have been a number of changes to the SSO community. Both the Hudson-Bergen Light Rail System and Kenosha Transit initiated revenue service in CY 2000, April and July respectively. This increased the total number of SOAs by one with the addition of the Wisconsin Department of Transportation to provide safety oversight of Kenosha Transit (an existing SOA—New Jersey Department of Transportation—assumed safety oversight of the Hudson-Bergen line).

In early 2001, the New Jersey Department of Transportation also assumed safety oversight responsibilities for the Port Authority Transit Corporation (PATCO), as the Delaware River Port Authority was no longer able to perform this function. This change was coordinated with the Pennsylvania Department of Transportation.

Further, with the initiation of revenue service for the Bi-State Development Agency's (BSDA) Metrolink Extension in the state of Illinois, the St. Clair County Transit District was officially designated in 2001 to provide oversight for BSDA's Illinois operations.

Finally, the Detroit Department of Transportation's Detroit Trolley service was recognized as an RFGS, increasing the total of RFGS overseen by the Michigan Department of Consumer & Industry Services to two.

With these changes, at the time of this report, there are 22 SOAs providing safety oversight for 36 RFGS. Within the next 3-5 years, FTA expects that an additional **seven** New Start transit agencies will initiate revenue service requiring the designation of an additional **six** state oversight agencies. Figure 2 depicts the recent changes, as well as the projected changes for the soon-to-be-affected states.

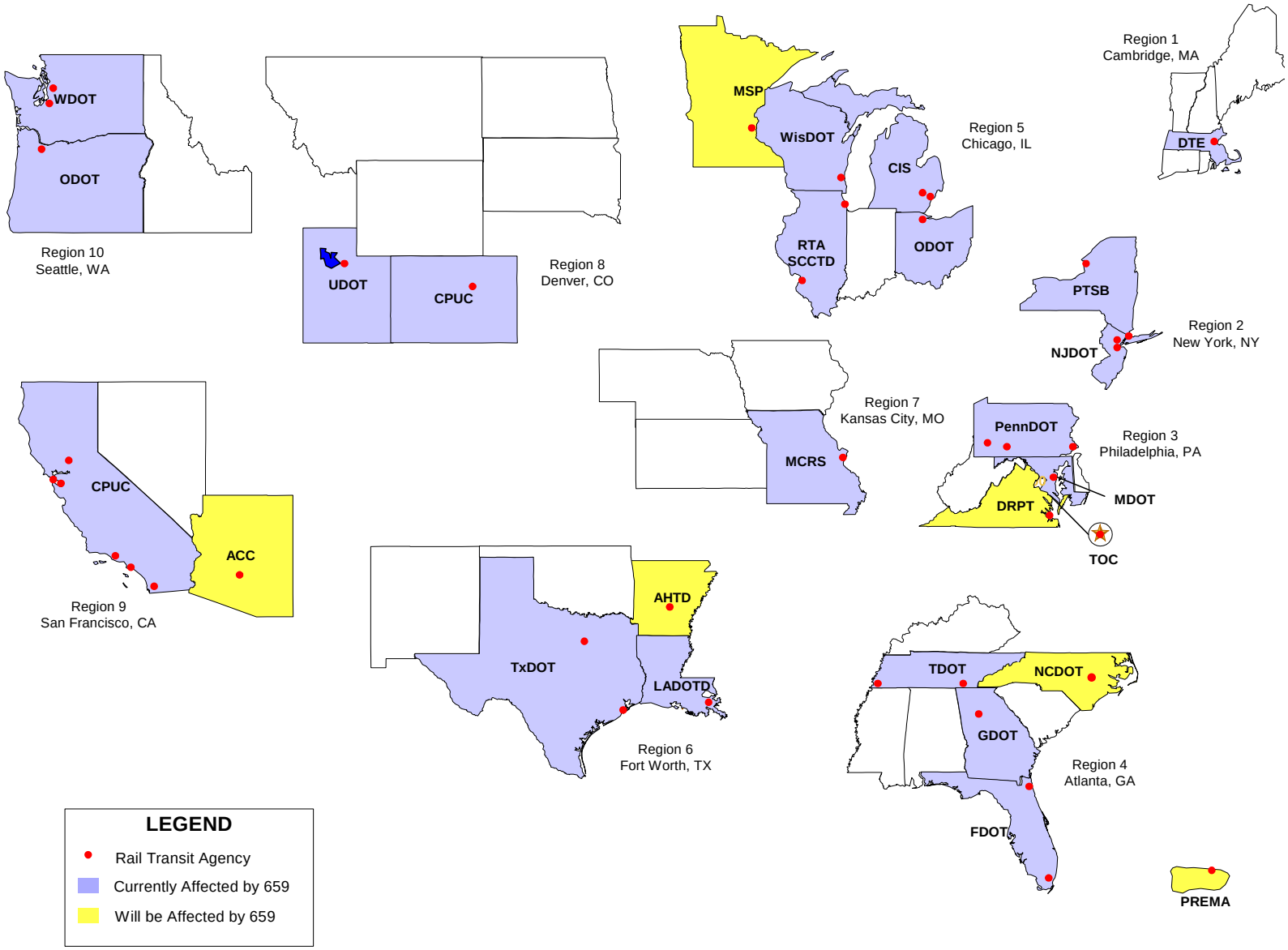


Figure 2. Current Map of States Affected by Part 659

Chapter 2.
Rail Transit in the United States

In 1991, rail transit provided 7.5 million daily passenger unlinked trips. One decade later, the nation's 36 major rail transit systems provide approximately 10 million daily unlinked passenger trips, a gain of 25 percent (see Table 5).

Table 5. Average Weekday Unlinked Passenger Trips, 2000

State	Modes	Rail Transit Agency	Average Daily Rail Transit Ridership	Part 659 Oversight Agency
CA	HR	BART (San Francisco)	348,000	California PUC
	HR,LR	LACMTA (Los Angeles)	125,000	
	LR, CC	Muni (San Francisco)	145,000	
	LR	San Diego Trolley	85,000	
	LR	Sacramento RTD	30,000	
	LR	Santa Clara Valley TA	28,500	
CO	LR	Denver RTD	30,500	Colorado PUC
DC-MD-VA	HR	Washington Metro	815,000	TOC
FL	HR, AG	Miami Metro-Dade	50,000	Florida DOT
	AG	Jacksonville TA	2,500	
GA	HR	MARTA (Atlanta)	265,000	Georgia DOT
IL	HR	CTA (Chicago)	496,000	Illinois RTA
IL	LR	Bi-State Development Agency	12,000	St. Clair County (IL only)
LA	LR	New Orleans RTA	25,000	Louisiana DOTD
MD	HR, LR	Baltimore MTA	76,000	Maryland DOT
MA	HR, LR	MBTA (Boston)	675,000	Massachusetts DTE
MI	AG	Detroit People Mover	4,000	Michigan CIS
	LR	Detroit Trolley	1,000	
MO	LR	Bi-State Development Agency	42,000	Missouri MCRS (Missouri operations only)
NJ	LR	Newark Light Rail	17,000	
	LR	Hudson-Bergen Light Rail	10,000	New Jersey DOT
	HR	Port Authority Transit Corporation	37,000	
NY	HR	NYCT (New York City)	5,900,000	New York PTSB
	LR	NFTA (Buffalo)	24,000	
OH	HR, LR	Cleveland	12,000	Ohio DOT
OR	LR	Portland Tri-Met	70,000	Oregon DOT
PA	HR, LR	SEPTA	400,000	
	LR, IP	PA Transit (Pittsburgh)	25,000	Pennsylvania DOT
	IP	CCTA (Cambria County)	2,000	
TN	LR	MATA (Memphis)	3,500	
	IP	CARTA (Chattanooga)	1,000	Tennessee DOT
TX	LR	Dallas (DART)	40,000	Texas DOT
	LR	GIT (Galveston)	1,000	
UT	LR	UTA (Salt Lake City)	25,000	Utah DOT
WA	LR	King County (Seattle)	500	Washington DOT
	AG	Monorail (Seattle)	1,000	
WI	LR	Kenosha Transit	600	Wisconsin DOT
		36 Agencies	**9,825,100**	

Rail transit now accounts for roughly 30 percent of all trips taken on public transportation. (See Table 6.) While other land transportation modes are experiencing reductions in passenger miles, rail transit is posting an average annual ***increase*** of 4.1 percent.

Table 6. Average Weekday Public Transportation Ridership, Fiscal Year 2000

Mode	Average Weekday Unlinked Passenger Trips	Percent of Total
Bus	20,000,000	61.8%
Commuter Rail	1,500,000	4.5%
Demand Response	360,000	1%
Ferry Boat	165,000	.5%
Heavy Rail	8,525,000	27%
Light Rail (including automated guideways, cable cars, inclined planes, and trolleys)	1,300,000	3.8%
Trolleybus	381,000	1.2%
Vanpool	51,000	.2%
TOTAL	**31,818,000**	**100%**

Since 1991, annual passenger miles have more than doubled for light rail and the number of systems providing service has increased from 14 to 20. Prompted by major ridership gains in New York and Washington, D.C., heavy rail transit has experienced a 30 percent gain in passenger miles over the same period (see Figure 3).

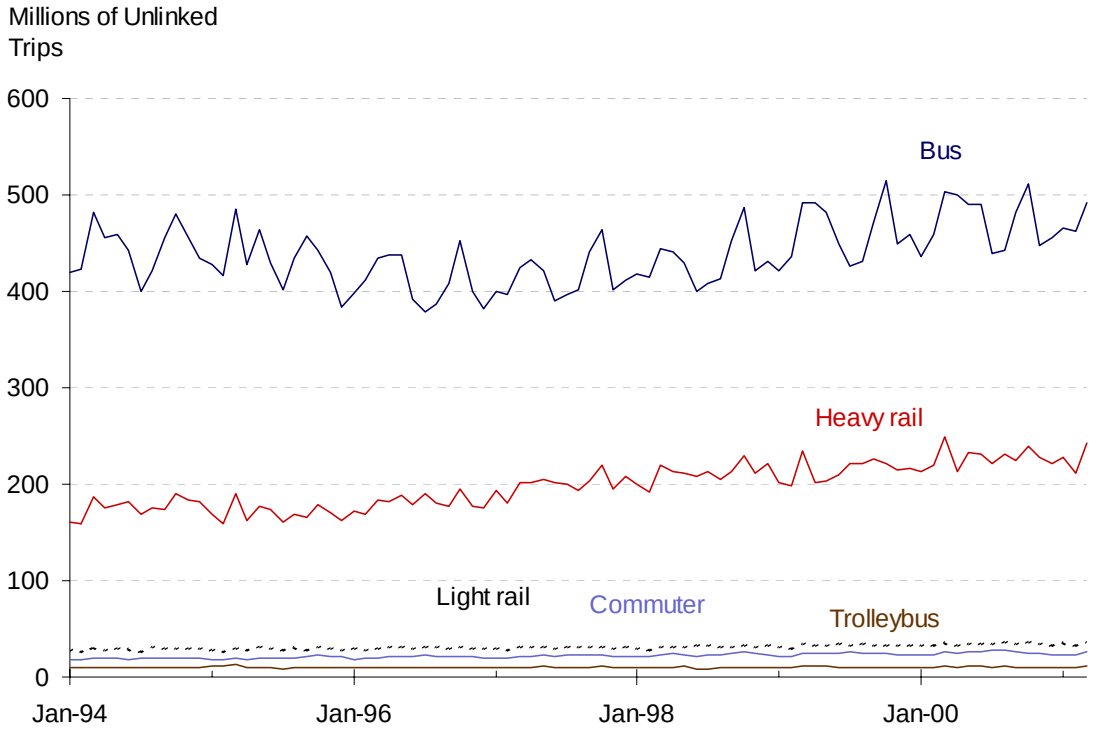


Figure 3. Ridership Growth – 1994-2000

Table 7 (Heavy Rail) and Table 8 (Light Rail) present general service data reported for 2000 by those RFGS affected by State Safety Oversight. For both of these tables, automated guideway, cable car, and inclined plane systems have been incorporated in the Light Rail Service Profile. The following service characteristics were compiled from 2000 NTD data:

- Annual Passenger Miles
- Annual Vehicle Revenue Miles
- Annual Passenger Unlinked Trips
- Average Weekday Unlinked Trips
- Average Length of Unlinked Passenger Trip
- Annual Vehicle Revenue Hours

Table 7. Heavy Rail Service Profile – 2000

NTD ID	Agency	State	Mode	Annual Passenger Unlinked Trips	Annual Passenger Miles	Annual Vehicles Revenue Miles	Annual Vehicle Revenue Hours	Average Weekday Unlinked Trips	Average Length of Unlinked Passenger Trip (miles)
1003	Boston-MBTA	MA	HR	138,259,519	473,924,299	20,663,407	939,246	448,385	3.43
2008	New York City Transit	NY	HR	1,677,506,585	8,319,909,312	323,176,760	17,497,114	5,512,652	4.96
2075	Philadelphia-PATCO	NJ	HR	10,581,143	93,220,498	4,097,782	141,303	37,972	8.81
3019	Philadelphia-SEPTA	PA	HR	89,551,788	400,453,946	16,239,192	880,942	296,175	4.47
3030	Washington-Metro	DC	HR	218,273,257	1,190,448,841	48,243,553	2,260,586	738,225	5.45
3034	Baltimore-MTA	MD	HR	13,608,659	70,639,677	4,223,008	169,067	47,795	5.19
4022	Atlanta-MARTA	GA	HR	83,796,606	503,490,135	21,561,493	817,423	273,990	6.01
4034	Miami - Dade TA	FL	HR	14,080,200	110,086,397	5,986,001	233,639	47,237	7.82
5015	Cleveland-RTA	OH	HR	7,341,096	54,008,892	2,064,918	95,671	24,079	7.36
5066	Chicago-RTA-CTA	IL	HR	176,250,504	1,002,999,223	55,635,175	2,699,455	589,383	5.69
9003	San Francisco-BART	CA	HR	90,974,498	1,184,094,227	57,377,586	1,535,442	310,268	13.02
9154	Los Angeles County Metro	CA	HR	27,957,650	74,729,093	3,567,756	185,571	83,230	2.67
	Heavy Rail Totals			**2,548,181,505**	**13,478,004,540**	**562,836,631**	**27,455,459**	**8,409,391**	**5.29**

Table 8. Light Rail Service Profile – 2000

NTD ID	Agency	State	Mode	Annual Passenger Unlinked Trips	Annual Passenger Miles	Annual Vehicles Revenue Miles	Annual Vehicle Revenue Hours	Average Weekday Unlinked Trips	Average Length of Unlinked Passenger Trip (miles)
0001	Seattle-Metro Transit	WA	LR	447,141	468,273	42,271	11,809	1,016	1.05
0008	Portland-Tri-Met	OR	LR	24,362,806	140,859,890	5,052,156	291,964	73,562	5.78
1003	Boston-MBTA	MA	LR	73,549,312	157,925,504	6,324,839	421,656	255,598	2.15
2004	Buffalo-Niagara Frontier	NY	LR	6,568,165	15,438,446	894,809	74,048	23,155	2.35
2080	New Jersey Transit	NJ	LR	4,107,641	10,058,944	540,518	45,312	16,045	2.45
2080	NJT - HBLRS	NJ	LR	244,951	649,618	1,197,570	12,122	3,181	2.65
3019	Philadelphia-SEPTA	PA	LR	24,994,338	61,538,772	3,084,370	304,854	83,123	2.46
3022	Pittsburgh-PATransit	PA	LR	7,358,650	33,216,196	1,824,708	125,136	24,592	4.51
3034	Baltimore-MTA	MD	LR	8,490,434	59,171,875	2,736,359	172,051	27,415	6.97
4003	Memphis Area TA	TN	LR	1,241,196	1,032,138	313,067	39,020	3,482	0.83
5003	Kenosha Transit	WI	LR	33,660	63,954	10,176	10,176	147	1.90
5015	Cleveland-RTA	OH	LR	4,318,422	24,851,922	1,141,863	73,455	14,062	5.75
5119	Detroit DOT	MI	LR	0	0	0	0	0	0.00
6032	New Orleans-RTA	LA	LR	5,365,482	13,238,188	672,510	77,270	14,963	2.47
6056	Dallas-DART	TX	LR	11,433,508	60,197,211	2,419,280	152,885	37,682	5.26
7006	St. Louis-Bi-State Dev.	MO	LR	14,165,766	95,326,967	2,528,479	101,405	41,454	6.73
8001	Salt Lake City-UTA	UT	LR	6,132,356	49,672,144	1,505,996	75,212	20,077	8.10

Table 8. Light Rail Service Profile – 2000 (cont.)

NTD ID	Agency	State	Mode	Annual Passenger Unlinked Trips	Annual Passenger Miles	Annual Vehicles Revenue Miles	Annual Vehicle Revenue Hours	Average Weekday Unlinked Trips	Average Length of Unlinked Passenger Trip (miles)
8006	Denver-RTD	CO	LR	6,675,202	28,222,709	1,458,759	108,187	22,467	4.23
9013	San Jose-Santa Clara VTA	CA	LR	7,913,730	35,757,928	2,421,865	163,350	25,576	4.52
9015	San Francisco-Muni	CA	LR	41,610,126	108,793,016	4,314,232	474,018	134,619	2.61
9019	Sacramento RTD	CA	LR	8,626,868	45,867,205	2,222,044	109,062	29,102	5.32
9054	San Diego Trolley	CA	LR	28,743,326	188,268,785	7,090,499	329,385	83,474	6.55
9154	Los Angeles County Metro	CA	LR	29,859,558	208,824,385	4,658,489	195,998	91,324	6.99
3012	Cambria County	PA	IP	121,779	20,761	19,186	16,534	1,076	0.17
0023	Seattle-Monorail Transit	WA	MO	2,463,597	2,217,237	207,056	27,180	6,806	0.90
3022	Pittsburgh-PATransit	PA	IP	411,332	61,778	2,776	1,080	280	0.15
3022	Pittsburgh-PATransit (PT)	PA	IP	806,650	96,712	28,294	4,950	2,204	0.12
4001	Chattanooga Area RTA	TN	IP	447,229	447,229	19,492	5,316	1,124	1.00
4034	Miami - Dade TA	FL	AG	4,230,225	4,407,744	986,509	90,637	14,295	1.04
4040	Jacksonville-JTA	FL	AG	563,102	233,346	203,244	18,547	2,054	0.41
5141	Detroit Transportation	MI	AG	1,485,856	1,783,698	380,940	34,636	4,151	1.20
9015	San Francisco-Muni	CA	CC	9,206,274	10,546,292	5,236,420	129,672	25,154	1.15
	Light Rail and Others Totals			**335,978,682**	**1,359,258,867**	**59,538,776**	**3,696,927**	**1,083,260**	**4.05**

When compared to 1999 service data (see Table 9), it is clear that both annual passenger trips and passenger miles have increased from 1999 totals, with light rail service seeing an increase of over 10 percent.

Table 9. 1999-2000 Comparison: Annual Passenger Unlinked Trips and Passenger Miles

Modes	Annual Unlinked Passenger Trips			Annual Passenger Miles		
	1999	2000	Increase	1999	2000	Increase
Heavy Rail	2,444,720,733	2,548,181,505	4%	12,567,040,684	13,478,004,540	7%
Light Rail	288,585,587	316,242,638	10%	1,190,168,592	1,339,444,070	13%
Other	19,508,290	19,736,044	1%	18,823,068	19,814,797	5%
All Modes	**2,752,814,610**	**2,884,160,187**	**5%**	**13,776,032,344**	**14,837,263,407**	**8%**

While almost all light rail systems nationwide are experiencing ridership growth, a large portion of the 10 percent increase in CY 2000 numbers can be attributed to the Utah Transit Authority's North/South Line, which initiated revenue service in late 1999, as well as the initiation of service on Hudson-Bergen's Light Rail Transit System.

Initiation of revenue service at Los Angeles County Metropolitan Authority's Red Line Extension helped contribute to the growth in heavy rail ridership numbers. An increase of approximately 5 percent in New York City Transit's ridership totals (now nearly 5 million daily) also added to this year's rise.

Further growth in ridership is expected throughout the decade as the substantial increases in Federal funding under TEA-21 are translated into operational service. Since January 1, 2000, 10 rail transit agencies have initiated major projects into revenue service (see Table 10). Between September 2000 and the end of 2003, 15 more agencies will bring projects online (see Table 11). By 2010, more than 40 major rail transit projects will have been initiated into revenue service. Combined, these projects will reflect a national investment in excess of $30 billion.

Table 10. Rail Agencies Initiating New Service by Early 2001

RFGS	Location	Project Name	Month of Service	Mode	Daily Ridership	Safety Contact
BSDA	St. Louis	St. Clair County Extension	5-01	Light Rail	14,500	Pamela McCombe 314-982-1400
RTD	Denver	Southwest Corridor Project	7-00	Light Rail	8,400	David Genova 303-299-4038
Hudson-Bergen	Newark	MOS-1, Phase I	4-00	Light Rail	34,900	Nagal Shashidhara 201-209-2549
		MOS-1, Phase II	11-00			
JTA	Jacksonville	Skyway Express	11-00	Monorail	2,200	Don Chapman 904-630-3123
Kenosha Transit	Wisconsin	Heritage Trolley System	6-00	Light Rail (trolley)	600	Jim Lawlor 262-653-4290
LACMTA	Los Angeles	North Hollywood Extension	6-00	Heavy Rail	60,000	Vijay Khawani 213-922-7275
MARTA	Atlanta	North Line Extension	12-00	Heavy Rail	33,000	Gene Wilson 404-848-4900
SCVTA	San Jose	Tasman East Light Rail	5-01	Light Rail	3-4,000	Nanci Eksterowicz 408-321-5593
SF Muni	San Francisco	F Market and Wharves Lines	3-00	Historic Streetcar	3-5,000	Harvey Becker 415-351-3461
WMATA	Washington, DC	Outer F Route Extension	3-01	Heavy Rail	43,350	Fred Goodine 202-962-2297

Table 11. Rail Transit Projects Online between 2000 and 2003

RFGS	Location	Project Name	Projected Date of Service	Mode	Daily Ridership	Safety Contact
BART	San Francisco	West Bay (SFO Airport) Extension	2002	Heavy Rail	70,000	Len Hardy 510-464-4870
		A/B Car Rehabilitation	2002	Heavy Rail	n.a.	Len Hardy 510-464-4870
DART	Dallas	Blue Line (North) Ext. Phase I Phase II Phase III Red Line (North Central) Phase I Phase II	 9-24-01 Spring 2002 Fall 2002 Summer 2002 2003	Light Rail	 20,000 38,000	Henry Hartberg 214-928-6010
Denver RTD	Denver	Platte Valley Corridor Extension	March 2002	Light Rail	15,000	David Genova 303-299-4038
HART	Tampa	Tampa Vintage Trolley	Spring 2002	Light Rail (trolley)	n.a.	Joe Diaz 813-623-5835
Hudson-Bergen	Newark	MOS-2, Phase A	Fall 2001	Light Rail	4,900	Nagal Shashidhara 201-209-2549
MDTA	Miami	Palmetto Extension	2002	Heavy Rail	5,000	Bonnie Todd 305-375-4240
Muni	San Francisco	New LRVs/Automatic Train Control Upgrade	2002	Light Rail	n.a.	Harvey Becker 415-351-3461
NCS	Newark	Barnch Brook Extension	Fall 2001	Light Rail	5,000	Paul Lidaka 973-491-7811
NYCT	New York City	Queens Boulevard Line Connector	Fall 2001	Heavy Rail	50,000	Cheryl Kennedy 718-243-4780
Sacramento RTD	Sacramento	Folsom Extension	December 2003	Light Rail	7,000	Bill Grizard 916-321-2846
		South Line	2003		n.a.	
SEPTA	Philadelphia	Market-Frankford Elevated Upgrade	2003	Heavy Rail	n.a.	Ron Hopkins 215-580-7911
SNJLRTS	Trenton to Camden, NJ	Southern New Jersey Light Rail	2003	Light Rail	4,500	n.a.
Tren Urbano	San Juan, Puerto Rico	Tren Urbano Rail Transit Project	2003	Heavy Rail	100,000	Rafael Jiminez 787-765-0927
Tri-Met	Portland	Airport MAX LRT Extension	September 10, 2001	Light Rail	7,500	Mike Russell 503-962-6408
UTA	Salt Lake City	University Extension	November 29, 2001	Light Rail	7,600	Ed Buchanan 801-352-6603
		Medical Center Extension	2003	Light Rail	4,500	

Rail Grade Crossings

Light rail is an attractive public transportation alternative for many reasons: its relatively low capital cost, its ability to operate both on and off streets, and its capacity to transport passengers with frequent stops in heavily congested areas. However, unlike heavy rail systems, which operate largely within exclusive right-of-way, the majority of light rail transit systems operate portions of their systems within unrestricted right-of-way on city streets, in mixed traffic, within median strips, and in pedestrian malls. This situation results in numerous, and sometimes continuous, roadway-light rail grade crossings. In some cases, light rail systems share grade crossings with mainline railroads.

Rail grade crossings and intermingling with street traffic create an operating environment for light rail transportation wrought with the potential for catastrophic occurrences. With at least 10 new light rail systems planned in the next decade, and an equal number of extensions under design and construction for existing light rail service, this vulnerability will only increase.

Table 12 highlights the rising number of rail grade crossings introduced into revenue service since 1997.

Table 12. Increase in Rail Grade Crossing Since 1997

Agency	Rail Grade Crossings Reported for 2000	Increase since 1997
Baltimore-Maryland-MTA	38	
Boston-MBTA	31	
Buffalo-NFTA	7	
Cleveland-RTA	24	2
Dallas-DART	64	
Denver-RTD	34	
Galveston-Island Transit	2	
Kenosha Transit	27	27
Los Angeles County Metro	103	26
Memphis-MATA	41	16
New Jersey Transit	1	
New Jersey-Hudson-Bergen	19	19
New Orleans-RTA	293	
Philadelphia-SEPTA	336	
Pittsburgh-PAT	44	2
Portland-Tri-Met	110	55
Sacramento-RT	101	15
Salt Lake City-UTA	61	61
San Diego Trolley	135	65
San Francisco-Muni	216	25
San Jose-Santa Clara VTA	97	33
Seattle-Metro	14	
St. Louis-Bi-State	12	
Total	**1810**	**(+) 346**

Table 13 provides additional information on the characteristics of these crossings.

Table 13. Grade Crossing Characteristics

Rail Transit Agency	1999 NTD Total Reported Grade Crossings	Total Rail Grade Crossings	Protected Grade Crossings	Traffic-Controlled Grade Crossings	Unprotected Street-running Grade Crossings	Shared Use Track? (Yes/No)	FRA Waiver Required? (Yes/No)	Shared Use Operations? (Yes/No)
SRTD	86	101	49	30	22	No	No	Yes
LACMTA	103	103	28	75	0	No	No	Yes
SCVTA	97	97	26	71	0	Yes	Yes	No
SDTI	135	135	83	30	22	Yes	No	Yes
SF MUNI - LR	216	216	15	201	0	No	No	No
SF MUNI - Historic	125	135	21	123	0	No	No	No
SF MUNI - Cable Car	77	77	1	76	0	No	No	No
RTD	34	34	3	31	0	No	No	Yes
CTA	25	25	25	0	0	No	No	Yes
MTA	38	38	33	0	5	Yes	Yes	Yes
MBTA	31	31	0	28	3	No	No	Yes
NO RTA	293	293	1	30	262	No	No	Yes
BSDA	12	12	12	0	0	No	No	Yes
NJT-NCS	0	1	0	1	0	No	No	No
HBLRT	0	19	2	19	0	No	No	No
NFTA	0	0	0	7	0	No	No	No
GCRTA	24	24	3	21	0	No	No	Yes
Tri-Met	110	110	35	62	12	No	No	Yes
SEPTA	46	46	290	0	0	No	No	No
PAT	44	36	8	0	0	No	No	No
MATA	41	41	20	20	1	No	No	No
DART	64	64	39	25	0	No	No	Yes
GIT	2	2	0	2	0	No	No	No
UTA	61	61	35	22	4	Yes	Yes	Yes
Kenosha	0	27	27	4	0	No	No	No
Totals	**1,664**	**1,694**	**756**	**878**	**331**	**4**	**3**	**13**

Addressing New Starts

FTA's Office of Safety and Security is continuing its support of New Starts through provisions of technical assistance to aid states in their development of an SSO Program, as well as to the Transit agency to help in its preparations to meet safety and security requirements. FTA's *Compliance Guidelines for States with New Starts Projects* help guide states, affected by Part 659, in the development of safety oversight programs that meet FTA requirements.

The Office of Safety and Security is also promoting system safety through its *Safety Certification Initiative,* for which it has established a System Safety Task Force with the American Public Transportation Association to draft a *Safety Certification Handbook* for the industry to support the application of system safety principles in the planning, design, and construction phases of major rail transit projects.

The Handbook is intended as an introductory reference on safety certification for rail transit safety, project development, and project management personnel. It describes the main concepts and benefits of a safety certification program (SCP). It outlines the Task Force's safety certification guidance, and provides information, sample forms and text to support preparation of key SCP elements, including:

- Safety Certification Management Plan
- Safety Design Criteria
- Hazard Management Policy and Plan
- Verification & Conformance Checklists
- Formal Certification

The Handbook is due to be released in early 2002.

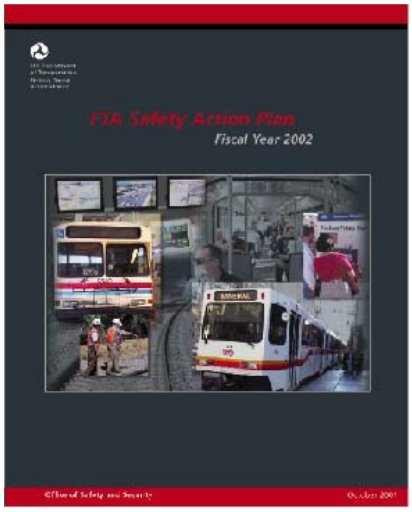
Chapter 3.
Safety and Rail Transit

Deaths and injuries are a major cost in transportation. Transportation fatalities rank third as the cause of lost years of life in the United States (behind heart disease and cancer). Historically, the rail transit industry provides the safest means of passenger transportation available in the United States. Table 14 presents annual fatalities by mode of transportation between 1995 and 2000, as reported by the Bureau of Transportation Statistics in the *Transportation Statistics Annual Report 2000* and the NTSB. For the six years between 1995 and 2000, the number of fatalities in rail transit has been a full order of magnitude less than other modes of transportation, or approximately .2 percent of the total.

Table 14. Transportation-related Fatalities, 1995 to 2000

Mode	1995	1996	1997	1998	1999	2000
Aviation (including air carriers, commuter air, on-demand air taxi, and general aviation)	963	1,089	753	667	693	777
Highway (including commercial and personal vehicles)	41,817	42,065	42,013	41,471	41,717	41,800
Rail (including freight, commuter railroads, and rail-grade crossings)	1,146	1,039	1,063	1,008	932	701
Rail transit (including heavy and light rail, automated guideways, cable cars, inclined planes and trolleys)	94	80	80	77	101	107
Waterborne (shipping and recreational boating)	875	759	867	844	834	801

FTA is committed to supporting the efforts of rail transit systems to further reduce the number of accidents, injuries and incidents. The highest priority of the DOT is to "promote the public health and safety by working toward the **elimination** of transportation-related deaths, injuries, and property damage." FTA's *Safety Brochure* series outlines activities to promote this priority.



Although great progress has been made over the last few decades, the potential for catastrophic occurrence remains. Effective integration of rail transit into city streets and major rail transportation corridors requires vigilance in the design, construction and operation of these systems.

In Fiscal Year (FY) 2000, the nation's rail transit system reported 107 transit-related fatalities to the NTD, of which 47 were suicides. These agencies also reported 12,005 injuries, defined as

> "Any physical damage or harm to a person requiring medical treatment, or any physical damage or harm to a person reported at the time and place of occurrence. For employees, an injury includes incidents resulting in time lost from duty or any definition consistent with a transit agency's current employee injury reporting practice."

Table 15 provides totals, by mode of service, for fatalities, injuries, and suicides, reported to NTD in 2000.

Table 15. Reported 2000 Fatalities and Injuries by Rail Transit Mode

Mode	Number of Systems	Fatalities		Injuries
		In-service	Suicides	
Heavy Rail	12	38	39	10,634
Light Rail	32	22	8	1,371
Total	**44**	**60**	**47**	**12,005**

NOTE: For Tables 15 and 16 and Figures 4 and 5, the modal category "Light Rail" includes automated guideways, cable cars, trolleys, and inclined planes.

Table 16 presents NTD fatality and injury statistics as rates for each mode, standardized across key indicators of service such as passenger trips and passenger miles. Both fatality and injury rates for each mode of service over a 10-year period are discussed below.

Table 16. FY 2000 Rates of Fatality and Injury by Rail Transit Mode

Mode	Number of Systems	Fatalities per 10 million Passenger Trips	Fatalities per 100,000,000 Passenger Miles	Injuries per 100,000 Passenger Trips	Injuries per 10,000,000 Passenger Miles
Heavy Rail	12	0.30	0.57	0.42	7.89
Light Rail	32	0.89	2.21	0.41	10.09

Figure 4 presents 10-year trend information for fatalities reported to NTD by mode, standardized by passenger miles. Figure 5 presents injuries, again using passenger miles for standardization and covering the period from 1991 through 2000. Fatality and injury trends are pointed downward with the exception of fatalities for light rail modes. While the fatality rate has risen from 1.41 to 2.21 per 100 million passenger miles***, it is important to note that over the same period, total passenger miles on light rail systems have increased 12.4 percent and unlinked passenger trips have increased approximately 10 percent.***

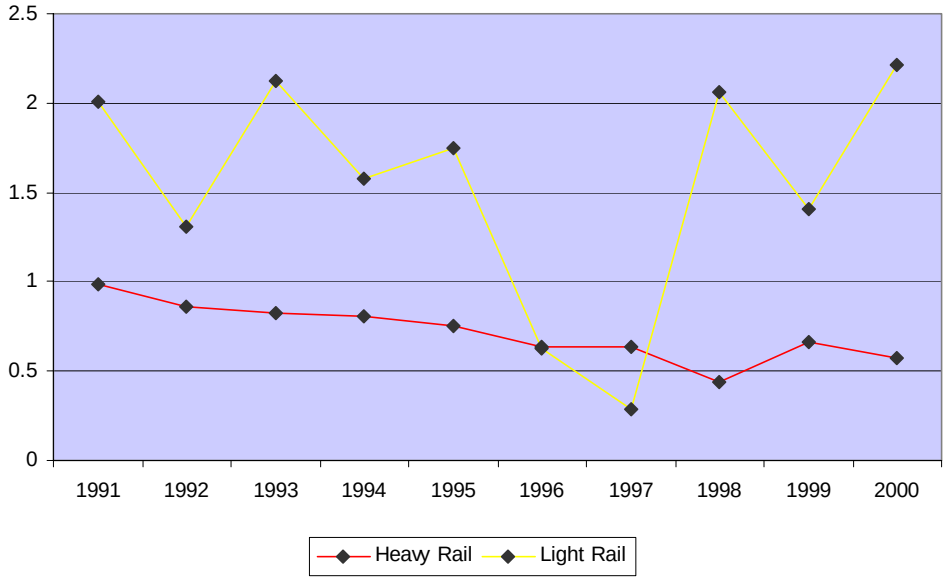


Figure 4. Fatalities per 100 Million Passenger Miles – 1991 through 2000 (including suicides)

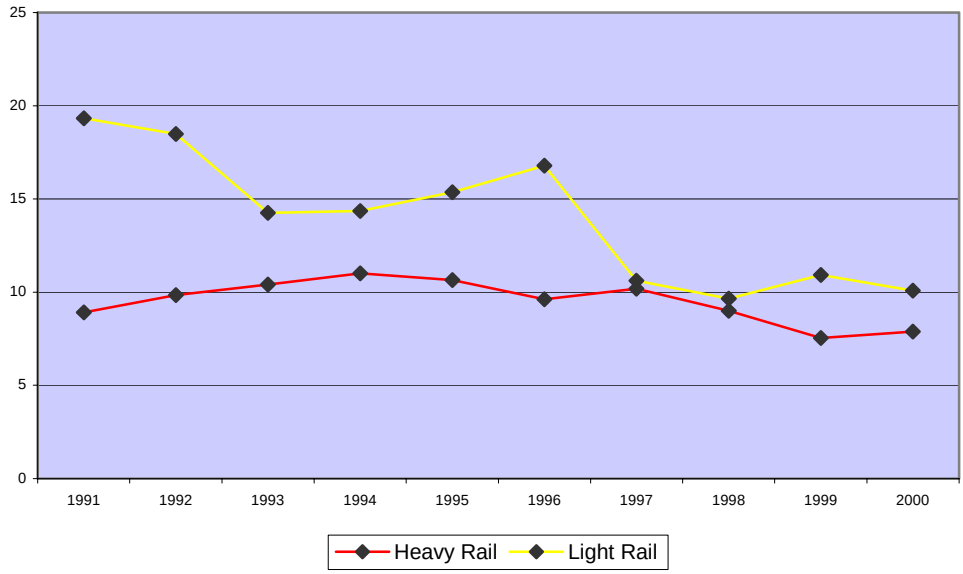


Figure 5. Injuries per 10 Million Passenger Miles – 1991 through 2000

Comparison between 1999 and 2000

As is clear from Figures 5 and 6, there was a decrease in the fatality rate per 10 million passenger trips for heavy rail of nearly 12 percent. Light rail, however, experienced an increase of 61 percent in the fatality rate by passenger trips (see Figure 6). However, when the fatality rate is standardized by passenger mile, the increase in the fatality rate is 5 percent less. Heavy rail saw a decrease in the fatality rate for both standardizations (see Figure 7).

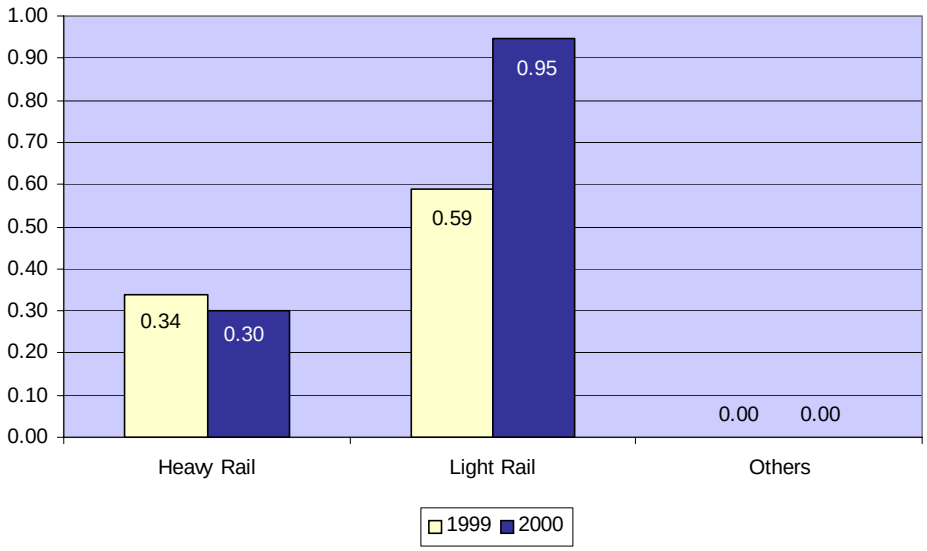


Figure 6. Fatalities per 10 Million Passenger Trips – 1999 and 2000

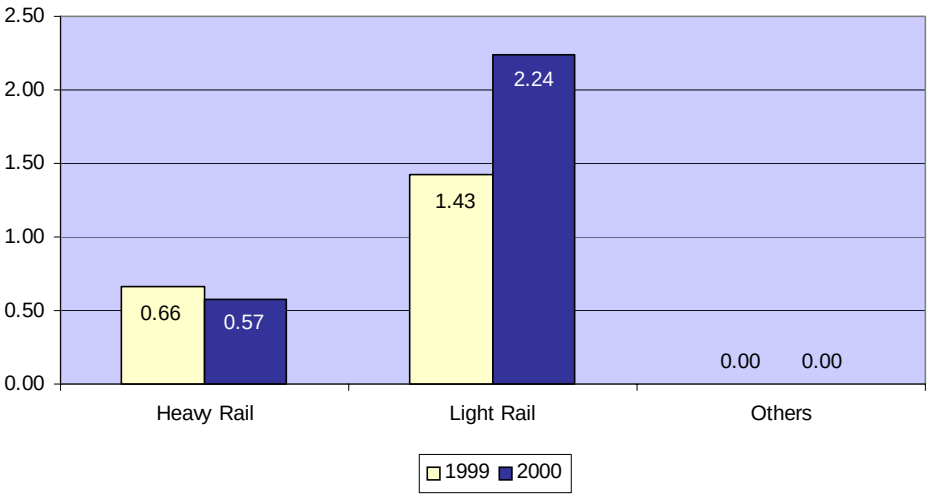


Figure 7. Fatalities per 100 Million Passenger Miles – 1999 and 2000

With the exception of a slight increase in the injury rates for heavy rail, overall injury rates were lower, with substantial decreases for "other" mode of service (automated guideway, cable car, trolleys, and inclined plane). As Figure 8 indicates, the decrease for "other" service modes fell roughly 46 percent. When standardized by passenger miles, the same trends follow (see Figure 9).

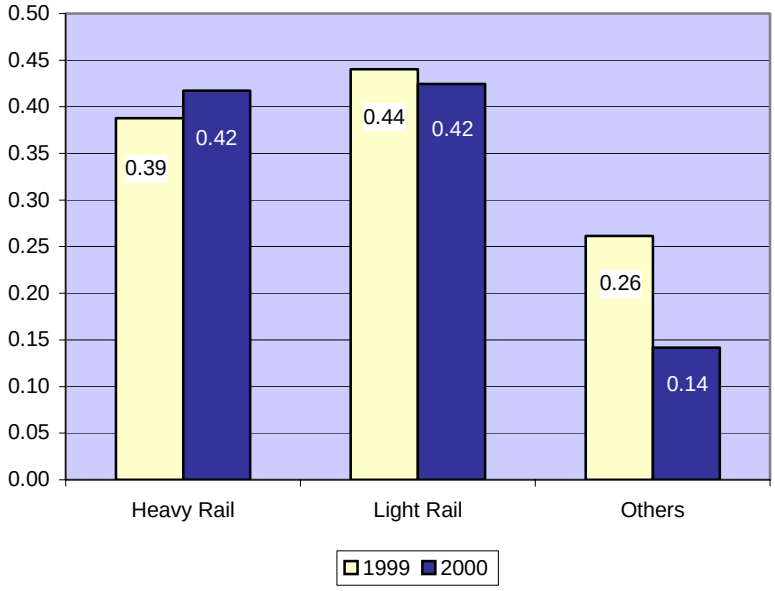


Figure 8. Injuries per 100,000 Unlinked Passenger Trips – 1999 and 2000

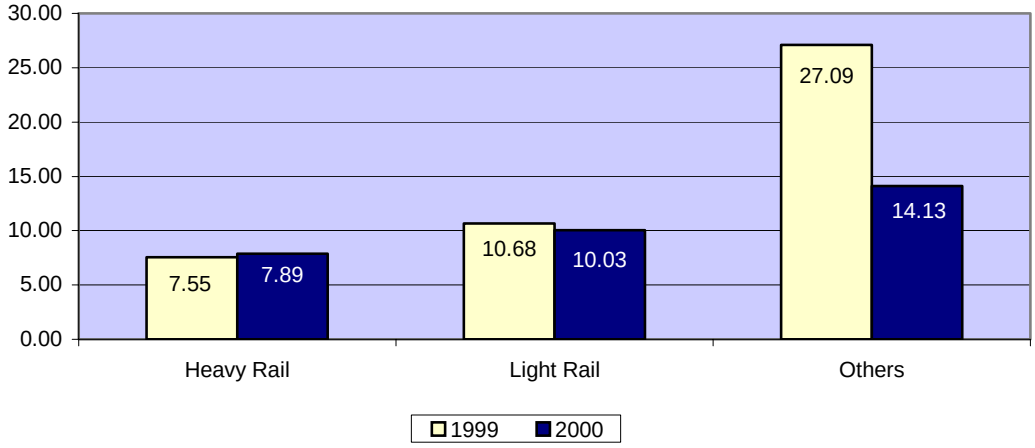


Figure 9. Injuries per 10 Million Passenger Miles – 1999 and 2000

Chapter 4.
Principal Findings from State Safety Oversight Annual Reporting

This section contains principal findings for accidents and resulting injuries and fatalities reported to FTA for CY 2000. Required by FTA's State Safety Oversight (SSO) Rule, SOAs report on annual activities, including accident data, for rail fixed guideway systems (RFGS) within their jurisdiction. Findings for CY 2000 are based on the incidents reported that meet FTA's criteria for "accident" as defined in FTA's SSO Rule codified as 49 CFR Part 659.5.

When comparing safety data from the NTD for reporting years 1999 and 2000 with data obtained through the State Safety Oversight Program, it is important to note that many RFGS report data to NTD on a fiscal year that may end in June or September. This is significant, as 1) fatality and injury totals will vary, and 2) fatality and injury totals reported to states on a calendar basis do not coincide with the NTD reporting of service data.

Accidents

Accident means any event involving the revenue service operation of a rail fixed Guideway system if as a result: (1) an individual dies; (2) an individual suffers bodily injury and immediately receives medical treatment away from the scene of the accident; or (3) a collision, derailment, or fire causes property damage in excess of $100,000.

It should be noted that as a program like the SSO Program matures, reporting diligence matures as well. Through FTA's ongoing SSO Audit Program, the Office of Safety and Security has made a concerted effort to clarify to States the accident data FTA expects to be collected and reported. It is suspected that this clarification has brought with it an increase in the capturing of "single person events" – slips, trips, and falls – as well as more detailed causal information.

In CY 2000, RFGS reported 3,192 incidents that met FTA's definition of ***accident***. This total represents an increase of approximately 22 percent over CY 1999 totals (2,627). Incidents on light rail service fell 28 percent (see Figure 10).

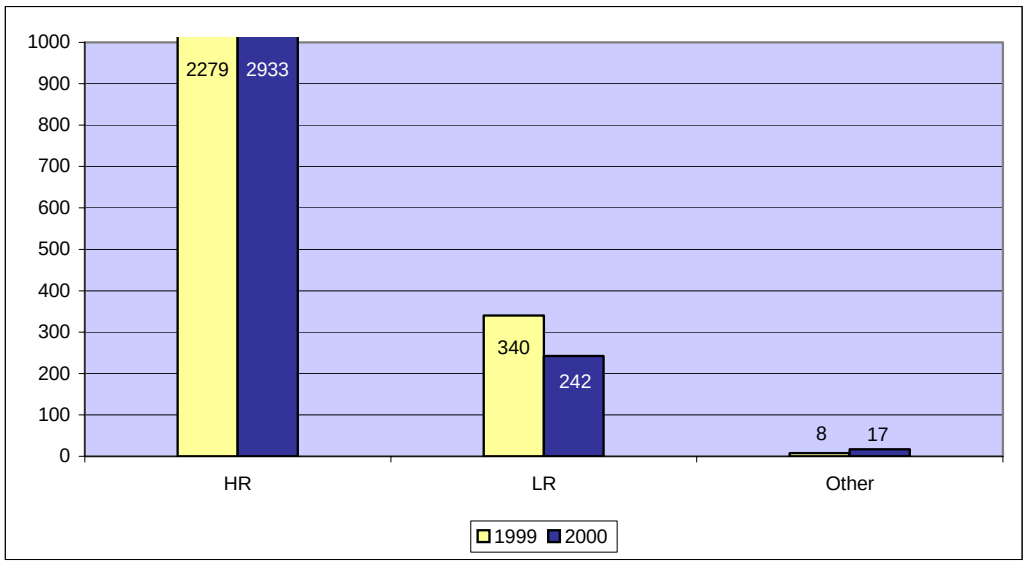


Figure 10. Total Reported Accidents – 1999 and 2000

Figure 11 depicts the total number of reported incidents by type for both CY 1999 and 2000. Of note, there was a reduction in reportable collisions and rail grade crossings, while reported fires, derailments, and single-person accidents all increased over CY 1999 totals.

- Collisions decreased 33 percent.
- Light Rail collisions decreased 29 percent.
- Derailments increased 250 percent.
- Rail Grade Crossing Incidents decreased 16 percent.
- Fires increased 140 percent.
- "Other" (single person incidents) increased 24 percent.

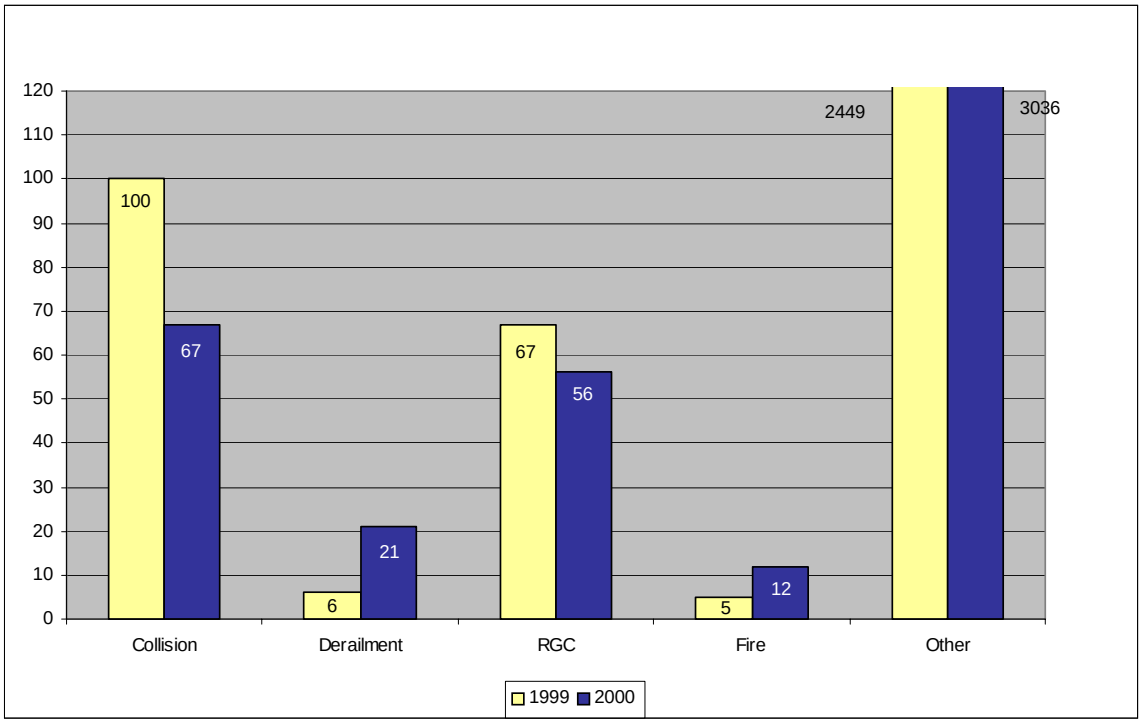


Figure 11. FTA Reportable Accidents by Type – 1999 and 2000

Heavy rail systems continue to struggle with the safety issues involved in the movement of large numbers of people through stations to subterranean or elevated platforms. Passenger injuries on escalators, stairwells, corridors, as well as while boarding and alighting trains remain this mode of service's primary safety concern. In addition, major heavy rail systems, constructed in the 1970s, are now aging, and must deal with the safety impacts of deteriorating infrastructures on operations, thus increasing emphasis on the importance of maintenance inspections and procedures to safe operations.

Addressing these concerns, and others identified through the implementation of a dedicated safety and security management program, is a central component of FTA's goal to develop ***zero tolerance for transit-related accidents and injuries***. Early identification of safety and security concerns provides the opportunity to modify designs and institute operational procedures to eliminate or control hazards. Using these techniques, options can be developed and presented to decision makers that allow greater complexity and performance in system design while increasing the level of safety and reducing associated losses. This shift in safety focus highlights the benefits of moving the consideration of hazards and risks as far "upstream" as possible in the design process.

As mentioned above, RFGS reported a total of 3,192 accidents to SOAs meeting FTA's definition. As depicted in Figure 11, of this total, 3,036 reported incidents were single-person events, leaving 156 total reported incidents for collisions, derailments, rail grade crossing incidents, and fires. Figure 12 depicts the categorization of reported accidents by mode and by accident type.

Key findings:

When excluding single-person events:

- 79 percent of accidents were collisions and rail grade crossing incidents.
- In 1999, 94 percent of accidents were collisions and rail grade crossing incidents.
- Light rail accounted for 55 percent of all reported collisions.
- Incidents at rail grade crossings accounted for 36 percent of reported accidents.

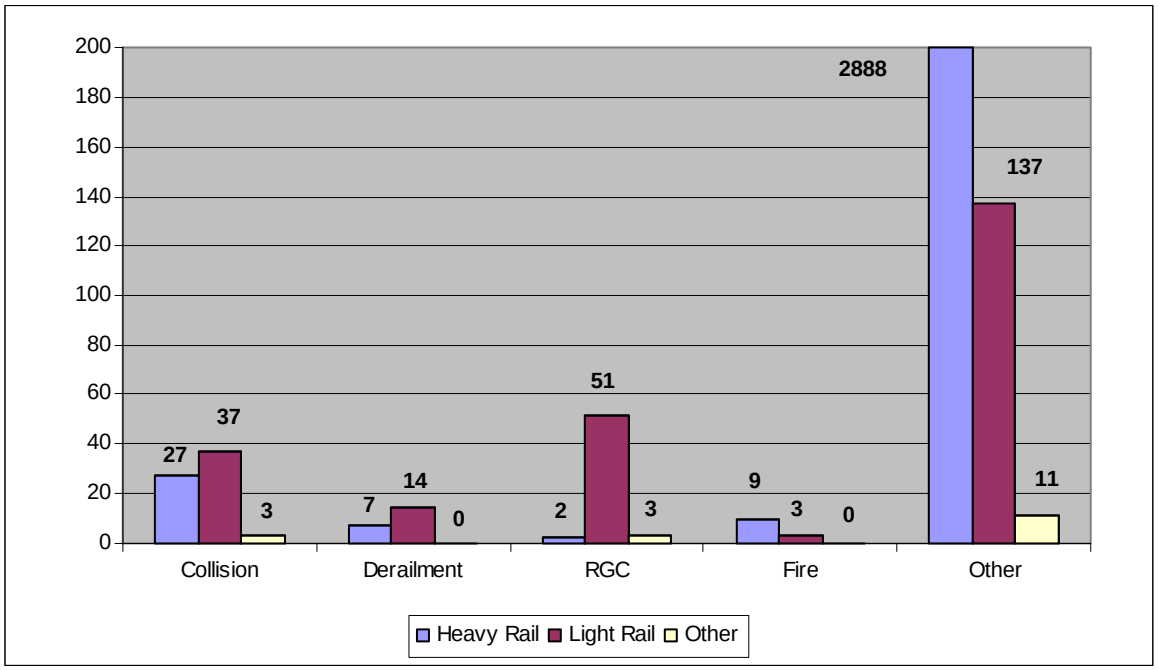


Figure 12. CY 2000 Accidents by Mode/Type

As depicted in Figure 11, accidents at rail grade crossings decreased 16 percent from 1999 to 2000. Figure 13 indicates that of the 56 rail grade crossing incidents, an overwhelming 72 percent of injuries resulting from those incidents occurred at traffic-controlled crossings. Interestingly, the only fatalities occurred at the protected crossings.

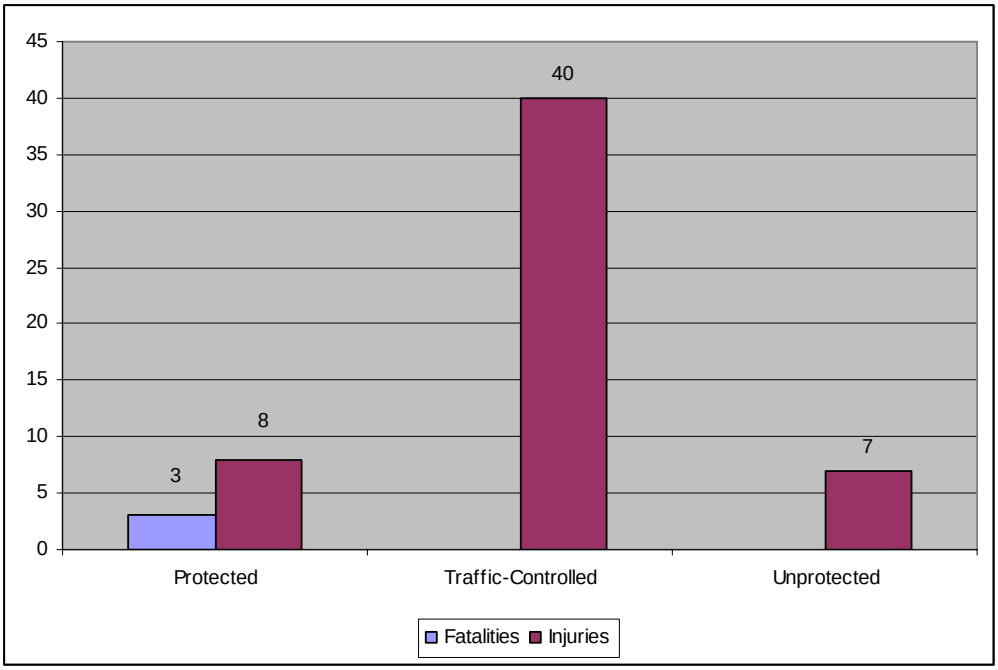


Figure 13. Accident Results by Rail Grade Crossing Characteristics

Fatalities

In CY 2000, rail transit agencies reported 102 fatalities to the SOAs. This represents a 9 percent decrease from the 112 fatalities reported in 1999. Of the 102 reported fatalities, 61 were the result of suicides and trespassing incidents. The remaining 41 fatalities represent a 5 percent increase when compared to 1999 (see Figure 14).

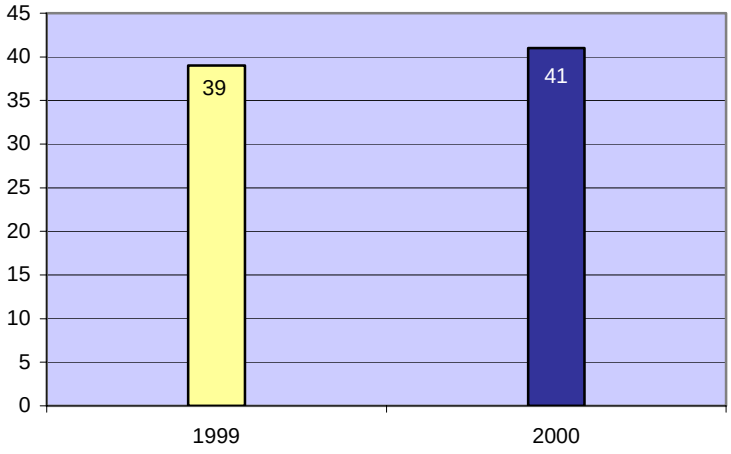


Figure 14. FTA Reportable Fatalities – Excluding Suicides

The heavy rail service mode accounted for 70 percent of the reported fatalities, more than triple (8 to 29) its 1999 reported totals. Light rail fatalities fell by over 50 percent (28 to 12) (see Figure 15). For other modes of service, including cable car, incline plane, and automated guideway, ***there were no fatalities reported in CY 2000***.

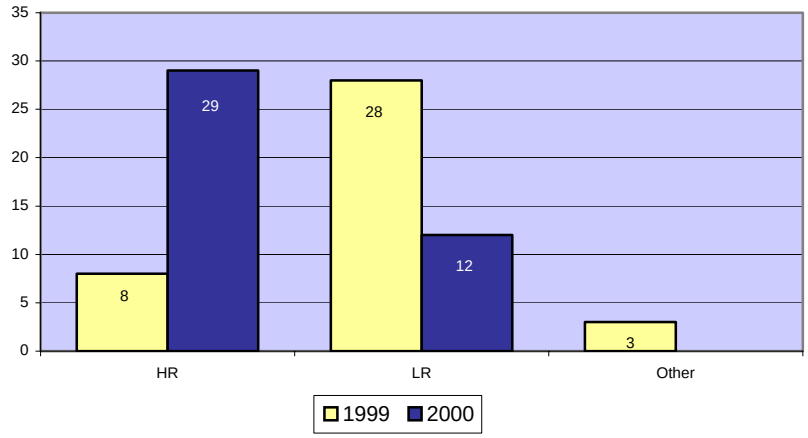


Figure 15. Reported Fatalities by Mode – Excluding Suicides

Fatalities resulting from reported collisions from CY 1999 to CY 2000 declined, from a total of 21 to 16, a decrease of 24 percent. There were a total of 3 fatalities from rail grade crossing incidents reported in CY 2000, 83 percent lower relative to 1999 (see Figure 16). For the second straight year, there were no reported fatalities from fires or derailments.

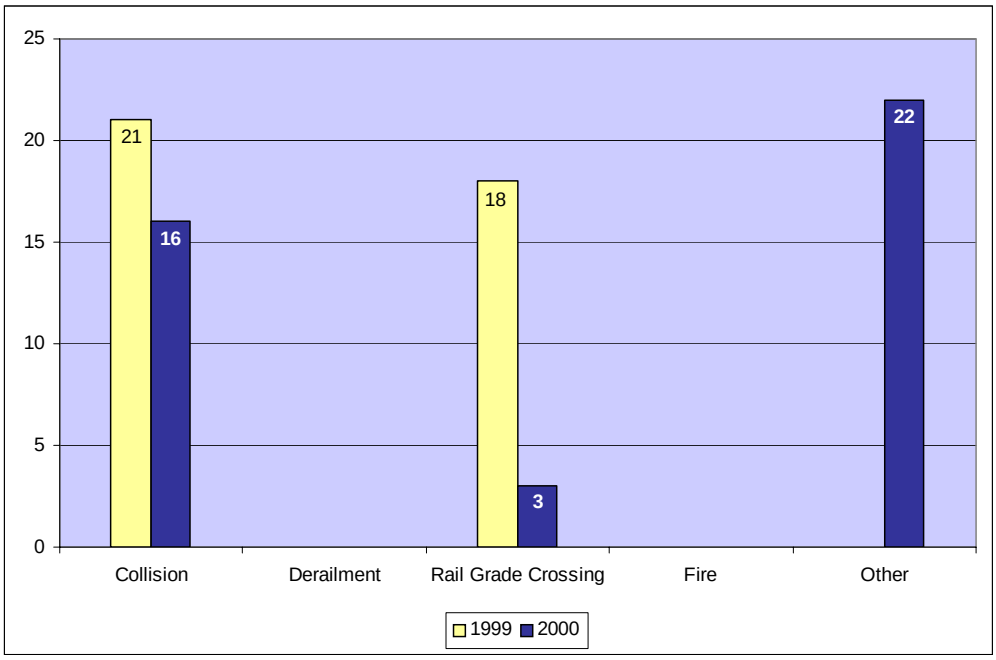


Figure 16. FTA Reportable Fatalities by Type – 1999 and 2000

Finally, in CY 2000, there were 22 fatalities in the "other" category that were not reported as suicides or trespassing incidents. Roughly half of these fatalities were attributed to passenger falls from trains or platforms, while an additional 25 percent were incidents in which persons were struck by trains while on platforms or near stations. This categorization differs from "other" fatalities reported in 1999 (see Figure 17).

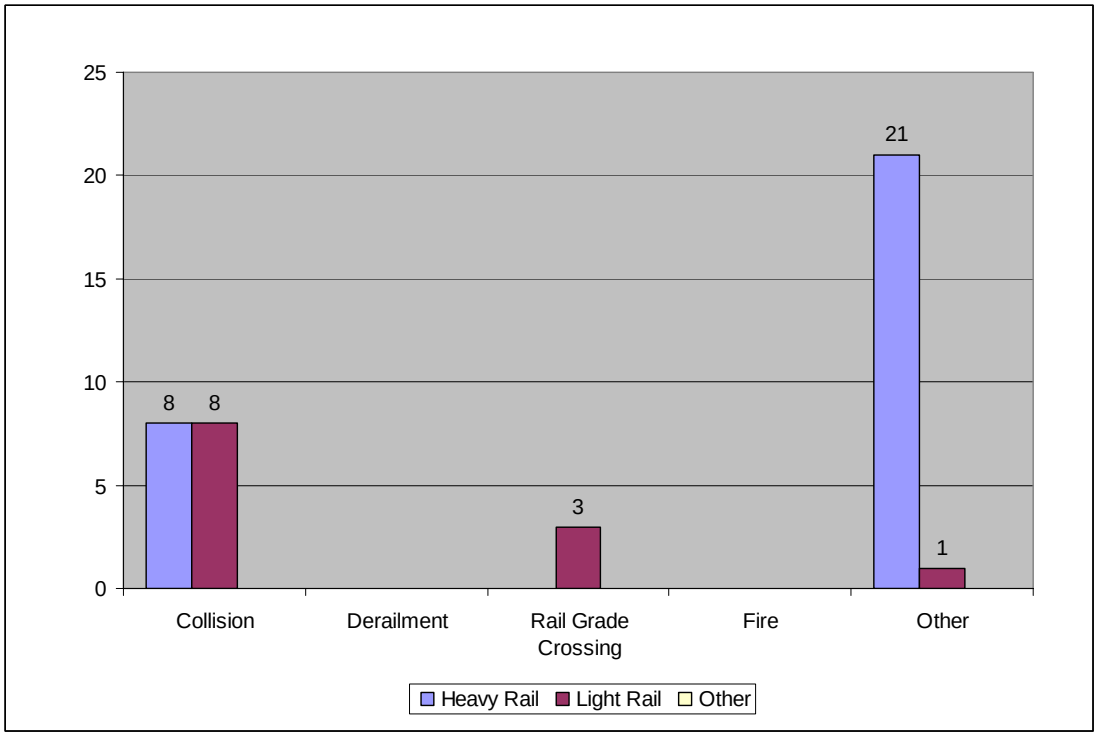


Figure 17. Fatalities by Mode/Type – Excluding Suicides

Key findings:

- Light rail transit experienced 92 percent of its fatalities resulting from collisions and rail grade crossing accidents.
- Heavy rail fatalities due to collisions remained constant since 1999.

Injuries

A total of 3,371 injuries from FTA reportable accidents were reported in CY 2000. This represents an increase of roughly 20 percent when compared to CY 1999 totals (2,839) (see Figure 18). When compared to 1999, injuries resulting from:

- Collisions decreased by 47 percent.
- Derailments rose from 1 to 119.
- Rail Grade Crossing incidents declined roughly 43 percent.
- Fires decreased by 1/3.
- Other reportable incidents rose by 22 percent.

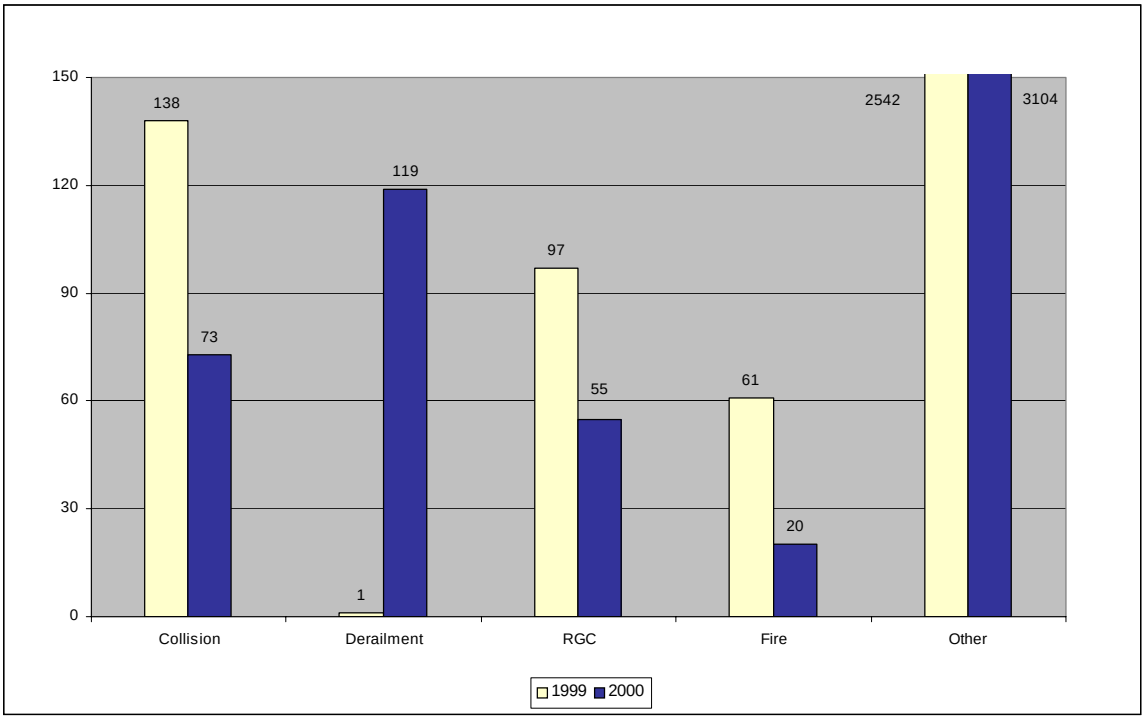


Figure 18. FTA Reportable Injuries – 1999 and 2000

While there was an increase in reported injuries for heavy rail accidents from CY 1999 to CY 2000—due in large part to an increase in slips, trips, and falls at heavy rail stations, injuries resulting from light rail incidents decreased by approximately 26 percent. There was only a slight decrease in the number of injuries for other modes of service, 23 down to 21 (see Figure 19).

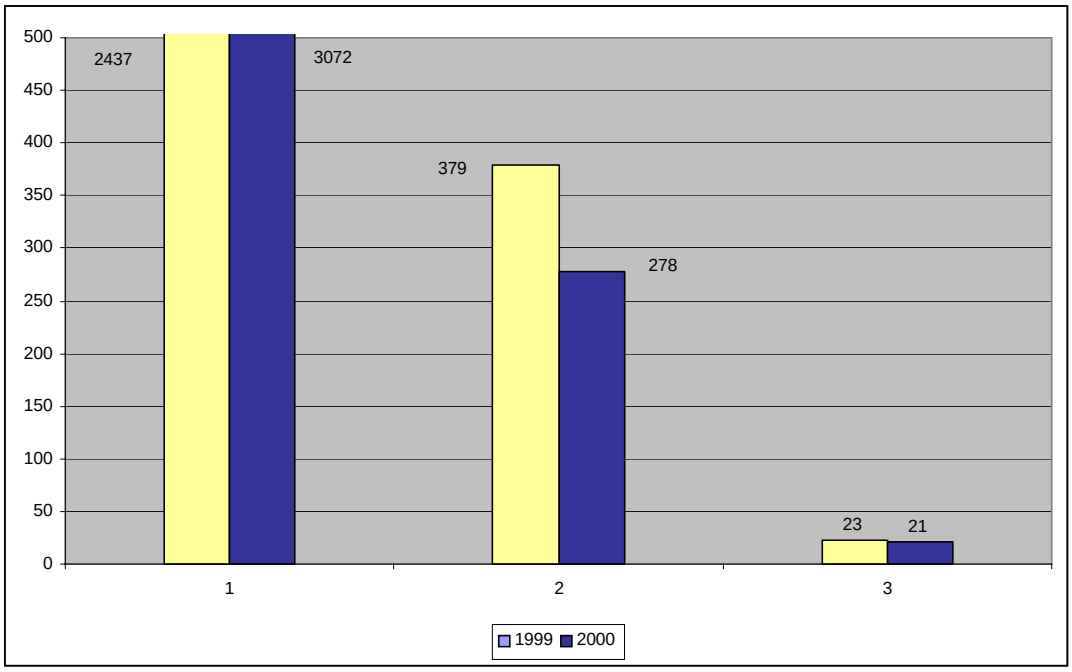


Figure 19. Total Injuries by Mode – 1999 and 2000

Figure 20 and Figure 21 portray the number of injuries reported in CY 2000 and 1999, respectively, by incident type for each mode of service.

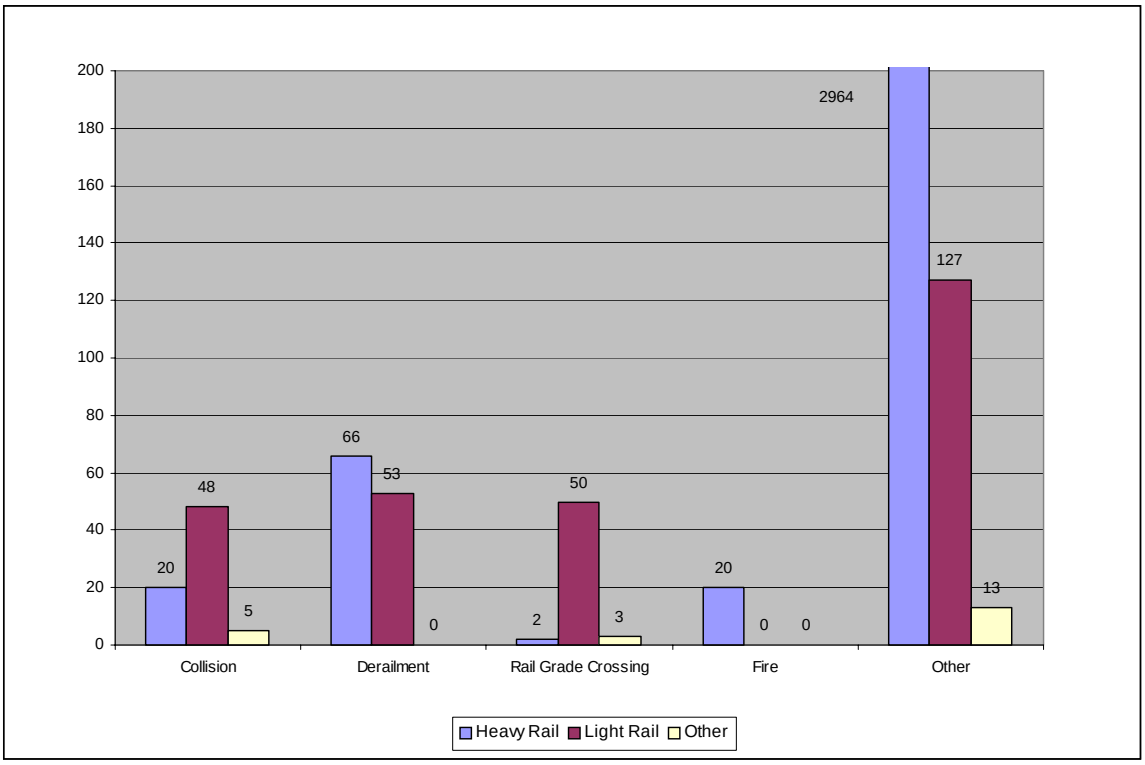


Figure 20. CY 2000 Injuries by Mode/Type

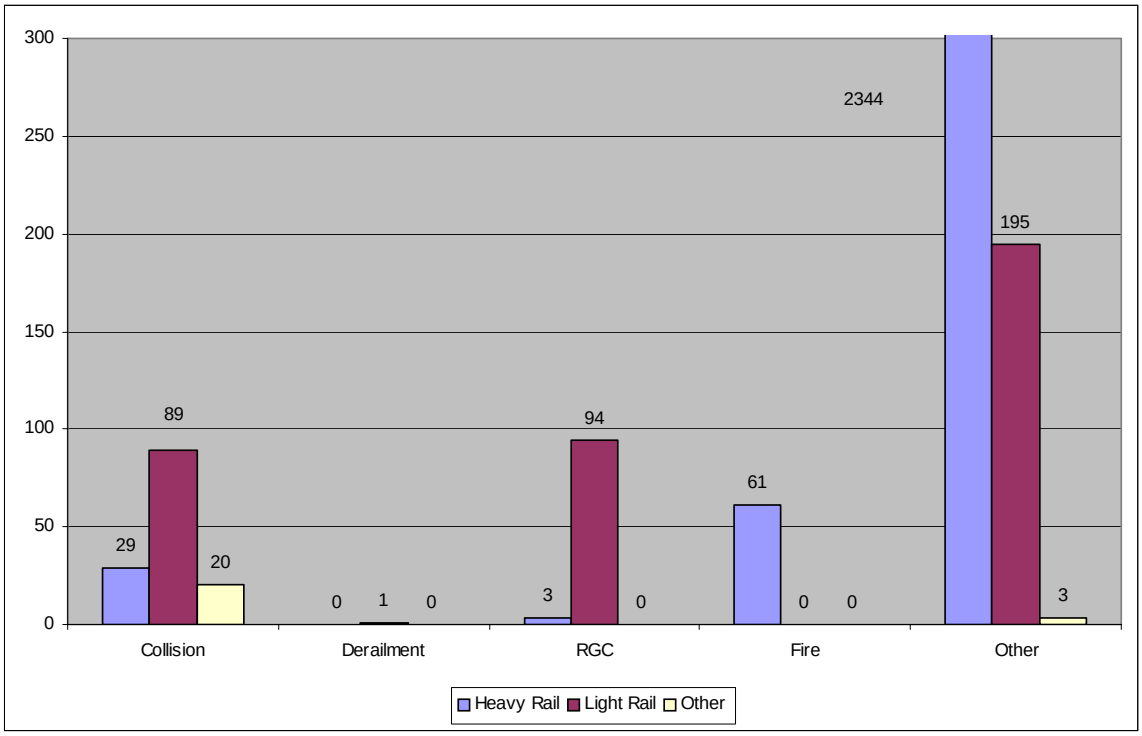


Figure 21. CY 1999 Injuries by Mode/Type

Key Findings:

In CY 2000:

- Light rail transit accounted for 66 percent of the injuries resulting from collisions – ***up 2 percent from 1999***.
- Light rail experienced 57 percent of the injuries from collisions, grade crossing accidents, derailments, and fires – ***down 5 percent from 1999***.
- Injuries resulting from collisions on heavy rail ***fell 31 percent.***
- As the number of reported derailments for both heavy and light rail increased, so did the number of resulting injuries.

Probable Cause

For the second straight year under FTA's State Safety Oversight Program, causal data for accidents meeting FTA's definition were reported. For the total 3,192 reported incidents, Figure 22 depicts the reported causal information.

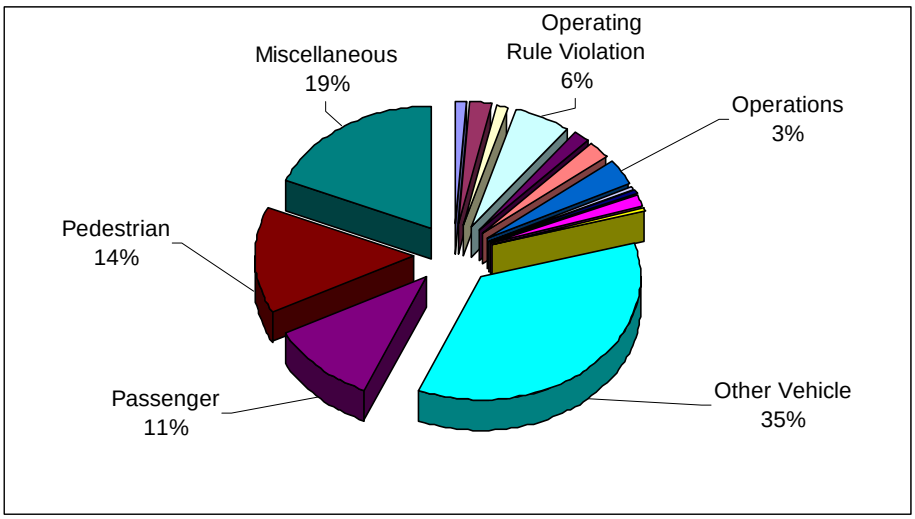


Figure 22. Probable Cause for Reported Accidents – Excluding "Other"*

*Only those incidents totaling more than 2 percent of the total reported causes are shown above.

The number of reported accidents for which the probable cause was determined to be an "other vehicle" rose from a 23 percent share of probable causes in CY 1999 to a 35 percent share in CY 2000. Also of note, the category of cause "pedestrian" was determined as the probable cause in 11 percent of CY 2000 accidents, up from 2 percent in CY 1999. However, accidents in which "rule violation" was determined as the cause decreased over the same period, from 22 percent in CY 1999 to 6 percent in CY 2000.

Table 17 depicts probable cause percentages by accident type and mode.

Table 17. Probable Cause Percentages by Accident Type and Mode

Probable Cause	Collisions			Derailments			Rail Grade Crossings			Fires		
Car Equipment Failure	HR	LR	Other	HR	LR	Other	HR	LR	Other	HR	LR	Other
Car Body		2%	17%									
Propulsion Unit										9%	25%	
Trucks				25%				2%				
Human Failure												
Operating Rule Violation	10%	2%	17%	75%	29%				33%			
Operating Procedures Violations			33%		14%				33%			
Drug/Alcohol Violation												
Fatigue												
Inattentiveness	3%	2%	17%		29%							
Operations	20%											
Crowd Control												
Improper Procedures											25%	
Track												
Track Component Deficiency					14%							
Track Component Failure					14%					3%		
Signal												
Signal Component Deficiency												
Signal Component Failure												
Cable												
Cable Component Deficiency												
Cable Component Failure											25%	
Other Vehicle	3%	42%	17%					85%		3%		
Passenger	47%	9%							33%		25%	
Pedestrian	3%	40%						13%				
Miscellaneous	13%	5%								84%		
Total incidents for which probable cause was determined	30	43	5	4	7	0	0	48	3	32	4	0

Key Findings:

- "Pedestrians" or "other vehicles" represented 82 percent of the reported probable causes for light rail collisions.
- The actions of passengers contributed to 47 percent of the reported probable causes for heavy rail collisions.
- Operating rule and procedure violations continue to contribute to accident causes.

Corrective Action Plans

In addition to Part 659's requirement that corrective action plans (CAPs) be developed for all accidents and unacceptable hazardous conditions that meet FTA's SSO definitions, SOAs are required to review and approve corrective actions that result from the *Internal Safety Audit Process* and the *Three-Year Review*, that meet FTA's threshold for reporting.

In 2000, eight states conducted Three-Year Safety Reviews. These reviews resulted in findings that required RFGS to submit a total of 310 CAPs. Of the 310 submitted CAPs, 308 were approved for implementation by the SOA.

In addition to the findings from the Three-Year Safety Reviews conducted at the RFGS, 10 RFGS submitted corrective actions for SOA approval as the result of internal safety audits. These corrective actions numbered 497, with 330 being approved for implementation. Of the entire 497 CAPs submitted, 151 remain open.

It should be noted that not all of the corrective actions that resulted from internal safety audits and Three-Year Safety Reviews met FTA's threshold for reporting, thus SOAs were not required to track their implementation and resolution. States and transit agencies, however, recognize the benefit of coordinating corrective action tracking activities to ensure their successful implementation.

Chapter 5.
Security Data

Many of the SOAs are beginning to collect security information from transit agencies. Often, this information is related to security breaches or incidents in which a predetermined threshold has been broached. However, currently there is not an SSO requirement to collect or compile security data. The data presented in this chapter crime data from RFGS Form 405 submissions were reviewed and analyzed. NTD Form 405 uses a system of classification (Part I and Part II crimes) based on definitions used by the FBI. The relationship between the FBI definitions and the three sub-groupings used in this report is illustrated in Table 18.

Table 18. NTD – FBI Crime Data Relationship

NTD Classification	Violent Crimes	Property Crimes	Quality of Life Crimes
PART I			
Homicide	◆		
Forcible Rape	◆		
Robbery	◆		
Aggravated Assault	◆		
Burglary		◆	
Larceny/Theft		◆	
Motor Vehicle Theft		◆	
Arson		◆	
PART II			
Other Assaults	◆		
Vandalism			◆
Sex Offenses			◆
Drug Abuse Violations			◆
Driving Under the Influence (DUI)			◆
Drunkenness			◆
Disorderly Conduct			◆
Trespassing			◆
Fare Evasion		◆	
Curfew and Loitering Laws			◆

In all, affected RFGS reported a total of 103,357 crimes (see Figure 23). This total is up from the 93,623 crimes reported for 1999.

Table 19 divides total crimes by the aforementioned sub-groups for the purpose of analysis.

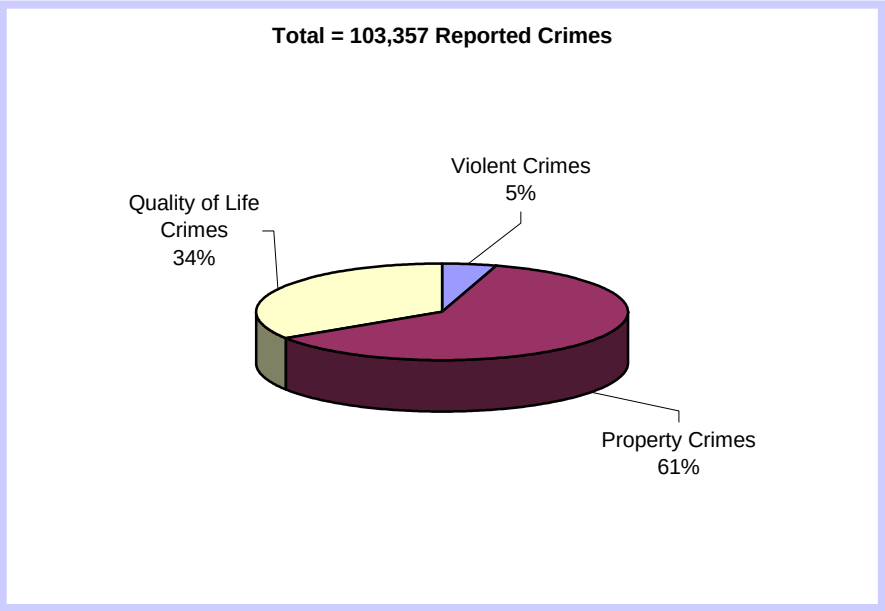


Figure 23. Rail Fixed Guideway System Crimes by Type - 2000

Table 19. Number of Crimes by Mode/by Category

Mode of Service	Violent Crimes		Property Crimes		Quality of Life Crimes	
	1999	2000	1999	2000	1999	2000
Heavy Rail	4,398	4,082	44,136	37,811	19,905	28,980
Light Rail	632	801	18,355	25,286	6,197	6,397
Total	5,030	4,883	62,491	63,097	26,102	35,377

Key findings:

- Violent crimes reported for 2000 decreased by 3 percent from 1999 totals.
- Property crimes increased 1 percent over the same period.
- Quality of life crimes also increased by 35 percent.

Figures 23-29 present crime data by mode and by categories using either passenger miles or passenger trips for standardization. Increased standardization in the reporting of Form 405 security incidents, as a result of FTA's Transit Security Audit Program, is largely responsible for the increase in quality of life crimes.

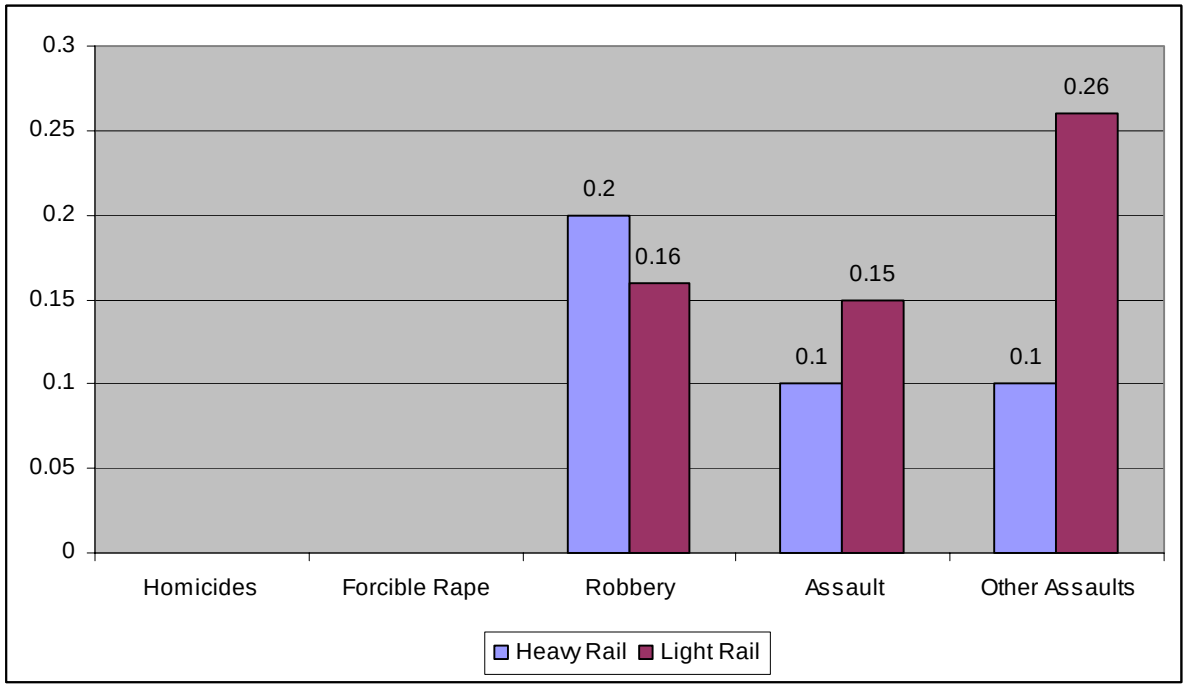


Figure 24. Violent Crimes by Mode per Million Passenger Miles

Key findings:

- Victimization rates for "Assaults" and "Other Assaults" are considerably higher for light rail than for heavy rail. Part of this can be contributed to the environment in which light rail operates, as well as due to increased coordination between local police departments and transit police in these "overlapping" jurisdictions.

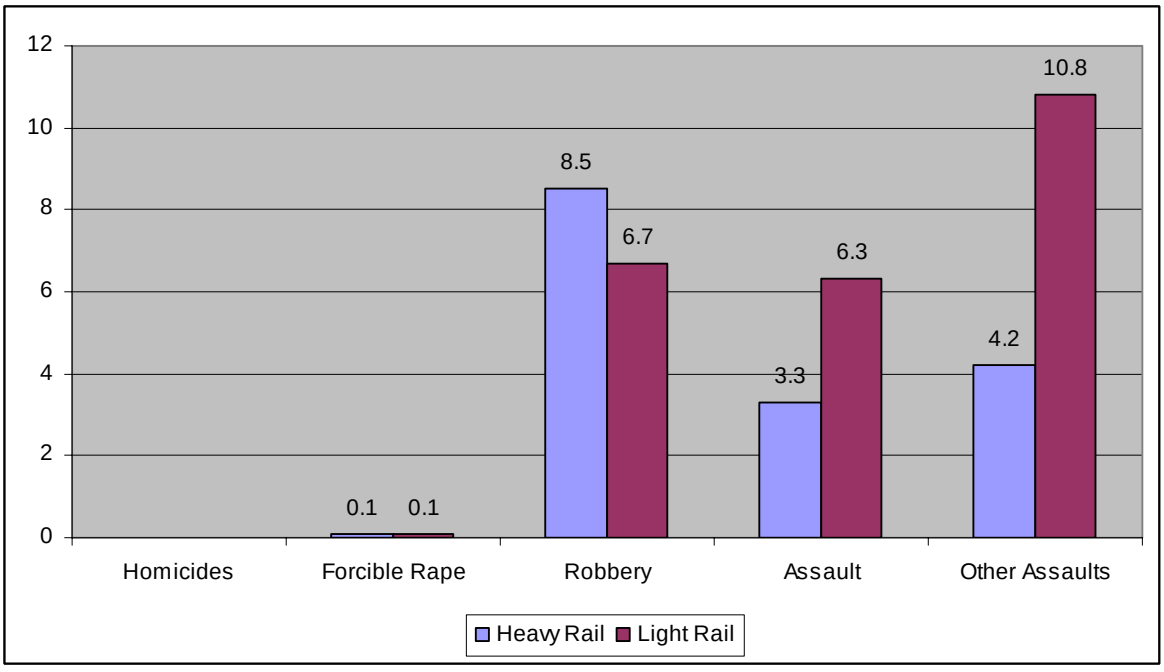


Figure 25. Violent Crimes by Mode per 10 Million Passenger Trips

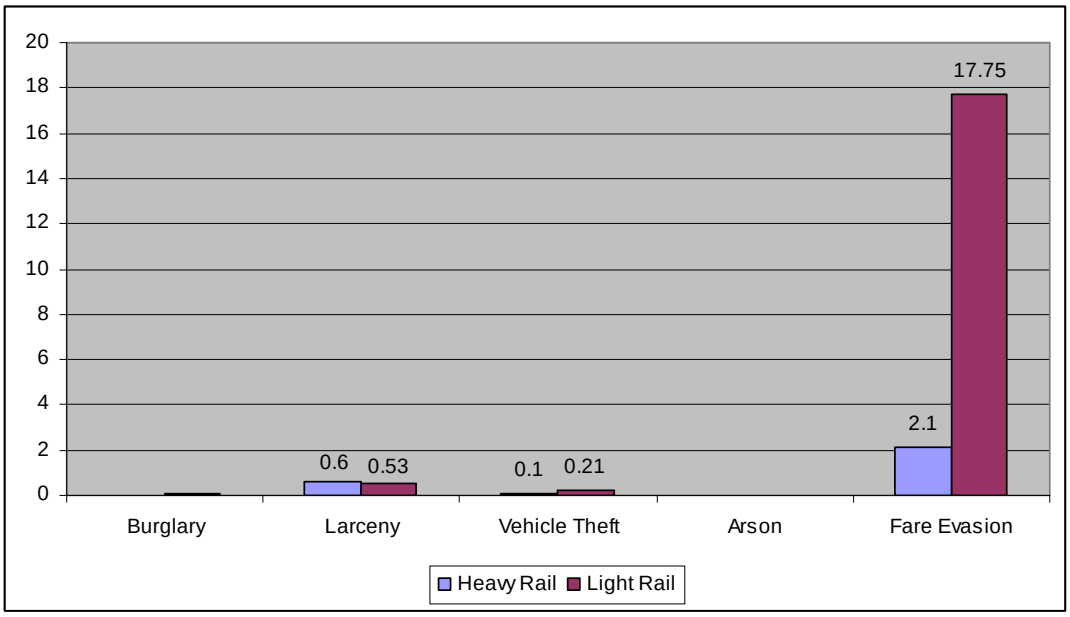


Figure 26. Property Crimes by Mode per Million Passenger Miles

Key findings:

- Rates of fare evasion are ~8 times higher for light rail systems than heavy rail.

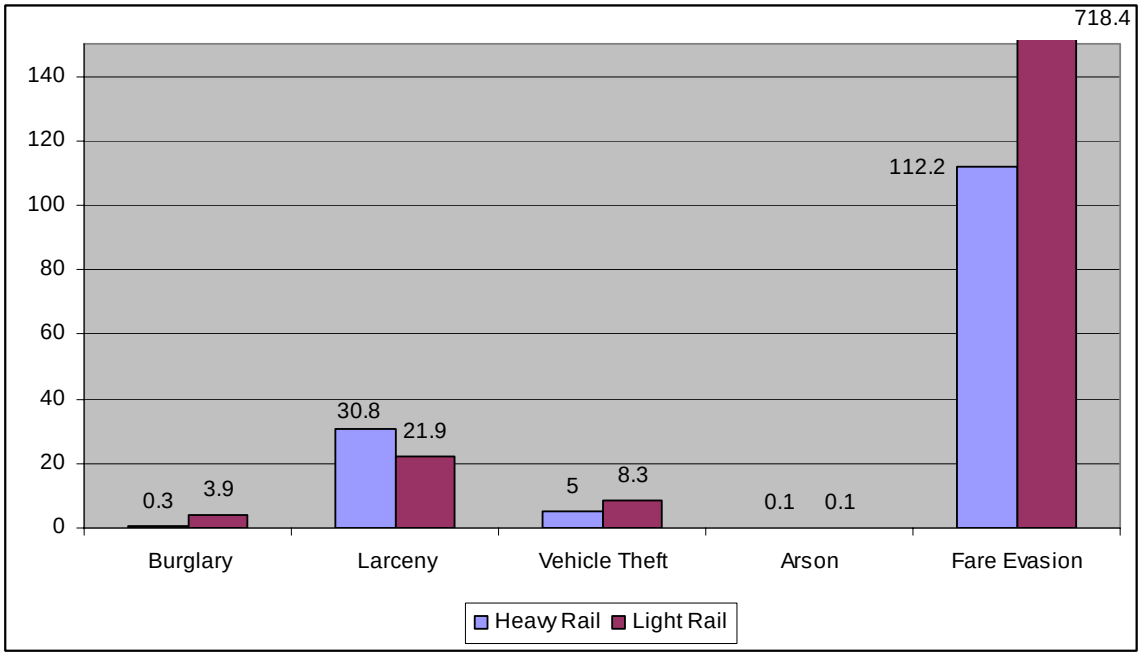


Figure 27. Property Crimes by Mode per 10 Million Passenger Trips

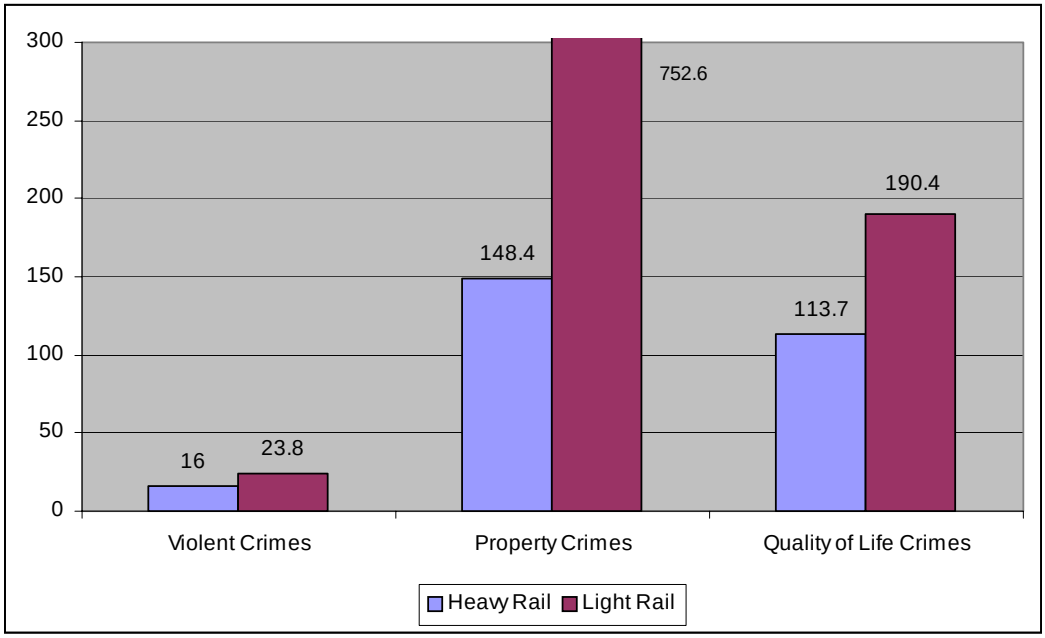


Figure 28. Crime Categories by Mode per 10 Million Passenger Trips

Key findings:

- Both Figure 28 and Figure 29 indicate that violent crime accounts for a very small minority of crime occurring at rail transit systems.

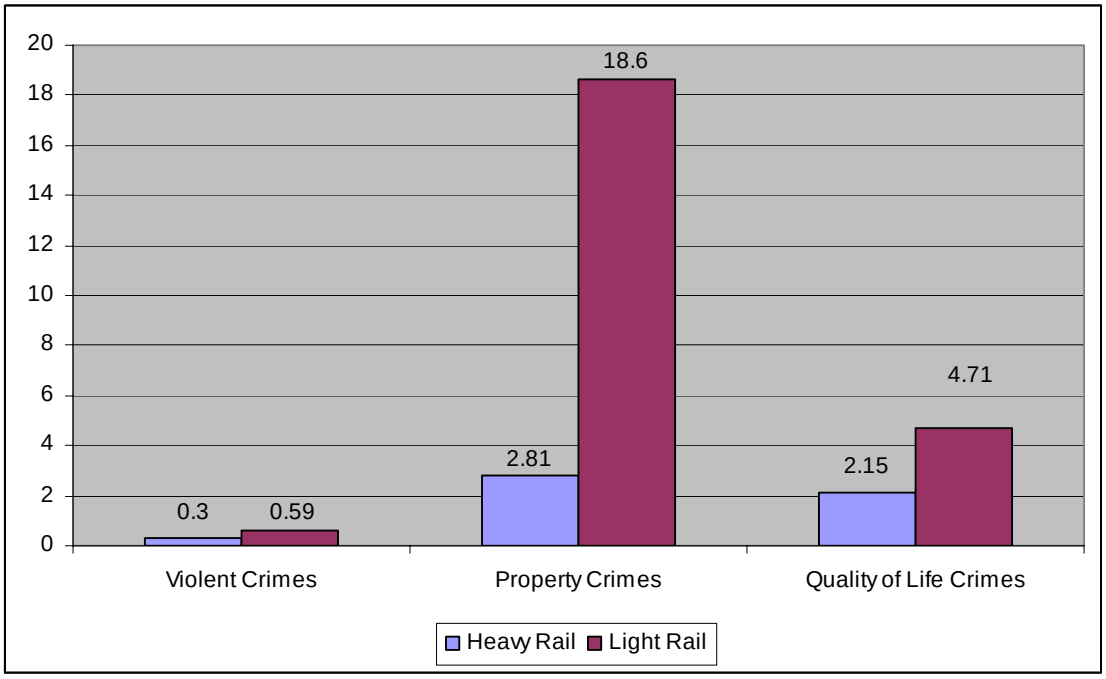


Figure 29. Crime Categories by Mode per Million Passenger Miles

Comparison between 1999 and 2000

When comparing crime rates for heavy rail between 1999 and 2000 the following findings can be made (see Figures 30 and 31):

- Violent crimes have decreased (11 percent by Trips and 14 percent by Miles).
- Property crimes are also down (18 percent by Trips and 20 percent by Miles).
- Quality of Life crimes have increased (40 percent by Trips and 36 percent Miles).

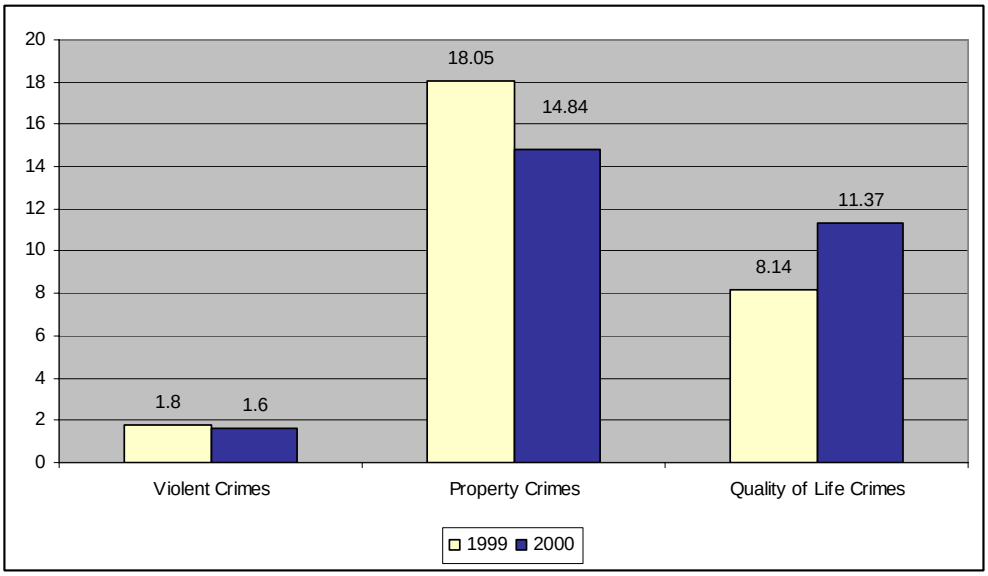


Figure 30. Crimes per 10 Million Passenger Trips – 1999 and 2000 Heavy Rail

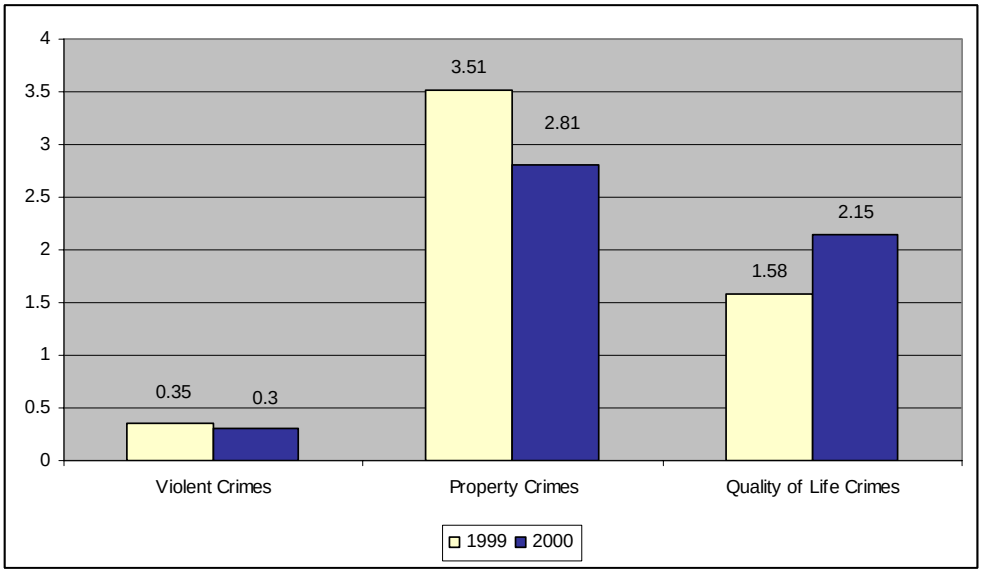


Figure 31. Crimes per Million Passenger Miles – 1999 and 2000 Heavy Rail

Key findings for Figures 32 and 33:

- While violent crime increased 16 percent per passenger trip, the increase was only 13 percent when passenger miles were used as the standard.
- Property crimes increased (26 percent by Trip and 23 percent by Mile).
- Quality of Life crime decreased (5 percent by Trip and 8 percent by Mile).

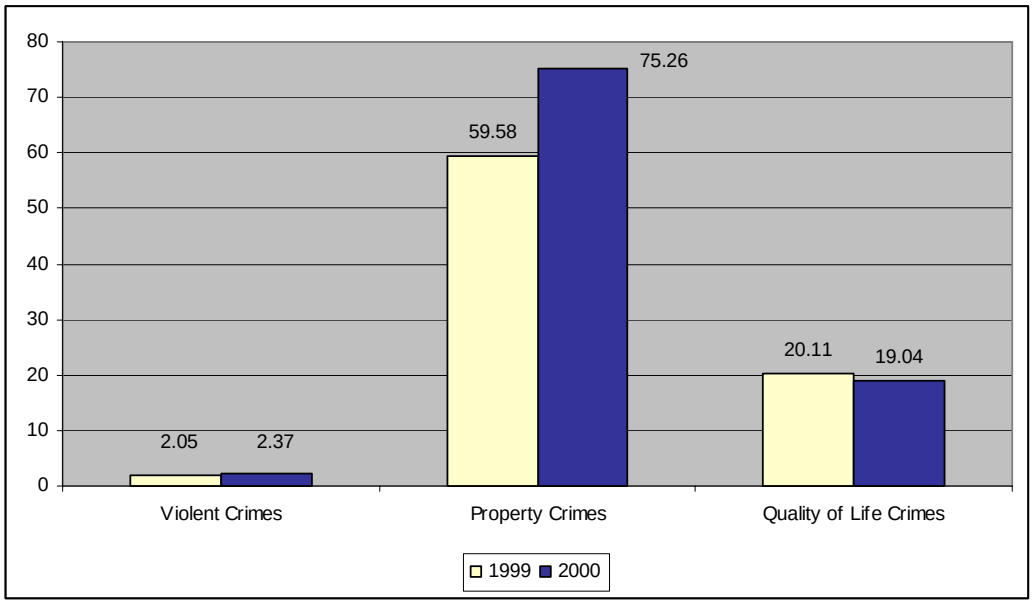


Figure 32. Crimes per 10 Million Passenger Trips – 1999 and 2000 Light Rail

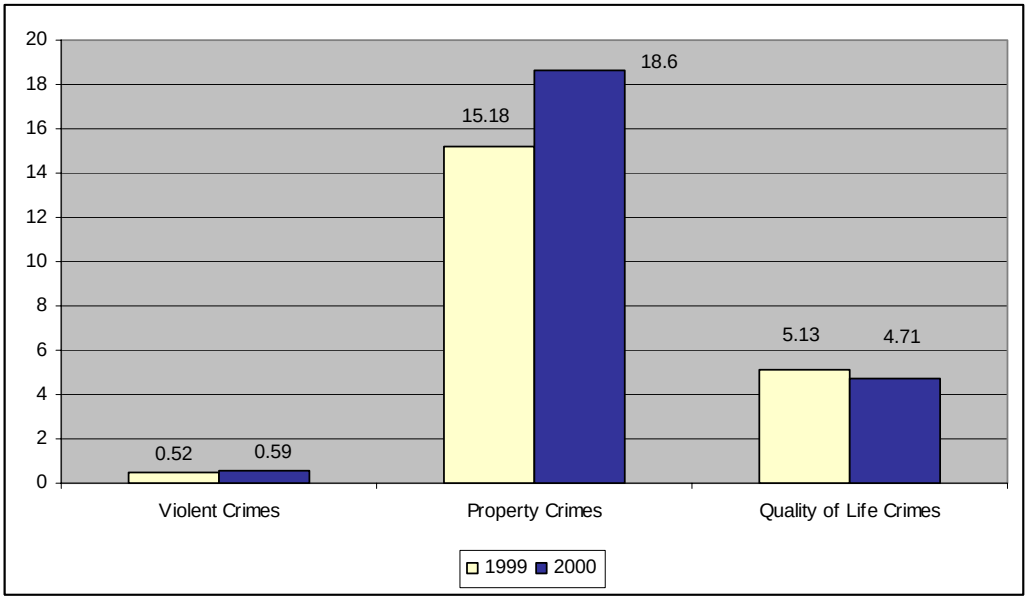


Figure 33. Crimes per Million Passenger Miles – 1999 and 2000 Light Rail

Chapter 6.
State Safety Oversight Audit Program

The State Safety Oversight Audit Program continues to be a priority for FTA's Office of Safety and Security. The Audit Program provides FTA with the opportunity to identify the requirements of Part 659 that have been most difficult for SOAs to implement. Further, it supports communication with the States that results in the greater sharing of technical information, the solicitation of best practices, and the development of activities that promote increased coordination between all stakeholders responsible for ensuring that system safety objectives are being identified and met each year.

Thus far (at the time of this report's production), FTA has audited 16 Oversight Agencies since the program began in the fall of 1998:

- Ohio Department of Transportation
- Florida Department of Transportation
- Tennessee Department of Transportation
- California Public Utilities Commission
- Texas Department of Transportation
- New York Public Transportation Safety Board
- Pennsylvania Department of Transportation
- Maryland Department of Transportation
- Louisiana Department of Transportation & Development
- Tri-State Oversight Committee
- Massachusetts Department of Telecommunication & Development
- New Jersey Department of Transportation
- Illinois Regional Transportation Authority
- Missouri Motor Carrier & Railroad Safety
- Georgia Department of Transportation
- Colorado Public Utilities Commission

To date, all audited states have addressed and fully resolved all findings of deficiency. No funds have been withheld from a state for failure to comply with audit findings.

FTA's Office of Safety and Security intends to complete its first cycle of audits in Spring 2002.

Audit Findings

It is clear from Figure 34 and Figure 35 that the majority of audit findings occur in State implementation of requirements for SSPP and Security Plan review and approval and accident investigation. While findings for the RFGS Internal Safety Audit Process category do not represent a large portion of the overall findings, the Internal Safety Audit Process finding of deficiency consistently indicates that the RFGS is not performing these audits or is performing them inadequately. Therefore, though it is difficult to make an immediate distinction of its importance in this table, this category of finding certainly demands attention due to its level of criticality within the implementation of a system safety program plan and safety program. In response to audit findings, FTA has provided technical assistance to those states resolving deficiencies and areas of concern. "Best practices," including forms, reports, procedures, and on-site activities, have been distributed to states and shared with the SOAs. At the end of the audit week, SOAs are given sample materials and flow charts that help to identify and describe the points of interaction necessary for effective program implementation.

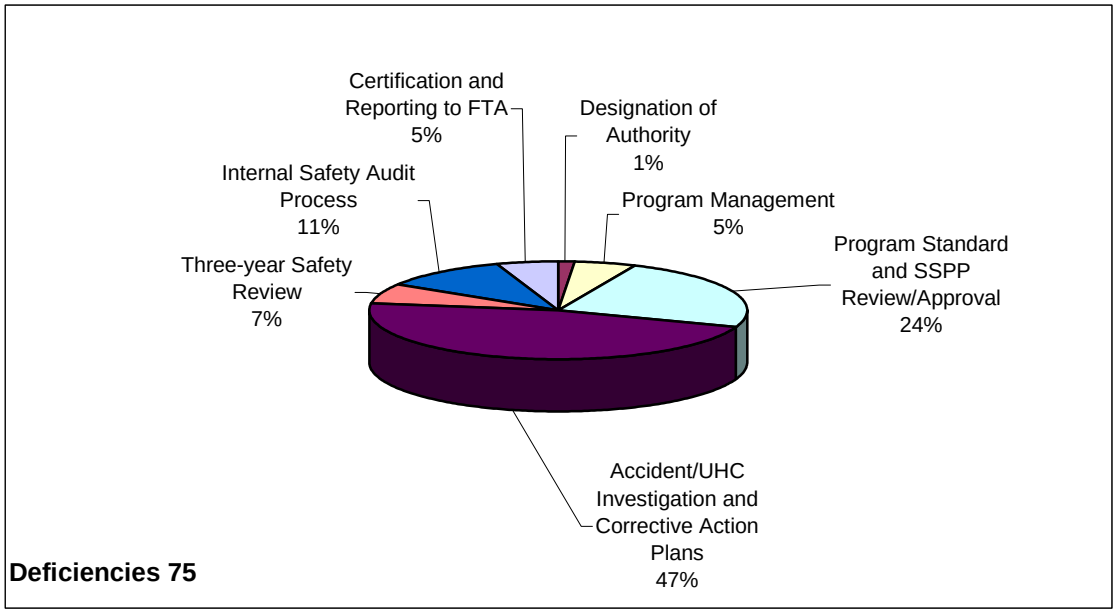


Figure 34. SSO Audit Deficiency Findings by Category

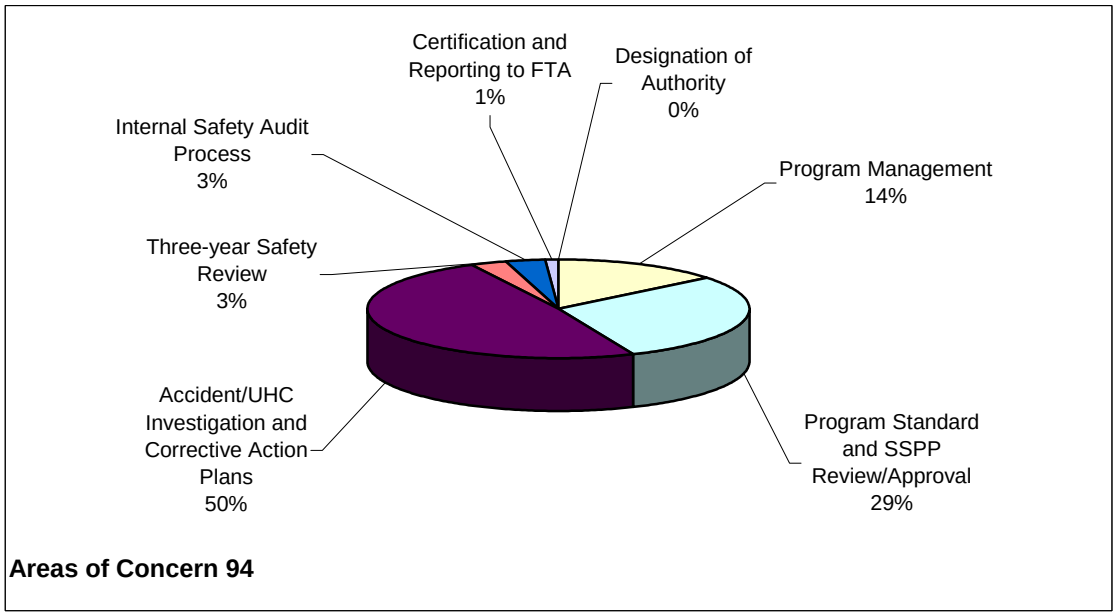


Figure 35. SSO Audit Area of Concern Findings by Category

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Table A1. State Contact Information

Name of Agency:	**Name of Safety Contact:**
Title:	A. Mailing Address: B. Physical Address (if different from mailing address):
Phone: **Fax:** **Email:**	

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Table A2. RFGS Contact Information Safety Contact

SAFETY CONTACT					
Name of Agency (acronym)	**Safety Contact**	**Mailing Address**	**Phone Number**	**Fax Number**	**Email**
SECURITY CONTACT					
Name of Agency	**Security Contact**	**Mailing Address**	**Phone Number**	**Fax Number**	**Email**

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Table A3. Chronology of System Safety and Security Program Standard

Date of Initial Adoption of System Safety Program Standard	Date of System Safety Program Standard Revision(s) (if applicable)	Date of Initial Adoption of System Security Program Standard	Date of System Security Program Standard Revisions (if applicable)
PLEASE ATTACH ELECTRONIC VERSION OF CURRENT SYSTEM SAFETY/SECURITY PROGRAM STANDARD.			

Table A4. Program Resources

Personnel Resources	Response
What was the Level of Effort (LOE) devoted by your State Safety Oversight Agency, in terms of Full-time Equivalents (FTEs), to implementing 49 CFR Part 659 requirements in 2000?	*Please specify to the nearest decimal place. For example, one FTE is 1.0; one-and-a-half FTEs is 1.5; two-and-a-quarter FTEs is 2.25, etc.* _____ FTE(s)
In 2000, did your Agency use contractors to support implementation of your Program?	*Please circle appropriate answer*: Yes No
If your Agency used contractors in 2000, what functions did they perform?	*Please list activities performed by consultants*:

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Table A5. RFGS SSPP and Security Plan Chronologies

Chronology of System Safety Program Plan Submission and Approval				
RFGS	**Date of Initial SSPP Submission to Oversight Agency**	**Date of Initial SSPP Approval**	**Date of SSPP Revisions, Submitted since Initial Approval (if applicable)**	**Date of Approval of Revised SSPP (if applicable)**
Chronology of System Security Program Plan Submission and Approval				
RFGS	**Date of Initial Security Plan Submission**	**Date of Initial Security Plan Approval**	**Date of Security Plan Revisions, submitted since Initial Approval (if applicable)**	**Date of Approval of Revised Security Plan (if applicable)**

PLEASE ATTACH ELECTRONIC VERSION OF CURRENT SYSTEM SAFETY PROGRAM PLAN(S) AND SECURITY PLAN(S) FOR THE RFGS IN YOUR JURISDICTION.

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Table A6. Rail Grade Crossing and FRA Shared Operations Inventory Categories

Rail Transit Agency	1999 NTD Total Reported Grade Crossings	2000 Total Rail Grade Crossings	2000 Protected Grade Crossings	2000 Traffic - controlled Grade Crossings	2000 Unprotected Street-running Grade Crossings	Who Maintains Protected Grade Crossings?	Shared Use Track? (Yes or No)	FRA Waiver Required? (Yes or No)	Shared Corridor Operations? (Yes or No)
Comments:									

Total Rail Grade Crossings (as reported to the 1999 National Transit Database) -- An intersection of highway roads, railroad tracks, or dedicated transit rail tracks that run either parallel or across mixed traffic situations with motor vehicles, light rail, commuter rail, heavy rail, trolleybus, or pedestrian traffic.

Total Rail Grade Crossings (as reported by the rail transit agency for 2000 to the National Transit Database) -- An intersection of highway roads, railroad tracks, or dedicated transit rail tracks that run either parallel or across mixed traffic situations with motor vehicles, light rail, commuter rail, heavy rail, trolleybus, or pedestrian traffic.

Protected Rail Grade Crossing -- A rail grade crossing equipped with urban traffic control devices. These devices could include gates, signals, signs, bells, and other warning indicators.

Traffic-controlled Rail Grade Crossing -- An intersection of street and light rail tracks, located in a mixed traffic roadway, where the light rail vehicle follows vehicular traffic lights to govern movement through the intersection.

Unprotected Street-running Grade Crossing -- An intersection of street and light rail tracks, located in a mixed traffic roadway, where the light rail vehicle does not use traffic lights or other traffic-control devices to guide movement through the intersection.

Grade Crossing Maintainer -- Organizations who maintain rail grade grossing protection devices.

Shared Use Operations -- Light rail operations that take place on the tracks of the general railroad system (i.e., light rail trolleys use track that is also used by freight railroads).

FRA Waiver -- Waiver of appropriate rules provided by FRA for a light rail operation sharing the track of the general railroad system with conventional equipment.

Shared Corridor -- Light rail operations, commuter rail operations and/or freight rail operations running side-by-side on separate, but parallel tracks. A shared corridor may also be located in the median of a highway or in some other configuration that includes the highway as part of the shared corridor.

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Table A7. Calendar Year 2000 FTA Reportable Accidents

RFGS and Mode	Collisions	Derailments	Rail Grade Crossing Incidents	Fires	Other

Table A8. Calendar Year 2000 FTA Reportable Fatalities

RFGS and Mode	Collisions	Derailments	Rail Grade Crossing Incidents	Fires	Other

Table A9. Calendar Year 2000 FTA Reportable Injuries

RFGS and Mode	Collisions	Derailments	Rail Grade Crossing Incidents	Fires	Other

Table A10. Location of FTA Reportable Rail Grade Crossing Accidents

RFGS and Mode	Protected Rail Grade Crossing	Traffic-controlled Rail Grade Crossing	Unprotected Street-running Grade Crossing	Total Fatalities	Total Injuries
Fatalities by Type of Grade Crossing					
Injuries by Type of Grade Crossing					

Protected Rail Grade Crossing -- A rail grade crossing equipped with urban traffic control devices. These devices could include gates, signals, signs, bells, and other warning indicators.

Traffic-controlled Rail Grade Crossing -- An intersection of street and light rail tracks, located in a mixed traffic roadway, where the light rail vehicle follows vehicular traffic lights to govern movement through the intersection.

Unprotected Street-running Grade Crossing -- An intersection of street and light rail tracks, located in a mixed traffic roadway, where the light rail vehicle does not use traffic lights or other traffic-control devices to guide movement through the intersection.

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Table A11. Probable Cause of FTA Reportable Accidents

NOTE: Please complete one table for each RFGS mode of service. For example, if an RFGS provides both heavy and light rail service, please complete one table for the agency's heavy rail service and one for the agency's light rail service.

Name of RFGS and Mode:_____

Cause Type		Collisions	Derailments	Rail Grade Crossing Incidents	Fires
Car Equipment Failure					
Body (including doors, frame, stairs)					
Propulsion Unit (power unit failure)					
Trucks (wheel/brake failure)					
Human Failure					
Operating Rule Violation					
Operating Procedures Violations					
Drug/Alcohol Violation					
Fatigue					
Inattentiveness					
Operations					
Crowd Control					
Improper Procedures					
Track					
Track Component Deficiency					
Track Component Failure					
Signal					
Signal Component Deficiency					
Signal Component Failure					
Cable					
Cable Component Deficiency					
Cable Component Failure					
Other Vehicle					
Passenger					
Pedestrian					
Miscellaneous (specify)					

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Table A12. Probable Cause – Other FTA Reportable Accidents

NOTE: Please complete one table for each RFGS mode of service. For example, if an RFGS provides both heavy and light rail service, please complete one table for the agency's heavy rail service and one for the agency's light rail service.

Name of RFGS and Mode:_____

Category of Cause		RFGS	Fatalities	Injuries
Suicides				
Suicide Attempts				
Slips, Trips, and Falls in Station				
Boarding/Deboarding Train				
Car Door Injury				
Escalators/Stairwells				
Homicides				
Assaults				
Trespassing				
Other – Please Specify				
Other – Please Specify				
Other – Please Specify				

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Table A13. Number of Unacceptable Hazardous Conditions and Probable Causes

RFGS and Mode	No. of FTA Reportable Unacceptable Hazardous Conditions in 2000	Probable Causes Identified

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Table A14. SSO Program Administration

Did your Agency conduct a Three-Year Safety Review of any RFGS within your jurisdiction in Calendar Year 2000?	*Yes* *No*
If "yes," for which RFGS did your Agency conduct this Review?	*Please list:*
Did your Agency receive an Annual Report from each RFGS within your jurisdiction describing the Internal Safety Audit Process conducted in 2000?	*Yes* *No*
If "no," please explain why this report was not received.	*Explanation:*

Table A15. Corrective Action Plans Resulting from Accident and Unacceptable Hazardous Conditions Investigations

RFGS	Submitted Corrective Action Plans	Approved Corrective Action Plans	Open Corrective Action Plans

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Table A16. Corrective Action Plans Resulting from Three-Year Safety Reviews

RFGS	Submitted Corrective Action Plans	Approved Corrective Action Plans	Open Corrective Action Plans

Table A17. Corrective Action Plans Resulting from Internal Safety Audit Process

RFGS	Submitted Corrective Action Plans	Approved Corrective Action Plans	Open Corrective Action Plans