

# INDIANA TRAFFIC SAFETY FACTS

# COMMERCIAL VEHICLES 2017



INDIANA UNIVERSITY  
PUBLIC POLICY INSTITUTE

## IN 2017:

- Of the 219,112 Indiana collisions reported in 2017, 8 percent (16,910) involved commercial vehicles (CV) and there were 130 fatal collisions involving CVs (16 percent of all fatal collisions).
- During the past five years, CV collisions increased annually about 5 percent. From 2016 to 2017, collisions involving large trucks barely increased (one percent), and bus collisions decreased 5 percent.
- In 2017, fatal CV collisions occurred predominately on the highways of the state: 87 percent CV-involved fatal collisions occurred on Indiana state roads, US routes, and interstates
- In 2017, 152 persons died in CV collisions—a 21 percent increase from 2016. Of these, only 18 persons were in the CVs (17 drivers and 1 occupant).
- In 2017, there were 3,297 persons injured in CV collisions—of these, one-third were CV occupants.
- Considering all motor vehicle collisions from 2013 to 2017, the occupants of CVs and the occupants of non-CVs were properly restrained about 90 percent of the time; vehicle occupants killed in CV collisions were properly restrained at substantially lower rates.
- Compared to non-CV collisions, CV collisions drop substantially on Saturdays and Sundays, but during Monday through Friday CV collisions peak around 3pm, ahead of the typical 5pm to 6pm peak seen in 2017 non-CV collisions.

## INTRODUCTION

This fact sheet summarizes Indiana traffic collisions involving commercial vehicles (CV), by examining collision characteristics, the types of vehicles, and individuals involved from 2013 to 2017. Data come from the Indiana State Police Automated Reporting and Information Exchange System (ARIES) as of April 6, 2018. Collision severity, person type, personal injury status, restraint use, and other selected aspects of collisions are examined for CVs and other involved (non-CV) traffic units. The incidence of hazmat placards and releases in Indiana collisions is also noted.

## DEFINITION

Commercial vehicles (CV) are defined as:

- (1) large trucks (single 2 axle, 6 tires; single 3 or more axles; truck/trailer--not semi; tractor--cab only, no trailer; tractor/one semi-trailer; tractor/double trailer; tractor/triple trailer),
- (2) combination vehicles,
- (3) pickup trucks over 10,000 pounds,
- (4) buses (15+ passengers with driver),
- (5) school buses, or
- (6) any vehicle with a hazardous materials (hazmat) placard.

Table 1. Indiana collisions involving commercial vehicles (CV) by collision severity, 2013-2017

Type of CV involved/ collision severity	Count of collisions					Annual rate of change	
	2013	2014	2015	2016	2017	2016-17	2013-17
<b>Total collisions</b>	<b>193,236</b>	<b>205,769</b>	<b>216,492</b>	<b>223,905</b>	<b>219,112</b>	<b>-2.1%</b>	<b>3.2%</b>
Fatal	710	704	751	776	834	7.5%	4.1%
Injury	32,852	33,860	34,468	35,336	34,219	-3.2%	1.0%
Property damage	159,674	171,205	181,273	187,793	184,059	-2.0%	3.6%
<b>Any CV</b>	<b>13,717</b>	<b>16,800</b>	<b>16,174</b>	<b>16,893</b>	<b>16,910</b>	<b>0.1%</b>	<b>5.4%</b>
Fatal	101	132	123	119	130	9.2%	6.5%
Injury	1,855	2,193	2,111	2,223	2,074	-6.7%	2.8%
Property damage	11,761	14,475	13,940	14,551	14,706	1.1%	5.7%
<i>Any CV as percent total</i>	7.1%	8.2%	7.5%	7.5%	7.7%		
<i>CV fatal as percent all fatal</i>	14.2%	18.8%	16.4%	15.3%	15.6%		
<b>Collisions involving a large truck</b>	<b>11,919</b>	<b>14,602</b>	<b>14,175</b>	<b>14,729</b>	<b>14,877</b>	<b>1.0%</b>	<b>5.7%</b>
Fatal	98	125	117	114	125	9.6%	6.3%
Injury	1,639	1,943	1,874	1,974	1,860	-5.8%	3.2%
Property damage	10,182	12,534	12,184	12,641	12,892	2.0%	6.1%
<i>Large truck as percent total</i>	6.2%	7.1%	6.5%	6.6%	6.8%		
<i>Large truck fatal as percent all fatal</i>	13.8%	17.8%	15.6%	14.7%	15.0%		
<b>Collisions involving a bus</b>	<b>1,658</b>	<b>2,042</b>	<b>1,923</b>	<b>2,043</b>	<b>1,949</b>	<b>-4.6%</b>	<b>4.1%</b>
Fatal	3	6	6	6	7	16.7%	23.6%
Injury	211	238	234	250	217	-13.2%	0.7%
Property damage	1,444	1,798	1,683	1,787	1,725	-3.5%	4.5%
<i>Bus as percent total</i>	0.9%	1.0%	0.9%	0.9%	0.9%		
<i>Bus fatal as percent all fatal</i>	0.4%	0.9%	0.8%	0.8%	0.8%		

Source: Indiana State Police Automated Reporting and Information Exchange System, as of April 6, 2018

Notes:

- 1) Includes any collisions involving one or more commercial vehicles, one or more large trucks, or one or more buses, as designated by ARIES.
- 2) Collisions involving a bus or a large truck are not mutually exclusive (e.g., collision involving truck and bus would be counted twice).

In partnership with:



# CV COLLISIONS AND UNITS INVOLVED

In 2017, there were 16,910 traffic collisions involving one or more CVs; of these, 88 percent (14,877) involved *large trucks* (Table 1). CV collisions have increased from 2013 to 2017 by about 5 percent per year, slightly faster than the average five-year change in all collisions (3 percent). From 2016 to 2017, there was a slight one percent increase in collisions involving *large trucks*, while collisions involving *buses* declined by about 5 percent. In 2017, there was a 9 percent increase in CV-involved fatal collisions, compared to an 8 percent increase for all fatal collisions. Of the 130 fatal collisions that included a CV in 2017, 96 percent (125) involved large trucks. Compared to their involvement in *all* collisions (8 percent), CV collisions account for 16 percent of fatal collisions.

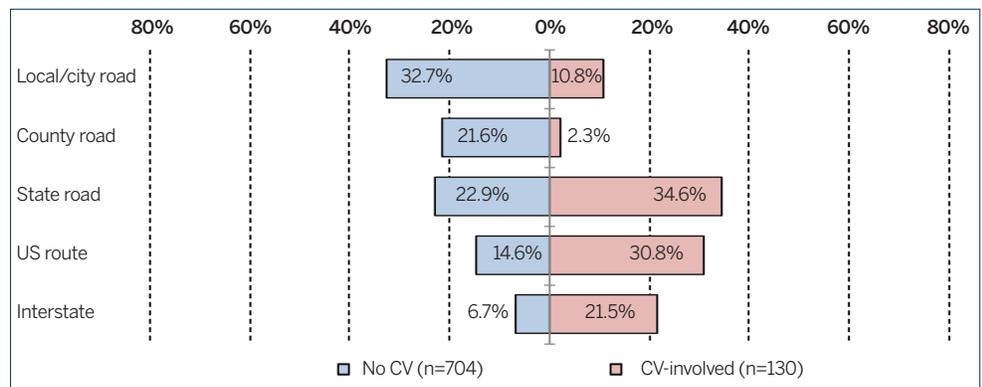
Compared to non-CV collisions, those involving CVs occur disproportionately on state roads, US routes, and interstates (e.g., in 2017, 7 percent of non-CV collisions happened on interstates, compared to 29 percent of CV collisions) (Table 2). The difference in where *fatal* collisions occur is similarly extreme: state roads, US routes, and interstates were the sites of 44 percent of non-CV fatal collisions, but accounted for 87 percent of fatal CV collisions. Fatal non-CV collisions are much more likely to occur on local, city, and county roads (Figure 1).

**Table 2. Indiana collisions with and without commercial vehicle (CV) involvement, by road class, 2013-2017**

						Annual rate of change		Percent totals
	2013	2014	2015	2016	2017	2016-17	2013-17	2017
<b>All collisions</b>								
<b>CV involved</b>	<b>13,717</b>	<b>16,800</b>	<b>16,174</b>	<b>16,893</b>	<b>16,910</b>	<b>0.1%</b>	<b>5.4%</b>	<b>100.0%</b>
Local/city road	4,430	5,308	5,103	5,330	5,257	-1.4%	4.4%	31.1%
County road	828	949	928	981	995	1.4%	4.7%	5.9%
State road	1,611	2,003	1,950	1,963	1,894	-3.5%	4.1%	11.2%
US route	1,583	1,944	1,867	1,847	1,892	2.4%	4.6%	11.2%
Interstate	3,436	4,538	4,241	4,677	4,852	3.7%	9.0%	28.7%
Unknown/not reported	1,829	2,058	2,085	2,095	2,020	-3.6%	2.5%	11.9%
<b>No CV involved</b>	<b>179,519</b>	<b>188,969</b>	<b>200,318</b>	<b>207,012</b>	<b>202,202</b>	<b>-2.3%</b>	<b>3.0%</b>	<b>100.0%</b>
Local/city road	82,147	86,897	94,143	98,811	96,755	-2.1%	4.2%	47.9%
County road	20,510	20,875	21,266	21,611	20,904	-3.3%	0.5%	10.3%
State road	25,331	26,657	27,698	27,598	27,261	-1.2%	1.9%	13.5%
US route	16,996	17,639	18,044	18,090	17,689	-2.2%	1.0%	8.7%
Interstate	11,884	13,599	13,638	14,696	14,679	-0.1%	5.4%	7.3%
Unknown/not reported	22,651	23,302	25,529	26,206	24,914	-4.9%	2.4%	12.3%
<b>Fatal collisions</b>								
<b>CV involved</b>	<b>101</b>	<b>132</b>	<b>123</b>	<b>119</b>	<b>130</b>	<b>9.2%</b>	<b>6.5%</b>	<b>100.0%</b>
Local/city road	11	12	10	15	14	-6.7%	6.2%	10.8%
County road	4	10	5	5	3	-40.0%	-6.9%	2.3%
State road	25	39	35	31	45	45.2%	15.8%	34.6%
US route	26	27	42	34	40	17.6%	11.4%	30.8%
Interstate	35	42	30	32	28	-12.5%	-5.4%	21.5%
Unknown/not reported	0	2	1	2	0	-100%	--	0.0%
<b>No CV involved</b>	<b>609</b>	<b>572</b>	<b>628</b>	<b>657</b>	<b>704</b>	<b>7.2%</b>	<b>3.7%</b>	<b>100.0%</b>
Local/city road	166	192	188	192	230	19.8%	8.5%	32.7%
County road	135	124	141	144	152	5.6%	3.0%	21.6%
State road	162	143	152	156	161	3.2%	-0.2%	22.9%
US route	95	72	90	102	103	1.0%	2.0%	14.6%
Interstate	43	32	50	55	47	-14.5%	2.2%	6.7%
Unknown/not reported	8	9	7	8	11	37.5%	8.3%	1.6%

Source: Indiana State Police Automated Reporting and Information Exchange System, as of April 6, 2018

**Figure 1. Percent of total fatal collisions, by commercial vehicle (CV) involvement and road class, 2017**



Source: Indiana State Police Automated Reporting and Information Exchange System (ARIES), as of April 6, 2018

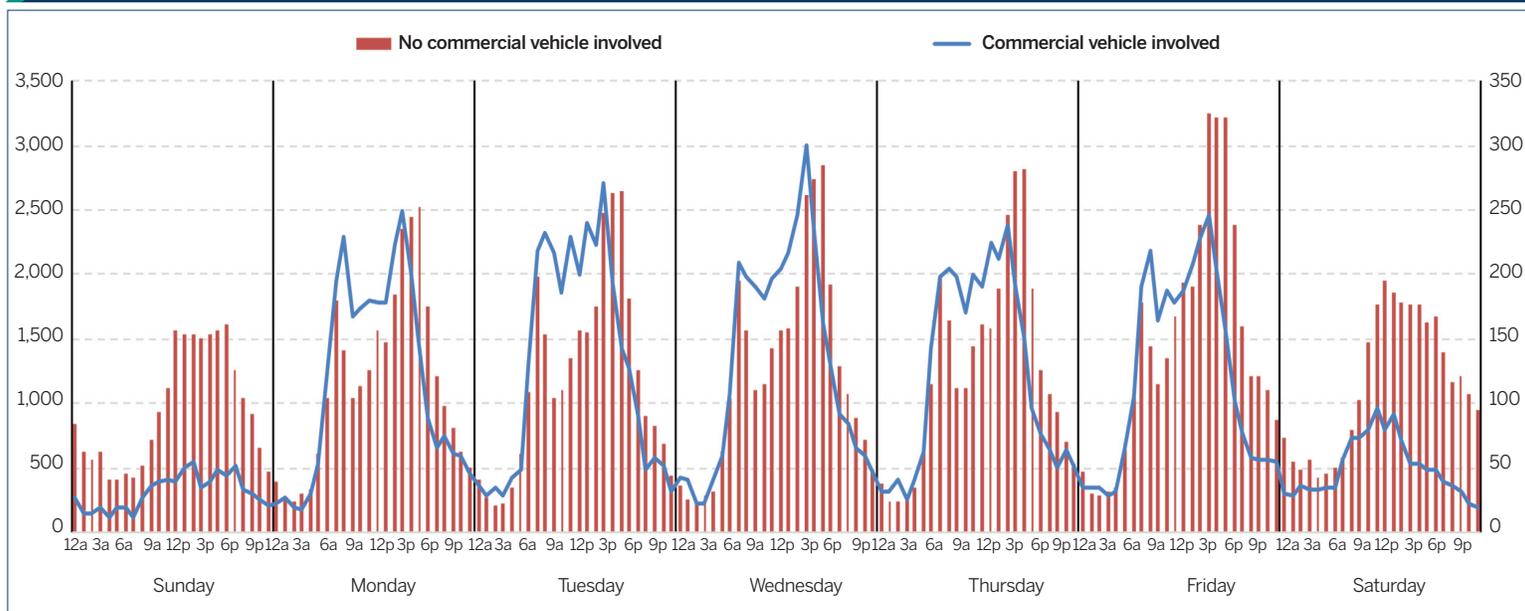
Notes:

- 1) Excludes cases with unknown road class.
- 2) Percentages refer to fatal collisions in road class as percent of all fatal collisions (e.g., 35 percent of all CV-involved fatal collisions occurred on state roads).

CV collisions occurred predominately during the Monday-Friday work week, and drop substantially on Saturday and Sunday, and more so than do non-CV collisions (Figure 2). In comparison to non-CV collisions, the

peak hours of CV collisions typically hover around 3pm, generally preceding the non-CV collision peaks during the work week.

Figure 2. All Indiana collisions by weekday, time, and commercial vehicle involvement, 2017



Source: Indiana State Police Automated Reporting and Information Exchange System, as of April 6, 2018.

## INDIVIDUALS INVOLVED IN CV COLLISIONS

Individuals involved in Indiana CV collisions include CV operators and passengers, the operators and passengers of other vehicles (motorists), and non-motorists. In 2017, this included 17,048 persons in CVs, as well as 11,788 other motorists and 73 non-motorists (Table 3). Persons involved in commercial vehicle collisions represent about 8 percent of all collision-involved individuals, but comprise about 17 percent of those killed. The disproportionality of CV-related fatalities is consistent across the five-year period. The 2017 proportional increase in CV collision fatalities (21 percent) was more than twice the annual increase in overall Indiana fatalities (10 percent). With CV occupant fatalities remaining the same in 2017 (18), the big increase in CV-related fatalities was in the number of other motorists killed—a 29 percent increase from 2016.

**Table 3. Individuals in Indiana collisions involving a commercial vehicle (CV) by vehicle type and injury severity, 2013-2017**

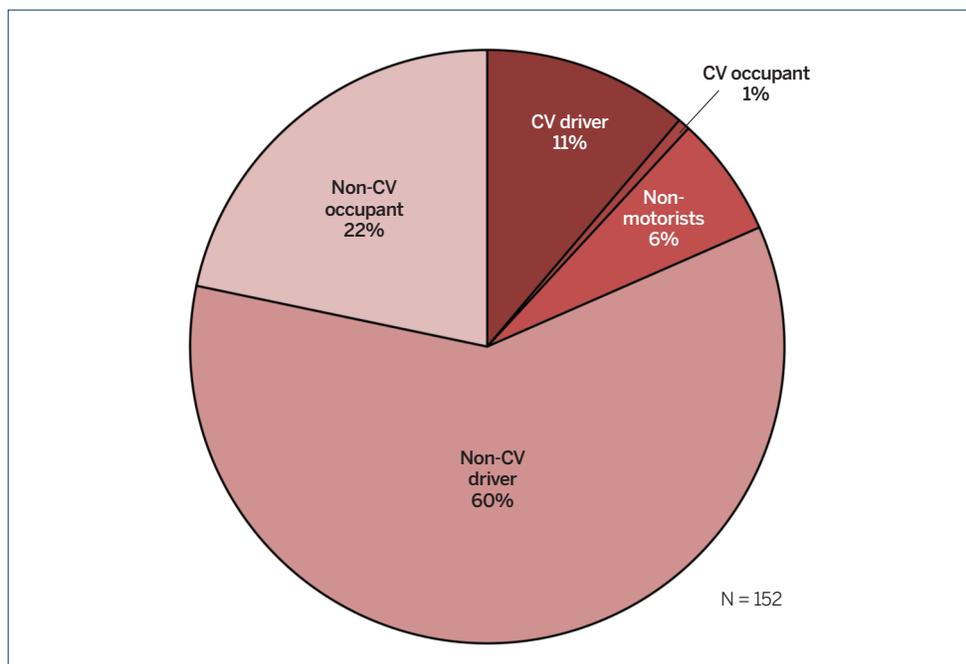
Vehicle type/injury status	Count of individuals					Annual rate of change	
	2013	2014	2015	2016	2017	2016-17	2013-17
<b>Individuals in all collisions</b>	<b>310,303</b>	<b>330,978</b>	<b>351,272</b>	<b>364,286</b>	<b>357,843</b>	<b>-1.8%</b>	<b>3.6%</b>
Individuals in CV collisions	23,171	28,513	27,584	28,921	28,909	0.0%	5.7%
<i>Percent of all in CV collisions</i>	7.5%	8.6%	7.9%	7.9%	8.1%		
<b>Persons in CV</b>	<b>13,646</b>	<b>16,907</b>	<b>16,241</b>	<b>16,969</b>	<b>17,048</b>	<b>0.5%</b>	<b>5.7%</b>
Fatal	17	19	20	18	18	0.0%	1.4%
Injured	1,061	1,190	1,110	1,215	1,071	-11.9%	0.2%
Not injured	12,568	15,698	15,111	15,736	15,959	1.4%	6.2%
<b>Other motorists</b>	<b>9,448</b>	<b>11,518</b>	<b>11,266</b>	<b>11,867</b>	<b>11,788</b>	<b>-0.7%</b>	<b>5.7%</b>
Fatal	97	118	104	96	124	29.2%	6.3%
Injured	1,797	2,124	2,275	2,280	2,179	-4.4%	4.9%
Not injured	7,554	9,276	8,887	9,491	9,485	-0.1%	5.9%
<b>Non-motorists</b>	<b>77</b>	<b>88</b>	<b>77</b>	<b>85</b>	<b>73</b>	<b>-14.1%</b>	<b>-1.3%</b>
Fatal	8	12	13	12	10	-16.7%	5.7%
Injured	57	63	51	55	47	-14.5%	-4.7%
Not injured	12	13	13	18	16	-11.1%	7.5%
<b>Fatalities in CV collisions</b>	<b>122</b>	<b>149</b>	<b>137</b>	<b>126</b>	<b>152</b>	<b>20.6%</b>	<b>5.7%</b>
<b>All Indiana fatalities</b>	<b>784</b>	<b>745</b>	<b>816</b>	<b>829</b>	<b>911</b>	<b>9.9%</b>	<b>3.8%</b>
<i>Percent of all in CV collisions</i>	15.6%	20.0%	16.8%	15.2%	16.7%		
<b>Fatal injury rates, CV collisions</b>							
In CV	0.1%	0.1%	0.1%	0.1%	0.1%		
Other motorists	1.0%	1.0%	0.9%	0.8%	1.1%		
Non-motorists	10.4%	13.6%	16.9%	14.1%	13.7%		
<b>Non-fatal injury rates, CV collisions</b>							
In CV	7.8%	7.0%	6.8%	7.2%	6.3%		
Other motorists	19.0%	18.4%	20.2%	19.2%	18.5%		
Non-motorists	74.0%	71.6%	66.2%	64.7%	64.4%		

Sources: Indiana State Police Automated Reporting Information Exchange System, as of April 6, 2018

Note: *Injured* includes *incapacitating, non-incapacitating, possible, unknown, or refused treatment.*

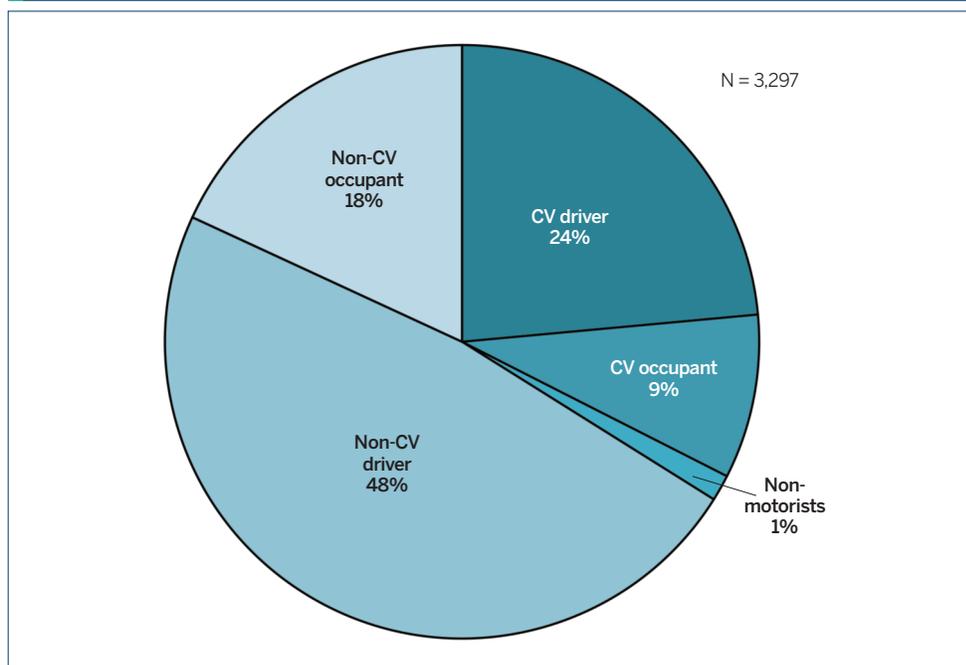
Persons *not* in CVs are more likely to be injured or killed than CV occupants. Not surprisingly, 2017 fatality and injury rates for non-motorists in CV collisions were high: 14 percent of involved non-motorists died and 64 percent were injured. CV occupants had lower fatality and injury rates (less than 1 percent and 7 percent, respectively) than other involved motorists (1 percent and 19 percent, respectively). Thus, non-CV drivers and their passengers comprised the largest numbers of individuals killed in CV collisions, 82 percent (Figure 3). In 2017, the CV drivers comprised the next largest group killed (11 percent). In terms of 3,297 individuals with non-fatal injuries in 2017 CV-involved collisions, non-CV drivers and CV drivers were the largest number of those hurt (about two-thirds), followed by non-CV occupants and CV occupants (Figure 4).

**Figure 3. Individuals killed in Indiana collisions involving commercial vehicles (CV), by person type, 2017**



Source: Indiana State Police Automated Reporting and Information Exchange System, as of April 6, 2018

**Figure 4. Individuals injured in Indiana collisions involving commercial vehicles (CV), by person type, 2017**



Source: Indiana State Police Automated Reporting and Information Exchange System, as of April 6, 2018

Note: *Injured* includes *incapacitating, non-incapacitating, possible, unknown, or refused treatment.*

## RESTRAINT USE

Approximately 9 of 10 drivers involved in CV collisions were properly restrained (Table 4). There has been almost no appreciable change in this overall restraint use in CV collisions from 2013 to 2017. However, individuals killed or injured in CV collisions have considerably lower restraint use rates. For example, the individuals killed in CVs were restrained about two-thirds of the time in 2017, compared to a 58 percent restraint use rate for other motorists killed. In terms of those suffering non-fatal injuries in CV collisions, the restraint use rates of individuals in CVs have typically been much lower than those of the non-CV occupants in each of the five years.

## INCIDENCE OF HAZMAT VEHICLES INVOLVED IN CV COLLISIONS

Very few CVs with *hazmat placards* were involved in collisions from 2013 to 2017—typically around 2 percent of all involved CVs (calculated from Figure 5). Until 2015, far more CVs without a *hazmat placard* released hazardous materials than did CVs with hazmat placards, but the number of collision-involved CVs with *hazmat placards* that had a hazmat release exceeded those without placards in 2015 and remained so through 2017. In any event, collision-involvement by CVs with hazmat placards (with or without a hazmat release) are relatively rare in the context of all Indiana collisions.

**Table 4. Safety equipment use among individuals involved in Indiana commercial vehicle (CV) collisions, by injury severity and person type, 2013-2017**

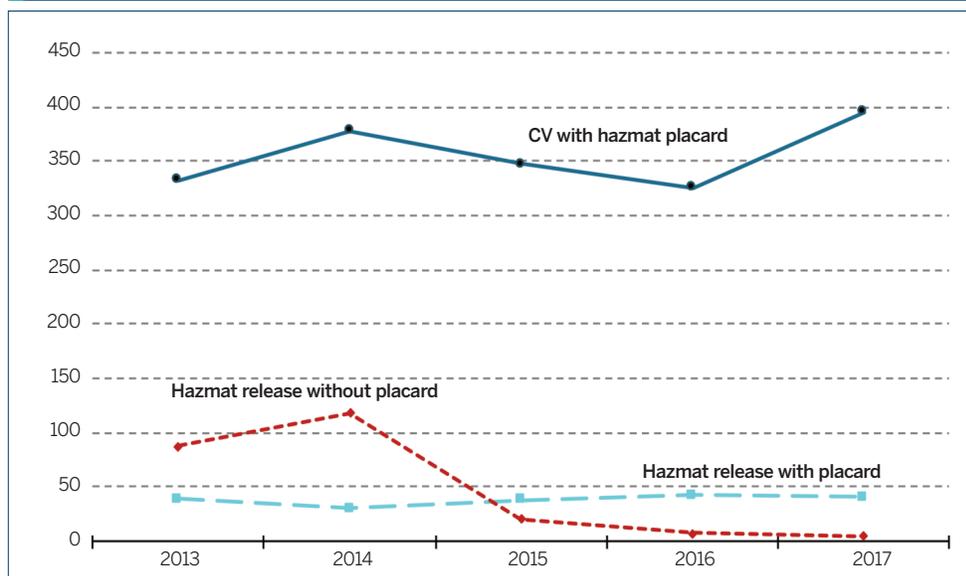
	Counts of individuals					Annual rate of change	
	2013	2014	2015	2016	2017	2016-17	2013-17
<b>All involved</b>							
CV occupants	13,646	16,907	16,241	16,969	17,048	0.5%	5.7%
Properly restrained	12,183	15,214	14,687	15,273	15,425	1.0%	6.1%
% restraint use	89.3%	90.0%	90.4%	90.0%	90.5%		
Non-CV occupants	9,448	11,518	11,266	11,867	11,788	-0.7%	5.7%
Properly restrained	8,653	10,579	10,267	10,939	10,863	-0.7%	5.9%
% restraint use	91.6%	91.8%	91.1%	92.2%	92.2%		
<b>Fatal injuries</b>							
CV occupants	17	19	20	18	18	0.0%	1.4%
Properly restrained	9	11	9	13	12	-7.7%	7.5%
% restraint use	52.9%	57.9%	45.0%	72.2%	66.7%		
Non-CV occupants	97	118	104	96	124	29.2%	6.3%
Properly restrained	67	70	63	50	72	44.0%	1.8%
% restraint use	69.1%	59.3%	60.6%	52.1%	58.1%		
<b>Non-fatal injuries</b>							
CV occupants	1,061	1,190	1,110	1,215	1,071	-11.9%	0.2%
Properly restrained	684	787	795	823	774	-6.0%	3.1%
% restraint use	64.5%	66.1%	71.6%	67.7%	72.3%		
Non-CV occupants	1,797	2,124	2,275	2,280	2,179	-4.4%	4.9%
Properly restrained	1,566	1,885	1,942	2,014	1,947	-3.3%	5.6%
% restraint use	87.1%	88.7%	85.4%	88.3%	89.4%		

Sources: Indiana State Police Automated Reporting Information Exchange System, as of April 6, 2018

Notes:

- 1) Excludes *non-motorists*.
- 2) Totals include individuals with 'NULL' and unknown restraint use.
- 3) Properly restrained includes restraints in vehicle collisions and/or helmets in motorcycle collisions.

**Figure 5. Commercial vehicles (CV) in Indiana collisions by hazmat placard and hazmat release, 2013-2017**



Source: Indiana State Police Automated Reporting and Information Exchange System, as of April 6, 2018

# PRIMARY FACTORS IN CV COLLISIONS

Law enforcement officers assign a primary factor to each collision in Indiana, and indicate whether the driver or operator of the involved units 'contributed' to the collision occurrence (ARIES calls this 'contributing circumstance'). When a driver's contributing circumstance to a collision matches the primary factor of the collision, the driver is said to be attributable in the crash; roughly speaking, this means that when attributable, the driver is at least partly 'at fault' in the collision. In a multi-vehicle collision, both vehicles can be attributable.

For all CVs and non-CVs in multi-vehicle collisions involving at least one CV, Table 5 shows counts and proportions of vehicles that were attributable across the various primary factors assigned to collisions in 2017. There were 28,160 vehicles involved in multi-vehicle CV collisions, of which 15,172 were CVs and 12,988 were other motor vehicles and/or non-motorists (these counts are virtually identical to 2016 counts). Overall, 52 percent of CVs were attributable (to the primary factor) and 48 percent of other involved vehicles or non-motorists were attributable. However, attributability varies by which primary factor was assigned to the collision. The primary factors for about 94 percent of traffic units involved in multi-vehicle CV collisions are linked to *driver-related* actions for both CVs and non-CVs, the most common of which include *unsafe lane movement*, *following too closely*, *improper turning*, and *unsafe backing* (for which CVs were more attributable); and *failure to yield*, *speed too fast for weather conditions*, or *improper passing* (non-CVs were more attributable).

**Table 5. Primary factor attributability by commercial vehicles (CV) and non-CV traffic units in Indiana multi-vehicle CV collisions, 2017**

Primary factor in collision	CV involved:			Non-CV vehicles involved			Percent of total vehicles involved	
	Total	Attributable to CV		Total	Attributable to non-CV		CV	Non-CV
		Count	%		Count	%		
<b>Total</b>	<b>15,172</b>	<b>7,946</b>	<b>52.4%</b>	<b>12,988</b>	<b>6,065</b>	<b>46.7%</b>	<b>100.0%</b>	<b>100.0%</b>
<b>Driver-related</b>	<b>14,231</b>	<b>7,380</b>	<b>51.9%</b>	<b>12,139</b>	<b>5,759</b>	<b>47.4%</b>	<b>93.8%</b>	<b>93.5%</b>
Unsafe lane movement	2,774	1,510	54.4%	2,294	1,082	47.2%	18.3%	17.7%
Following too closely	2,302	1,123	48.8%	2,165	952	44.0%	15.2%	16.7%
Failure to yield right of way	1,893	785	41.5%	1,817	1,067	58.7%	12.5%	14.0%
Unsafe backing	1,542	1,052	68.2%	1,078	258	23.9%	10.2%	8.3%
Other - driver	1,210	813	67.2%	945	445	47.1%	8.0%	7.3%
Improper turning	1,183	798	67.5%	755	167	22.1%	7.8%	5.8%
Improper lane usage	671	368	54.8%	574	263	45.8%	4.4%	4.4%
Left of center	438	178	40.6%	400	251	62.8%	2.9%	3.1%
Disregard signal/reg sign	378	142	37.6%	418	238	56.9%	2.5%	3.2%
Speed too fast for weather conditions	396	84	21.2%	357	282	79.0%	2.6%	2.7%
Improper passing	395	125	31.6%	345	231	67.0%	2.6%	2.7%
Driver distracted	297	121	40.7%	280	144	51.4%	2.0%	2.2%
Unsafe speed	261	86	33.0%	253	133	52.6%	1.7%	1.9%
Overcorrecting/oversteering	239	123	51.5%	194	84	43.3%	1.6%	1.5%
Ran off road right	105	38	36.2%	113	57	50.4%	0.7%	0.9%
Driver asleep or fatigued	90	15	16.7%	81	67	82.7%	0.6%	0.6%
Driver illness	23	5	21.7%	29	16	55.2%	0.2%	0.2%
Wrong way on one way	19	8	42.1%	19	11	57.9%	0.1%	0.1%
Cell phone usage	6	0	0.0%	9	7	77.8%	0.0%	0.1%
Pedestrian action	6	5	83.3%	8	2	25.0%	0.0%	0.1%
Other telematics in use	3	1	33.3%	5	2	40.0%	0.0%	0.0%
<b>Environment-related</b>	<b>332</b>	<b>198</b>	<b>59.6%</b>	<b>290</b>	<b>164</b>	<b>56.6%</b>	<b>2.2%</b>	<b>2.2%</b>
Animal on roadway	97	46	47.4%	94	65	69.1%	0.6%	0.7%
View obstructed	80	54	67.5%	74	30	40.5%	0.5%	0.6%
Other - environment	71	48	67.6%	54	23	42.6%	0.5%	0.4%
Roadway surface condition	63	34	54.0%	51	39	76.5%	0.4%	0.4%
Obstruction not marked	9	6	66.7%	9	4	44.4%	0.1%	0.1%
Traffic control problem	5	4	80.0%	3	2	66.7%	0.0%	0.0%
Lane marking obscured	3	3	100.0%	3	1	33.3%	0.0%	0.0%
Severe crosswinds	3	2	66.7%	1	0	0.0%	0.0%	0.0%
Holes/ruts in surface	1	1	100.0%	1	0	0%	0.0%	0.0%
<b>Vehicle-related</b>	<b>609</b>	<b>368</b>	<b>60.4%</b>	<b>559</b>	<b>142</b>	<b>25.4%</b>	<b>4.0%</b>	<b>4.3%</b>

Sources: Indiana State Police Automated Reporting Information Exchange System, as of April 6, 2018

Notes:

- 1) *Primary factors* are counts of vehicles involved in multi-vehicle collisions with that primary factor. For example, there were 609 CVs involved in collisions due to vehicle-related primary factors, of which 60 percent had the same vehicle-related contributing circumstance. Note that more than one vehicle may have contributing circumstances that match the *primary factor* in multi-vehicle collisions.
- 2) *Attributable/Attributability*: a vehicle and/or driver is considered attributable in a collision when linked by the reporting officer to the primary factor or cause of the collisions.
- 3) Excludes unknown or unspecified primary factors.

## DEFINITIONS

**Annual rate of change (ARC)** – The rate that a beginning value must increase/decrease each period (e.g. month, quarter, year) in a time series to arrive at the ending value in the time series. ARC is a “smoothed” rate of change because it measures change in a variable as if the change occurred at a steady rate each period with compounding. For example, to measure change in a variable from 2013 to 2017, it is calculated as  $(\text{Value in 2017}/\text{Value in 2013})^{1/4} - 1$ .

**Commercial vehicle** - Units identified within ARIES as (1) large trucks (*single 2 axle, 6 tires; single 3 or more axles; truck/trailer--not semi; tractor--cab only, no trailer; tractor/one semi-trailer; tractor/double trailer; tractor/triple trailer*), (2) combination vehicles, (3) pickup trucks over 10,000 pounds, (4) buses (15+ passengers with driver), (5) school buses, or (6) any vehicle displaying a hazardous materials (*hazmat*) placard.

**Contributing circumstance** - Actions of the driver, apparent environmental conditions, or apparent vehicle conditions that contributed to the collision.

**Hazmat placard** - A sign that must be affixed to any motor vehicle transporting hazardous materials in quantities above the thresholds established by the USDOT, or other authorized entity.

**Hazmat release** – Some or all of the hazardous materials carried by the commercial vehicle were released at the crash site.

**Motorists** – Drivers/operators of collision-involved motor vehicles and the injured occupants in those vehicles.

**Non-motorist** - Pedestrians, pedalcyclists, or animal-drawn vehicle operators.

**Primary factor** - The single factor that the investigating officer believes to be the main or primary factor that contributed to the collision’s occurrence. Each collision may have only one primary factor.

**Vehicle (unit) attributability** – The vehicle’s *contributing circumstance* is the same as the collision *primary factor*. A vehicle and/or driver is considered attributable in an Indiana collision when linked by the reporting officer to the *primary factor* or cause of the collisions.

**Restraint use** –Vehicle occupants are counted as restrained when the investigating officer selected any one of the following passenger vehicle safety equipment categories on the Indiana Crash Report: (1) *Lap belt only*; (2) *Harness*; (3) *Airbag deployed and harness*; (4) *Child restraint*; or (5) *Lap and harness*. For motorcycle riders, safety equipment use implies the use of a helmet.

## DATA SOURCES

Indiana State Police Automated Reporting Information Exchange System (ARIES), as of April 6, 2018.

This publication was prepared on behalf of the Indiana Criminal Justice Institute (ICJI) by the Indiana University Public Policy Institute (PPI). Please direct any questions concerning data in this document to ICJI at 317-232-1233.

This publication is one of a series of publications that form the analytical foundation of traffic safety program planning and design in the state of Indiana. Funding for these publications is provided by ICJI and the National Highway Traffic Safety Administration.

An electronic copy of this document can be accessed via the PPI website (<http://trafficsafety.iupui.edu>), the ICJI website ([www.in.gov/cji/](http://www.in.gov/cji/)), or you may contact the PPI at 317-261-3000.

### **Traffic Safety Project**

Designing and implementing effective traffic safety policies requires data-driven analysis of traffic collisions. To help in the policy-making process, the Indiana University Public Policy Institute collaborates each year with the Indiana Criminal Justice Institute to analyze vehicle crash data from the Automated Reporting Information Exchange System (ARIES), maintained by the Indiana State Police. This marks the twelfth year of this partnership. Research findings are summarized in a series of publications on various aspects of traffic collisions, including alcohol-related crashes, commercial vehicles, dangerous driving, child passenger safety, motorcycles, occupant protection, and drivers. An additional publication provides detailed information for each county and municipality. These publications serve as the analytical foundation of traffic safety program planning and design in Indiana.

Indiana collision data are obtained from Indiana Crash Reports, as completed by law enforcement officers. Crash reports for all Indiana collisions are entered electronically through ARIES. Collision trends as reported in these publications incorporate the effects of changes to data elements on the Crash Report, agency-specific enforcement policy changes, re-engineered roadways, driver safety education programs, and other unspecified effects. A collision produces three levels of data: collision, unit (vehicles), and individual. For this reason, readers should pay particular attention to the wording of statements about the data to avoid misinterpretations. If you have questions regarding trends or unexpected results, please contact the Indiana Criminal Justice Institute, Traffic Safety Division for more information.

### **The Indiana Criminal Justice Institute**

Guided by a Board of Trustees representing all components of Indiana's criminal and juvenile justice systems, the Indiana Criminal Justice Institute serves as the state's planning agency for criminal justice, juvenile justice, traffic safety, and victim services. ICJI develops long-range strategies for the effective administration of Indiana's criminal and juvenile justice systems and administers federal and state funds to carry out these strategies.

### **Indiana University Public Policy Institute**

The IU Public Policy Institute delivers unbiased research and data-driven, objective, expert analysis to help public, private and nonprofit sectors make important decisions that directly impact quality of life in Indiana. Using the knowledge and expertise of our staff and faculty, we provide research and analysis that is free of political and ideological bias. A multidisciplinary institute within the Indiana University School of Public and Environmental Affairs (SPEA), our efforts also support the Indiana Advisory Commission on Intergovernmental Relations (IACIR).

### **The National Highway Traffic Safety Administration (NHTSA)**

NHTSA provides leadership to the motor vehicle and highway safety community through the development of innovative approaches to reducing motor vehicle crashes and injuries. The mission of NHTSA is to save lives, prevent injuries and reduce economic costs due to road traffic crashes, through education, research, safety standards and enforcement activity.



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