#### **HEAVY TRUCK/BUS INVOLVED CRASHES**

These crashes involve a heavy truck/bus - defined as having a Gross Vehicle Weight Rating (GVWR) over 10,000 lbs., 8+ occupants, or a hazmat placard.

Heavy truck/bus crashes differ from other vehicle crashes in a number of ways, many reflecting the size and use of these vehicles. When compared to the overall crash picture, heavy truck/bus crashes involve:

- · More turning, backing, and changing lanes as the truck/bus driver action prior to crash.
- More collisions with bridge piers/abutments/supports and parked motor vehicles, as well as noncollision events such as jackknife, cargo loss/shift, and overturn as the most harmful event.
- Fewer collisions with ditches, trees, and animals.
- Fewer single-vehicle crashes but more sideswipes.
- Fewer drivers indicated to be speeding, failing to yield, reckless driving, disregarding traffic control, and unable to stop in assured clear distance, but more drivers indicated to be making backing, lane use, and turning errors.
- · Fewer crashes outside of the shoulder/curb.
- More crashes between the hours of 7:00 AM and 3:59 PM, and fewer crashes between 4:00 PM and 6:59 AM.
- More crashes Monday through Friday and fewer crashes Saturday and Sunday.





DRIVER ACTION	ALL CF	RASHES	FATAL C	RASHES	INJURY (	CRASHES
PRIOR TO CRASH	Number of Heavy Trucks	% of Total	Number of Heavy Trucks	% of Total	Number of Heavy Trucks	% of Total
Going Straight Ahead	7,698	51.4	68	66.0	1,495	57.8
Turning Left	1,163	7.8	7	6.8	173	6.7
Turning Right	1,000	6.7	2	1.9	76	2.9
Stopped on Roadway	976	6.5	2	1.9	212	8.2
Involved in Prior Crash at Same Location	2	0.0	0	0.0	0	0.0
Changing Lanes	741	4.9	0	0.0	75	2.9
Backing	841	5.6	1	1.0	31	1.2
Slowing/Stopping on Roadway	971	6.5	8	7.8	239	9.2
Slowing/Stopping Other Area	15	0.1	0	0.0	3	0.1
Starting Up on Roadway	257	1.7	1	1.0	45	1.7
Starting Up in Other Area	1	0.0	0	0.0	0	0.0
Entering Parking	23	0.2	0	0.0	2	0.1
Leaving Parking	10	0.1	0	0.0	1	0.0
Entering Roadway	116	0.8	1	1.0	19	0.7
Leaving Roadway	33	0.2	0	0.0	4	0.2
Making U-Turn	31	0.2	0	0.0	6	0.2
Overtaking or Passing	84	0.6	1	1.0	12	0.5
Avoiding Object	11	0.1	0	0.0	0	0.0
Avoiding Animal	12	0.1	0	0.0	3	0.1
Avoiding Pedestrian	3	0.0	1	1.0	0	0.0
Avoiding Vehicle (front/back)	133	0.9	0	0.0	32	1.2
Avoiding Vehicle (angle)	64	0.4	0	0.0	17	0.7
Driverless Moving	8	0.1	0	0.0	0	0.0
Parked	478	3.2	7	6.8	91	3.5
Crossing at Intersection	3	0.0	0	0.0	1	0.0
Crossing Not at Intersection	0	0.0	0	0.0	0	0.0
Getting On/Off Vehicle	0	0.0	0	0.0	0	0.0
n Roadway With Traffic	1	0.0	0	0.0	0	0.0
n Roadway Against Traffic	1	0.0	0	0.0	1	0.0
Standing/Lying in Roadway	0	0.0	0	0.0	0	0.0
Pushing/Working on Vehicle	0	0.0	0	0.0	0	0.0
Other Work in Roadway	1	0.0	0	0.0	0	0.0
Playing in Roadway	0	0.0	0	0.0	0	0.0
n Roadway Other Reason	2	0.0	0	0.0	0	0.0
Not in Roadway	3	0.0	0	0.0	0	0.0
Negotiating a Curve	206	1.4	4	3.9	43	1.7
Other	36	0.2	0	0.0	3	0.1
Jnknown	40	0.2	0	0.0	2	0.1
Uncoded & Errors	8	0.3	0	0.0	0	0.0
TOTAL	14,972	100.0	103	100.0	2,586	100.0





MOST HARMFUL EVENT	ALL CR	ASHES	FATAL C	RASHES	INJURY CRASHES	
IN A NONCOLLISION	Number of Heavy Trucks	% of Total	Number of Heavy Trucks	% of Total	Number of Heavy Trucks	% of Total
Loss of Control	82	0.5	1	1.0	14	0.5
Cross Centerline	31	0.2	0	0.0	7	0.3
Cross Median	7	0.0	0	0.0	1	0.0
Ran Off Roadway Left	36	0.2	0	0.0	5	0.2
Ran Off Roadway Right	77	0.5	0	0.0	15	0.6
Re-Enter Roadway	6	0.0	0	0.0	1	0.0
Overturn	256	1.7	8	7.8	113	4.4
Separation of Units	20	0.1	0	0.0	2	0.1
Fire/Explosion	36	0.2	1	1.0	2	0.1
Immersion	2	0.0	0	0.0	0	0.0
Jackknife	122	0.8	0	0.0	8	0.3
Downhill Runaway	1	0.0	0	0.0	1	0.0
Cargo Loss/Shift	98	0.7	0	0.0	3	0.1
Individual Fell from Vehicle	2	0.0	0	0.0	1	0.0
Equipment Failure (blown tire, brake failure, etc.)	79	0.5	0	0.0	5	0.2
Other Noncollision	80	0.5	0	0.0	6	0.2
SUBTOTAL	935	6.2	10	9.7	184	7.1

MOST HARMFUL EVENT IN A COLLISION WITH	ALL CRASHES		FATAL C	FATAL CRASHES		CRASHES
A NONFIXED OBJECT	Number of Heavy Trucks	% of Total	Number of Heavy Trucks	% of Total	Number of Heavy Trucks	% of Total
Pedestrian	30	0.2	6	5.8	23	0.9
Bicyclist	18	0.1	3	2.9	10	0.4
Motor Vehicle in Transport (in motion or on roadway)	11,382	76.0	76	73.8	2,143	82.9
Parked Motor Vehicle	731	4.9	1	1.0	45	1.7
Work Zone/Maintenance Equipment	16	0.1	1	1.0	3	0.1
Cargo Falling/Shifting/Anything Set in Motion by a Motor Vehicle	68	0.5	0	0.0	3	0.1
Railroad Train	9	0.1	0	0.0	1	0.0
Animal	521	3.5	0	0.0	3	0.1
Other Nonfixed Object	146	1.0	1	1.0	14	0.5
SUBTOTAL	12,921	86.3	88	85.4	2,245	86.8

The majority of heavy trucks/buses are involved in crashes with a motor vehicle in transport for all crashes (76.0%), fatal crashes (73.8%), and injury crashes (82.9%) for most harmful event in the crash.





MOST HARMFUL EVENT	ALL CR	ASHES	FATAL C	CRASHES	INJURY CRASHES	
IN A COLLISION WITH A FIXED OBJECT	Number of Heavy Trucks	% of Total	Number of Heavy Trucks	% of Total	Number of Heavy Trucks	% of Total
Bridge Pier/Abutment/Support	41	0.3	2	1.9	6	0.2
Bridge Rail	27	0.2	0	0.0	3	0.1
Bridge Overhead Structure	31	0.2	0	0.0	2	0.1
Guardrail Face	64	0.4	0	0.0	12	0.5
Guardrail End	18	0.1	0	0.0	2	0.1
Cable Barrier	37	0.2	0	0.0	2	0.1
Concrete Barrier	99	0.7	1	1.0	34	1.3
Traffic Sign/Post	58	0.4	0	0.0	0	0.0
Traffic Signal Equipment	40	0.3	0	0.0	1	0.0
Utility Pole/Light Support	156	1.0	1	1.0	8	0.3
Other Post/Pole/Support	41	0.3	0	0.0	3	0.1
Culvert	6	0.0	0	0.0	1	0.0
Curb	11	0.1	0	0.0	1	0.0
Ditch	155	1.0	1	1.0	30	1.2
Embankment	17	0.1	0	0.0	6	0.2
Fence	18	0.1	0	0.0	3	0.1
Mailbox	21	0.1	0	0.0	2	0.1
Tree	125	0.8	0	0.0	32	1.2
Railroad Crossing Signal	10	0.1	0	0.0	0	0.0
Building	7	0.0	0	0.0	2	0.1
Traffic Island	2	0.0	0	0.0	1	0.0
Fire Hydrant	14	0.1	0	0.0	0	0.0
mpact Attenuator (crash cushion)	9	0.1	0	0.0	2	0.1
Other Fixed Object	108	0.7	0	0.0	4	0.2
SUBTOTAL	1,115	7.4	5	4.9	157	6.1

	ALL CRASHES		FATAL CRASHES		INJURY CRASHES	
	Number of Heavy Trucks	% of Total	Number of Heavy Trucks	% of Total	Number of Heavy Trucks	% of Total
Uncoded & Errors	1	0.0	0	0.0	0	0.0
No Event Coded as Most Harmful	0	0.0	0	0.0	0	0.0
MOST HARMFUL EVENT TOTAL	14,972	100.0	103	100.0	2,586	100.0





ODACH TVDF	ALL CR	ASHES	FATAL CRASHES		INJURY CRASHES	
CRASH TYPE	Number of Heavy Trucks	% of Total	Number of Heavy Trucks	% of Total	Number of Heavy Trucks	% of Total
Single Motor Vehicle	2,224	14.9	16	15.5	295	11.4
Head-On	144	1.0	19	18.4	64	2.5
Head-On - Left Turn	137	0.9	3	2.9	64	2.5
Angle	1,847	12.3	28	27.2	555	21.5
Rear-End	3,277	21.9	20	19.4	850	32.9
Rear-End - Left Turn	135	0.9	2	1.9	33	1.3
Rear-End - Right Turn	96	0.6	0	0.0	11	0.4
Sideswipe - Same Direction	4,631	30.9	6	5.8	453	17.5
Sideswipe - Opposite Directions	539	3.6	3	2.9	56	2.2
Backing	788	5.3	0	0.0	17	0.7
Other	1,106	7.4	6	5.8	184	7.1
Unknown	48	0.3	0	0.0	4	0.2
Uncoded & Errors	0	0.0	0	0.0	0	0.0
TOTAL	14,972	100.0	103	100.0	2,586	100.0

The highest percentage of heavy trucks/buses are involved in same direction sideswipes for all crashes (30.9%), angle crashes for fatal crashes (27.2%), and rear-end crashes for injury crashes (32.9%).

HAZADDONG ACTION	ALL CR	ASHES	FATAL C	RASHES	INJURY C	RASHES	HAZARDOUS CI	TATION ISSUED
HAZARDOUS ACTION	Number of Heavy Trucks	% of Total						
None	7,637	51.0	72	69.9	1,463	56.6	27	1.2
Speed Too Fast	557	3.7	2	1.9	141	5.5	248	10.8
Speed Too Slow	3	0.0	0	0.0	1	0.0	0	0.0
Failed to Yield	909	6.1	2	1.9	176	6.8	383	16.7
Disregard Traffic Control	167	1.1	5	4.9	73	2.8	88	3.8
Drove Wrong Way	6	0.0	0	0.0	0	0.0	2	0.1
Drove Left of Center	59	0.4	0	0.0	11	0.4	14	0.6
Improper Passing	106	0.7	1	1.0	8	0.3	27	1.2
Improper Lane Use	778	5.2	0	0.0	73	2.8	269	11.8
Improper Turn	422	2.8	0	0.0	22	0.9	129	5.6
Improper/No Signal	18	0.1	1	1.0	1	0.0	3	0.1
Improper Backing	599	4.0	0	0.0	17	0.7	161	7.0
Unable to Stop in Assured Clear Distance	1,338	8.9	3	2.9	333	12.9	584	25.5
Reckless Driving	18	0.1	1	1.0	6	0.2	3	0.1
Careless/Negligent Driving	257	1.7	3	2.9	55	2.1	106	4.6
Other	1,120	7.5	4	3.9	95	3.7	233	10.2
Unknown	978	6.5	9	8.7	111	4.3	10	0.4
TOTAL	14,972	100.0	103	100.0	2,586	100.0	2,287	100.0

After no hazardous action, the most common hazardous action coded for drivers of heavy trucks/buses in all crashes (8.9%) and injury crashes (12.9%) is unable to stop in assured clear distance and for fatal crashes is "unknown" (8.7%).





RELATIONSHIP TO ROADWAY	ALL CR	ASHES	FATAL C	CRASHES	INJURY CRASHES	
(LOCATION OF FIRST IMPACT)	Number of Heavy Trucks	% of Total	Number of Heavy Trucks	% of Total	Number of Heavy Trucks	% of Total
On the Road	13,817	92.3	94	91.3	2,402	92.9
In the Median	104	0.7	2	1.9	19	0.7
On the Shoulder	440	2.9	5	4.9	82	3.2
Outside of the Shoulder/Curb-Line	382	2.6	2	1.9	65	2.5
In the Gore (area between ramp and freeway convergence)	12	0.1	0	0.0	3	0.1
On-Street Parking	159	1.1	0	0.0	8	0.3
Off the Roadway	0	0.0	0	0.0	0	0.0
On the Sidewalk	18	0.1	0	0.0	1	0.0
In the Bicycle Lane	3	0.0	0	0.0	1	0.0
Other/Unknown	37	0.2	0	0.0	5	0.2
TOTAL	14,972	100.0	103	100.0	2,586	100.0

TIME OF DAY	ALL CRASHES		FATAL CRASHES		INJURY CRASHES	
	Number of Heavy Trucks	% of Total	Number of Heavy Trucks	% of Total	Number of Heavy Trucks	% of Total
12:00 AM - 2:59 AM	418	2.8	3	2.9	71	2.7
3:00 AM - 5:59 AM	569	3.8	7	6.8	104	4.0
6:00 AM - 8:59 AM	2,501	16.7	15	14.6	448	17.3
9:00 AM - 11:59 AM	3,208	21.4	20	19.4	544	21.0
12:00 PM - 2:59 PM	3,686	24.6	29	28.2	629	24.3
3:00 PM - 5:59 PM	2,959	19.8	18	17.5	490	18.9
6:00 PM - 8:59 PM	1,060	7.1	7	6.8	198	7.7
9:00 PM - 11:59 PM	569	3.8	4	3.9	101	3.9
Unknown	2	0.0	0	0.0	1	0.0
TOTAL	14,972	100.0	103	100.0	2,586	100.0

Heavy truck/bus frequencies in crashes peak in the early afternoon, then drop off steadily until 3:00 AM. The time period between 12:00 PM and 2:59 PM is the most common time for trucks/buses to be involved in all crashes (24.6%), fatal crashes (28.2%), and injury crashes (24.3%).

ROADWAY TYPE	ALL CRASHES		FATAL C	RASHES	INJURY CRASHES	
KUADWAY I TPE	Number of Heavy Trucks	% of Total	Number of Heavy Trucks	% of Total	Number of Heavy Trucks	% of Total
Interstate Routes	3,106	20.7	19	18.4	643	24.9
US and Michigan Routes	4,501	30.1	45	43.7	857	33.1
County Roads and City Streets	7,328	48.9	39	37.9	1,078	41.7
Uncoded & Errors	37	0.2	0	0.0	8	0.3
TOTAL	14,972	100.0	103	100.0	2,586	100.0

For all crashes (48.9%) and injury crashes (41.7%), the highest percentage of heavy trucks/buses are involved in crashes on county roads and city streets. For fatal crashes, the highest percentage of heavy trucks/buses are involved in crashes on US and Michigan routes (43.7%).





DAY OF WEEK	ALL CRASHES		FATAL C	RASHES	INJURY CRASHES	
DAT OF WEEK	Number of Heavy Trucks	% of Total	Number of Heavy Trucks	% of Total	Number of Heavy Trucks	% of Total
Monday	2,641	17.6	15	14.6	451	17.4
Tuesday	2,818	18.8	19	18.4	427	16.5
Wednesday	2,711	18.1	19	18.4	485	18.8
Thursday	2,636	17.6	22	21.4	475	18.4
Friday	2,633	17.6	18	17.5	451	17.4
Saturday	957	6.4	6	5.8	179	6.9
Sunday	576	3.8	4	3.9	118	4.6
TOTAL	14,972	100.0	103	100.0	2,586	100.0

The highest percentage of heavy trucks/buses are involved in crashes on Tuesday for all crashes (18.8%), Thursday for fatal crashes (21.4%), and Wednesday for injury crashes (18.8%).

DRIVER GENDER	ALL CRASHES		FATAL CRASHES		INJURY CRASHES	
DNIVEN DENIDEN	Number of Heavy Trucks	% of Total	Number of Heavy Trucks	% of Total	Number of Heavy Trucks	% of Total
Male	13,063	87.2	94	91.3	2,313	89.4
Female	1,125	7.5	5	4.9	187	7.2
Uncoded & Errors	784	5.2	4	3.9	86	3.3
TOTAL	14,972	100.0	103	100.0	2,586	100.0

The highest percentage of heavy truck/bus drivers are male in all crashes (87.2%), fatal crashes (91.3%), and injury crashes (89.4%).

NUMBER OF OCCUPANTS	ALL CR	ASHES	FATAL C	RASHES	INJURY CRASHES		
	Number of Heavy Trucks	% of Total	Number of Heavy Trucks	% of Total	Number of Heavy Trucks	% of Total	
1 occupant	12,262	81.9	86	83.5	2,098	81.1	
2 occupants	1,283	8.6	10	9.7	264	10.2	
3 occupants	249	1.7	1	1.0	56	2.2	
4 occupants	106	0.7	2	1.9	23	0.9	
5 occupants	44	0.3	0	0.0	12	0.5	
6+ occupants	273	1.8	0	0.0	51	2.0	
0 occupants	446	3.0	3	2.9	63	2.4	
Unknown	309	2.1	1	1.0	19	0.7	
TOTAL	14,972	100.0	103	100.0	2,586	100.0	





VEHICLE TYPES INVOLVED IN CRASH With Heavy Truck/Bus	ALL CR	ASHES	FATAL C	RASHES	INJURY CRASHES		
	Number of Vehicles	% of Total	Number of Vehicles	% of Total	Number of Vehicles	% of Total	
Passenger Car, SUV, Van	10,368	82.0	59	57.3	2,287	83.7	
Motor Home	37	0.3	0	0.0	10	0.4	
Pickup Truck	1,637	12.9	21	20.4	332	12.1	
Small Truck Under 10,000 lbs. GVWR	65	0.5	1	1.0	10	0.4	
Motorcycle	34	0.3	4	3.9	24	0.9	
Moped/Goped	6	0.0	2	1.9	4	0.1	
Go-Cart/Golf Cart	0	0.0	0	0.0	0	0.0	
Snowmobile	4	0.0	0	0.0	2	0.1	
Off-Road Vehicle (ORV)/All-Terrain Vehicle (ATV)	6	0.0	1	1.0	1	0.0	
Other (non-registered farm equipment, construction equipment, snow plows, etc.)	84	0.7	1	1.0	7	0.3	
Truck/Bus (over 10,000 lbs. GVWR/8+ occupants/hazmat placard)	0	0.0	0	0.0	0	0.0	
Uncoded & Errors	409	3.2	14	13.6	57	2.1	
SUBTOTAL	12,650	100.0	103	100.0	2,734	100.0	

HEAVY TRUCK/BUS Gross Vehicle Weight Rating	ALL CR	ASHES	FATAL C	RASHES	INJURY CRASHES		
	Number of Heavy Trucks	% of Total	Number of Heavy Trucks	% of Total	Number of Heavy Trucks	% of Total	
10,000 lbs. or Less	95	0.6	1	1.0	5	0.2	
10,001-26,000 lbs.	5,672	37.9	23	22.3	830	32.1	
Greater Than 26,000 lbs.	8,943	59.7	79	76.7	1,746	67.5	
Uncoded & Errors	262	1.7	0	0.0	5	0.2	
SUBTOTAL	14,972	100.0	103	100.0	2,586	100.0	

	ALL CR	ASHES	FATAL C	RASHES	INJURY CRASHES		
	Number of Vehicles	% of Total	Number of Vehicles	% of Total	Number of Vehicles	% of Total	
Total Number of Vehicles in Heavy Truck/Bus Crashes	27,622		206		5,320		





	HEAVY TRUCK/BUS INVOLVED CRASH							NON-HEAVY TRUCK/BUS INVOLVED CRASH			
DRIVER HAZARDOUS ACTION Where Hazardous Citation Issued	Single Ver	nicle Crash	Multi-Vehicle Crash				Single Vehicle Crash		Multi-Vehicle Crash		
	Number of Heavy Trucks	% of Total	Number of Heavy Trucks	% of Total	Number of Non-Heavy Truck Vehicles	% of Total	Number of Vehicles	% of Total	Number of Vehicles	% of Total	
None	7	1.7	20	1.1	17	0.7	136	1.3	661	1.0	
Speed Too Fast	192	45.6	56	3.0	184	8.0	5,026	47.9	2,136	3.3	
Speed Too Slow	0	0.0	0	0.0	3	0.1	18	0.2	23	0.0	
Failed to Yield	8	1.9	375	20.1	587	25.6	371	3.5	19,515	30.2	
Disregard Traffic Control	2	0.5	86	4.6	152	6.6	113	1.1	4,966	7.7	
Drove Wrong Way	1	0.2	1	0.1	5	0.2	14	0.1	104	0.2	
Drove Left of Center	2	0.5	12	0.6	29	1.3	121	1.2	573	0.9	
Improper Passing	0	0.0	27	1.4	71	3.1	25	0.2	662	1.0	
Improper Lane Use	24	5.7	245	13.1	279	12.2	288	2.7	3,626	5.6	
Improper Turn	23	5.5	106	5.7	44	1.9	63	0.6	1,589	2.5	
Improper/No Signal	0	0.0	3	0.2	2	0.1	0	0.0	113	0.2	
Improper Backing	4	1.0	157	8.4	23	1.0	21	0.2	1,259	1.9	
Unable to Stop in Assured Clear Distance	7	1.7	577	30.9	603	26.3	357	3.4	24,416	37.8	
Reckless Driving	0	0.0	3	0.2	19	0.8	328	3.1	358	0.6	
Careless/Negligent Driving	66	15.7	40	2.1	156	6.8	2,109	20.1	2,142	3.3	
Other	80	19.0	153	8.2	114	5.0	1,304	12.4	2,257	3.5	
Unknown	5	1.2	5	0.3	4	0.2	207	2.0	231	0.4	
CITED VEHICLES SUBTOTAL	421	100.0	1,866	100.0	2,292	100.0	10,501	100.0	64,631	100.0	

	HEAVY TRUCK/BUS INVOLVED CRASH						NON-HEAVY TRUCK/BUS INVOLVED CRASH			
	Single Veh	nicle Crash	Multi-Vehicle Crash				Single Vehicle Crash		Multi-Vehicle Crash	
	Number of Heavy Trucks	% of Total	Number of Heavy Trucks	% of Total	Number of Non-Heavy Truck Vehicles	% of Total	Number of Vehicles	% of Total	Number of Vehicles	% of Total
Cited Vehicles	421	18.3	1,866	14.7	2,292	18.7	10,501	10.3	64,631	19.4
Vehicles with No Citation Issued	1,880	81.7	10,796	85.2	9,925	81.1	91,301	89.7	268,067	80.4
Vehicles with Unknown Citation	0	0.0	9	0.1	14	0.1	19	0.0	533	0.2
TOTAL VEHICLES INVOLVED	2,301	100.0	12,671	100.0	12,231	100.0	101,821	100.0	333,231	100.0



