Monthly Labor Review

February 2015

ERRATA On May 28, 2015, a correction was made to paragraph four under "BLS survey of occupational injuries and illnesses" in this article. The sentence, as originally published, incorrectly identified the cost of security cameras on buses as $18,000 per camera rather than per bus.

When the wheels on the bus stop going round and round: occupational injuries, illnesses, and fatalities in public transportation

Injuries and illnesses to bus drivers endanger not only their lives but also the lives of their passengers. In 2013, approximately 5,780 transit and intercity bus drivers experienced a days-away-from-work injury or illness while on the job. This article explores occupational injuries, illnesses, and fatalities to bus drivers and urban transit workers and examines how individual transit systems are collecting and analyzing their own employee safety data. The findings reveal that mass transit systems have taken steps to protect their employees from harm on the job and that injuries and illnesses to bus drivers and urban transit workers have declined in recent years.

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In October 2012, a Washington (DC) Metropolitan Area Transit Authority (WMATA) bus driver was hospitalized after a rock was thrown through an open window and hit her head while she was driving.[1] In August 2013, a gunman rushed on to a King County metro bus in downtown Seattle and shot the driver during rush hour.[2] These sorts of violent attacks involving bus drivers endanger not just the bus drivers but the passengers as well. The safety of citizens who rely on public transportation depends on the safety of the bus operators.

According to the U.S. Bureau of Labor Statistics (BLS) Survey of Occupational Injuries and Illnesses (SOII), an estimated 5,780 state and local government transit and intercity bus drivers (Standard Occupational Classification [SOC] code 53-3021[3]) were injured on the job in 2013 and required at least 1 day away from work because of the

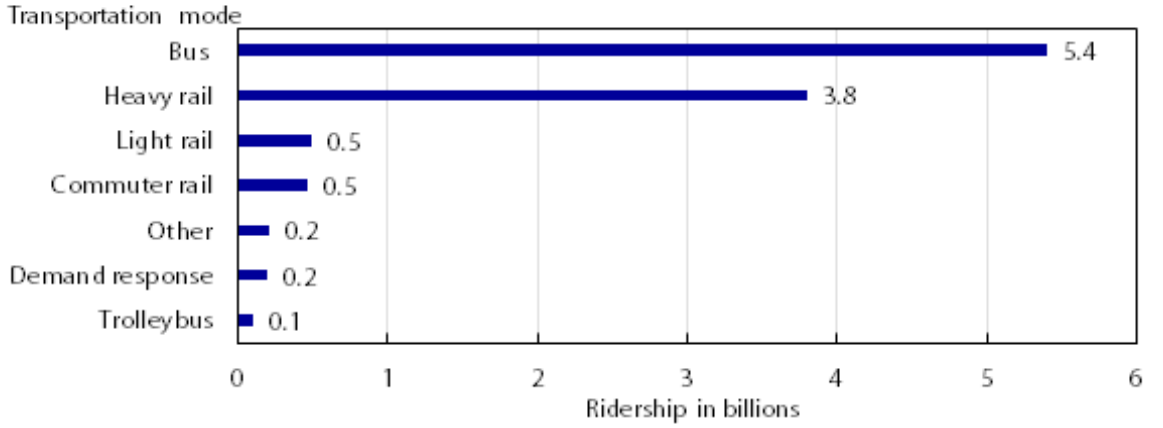
injury. While bus ridership and public transportation use in general are on the rise across the country, employees in our nation's urban transit systems industry (also later referred to as "urban transit" or "urban transit industry") face occupational hazards because of weather, traffic, aging infrastructure, and violence.

This article explores trends in occupational injuries, illnesses, and fatalities to bus drivers and urban transit workers, captured by the BLS SOII and the Census of Fatal Occupational Injuries (CFOI) as well as examines how individual transit systems are collecting and analyzing their own employee safety data.

Ridership

According to the American Public Transportation Association, just over half (5.4 billion) of the 10.7 billion public transportation trips in the United States in 2013 were made via motor bus.[4] (See figure 1.) The use of public transportation has increased 13 percent from 2003 to 2013.[5] Heavy rail, such as a metro or subway, was the second most popular mode of transportation, with 3.8 billion trips made in 2013.

Figure 1. Public transportation use by mode, 2013



Note: *Other* = aerial tramway, automated guideway, cable car, ferryboat, inclined plane, monorail, and vanpool. *Commuter rail* = service characterized by an electric- or diesel-propelled railway for urban passenger-train service (also called metropolitan rail, regional rail, or suburban rail) consisting of local short-distance travel, operating between a central city and adjacent suburbs. *Heavy rail* = service (also called metro, subway, rapid transit, or rapid rail) operating on an electric railway with the capacity for a heavy volume of traffic. *Light rail* = service (also called streetcar, tramway, or trolley) operating passenger rail cars singly (or in short, usually two-car or three-car, trains) on fixed rails in right-of-way that is often separated from other traffic for part or much of the way. *Demand response* = service (also called paratransit or dial-a-ride) characterized by the use of passenger automobiles, vans, or small buses operating in response to calls from passengers or their agents to the transit operator, who then dispatches a vehicle to pick up and transport the passengers to their destinations.

Source: American Public Transportation Association.

The Federal Transit Administration (FTA) uses the National Transit Database to collect and share data from transit systems following accidents or safety incidents. To be recordable under FTA standards, injury and illness cases must involve immediate medical treatment away from the scene. FTA data include injuries and illnesses to employees, passengers, and passersby. The SOII uses the Occupational Safety and Health Administration (OSHA) recordkeeping standards to define recordable cases.[6] OSHA rules do not specify immediate medical treatment away from the scene and only include injuries or illness to employees. A workplace injury is an OSHA recordable days-away-from-work case if it requires an employee to miss a full day of work following the day of the injury or illness. According to the FTA, bus injuries accounted for over half of all FTA recordable injuries in 2013. (See table 1.) Since the majority of public transportation use and transportation injuries are bus related, the

following portion of the article focuses on nonfatal occupational injuries and illnesses to transit and intercity bus drivers. (From this point forward, transit and intercity bus drivers [SOC code 53-3021] are referred to only as “bus drivers.”)

Table 1. Federal Transit Administration recordable injuries, by transportation type, in 2013

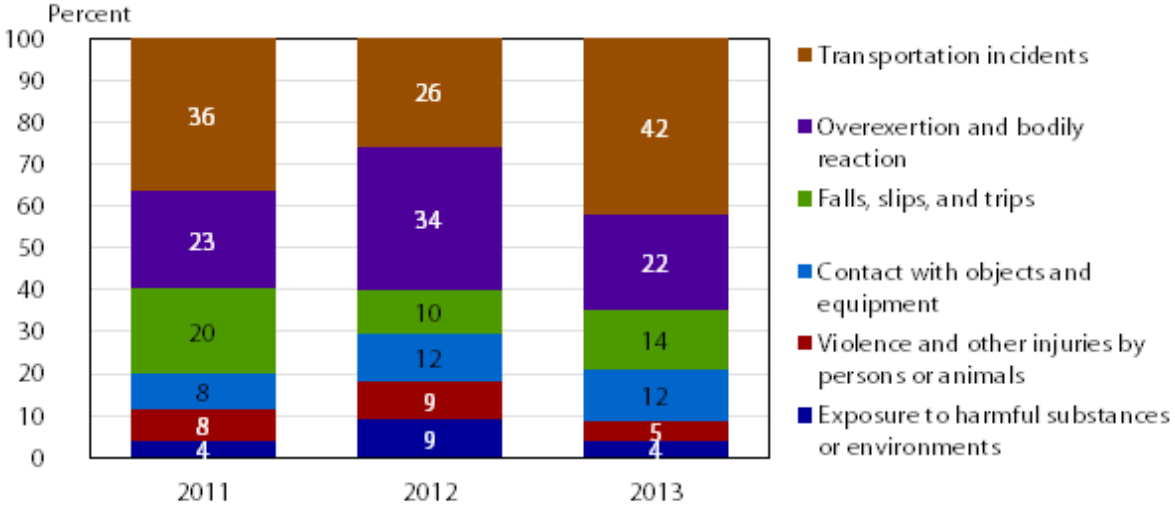
Type of transportation	Number of injuries in 2013
Motor bus	13,587
Heavy rail	7,748
Demand response	1,555
Other	1,053
Light rail	794
Total	24,737

Source: U.S. Department of Transportation Federal Transit Administration, Safety and Security Data 2013, http://www.ntdprogram.gov/ntdprogram/pubs/MonthlyData/S&STimeSeries-July2014-11032014.xls.

BLS survey of occupational injuries and illnesses

An estimated 5,780 days-away-from-work injury and illness cases occurred to state and local government bus drivers in 2013, down from 7,240 cases in 2012. These operators “drive a bus or motor coach, including regular route operations, charters, and private carriage. These drivers may collect fares or tickets.”[7] Bus drivers, by nature of the job, spend almost all of their worktime on the road. As a result, transportation incidents were the most prevalent event leading to occupational injuries or illnesses among state and local bus drivers in 2011 and 2013, accounting for 36 percent of reported injuries and illnesses to workers in this occupation in 2011 and 42 percent in 2013. (See figure 2.) However, in 2012, the overexertion and bodily reaction category,[8] such as lifting, pulling, twisting, kneeling, and repetitive motion, was the most common event leading to a days-away-from-work injury or illness, accounting for 34 percent of cases, whereas a transportation incident was the next most common event in 2012, accounting for 26 percent of days-away-from-work cases to state and local bus drivers. Bus drivers face the natural elements daily and are exposed to icy sidewalks and wet conditions. The event category falls, slips, and trips accounted for 20 percent of the injury and illness events in 2011, 10 percent in 2012, and 14 percent in 2013. Violence and other injuries by persons or animals led to 8 percent of injury and illness days-away-from-work cases in 2011, 9 percent in 2012, and 5 percent in 2013. (From this point forward, the event category violence and other injuries by persons or animals is referred to as “violent events.”)

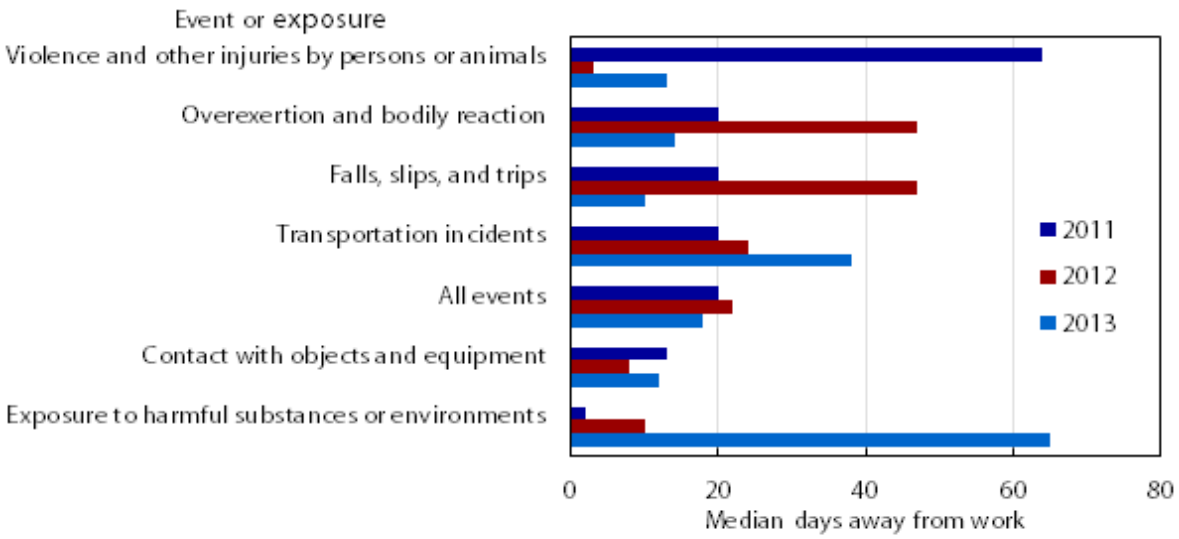
Figure 2. Percent distribution of nonfatal occupational injury and illness cases, by event or exposure, that required days away from work for state and local government bus drivers, 2011–2013



Note: Components may not sum to 100 because of rounding.
Source: U.S. Bureau of Labor Statistics.

The median number of days away from work provides a measure of severity for workplace injuries and illnesses reported to the BLS SOII. The median number of days away from work because of a workplace injury or illness for bus drivers in state and local government was 20 days in 2011, 22 days in 2012, and 18 days in 2013—over twice as long as the median of 9 days for all state and local government workers, unchanged from 2011 to 2013. (See figure 3.) Although only 8 percent of injury and illnesses cases with days away from work were the result of violent events in 2011, these injuries and illnesses were the most severe, requiring a median of 64 days away from work in 2011. Alternatively, in 2012, the event categories falls, slips, and trips and overexertion and bodily reaction both had a median of 47 median days away from the work. In 2013, the most severe event leading to days away from work was exposure to harmful substances or environments, with 65 median days away from work. The severity of these cases suggests that they are possible areas of focus to help keep transit workers safe and healthy and on the road.

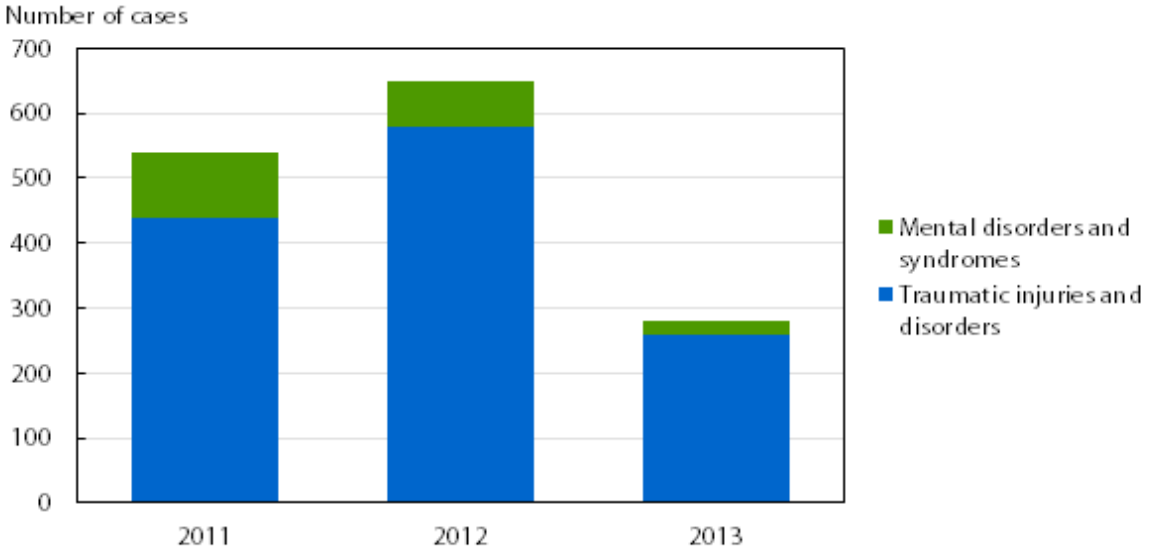
Figure 3. Median number of days away from work for nonfatal occupational injury and illness cases, by event or exposure, for state and local government bus drivers, 2011–2013



Source: U.S. Bureau of Labor Statistics.

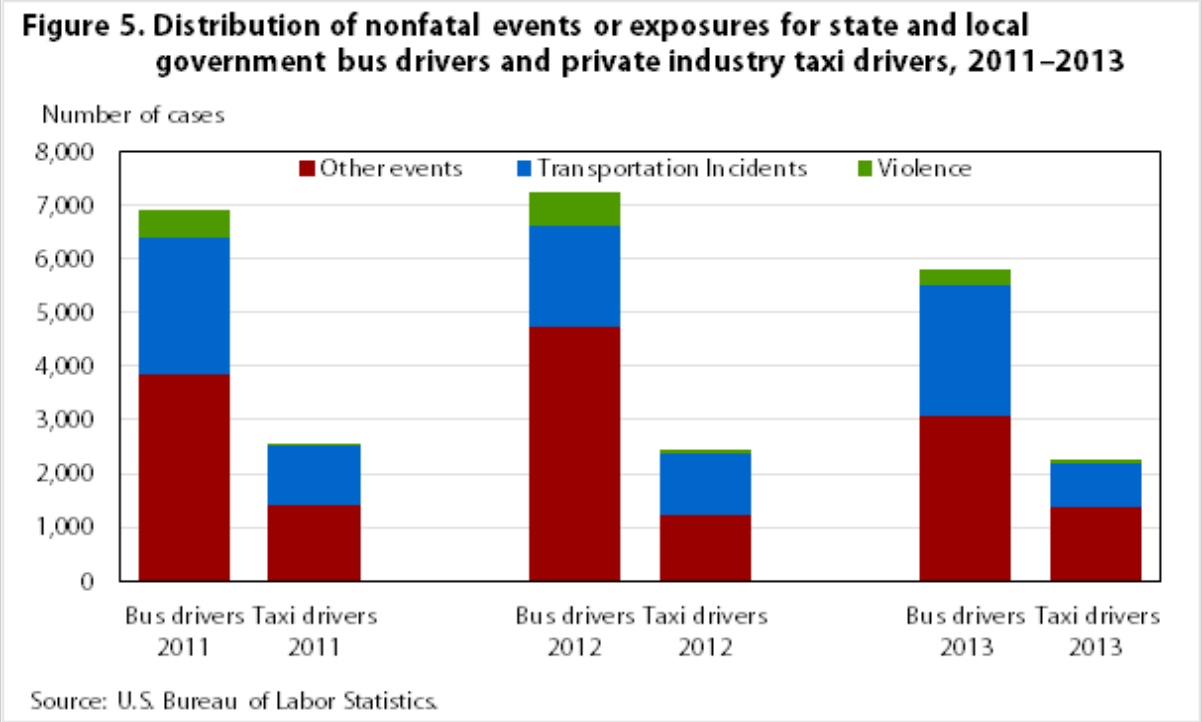
Among violent events leading to injuries or illnesses to bus drivers from 2011 to 2013, the majority of cases resulted in traumatic injuries and disorders to the worker. (See figure 4.) Traumatic injuries include sprains, strains, tears, surface wounds, bruises, and contusions. In 2011, nearly 19 percent of violent event cases resulted in mental disorders or syndromes for the affected worker, including post-traumatic stress disorder (PTSD) and anxiety. These workers suffering from mental disorders or syndromes experienced a median of 4 days away from work in 2011. In 2012, 11 percent of violent events led to a mental disorder or syndrome, which caused affected workers to miss a median of 32 days of work following the event. In 2013, fewer injuries and illnesses occurred from violent events than in 2012, and of those cases, only 20 cases, or 7 percent, resulted in a mental disorder or syndrome.

Figure 4. Distribution of nature of injuries or illnesses for state and local government bus drivers, caused by violent events, 2011–2013



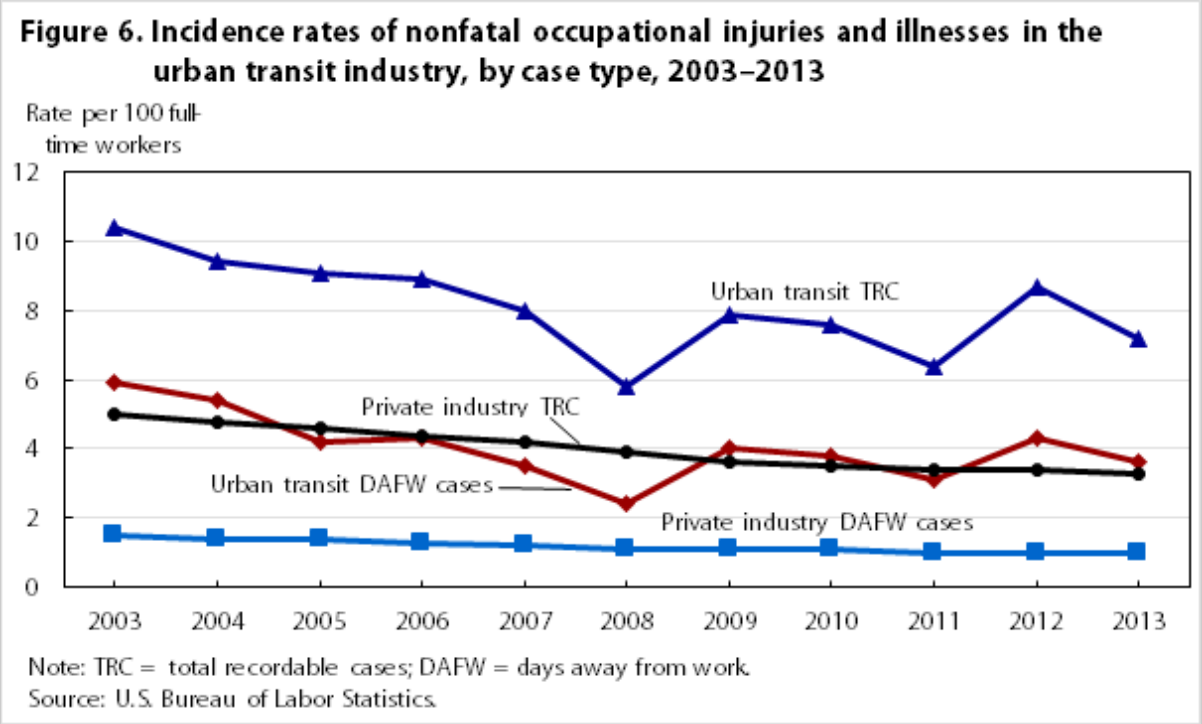
Source: U.S. Bureau of Labor Statistics.

Although taxi drivers are not the primary focus of this article, both private industry taxi drivers and state and local government bus drivers—by the nature of their work—face similar occupational risks, such as traffic and weather, and the events leading to injuries between the two occupations are similar. (See figure 5.) Transportation incidents were a common event leading to injuries and illnesses for both bus drivers and taxi drivers, accounting for 44 percent of taxi driver cases in 2011, 48 percent in 2012, and 37 percent in 2013.[9] One notable difference between the distribution of event types between bus drivers and taxi drivers is the substantially higher proportion of nonfatal injury and illness cases among state and local bus drivers caused by violence, compared with the proportion of nonfatal injury and illness cases among taxi drivers. From 2011 to 2013, only 2 percent of days-away-from-work injury and illness cases to taxi drivers were precipitated by a violent event. Both taxi and bus drivers interact with their customers face-to-face; however, most taxi drivers do so through a partition, allowing for extra protection for the driver. Although partitions are standard for taxi drivers, metropolitan transit systems are still installing partitions to protect bus drivers. The *Huffington Post* reported in August 2013 that the New York City Metropolitan Transportation Authority (MTA) had installed security upgrades of cameras and floor-to-ceiling partitions in only a quarter of its 5,700 bus fleet, with the hope to double this number by 2015. The partitions cost at least $6,000 and security cameras $18,000 per bus, a substantial cost for metropolitan bus systems with thousands of buses.[10]



Data available on the urban transit systems industry

The BLS SOII does not currently publish injury and illness estimates for the state and local government urban transit systems industry.[11] The SOII does, however, publish estimates for the private sector urban transit systems industry. These data are of interest because the total recordable injury and illness rate for workers in the private urban transit systems industry is significantly higher than that of the private sector industry in general from 2003 through 2013. (See figure 6.) The total recordable rate of injury and illness on the job in the private urban transit industry was significantly lower in 2013 than in 2003. Although in 2013, the total rate of recordable injury and illness cases for private sector urban transit systems (7.2 cases per 100 full-time workers) was still significantly higher than the overall private industry rate (3.3 cases per 100 full-time workers). In 2013, workers in the urban transit industry experienced days-away-from-work injuries and illnesses at a rate (3.6 cases per 100 full-time workers) similar to the total recordable case rate in the private industry (3.3 cases per 100 full-time workers) and significantly higher than the rate of cases with days away from work in the private industry (1.0 case per 100 full-time workers). Days-away-from-work cases are typically more severe occupational injuries and illnesses, with workers requiring a day beyond the day of injury to receive treatment or recover.

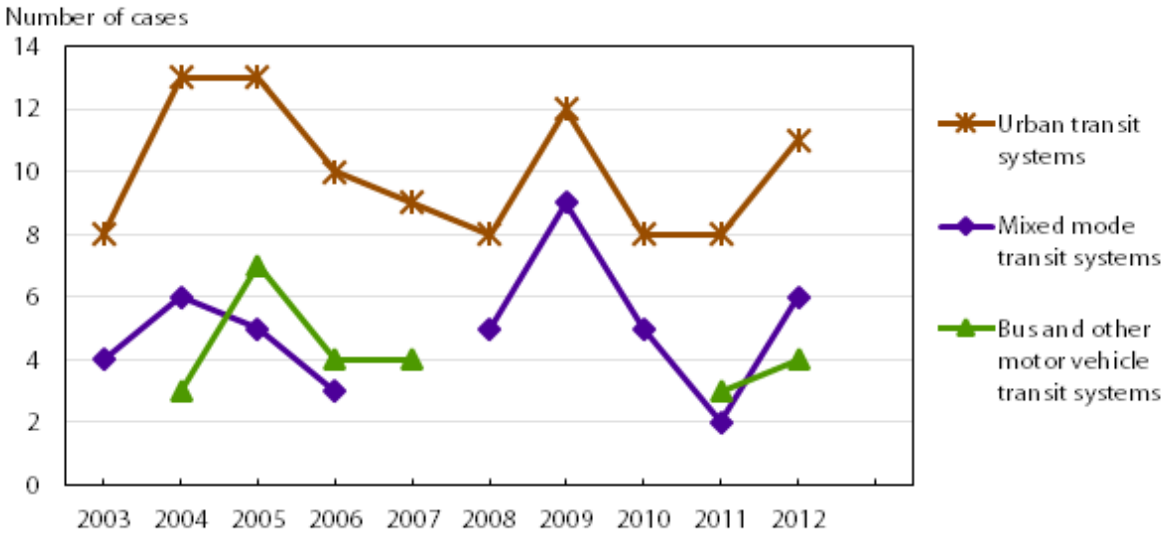


Although the BLS does not currently publish state and local government estimates at the detailed urban transit industry level for nonfatal data, the evaluation of the occupational hazards to employees working in urban transit systems is more complete by analyzing both bus drivers, a prominent occupation in urban transit systems, and the patterns of occupational injuries and illnesses in the accompanying private and public urban transit system industries. Fortunately, the BLS CFOI captures fatal occupational injuries in both the private and public urban transit system industries, which allows a more comprehensive analysis of deaths to workers in public transportation.

BLS census of fatal occupational injuries

From 2003 to 2012, 100 urban transit systems workers have died on the job, including workers from both private and public entities.[12] The urban transit systems industry comprises the following detailed industries: mixed mode transit systems (North American Industry Classification System [NAICS] 485111), commuter rail systems (NAICS 485112), bus and other motor vehicle transit systems (NAICS 485113), and other urban transit systems (NAICS 485119). Figure 7 shows the trend in fatal injuries in the urban transit systems industry and publishable data for its subindustries. Since 2003, the number of fatal injuries in urban transit systems has fluctuated, never falling below 8 fatal injuries annually and spiking to 13 fatal injuries in both 2004 and 2005. The bus and other motor vehicle transit systems industry had more fatal injuries than the mixed mode transit systems industry in 2005, 2006, and 2011. In 2008, 2009, 2010, and 2012, the majority of fatal injuries recorded in the urban transit systems industry occurred in the mixed mode transit systems industry.

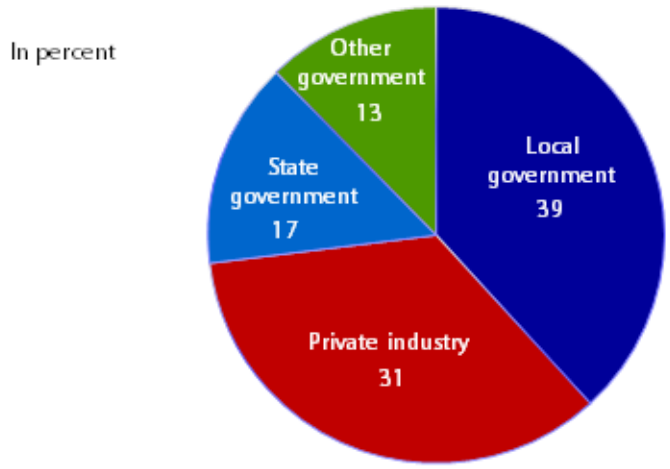
Figure 7. Number of fatal occupational injuries to urban transit workers, all ownerships, 2003–2012



Note: For some years, data did not meet publication criteria.
Source: U.S. Bureau of Labor Statistics.

When safety and health data in urban transit systems are evaluated, the ownership of the establishment at which the employee was working should be considered. From 2003 to 2012, the highest proportion of fatal injuries (39 percent) occurred among workers at local government urban transit establishments (see figure 8), while another 31 percent of fatal injuries occurred in private companies in this industry and 17 percent of fatal injuries occurred in state government urban transit system establishments. During this period, 13 percent of fatalities occurred to workers classified in “other government,” a category that includes regional cooperative entities; for example, regional transportation systems serving multiple states, which are not classified in state and local government. Overall, 69 percent of fatal injuries in urban transit systems occurred in government establishments.

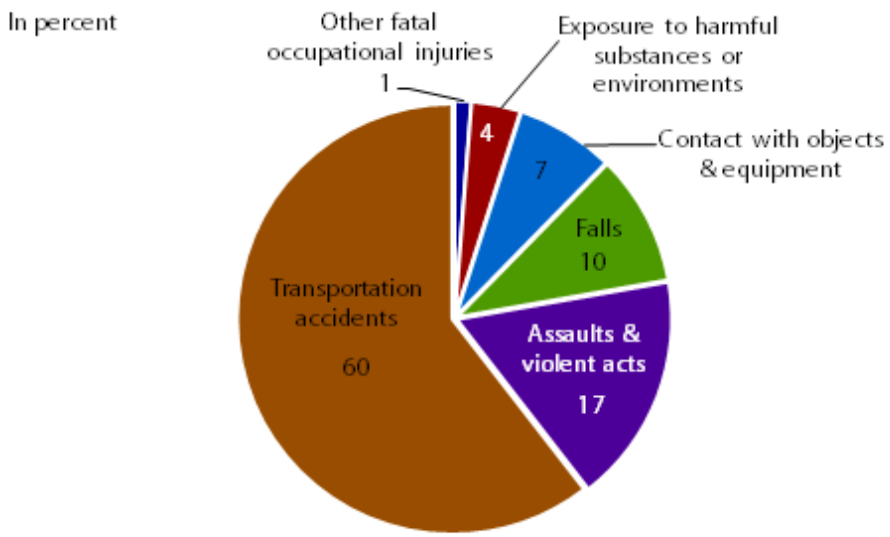
Figure 8. Percent distribution of fatal occupational injuries among urban transit systems workers by ownership, 2003–2012



Source: U.S. Bureau of Labor Statistics.

Case details for fatal and nonfatal workplace injuries and illness are classified using the Occupational Injury and Illness Classification System (OIICS).[13] A change in the OIICS in 2010 (to OIICS version 2.01) constituted a break in series for BLS occupational injury and illness data; therefore, case details for injuries or illnesses that occurred in 2011 and later should not be compared with data for prior years. Since only 2 years of final fatal data in which cases were coded using OIICS version 2.01 were available at the time of publication of this article, the analysis in the next section focuses on the case details of fatal occupational injuries from 2003 to 2010. Of all fatal injuries in the urban transit systems industry, 60 percent (or 49 cases) resulted from transportation accidents. (See figure 9.) Also, 28 of the 49 fatal injuries precipitated by a transportation accident were not highway collisions but were cases in which the worker was struck by vehicle in a parking lot or nonroadway. The second most common cause of a fatal work injury, with 17 percent, was the assaults and violent acts category. Falls accounted for 10 percent, or eight cases, of fatal workplace injuries in urban transit systems.

Figure 9. Percent distribution of fatal occupational injuries among urban transit systems workers by event or exposure, 2003–2010



Note: Components may not sum to 100 because of rounding.
Source: U.S. Bureau of Labor Statistics.

Evaluation of published rates

Metropolitan mass transit systems typically publish public reports that include performance measures, including safety and health statistics. These reports would be a great source for public transit stakeholders and the public to compare and evaluate the safety goals and performance of these systems, concerning both employees and passengers. However, individual transit systems record and benchmark their safety and health data differently, so the lack of a standard format makes the safety and health approaches between the different systems difficult to compare.[14] For example, the New York City MTA publishes annual rates of worker injuries or illnesses per 100 employees that result in lost time,[15] which means the injury or illness prevented the employee from working for at least one full shift following the day of the incident. Conversely, the Chicago Transit Authority (CTA) publishes safety metrics per 100,000 miles traveled and includes property damage, not just injuries to workers or passengers (see table 2).[16]

Table 2. Urban transit systems of major metropolitan areas by incidence rate, mode of transportation, rate description, and time

Metropolitan area	Incidence rate	Mode of transportation	Description of rate	Time
Chicago, IL, CTA	0.48	Bus	Safety-related incident per 100,000 miles	Calendar year 2013
Philadelphia, PA, SEPTA	4.38	Combined for system	Employee lost-time injuries per 200,000 work hours	Fiscal year 2013 (July 2012–June 2013)
Washington, DC, WMATA	4.81	Combined for system	OSHA injury rate per 200,000 hours[(1)]	Calendar year 2013
New York, NY, MTA	6.79	Bus	Employee lost-time rate per 100 employees	Calendar year 2013

Notes:

[(1)] Washington Metropolitan Area Transit Authority (WMATA) employee injury rate standard is comparable with the Occupational Safety and Health Administration (OSHA) recordkeeping standard, http://www.wmata.com/about_metro/scorecard/documents/Vital_Signs_CY_2013.pdf.

Sources: Chicago Transit Authority (CTA), Southeastern Pennsylvania Transportation Authority (SEPTA), WMATA, and Metropolitan Transportation Authority (MTA).

The transportation system in Philadelphia, the Southeastern Pennsylvania Transportation Authority (SEPTA), publishes both lost time and nonlost time injuries,[17] but the data provided are by fiscal year instead of calendar year, thus making these data difficult to compare with those of other systems. The Washington, DC, public transportation system (WMATA) previously used workers' compensation laws to define a workplace injury.[18] Workers' compensation laws differ by state, so even if all major transportations systems used workers' compensation laws to define workplace injuries, these rates would not be comparable. Citing alignment with industry practices, WMATA began using OSHA's recordkeeping rules to define workplace injuries and illnesses in 2013.

Among four of the most frequented systems in the country (see table 2), no two rates are truly comparable. The Chicago CTA and New York City MTA break out injury statistics by mode of transportation, allowing for a clearer understanding of the workplace safety, since the nature of work and environment differs greatly between bus and rail systems. Thus, separate data allow safety and occupational risks in different workplace environments to be better evaluated. Statistics provided when modes of transportation are combined, such as the data available from Washington, DC, and Philadelphia, PA, show less clearly the workplace hazards facing employees.

Summary

Public transportation use in the United States is growing. Employees in this industry face varied occupational risks that, when they result in injuries or illnesses to workers, can also result in risks and injuries to riders. For example, if a bus driver is injured while operating a vehicle, every passenger on that vehicle may be endangered. Workplace injuries and illnesses to bus drivers and urban transit systems workers can require time away from work, and events like violence can jeopardize the safety and reliability of public transportation systems as they continue to grow. Mass transit systems have taken steps to protect their employees from harm on the job and to review the safety of their workplaces. Safety measures implemented in some systems, such as cameras on rail cars and buses and protective partitions for bus drivers, are designed to increase the safety of our urban transit systems

workers and, by extension, all citizens using public transportation. Mass transit systems should continue to monitor safety benchmarks and protect employees from workplace hazards.

SUGGESTED CITATION

Gina Dowdell Hunter , "When the wheels on the bus stop going round and round: occupational injuries, illnesses, and fatalities in public transportation," *Monthly Labor Review,* U.S. Bureau of Labor Statistics, February 2015, https://doi.org/10.21916/mlr.2015.3.

NOTES

[1] Luz Lazo, "Citing attacks directed at buses, metro weighs service cuts in Anacostia," *The Washington Post*, October 28, 2012, http://www.washingtonpost.com/local/trafficandcommuting/citing -attacks-directed-at-buses-metro-weighs-service-cuts-in-anacostia/2012/10/28/3afd6fec-1d29-11e2-9cd5-b55c38388962_story.html.

[2] KOMO Staff and Associated Press, "Bus driver shot in downtown Seattle; police fatally shoot gunman" (KOMOnews.com, August 12, 2013), http://www.komonews.com/news/local/Metro-bus-driver-shot-in-downtown-Seattle-police-shoot-suspect-219273481.html.

[3] Transit and intercity bus drivers are classified in the 2010 Standard Occupational Classification as code 53-3021. For more information, see the *Standard Occupational Classification Manual: 2010* (U.S. Bureau of Labor Statistics, March 11, 2010), https://www.bls.gov/soc/2010/.

[4] "Public Transportation Ridership Report, Fourth Quarter 2013" (American Public Transportation Association, February 26, 2014), http://www.apta.com/resources/statistics/Documents/Ridership/2 013-q4-ridership-APTA.pdf.

[5] "Transit Ridership Report, Fourth Quarter 2003" (American Public Transportation Association, August 3, 2004), http://www.apta.com/resources/statistics/Documents/Ridership/20 03_q4_ridership_APTA.pdf.

[6] Occupational Safety and Health Administration details on recordkeeping can be found from Code of Federal Regulations, Recording and Reporting Occupational Injuries and Illness, Title 29, § 1904.7, https://www.osha.gov/pls/oshaweb/owadisp.show_ document?p_table=STANDARDS&p_id=9638.

[7] *Standard Occupational Classification Manual: 2010,* https://www.bls.gov/soc/2010/.

[8] The event or exposure leading to an injury or illness on the job is classified by the Occupational Injury and Illness Classification System 2.01, "overexertion and bodily reaction," event code 7. For more information, see https://www.bls.gov/iif/osh_oiics_2010_2_4_2.pdf.

[9] Taxi drivers are classified in the 2010 Standard Occupational Classification as code 53-3041. For more information, see https://www.bls.gov/soc/2010/soc533041.htm.

[10] Jon Gerberg, "MTA bus driver assaults prompt agency to install cameras, partitions in more NYC buses," *The Huffington Post*, August 15, 2013, http://www.huffingtonpost.com/2013/08/15/mta-bus-driver-assault_n_3762651.html?utm_hp_ref=new-york.

[11] The urban transit systems industry is classified by the North American Industry Classification System, 2007, as code 4851. For more information, see https://www.census.gov/cgi-bin/sssd/naics/naicsrch.

[12] At the time of publication of this article, final 2013 Census of Fatal Occupational Injuries data were not available.

[13] For more information, see *Injuries, Illnesses, and Fatalities: Occupational Injury and Illness Classification Manual* (U.S. Bureau of Labor Statistics, January 10, 2012), https://www.bls.gov/iif/oshoiics.htm.

[14] The Federal Transit Administration National Transit Database aggregates comparable safety incident data from all transit systems in the United States; however, the database provides counts for each transit system but not comparable rates.

[15] "MTA monthly comparison" (New York City Metropolitan Transportation Authority, 2013 and 2014 data), http://web.mta.info/persdashboard/agencies/mtabus/ep/247825_ch artmth.htm.

[16] "December 2013 performance metrics" (Chicago Transit Authority, January 2014), p. 2, http://www.transitchicago.com/assets/1/performance_metrics/CTA _Company_Wide_KPI_December_2013.pdf.

[17] "Six-month report on corporate key performance indicators, Report no. 6" (Southeastern Pennsylvania Transportation Authority, September 5, 2012), p. 2, http://septa.org/strategic-plan/reports/KPI-008.pdf.

18 "Vital signs report: a scorecard of metro's key performance indicators (KPIs) 2013 year-end results" (Washington Metropolitan Area Transit Authority, February 2014), p. 24, http://www.wmata.com/about_metro/scorecard/documents/Vital_Signs_CY_2013.pdf.

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