BUS SAFETY DATA REPORT

Bus Transit Safety Data 2008–2018

September 2021

U.S. Department of Transportation
Federal Transit Administration

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14. ABSTRACT

The Bus Safety Data Report (BSDR) is a data analysis prepared by the Federal Transit Administration. The goal of the BSDR is to present and summarize bus transit safety and security event data with a focus on patterns and trends in event, fatality, and injury data within the report's period of study. This BSDR presents data reported through the National Transit Database program for the years 2008 through 2018. This report includes trends across the eleven-year study period and highlights 2018 data, the most recent year of data available for analysis.

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Executive Summary

The Bus Safety Data Report (BSDR) is a data analysis prepared by the Federal Transit Administration (FTA) to illustrate bus transit safety outcomes and present trends and patterns in bus safety and security event data. This BSDR provides a snapshot of bus transit's safety performance for the eleven-year period of calendar years (CY) 2008 through 2018. It focuses on the different types of safety and security events that occurred and the outcomes of those events in terms of fatalities and injuries.

By reviewing this data analysis, FTA can identify areas where it may conduct research, develop training, or perform assessments targeted at improving conditions that pose the greatest risk of harm to bus transit customers, employees, and the general public. Bus transit agencies and others in the transit industry who continuously seek to improve bus transit safety may also find the BSDR to be a useful reference on industrywide safety performance.

The BSDR may be especially beneficial to bus transit agencies as they implement their safety risk management process described in their Agency Safety Plans. Reviewing bus transit safety data from across the country could be helpful to agencies in identifying, prioritizing and managing safety risks within their own systems. Additionally, the analysis methodologies used in this report may serve as useful models for transit agencies conducting safety performance measurement activities.

The data presented in the BSDR come from the bus transit providers who report to FTA's National Transit Database (NTD). The NTD requires all recipients of FTA's Urbanized Area Formula Grants (§ 5307) and all general rural transit and tribal transit recipients of FTA's Formula Grants for Rural Areas (§ 5311) to report their safety and security data to the NTD. There are other bus transit providers who are not required to report but do so voluntarily. Voluntary reporters must adhere to NTD reporting requirements to ensure their data meet the quality standards of other reporters. More information on safety and security data reporting requirements is included in Appendix A.

As of 2018, FTA requires NTD bus reporters to submit data on all events resulting in a fatality, one or more injuries, $25,000 or more in property damage, fire suppression, an evacuation for life-safety reasons, or a collision requiring towing for at least one vehicle. See Appendix B for NTD definitions and reporting thresholds. These event reporting thresholds evolved over the course of the eleven-year period included in this report, and this affected the frequency with which agencies reported certain types of events. The

analyses presented in this report identify these changes. Appendix C includes a summary of threshold changes and their impacts on BSDR analyses.

Throughout this report, analyses are presented using raw counts of events, fatalities, and injuries, along with rates per 100 million vehicle revenue miles traveled (100M VRM). These rates provide a better comparison across different modes and years, as they adjust for the fact that bus transit modes provide different levels of service and that the bus transit industry, as a whole, provides varying levels of service each year.

The following pages present summary data and key takeaways from the BSDR. The report introduction and the presentation of detailed safety data begin on page 1, following the Executive Summary.

Events, Fatalities, and Injuries

In 2018, bus transit providers reported the following to the NTD:

- **15,185 events** that resulted in
  - **88 fatalities** and
  - **16,766 injuries**.

While reported events increased from 2017 to 2018, fewer fatalities and injuries resulted from those events.

- **Events** increased 1.0% in 2018 and averaged an increase of 3.7% per year from 2011 to 2018.[a, b]
- **Fatalities** decreased 14.6% in 2018 and averaged a decrease of 1.9% per year from 2008 to 2018.
- **Injuries** decreased 0.3% in 2018 and averaged a decrease of 0.1% per year from 2008 to 2018.

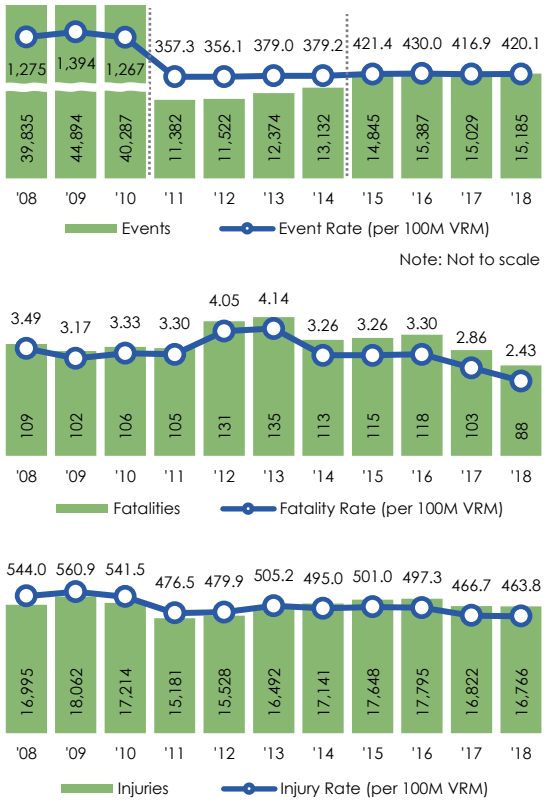


Figure 1. Total Events, Fatalities, Injuries, and Rates per 100M VRM

When the increasing levels of bus service provided over that period are adjusted for, there are slightly different percentages.

- The 2018 event rate of 420.1 per 100M VRM shows a 0.8% increase from 2017, with a 2.0% average annual increase from 2011 to 2018.[a]
- In 2018 there were 2.43 fatalities per 100M VRM. This reflects a 14.8% decrease from the 2017 rate and a 3.2% average decrease per year from 2008 to 2018.
- The 2018 rate of 463.8 injuries per 100M VRM shows a 0.6% decrease from 2017, with a 1.4% average annual decrease from 2008 to 2018.

[a] Prior to the 2011 reporting year, FTA stopped collecting non-major security event data. This change significantly reduced the number of reportable events beginning in 2011.

[b] Starting in 2015, FTA required agencies to report all collisions resulting in towing to ensure consistency with other Federal reporting programs. This new requirement led to more reportable events beginning in 2015.

Further Data Analyses

Additional analyses of event data submitted by "Full Reporters" is presented below. FTA requires more detailed event reporting from large § 5307 agencies (Full Reporters) than from smaller § 5307 agencies and § 5311 agencies (Reduced Reporters). This difference in reporting requirements relieves some of the reporting burden for smaller operators. (See Appendix A for more details.)

Full Reporters submitted 96% of bus transit events from 2011 to 2018. Full Reporters also submitted 91% of fatalities and 98% of injuries reported from 2008 to 2018.

Fatalities and Injuries by Person Type

- The public, which includes pedestrians, bicyclists, and occupants of other vehicles, accounted for 78% of bus transit **fatalities** from 2008 to 2018. Transit customers accounted for 18% of fatalities, while workers represented 4% during these years.

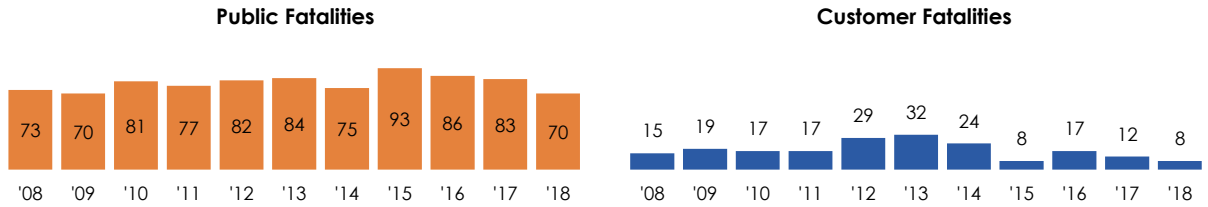


Figure 2. Trends in Full Reporter Public and Customer Fatalities

- Transit customers and workers accounted for 83% of bus transit **injuries** in the analysis period. The public represented 17% of reportable injuries.

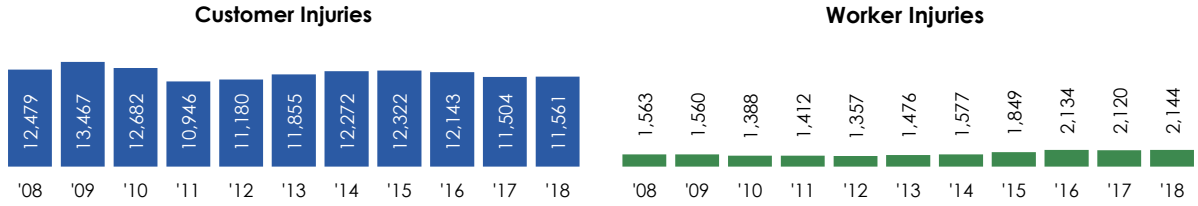


Figure 3. Trends in Full Reporter Customer and Worker Injuries

- Bus worker injuries increased from 2008 to 2018, while customer injuries decreased.

Modal Comparison

This BSDR compares data from fixed-route bus modes with data from demand response modes. See Appendix B for precise definitions of these modal categories.

- From 2011 to 2018, most events (87%), fatalities (92%), and injuries (89%) occurred on fixed-route bus modes.

Event Types

This BSDR compares data from different types of events: collisions, security events, fires, and all "other" events. See Appendix B for precise definitions of these event types.

- Collisions resulted in 83% of bus transit fatalities reported from 2008 to 2018. Collisions also accounted for 50% of injuries.
- Another 47% resulted from "other" safety events during this period. "Other" safety events include, but are not limited to, slips, falls, electric shocks, and smoke events.
- From 2008 to 2018, security events accounted for 11% of bus transit fatalities and 3% of injuries. Fires accounted for less than 1% of fatalities and injuries.

Collision Fatalities and Injuries

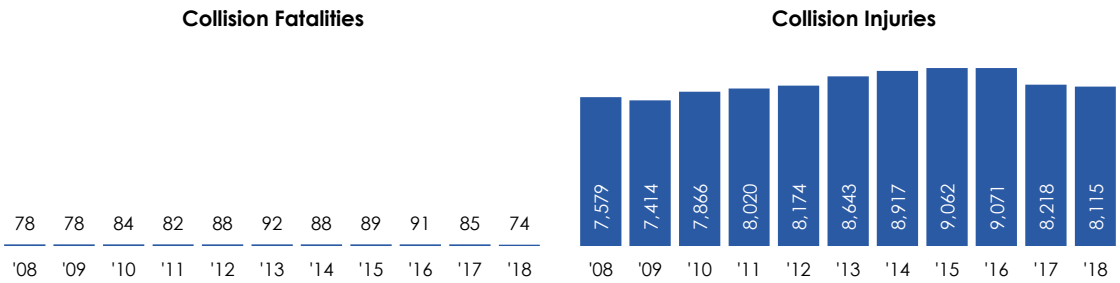


Figure 4. Trends in Full Reporter Collision Fatalities and Injuries

- In 2018, Full Reporter agencies had 12.9% fewer collision fatalities and 1.3% fewer collision injuries than in 2017. Annual totals for both collision fatalities and collision injuries generally increased from 2008 to 2016, then decreased in both 2017 and 2018.
- After increasing service levels are adjusted for, the annual collision fatality rate did not consistently move in one direction during the analyzed period but instead fluctuated between 2.49 and 3.25 fatalities per 100M VRM. The annual collision injury rate similarly fluctuated between 254.41 and 312.26 injuries per 100M VRM.

Collision Types Resulting in Fatalities and Injuries

This BSDR compares fatalities and injuries resulting from different types of collisions. See Appendix B for precise collision type definitions.

- Collisions between transit vehicles and either persons or non-transit vehicles resulted in 97% of collision **fatalities**.
- A large majority (88%) of collision **injuries** resulted from collisions between transit vehicles and non-transit vehicles.

Trends in Collision Types Resulting in the Most Fatalities and Injuries

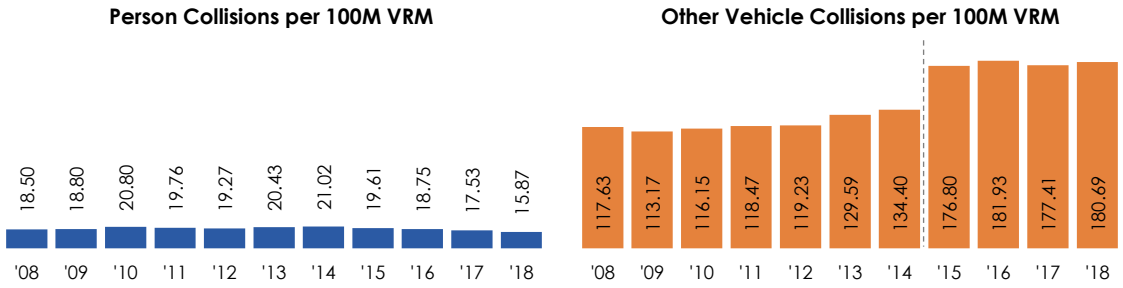


Figure 5. Trends in Full Reporter Person and Other Vehicle Collisions[a]

- In 2018, the transit vehicle-to-person collision rate (per 100M VRM) decreased 9.5% from 2017, reflecting a 1.4% average decrease per year since 2008.
- Collisions between transit vehicles and non-transit vehicles increased by 1.8% per 100M VRM between 2017 and 2018.
- In 2015, FTA began requiring agencies to report all collisions involving transit vehicles when an involved vehicle requires towing. Previously, towing alone did not require an event report. Because of this new requirement, the number of reportable collisions increased compared to previous years.

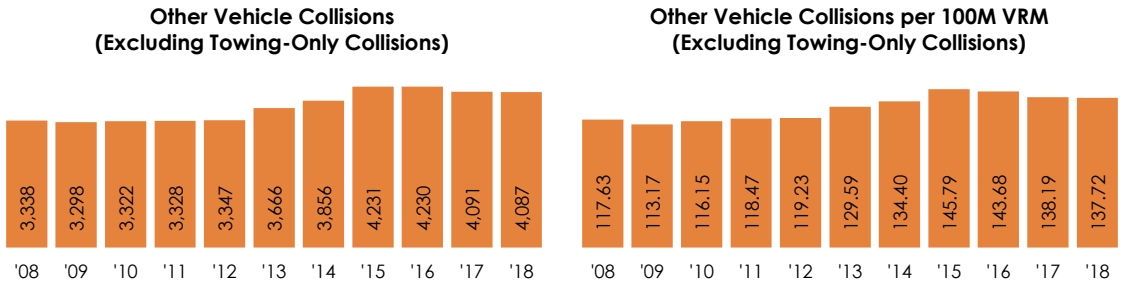


Figure 6. Trends in Other Vehicle Collisions and Rate per 100M VRM Excluding Collisions Reportable Solely from Towing

- When excluding collisions reported solely due to towed vehicles, collisions between transit vehicles and non-transit vehicles generally increased from 2008 to 2015, then decreased from 2016 to 2018.
- Agencies reported these collisions more frequently per 100M VRM from 2008 to 2015 as well, averaging a 2.7% increase per year. From 2015 to 2018, these annual rates decreased 1.4% per year on average.

[a] Starting in 2015, FTA required agencies to report all collisions resulting in towing to ensure consistency with other Federal reporting programs. This new requirement led to more reportable events beginning in 2015.

"Other" Event Occurrences and Injuries

"Other" events resulted in 47% of injuries during the analyzed period. Together, personal injury events (PIE) occurring on vehicles and PIE occurring during boarding or alighting accounted for 90% of "other" event injuries reported from 2008 to 2018.

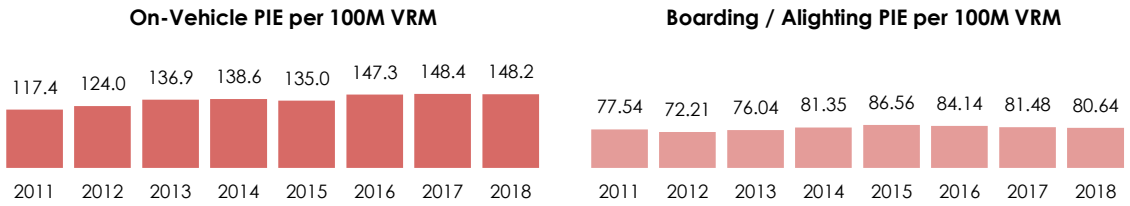


Figure 7. Trends in On-Vehicle and Boarding / Alighting PIE per 100M VRM

- On-Vehicle PIE per 100M VRM increased 3.0% per year from 2011 to 2018.[a]
- Boarding / alighting PIE per 100M VRM fluctuated between 72.21 and 86.56 events per 100M VRM during the same period.

Security Event Fatalities and Injuries

This BSDR presents the distribution and trends of fatalities and injuries by security event type. See Appendix B for precise definitions of security event types.

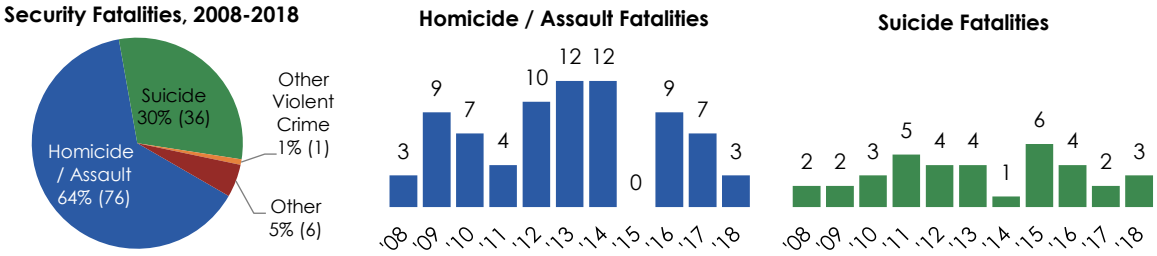


Figure 8. Full Reporter Security Event Fatalities by Security Event Type

- Most (94%) security event fatalities resulted from either homicides or suicides.
- Homicides resulted in between 0 and 12 fatalities per year in the 2008–2018 period, while suicides resulted in between 1 and 6 fatalities per year in this same period.

[a] Prior to the 2011 reporting year, FTA stopped collecting non-major security event data. This change significantly reduced the number of reportable events beginning in 2011.

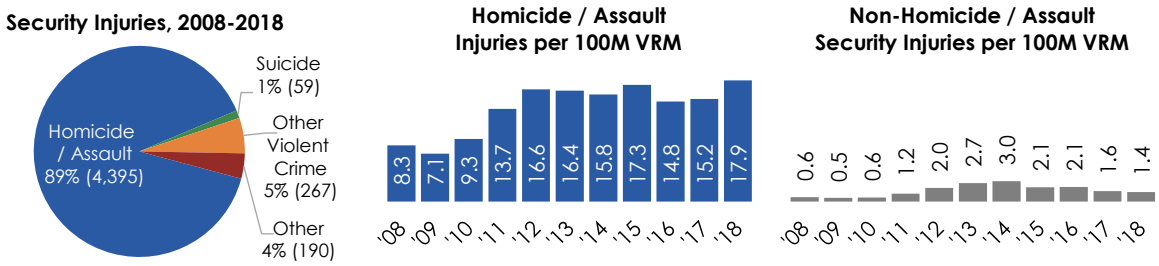


Figure 9. Full Reporter Security Event Injuries by Security Event Type

- Most (89%) security event injuries resulted from assaults and homicides. Assault and homicide injuries per 100M VRM increased at an average rate of 7.2% per year from 2008 to 2018.
- The annual rate of injuries resulting from any security event other than an assault or homicide fluctuated between 0.5 and 3.0 injuries per 100M VRM during this same period.

Introduction

The Bus Safety Data Report (BSDR) is a data analysis prepared by the Federal Transit Administration (FTA) to advance the safety and reliability of bus transit services provided across the United States. The goal of the BSDR is to present and summarize bus transit safety and security events that occurred between 2008 and 2018 and the consequences of those events in terms of fatalities and injuries. This report highlights totals and rates from 2018 and provides trends across the eleven-year study period, which may be useful to develop and conduct research, training, and evaluations to reduce the risk of harm to bus transit customers, employees, and the general public.

Industry Overview

The BSDR includes data from all bus transit providers that report to the National Transit Database (NTD). NTD bus transit reporters include:

- Recipients or beneficiaries of FTA's Urbanized Area Formula Grants (§ 5307), including local transit operators that provide service within Urbanized Areas (UZAs);
- Recipients or beneficiaries of FTA's Formula Grants for Rural Areas (§ 5311), including States[1] reporting on behalf of rural transit agencies and Indian tribes; and
- Voluntary NTD reporters that do not receive the program funds listed above. Voluntary reporters may be public or private and may operate in either urban or rural areas.

The BSDR does not include NTD data from rail transit modes or ferryboat systems. For the purposes of the BSDR, the data are limited to bus modes (rubber-tired motor vehicles operating on roadways). Please see Appendix B for a detailed breakdown of the NTD modes included in the BSDR.

The public can access summaries of NTD safety and security data through the NTD website.

What Safety and Security Event Data Does NTD Capture?

In 2018, NTD reporters provided data on safety and security events related to their operations that surpassed at least one of the following thresholds:

- A fatality resulting from an event occurs within 30 days,

[1] "States" include the 50 States of the United States, the District of Columbia, Puerto Rico, the Northern Mariana Islands, Guam, American Samoa, and the Virgin Islands.

- One or more persons are injured as a result of an event and require immediate transport for medical attention,
- The estimated property damage from an event is at least $25,000,
- At least one motor vehicle is towed away from the scene of a collision event,
- A fire requires suppression, or
- An evacuation is made due to potentially life-threatening conditions.

Please see Appendix B for a more detailed explanation of event reporting thresholds.

Threshold Changes in Data Collection

The event reporting thresholds listed above have evolved over the course of the eleven-year period this report analyze, and this affected the frequency of certain types of reported events. The table below summarizes the event reporting changes that affect the data presented in this report.

Time of Change	Threshold Change(s)	Impact to Data Trends
October 2010	FTA stopped requiring agencies to report non-major security events, such as fare evasion citations and nonviolent civil disturbances, on their monthly S&S-50 summary forms.	Reduced security events reported in calendar year (CY) 2011 and later years.
2011 Reporting Year	FTA established a specific collision type category for collisions between two transit vehicles.	Increased collisions classified as between transit vehicles in CY 2011 and later years.
2012 Reporting Year	FTA began requiring agencies to report commuter bus (CB) and bus rapid transit (RB) mode data separately from the traditional bus (MB) mode.	Enabled analysis of CB and RB mode events, fatalities, and injuries starting in CY 2013.
2015 Reporting Year	FTA began requiring agencies to report all collisions resulting in a vehicle being towed away from the scene of an event.	Increased collisions reported in CY 2015 and later years.

Table 1. Summary of Event Reporting Changes Impacting BSDR Analyses

Please see Appendix C for a more detailed explanation of event reporting changes.

Limitations of This Analysis

This report presents analyses that reflect safety and service data for the years 2008 through 2018 as reported to the NTD through June 2, 2020.[2] FTA typically considers agencies' NTD event reporting data final by December 31 of the year after the calendar year of the event. FTA considers 2018 data largely complete at the time of this report's publication.

All analyses in this report provide descriptive statistics that illustrate the distribution of events and consequences across categories and present trends in bus transit safety outcomes between 2008 and 2018. This report does not estimate or otherwise draw conclusions on safety outcomes beyond 2018.

How the BSDR Advances Safety Initiatives

The primary purpose of the BSDR is to inform the public about the safety performance of bus transit providers that are under FTA's oversight. The data presented in this report may also allow FTA and the industry to identify and analyze areas that could benefit from further research, targeted assessments, and improved training to address conditions that pose the greatest safety risk to passengers/customers, employees, and the general public.

The analyses in the BSDR may also be useful to agencies that are certifying compliance with the FTA Public Transportation Agency Safety Plan (PTASP) regulation (49 CFR Part 673). The PTASP regulation requires bus agencies that receive Section 5307 funding to develop an Agency Safety Plan (ASP). The analysis methodologies used in this report may serve as useful models for the performance measurement activities bus agencies and State Departments of Transportation (DOTs) must include in the ASPs (once analyses have been tailored to the circumstances of the individual agency).

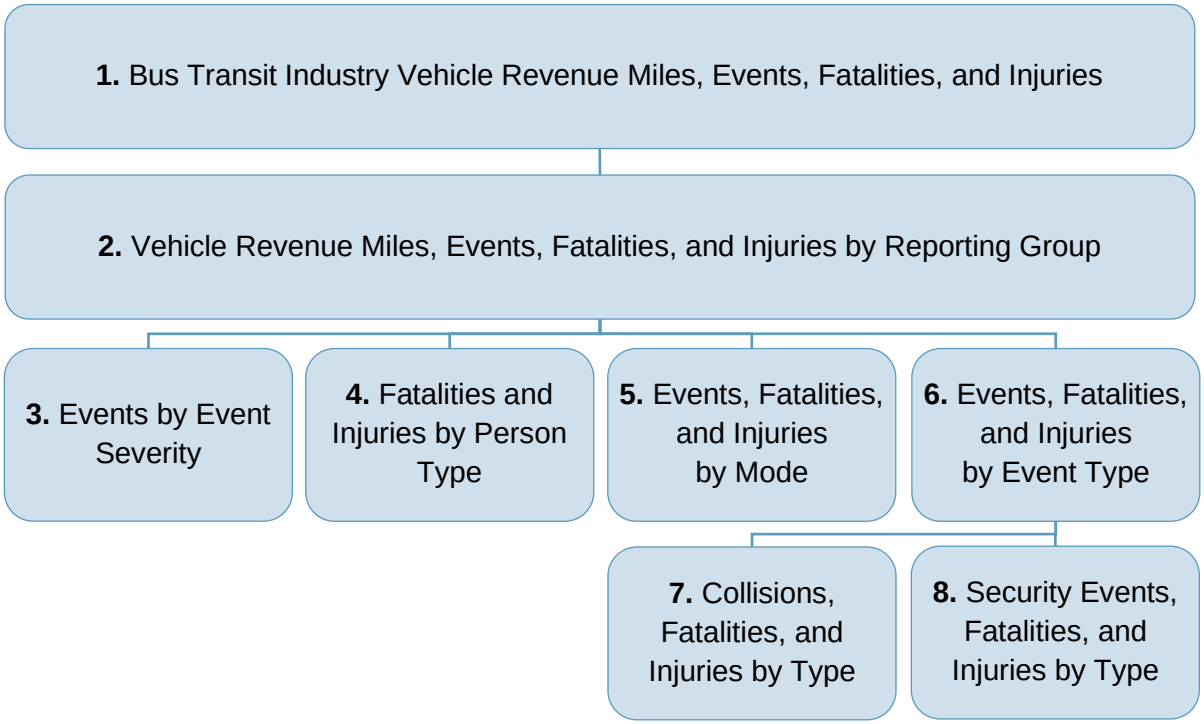
Furthermore, agencies and State DOTs may benefit from reviewing the national safety and security data of agencies that are similar in size. This may help them identify and prioritize safety concerns within their agency and assess and mitigate the associated safety risk.

Reviewing national trends may also assist the bus industry, as a whole, in identifying improvements to equipment and standard operating procedures.

[2] Some transit agencies had submitted revisions to their historical safety and security event reports that were not published as of June 2, 2020. This report includes all revisions FTA had received by June 2, 2020, regardless of whether or not these changes had been published in other FTA data products.

Structure of the Report

The BSDR begins with an analysis of industry-wide service and safety data trends across the 2008–2018 period. Following the summary analysis, the report explains the different levels of reporting requirements for bus transit agency data submissions. The report then presents more specific analyses on safety and security event data according to event severity, person type, bus transit mode, event type, and subsets of these categories. The illustration below shows the order in which these analyses appear.



1. Bus Transit Industry Data and Annual Trends (2008–2018)

1-1. Total Bus Transit Service Provided in VRM (Billions)

VRM (Billions)

2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Avg	Trend
3.12	3.22	3.18	3.19	3.24	3.26	3.46	3.52	3.58	3.60	3.61	3.36	

Figure 10. Total VRM (Billions)

- Transit agencies provided 3.61 billion VRM of bus service in 2018. That figure reflects a slight 0.3% increase from 2017 and a 1.3% average annual increase since 2008.

1-2. Total Safety and Security Events and Rates per 100M VRM

Events

2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Avg	Trend
39,835	44,894	40,287	11,382	11,522	12,374	13,132	14,845	15,387	15,029	15,185	21,261	

Event Rate per 100M VRM

2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Avg	Trend
1,275.1	1,394.2	1,267.3	357.3	356.1	379.0	379.2	421.4	430.0	416.9	420.1	632.2	

Figure 11. Total Safety and Security Events and Rates per 100M VRM[a, b]

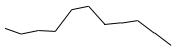
- Bus transit agencies reported 15,185 events to the NTD in 2018. This reflects a 1.0% increase from 2017. On a per VRM basis, the 2018 event rate was 0.8% greater than 2017.
- Between 2011 and 2018,[a] events reported to the NTD increased at an average rate of 3.7% per year. After these data are standardized by vehicle revenue miles, this is equivalent to an average increase of 2.0% per year.
- Once events reported solely due to the towed-vehicle threshold change are excluded,[b] the average increase was 2.5% per year for events and 0.9% per year for events per 100M VRM during this time period.

[a] Prior to the 2011 reporting year, FTA stopped collecting non-major security event data. This change significantly reduced the number of reportable events beginning in 2011.

[b] Starting in 2015, FTA required agencies to report all collisions resulting in towing to ensure consistency with other Federal reporting programs. This new requirement led to more reportable events beginning in 2015.

1-3. Total Fatalities and Rates per 100M VRM

Fatalities

2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Avg	Trend
109	102	106	105	131	135	113	115	118	103	88	111	

Fatality Rate per 100M VRM

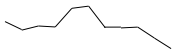
2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Avg	Trend
3.5	3.2	3.3	3.3	4.0	4.1	3.3	3.3	3.3	2.9	2.4	3.3	

Figure 12. Total Fatalities and Rates per 100M VRM

- Bus transit agencies reported 88 fatalities resulting from reportable events in 2018. This is a 14.6% decrease from the previous year and a 1.9% average annual decrease since 2008.
- When measured per VRM, the fatality rate for 2018 was 14.8% lower than in 2017 but reflects a 3.2% average annual decrease since 2008.

1-4. Total Injuries and Rates per 100M VRM

Injuries

2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Avg	Trend
16,995	18,062	17,214	15,181	15,528	16,492	17,141	17,648	17,795	16,822	16,766	16,877	

Injury Rate per 100M VRM

2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Avg	Trend
544.0	560.9	541.5	476.5	479.9	505.2	495.0	501.0	497.3	466.7	463.8	501.8	

Figure 13. Total Injuries and Rates per 100M VRM

- Bus transit agencies reported 16,766 injuries in 2018, 0.3% fewer than were reported in 2017. The rate of 463.8 injuries per 100M VRM traveled was 0.6% lower than the comparable 2017 rate.
- Between 2008 and 2018, reportable injuries decreased at an average pace of 0.1% per year. The injury rate per 100M VRM decreased by 1.4% per year during that same time frame.

2. Detailed vs. Reduced Event Reporting

The BSDR presents NTD data submitted by the thousands of bus transit agencies across the United States that receive or benefit from funding each year via Urbanized Area Formula Grants (§ 5307) or Formula Grants for Rural Areas (§ 5311) programs and are required to report (except for agencies that benefit solely from the Intercity Bus Program). Data from bus public transportation providers who voluntarily report to the NTD are also included.

Large bus transit operators provide both detailed individual event reports for major events and monthly summaries of non-major events to the NTD. To reduce the reporting burden on small operators, FTA does not require the smallest transit agencies to report with the same level of detail as larger agencies. Instead, these small agencies provide summaries of reportable events and resulting fatalities and injuries with their annual report. The table below summarizes the characteristics of bus transit agencies as related to the two types of event reporting. Please see Appendix A for more details.

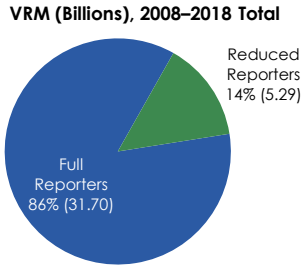
Characteristic	Full Reporters (Detailed Event Reporting)	Reduced Reporters (Reduced Event Reporting)
Fleet size and area served	• Serves urban areas **and** fleet is over 30 vehicles.	• Serves urban areas **and** fleet is 30 vehicles or fewer, **or** • Serves **only** rural areas.
FTA funding	• § 5307 funds • No FTA funding, (voluntary reporter)	• § 5307 funds (if serving urban areas) • § 5311 funds (if only serving rural areas)

Table 2. Reporting Requirements by Agency Reporting Group

The number of agencies reporting bus safety data to the NTD varies each year; in 2018 there were 1,670 Reduced Reporters and 495 Full Reporters.

The following section presents the proportion of safety trends and comparisons between Full and Reduced Reporters from 2008 to 2018. **Starting with the section "Full Reporter Agency Events," analyses are based on the data from detailed event reporting and are therefore limited to Full Reporters.**

2-1. Bus Transit VRM (Billions) by Agency Reporting Group

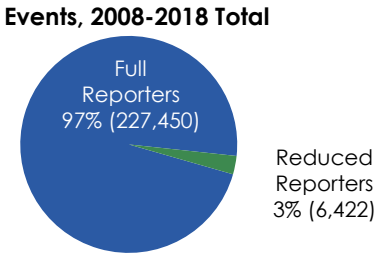


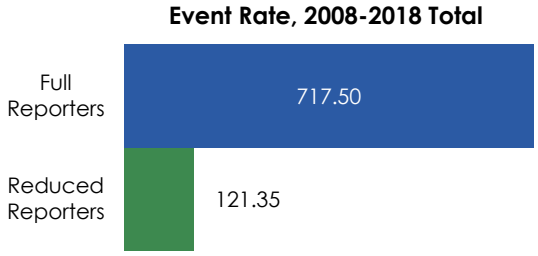
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Avg	Trend
Full Reporters	2.84	2.91	2.86	2.81	2.81	2.83	2.87	2.90	2.94	2.96	2.97	2.88	
Reduced Reporters	0.29	0.31	0.32	0.38	0.43	0.44	0.59	0.62	0.63	0.64	0.65	0.48	
All Reporters	3.12	3.22	3.18	3.19	3.24	3.26	3.46	3.52	3.58	3.60	3.61	3.36	

Figure 14. Service Provided in VRM (Billions) by Agency Reporting Group

- Full Reporter bus transit agencies provided 82% of VRM in 2018.
- The amount of bus service reported under the reduced reporting requirements has increased. Reduced Reporters provided 360 million more VRM in 2018 than in 2008.[a]

2-2. Events and Rates per 100M VRM by Agency Reporting Group





Events	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Avg	Trend
Full Reporters	38,907	44,490	39,990	11,072	11,018	11,881	12,373	14,121	14,676	14,377	14,545	20,677	
Reduced Reporters	928	404	297	310	504	493	759	724	711	652	640	584	
All Reporters	39,835	44,894	40,287	11,382	11,522	12,374	13,132	14,845	15,387	15,029	15,185	21,261	

Event Rate	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Avg	Trend
Full Reporters	1,371.1	1,526.6	1,398.2	394.2	392.5	420.0	431.3	486.6	498.5	485.6	490.1	717.5	
Reduced Reporters	323.9	132.1	93.2	82.3	117.5	113.2	127.8	116.6	112.1	101.2	98.9	121.4	
All Reporters	1,275.1	1,394.2	1,267.3	357.3	356.1	379.0	379.2	421.4	430.0	416.9	420.1	632.2	

Figure 15. Events by Agency Reporting Groups and Rates per 100M VRM[b, c]

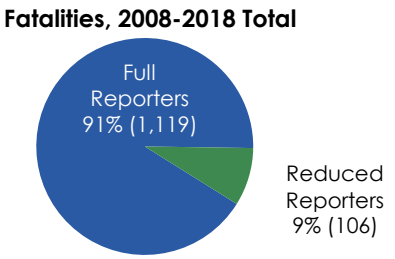
- Full Reporters accounted for 96% of the events reported to the NTD in 2018.

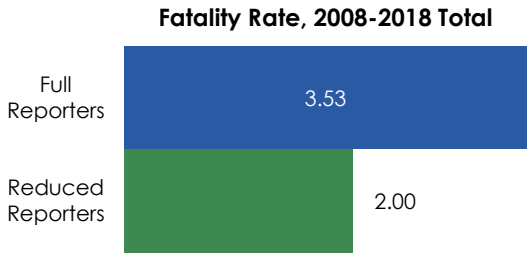
[a] To reduce the reporting burden, § 5307 recipients operating between 10 and 30 vehicles became eligible for reduced reporting in 2012, increasing the share of VRM reported by Reduced Reporters.

[b] Prior to the 2011 reporting year, FTA stopped collecting non-major security event data. This change significantly reduced the number of reportable events beginning in 2011.

[c] Starting in 2015, FTA required agencies to report all collisions resulting in towing to ensure consistency with other Federal reporting programs. This new requirement led to more reportable events beginning in 2015.

2-3. Fatalities and Rates per 100M VRM by Agency Reporting Group





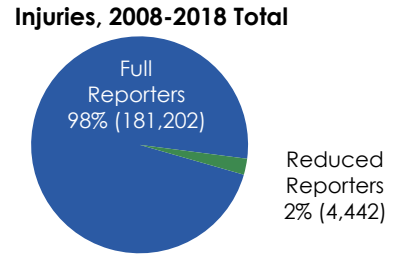
Fatalities	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Avg	Trend
Full Reporters	91	96	101	97	115	123	104	102	109	98	83	102	
Reduced Reporters	18	6	5	8	16	12	9	13	9	5	5	10	
All Reporters	109	102	106	105	131	135	113	115	118	103	88	111	

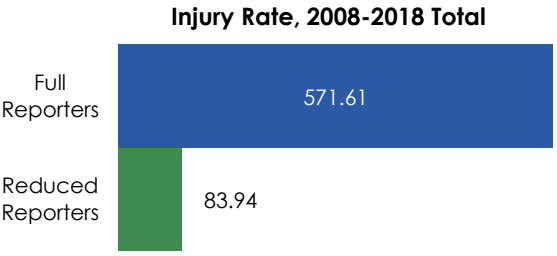
Fatality Rate	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Avg	Trend
Full Reporters	3.2	3.3	3.5	3.5	4.1	4.3	3.6	3.5	3.7	3.3	2.8	3.5	
Reduced Reporters	6.3	2.0	1.6	2.1	3.7	2.8	1.5	2.1	1.4	0.8	0.8	2.0	
All Reporters	3.5	3.2	3.3	3.3	4.0	4.1	3.3	3.3	3.3	2.9	2.4	3.3	

Figure 16. Fatalities by Agency Reporting Group and Rates per 100M VRM

- Full Reporters accounted for 94% of bus fatalities in 2018. These agencies reported over three times more fatalities per 100M VRM of service than Reduced Reporters.

2-4. Injuries and Rates per 100M VRM by Agency Reporting Group





Injuries	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Avg	Trend
Full Reporters	16,783	17,749	16,873	14,887	15,119	16,088	16,646	17,019	17,318	16,379	16,341	16,473	
Reduced Reporters	212	313	341	294	409	404	495	629	477	443	425	404	
All Reporters	16,995	18,062	17,214	15,181	15,528	16,492	17,141	17,648	17,795	16,822	16,766	16,877	

Injury Rate	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Avg	Trend
Full Reporters	591.4	609.0	589.9	530.0	538.6	568.7	580.2	586.4	588.2	553.3	550.6	571.6	
Reduced Reporters	74.0	102.4	107.0	78.0	95.4	92.7	83.4	101.3	75.2	68.8	65.7	83.9	
All Reporters	544.0	560.9	541.5	476.5	479.9	505.2	495.0	501.0	497.3	466.7	463.8	501.8	

Figure 17. Injuries by Agency Reporting Group and Rates per 100M VRM

- Full Reporters accounted for 97% of bus injuries in 2018. These agencies reported over eight times more injuries per 100M VRM of service than Reduced Reporters.

3. Full Reporter Agency Events

Full Reporter agencies report safety and security event details to the NTD in sufficient detail to allow a deeper analysis of events. This section of the BSDR presents events based on the severity of the event. The following sections also present Full Reporter safety and security event data by other criteria, including person type of fatalities and injuries, mode, event type, collision type, and security event type. **The following sections do not include data from Reduced Reporters since Reduced Reporter data are not collected in a way that supports these detailed analyses.**

The NTD groups reportable events for Full Reporters into these two categories:

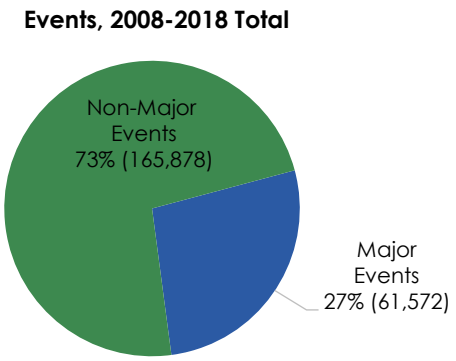
- **Major events**: FTA requires agencies to provide detailed individual reports on each event.
- **Non-major events**: FTA requires agencies to provide monthly event, injury, and fatality summaries.

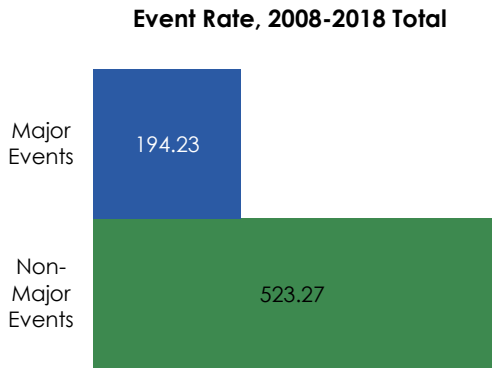
Category	BSDR Events Included for Full Reporters
Major Events	• Any collision, hazardous material spill, security event, or act of God meeting any event reporting threshold. • Any fire meeting the fatality, injury, property damage, or evacuation reporting thresholds. • Any other event meeting the fatality, property damage, or evacuation reporting thresholds. • Any other event resulting in injuries requiring immediate transportation for medical attention for two or more people.
Non-Major Events	• Any fire requiring suppression that does not qualify as a major event. • Any event meeting the injury reporting threshold that does not qualify as a major event.

Table 3. NTD Reporting Criteria for Major and Non-Major Events, 2018

Appendix A provides a full account of what criteria FTA uses to determine Full Reporters' required level of NTD reporting detail.

3-1. Events and Rates per 100M VRM by Event Severity





Events	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Avg	Trend
Major Events	4,602	4,383	4,523	4,690	4,782	5,197	5,419	6,933	7,141	6,858	7,044	5,597	
Non-major Events	34,305	40,107	35,467	6,382	6,236	6,684	6,954	7,188	7,535	7,519	7,501	15,080	
All Events	38,907	44,490	39,990	11,072	11,018	11,881	12,373	14,121	14,676	14,377	14,545	20,677	

Event Rate	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Avg	Trend
Major Events	162.2	150.4	158.1	167.0	170.4	183.7	188.9	238.9	242.6	231.7	237.4	194.2	
Non-major Events	1,208.9	1,376.2	1,240.0	227.2	222.2	236.3	242.4	247.7	255.9	254.0	252.8	523.3	
All Events	1,371.1	1,526.6	1,398.2	394.2	392.5	420.0	431.3	486.6	498.5	485.6	490.1	717.5	

Figure 18. Events by Event Severity and Rates per 100M VRM[a, b]

- Slightly less than half of the events reported to the NTD in 2018 were major events, which include all collisions, security events, and fires that involve a fatality, injury, $25,000 in property damage, an evacuation for life safety purposes, or a towaway.
- After major events reported solely due to the vehicle-towing threshold change are excluded,[b] there were over 1,000 more major events in 2018 than in 2008, with an increase at an average annual rate of 1.9%. The major event rate averaged an increase of 1.5% a year, from 162.2 per 100M VRM in 2008 to 191.5 in 2018.
- Agencies reported an increasing number of non-major events between 2011 and 2018;[a] these totals increased by an average of 2.0% each year during that time. When adjusted for changing service levels, the non-major event rate increased from 227.2 per 100M VRM to 252.8 in the same time frame, an average annual increase of 1.3%.

[a] Prior to the 2011 reporting year, FTA stopped collecting non-major security event data. This change significantly reduced the number of reportable events beginning in 2011.

[b] Starting in 2015, FTA required agencies to report all collisions resulting in towing to ensure consistency with other Federal reporting programs. This new requirement led to more reportable events beginning in 2015.

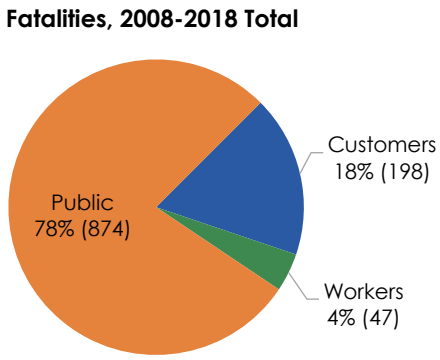
4. Full Reporter Fatalities and Injuries by Person Type

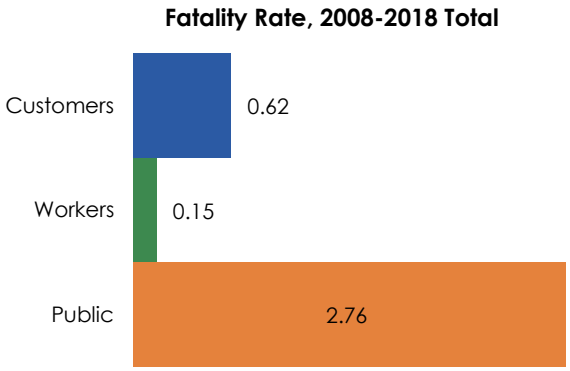
Agencies categorize fatalities and injuries by person type when they submit event reports to the NTD. The BSDR analyzes these data to determine the frequency and trends of fatalities and injuries sustained by the following person types:

- **Customers**, including all passengers and patrons on transit property;
- **Workers**, including bus transit agency employees and contractors; and
- **Public**, including drivers or passengers of other motor vehicles, pedestrians, bicyclists, and individuals committing or attempting suicide.

Appendix B provides greater detail on the above groups and the associated NTD safety and security event data classifications.

4-1. Fatalities and Rates per 100M VRM by Person Type





Fatalities	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Avg	Trend
Customers	15	19	17	17	29	32	24	8	17	12	8	18	
Workers	3	7	3	3	4	7	5	1	6	3	5	4	
Public	73	70	81	77	82	84	75	93	86	83	70	79	
All Person Types	91	96	101	97	115	123	104	102	109	98	83	102	

Fatality Rate	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Avg	Trend
Customers	0.53	0.65	0.59	0.61	1.03	1.13	0.84	0.28	0.58	0.41	0.27	0.62	
Workers	0.11	0.24	0.10	0.11	0.14	0.25	0.17	0.03	0.20	0.10	0.17	0.15	
Public	2.57	2.40	2.83	2.74	2.92	2.97	2.61	3.20	2.92	2.80	2.36	2.76	
All Person Types	3.21	3.29	3.53	3.45	4.10	4.35	3.62	3.51	3.70	3.31	2.80	3.53	

Figure 19. Fatalities by Person Type and Rates per 100M VRM

- Together, customers and workers accounted for fewer than one out of every five fatalities reported to the NTD in 2018. The public, including pedestrians and occupants of other vehicles, represented over 80% of the fatalities.

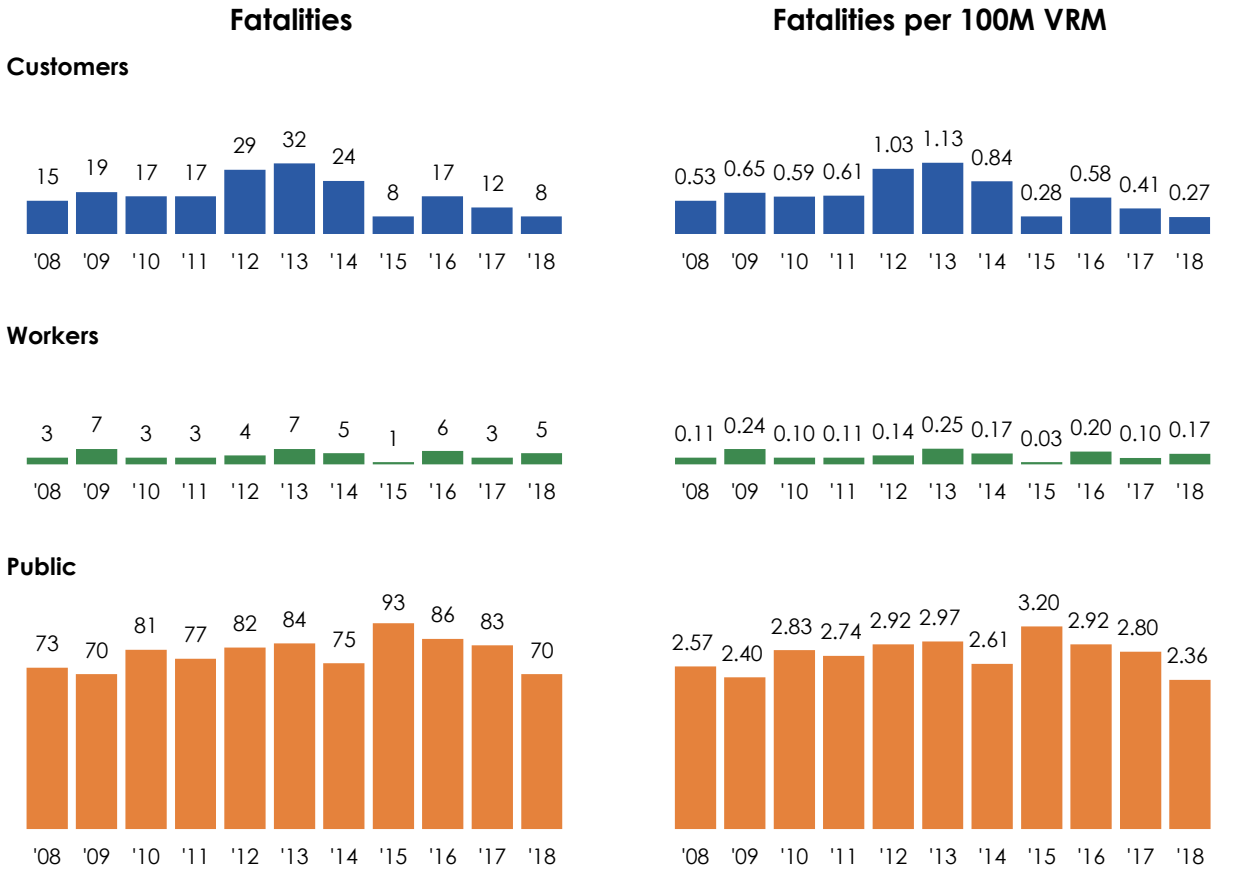


Figure 20. Fatality and Fatality Rate Trends by Person Type

- The number of customer fatalities fluctuated throughout the analyzed period. Agencies reported less than one customer fatality per 100M VRM traveled in all analyzed years, except 2012 and 2013.
- Worker fatalities were less common than customer fatalities and fluctuated throughout the analyzed period. Between 2008 and 2018, agencies reported 0.25 or fewer worker fatalities per 100M VRM traveled each year.
- Reports of public fatalities fluctuated during the analyzed period. The rate of these fatalities per 100M VRM varied between 2.36 and 3.20 per 100M VRM during this time frame.

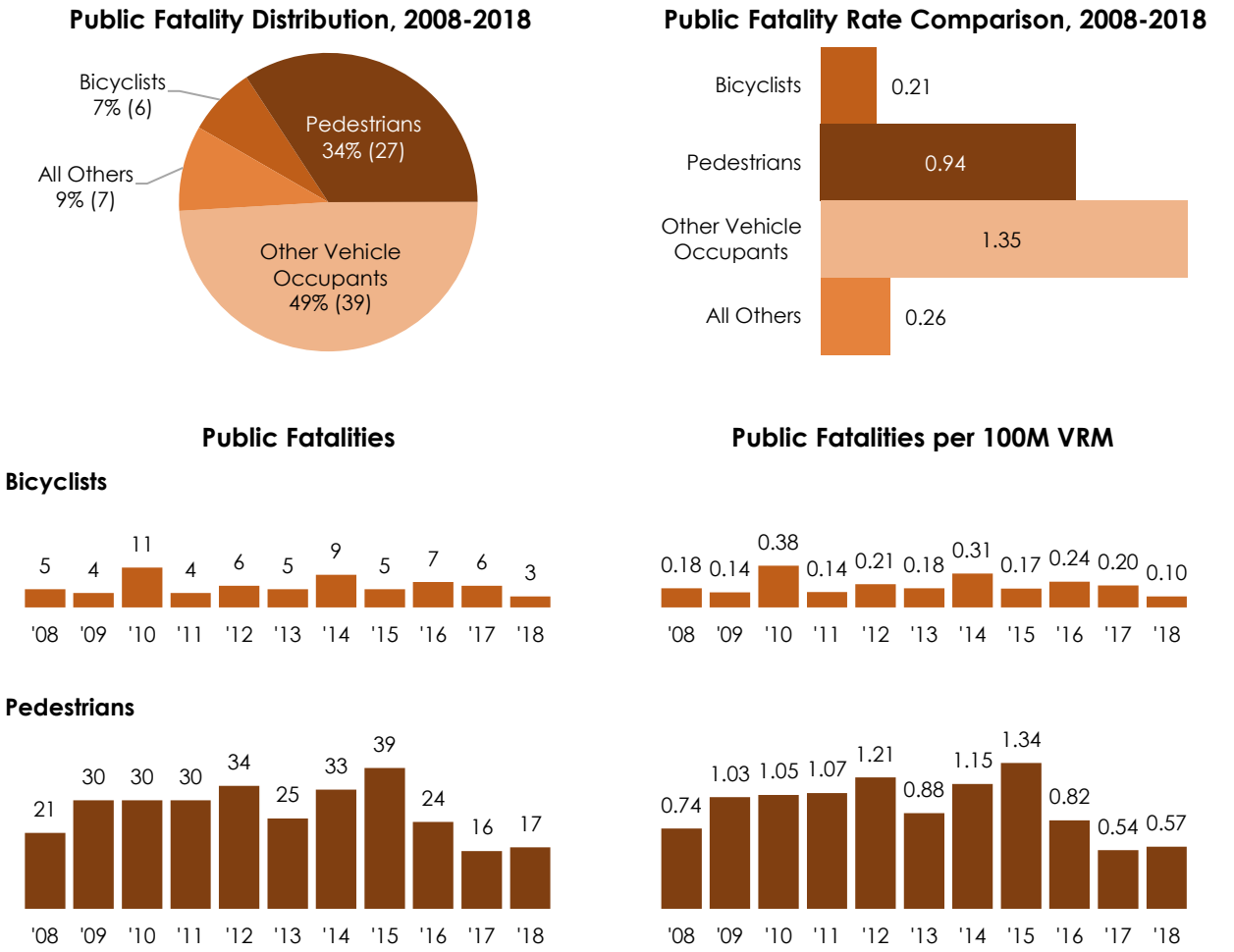


Figure 21. Public Fatality and Fatality Rate Trends by Person Type – Bicyclists and Pedestrians

- Pedestrian fatalities accounted for 24% of all public fatalities in 2018. In each year from 2008 to 2016, there were 0.74 to 1.34 pedestrian fatalities per 100M VRM of bus service; the rate was lower in 2017 and 2018. Calculated across the entire analyzed period, pedestrian fatalities per 100M VRM decreased 2.3% per year on average.
- Bicyclist fatalities accounted for 4% of 2018 public fatalities. Annual rates of bicyclist fatalities per 100M VRM fluctuated between 0.10 and 0.38 without a clear trend during that eleven-year period.

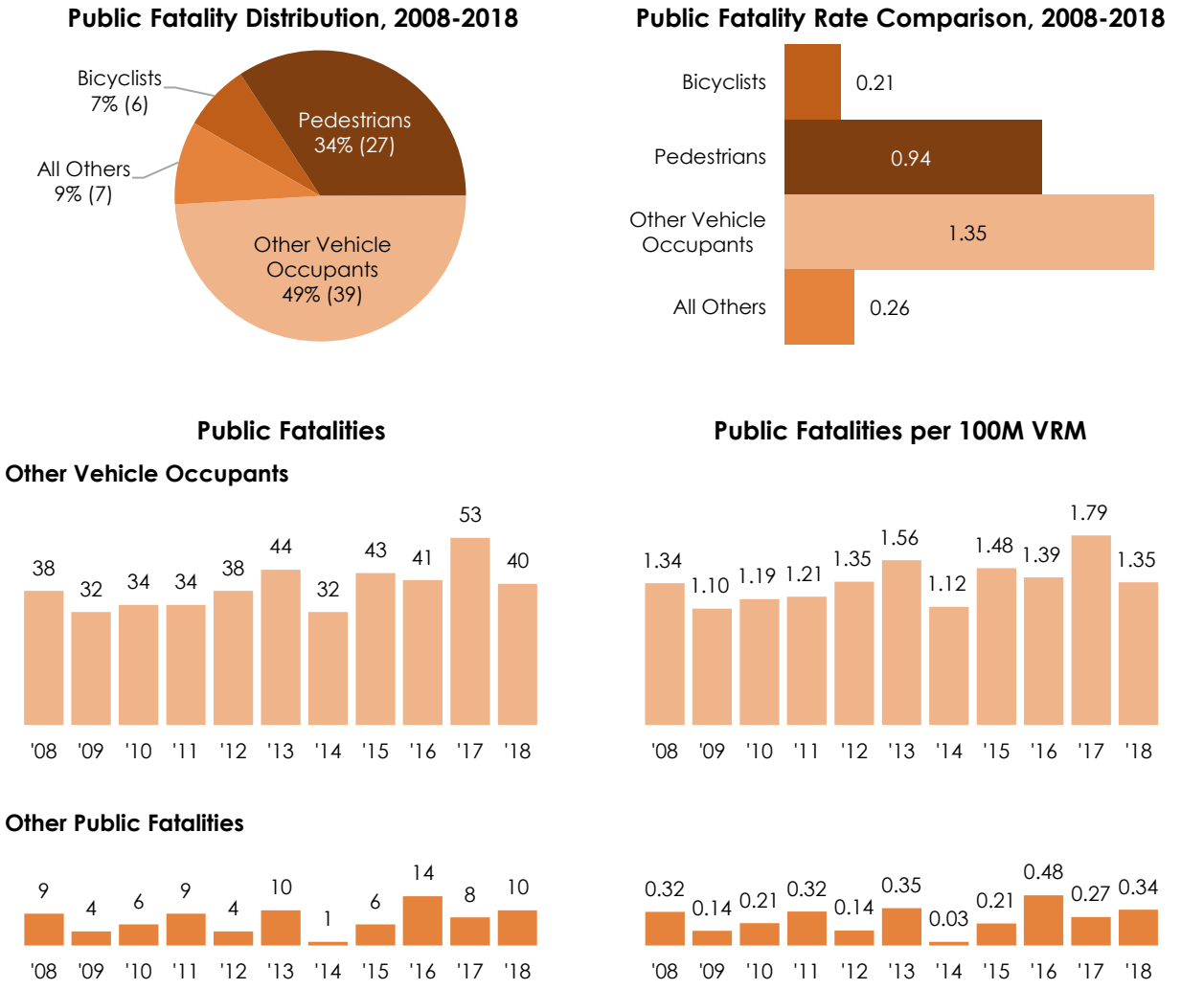
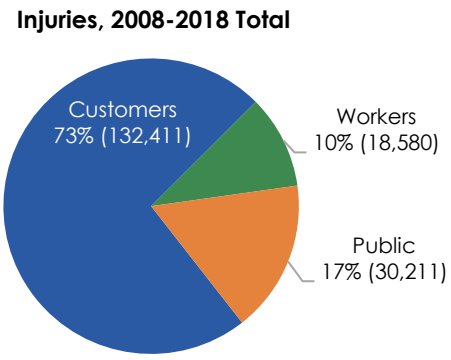
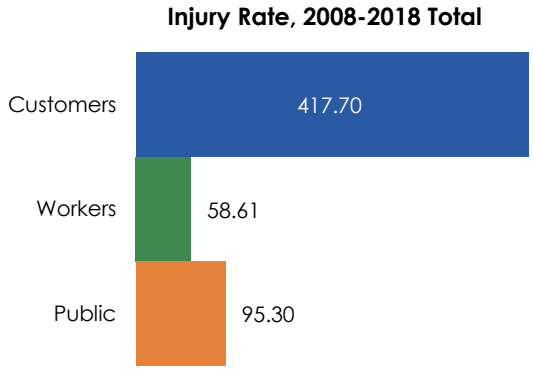


Figure 22. Public Fatality and Fatality Rate Trends by Person Type – Other Vehicle Occupants and Other Public Fatalities

- Other vehicle occupants, a category including drivers and passengers of non-transit motor vehicles, accounted for 57% of all public fatalities reported in 2018. Other vehicle occupant fatalities per 100M VRM increased at a slight 0.06% average annual rate from 2008 to 2018.
- 91% of public fatalities reported in the eleven-year analyzed period were bicyclists, pedestrians, or other vehicle occupants.

4-2. Injuries and Rates per 100M VRM by Person Type





Injuries	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Avg	Trend
Customers	12,479	13,467	12,682	10,946	11,180	11,855	12,272	12,322	12,143	11,504	11,561	12,037	
Workers	1,563	1,560	1,388	1,412	1,357	1,476	1,577	1,849	2,134	2,120	2,144	1,689	
Public	2,741	2,722	2,803	2,529	2,582	2,757	2,797	2,848	3,041	2,755	2,636	2,746	
All Person Types	16,783	17,749	16,873	14,887	15,119	16,088	16,646	17,019	17,318	16,379	16,341	16,473	

Injury Rate	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Avg	Trend
Customers	439.8	462.1	443.4	389.7	398.3	419.1	427.7	424.6	412.5	388.6	389.6	417.7	
Workers	55.1	53.5	48.5	50.3	48.3	52.2	55.0	63.7	72.5	71.6	72.2	58.6	
Public	96.6	93.4	98.0	90.0	92.0	97.5	97.5	98.1	103.3	93.1	88.8	95.3	
All Person Types	591.4	609.0	589.9	530.0	538.6	568.7	580.2	586.4	588.2	553.3	550.6	571.6	

Figure 23. Injuries by Person Type and Rates per 100M VRM

- In 2018, 71% of reported injuries were injuries to customers. Workers accounted for 13% of injuries the same year.
- Members of the public, including pedestrians and occupants of other vehicles, sustained roughly one in six injuries reported to the NTD in 2018.
- Agencies reported 918 fewer customer injuries in 2018 than in 2008.

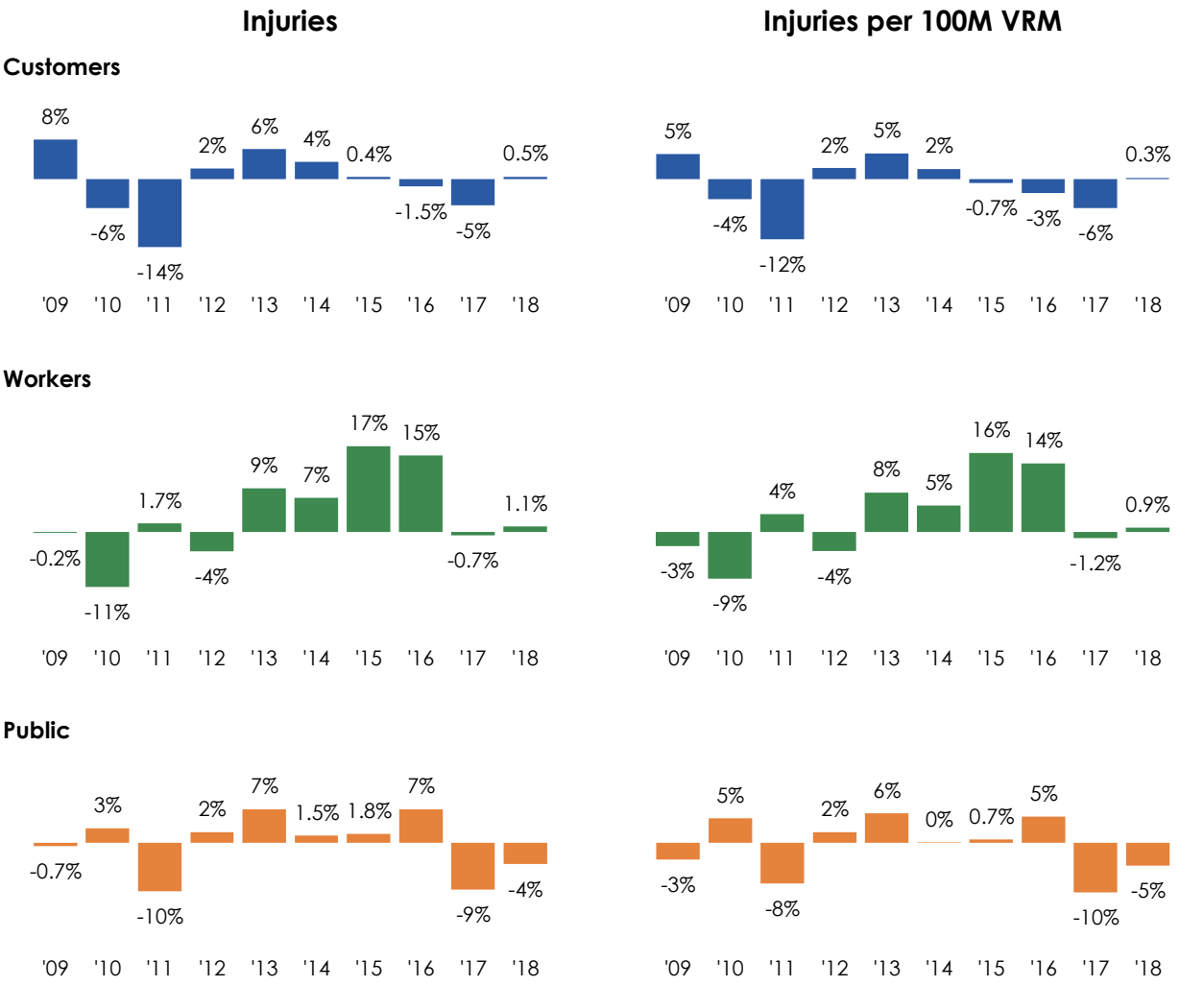


Figure 24. Annual Percent Change in Injuries and Injury Rates by Person Type

- In six of the ten years in the analyzed period, reported worker injuries increased from the previous year. On a per VRM basis, the worker injury rate increased at a 2.5% average annual rate, from 55.1 injuries per 100M VRM in 2008 to 72.2 in 2018.
- Bus transit reported a decreasing number of injuries sustained by the public (including pedestrians and occupants of other vehicles) during the analyzed period. Between 2017 and 2018, the public injury rate decreased 4.6%, from 93.1 to 88.8 per 100M VRM. On average, over the entire 2008–2018 period, this rate decreased 0.8% per year.

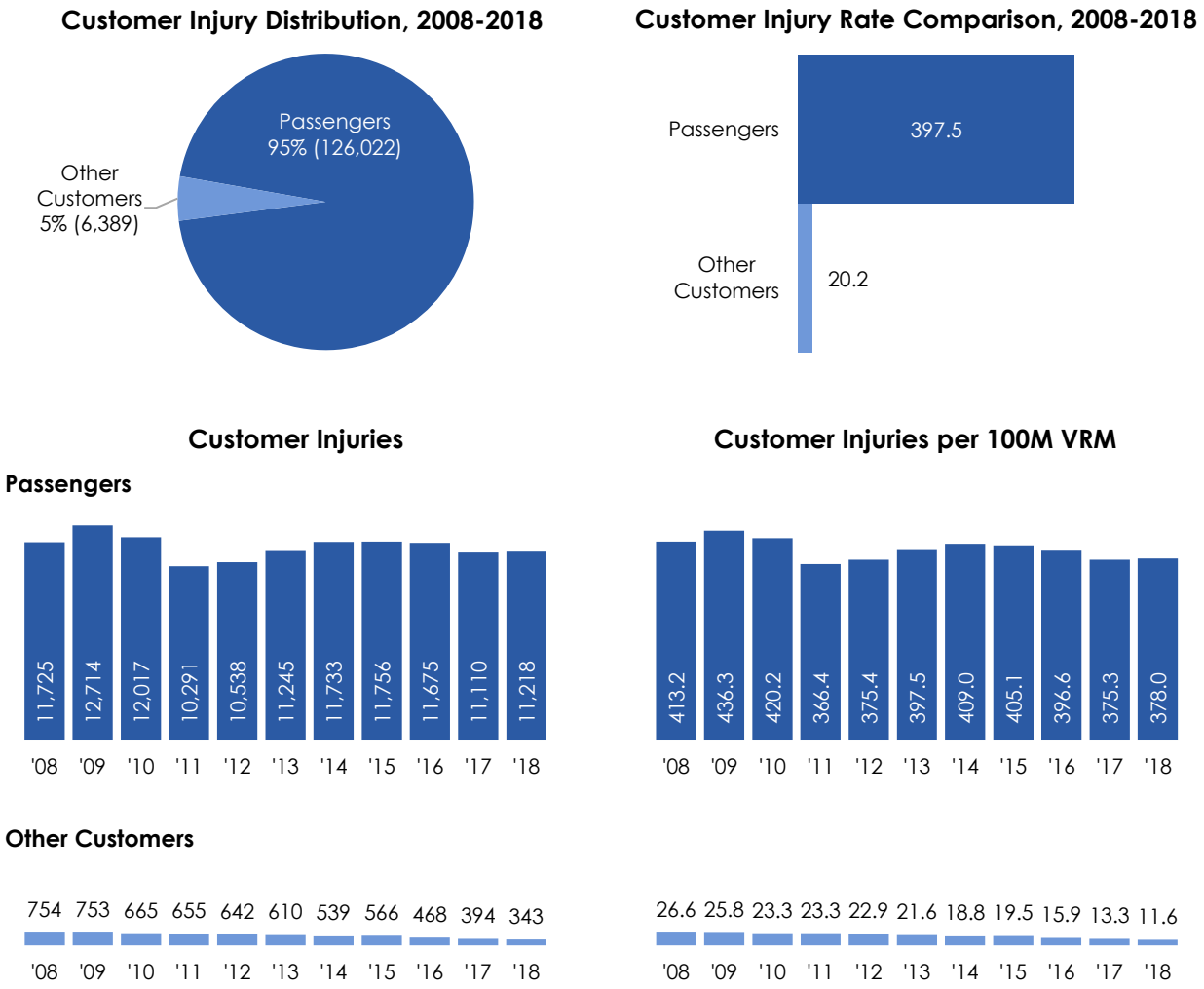


Figure 25. Customer Injuries and Injury Rates by Person Type

- Passengers, including customers either on board bus transit vehicles or in the process of boarding or alighting, accounted for 95% of all customer injuries reported by bus agencies from 2008 to 2018. Passenger injury rates decreased 0.8% per year on average from 2008 to 2018, from 413.2 to 378.0 injuries per 100M VRM.
- Around one in twenty customer injuries reported in the analyzed period were not passengers. Annual injury rates for these customers also decreased from 26.6 injuries per 100M VRM in 2008 to 11.6 in 2018, a 7.3% average annual decrease.

5. Full Reporter Agency Events by Mode

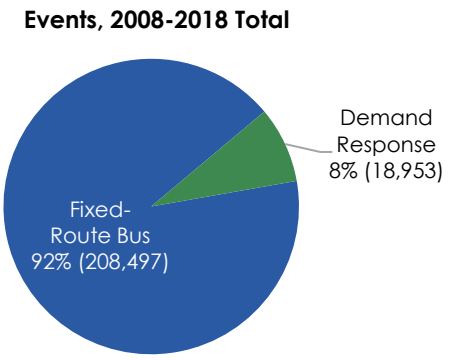
FTA divides bus transit into nine different modes, as classified in the NTD. For data presentation, the BSDR organizes these into two modal categories: fixed-route bus and demand response. Please see Appendix B for a detailed summary of NTD modes and BSDR groupings.

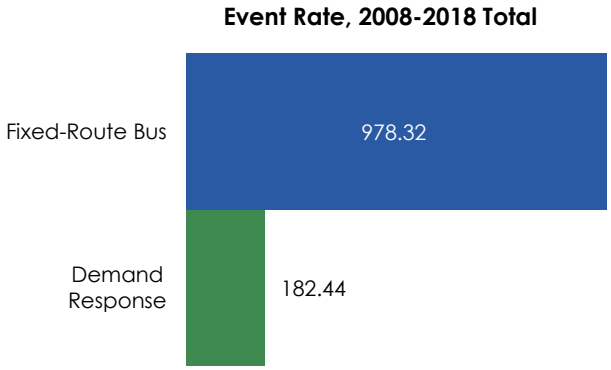
The data presented on the following pages show the trends and distribution of events, fatalities, and injuries involving these two modal categories.

Modal Category	Description
Fixed-Route Bus	Local, express, or rapid bus service that follows a fixed route and typically also a fixed schedule. Passengers typically board and alight at fixed stops. Fixed-route bus modes include traditional bus service (MB), trolleybuses (TB), commuter buses (CB), bus rapid transit (RB), jitneys (JT), and públicos (PB).
Demand Response	Point-to-point transit service where service is typically provided upon request or reservation and when boarding and alighting locations are arranged.

Table 4. Modal Categories

5-1. Events and Rates per 100M VRM by Mode





Events	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Avg	Trend
Fixed-Route Bus	36,988	42,483	38,349	9,725	9,737	10,473	10,846	12,290	12,587	12,427	12,592	18,954	
Demand Response	1,919	2,007	1,641	1,347	1,281	1,408	1,527	1,831	2,089	1,950	1,953	1,723	
All Modes	38,907	44,490	39,990	11,072	11,018	11,881	12,373	14,121	14,676	14,377	14,545	20,677	

Event Rate	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Avg	Trend
Fixed-Route Bus	1,856.3	2,103.6	1,955.4	511.8	518.6	558.1	571.1	642.3	646.4	634.5	640.4	978.3	
Demand Response	227.1	224.3	182.5	148.2	137.8	147.8	157.4	185.2	209.6	194.6	195.0	182.4	
All Modes	1,371.1	1,526.6	1,398.2	394.2	392.5	420.0	431.3	486.6	498.5	485.6	490.1	717.5	

Figure 26. Events by Mode and Rates per 100M VRM[a, b]

- More than four out of five bus transit events occurred on fixed-route bus modes in 2018. The fixed-route bus event rate per 100M VRM was over three times higher than the demand response event rate for that same year.
- Fixed-route bus modes reported 302 more events in 2018 than in 2015. (2015 is the first comparable year in the analyzed period, due to changing event reporting thresholds.[a, b]) Demand response mode events increased by 122 events during this same time frame.
- After changes in service levels are accounted for, the annual fixed-route bus event rate increased 0.9% between 2017 and 2018.
- However, the event rate decreased an average of 0.1% per year from 2015 to 2018. The demand response event rate increased 1.3% per year over the same period.

[a] Prior to the 2011 reporting year, FTA stopped collecting non-major security event data. This change significantly reduced the number of reportable events beginning in 2011.

[b] Starting in 2015, FTA required agencies to report all collisions resulting in towing to ensure consistency with other Federal reporting programs. This new requirement led to more reportable events for both fixed-route and demand response bus modes beginning in 2015.

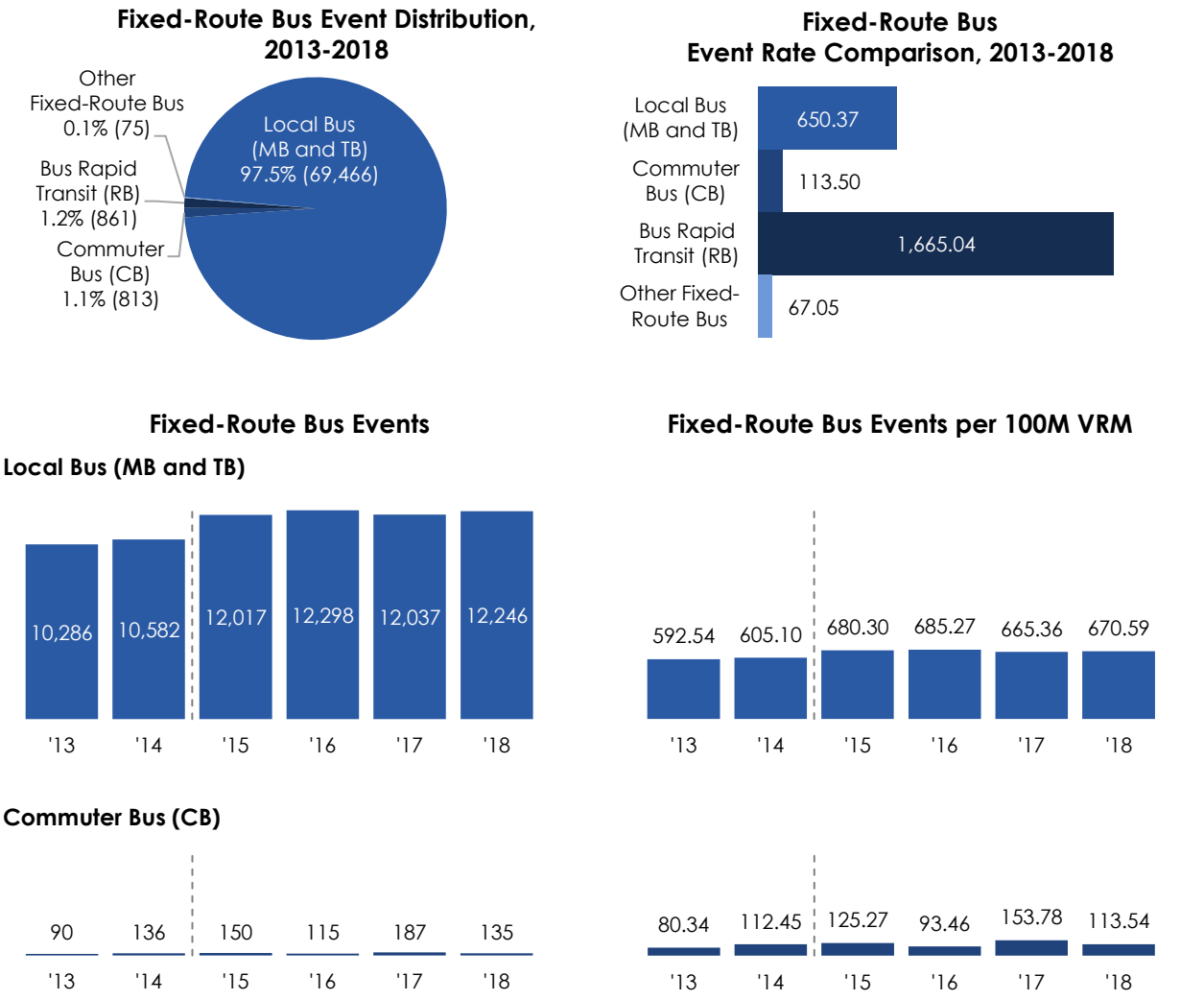


Figure 27. Local and Commuter Bus Events and Event Rates per 100M VRM[a, b]

- In 2018, local bus modes (MB and TB) reported over 97% of all fixed-route bus events, which fit the pattern of the 2013–2018 period. During the 2015–2018 period, local bus events per 100M VRM decreased 0.4% per year on average.
- CB modes reported 1.1% of fixed-route bus events in 2018. The CB event rate per 100M VRM fluctuated without a clear trend from 2015 to 2018.

[a] FTA split commuter bus (CB) and bus rapid transit (RB) modes from the bus (MB) mode during 2012. Safety analysis of these is possible beginning in CY 2013.

[b] Starting in 2015, FTA required agencies to report all collisions resulting in towing to ensure consistency with other Federal reporting programs. This new requirement led to more reportable events beginning in 2015.

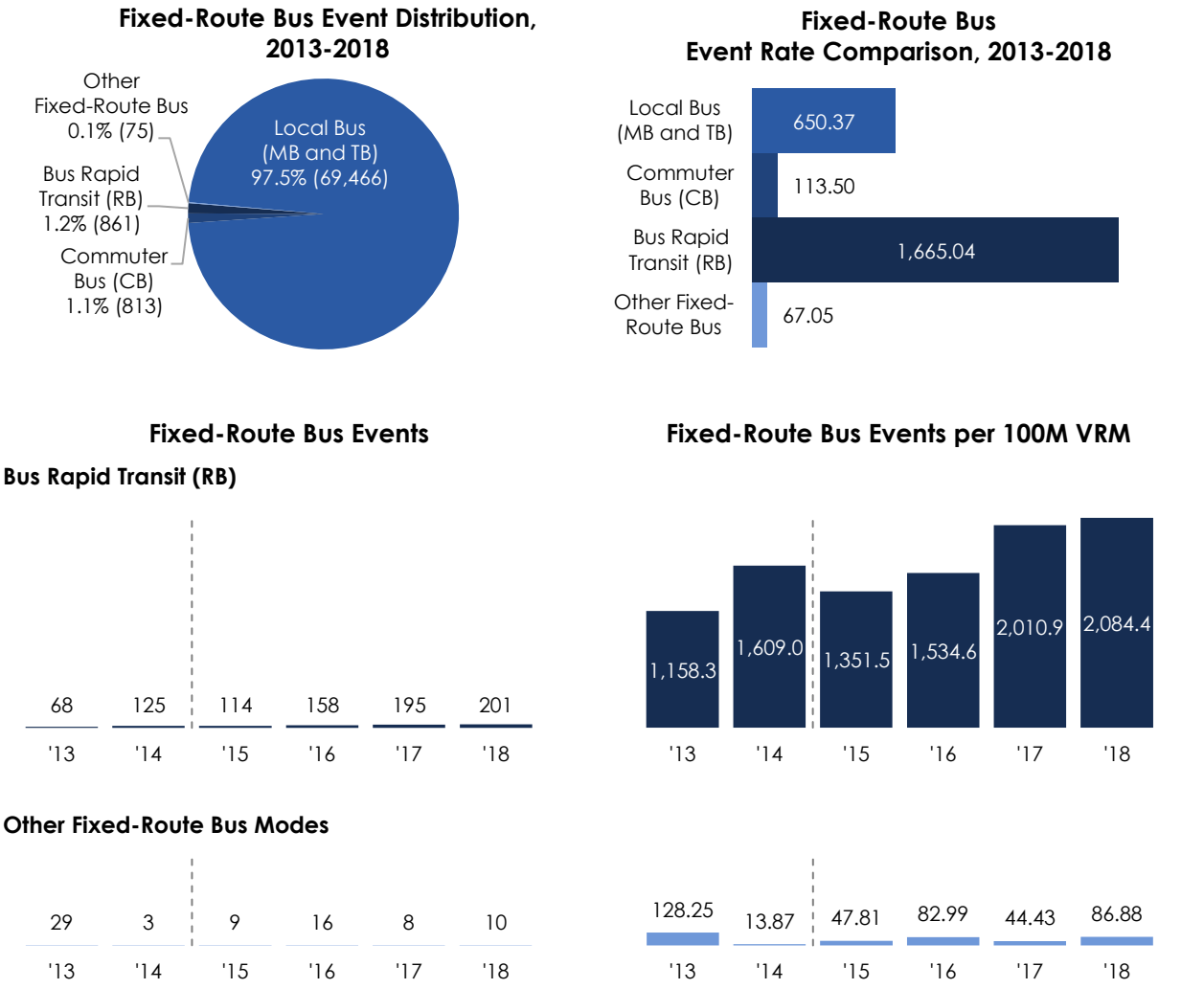


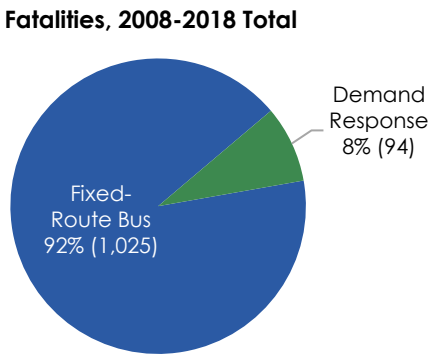
Figure 28. Bus Rapid Transit and Other Fixed-Route Bus Events and Event Rates per 100M VRM[a, b]

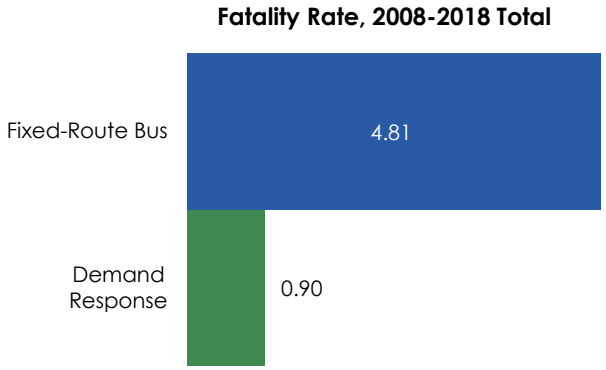
- Despite reporting only 1.6% of all fixed-route bus events in 2018, bus rapid transit (RB) modes have the highest event rate of any fixed-route bus category. In the 2015–2018 period, the RB event rate increased 11.4% per year on average, from 1,351.5 events per 100M VRM in 2015 to 2,084.4 in 2018.
- Other fixed-route bus modes (those not reported as MB, TB, CB, or RB) accounted for less than 1% of all fixed-route bus events reported each year from 2013 to 2018.

[a] FTA split commuter bus (CB) and bus rapid transit (RB) modes from the bus (MB) mode during 2012. Safety analysis of these is possible beginning in CY 2013.

[b] Starting in 2015, FTA required agencies to report all collisions resulting in towing to ensure consistency with other Federal reporting programs. This new requirement led to more reportable events beginning in 2015.

5-2. Fatalities and Rates per 100M VRM by Mode





Fatalities	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Avg	Trend
Fixed-Route Bus	84	85	90	93	99	111	93	96	103	91	80	93	
Demand Response	7	11	11	4	16	12	11	6	6	7	3	9	
All Modes	91	96	101	97	115	123	104	102	109	98	83	102	

Fatality Rate	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Avg	Trend
Fixed-Route Bus	4.22	4.21	4.59	4.89	5.27	5.92	4.90	5.02	5.29	4.65	4.07	4.81	
Demand Response	0.83	1.23	1.22	0.44	1.72	1.26	1.13	0.61	0.60	0.70	0.30	0.90	
All Modes	3.21	3.29	3.53	3.45	4.10	4.35	3.62	3.51	3.70	3.31	2.80	3.53	

Figure 29. Fatalities by Mode and Rates per 100M VRM

- Over 96% of bus transit fatalities occurred on fixed-route modes in 2018 and the fixed-route bus fatality rate (per 100M VRM) was more than ten times the demand response fatality rate.
- Fixed-route bus service reported fewer fatalities in 2018 than in any other year of the analyzed period.
- There were three demand response fatalities in 2018, the lowest annual total for demand response in analyzed period. Demand response fatalities fluctuated throughout the eleven-year period. The highest single year was 2012, with 16 fatalities.

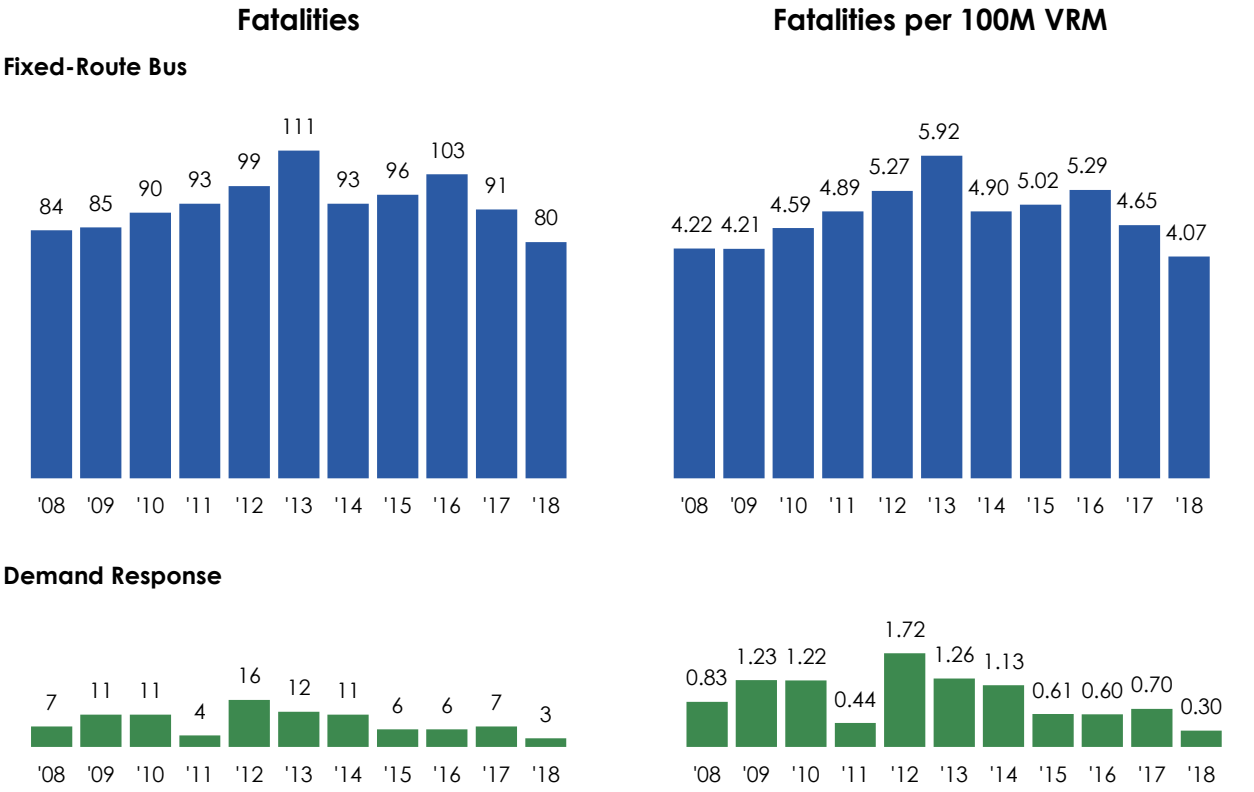


Figure 30. Fatality and Fatality Rate Trends by Bus Mode

- During the analyzed period, the fixed-route bus fatality rate fluctuated between 4.07 and 5.92 fatalities per 100M VRM. The 2018 fixed-route bus fatality rate was the lowest recorded in this time frame.
- The annual demand response fatality rate fluctuated throughout the eleven-year period, but the rate did not exceed two fatalities per 100M VRM in any year.

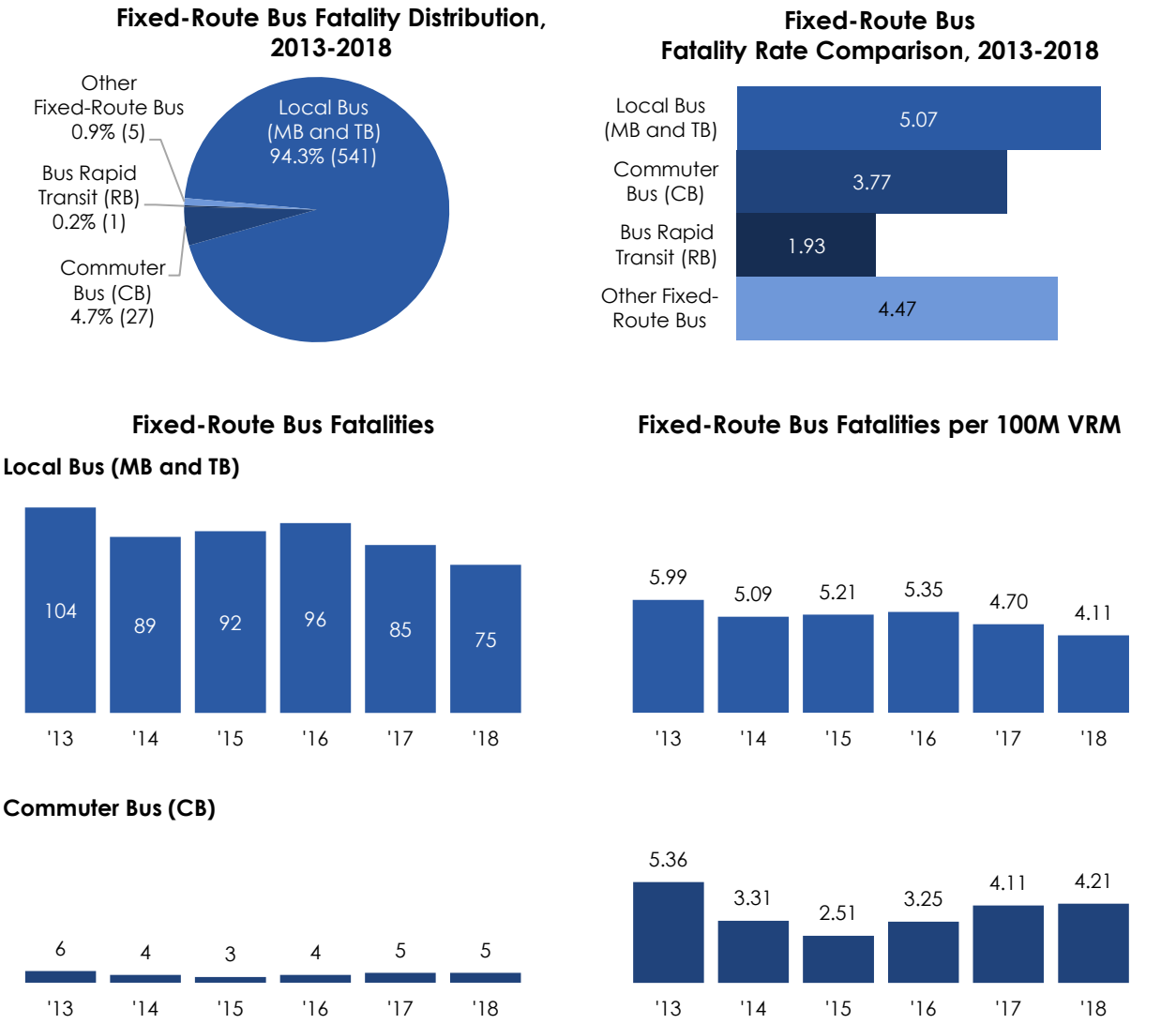


Figure 31. Local and Commuter Bus Fatalities and Fatality Rates per 100M VRM[a]

- Local bus modes (MB and TB) accounted for 94% of all fixed-route bus mode fatalities in 2018. The annual fatality rate at these modes decreased an average of 6.1% each year during the six-year period from 2013 to 2018.
- CB modes reported 6% of all fixed-route bus fatalities in 2018 but had a slightly higher fatality rate than local bus modes (4.21 fatalities per 100M VRM compared to 4.11). However, over the six-year analyzed period, CB modes had a lower fatality rate than local bus modes (3.77 and 5.07 fatalities per 100M VRM respectively).

[a] FTA split commuter bus (CB) and bus rapid transit (RB) modes from the bus (MB) mode during 2012. Analysis of these modes became possible beginning in CY 2013.

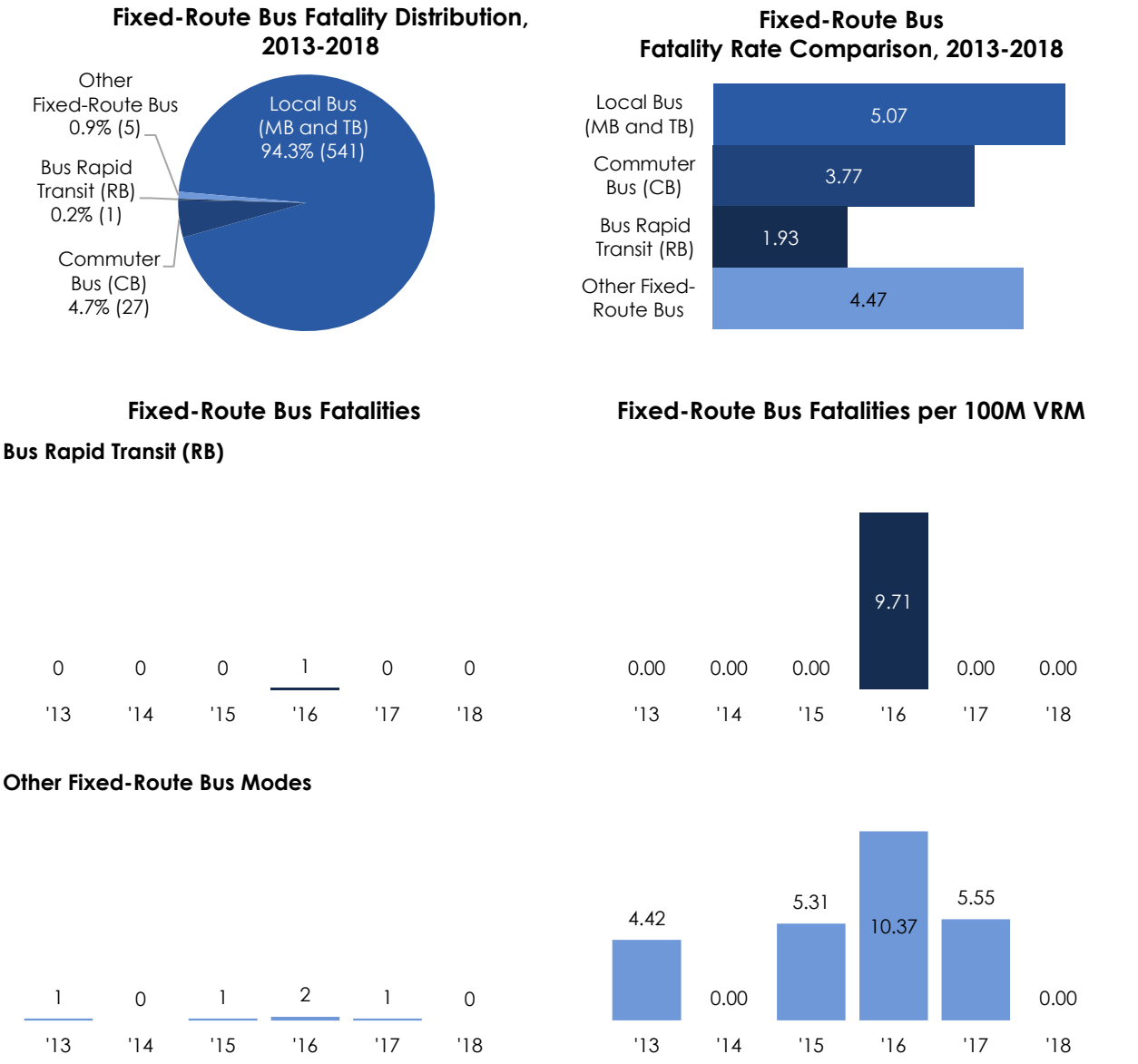
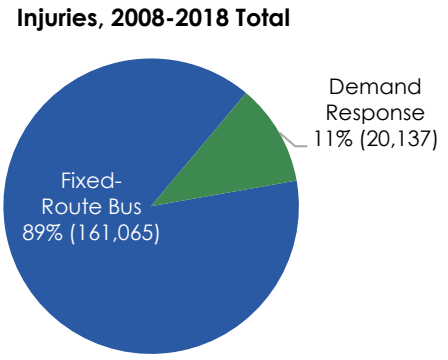


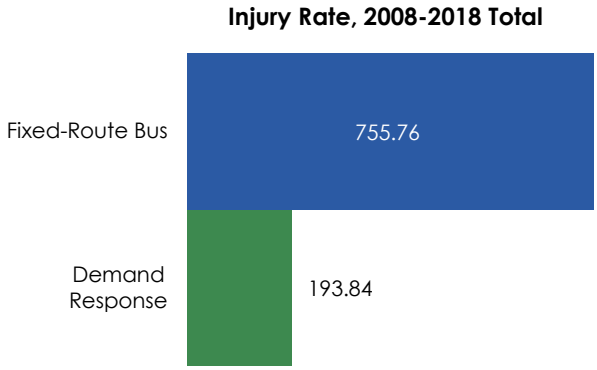
Figure 32. Bus Rapid Transit and Other Fixed-Route Bus Fatalities and Fatality Rates per 100M VRM[a]

- RB modes reported no fatalities in 2018 and only one fatality during the 2013–2018 period. Over that entire period, RB modes accounted for less than 1% of all fixed-route bus fatalities. The one fatality occurred in 2016.
- Modes other than MB, TB, CB, and RB accounted for no 2018 fatalities and less than 1% of fixed-route bus fatalities reported from 2013 to 2018.

[a] FTA split commuter bus (CB) and bus rapid transit (RB) modes from the bus (MB) mode during 2012. Analysis of these modes became possible beginning in CY 2013.

5-3. Injuries and Rates per 100M VRM by Mode





Injuries	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Avg	Trend
Fixed-Route Bus	14,781	15,784	15,185	13,322	13,572	14,387	14,807	15,156	15,135	14,467	14,469	14,642	
Demand Response	2,002	1,965	1,688	1,565	1,547	1,701	1,839	1,863	2,183	1,912	1,872	1,831	
All Modes	16,783	17,749	16,873	14,887	15,119	16,088	16,646	17,019	17,318	16,379	16,341	16,473	

Injury Rate	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Avg	Trend
Fixed-Route Bus	741.8	781.6	774.3	701.2	722.8	766.7	779.7	792.1	777.2	738.7	735.9	755.8	
Demand Response	236.9	219.6	187.8	172.2	166.4	178.6	189.6	188.4	219.0	190.8	186.9	193.8	
All Modes	591.4	609.0	589.9	530.0	538.6	568.7	580.2	586.4	588.2	553.3	550.6	571.6	

Figure 33. Injuries by Mode and Rates per 100M VRM

- Fixed-route modes accounted for almost nine of every ten bus injuries that agencies reported in 2018. The injury rate per 100M VRM for fixed-route bus modes was over three times higher than for demand response modes that same year.
- Injuries per 100M VRM of fixed-route bus service decreased from 741.8 in 2008 to 735.9 in 2018—an average decrease of 0.1% per year.
- The annual demand response injury rate also decreased over the eleven-year period. The rate changed from 236.9 reported injuries per 100M VRM in 2008 to 186.9 in 2018, reflecting a 2.1% average decrease each year.

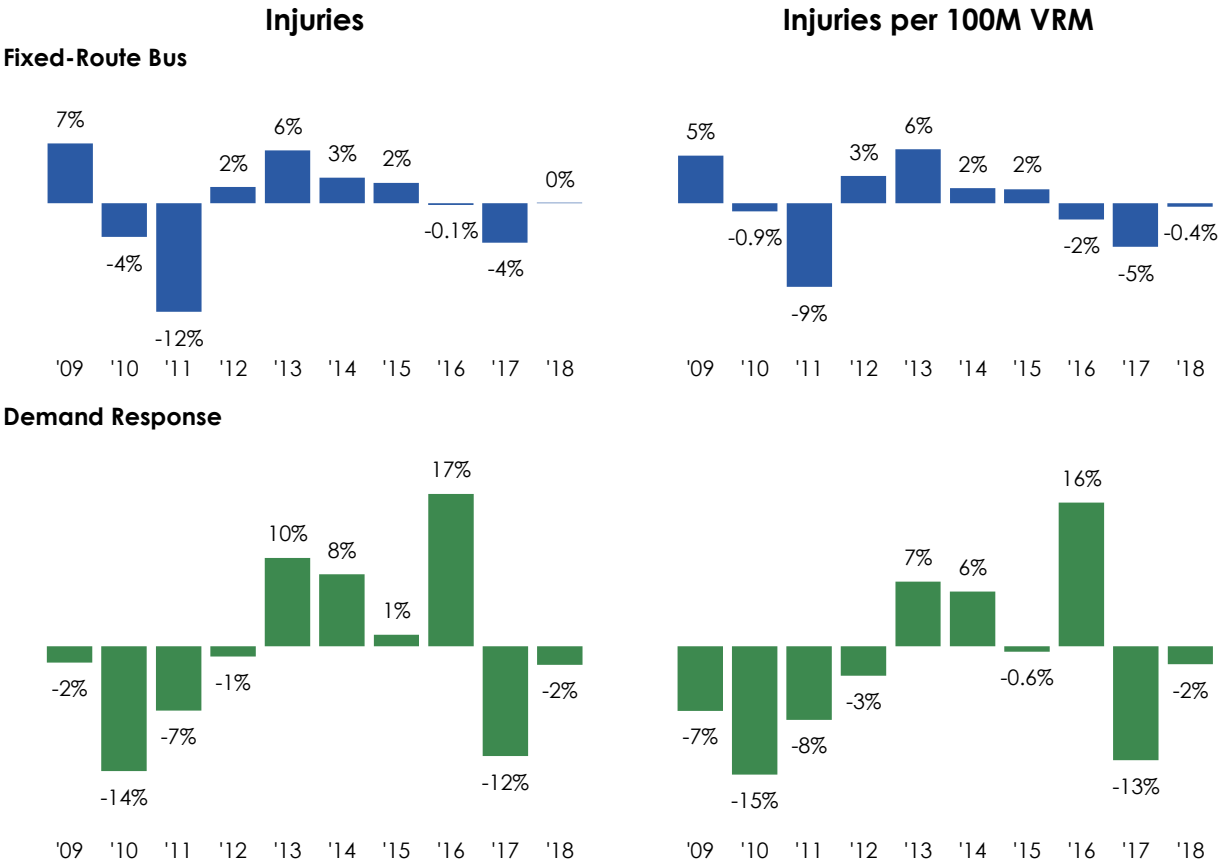


Figure 34. Annual Percent Change in Injuries and Injury Rates by Bus Mode

- Annual fixed-route bus injury reports dropped more than 10% between 2010 and 2011. Agencies reported over 1,000 fewer injuries in 2011 than 2010, as shown in Figure 33 on page 28.
- After varying service levels are taken into account, the annual fixed-route bus injury rate increased 2.5% on average from 2011 to 2015. However, after 2015 the rate decreased every year of the analyzed period.
- The annual rate of reported demand response injuries per 100M VRM decreased each year from 2009 to 2012, rose three out of four years from 2013 to 2016, and then decreased in the last two years of the analyzed period. The rate recorded in 2018 (186.9 per 100M VRM) was 21% lower than the rate in 2008 (236.9).

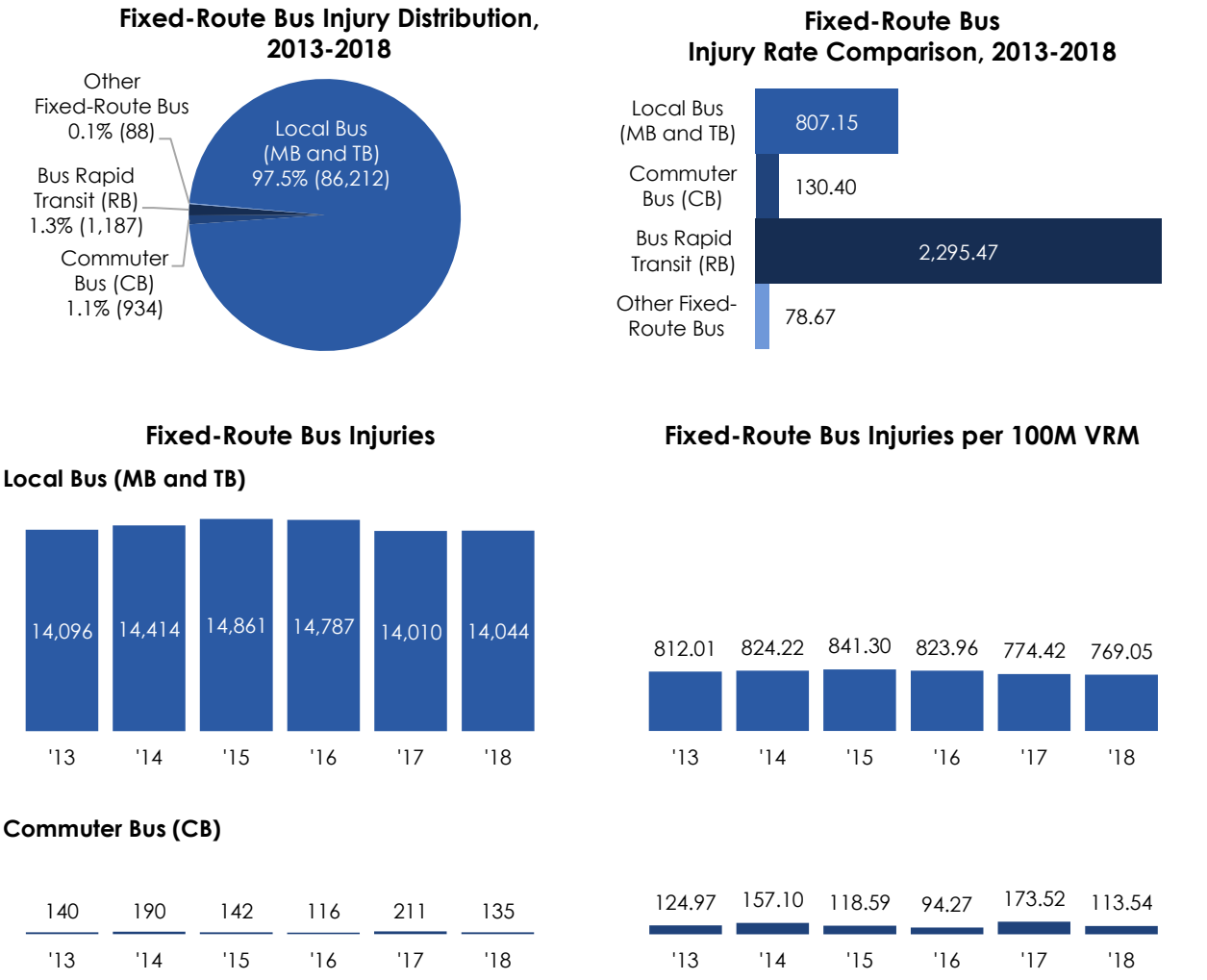


Figure 35. Local and Commuter Bus Injuries and Injury Rates per 100M VRM[a]

- Local bus (MB and TB) modes reported over 97% of fixed-route bus injuries in 2018, which fit the pattern of the 2013–2018 period. Local bus injuries increased each year from 2013 to 2015 but then decreased in 2016, 2017, and 2018.
- The annual local bus injury rate also showed this pattern, with injuries per 100M VRM decreasing at a 2.2% average annual rate from 2015 to 2018.
- CB modes reported 0.9% of all fixed-route bus injuries in 2018 and 1.1% of those reported in the six-year analyzed period.

[a] FTA split commuter bus (CB) and bus rapid transit (RB) modes from the bus (MB) mode during 2012. Analysis of these modes became possible beginning in CY 2013.

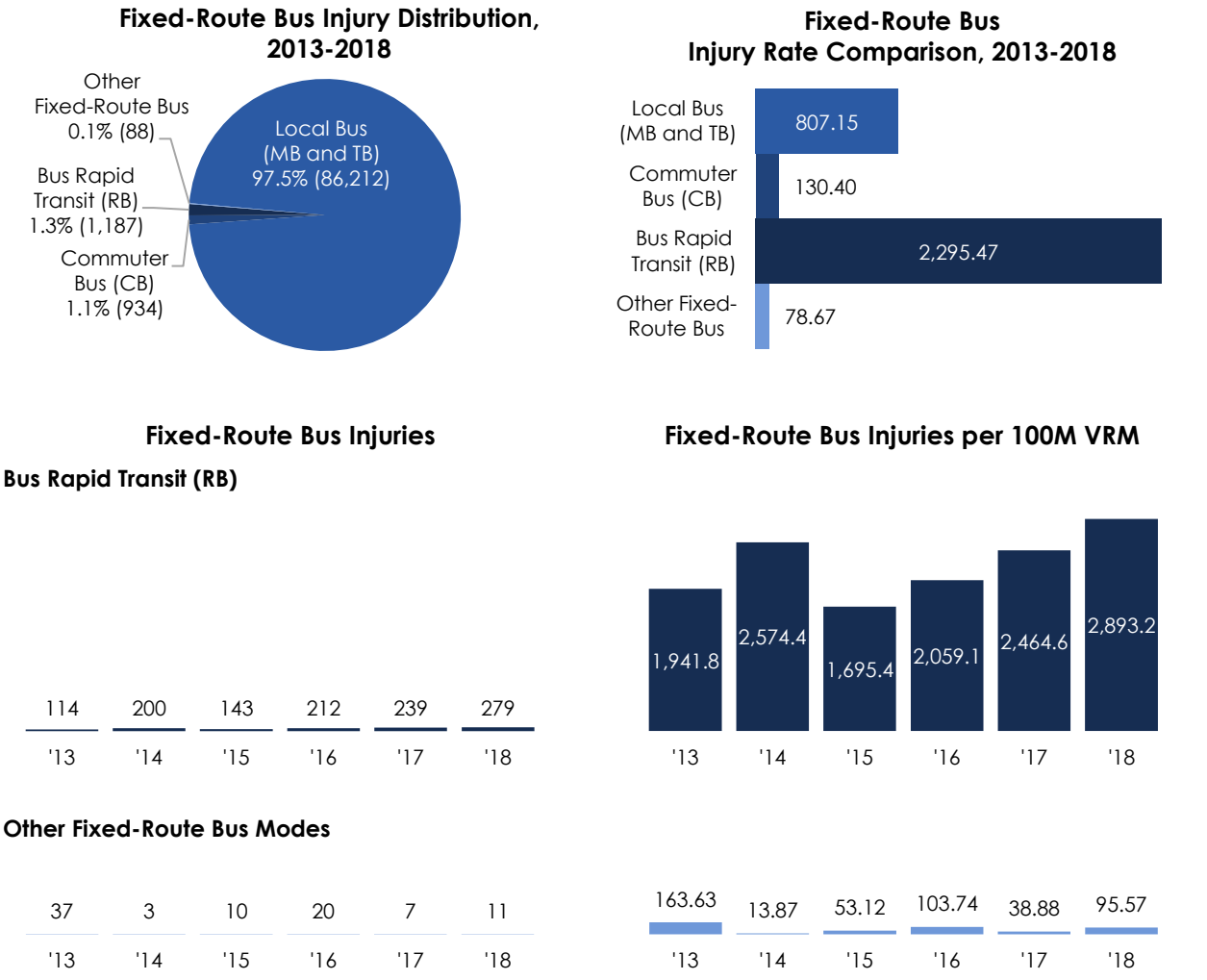


Figure 36. Bus Rapid Transit and Other Fixed-Route Bus Injuries and Injury Rates per 100M VRM[a]

- RB modes reported 1.9% of all fixed-route bus injuries in 2018. However, when standardized by 100M VRM, RB modes had a higher injury rate than all other fixed-route bus modes that year, as well as in every year of the 2013–2018 period.
- The RB mode injury rate generally increased from 2013 to 2018. Measured across the six-year period, RB injuries per 100M VRM increased 6.9% per year on average.
- Fixed-route bus modes other than MB, TB, RB, and CB reported less than 1% of fixed-route bus injuries in 2018 and less than 1% of all fixed-route bus injuries reported from 2013 to 2018.

[a] FTA split commuter bus (CB) and bus rapid transit (RB) modes from the bus (MB) mode during 2012. Analysis of these modes became possible beginning in CY 2013.

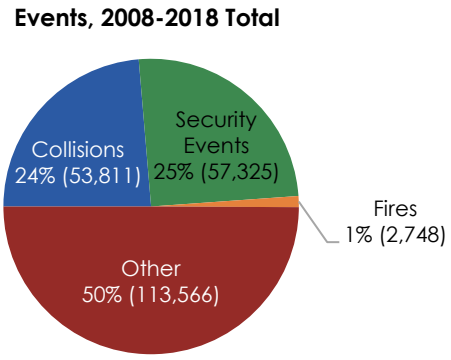
6. Full Reporter Agency Events by Event Type

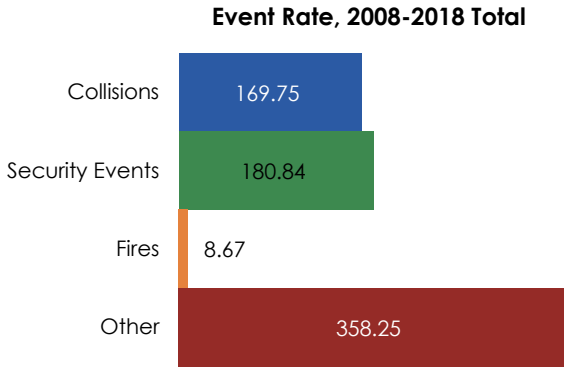
FTA requires bus transit agencies to submit an event type with every NTD event report. The BSDR uses these data to create the four event types shown in the table below. Appendix B includes additional details on how the BSDR groups events into these categories. The analyses on the following pages show the trend and distribution of events, fatalities, and injuries for these four event types.

Event Type	Description
Collision	A collision between a transit vehicle and anything else, including other vehicles, pedestrians, and stationary objects.
Security Event	Any event where a person causes harm to themselves or another person or causes damage to property. This includes assaults, suicides, and bomb threats.
Fire	Fire on transit agency property.
Other	Any other event surpassing a reporting threshold, including personal injury events (PIE), such as slips, falls, and electric shocks, as well as fare evasion citations and events related to natural disasters.

Table 5. Event Types

6-1. Events and Rates per 100M VRM by Event Type





Events	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Avg	Trend
Collisions	4,087	3,979	4,085	4,091	4,093	4,483	4,729	5,937	6,177	6,022	6,128	4,892	
Security Events	15,934	21,125	16,110	420	521	545	542	550	518	495	565	5,211	
Fires	364	303	234	293	226	208	199	229	223	256	213	250	
Other	18,522	19,083	19,561	6,268	6,178	6,645	6,903	7,405	7,758	7,604	7,639	10,324	
All Event Types	38,907	44,490	39,990	11,072	11,018	11,881	12,373	14,121	14,676	14,377	14,545	20,677	

Event Rate	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Avg	Trend
Collisions	144.0	136.5	142.8	145.6	145.8	158.5	164.8	204.6	209.8	203.4	206.5	169.8	
Security Events	561.5	724.9	563.3	15.0	18.6	19.3	18.9	19.0	17.6	16.7	19.0	180.8	
Fires	12.8	10.4	8.2	10.4	8.1	7.4	6.9	7.9	7.6	8.6	7.2	8.7	
Other	652.7	654.8	683.9	223.1	220.1	234.9	240.6	255.2	263.5	256.9	257.4	358.3	
All Event Types	1,371.1	1,526.6	1,398.2	394.2	392.5	420.0	431.3	486.6	498.5	485.6	490.1	717.5	

Figure 37. Events by Event Type and Rates per 100M VRM[a, b]

- Slightly more than half of events in 2018 were "other" events. "Other" events include PIE like slips, falls, and electric shocks, as well as events related to natural disasters. This report examines "other" events in more detail on the following page.
- Another 42% of events in 2018 were collisions. This report examines collisions in more detail starting on page 41.
- After collisions reported solely due to the towed-vehicle threshold change are excluded,[b] bus agencies submitted over 600 more collisions in 2018 than in 2008, which reflects an annual average increase of 1.4% during that eleven-year period.

[a] Prior to the 2011 reporting year, FTA stopped collecting non-major security event data. This change significantly reduced the number of reportable events beginning in 2011.

[b] Starting in 2015, FTA required agencies to report all collisions resulting in towing to ensure consistency with other Federal reporting programs. This new requirement led to more reportable events beginning in 2015.

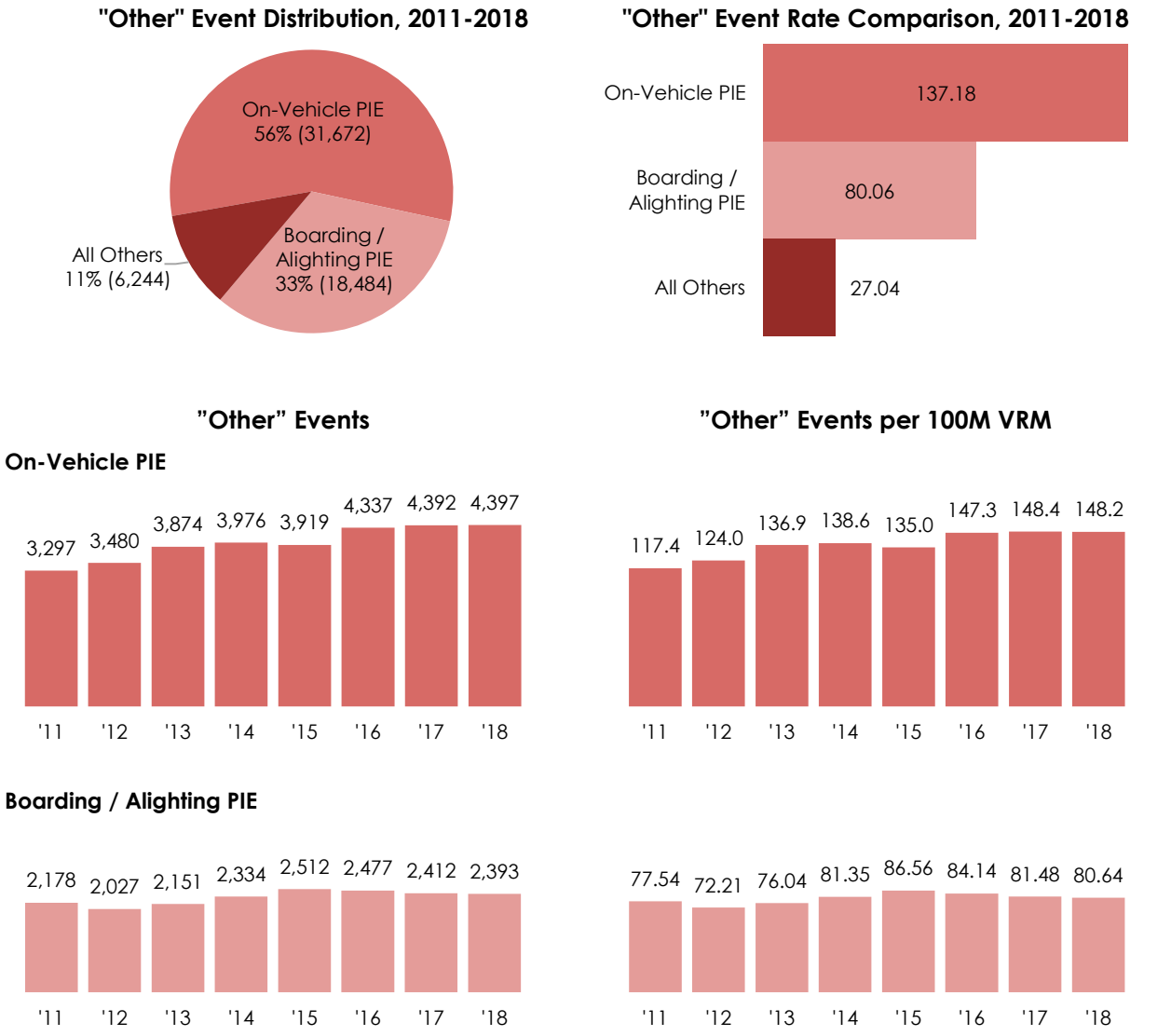


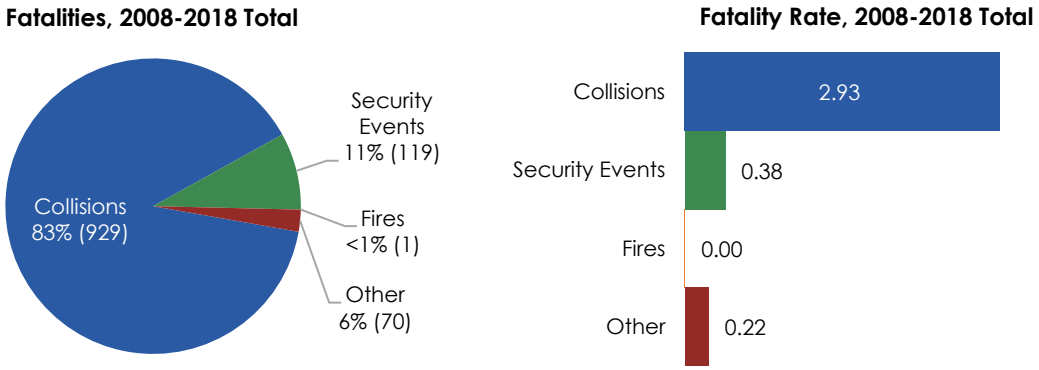
Figure 38. "Other" Events by Detailed Event Type and Rates per 100M VRM[a, b]

- Over half of the "other" events agencies reported in 2018 were personal injury events (PIE) occurring while onboard transit vehicles. PIE while boarding or alighting from transit vehicles accounted for another 31% of these events.
- During the 2011–2018 period, the annual on-vehicle PIE rate per 100M VRM increased 3.0% per year on average. The annual boarding / alighting PIE rate fluctuated between 72.21 and 86.56 events per 100M VRM during that time.

[a] "Other" events are any safety event other than collisions and fires, including PIE, such as slips, falls and electric shocks, as well as fare evasion citations and events related to natural disasters.

[b] Prior to the 2011 reporting year, FTA stopped collecting non-major security event data. Because of this change, 2011 is the first year of comparable data for this analysis.

6-2. Fatalities and Rates per 100M VRM by Event Type



Fatalities	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Avg	Trend
Collisions	78	78	84	82	88	92	88	89	91	85	74	84	
Security Events	5	12	10	9	14	19	13	6	14	10	7	11	
Fires	0	0	0	0	0	0	0	0	0	1	0	0	
Other	8	6	7	6	13	12	3	7	4	2	2	6	
All Event Types	91	96	101	97	115	123	104	102	109	98	83	102	

Fatality Rate	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Avg	Trend
Collisions	2.75	2.68	2.94	2.92	3.13	3.25	3.07	3.07	3.09	2.87	2.49	2.93	
Security Events	0.18	0.41	0.35	0.32	0.50	0.67	0.45	0.21	0.48	0.34	0.24	0.38	
Fires	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	
Other	0.28	0.21	0.24	0.21	0.46	0.42	0.10	0.24	0.14	0.07	0.07	0.22	
All Event Types	3.21	3.29	3.53	3.45	4.10	4.35	3.62	3.51	3.70	3.31	2.80	3.53	

Figure 39. Fatalities by Event Type and Rates per 100M VRM

- Nearly nine out of ten fatalities in 2018 resulted from collisions. (See the section beginning on page 41 for more details.) The majority of the remaining fatalities that year resulted from security events, which are examined in more detail starting on page 51.
- Agencies only reported one bus fire fatality in the eleven-year analyzed period. That fatality occurred in 2017.
- The annual rate of security event fatalities did not exceed one per 100M VRM in any year of the analyzed period. The same is true for fatalities resulting from “other” events like slips, falls, and electric shocks.

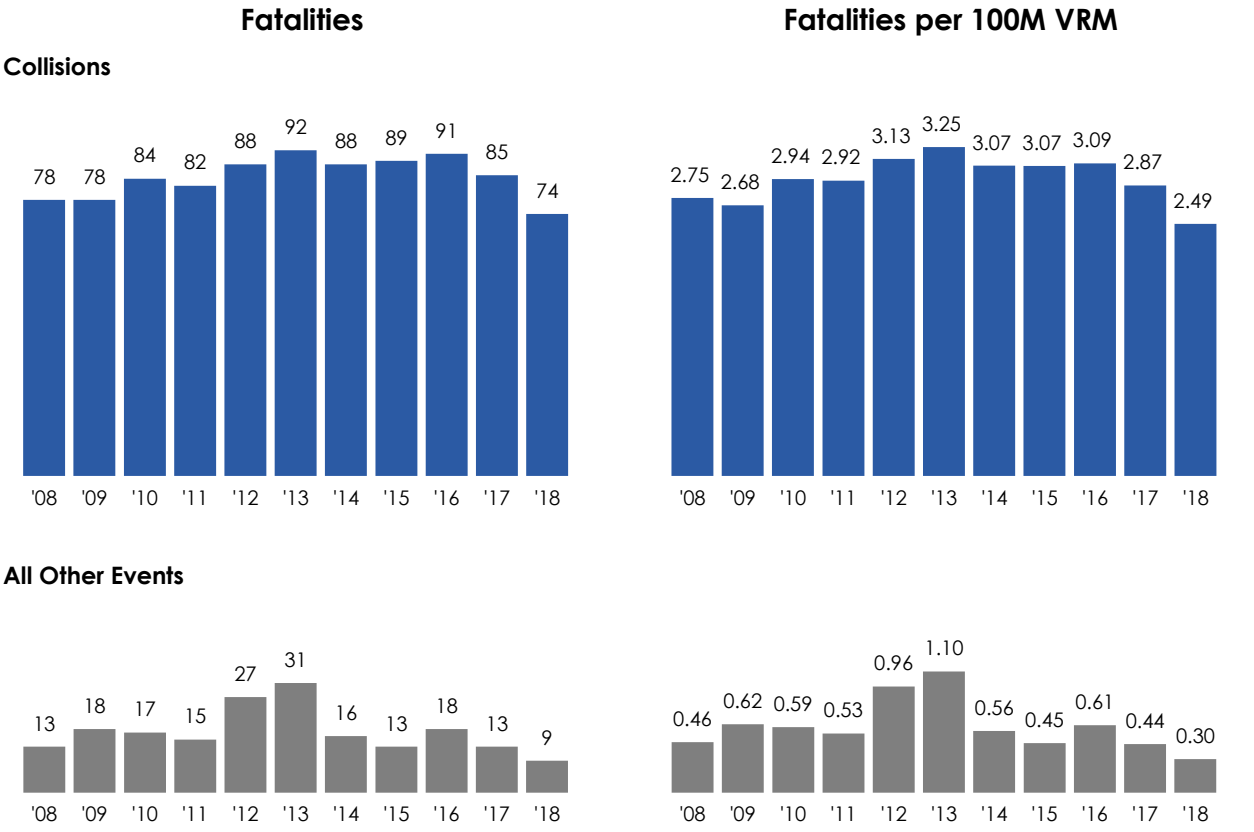
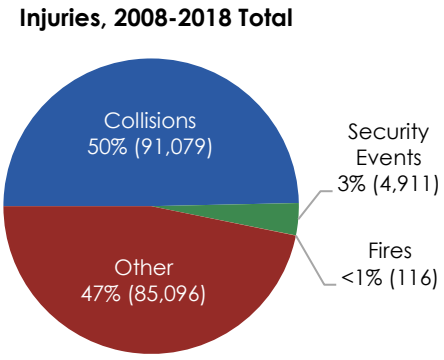
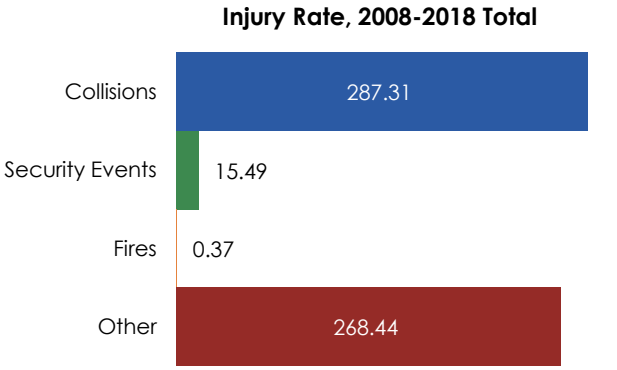


Figure 40. Fatality and Fatality Rate Trends by Event Type

- Agencies reported more collision fatalities than fatalities from all other event types combined in every year of the analyzed period.
- Collisions resulted in 4 fewer fatalities in 2018 than in 2008. After changing service levels are adjusted for, the collision fatality rate fluctuated between 2.49 and 3.25 fatalities per 100M VRM during the analyzed period.
- The annual rate of non-collision fatalities fluctuated between 0.30 and 1.10 per 100M VRM between 2008 and 2018.

6-3. Injuries and Rates per 100M VRM by Event Type





Injuries	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Avg	Trend
Collisions	7,579	7,414	7,866	8,020	8,174	8,643	8,917	9,062	9,071	8,218	8,115	8,280	
Security Events	254	223	282	418	523	541	540	562	499	495	574	446	
Fires	22	11	7	19	9	14	4	6	7	13	4	11	
Other	8,928	10,101	8,718	6,430	6,413	6,890	7,185	7,389	7,741	7,653	7,648	7,736	
All Event Types	16,783	17,749	16,873	14,887	15,119	16,088	16,646	17,019	17,318	16,379	16,341	16,473	

Injury Rate	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Avg	Trend
Collisions	267.1	254.4	275.0	285.5	291.2	305.5	310.8	312.3	308.1	277.6	273.5	287.3	
Security Events	9.0	7.7	9.9	14.9	18.6	19.1	18.8	19.4	16.9	16.7	19.3	15.5	
Fires	0.8	0.4	0.2	0.7	0.3	0.5	0.1	0.2	0.2	0.4	0.1	0.4	
Other	314.6	346.6	304.8	228.9	228.5	243.6	250.4	254.6	262.9	258.5	257.7	268.4	
All Event Types	591.4	609.0	589.9	530.0	538.6	568.7	580.2	586.4	588.2	553.3	550.6	571.6	

Figure 41. Injuries by Event Type and Rates per 100M VRM

- About half of agency-reported injuries in 2018 resulted from collisions. Further analysis of collision injuries begins on page 47.
- "Other" events like slips, trips, and electric shocks accounted for an additional 47% of injuries reported in 2018. Further analysis of "other" event injuries begins on page 40.
- Security event injuries varied from 223 to 574 each year of the analyzed period but accounted for under 5% of all injuries reported from 2008 to 2018.
- Agencies reported fewer than 100 fire injuries in every year of the analyzed period.

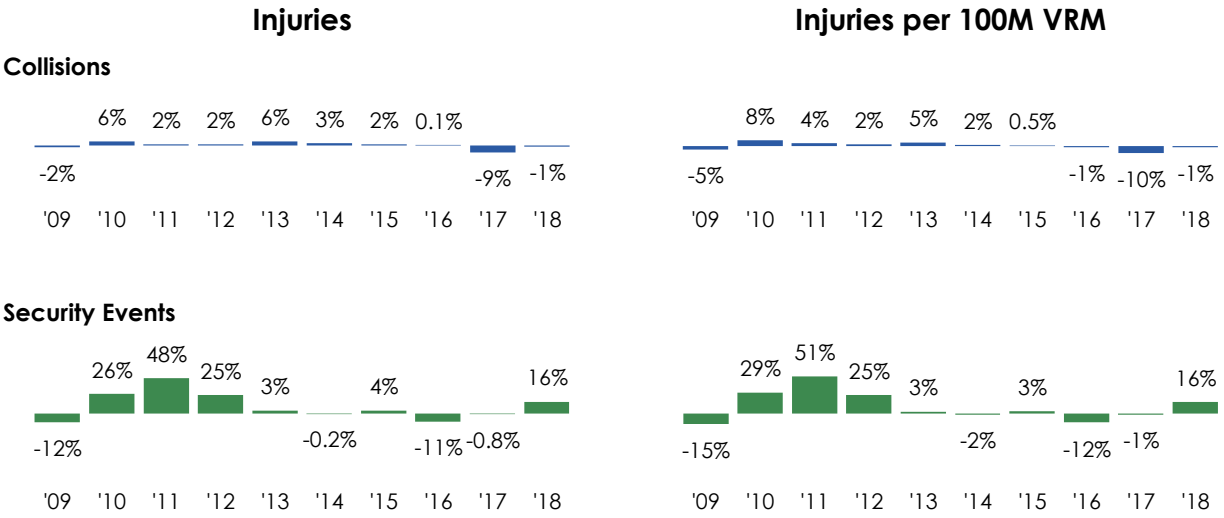


Figure 42. Annual Percent Change in Collision and Security Event Injuries and Injury Rates

- Agencies reported fewer collision injuries in 2018 than in 2017. After increasing service levels are accounted for, the annual collision injury rate fluctuated between 254.4 and 312.3 injuries per 100M VRM in the analyzed period.
- Between 2010 and 2015, the reported collision injury rate increased each year. However, from 2016 to 2018, agencies reported fewer collision injuries per 100M VRM than the previous year.
- The security event injury rate increased over the eleven-year period, from 9.0 injuries per 100M VRM in 2008 to 19.3 in 2018. On average, the annual security event injury rate increased 7.3% per year during this time frame.

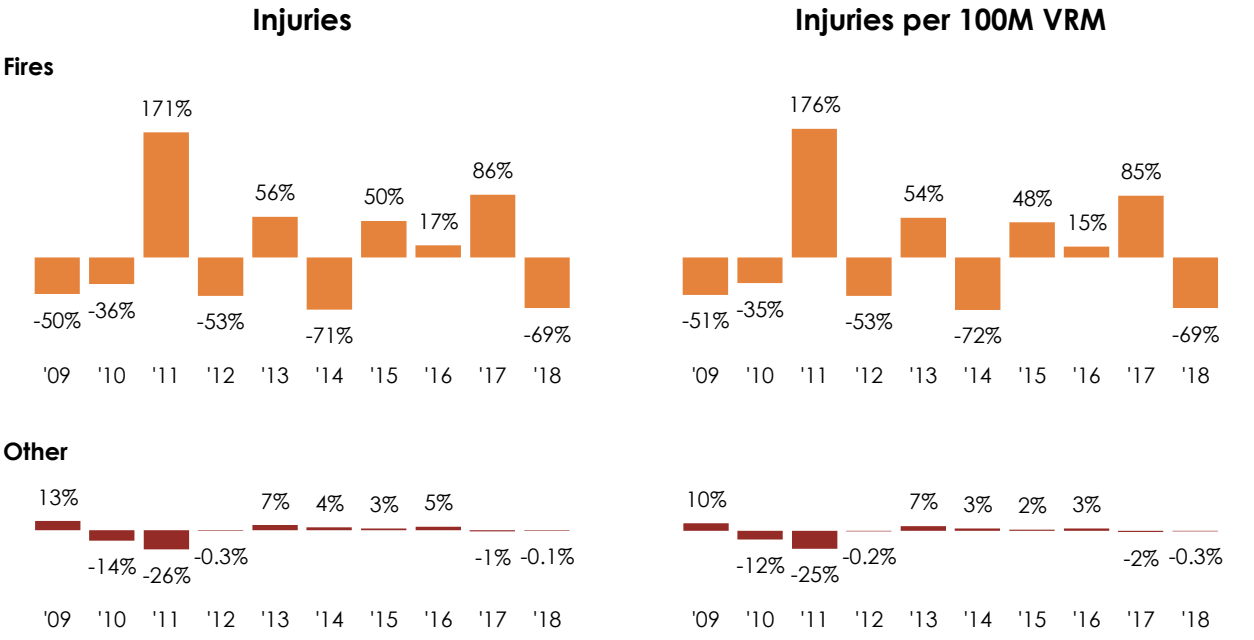


Figure 43. Annual Percent Change in Fire and "Other" Event Injuries and Injury Rates

- The annual fire injury rate fluctuated between 0.1 and 0.8 injuries per 100M VRM during the analyzed period.
- Agencies reported 1,280 fewer injuries resulting from "other" events in 2018 than in 2008.
- From 2013 to 2016, agencies reported more injuries resulting from "other" events per 100M VRM each year. This injury rate decreased in 2017 and 2018.

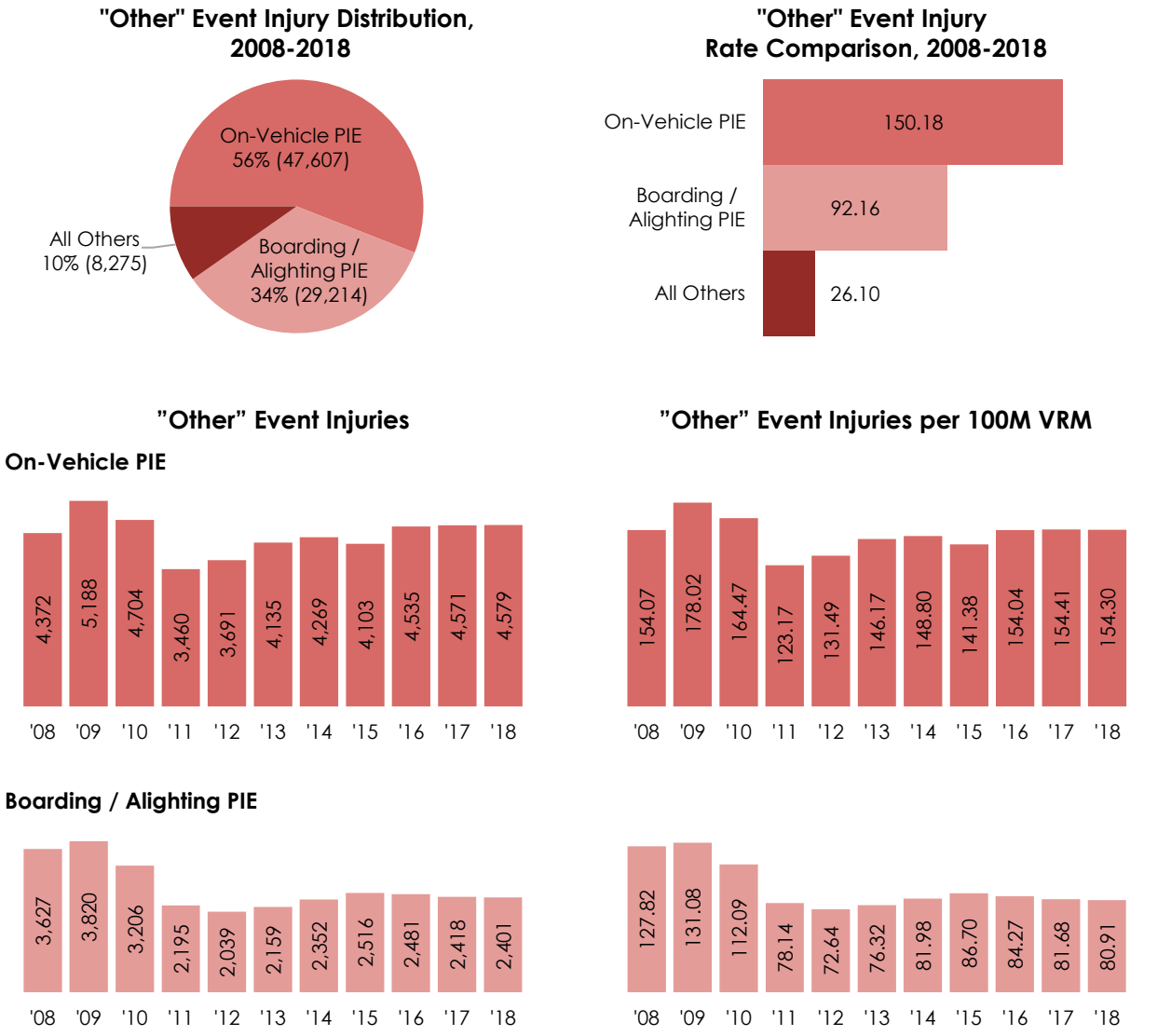


Figure 44. "Other" Event Injuries by Event Type and Rates per 100M VRM[a]

- Over half (60%) of "other" event injuries reported in 2018 resulted from on-vehicle PIE, or personal injury events, occurring while onboard transit vehicles. Boarding / alighting PIE accounted for another 31% of 2018 "other" event injuries.
- Annual tallies of on-vehicle PIE injuries per 100M VRM fluctuated from 2008 to 2018. This rate generally increased at a 0.01% average annual rate during this time.
- Annual tallies of the boarding / alighting PIE injury rate per 100M VRM fluctuated between 72.64 and 131.08 during the eleven-year period.

[a] "Other" events are any safety event other than collisions and fires, including PIE, such as slips, falls and electric shocks, as well as fare evasion citations and events related to natural disasters.

7. Full Reporter Agency Collisions by Collision Type

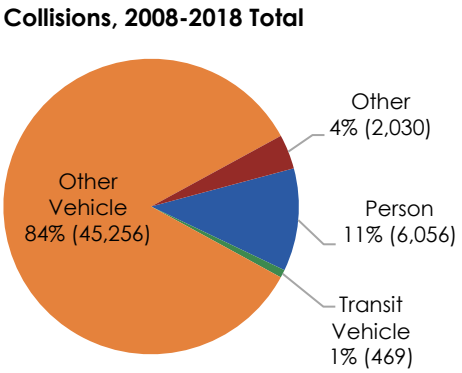
FTA requires bus transit agencies to include additional details in each collision report submitted to the NTD. The BSDR uses these data to create the four collision type categories shown in the table below. Appendix B includes additional details on how the BSDR groups collisions into these categories.

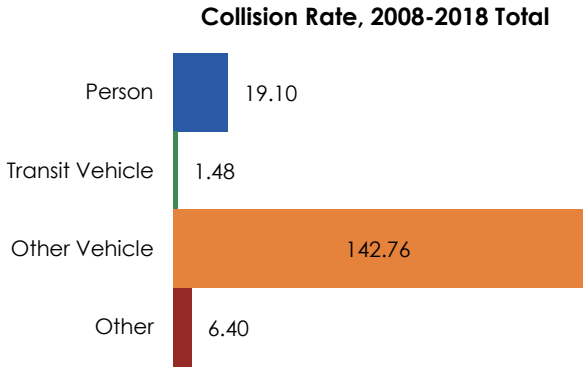
The following pages present the trends and distribution of events, fatalities, and injuries based on these four collision type categories.

Collision Type	Description
Person	Collision involving a transit vehicle and at least one individual not in a motor vehicle, including pedestrians and bicyclists.
Transit Vehicle	Collision between two or more transit vehicles not involving a collision with a person.
Other Vehicle	Collision between a transit vehicle and at least one non-transit motor vehicle (such as a car or motorcycle) that does not fit into either category above.
Other	Transit vehicle collisions with anything not included in the categories above, including those involving fixed objects or animals.

Table 6. Collision Types

7-1. Collisions and Rates per 100M VRM by Collision Type





Collisions	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Avg	Trend
Person	525	548	595	555	541	578	603	569	552	519	471	551	
Transit Vehicle	19	16	8	59	50	40	59	63	56	50	49	43	
Other Vehicle	3,338	3,298	3,322	3,328	3,347	3,666	3,856	5,131	5,356	5,252	5,362	4,114	
Other	205	117	160	149	155	199	211	174	213	201	246	185	
All Collision Types	4,087	3,979	4,085	4,091	4,093	4,483	4,729	5,937	6,177	6,022	6,128	4,892	

Collision Rate	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Avg	Trend
Person	18.5	18.8	20.8	19.8	19.3	20.4	21.0	19.6	18.7	17.5	15.9	19.1	
Transit Vehicle	0.7	0.5	0.3	2.1	1.8	1.4	2.1	2.2	1.9	1.7	1.7	1.5	
Other Vehicle	117.6	113.2	116.1	118.5	119.2	129.6	134.4	176.8	181.9	177.4	180.7	142.8	
Other	7.2	4.0	5.6	5.3	5.5	7.0	7.4	6.0	7.2	6.8	8.3	6.4	
All Collision Types	144.0	136.5	142.8	145.6	145.8	158.5	164.8	204.6	209.8	203.4	206.5	169.8	

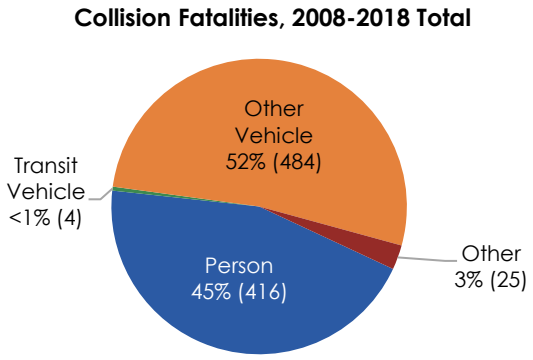
Figure 45. Collisions by Collision Type and Rates per 100M VRM[a, b]

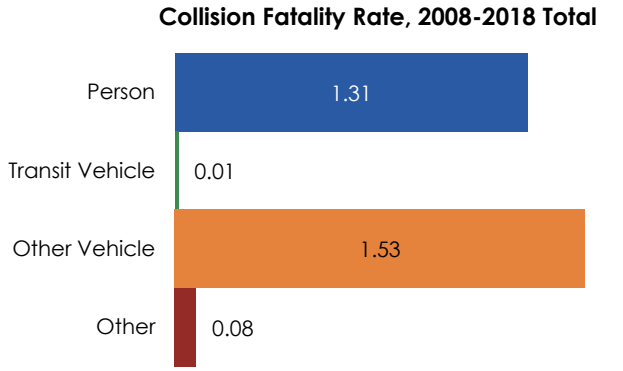
- More than four out of five collisions reported to the NTD in 2018 were collisions with a non-transit ("other") motor vehicle, such as a privately owned car.
- Another 8% of collisions in 2018 were collisions with persons. The 2018 bus-to-person collision rate (15.9 per 100M VRM) decreased 9.5% from 2017, when it was 17.5, and 1.4% per year since 2008, when it was 18.5 per 100M VRM.
- After collisions solely reportable due to the towed-vehicle policy change are excluded,[b] agencies reported over 700 more collisions with non-transit motor vehicles in 2018 than in 2008, an annual average increase of 1.9% per year.

[a] In 2011, FTA established a specific collision type category for collisions between two transit vehicles. This change increased the number of collisions classified as between transit vehicles beginning in 2011.

[b] Starting in 2015, FTA required agencies to report all collisions resulting in towing to ensure consistency with other Federal reporting programs. This led to more reportable collisions, accounting for 71% of the increase in non-transit motor vehicle collisions seen between 2014 and 2015.

7-2. Collision Fatalities and Rates per 100M VRM by Collision Type





Fatalities	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Avg	Trend
Person	33	41	45	37	42	41	45	42	38	26	26	38	
Transit Vehicle	0	0	0	0	0	0	0	1	2	0	1	0	
Other Vehicle	43	36	37	42	41	48	38	45	49	59	46	44	
Other	2	1	2	3	5	3	5	1	2	0	1	2	
All Collision Types	78	78	84	82	88	92	88	89	91	85	74	84	

Fatality Rate	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Avg	Trend
Person	1.16	1.41	1.57	1.32	1.50	1.45	1.57	1.45	1.29	0.88	0.88	1.31	
Transit Vehicle	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.07	0.00	0.03	0.01	
Other Vehicle	1.52	1.24	1.29	1.50	1.46	1.70	1.32	1.55	1.66	1.99	1.55	1.53	
Other	0.07	0.03	0.07	0.11	0.18	0.11	0.17	0.03	0.07	0.00	0.03	0.08	
All Collision Types	2.75	2.68	2.94	2.92	3.13	3.25	3.07	3.07	3.09	2.87	2.49	2.93	

Figure 46. Collision Fatalities by Collision Type and Rates per 100M VRM[a]

- More than six out of every ten collision fatalities that agencies reported in 2018 resulted from collisions with a non-transit motor vehicle. (Fatalities from collisions with non-transit motor vehicles are labeled “Other Vehicle” above.)
- In 2018, 35% of collision fatalities resulted from collisions with persons. Collisions with persons made up 8% of 2018 reported collisions (see Figure 45 on page 42).
- One fatality in 2018 resulted from collisions between two or more bus transit vehicles. These collisions did not result in more than two fatalities during any year of the analyzed period.
- There was one fatality from collisions with other objects (such as an animal or fixed object) in 2018.

[a] In 2011, FTA established a specific collision type category for collisions between two transit vehicles. This change increased the number of collisions classified as between transit vehicles beginning in 2011.

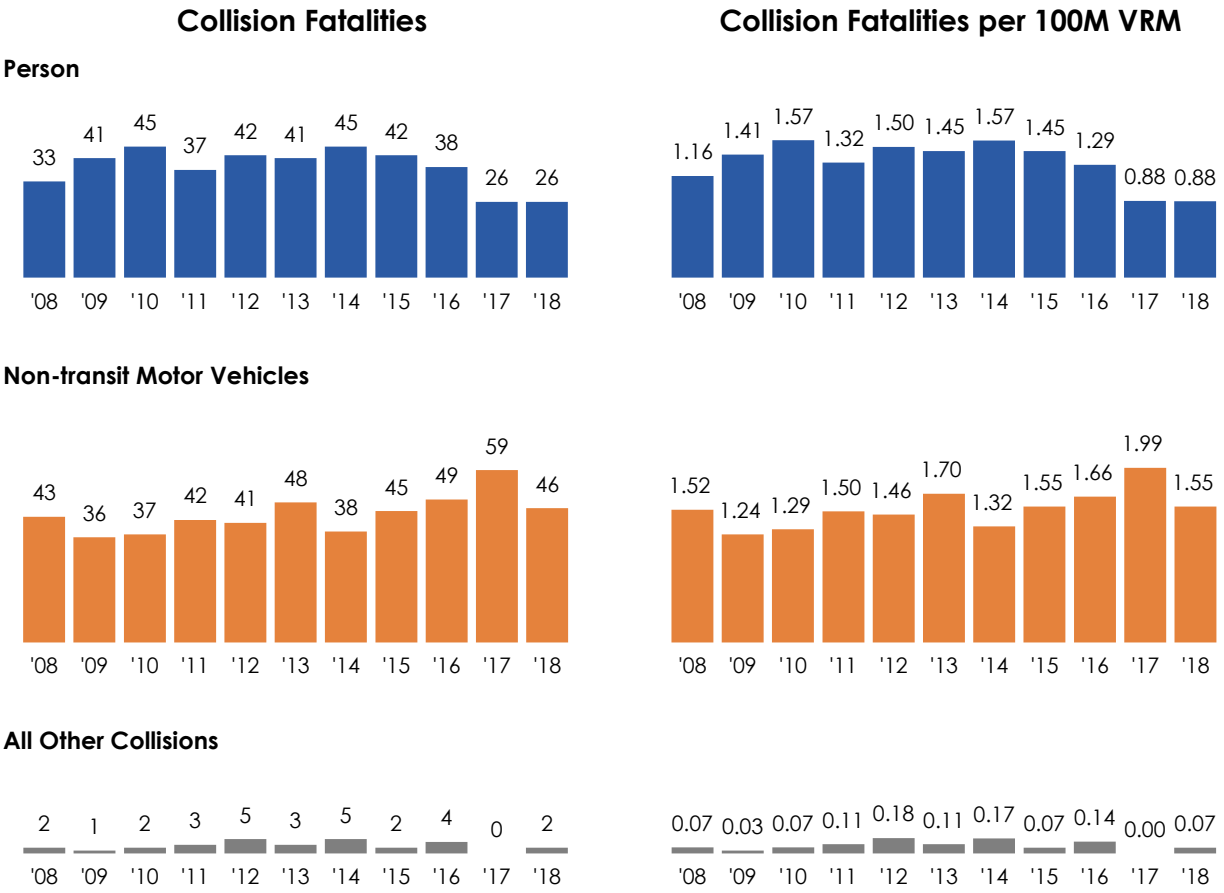


Figure 47. Collision Fatality and Fatality Rate Trends by Collision Type

- Over 90% of all reported collision fatalities in every year of the analyzed period resulted from either a collision with a person or non-transit motor vehicle.
- After changing service levels are accounted for, the annual rate of bus-to-person collision fatalities fluctuated between 0.88 and 1.57 fatalities per 100M VRM between 2008 and 2018. This annual figure did not show a yearly increase in the last four years of this eleven-year period.
- The annual rate of bus-to-non-transit motor vehicle collision fatalities fluctuated between 1.24 and 1.99 fatalities per 100M VRM in the analyzed period. The highest annual rate occurred in 2017.

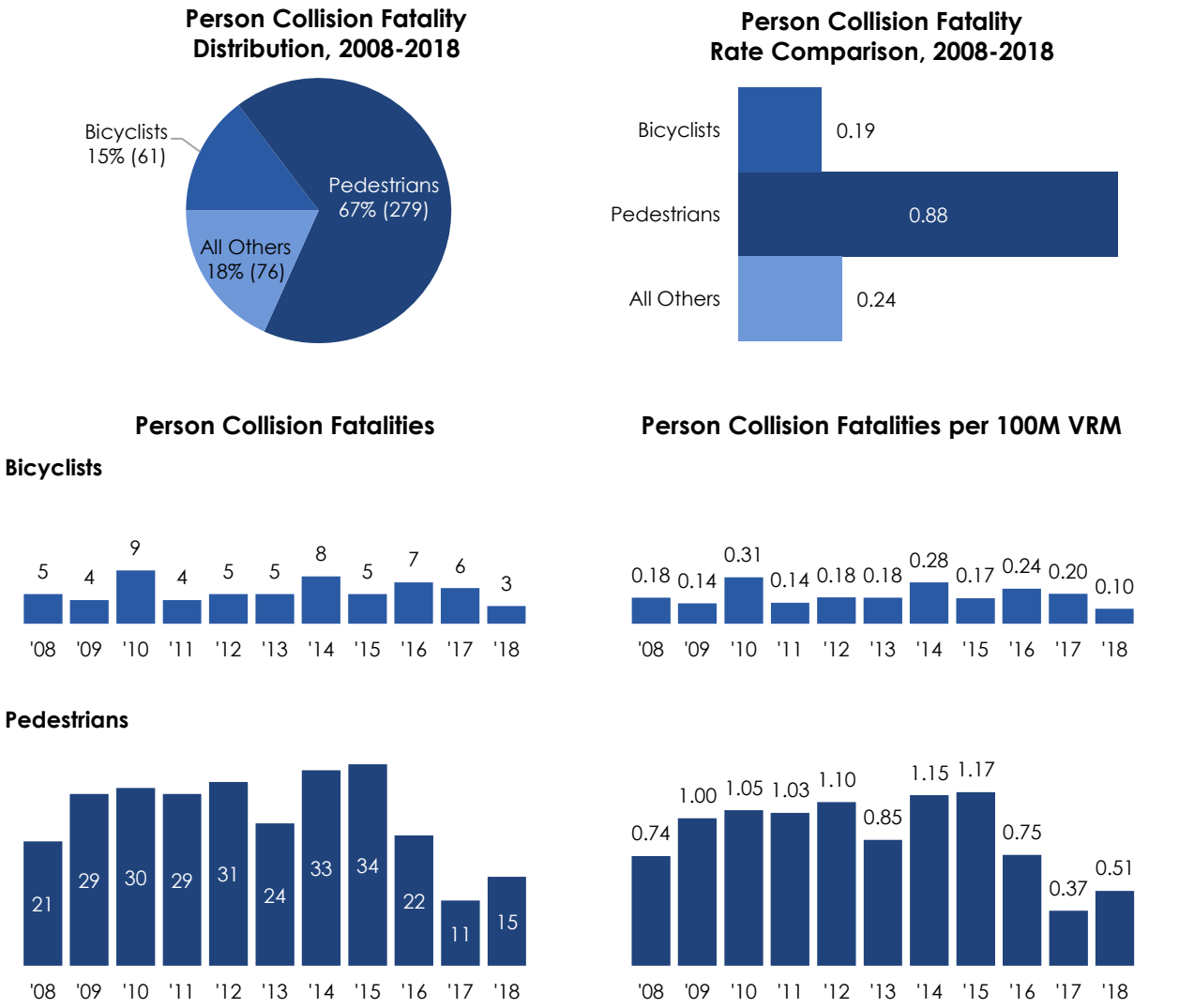


Figure 48. Person Collision Fatalities by Person Type and Rates per 100M VRM

- Pedestrian fatalities accounted for 58% of person collision fatalities in 2018 and 67% of those reported in the 2008–2018 period. Bicyclist fatalities accounted for an additional 12% of person collision fatalities in 2018 and 15% of those reported in the eleven-year period.
- Annual pedestrian collision fatality rates per 100M VRM generally increased from 2008 to 2015, but then generally decreased from 2015 to 2018.
- The bicyclist collision fatality rate fluctuated between 0.10 and 0.31 fatalities per 100M VRM during the entire eleven-year period.

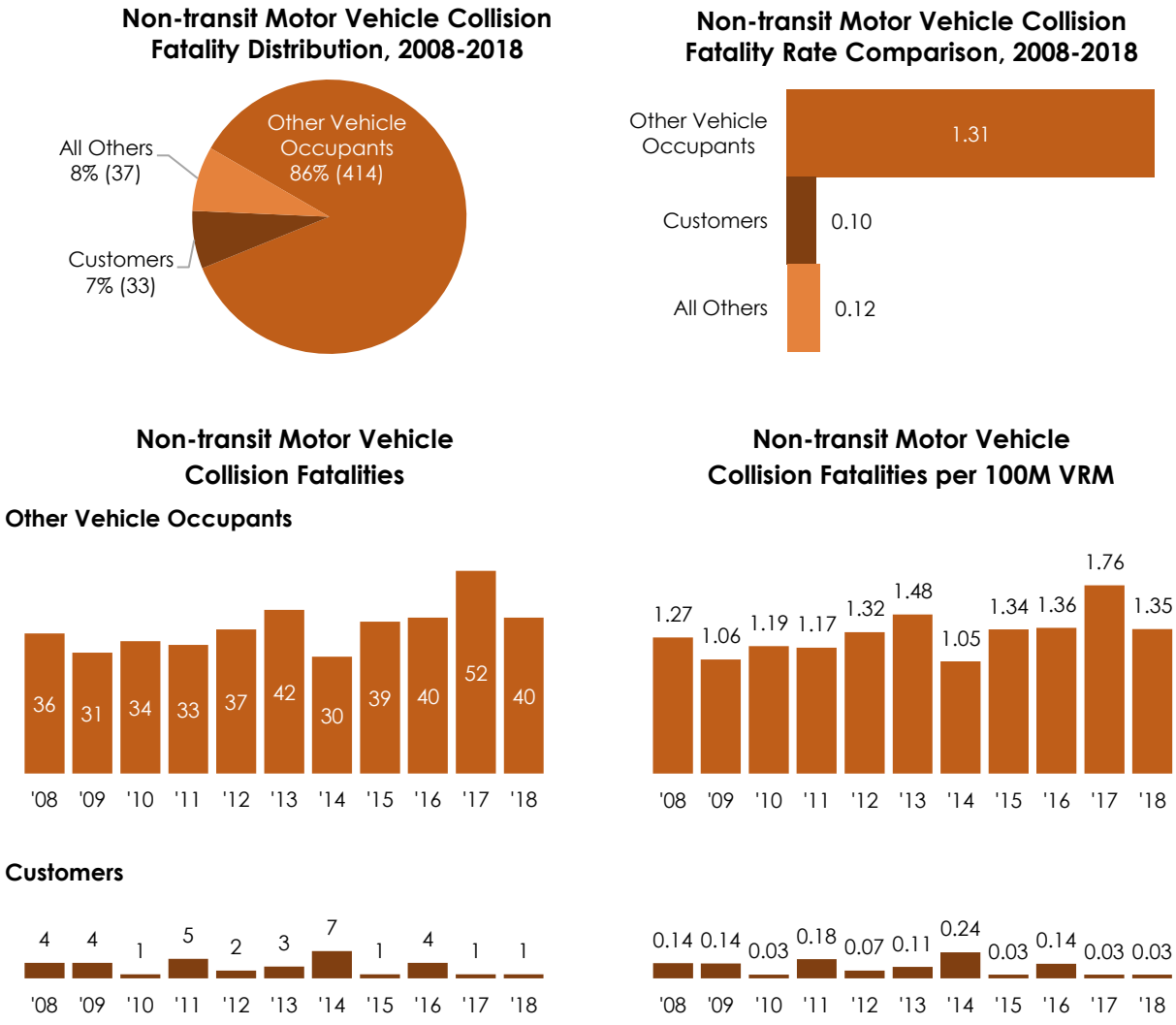
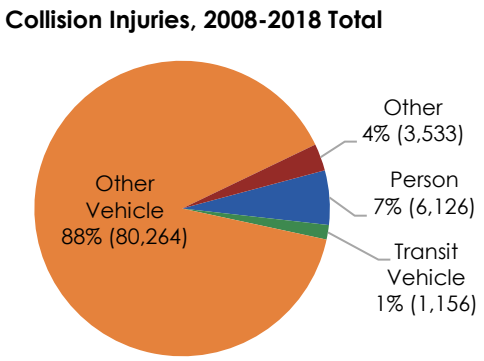
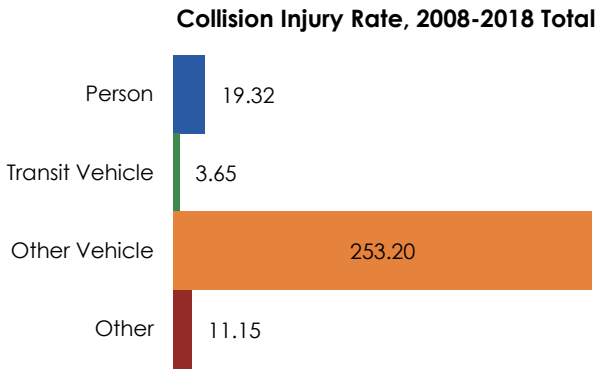


Figure 49. Non-transit Motor Vehicle Collision Fatalities by Person Type and Rates per 100M VRM

- In 2018, other vehicle occupants accounted for 87% of fatalities resulting from collisions between buses and non-transit motor vehicles.
- The annual rate of other vehicle occupant fatalities from bus-to-non-transit motor vehicle collisions per 100M VRM fluctuated irregularly from 2008 to 2018 but increased by 0.6% per year on average during that eleven-year period.
- Customers accounted for 2% of fatalities resulting from collisions between buses and non-transit motor vehicles in 2018 but 7% of those reported across the 2008–2018 period. The annual customer fatality rate from these collisions fluctuated between 0.03 and 0.24 fatalities per 100M VRM during this time.

7-3. Collision Injuries and Rates per 100M VRM by Collision Type





Injuries	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Avg	Trend
Person	544	537	602	544	537	593	630	569	559	528	483	557	
Transit Vehicle	34	49	12	210	99	74	132	140	174	103	129	105	
Other Vehicle	6,591	6,550	6,903	6,894	7,221	7,603	7,789	8,098	8,019	7,333	7,263	7,297	
Other	410	278	349	372	317	373	366	255	319	254	240	321	
All Collision Types	7,579	7,414	7,866	8,020	8,174	8,643	8,917	9,062	9,071	8,218	8,115	8,280	

Injury Rate	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Avg	Trend
Person	19.2	18.4	21.0	19.4	19.1	21.0	22.0	19.6	19.0	17.8	16.3	19.3	
Transit Vehicle	1.2	1.7	0.4	7.5	3.5	2.6	4.6	4.8	5.9	3.5	4.3	3.6	
Other Vehicle	232.3	224.8	241.4	245.4	257.2	268.8	271.5	279.0	272.4	247.7	244.7	253.2	
Other	14.4	9.5	12.2	13.2	11.3	13.2	12.8	8.8	10.8	8.6	8.1	11.1	
All Collision Types	267.1	254.4	275.0	285.5	291.2	305.5	310.8	312.3	308.1	277.6	273.5	287.3	

Figure 50. Collision Injuries by Collision Type and Rates per 100M VRM[a]

- Nine out of every ten collision-related injuries in 2018 resulted from non-transit motor vehicle collisions. These collisions resulted in more injuries than all other collisions combined in the 2008–2018 period.
- Collisions between buses and persons not in a motor vehicle resulted in 483 reported injuries in 2018. This is the only year in the analyzed period when agencies reported fewer than 500 injuries from these collisions to the NTD.
- Agencies reported 129 injuries resulting from collisions between bus transit vehicles in 2018, or 1.6% of all bus collision injuries. During the 2011–2018 period,[a] these collisions also accounted for 1.6% of all bus collision injuries.

[a] In 2011, FTA established a specific collision type category for collisions between two transit vehicles. This change increased the number of collisions classified as between transit vehicles beginning in 2011.

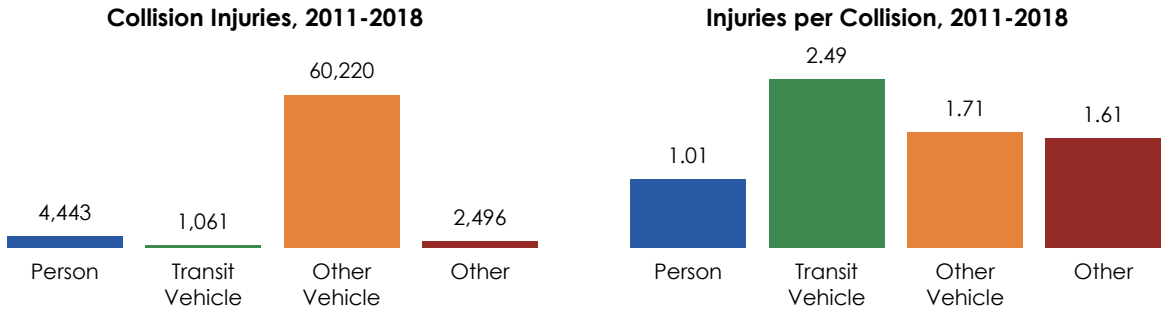


Figure 51. Collision Injury Totals and per Collision by Collision Type[a]

- As shown in Figure 45 on page 42, agencies reported fewer collisions between transit vehicles than any other type of collision from 2011 to 2018. However, these collisions resulted in more reported injuries per collision than other collision types during this time frame.

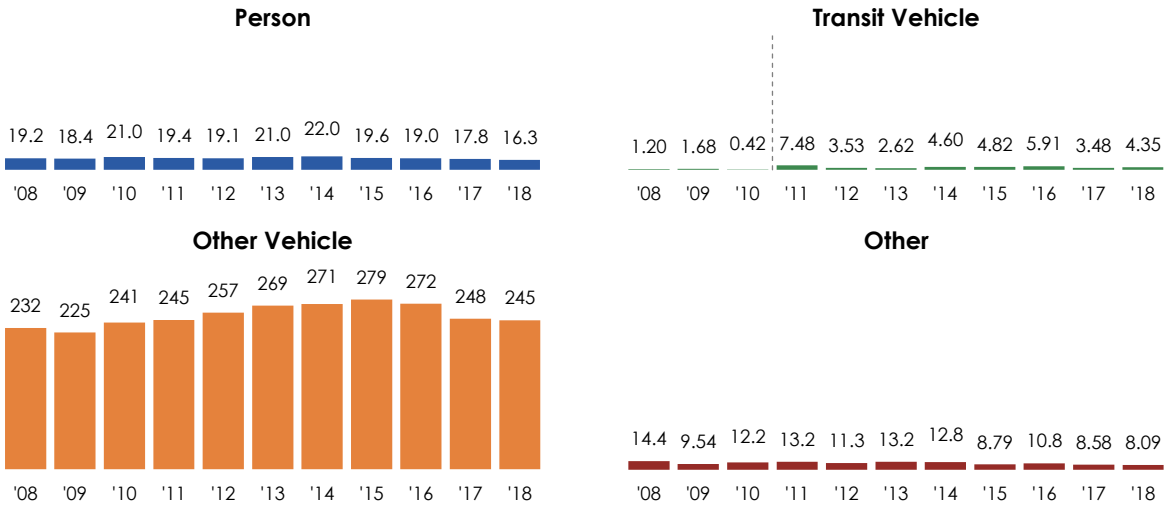


Figure 52. Collision Injuries per 100M VRM by Collision Type[a]

- The 2018 annual rate of bus-to-non-transit-motor vehicle collision injuries (245 injuries per 100M VRM) was 5.4% higher than the rate in 2008 (232). However, the annual rate of these injuries had been decreasing in the last three years of the analyzed period (2016–2018).
- The bus-to-person collision injury rate averaged a 1.5% decrease per year during the eleven-year time frame, down to 16.3 injuries per 100M VRM in 2018 from 19.2 in 2008.

[a] In 2011, FTA established a specific collision type category for collisions between two transit vehicles. This change increased the number of collisions classified as between transit vehicles beginning in 2011.

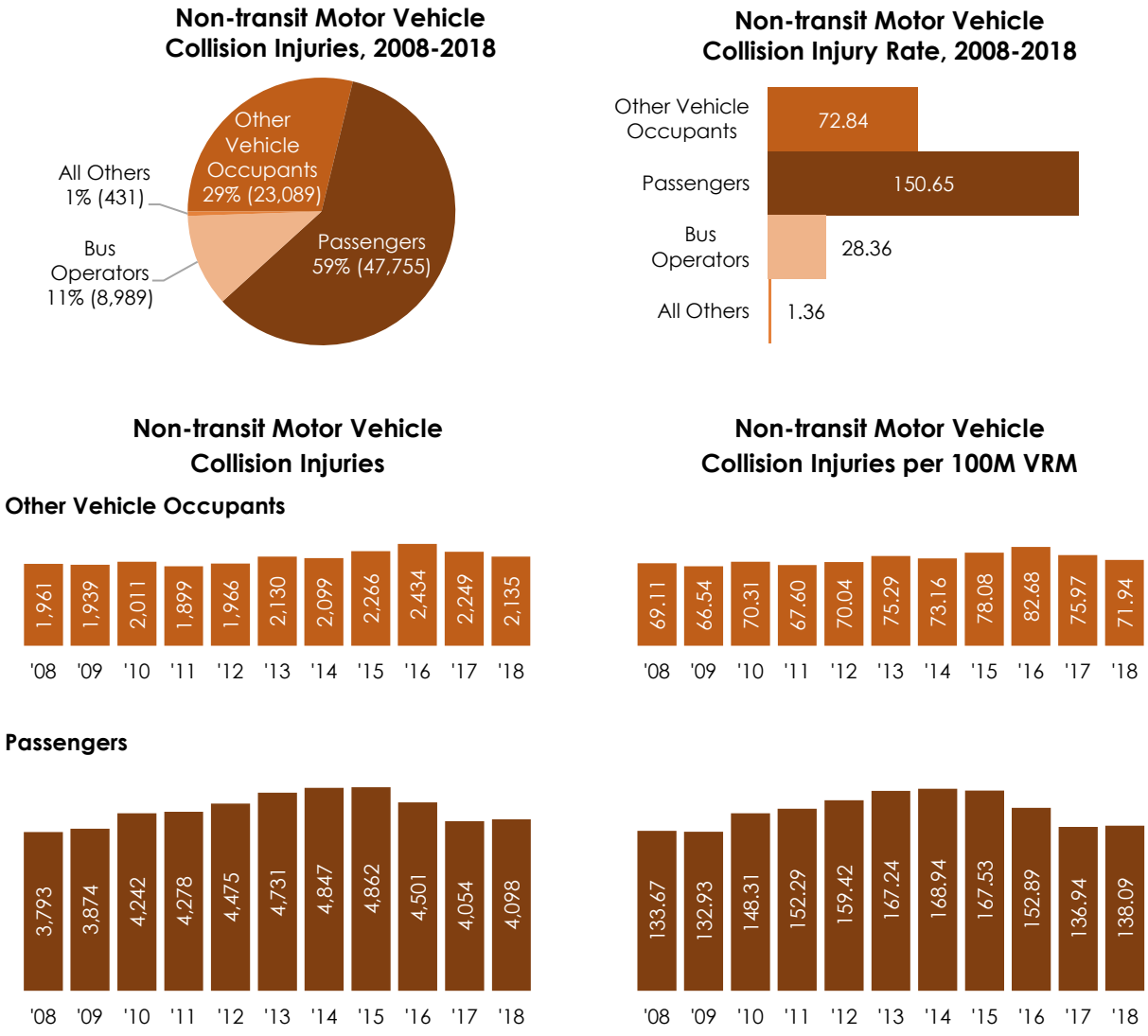


Figure 53. Other Vehicle Occupant and Passenger Injuries from Non-Transit Motor Vehicle Collisions and Rates per 100M VRM

- Passengers accounted for 56% of injuries resulting from non-transit motor vehicle collisions in 2018. The passenger injury rate from non-transit motor vehicle collisions per 100M VRM generally increased from 2008 to 2014. This rate then reversed course in later years of the analyzed period—from 2014 to 2018 the rate decreased 4.0% per year on average.
- Other vehicle occupants accounted for 29% of non-transit motor vehicle collision injuries in 2018. The annual other vehicle occupant injury rate from these collisions fluctuated between 66.54 and 82.68 injuries per 100M VRM during the 2008–2018 period.

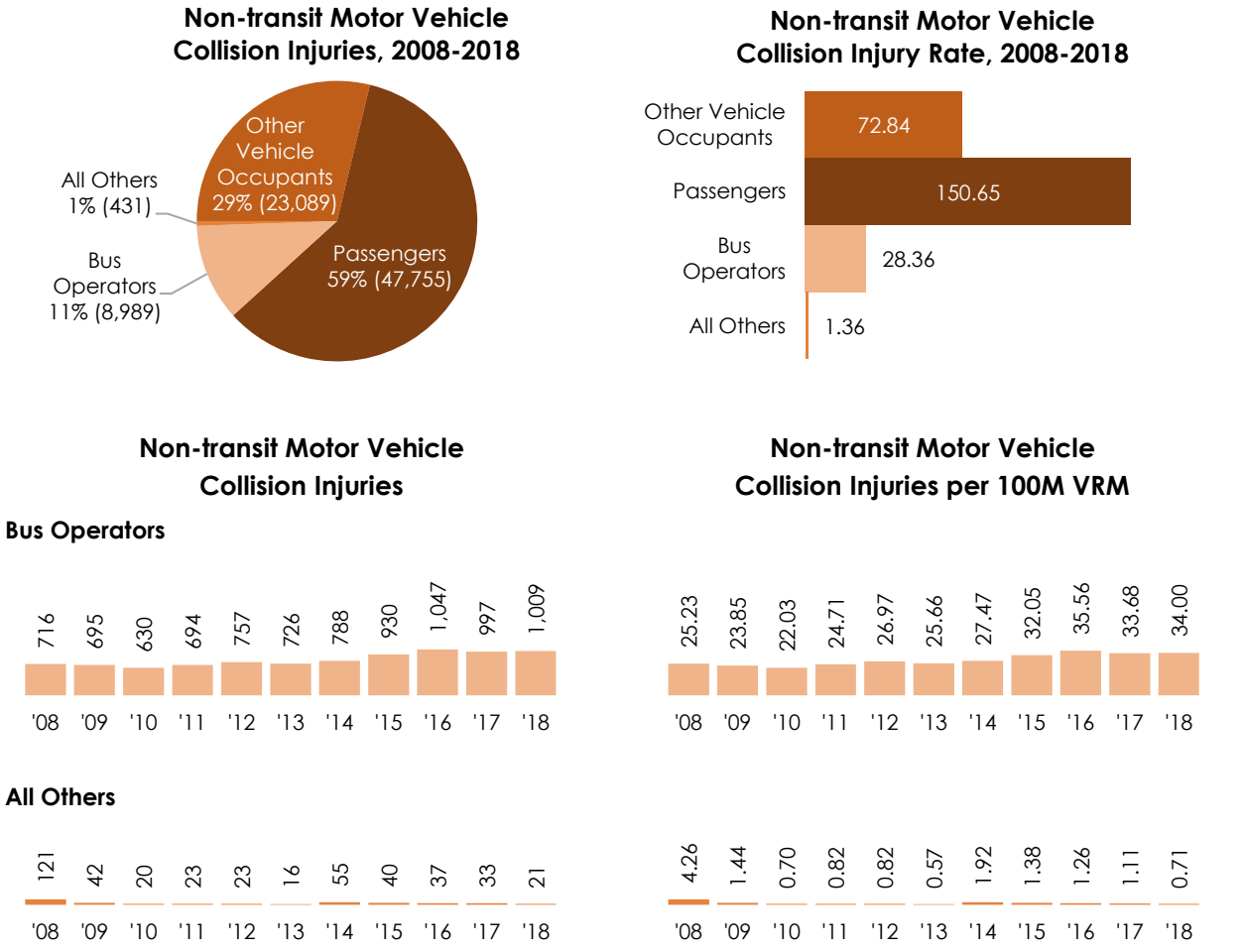


Figure 54. Bus Operator and Other Injuries from Non-Transit Motor Vehicle Collisions and Rates per 100M VRM

- Bus operators accounted for 14% of non-transit motor vehicle collision injuries in 2018.
- From 2008 to 2018, the annual bus operator injury rate per 100M VRM from collisions with non-transit motor vehicles increased 2.7% per year on average.
- Less than 1% of non-transit motor vehicle collision injuries in 2018 were sustained by individuals who were not passengers, bus operators, or non-transit motor vehicle occupants.

8. Full Reporter Agency Security Events by Type

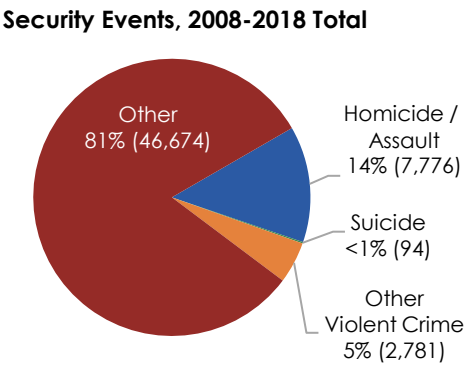
FTA requires bus transit agencies to submit an event type for every event they report to the NTD. The BSDR uses these data to further categorize security events into the four groups shown in the table below. Appendix B includes more details on how the BSDR uses NTD data to create these four security event groups.

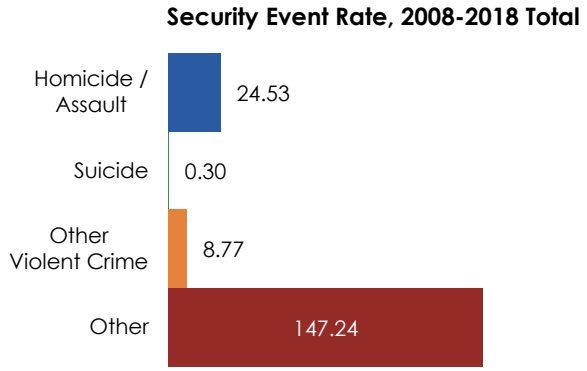
The following pages present the trends and distribution of security events and the resulting fatalities and injuries based on these four security event categories.

Security Event Type	Description
Homicide / Assault	An attack committed against a person on transit agency property, whether deadly or not.
Suicide	A successful or unsuccessful attempt by an individual to end their own life on transit agency property.
Other Violent Crime	Other violent crimes committed against an individual on transit agency property, including robberies and rapes.
Other	All other security events, including bomb threats, suspicious packages, vandalism, and larcenies.

Table 7. Security Event Types

8-1. Security Events and Rates per 100M VRM by Security Event Type





Events	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Avg	Trend
Homicide / Assault	1,573	1,519	1,158	371	449	443	436	469	414	437	507	707	
Suicide	7	7	3	7	6	9	12	12	10	8	13	9	
Other Violent Crime	941	969	634	24	26	48	48	25	31	16	19	253	
Other	13,413	18,630	14,315	18	40	45	46	44	63	34	26	4,243	
All Security Events	15,934	21,125	16,110	420	521	545	542	550	518	495	565	5,211	

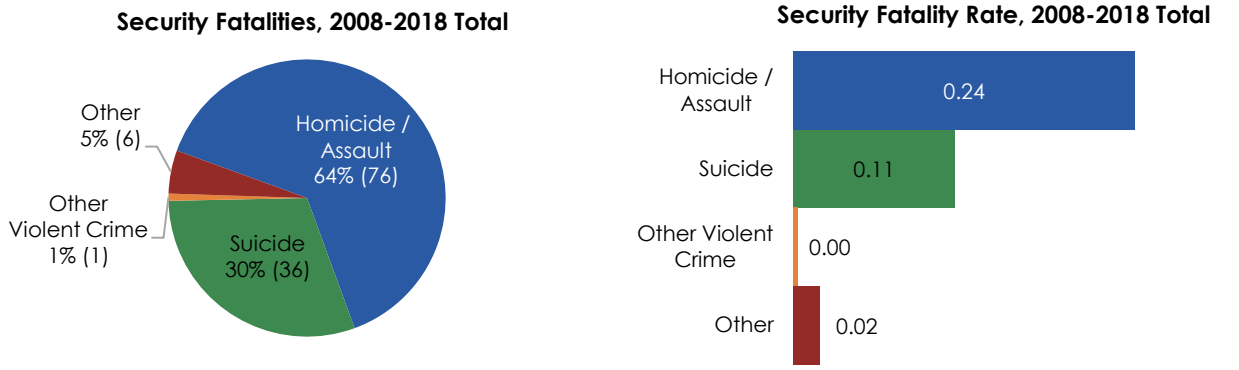
Event Rate	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Avg	Trend
Homicide / Assault	55.4	52.1	40.5	13.2	16.0	15.7	15.2	16.2	14.1	14.8	17.1	24.5	
Suicide	0.25	0.24	0.10	0.25	0.21	0.32	0.42	0.41	0.34	0.27	0.44	0.30	
Other Violent Crime	33.2	33.3	22.2	0.9	0.9	1.7	1.7	0.9	1.1	0.5	0.6	8.8	
Other	472.7	639.3	500.5	0.6	1.4	1.6	1.6	1.5	2.1	1.1	0.9	147.2	
All Security Events	561.5	724.9	563.3	15.0	18.6	19.3	18.9	19.0	17.6	16.7	19.0	180.8	

Figure 55. Security Events by Type and Rates per 100M VRM[a]

- Nine out of every ten security events reported in 2018 were homicides and assaults.
- The 507 assaults and homicides reported in 2018 represent the highest annual total in this category for the eight-year period between 2011[a] and 2018.
- After changing service levels are adjusted for, agencies reported 17.1 homicides and assaults per 100M VRM of bus service in 2018, also the highest in the eight-year period. The figure reflects a 15.7% increase from 2017, when agencies reported 14.8 per 100M VRM, and a 3.3% average yearly increase from 2011, when agencies reported 13.2.
- The 26 “other” security events reported in 2018 included suspicious packages, bomb threats, and motor vehicle theft.

[a] Prior to the 2011 reporting year, FTA stopped collecting non-major security event data. This change significantly reduced the number of reportable events beginning in 2011.

8-2. Security Event Fatalities and Rates per 100M VRM by Security Event Type



Fatalities	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Avg	Trend
Homicide / Assault	3	9	7	4	10	12	12	0	9	7	3	7	
Suicide	2	2	3	5	4	4	1	6	4	2	3	3	
Other Violent Crime	0	0	0	0	0	1	0	0	0	0	0	0	
Other	0	1	0	0	0	2	0	0	1	1	1	1	
All Security Events	5	12	10	9	14	19	13	6	14	10	7	11	

Fatality Rate	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Avg	Trend
Homicide / Assault	0.11	0.31	0.24	0.14	0.36	0.42	0.42	0.00	0.31	0.24	0.10	0.24	
Suicide	0.07	0.07	0.10	0.18	0.14	0.14	0.03	0.21	0.14	0.07	0.10	0.11	
Other Violent Crime	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	
Other	0.00	0.03	0.00	0.00	0.00	0.07	0.00	0.00	0.03	0.03	0.03	0.02	
All Security Events	0.18	0.41	0.35	0.32	0.50	0.67	0.45	0.21	0.48	0.34	0.24	0.38	

Figure 56. Security Event Fatalities by Type and Rates per 100M VRM

- Homicides and suicides together accounted for most (94%) security event fatalities reported between 2008 and 2018.
- In 2018, homicides and suicides together accounted for six out of a total of seven reported security event fatalities.
- Homicides accounted for more fatalities than suicides in eight of the eleven years of the analyzed period.

Figure 57. Security Event Fatality and Fatality Rate Trends by Security Event Type

- In each year of the analyzed period, from 2008 to 2018, all security event types combined resulted in less than one fatality per 100M VRM.
- The annual rate of homicide fatalities reported per 100M VRM fluctuated between 0.00 and 0.42 fatalities per 100M VRM in the eleven-year period.
- The annual suicide fatality rate fluctuated between 0.03 and 0.21 fatalities per 100M VRM during this time frame.

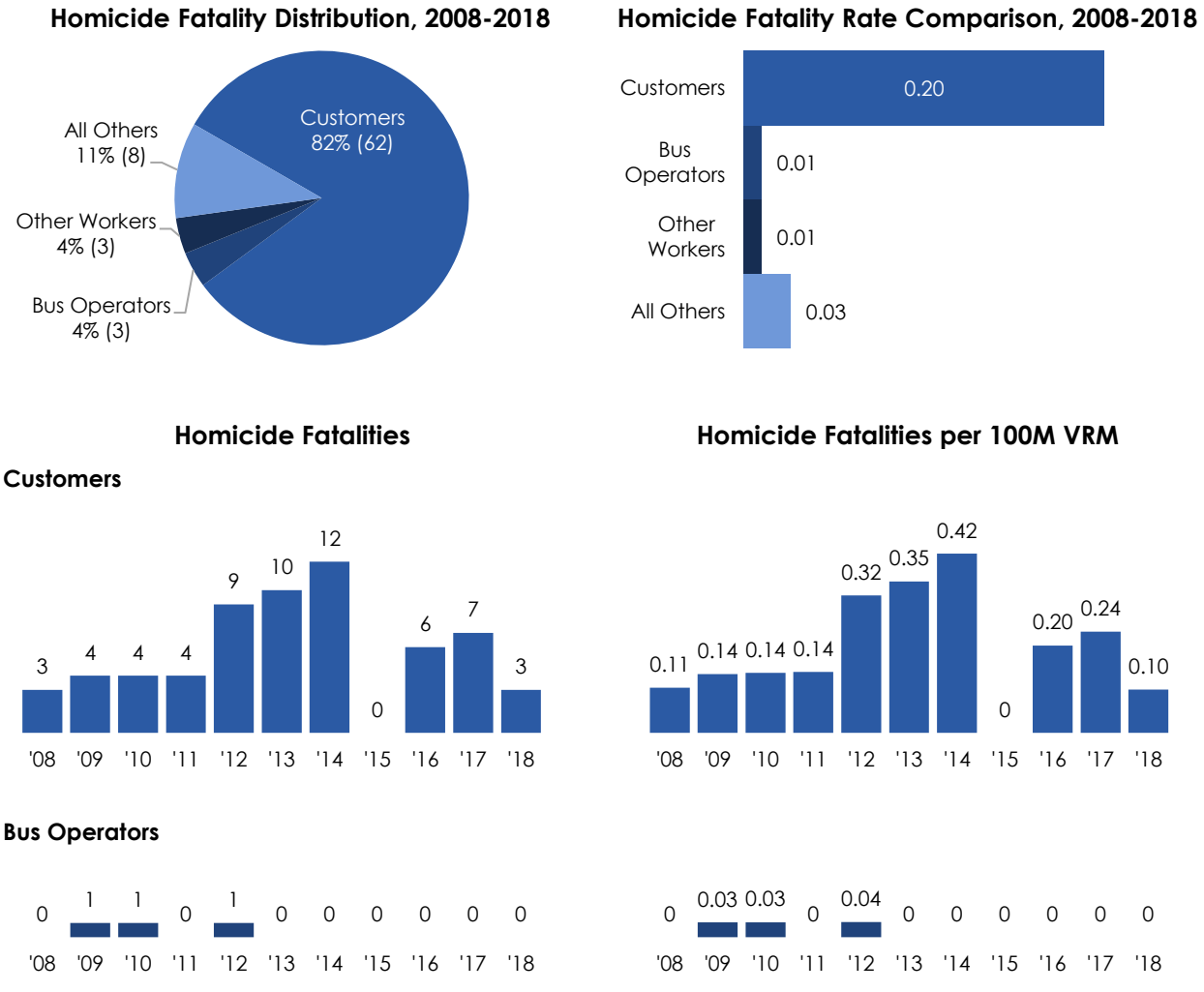


Figure 58. Customer and Bus Operator Fatalities from Homicides and Rates per 100M VRM

- Customers accounted for all homicide fatalities agencies reported to the NTD in 2018 and 82% of homicide fatalities reported during the 2008–2018 period. The annual customer fatality rate from homicides fluctuated between 0 and 0.42 per 100M VRM during this time.
- Bus operators accounted for 4% of homicide fatalities during the eleven-year analyzed period. Agencies last reported a bus operator homicide fatality in 2012 and did not report any from 2013 to 2018.

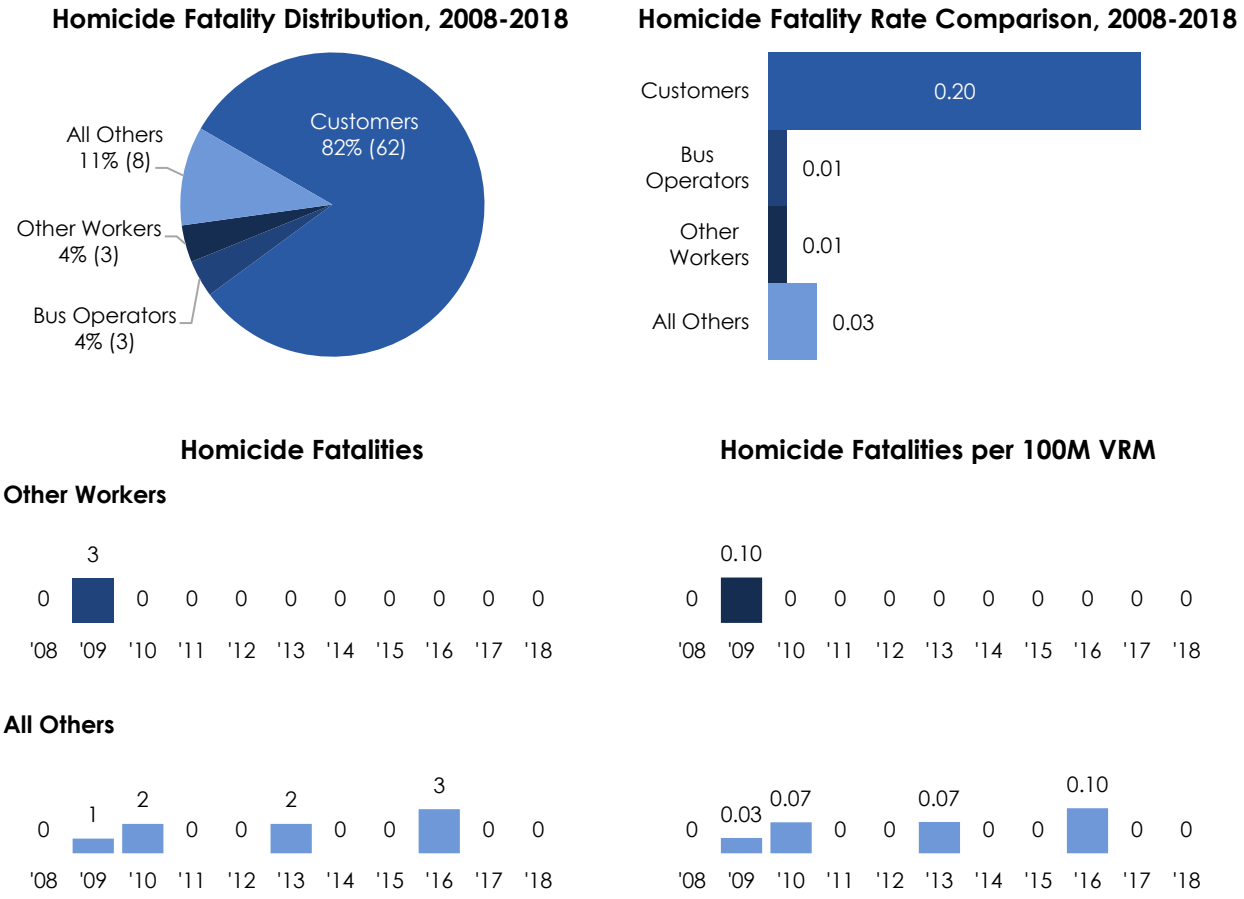
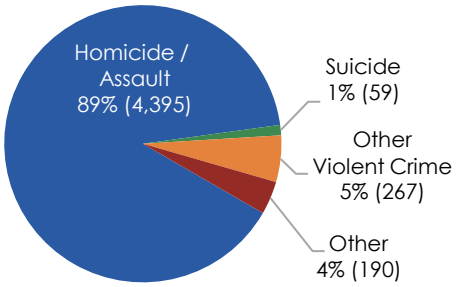


Figure 59. Other Homicide Fatalities and Rates per 100M VRM by Person Type

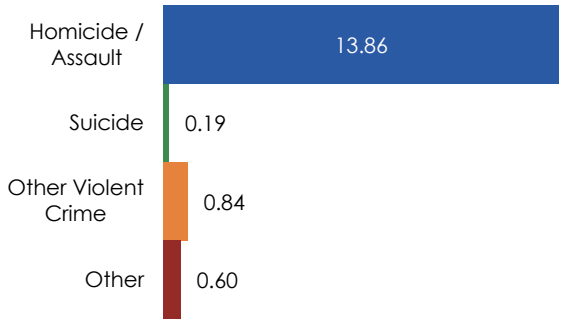
- Workers other than bus operators accounted for 4% of homicide fatalities reported from 2008 to 2018. The last event involving a homicide fatality to one of these workers occurred in 2009.
- Non-customers, like trespassers and pedestrians, accounted for 11% of homicide fatalities reported during the eleven-year analyzed period. Agencies last reported a non-customer homicide fatality in 2016 and did not report any in 2017 or 2018.

8-3. Security Event Injuries and Rates per 100M VRM by Security Event Type

Security Injuries, 2008-2018 Total



Security Injury Rate, 2008-2018 Total



Injuries	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Avg	Trend
Homicide / Assault	236	207	265	385	466	464	454	501	436	449	532	400	
Suicide	5	5	0	2	2	5	11	6	7	6	10	5	
Other Violent Crime	6	9	13	25	26	47	49	25	31	17	19	24	
Other	7	2	4	6	29	25	26	30	25	23	13	17	
All Security Events	254	223	282	418	523	541	540	562	499	495	574	446	

Injury Rate	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Avg	Trend
Homicide / Assault	8.32	7.10	9.27	13.71	16.60	16.40	15.82	17.26	14.81	15.17	17.93	13.86	
Suicide	0.18	0.17	0.00	0.07	0.07	0.18	0.38	0.21	0.24	0.20	0.34	0.19	
Other Violent Crime	0.21	0.31	0.45	0.89	0.93	1.66	1.71	0.86	1.05	0.57	0.64	0.84	
Other	0.25	0.07	0.14	0.21	1.03	0.88	0.91	1.03	0.85	0.78	0.44	0.60	
All Security Events	8.95	7.65	9.86	14.88	18.63	19.12	18.82	19.37	16.95	16.72	19.34	15.49	

Figure 60. Security Event Injuries by Type and Rates per 100M VRM

- Assaults and homicides accounted for over 90% of security event injuries reported in 2018. These events accounted for a large majority of all security event injuries in each year of the analyzed period. More details are available starting on page 59.
- In 2018, other violent crime injuries, which include those resulting from robberies and rapes, were the next most commonly reported type of security event injuries but accounted for 3% of all security event injuries reported. Across the entire eleven-year period, these events accounted for a slightly higher proportion of reported security event injuries (5%).
- Agencies reported 10 injuries resulting from suicides and attempted suicides in 2018, or 2% of all security event injuries for the year. On average, during the 2008–2018 period, 1% of security event injuries resulted from suicide attempts.

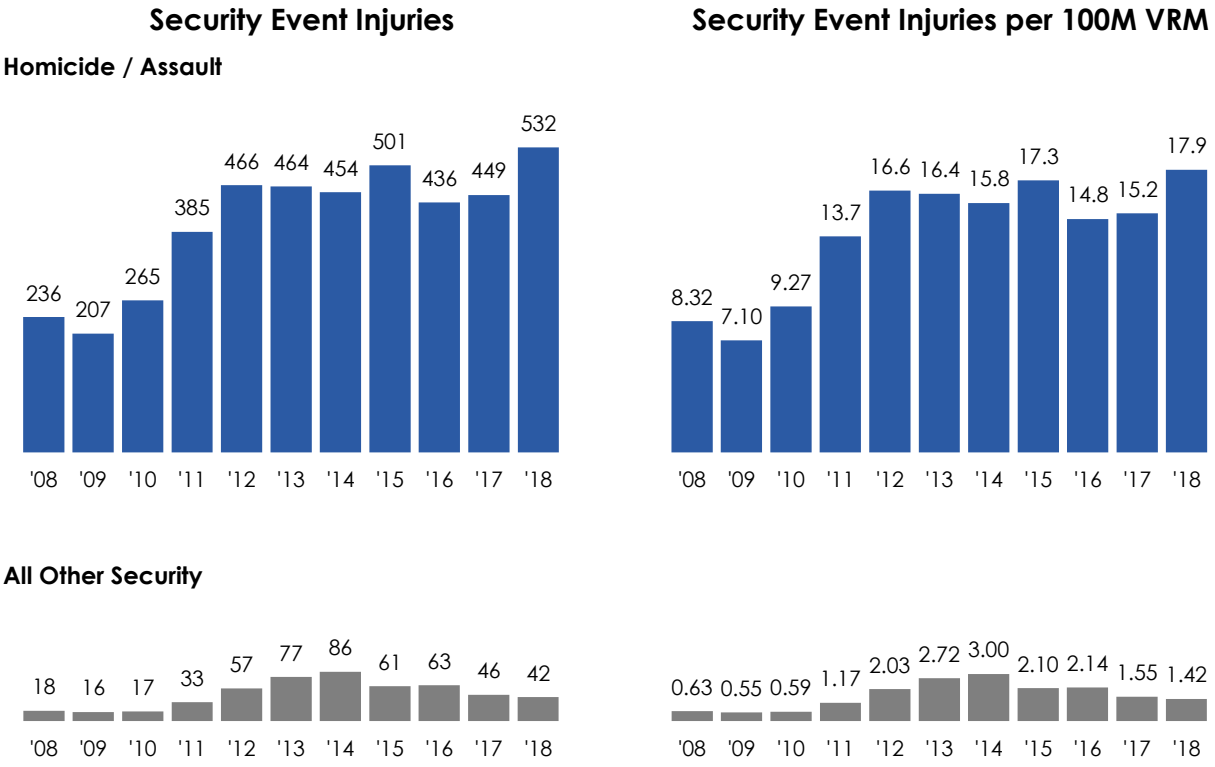


Figure 61. Security Event Injuries by Security Event Type

- The 532 assault and homicide injuries reported in 2018 represent the largest annual total reported for that category in the analyzed period. When adjusted for changing service levels, the 2018 assault and homicide injury rate (17.9 injuries per 100M VRM) is the highest in this time frame as well. That figure reflects an 18% increase in the assault and homicide injury rate from 2017, when agencies reported 15.2 injuries per 100M VRM from these events.
- The annual assault and homicide injury rate increased 7.2% per year on average during the eleven-year period. In 2008, agencies reported 8.32 injuries from these events per 100M VRM.
- Agencies reported considerably fewer security event injuries in the 2008–2011 period. From 2012 to 2018, the assault and homicide injury rate increased an average of 1.1% per year.

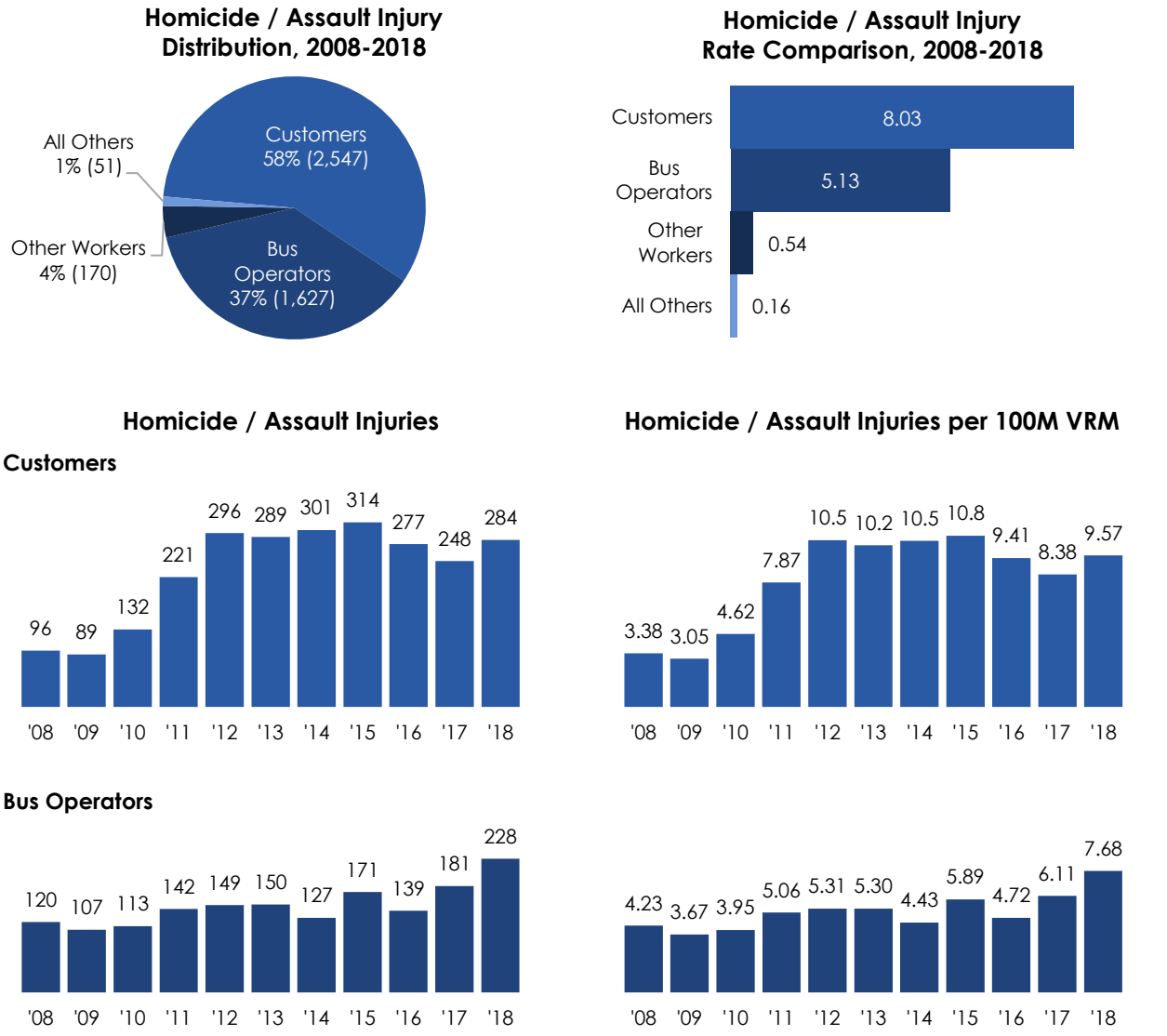


Figure 62. Customer and Bus Operator Injuries from Homicides and Assaults and Rates per 100M VRM

- Customers accounted for 53% of homicide / assault injuries reported to the NTD in 2018 and 58% of those reported across the 2008–2018 period.
- From 2008 to 2012, agencies reported more customer homicide / assault injuries, but these annual tallies leveled off from 2013 to 2018. The annual homicide / assault customer injury rate fluctuated between 8.38 and 10.8 injuries per 100M VRM in the latter six-year period.
- Bus operators accounted for 43% of homicide / assault injuries in 2018. The annual bus operator homicide / assault injury rate per 100M VRM increased 5.6% per year on average during the eleven-year analyzed period.

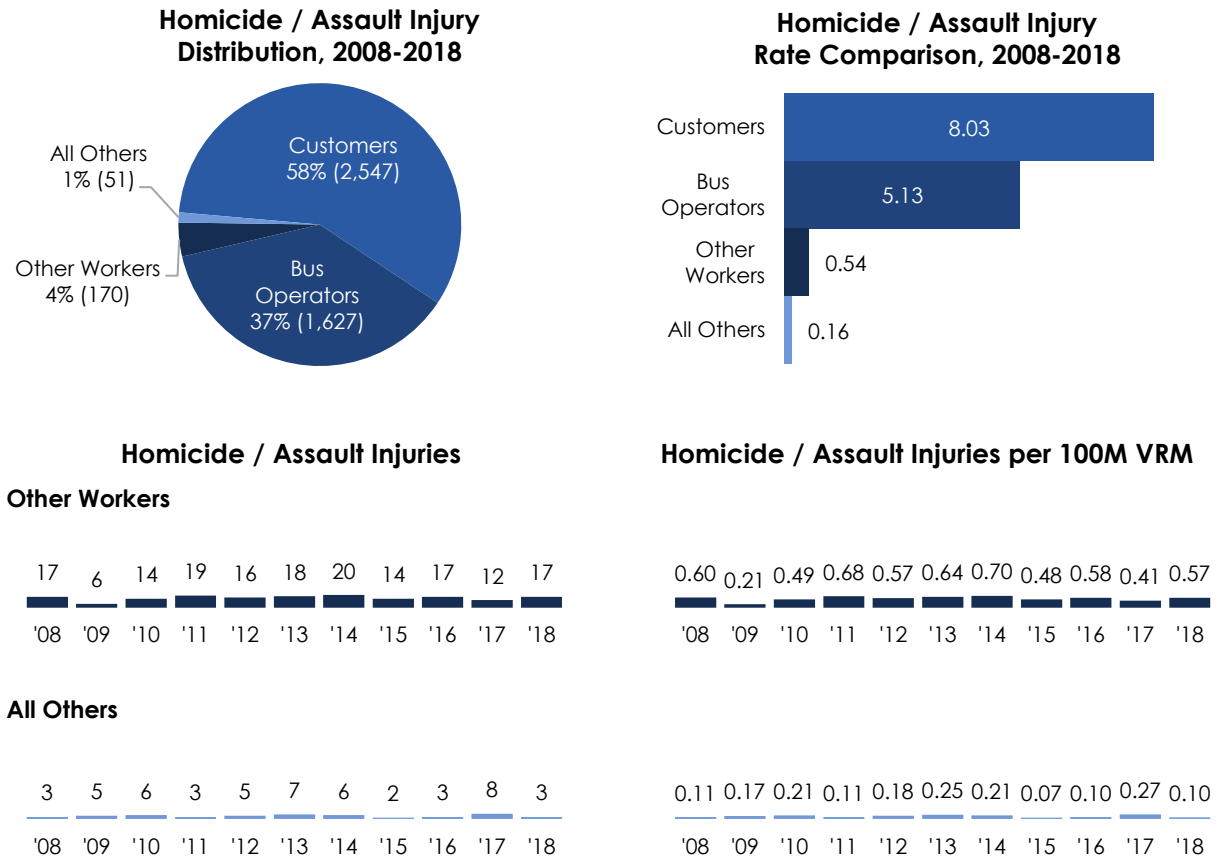


Figure 63. Other Injuries from Homicides and Assaults and Rates per 100M VRM

- Workers other than bus operators accounted for 3% of homicide / assault injuries in 2018. The “other worker” homicide / assault injury rate fluctuated between 0.21 and 0.70 injuries per 100M VRM during this eleven-year period.
- Non-customers like pedestrians and other vehicle occupants accounted for less than 1% of the homicide / assault injuries reported in 2018. The non-customer homicide / assault injury rate fluctuated between 0.07 and 0.27 injuries per 100M VRM from 2008 to 2018.

Appendix A. NTD Reporting Requirements

Reporting Level

The level of detail FTA requires in NTD safety and security event reporting varies depending on the transit agency characteristics outlined below.

To reduce the burden on small operators, FTA does not require the smallest transit agencies, with the least complex operations, to report at the same level of detail as larger agencies. These "Reduced Reporters" are small § 5307 recipients (with fleets of no more than 30 vehicles) and § 5311 agencies. Reduced Reporters only provide annual totals of events, fatalities, and injuries and do not submit additional information that would support more comprehensive analyses.

FTA requires more detailed event reporting from larger § 5307 agencies with fleets of more than 30 vehicles. FTA calls the large § 5307 group "Full Reporters." Currently, FTA requires Full Reporters to provide the NTD with detailed reports of each event surpassing a major reporting threshold and monthly summaries of non-major events.

FTA also accepts NTD reports from voluntary reporters. Voluntary reporters have to follow the same reporting requirements for safety data that the mandatory reporters mentioned above must follow.

The criteria that FTA uses to determine whether or not a bus transit agency can be a Reduced Reporter are detailed in the table on the following page.

BSDR Reporting Level	Agency Characteristics	Reporting Requirements
Full Reporters	• Receives Urbanized Area Formula Grants (§ 5307) funding and operates more than 30[1] vehicles across all modes and types of service. • Receives § 5307 funding and operates on fixed guideway or high-intensity busways with any fleet size. • Reports voluntarily, operates transit service within Urbanized Areas (UZAs), and either operates at least 30 vehicles or operates on fixed guideway or high-intensity busways.	• For each major event (see below), Full Reporters must complete a detailed event report on an S&S-40 form (using the online NTD Reporting Tool) within 30 days of the event. • Full Reporters must tally non-major events (see below) on the S&S-50 form using the online NTD Reporting Tool by the end of the following month. The S&S-50 should include monthly counts of non-major events and resulting injuries grouped by event type and location type.
Reduced Reporters	• Receives § 5307 funding but does not fit the full reporting criteria above. • Receives Formula Grants for Rural Areas (§ 5311) funding as a subrecipient of a State Department of Transportation[2] and qualifies as either a Rural General Public Transit or Urban/Tribal Recipient. • Receives § 5311 directly as part of the Tribal Transit Grants program.	• Reduced Reporters must tally all events and resulting fatalities and injuries on the agency's Annual Report each year.

[1] To reduce the reporting burden on small agencies, FTA has allowed § 5307 agencies with 30 or fewer fleet vehicles to use reduced reporting requirements with a small systems waiver since the 2012 reporting year. Prior to that time, FTA required full reporting from § 5307 agencies operating fleets of 10 or more vehicles.

[2] State Departments of Transportation (DOTs) file their subrecipients' Annual Reports.

Major and Non-Major Event Reporting

Full Reporters provide considerably more detail than Reduced Reporters for events that qualify as major events. The table below outlines the criteria FTA currently uses to distinguish between major events and non-major events.

BSDR Event Severity	Events Included
Major Events	• Any event that results in a confirmed fatality within 30 days of the event. • Any event that results in injuries requiring immediate transportation for medical attention for two or more people, $25,000 or more in estimated property damage, or an evacuation for life safety purposes.[3] • Any collision, fire, hazardous material spill, security event, or act of God that results in injuries to a single individual requiring immediate transportation for medical attention. • Any collision that requires the towing away of one or more motor vehicles from the scene.
Non-Major Events[4]	• Any fire requiring suppression that does **not** result in a fatality within 30 days, an injury requiring immediate transportation for medical attention, $25,000 or more in estimated property damage, or an evacuation for life safety purposes. • Any event (such as a slip, fall, or electric shock) that is **not** a collision, fire, hazardous material spill, security event, or act of God that results in injuries to exactly one individual requiring immediate transportation for medical attention and does not result in a fatality within 30 days, $25,000 or more in estimated property damage, or an evacuation for life safety purposes.

[3] Prior to the 2015 reporting year, events classified by the NTD as "Other Safety Occurrence Not Otherwise Classified" and that only resulted in injuries (and no other major event threshold) were reported as non-major events. In an effort to align NTD data collection with State Safety Oversight (SSO) program investigation requirements, in 2015 FTA began requiring any event with two or more injuries to be reported to the NTD as a major event.

[4] Prior to the 2011 reporting year, FTA required that agencies report certain categories of security events that did not meet a major reporting threshold. In October 2010, FTA stopped collecting non-major security event data. This change significantly reduced the annual number of reportable events beginning in 2011.

Appendix B. Definitions

Collision Type

For every reportable collision, NTD Full Reporters identify the person(s) and/or object(s) the transit vehicle collided with. The BSDR uses these data to group collisions into the collision types shown below. Suicides reported to the NTD as collisions do not have a collision type, since the BSDR considers all suicides to be security events.

BSDR Collision Type	NTD "Collision with" Data
Person	Report indicates that a transit vehicle collided with at least one person not in a motor vehicle, like a pedestrian or bicyclist.
Transit Vehicle[1]	Report indicates that a transit vehicle collided with at least one other transit vehicle (transit bus, van, non-revenue vehicle, etc.) and did not collide with a person, as described above.
Other Vehicle	Report indicates that the transit vehicle collided with a motor vehicle (car, truck, van, motorcycle, etc.) and did not collide with a person or transit vehicle, as described above.
Other	All other collisions involving a transit vehicle, including those where the report indicates the transit vehicle did not collide with a person, transit vehicle, or other motor vehicle, as described above. This includes collisions with fixed objects and animals.

Event

The BSDR includes all bus events that are reportable to the NTD. While that definition has evolved during the 2008–2018 period, in 2018 an event was any event affecting persons engaged with the transit system where any of the following occur:

- A fatality
- An injury
- Estimated property damage of $25,000 or more
- A collision between motor vehicles that results in at least one vehicle needing to be towed away from the scene
- A fire requiring suppression
- An evacuation for life safety reasons

[1] In 2011, FTA established a specific collision type category for collisions between two transit vehicles. This change increased the number of collisions classified as between transit vehicles beginning in 2011.

See Appendix A for more information on the NTD criteria for delineating major and non-major events and the differences in reporting requirements between different program participants.

See Appendix C for more information on how changes in the NTD safety and security event reporting requirements over time impact the analyses of this BSDR.

Event Type

NTD Full Reporters categorize all individual event reports into one of several dozen event types on the Safety and Security (S&S)-40 form (for major events) and provide summaries of up to 12 distinct event types on the S&S-50 form (for non-major events). The BSDR uses four distinct event type categories, as shown in the table below.

BSDR Event Type	NTD S&S-40 Event Type(s)	NTD S&S-50 Event Type(s)
Collision	• Non-Rail Collision	• (N/A)
Security Event[2]	• Aggravated Assault • Arson • Assault • Attempted Suicide • Bomb Threat • Bombing • Burglary • Chemical / Biological / Nuclear / Radiological • Hijacking • Homicide • Larceny / Theft • Motor Vehicle Theft • Other Security Event • Rape • Robbery • Suicide • Suspicious Package • Vandalism	• Burglary • Larceny • Motor Vehicle Theft • Non-aggravated Assault • Other Arrests • Robbery • Trespassing • Vandalism
Fire	• Non-Rail Fire	• Fire

[2] For consistency across all years of data, this report categorizes S&S-40 events resulting in suicide fatalities or injuries as suicides regardless of the event type provided by the NTD reporter.

BSDR Event Type	NTD S&S-40 Event Type(s)	NTD S&S-50 Event Type(s)
Other	• Earthquake • Flood • Hurricane • Non-Rail Hazardous Material Spill • Non-Transit Non-Rail Collision • Other High Winds • Other Safety Event • Snow Storm • Tornado	• Fare Evasion • Non-Violent Civil Disturbance • Not Otherwise Classified Safety Events

Fatality

Fatalities are losses of life resulting from an event that are confirmed within 30 days of the event and are not the result of illness or other natural causes. Suicides are included in these figures.

Injury

Injuries include any damage or harm to persons as a result of an event that requires transportation away from the scene for immediate medical attention. Illnesses not related to an event that require immediate medical attention are not included.

Mode

A mode is a system for carrying passengers that is defined by its vehicle type, technologies, and operational characteristics. FTA identifies nine distinct bus modes. NTD Full Reporters identify the mode on which each event occurs on the S&S-40 and S&S-50 forms. The BSDR uses two distinct mode categories, as shown in the table below.

BSDR Mode	NTD Mode(s)
Fixed-Route Bus	Bus (MB) Bus Rapid Transit (RB) Commuter Bus (CB) Jitney (JT) Público (PB) Trolleybus (TB)

BSDR Mode	NTD Mode(s)
Demand Response	Demand Response (DR) Demand Response-Taxi (DT) Vanpool (VP)

Person Type

NTD Full Reporters categorize all people who sustained a fatality or injury, for all reportable events, by person type. On the S&S-40 form, reporters select between 14 categories to describe the relationship between each fatality or injury and the bus transit agency for each individual event. On the S&S-50 form, reporters select from three categories to summarize all similar "Other Safety Occurrences Not Otherwise Classified" events occurring in the same month. The BSDR uses three distinct person type categories, as shown in the table below.

BSDR Person Type	S&S-40 Person Type(s)	S&S-50 Person Type(s)
Customer	• Person waiting for / leaving from transit • Transit vehicle rider	• Customers
Worker	• Other transit staff • Other worker • Transit vehicle operator	• Workers
Public[3]	• Occupant of other vehicle • Other • Pedestrian: bicyclist • Pedestrian: in crosswalk • Pedestrian: not in crosswalk • Pedestrian: person crossing tracks • Pedestrian: person walking along tracks • Suicides • Trespassers	• Other

[3] For consistency across all years of data, this report categorizes fatalities from suicides and injuries from suicide attempts as public, regardless of the person type provided on an S&S-40 form.

To provide more context, in certain analyses the BSDR uses more specific person types. These are defined below:

- **Bicyclists** are non-customers on bicycles, when involved in reportable events. This is determined using fatality and injury counts from the "pedestrian: bicyclist" person type on S&S-40 forms.
- **Bus Operators** are workers driving transit revenue vehicles. This is determined using fatality and injury counts from the "transit vehicle operator" person type on S&S-40 forms.
- **Other Vehicle Occupants** are drivers or passengers of non-transit motor vehicles involved in reportable events. This is determined using fatality and injury counts from the "occupant of other vehicle" person type on S&S-40 forms.
- **Passengers** are customers either on or in the process of boarding or alighting from a transit vehicle. For most types of events, this is determined using fatality and injury counts from the "transit vehicle rider" person type on S&S-40 forms. For PIE, this is determined using "event identifier" data on S&S-40 forms, or "location type" data on S&S-50 forms.
- **Pedestrians** are non-customers neither within a motor vehicle nor on a bicycle when involved in reportable events. This is determined using fatality and injury counts from all person types that begin with "pedestrian" on S&S-40 forms, excluding the "pedestrian: bicyclist" type.

Personal Injury Event

Personal injury events (PIE) are a subset of the BSDR "other" event type, consisting of NTD non-major events (reported on the S&S-50 form as "Not Otherwise Classified Safety Events") and NTD major events (reported on the S&S-40 form as "Other Safety Events") where no fatality occurred, no life-safety evacuation occurred, and any estimated property damage was under $25,000. Two location-specific types of personal injury events are called out in BSDR analyses and are explained below.

BSDR PIE Type	Description
On-Vehicle PIE	Report indicated that the PIE occurred in a transit vehicle but not while boarding or alighting. This includes events both involving a securement issue and not involving a securement issue.
Boarding / Alighting PIE	Report indicated that the PIE occurred while boarding or alighting from a transit vehicle. This includes all location types that mention boarding or alighting.

Security Event Type

NTD Full Reporters categorize all individual events into one of several dozen event types on the S&S-40 form and provide summaries of up to 12 distinct event types on the S&S-50 form. For all events categorized as "security events" (see above), the BSDR categorizes the events into the four distinct event types shown below.

BSDR Security Event Type	NTD S&S-40 Event Type(s)	NTD S&S-50 Event Type(s)
Homicide / Assault	• Aggravated Assault • Assault • Homicide	• Non-aggravated assault
Suicide[4]	• Attempted Suicide • Suicide	• (N/A)
Other Violent Crime	• Rape • Robbery	• Robbery
Other	• Arson • Bomb Threat • Bombing • Burglary • Chemical / Biological / Nuclear / Radiological • Hijacking • Larceny / Theft • Motor Vehicle Theft • Other Security Event • Suspicious Package • Vandalism	• Burglary • Larceny • Motor Vehicle Theft • Other Arrests • Trespassing • Vandalism

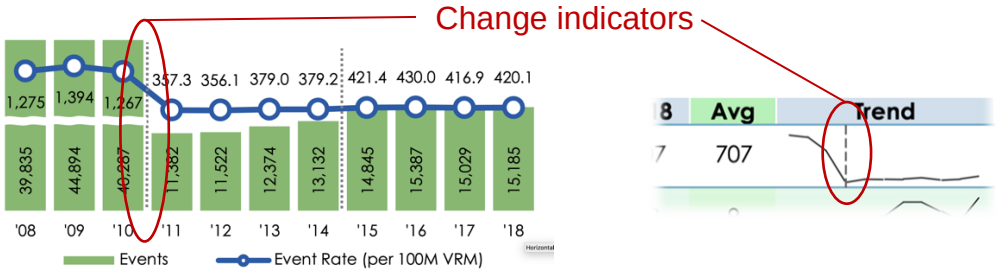
[4] For consistency across all years of data, this report categorizes S&S-40 events resulting in suicide fatalities or injuries as suicides regardless of the event type provided by the NTD reporter.

Appendix C. Reporting Requirement Changes

The BSDR presents data that transit agencies have reported to the NTD. During the period covered in this report, FTA made several changes to reporting requirements. These changes impacted what data agencies report. The annual analyses presented in this report indicate when trends are impacted by one or more of these reporting requirement changes. The BSDR identifies these changes with vertical dashed lines to indicate the time of the change and footnotes that explain the specific reporting change and how it affects the presented data. These changes are described below.

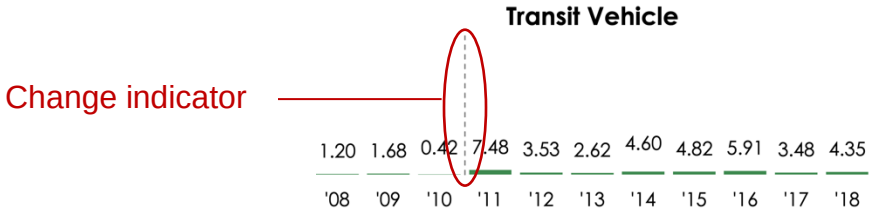
Change 1: Non-major security events

- **What changed?** Beginning in October 2010, FTA stopped collecting non-major security events such as fare evasion citations and nonviolent civil disturbances. FTA continues to collect security events that meet a major reporting threshold.
- **Analysis impact:** This change resulted in a reduction in security events (and total events) in 2011 and after. The BSDR depicts this change in applicable charts by using a vertical dashed line to indicate when the impact of the change begins.



Change 2: Collision event detail

- **What changed?** Beginning in 2011, FTA began requiring agencies to select a specific collision type to indicate that a collision was between two transit vehicles. Before 2011, this type of distinction could only be made based on associated descriptions in the event report.
- **Analysis impact:** For data from 2011 onward, the BSDR is able to classify more collisions as occurring between two transit vehicles. The BSDR uses a vertical dashed line to indicate the when the impact of the change begins.



Change 3: New mode categories

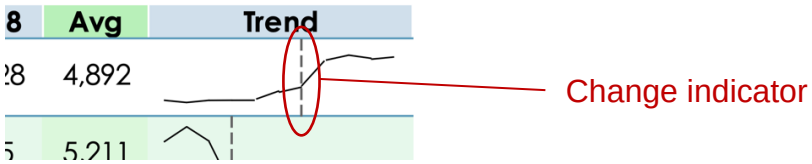
- **What changed?** Beginning in Fiscal Year 2013, FTA added two new bus modes: commuter bus (CB) and bus rapid transit (RB). Previously, these services were reported under the bus (MB) mode. With this change, agencies began reporting safety and security events under these more granular modal categories.

- **Analysis impact:** With data from CY 2013 onward, the BSDR is able to perform modal analyses of the CB and RB modes. In the BSDR, these analyses begin with CY 2013, the first available full year for these modal distinctions.

Change 4: Towed vehicle reporting threshold

- **What changed?** Beginning in 2015, FTA revised its major event thresholds to include all collisions that resulted in a vehicle being towed away from the scene of an event. Prior to 2015, events that did not meet another event threshold would not have been reported to the NTD.

- **Analysis impact:** This change resulted in an increase in events, specifically collisions, starting in 2015. The BSDR depicts this change in applicable charts by using a vertical dashed line to indicate when the impact of the change begins.



Appendix D. Methodology

Data Collection

Program participants enter safety data through the online NTD Reporting Tool based on their reporting requirements. This system stores reporters' data in a database that FTA can use to extract the most up-to-date information possible. This BSDR presents data from 2008 through 2018.

Data Processing

To enable meaningful data analysis, analysts process safety data collected from the online NTD Reporting Tool in several ways. Using the agency information participants provide to the NTD, analysts examine program participant data based on whether or not an agency is a Full Reporter.

Full reporting agencies provide more detail on events, including

- Mode
- Event type
- Location type
- Fatality person type(s)
- Injury person type(s)
- Object collided with (collisions only)
- Security event type (security events only)
- Data indicating which reporting threshold(s) the event met (e.g., a reportable injury, a life-safety evacuation, etc.)

All of the above details involve grouping categorical data provided by NTD reporters as outlined in Appendix B.

Data Analysis

Analysts conduct quantitative analyses of NTD data to identify trends in safety outcomes for the bus transit industry. This report presents analyses that focus on outcomes from 2018 and tracks changes across the years covered within the report (2008 to 2018) when those years reflect consistent data collection practices.

The quantitative analyses in this report provide statistics on service and safety data (or portions of that data) submitted to the NTD. These analyses are not designed to estimate or predict safety performance beyond 2018.

Unless otherwise noted, this report calculates annual average percentage change over multiple years as

$$r = \left(\frac{C_a}{C_b}\right)^{\frac{1}{y}} - 1,$$

which is a transformation of

$$C_a = C_b(1 + r)^y.$$

C_a is the count in the later year; C_b is the count in the earlier year; r is the annual average rate of change; y is the number of years between the two counts. This calculation method results in a figure that is more comparable to a single year percentage change than the results of other calculation methods.

Data Considerations

FTA first introduced NTD safety and security data collection as a pilot program in 2002. Over the last 17 years, most transit agencies that report to the NTD have developed internal data collection and processing procedures to meet the reporting requirements.

FTA has also implemented a system of validation checks that has improved the accuracy of reported data in recent years. Though data quality and completeness have improved significantly over time, the analyses of NTD event reports included here may still contain errors or omissions due to transit agency input errors.

Appendix E. Figures and Tables in the BSDR

List of Figures

List of Tables