Identifying The Most Important Factors Associated With Severe CMV Crashes

Improving CMV Crash Reporting And Training Of Law Enforcement Officers

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Identifying The Most Important Factors Associated with Severe CMV Crashes

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Funded By: Federal Motor Carrier Safety Administration (FMCSA)

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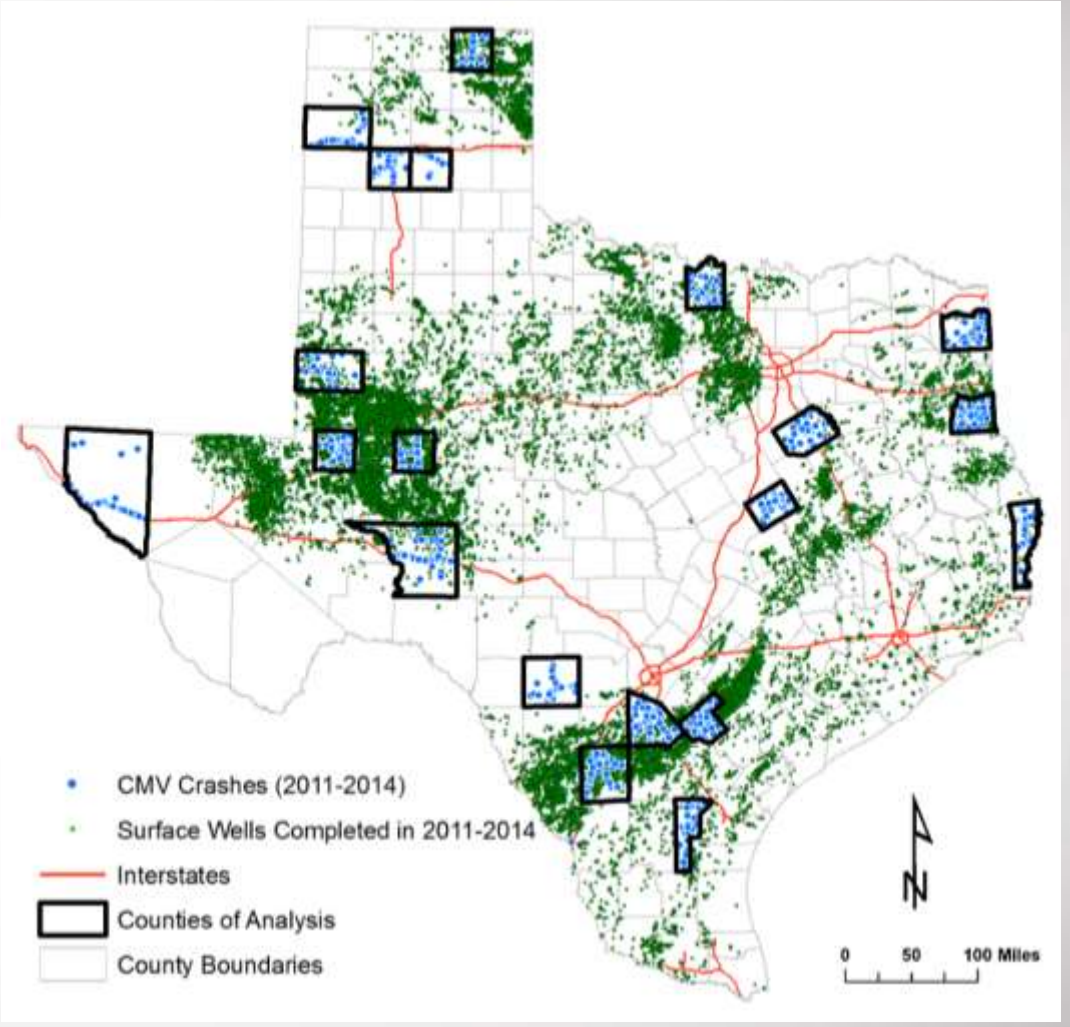
Project Goal

- Combine safety data sources
- Evaluate top crash factors
- Compare oilfield & non-oilfield locations
- Visualize CMV crash risk
- Inform safety efforts



Crash severity measures…

- Based on reported injuries/fatalities
  - Estimated Crash Cost
    - Using National Safety Council economic impact values
  - KABC/O

CMV and passenger vehicle crash on I-10, Sutton County, ca. 2012. Image by D. Bierling, Texas A&M Transportation Institute.

‘Stacked’ data…

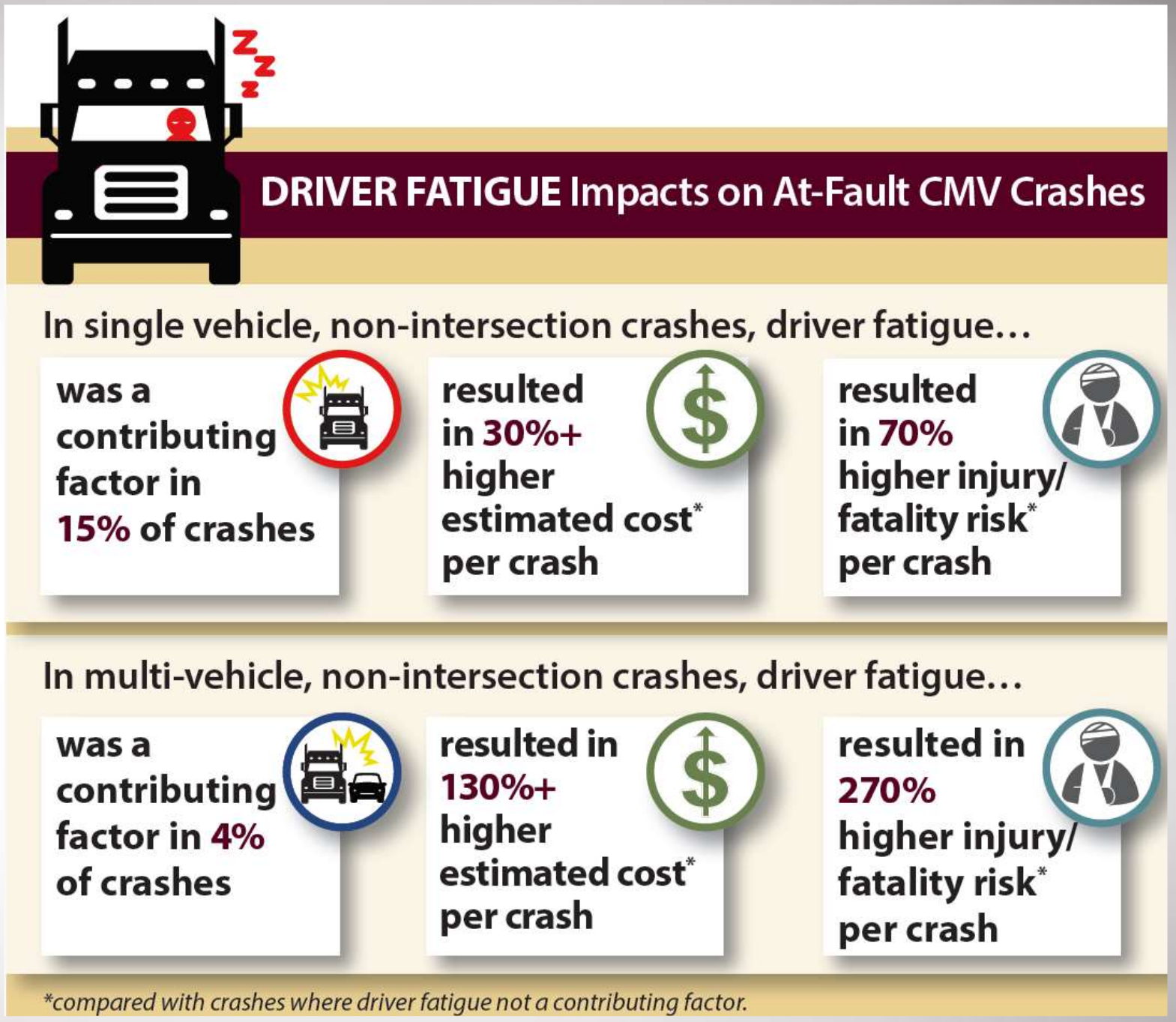
1. Physical context – Location, geographic setting
2. Roadway properties – Infrastructure, management, administration
3. Driving environment
4. Driving apparatus – Vehicle characteristics
5. Driver characteristics
6. Driver behaviors
7. Crash parameters

Driver behaviors considered…

Variable Group	Variable
Contributing factors	Backing-related
	Parking-related
	Passing-related
	Lane use-related
	Stopping-related
	Turning-related
	Distracted driving-related
	Speed-related
	Failure to yield right-of-way (FTYROW)
	Driver fatigued, ill, or impaired
	Dangerous driving-related
	Load securement or size-related
	Other moving contributing factors
	Vehicle defects-related
Citations	Alcohol or drugs
	Unsafe backing
	Disregarded sign or signal
	Driving where prohibited
	FTYROW - Driveway, intersection, stop sign, or signal
	FTYROW - Turning-related
	FTYROW - Other
	Intoxicated assault
	Load securement, size, or weight
	Other moving violations
	Passing or lane use-related
	Speed-related
	Vehicle or equipment defects

- Contributing factors, vehicle defects, and citations from crash reports
- Grouped by frequency and type/similarity
- Vehicle defects grouped in one category (low individual frequencies)
- Also used for at-fault assignment

Results: Significant Driver Behaviors



Results: Significant Driver Behaviors

IMPROPER STOPPING
Impacts on At-Fault CMV Crashes

In intersection crashes, stopping problems…

were a contributing factor in 18% of crashes

resulted in 60%+ higher estimated cost* per crash

resulted in 170% higher injury/fatality risk* per crash

**compared with crashes where stopping problems were not a contributing factor.*

IMPROPER LANE USE
Impacts on At-Fault CMV Crashes

In single vehicle, non-intersection crashes, improper lane use…

was a contributing factor in 31% of crashes

resulted in 30%+ higher injury/fatality risk per crash

Results: Significant Driver Behaviors

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OVERTURNS/ROLLOVERS in At-Fault, CMV, Single-Vehicle Crashes…

- were a contributing factor in **40%** of crashes
- resulted in **80%** higher estimated cost* per crash
- resulted in **110%** higher injury/fatality risk* per crash

**compared with crashes where overturns/rollovers did not occur.*

Results: Significant Driver Behaviors

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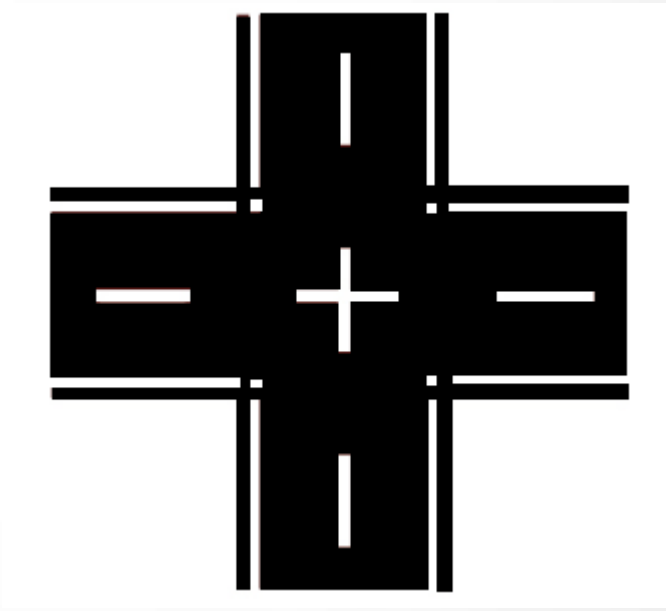
At-Fault CMV Crashes Involving Multiple Vehicles…

resulted in nearly 50% higher estimated costs compared to single-vehicle crashes

Results: Oilfield Measures

- Oilfield/non-oilfield measures did not retain significant relationships with at-fault CMV crash severity, after accounting for other variables in models
  - Unexpected result
  - Crash frequencies in oilfield areas are higher, but not severity per crash

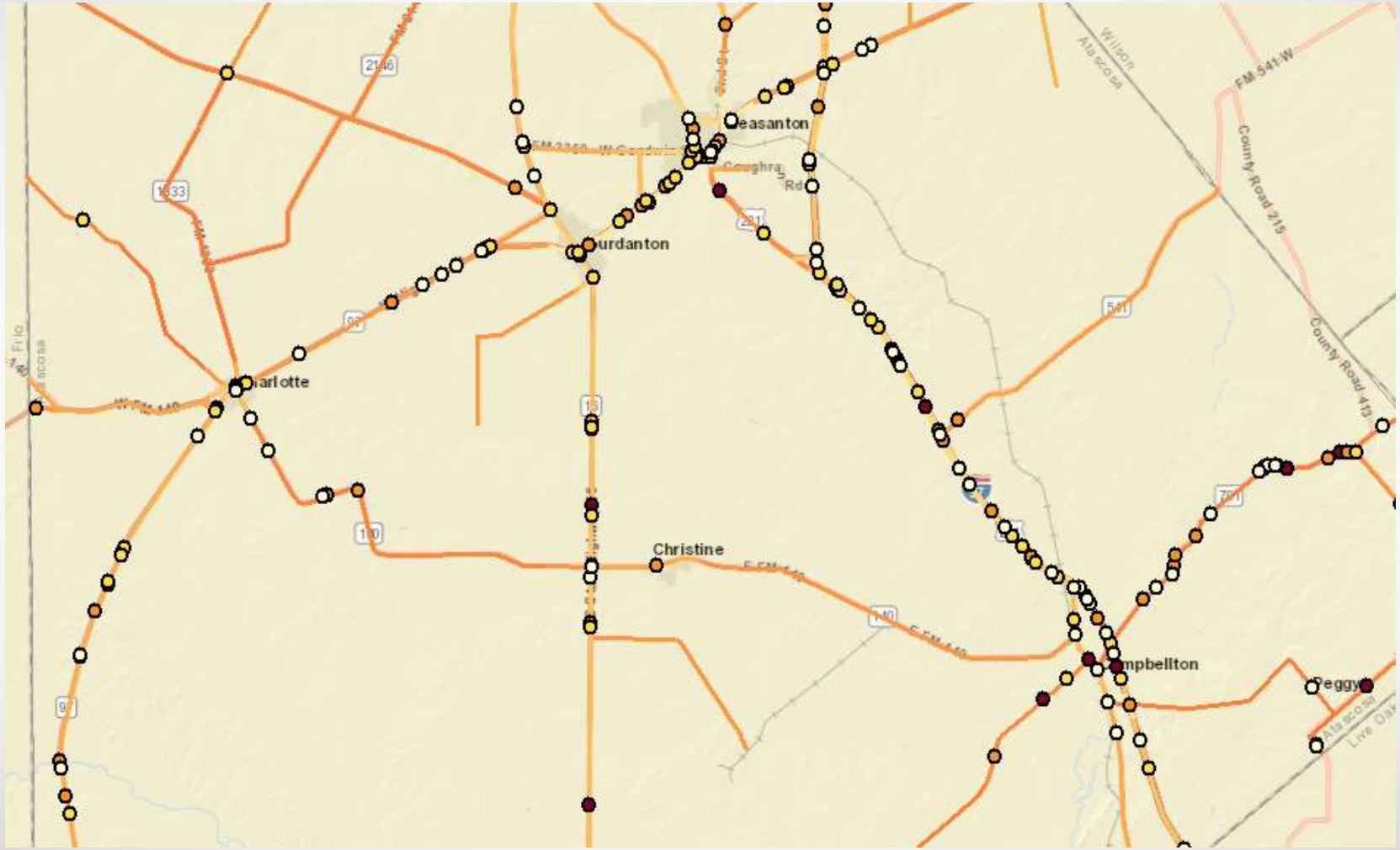
Other Results



Other Results

- The following were also associated with increased at-fault CMV crash severity (depending on model):
  - Lower socio-economic status of crash location
  - Low/intermediate flex road surface (compared to high flex road surface); load-limited roads
  - Van cargo body style (compared to other styles)
  - Heavier (5+ ton) CMV
  - Dark or nighttime crashes (compared to light/day)
  - Intrastate carrier (compared to interstate)

Application – Mapping example



Atascosa County, Texas

http://www.arcgis.com/home/webmap/viewer.html?webmap=275a3ab6e5c84674a8ced486762f9b66&extent=-110.8984,24.9276,-89.2004,37.2227

Texas A&M Transportation Institute

Improving The Collection And Reporting Of Large Truck Crash Data In CRIS

Eva Shipp, PhD-Principal Investigator and Amber Trueblood, DrPH-Co-Principal Investigator

Project Team: David Bierling, Paige Ericson-Graber, Jon Graber, Ashesh Pant, Marcie Perez, Jena Prescott, Lingtao Wu

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Background

- Potential underreporting was identified in a prior study
- Accurate large truck crash statistics are crucial for resource allocation and determining countermeasures for protecting the general public

Project Goal

- Utilize data from CRIS to examine the degree to which large truck crashes are underreported in Texas
- Obtain information from LEOs, TxDOT and DPS, and third party data service providers on potential barriers to reporting large truck crashes.
- Development a training and communications plan and a tip card addressing large truck crash reporting for law enforcement.

Project Tasks

Develop a review panel composed of large truck stakeholders to guide the project.

Evaluate crash data to identify large truck crashes.

Conduct focus groups to identify large truck crash reporting barriers with LEOs, agencies, and third parties.

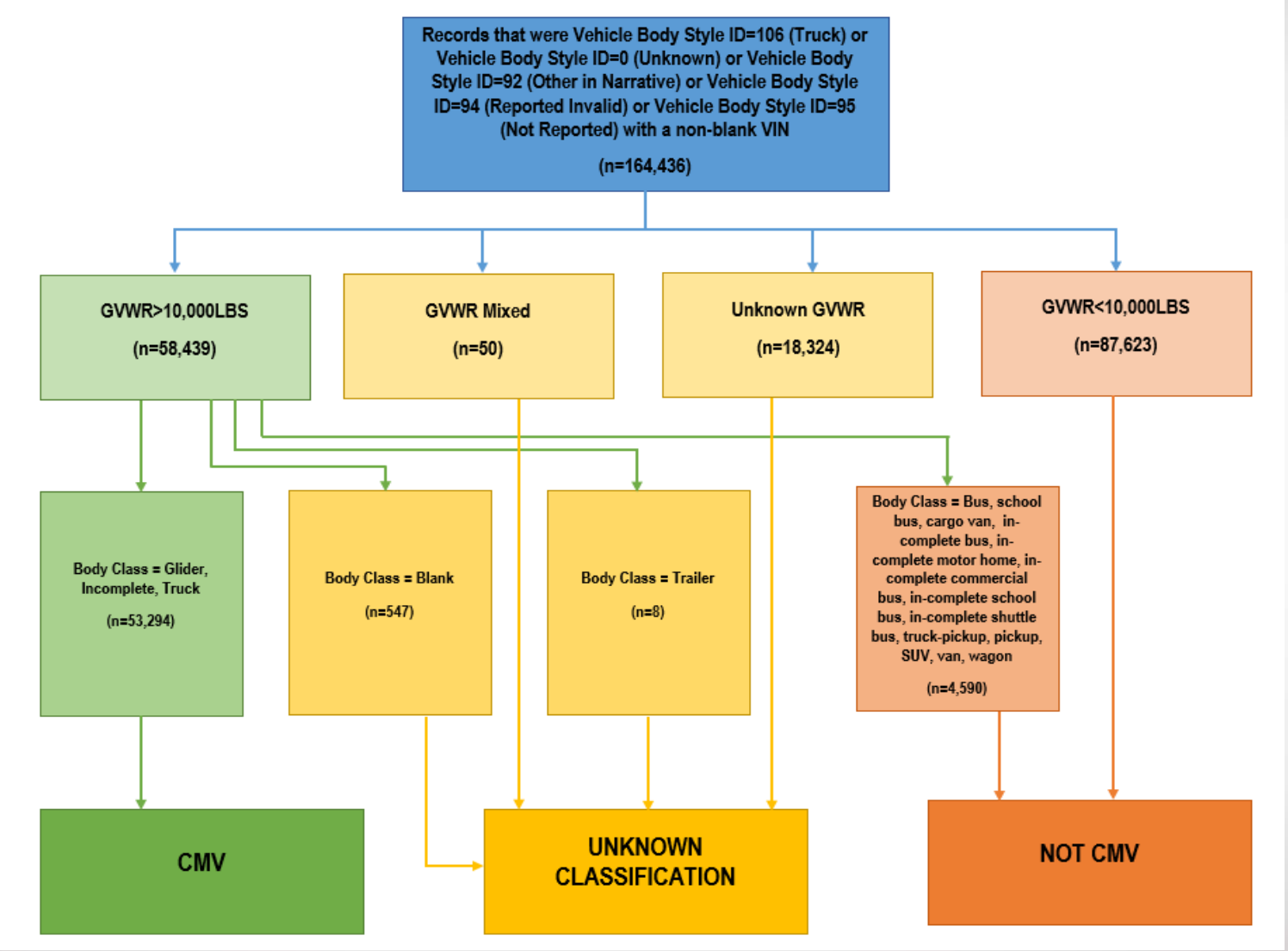
Develop a training and communications plan to help improve large truck crash reporting for LEOs, TxDOT, DPS, and other agencies.

Develop a tip card for LEOs to carry to easily identify large truck crashes.

Crash Analysis Findings: VIN Decoder

- 229,921 crashes identified as potentially involving large trucks
  - 75.7% had a VIN that could be run through the NHTSA Batch VIN Decoder
  - 24.4% were not run through the decoder: no VIN, not TxDOT reportable, or were hit-and-runs.

Crash Analysis Findings: VIN Decoder



Crash Analysis Findings: Modeling

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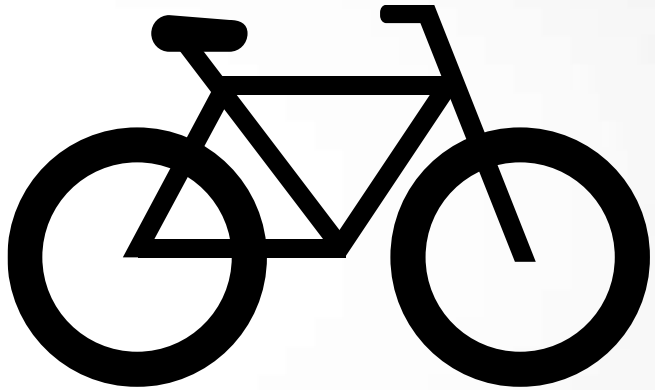

Crash Analysis Findings: Modeling

Focus Group Findings

- Training was identified as a significant barrier
  - What is a CMV?
    - Variations between State DOT, State, and Federal Definitions
  - What is the difference between interstate and intrastate commerce?
  - Where do they obtain the information for the CMV section?
  - How to process rental trucks (e.g., Penske)?
- Improvements to crash reporting forms and electronic systems
- Promotion of data linkage where feasible

Tasks In-Progress

Develop a training and communications plan to help improve large truck crash reporting for LEOs, TxDOT, DPS, and other agencies.

Develop a tip card for LEOs to carry to easily identify large truck crashes.

Questions?