

IMPROVING CMV SAFETY ON RURAL ROADS IN TEXAS: From Data to Information for Law Enforcement and Large Truck Drivers

THE PROBLEM:

Large Truck Crashes in Texas

- Texas is one of the top 10 states for the number of fatal truck and bus crashes
- Over 50 percent of Texas truck vehicle miles traveled is travelled on rural roadways based on 2019 and 2020 estimates.¹
- Overall in Texas, crashes on rural roads are nearly 3 times as likely to be fatal compared to urban roads.²
- Rural roadways carry an increased risk for fatal and serious injury crashes because there are fewer roadway design safety features and traffic controls, the posted speed limits are higher, and congestion is lower.
- The heavy weight of trucks can increase crash severity.

**4% of truck tractor crashes are rural vs
10% of heavy truck/pick-up crashes and
8% of passenger vehicle crashes**

PROJECT OVERVIEW: To address large truck tractor (TT) and heavy truck/pick-up (HT/PU) crashes on rural roadways in Texas, this project involved developing data-driven tools for drivers/fleet operators and law enforcement officers. These tools include information on risk factors for higher severity crashes and visualizations designed to identify rural roadways that are more prone to crashes involving trucks.



PROJECT DATA:

Vehicle Type & Geographical Factors

This project compared crashes involving truck tractors (TT) with heavy truck/pick-up (HT/PU)³ and passenger car (PC) crashes. It also compared rural, fringe, and urban crashes that were defined based on population size^{4,5} and extraterritorial jurisdictions.⁶ Fringe crashes occur in buffer areas between rural and urban areas. Generally, crashes involving TTs and HT/PUs were increasingly more severe along a continuum moving from urban (25%) to fringe (6%) to rural (10%) areas. But percentages varied by single versus multi-vehicle crashes. High risk driving behaviors also varied by vehicle type and geographic locations.

The percentage of severe crashes was highest at 13% for multi-vehicle crashes involving truck tractors in rural areas followed closely at 11% by heavy truck/pick-up crashes in rural areas.

SPEEDING in rural vs fringe and urban	DISTRACTION in rural vs fringe and urban	IMPAIRMENT in rural vs fringe and urban	FATIGUE in rural vs fringe and urban	NO RESTRAINT USE in rural vs fringe vs urban
TT: 16% vs 7% & 2%	TT: 9% vs 12% & 12%	TT: 4% vs 7% & 2%	TT: 4% vs 2% & 1%	TT: 3% vs 2% & 1%
HT/PU: 13% vs 6% & 1%	HT/PU: 12% vs 16% & 14%	HT/PU: 4% vs 3% & 2%	HT/PU: 5% vs 2% & 1%	HT/PU: 5% vs 2% & 1%
PC: 16% vs 9% & 2%	PC: 7% vs 11% & 12%	PC: 6% vs 5% & 3%	PC: 4% vs 2% & 1%	PC: 3% vs 2% & 1%

Single Vehicle (SV); Motor Vehicle (MV); Truck Tractor (TT); Heavy Truck/Pick-Up (HT/PU)³

¹ FMCSA. 2019 CMV Traffic Safety Fact Sheet. Available at: <https://www.fmcsa.dot.gov/sites/fmcsa.dot.gov/files/docs/safety/data-and-statistics/473411/cmvttrafficsafetyfactsheet2018.pdf>

² TxDOT. (2020). Rural and Urban Crashes and Injuries by Severity https://ftp.txdot.gov/pub/txdot-info/trf/crash_statistics/2020/11.pdf

³ >10,000 pounds but not a truck tractor

⁴ U.S. Census. Geography Tools. Retrieved from <https://www.census.gov/programs-surveys/acs/geography-acs/geography-tools.html>

⁵ U.S. Census. 2013-2017 ACS 5-year Estimates. Retrieved from <https://www.census.gov/programs-surveys/acs/technical-documentation/table-and-geography-changes/2017/5-year.html>

⁶ <https://statutes.capitol.texas.gov/Docs/LG/htm/LG.42.htm>

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Driving Behavioral Factors that Increase Crash Severity in Rural/Fringe Areas

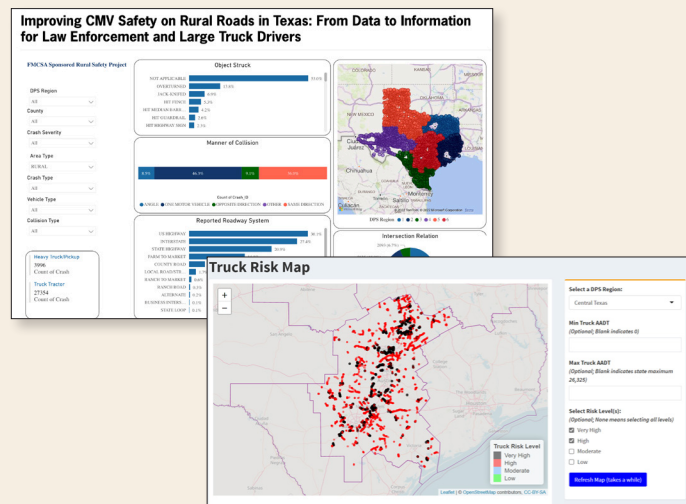
	Driver Age	Sex	No Seatbelt Use	Distracted	Speeding	Drug/ Alcohol Impairment	Failed to Yield Right of Way	Improper Turn	Improper Lane Change	Faulty Evasive Action	Failed to Keep in Lane
Single Vehicle Crashes											
SV TT Driver	40-64 years		X			X				X	X
SV HT/PU Driver			X			X					X
Multi-Vehicle Crashes (TT with a PC)											
MV TT Driver – Intersection	25-64 years		X			X	X				
MV PC Driver – Intersection	65+ years		X		X	X	X				
MV TT Driver – Non- Intersection	25-64 years		X			X	X	X			
MV PC Driver – Non- Intersection	65+ years		X	X	X	X			X		
Multi-Vehicle Crashes (HT/PU with a PC)											
MV HT/PU Driver – Intersection	25+ years	Male				X	X			X	
MV PC Driver – Intersection			X		X	X	X				
MV HT/PU – Non- Intersection	40-65 years		X	X		X				X	
MV PC Driver – Non- Intersection	>65 years		X		X	X		X			

*Based on adjusted statistical models⁷; Single Vehicle (SV); Multi-vehicle (MV); Truck Tractor (TT); Heavy Truck/Pick-Up (HT/PU); Passenger Car (PC)

A SOLUTION:

Tools for Fleet Operators/Drivers, Law Enforcement, and Safety Stakeholders

- Crash Data Dashboard
- Fatal Crash Diagrams
- Map Tools to Identify High-Risk Roads for Truck Crashes
 - Web-based version (users can filter roadways by amount of truck travel and risk level)
 - Google Earth Map version



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⁷ Data from the Texas Crash Records Information System (CRIS) for 2014-2018 and abstracted on April 2, 2020.