

## **Freight Safety: 1999-2001**

This paper examines freight safety. This is defined as safety involving commercial motor vehicle, railroad trains, and shipping. Because of limited data, the report will focus only on crashes involving commercial motor vehicles and railroad-highway grade crossing crashes.

### **Commercial Motor Vehicle Crashes**

Because of the economic importance of freight, safety is of paramount consideration. The Houston-Galveston region appears to have a serious truck safety problem. From 1998 to 2001, there were 20,248 crashes involving a commercial motor vehicle. This was approximately 6% of all motor vehicle crashes in the eight-county region. Comparing these to the rest of the state is difficult. But a rough estimate can be obtained by calculating the per capita rate. Unfortunately, we only have 1999 data. In 1999, the number of commercial motor vehicle crashes per 100,000 population was 98.1 for the region while, for the State of Texas, per capita rate was 81.2. Thus, the region has a higher share of commercial motor vehicle crashes. Unfortunately, there is not good data on the number of commercial motor vehicles so that it's not clear whether the region's rate is high when compared to a more direct baseline.

What may be of more concern is that the numbers keep increasing. In 1998, there were 4,879 crashes involving commercial motor vehicles. By 1999, this had increased to 4,984, to 5,144 in 2000 and to 5,241 in 2001. This represents an annual growth rate of 2.4%. The growth rate is higher than the population growth rate over the period (1.5%), but about the same as the growth in vehicle miles traveled (2.7%).

As would be expected, a disproportionate number of commercial motor vehicle crashes occur on freeways and other major arterials (figure 1). For example, about 35% occur on the freeways themselves and about 59% occur on the State road system (interstate highway, state roads, and Farm to Market roads; this is in contrast to 47% of all crashes occurring on these types of roads. Because of the size of the vehicles, a large amount of their travel routes must be on the larger roads. Virtually all of the major hot spots that have been identified are on the freeways (figure 1).

Progress has been made in recent years due to increased weight enforcement on overweight trucks by the Houston Police Department and a "no trucks in the left lane" policy on IH-10 East and SH 225. From all accounts, severe truck crashes have been reduced on the eastern part of the region, primarily due to these policies. Nevertheless, more progress is needed.

### **Contributing Factors**

Between 1999 and 2001, there were 15,369 crashes involving a Commercial Motor Vehicle (CMV). In these crashes, 9% involved only one vehicle, 77% involved two vehicles, 10% involved three vehicles, and 4% involved four or more vehicles.

The State crash form does not have a field on who was at fault for the crash. But, it does have a field on contributing factors to the crash. For each vehicle and driver involved in a crash, any contributing factors are listed. Generally, the driver who was most at fault is listed as having a contributing factor whereas the other drivers are not. However, it is possible to have two (or more) drivers listed as having a contributing factor (e.g., one is speeding while the other runs a

red light). Between 1999 and 2001, there were 15,369 crashes involving one or more commercial motor vehicles (CMV).

We examined the contributing factors for vehicle/drivers 1, 2 and 3 only for these crashes since these account for 96% of all CMV crashes.. Of the 15,369 CMV crashes, vehicle 1 was a commercial motor vehicle in 11,403 of these, vehicle 2 was a commercial motor vehicle in 9,268, and vehicle 3 was a commercial motor vehicle in 1,434. In 5,511 crashes (or 35.8%), both vehicles 1 and 2 were commercial motor vehicles. In 974 crashes, vehicles 1 and 3 were commercial motor vehicles. In 787 crashes, vehicles 2 and 3 were commercial motor vehicles and in 517 crashes, vehicles 1, 2 and 3 were commercial motor vehicles. In general, there is greater than one-third likelihood that a CMV crash will involve two or more commercial motor vehicles.

In all, 19,591 contributing factors were listed for these crashes of which the CMV drivers accounted for the most (60.6% v. 39.4%). Table 1 lists the contributing factors for CMV drivers drivers 1, 2 and 3 who were involved in a CMV crash:

**Table 1**  
**Contributing Factors for CMV Drivers 1, 2 & 3**  
**Involved in a Crash: 1999-2001**

<u>Factor</u>	<u>Frequency</u>	<u>% of Factors Listed</u>
'Other' factor/N.I.	3,963	33.4%
Speeding	3,894	32.80%
Failing to yield ROW	1,273	10.7%
Improper turn	818	6.9%
Running red light	639	5.4%
Following too close	373	3.1%
DUI	287	2.4%
Fail to stop at stop sign	220	1.9%
Improper passing	172	1.4%
Other mention	239	2.0%

The most frequent factor listed was 'other', essentially no information being provided. The most mentioned specific factor was speeding, both above the speed limit and within the speed limit but unsafe (33.1%). This is, by far, the most cited contributing factor suggesting that about one-third of all CMV drivers involved in a crash were speeding. After this factor, the next most common reasons were failing to yield the right-of-way (10.8%), making an improper turn (6.9%), running a red light (5.4%) and following too close (3.0%). As with non-CMV drivers, speeding is the dominant factor involved in crashes when the CMV driver is seen 'at fault'.

We also analyzed the passenger vehicles/drivers involved who were involved in CMV crashes to see if there were different behavioral factors. Table 2 presents the results in the same order as table 1:

**Table 2**  
**Contributing Factors for Passenger Drivers 1, 2 & 3**  
**Involved in a Crash: 1999-2001**

<u>Factor</u>	<u>Frequency</u>	<u>% of Factors Listed</u>
'Other' factor/N.I.	2,897	37.6%
Speeding	2,968	38.5%
Failing to yield ROW	371	4.8%
Improper turn	221	2.9%
Running red light	399	5.2%
Following too close	211	2.7%
DUI	235	3.0%
Fail to stop at stop sign	156	2.0%
Improper passing	155	2.0%
Other mention	100	1.3%

Comparing tables 1 and 2, the distribution of contributing factors by passenger drivers is somewhat similar to that of the CMV drivers. But, there are some important differences. The CMV drivers were more likely to have failed to yield the right-of-way (10.7% v. 4.8%), more likely to have made an improper turn (6.9% v. 2.9%), and more likely to have been following too close (3.1% v. 2.7%). Conversely, passenger drivers are more likely to have been speeding than the CMV drivers (37.6% v. 33.4%), more likely to have been driving under the influence of alcohol or drugs (3.0% v. 2.4%) and more likely to have made an improper pass (2.0% v. 1.4%). For the other factors, there were no substantial differences.

Thus, a pattern of behavior involved in CMV crashes starts to become clearer. First, speed is a major factor in a CMV crashes, whether it is by the CMV drivers or the passenger driver. In a typical crash involving a CMV driver, the passenger driver is more likely to be speeding. But, speed is the dominant factor associated with a sizeable proportion of crashes whether by the CMV or passenger vehicle driver (33.8% of all drivers were seen as speeding). After speed, the CMV drivers are seen as failing to yield the right-of-way, more likely to have made an improper turn, or more likely to have been following too close than the passenger vehicle driver. Conversely, the passenger vehicle drivers are seen as more likely to have been DUI and more likely to have made an improper pass.

### **Policy Options**

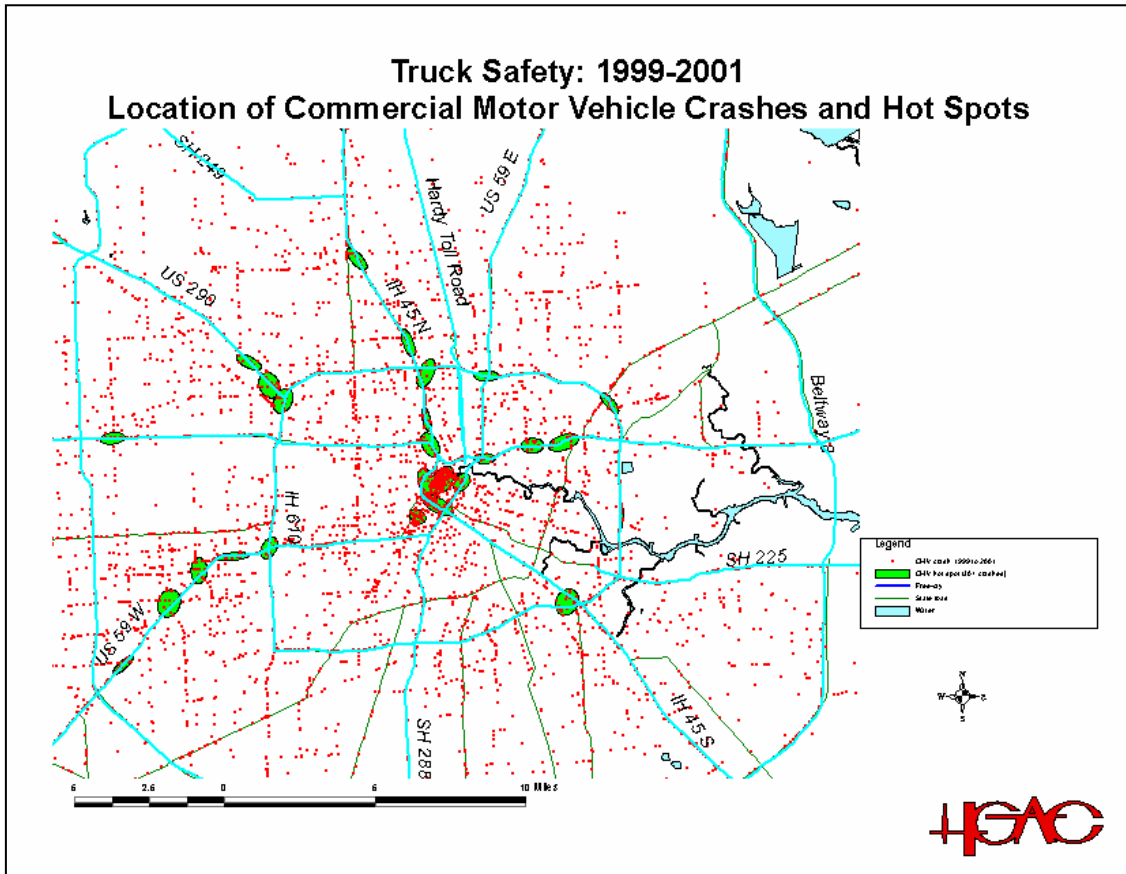
1. Speed enforcement will substantially reduce the number of crashes
2. For the CMV drivers, enforcement of improper turns and of following too close should help reduce CMV crashes
3. For the passenger drivers, enforcement of illegal passing will help reduce CMV crashes.
4. For both types of drivers, enforcement of DUI should help reduce crashes.

### **Highway-Rail Grade Crossing Collisions**

A major indicator of how railroad safety interfaces with road safety is the number of highway/railroad crashes. Between 1990 and June 2003, there were 1,183 crashes involving a railroad train and a motor vehicle in the eight-county region, an average of about 95 a year. Unfortunately, for State and local level comparisons, there are not good baseline data.

Consequently, the region's highway/rail safety is compared to the State total. Regarding rail safety, the region has a relatively severe problem, which appears to be getting worse. According to the Federal Railroad Administration, from 2000 to 2002, there were 247 highway/rail crashes in the region (there was no information for Chambers County). These involved 13 fatalities and 74 injuries. The 247 crashes accounted for 23.2% of the State's total highway/rail crashes.

Figure 1:



However, compared to 10-years earlier (1990-1992), the percentage of highway/railroad crashes in the region decreased only slightly, but has increased as a share of the state's rail-highway grade crossing crashes; between 1990-92, the region had 252 crashes and accounted for only 15.8% of the State's total highway/rail crashes (Federal Railroad Administration database, 2003; <http://safetydata.fra.dot.gov/officeofsafety/>). Figure 2 shows the location of the crashes.

Part of this proportional increase can be explained by the region's increasing share of population. In 2000, for example, the region had 22.3% of the State's population. But, the fact that total highway/rail crashes in Texas decreased over the 10-year period from 1594 to 1073, whereas the region showed no changes in these types of crashes, suggests that safety measures have not been sufficiently taken to reduce the number of highway/rail crashes.

H-GAC has identified eight hot spots where there were eight or more highway/rail crashes between 1990 and June 2003 (figure 3):

1. Knapp Road and a BNSF (Burlington Northern Santa Fe) line in Brazoria County (13 crashes)
2. Almeda Genoa Road and a BNSF line in Harris County (13 crashes)
3. Market Street and a UP (Union Pacific) line in Harris County (12 crashes)
4. Antoine Drive and a BNSF line in Harris County (10 crashes)
5. FM 1960 and a BNSF line in Harris County (9 crashes)
6. Lawndale Road and a BNSF line in Harris County (9 crashes)
7. Hillcroft and a UP line in Harris County (8 crashes)
8. Park Terrace/Shady Park Drive and a UP line in Harris County (8 crashes)

There are 22 more locations where there were 5-7 crashes between 1990 and June 2003. In addition, there are small areas (hot spots) where there are many crashes involving trains and motor vehicles, including the East End of Houston, the Pasadena-La Porte area, and the US 90A corridor.

In short, rail-highway grade crossing safety is an important problem. To channel resources efficiently, H-GAC has placed a priority on improving safety at these locations. Consequently, all eight locations are recommended for inclusion in the RTP as potential projects.

**Figure 2:**

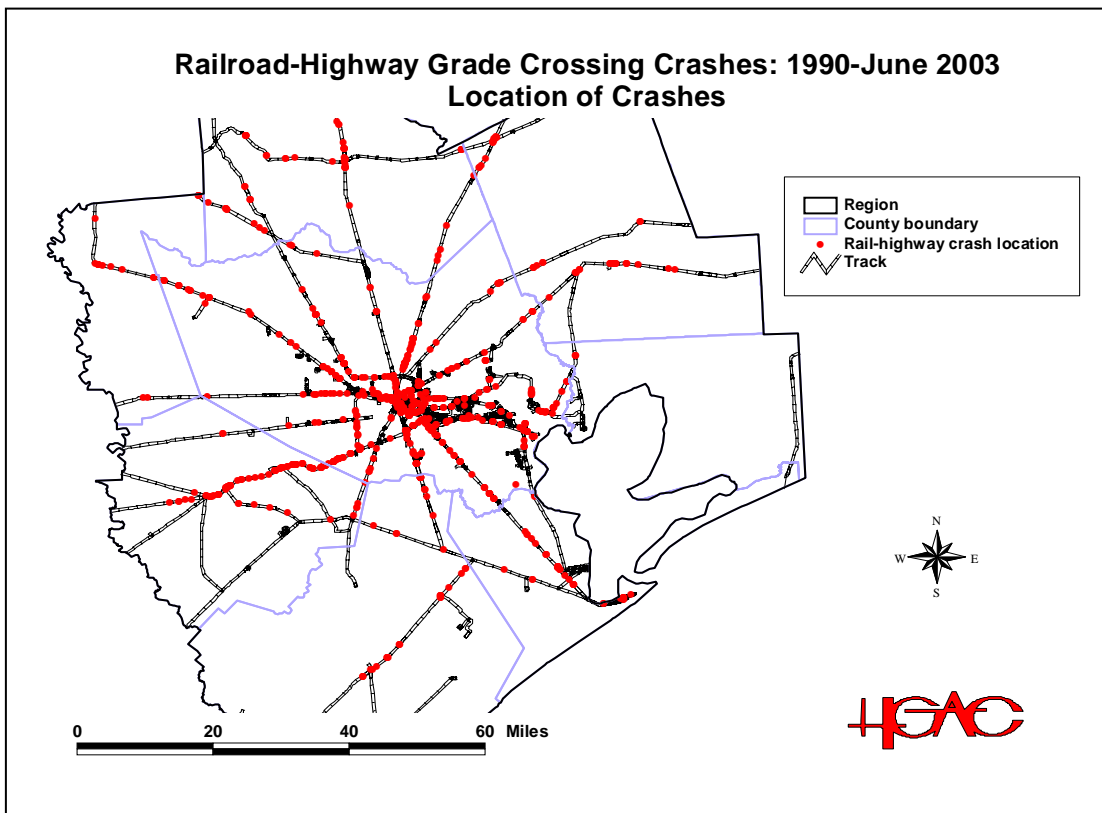


Figure 3:

