

Transit Collisions: Data Overview & FTA Research Initiatives

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Transportation Research Board Annual Meeting

01/08/2024

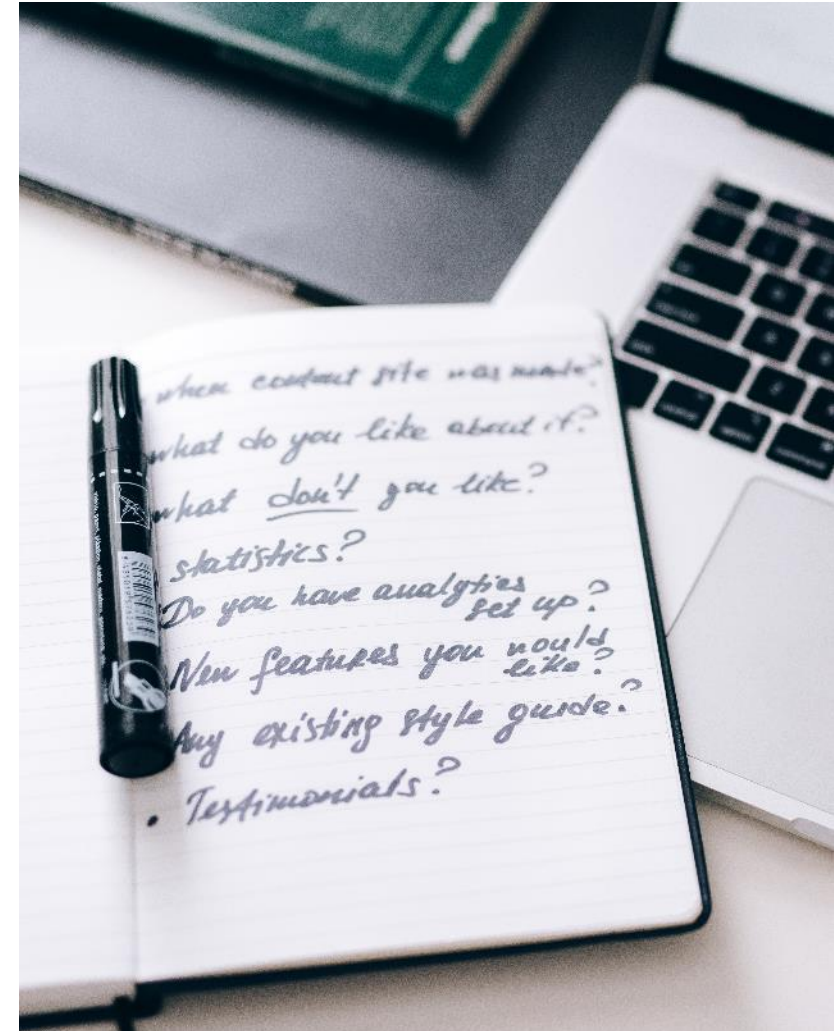


U.S. Department of Transportation
Federal Transit Administration



Agenda

1. Office of Transit Safety & Oversight (TSO)
 - Who we are & what we do
 - Transit collision data
 - Programmatic initiatives
2. Office of Research, Demonstration and Innovation (TRI)
 - Transit Collision Avoidance and Mitigation Research initiatives



Office of Transit Safety & Oversight (TSO)



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Federal Transit Administration

TSO purpose and programs

Our mission

Deliver a national safety and oversight program that reduces safety events on public transportation systems through the effective use of public funds.

Our work

- Foster continuous improvements in transit safety through the implementation of Safety Management System (SMS) methods and principles.
- Provide compliance oversight and technical assistance to transit industry stakeholders regarding safety-related rules and guidance.
- Administer an effective and comprehensive national program for the oversight of recipient compliance with FTA assistance program requirements and strong stewardship of federal funds.

Office of System Safety

Divisions

- Safety Assurance and Risk Management
- Safety Policy and Promotion

Today's focus

- Overview of collision data
- FTA & TSO initiatives related to transit collisions

Collision data

Topics

- Bus collisions
 - State of bus safety
 - Bus to Privately Operated Vehicle (POV)
 - Bus to POV intersections
- Rail collisions
 - State of rail safety
 - Rail to POV
 - Rail grade crossing (RGX)
 - Rail to person

Note on data visualizations

- Coverage: FY 2019-2022
- Source: National Transit Database
- Data as of: October 2, 2023 unless otherwise noted
- FY22-23 data are preliminary

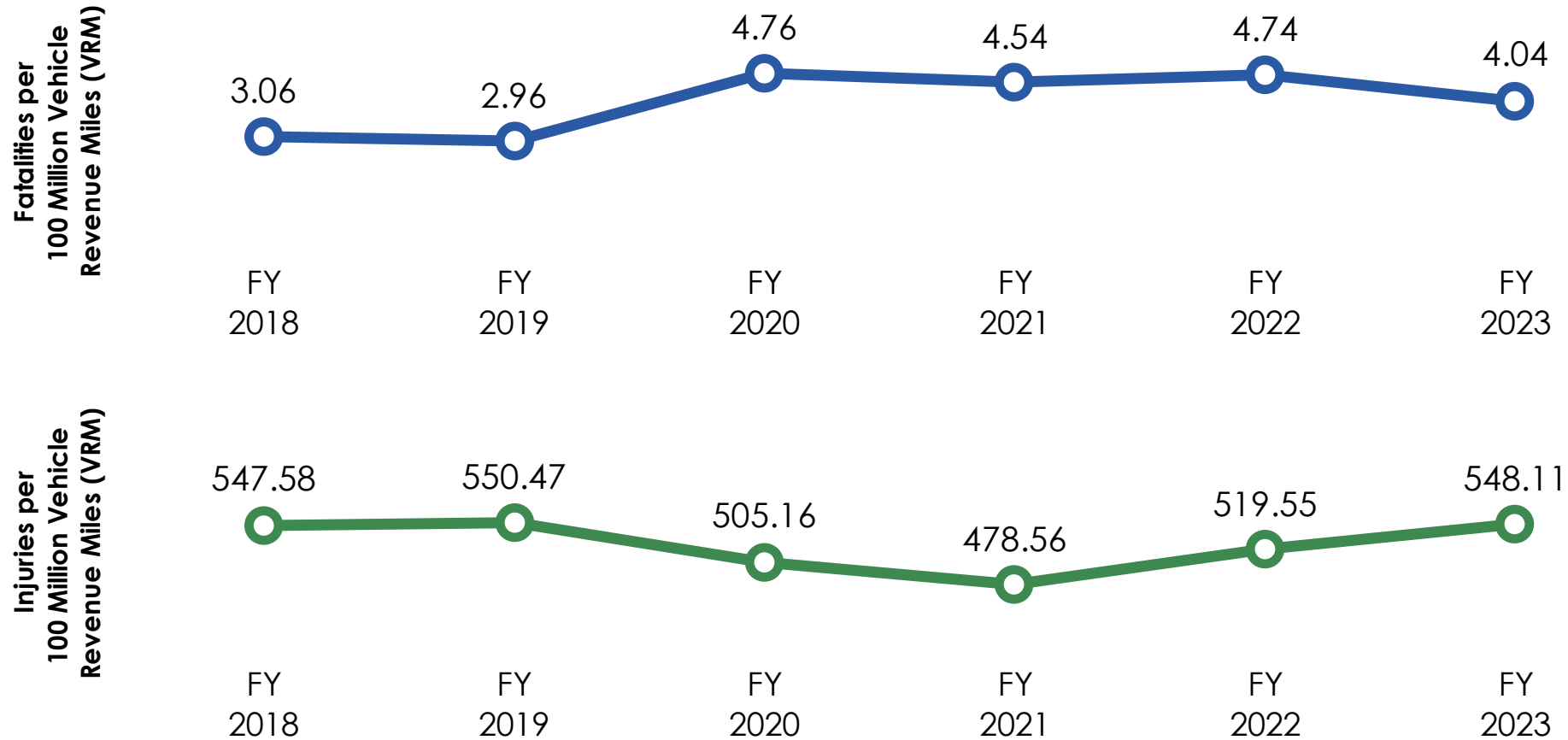
Bus collision data



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Bus Transit Safety: annual trends

Fatality rates increased in 2020 and injury rates have increased each year since 2021.

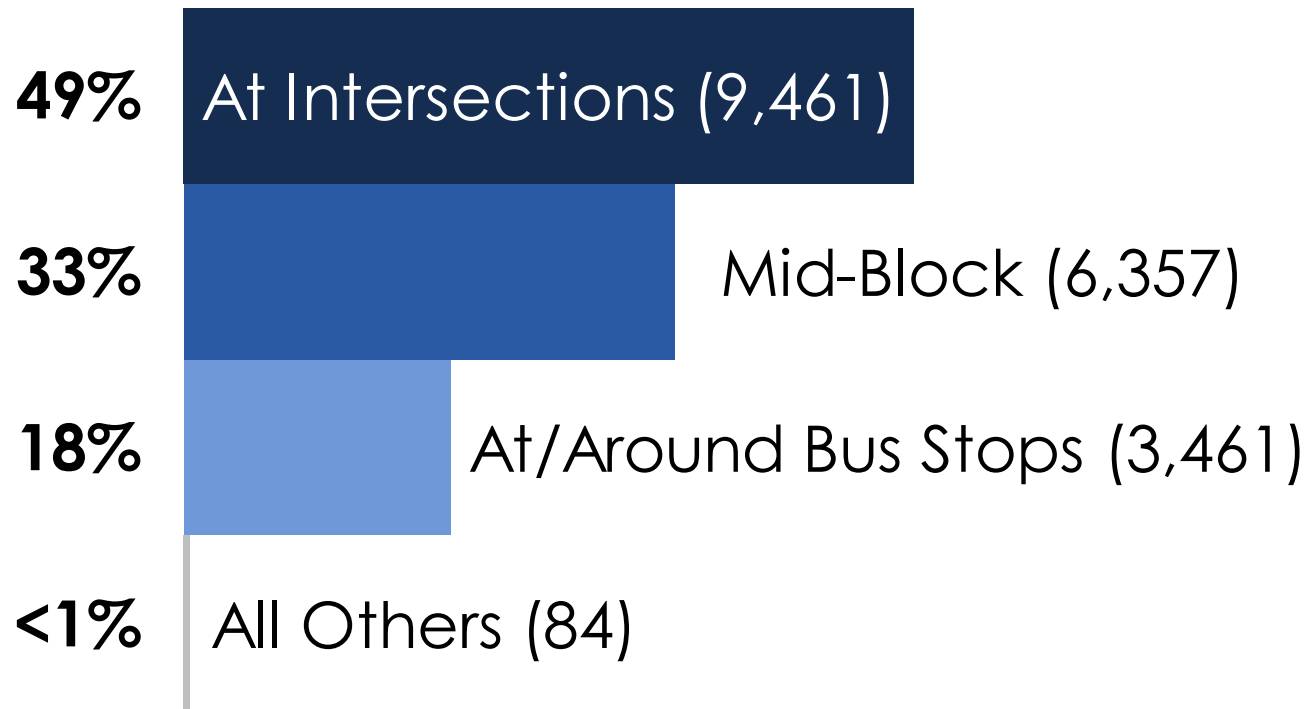


Data as of: Nov 3, 2023

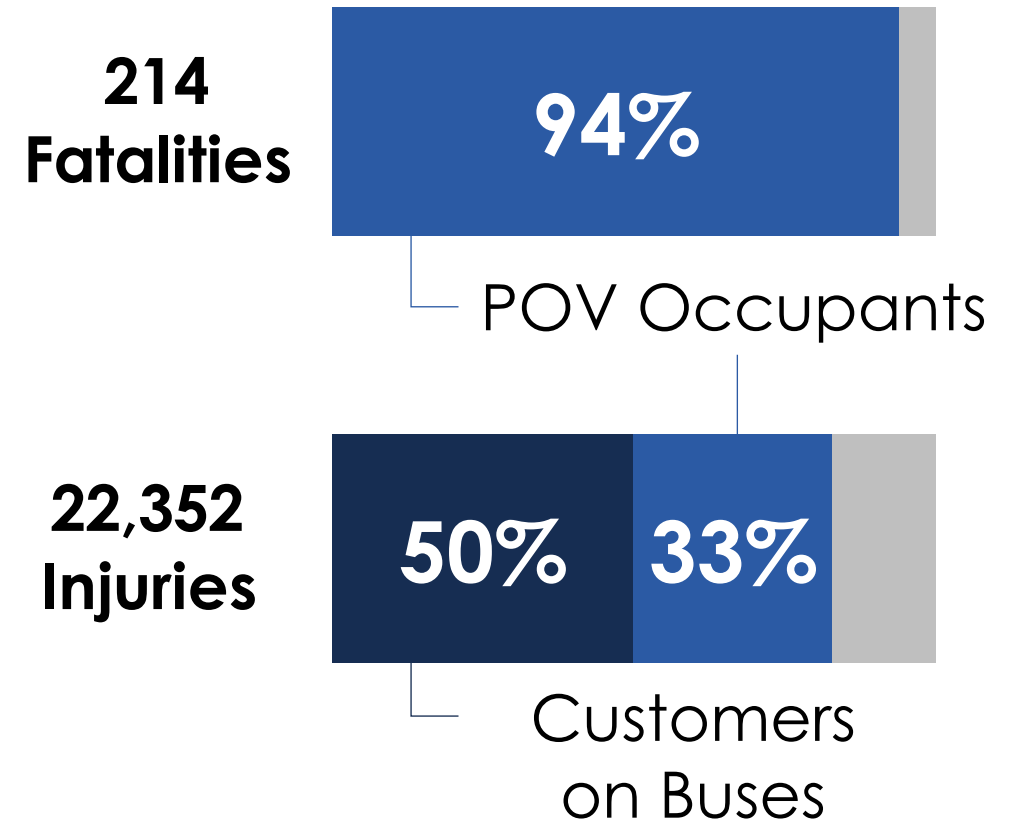
Bus-to-POV collisions, FY 2019-2022

In bus-to-POV collisions, POV occupants account for nearly all fatalities.

Collisions By Location



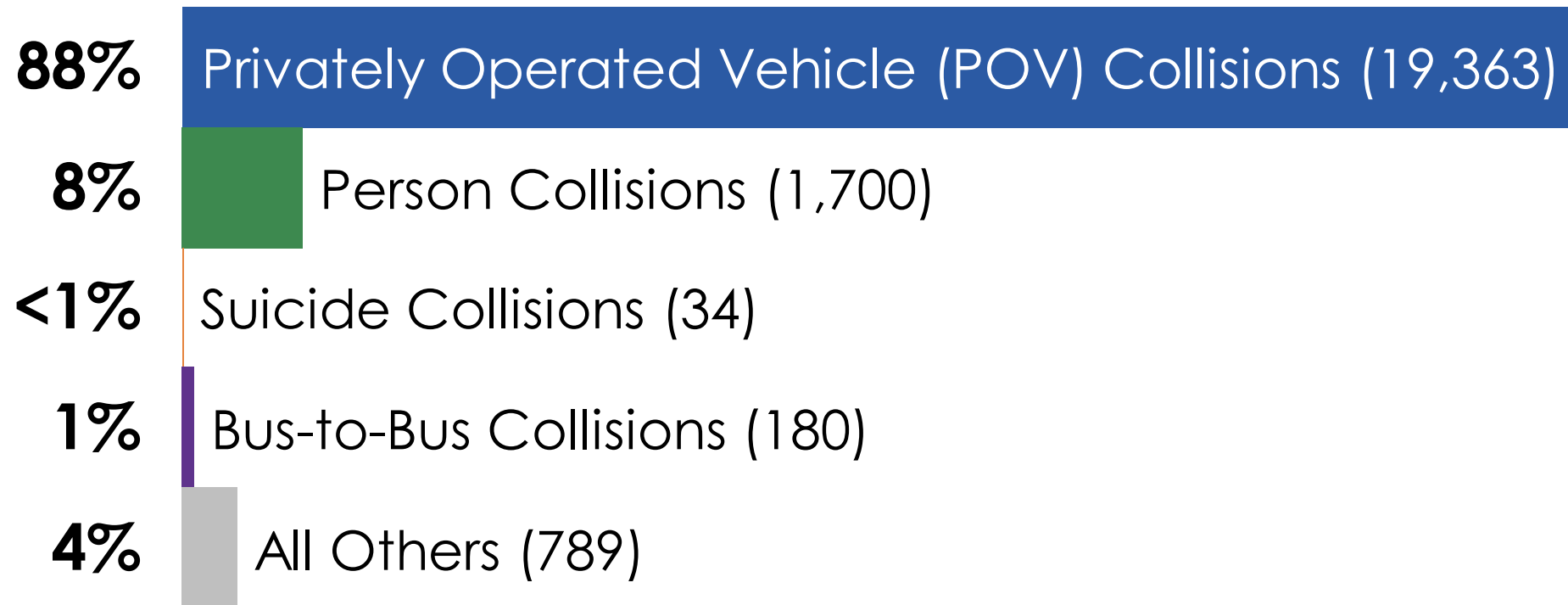
Fatalities and Injuries



Bus collisions by type

Most bus collisions involve privately operated vehicles (POVs).

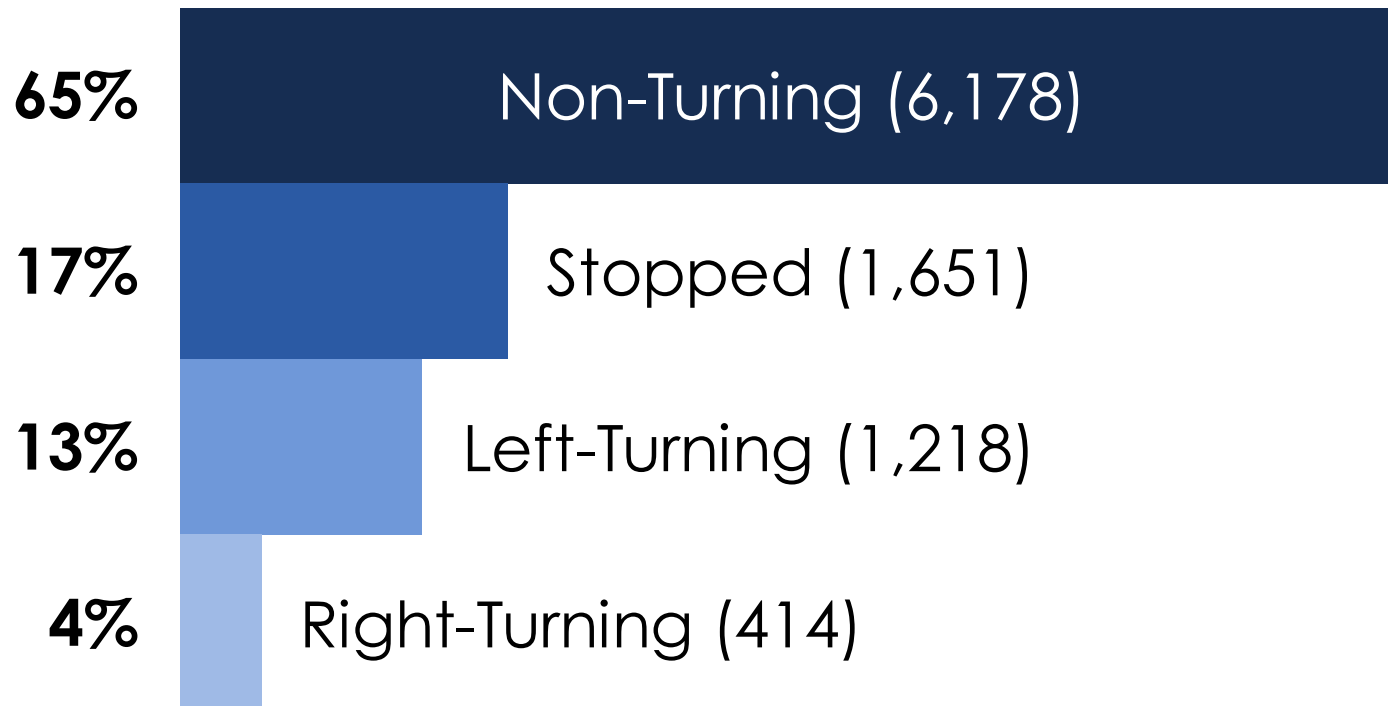
Bus Transit Vehicle Collisions by Collision Type, FY 2019–2022



Bus-to-POV intersection collisions

Most bus-to-POV collisions occur when the bus is in motion and not turning.

Bus-to-POV Intersection Collisions by Bus Movement, FY 2019–2022



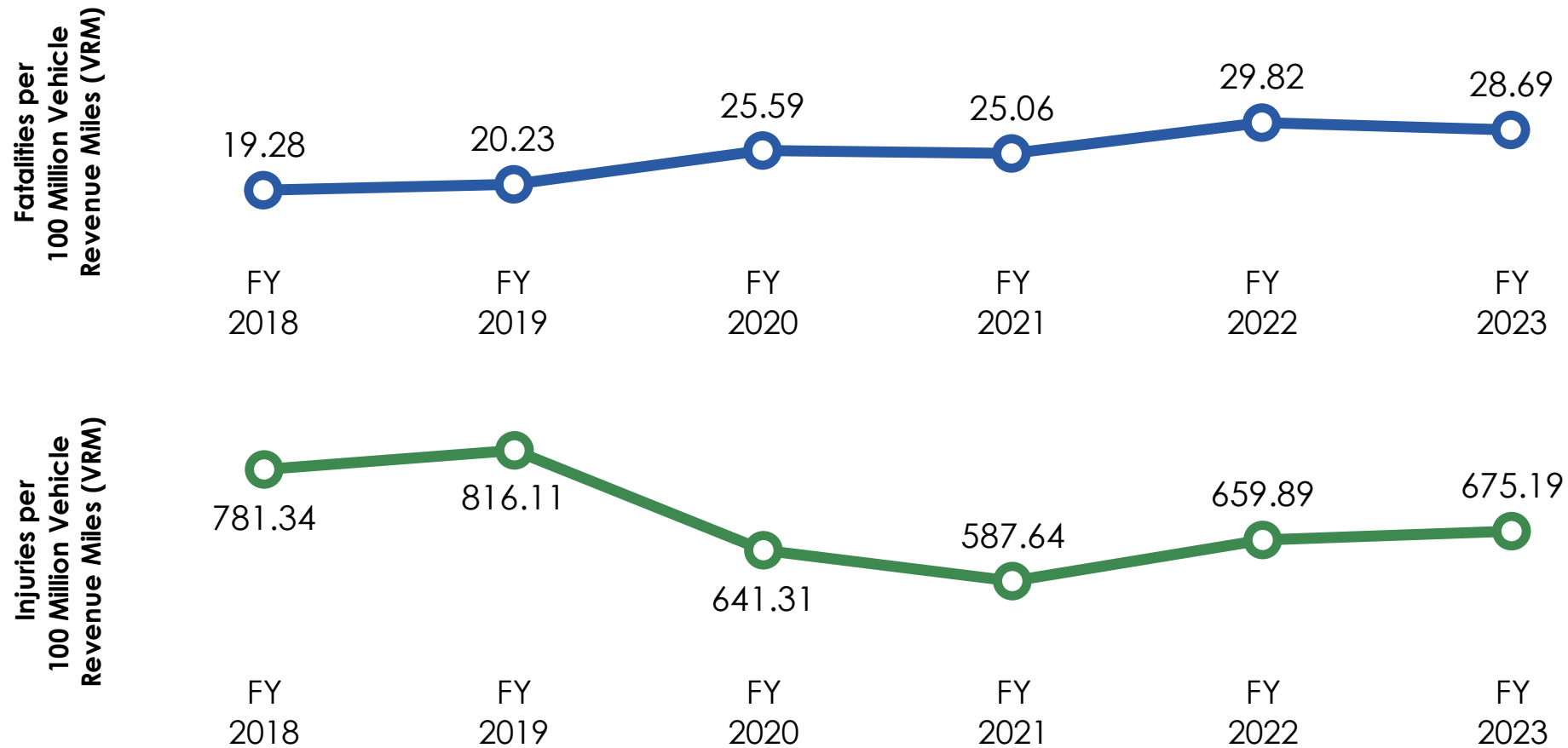
Rail collision data



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Rail Transit Safety: annual trends

Fatalities have increased since 2019 and injuries have increased each year since 2020.

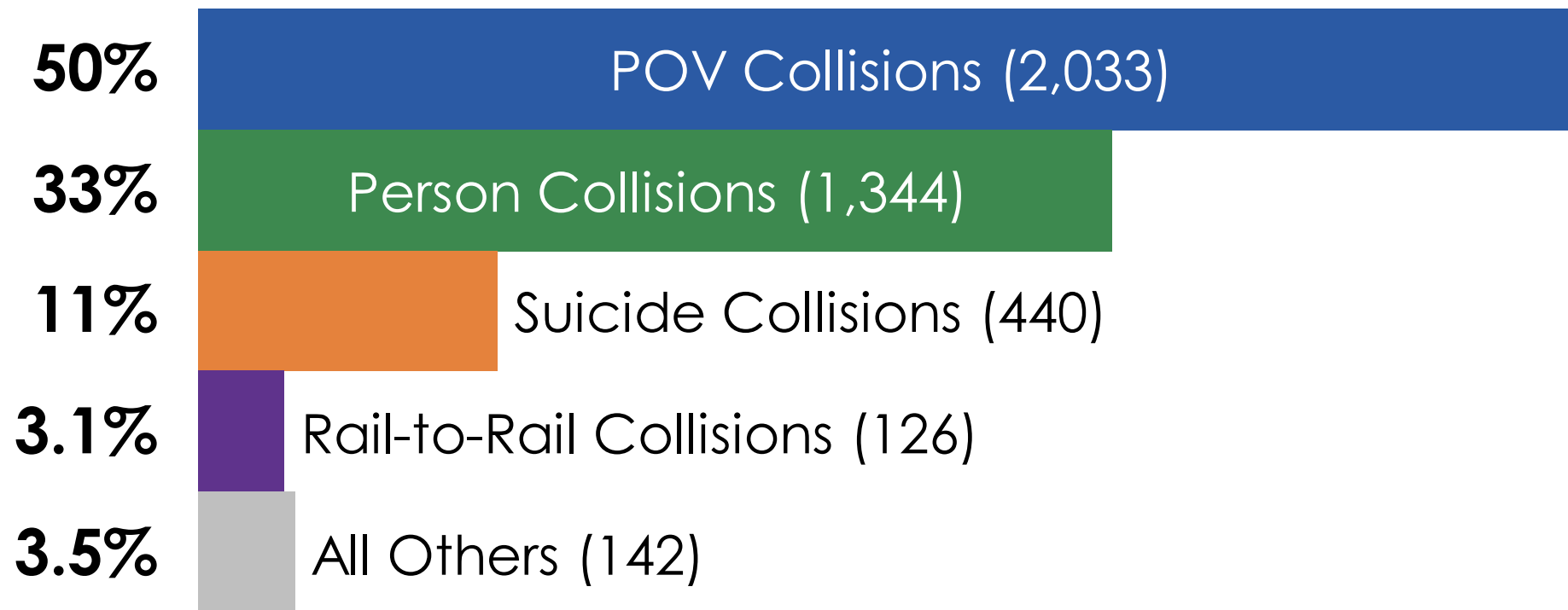


Data as of: Nov 3, 2023

Rail collisions by type, FY 2019-2022

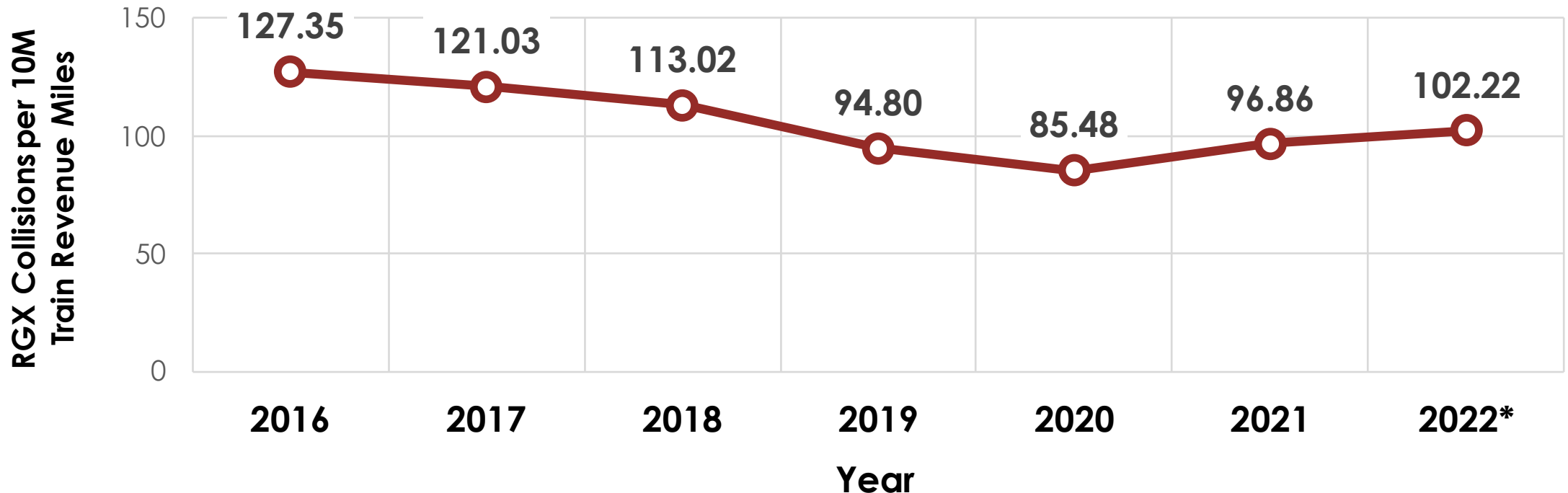
Most rail collisions involve privately operated vehicles.

Rail Transit Vehicle Collisions by Collision Type, FY 2019–2022



Transit Rail Grade Crossing (RGX) Collision Trends, CY 2016-2022

The annual RGX collision rate and count have increased since 2020.

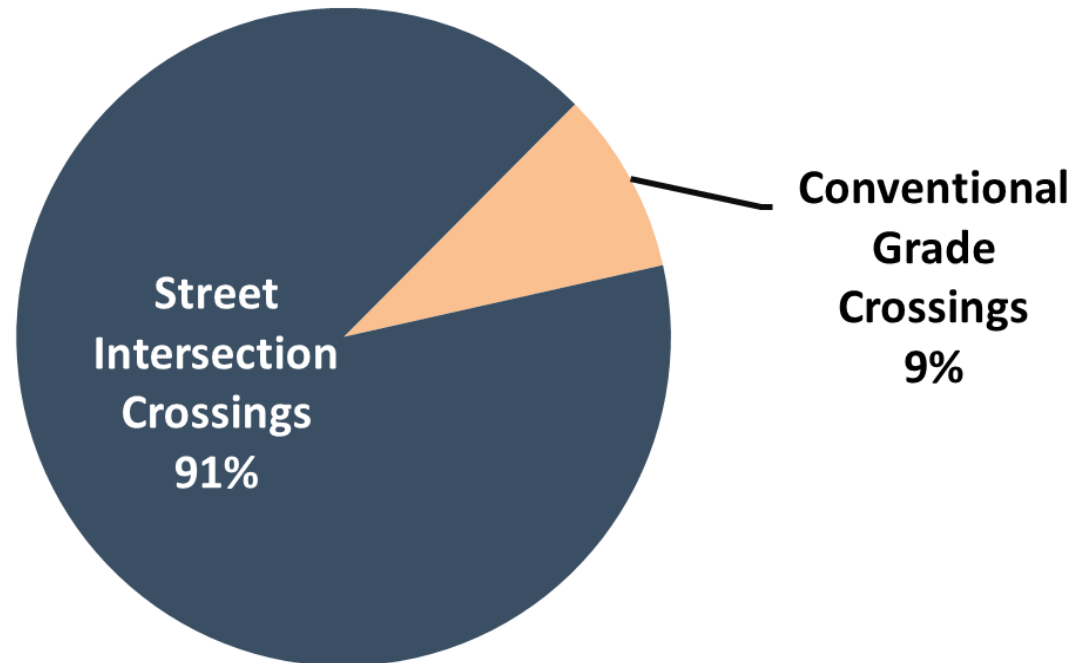


	2016	2017	2018	2019	2020	2021	2022*
Total Collisions	787	775	733	620	458	522	592

RGX incidents by crossing type

Incidents reported were nearly *10 times higher* at street intersection crossings than conventional grade crossings during a recent FTA survey.

Percentage of Incidents Reported at Conventional Grade Crossings vs. Street Intersection Crossings

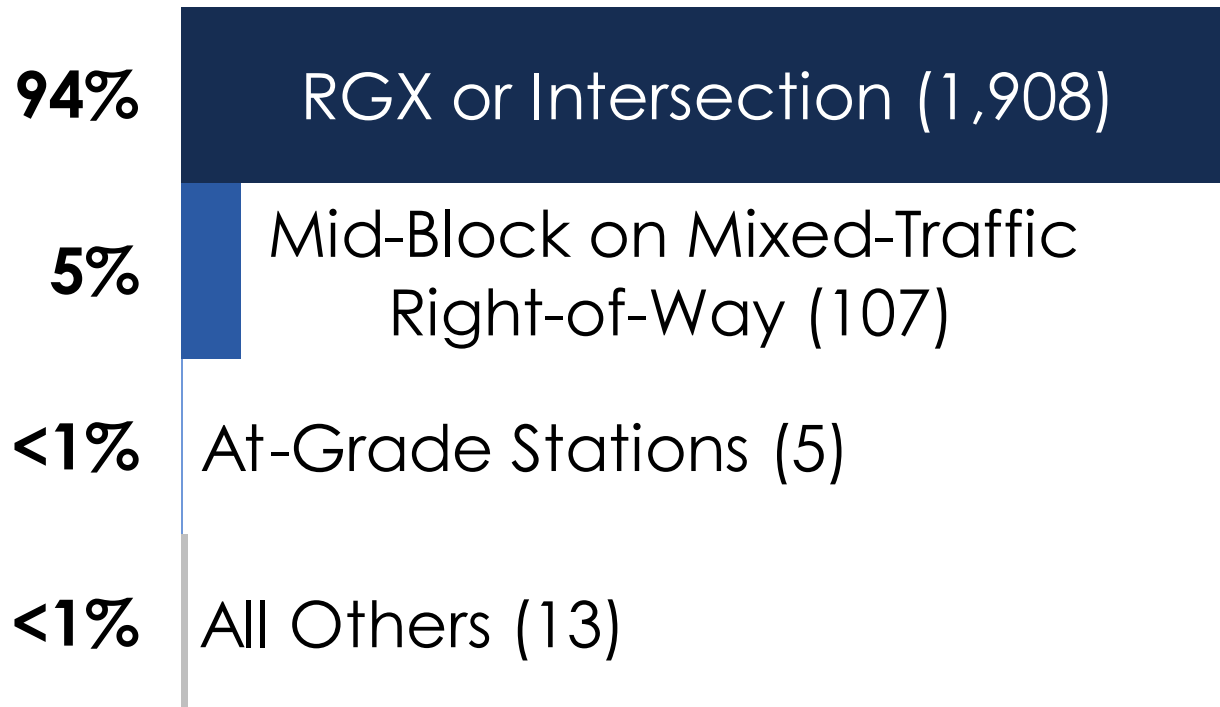


Source: [FTA Standards Development Program: Rail Transit Roadway/Pedestrian Grade Crossing Exploratory Report](#) | May 2022

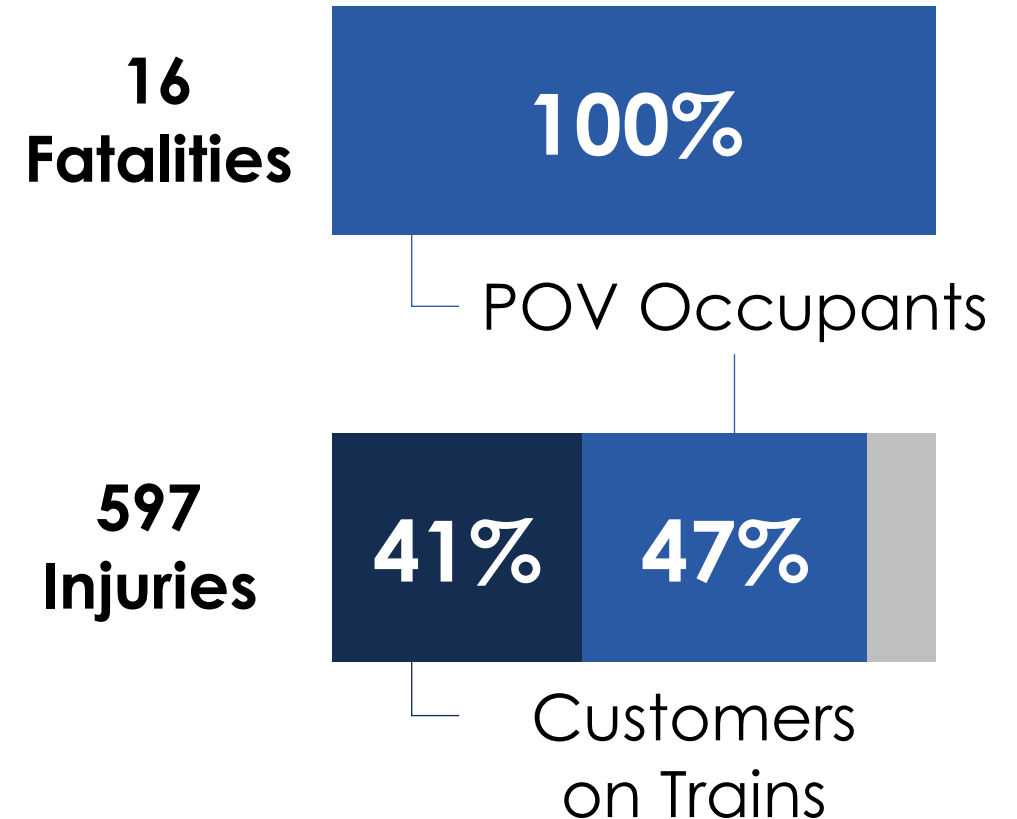
Rail-to-POV collisions, FY 2019-2022

In rail-to-POV collisions, POV occupants account for all fatalities and nearly half of injuries.

Collisions By Location



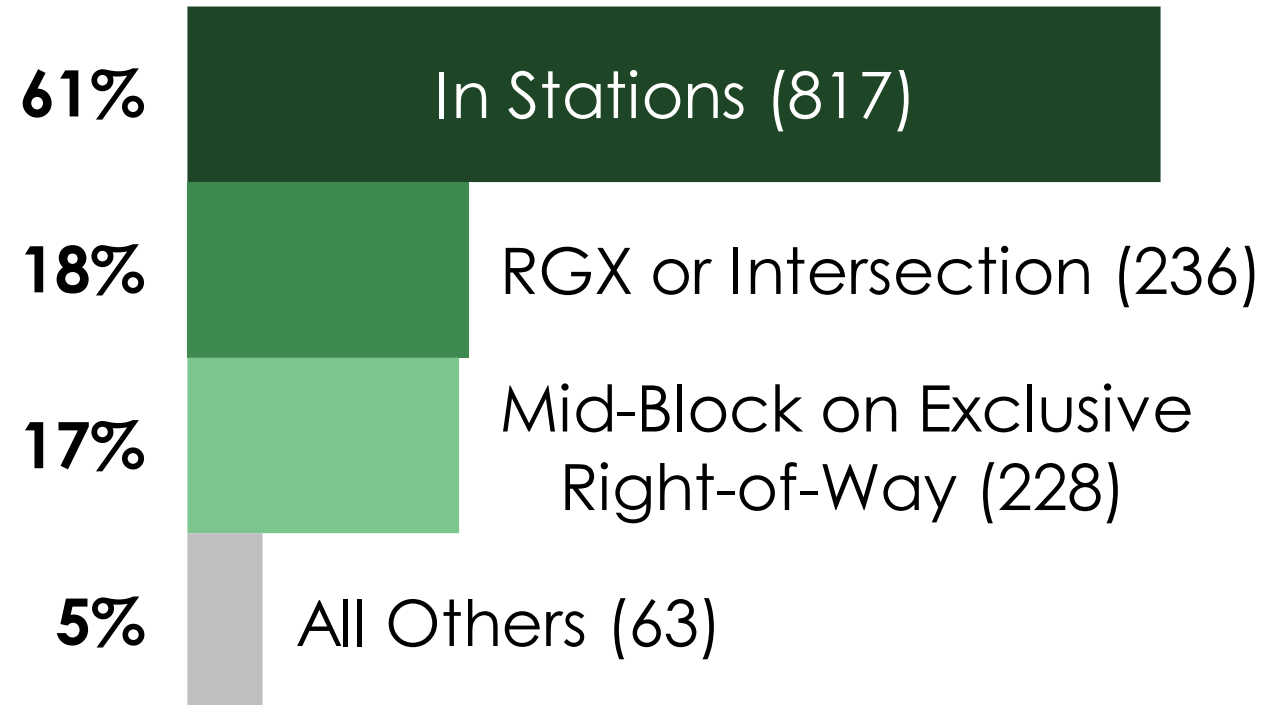
Fatalities and Injuries



Rail-to-Person Collisions, FY 2019-2022

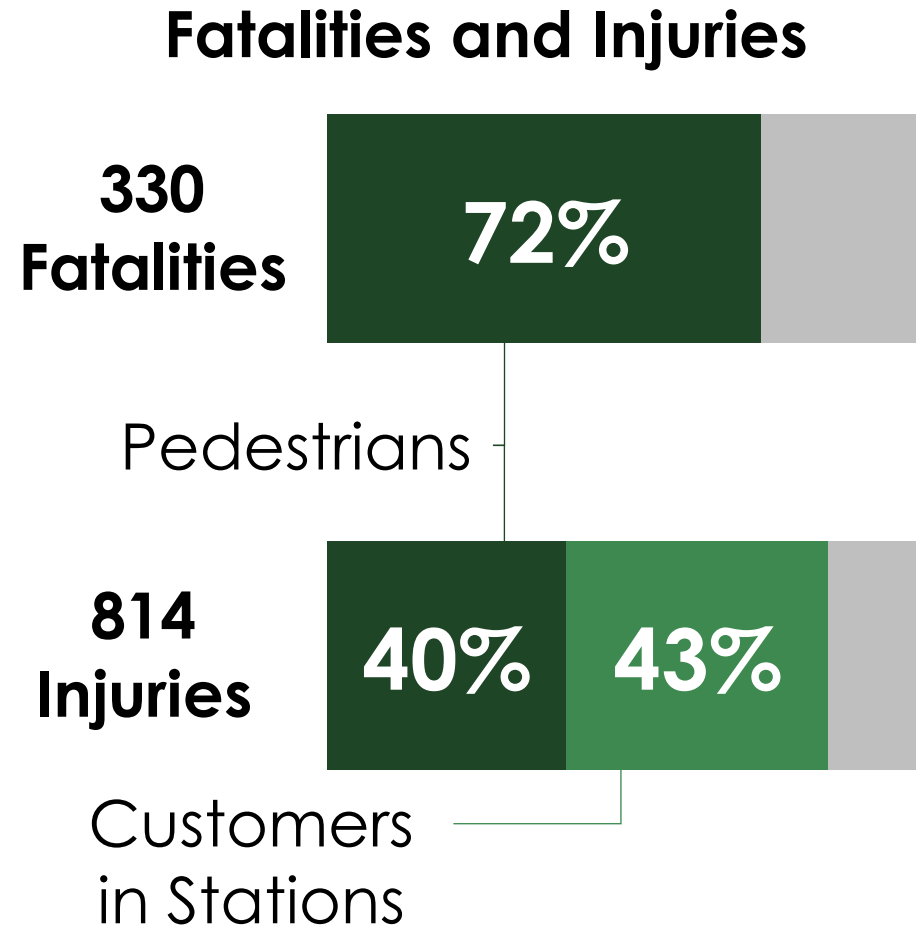
Most rail-to-person collisions occur in stations.

Collisions By Location



Rail-to-Person Collisions, FY 2019-2022

In rail-to-person collisions, pedestrians account for most fatalities.



Transit collision programmatic initiatives



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Safety Advisory SA-23-1

Purpose & resources

- Recommend that transit agencies that provide bus service consider mitigations to reduce bus-to-person collisions
- Bus-to-Person Collisions Safety Advisory [website](#)

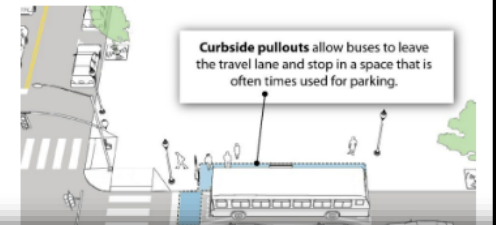
Bus-to-Person Collisions Safety Advisory 23-1

Overview

On September 19, 2023, FTA issued [Safety Advisory 23-1: Bus-to-Person Collisions](#) to recommend that transit agencies that provide bus service consider mitigation strategies to reduce bus-to-person collisions to help reduce the likelihood and severity of bus collisions with pedestrians, bicyclists and micromobility users.

Data from the National Transit Database shows that bus-to-person collisions remain a top safety concern, accounting for 15 percent of fatalities from 2008 to 2021, and a predominant risk focus area.

To improve bus safety, bus transit agencies should assess specific hazards that may cause or contribute to bus-to-person collisions, assess the associated safety risks, and implement appropriate mitigations to reduce the likelihood and severity of those collisions. At a minimum, agencies should consider the following bus operator vision impairment mitigation strategies:



Likelihood	5 Very High	4 High	3 Moderate	2 Low	1 Very Low	Risk Rating				
						Negligible	Marginal	Moderate	Serious	Catastrophic
						A	B	C	D	E
						Severity				

Rail grade crossing (RGX) resources

RGX website

- OLI Transit Materials
- Transit Safety Pledges
- FTA presentations
- TRACS Reports
- FTA Research

RGX webinar

- Spotlight on Safety: Transit Rail Grade Crossings
- Featured guest speakers from the Center for Urban Transportation Research, MxV Rail, TriMet and Operation Lifesaver, Inc.



Website



Presentation



Recording



Office of Research, Demonstration and Innovation (TRI)



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FTA Research Initiatives

Transit Collision Avoidance & Mitigation Research Initiatives

- FTA Safety Research & Demonstration Pilot Program
- FTA Safety Standards Development Program

Safety Research Demonstration Program Objectives & Areas of Focus

Assist transit agencies to explore advanced technologies, designs or practices to prevent and mitigate safety hazards on their systems

Evaluate cost-effectiveness and practicability of potential solutions

Rail

Track worker protection (secondary warning systems)

Grade-crossing safety (vision systems, safety campaigns & signage, risk ranking tools)

Trespassing and suicide (trespassing detection systems, rail vehicle designs)

Bus

Operator visibility (mirror designs)

Collision avoidance technologies (vision, LiDAR)

Safety Research Demonstration Pilot Program Highlights

- ❑ FTA awarded a total of \$16 million for 15 demonstration projects
- ❑ 12 projects are rail related and 3 are bus related
- ❑ 13 different transit agencies, 5 Universities and various technology providers and organizations
- ❑ 7 projects have completed to date
- ❑ 4 technical reports have been published

Safety Standards Program Objectives & Areas of Focus

Collect and analyze transit industry data by performing literature reviews, scans, surveys, case studies and develop findings and recommendations

Support development of voluntary standards to address safety specific challenges and emerging requirements

Rail

Rail Transit Roadway Worker Protection Standards Review

Mitigations for Trespasser and Suicide Fatalities and Injuries

Rail Transit Roadway/Pedestrian Grade-crossing Exploratory Report (Hazard Analysis)

Needs Assessment for Transit Rail Transmission-Based Train Control

Bus

Transit Bus Crashworthiness/Crash Energy Management Standards Review

Crashworthiness/Crash Energy Management Standards Review (gaps for less than 30 Ft Bus)

Safety Standards Program Highlights

- ❑ FTA awarded over \$4 million to perform safety standards projects
- ❑ Program conducted studies on rail, bus and workforce safety areas
- ❑ Center for Urban Transportation Research worked with MxV Rail, APTA, Transit Standard Working Group and various transit agencies
- ❑ 26 Standards reports have been published

NOTE: In August 2023, FTA awarded a new Standards Development project to APTA to conduct industry needs assessment in all areas of transit and develop standards where needed:

<https://www.transit.dot.gov/research-innovation/standards-development-program>

Safety Standards Reports

- ❑ All 26 reports cited earlier are available on FTA webpage: <https://www.transit.dot.gov/research-innovation/fta-reports-and-publications>
- ❑ Six reports on Rail and Bus collision related research are available:

<https://www.transit.dot.gov/sites/fta.dot.gov/files/2022-08/FTA-Report-No-0227.pdf>

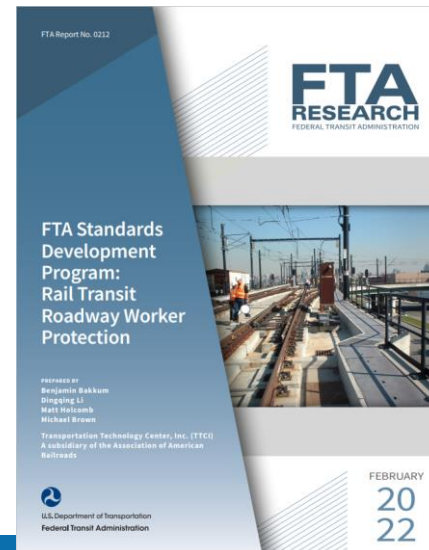
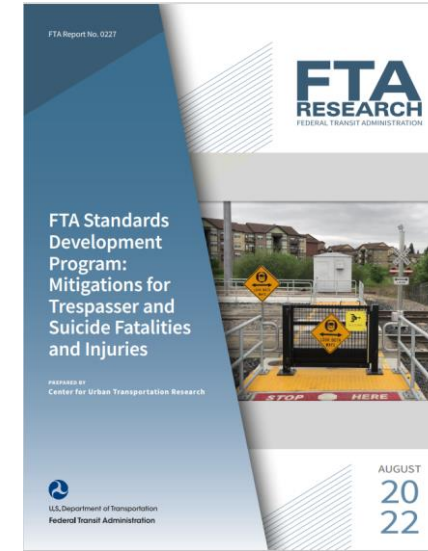
<https://www.transit.dot.gov/sites/fta.dot.gov/files/2022-08/FTA-Report-No-0225.pdf>

<https://www.transit.dot.gov/sites/fta.dot.gov/files/2022-05/FTA-Report-No-0216.pdf>

<https://www.transit.dot.gov/sites/fta.dot.gov/files/2022-02/FTA-Report-No-0212.pdf>

<https://www.transit.dot.gov/sites/fta.dot.gov/files/2021-05/FTA-Report-No-0179.pdf>

<https://www.transit.dot.gov/sites/fta.dot.gov/files/2020-12/FTA-Report-No-0141.pdf>



Information on FTA Research

- ❑ FTA Project, research and final technical reports are posted online
- ❑ FTA annual Research Report to Congress
- ❑ To participate on any of future FTA research programs
 - FTA website
 - Grants.gov
 - Federal Register Notice

Thank you!

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