



Enhancing Data Driven Enforcement Through Partnerships With Universities

2024 Northeast Commercial
Vehicle Safety Summit

UMassAmherst
The Commonwealth's Flagship Campus

Traffic Safety Research Program

Housed in ...

- University of Massachusetts Amherst
 - College of Engineering
 - Department of Civil & Environmental Engineering
 - UMass Transportation Center

Support highway safety through combined multidisciplinary approach

Scientific data-driven
problem
identification,
program design, and
evaluation



Traditional highway
safety practices
(engineering,
enforcement &
education)



Project Experience

Safety Data Warehousing

Data Analysis & Technical Assistance

Web Data Tool Development

Human Subject Survey Research & Administration

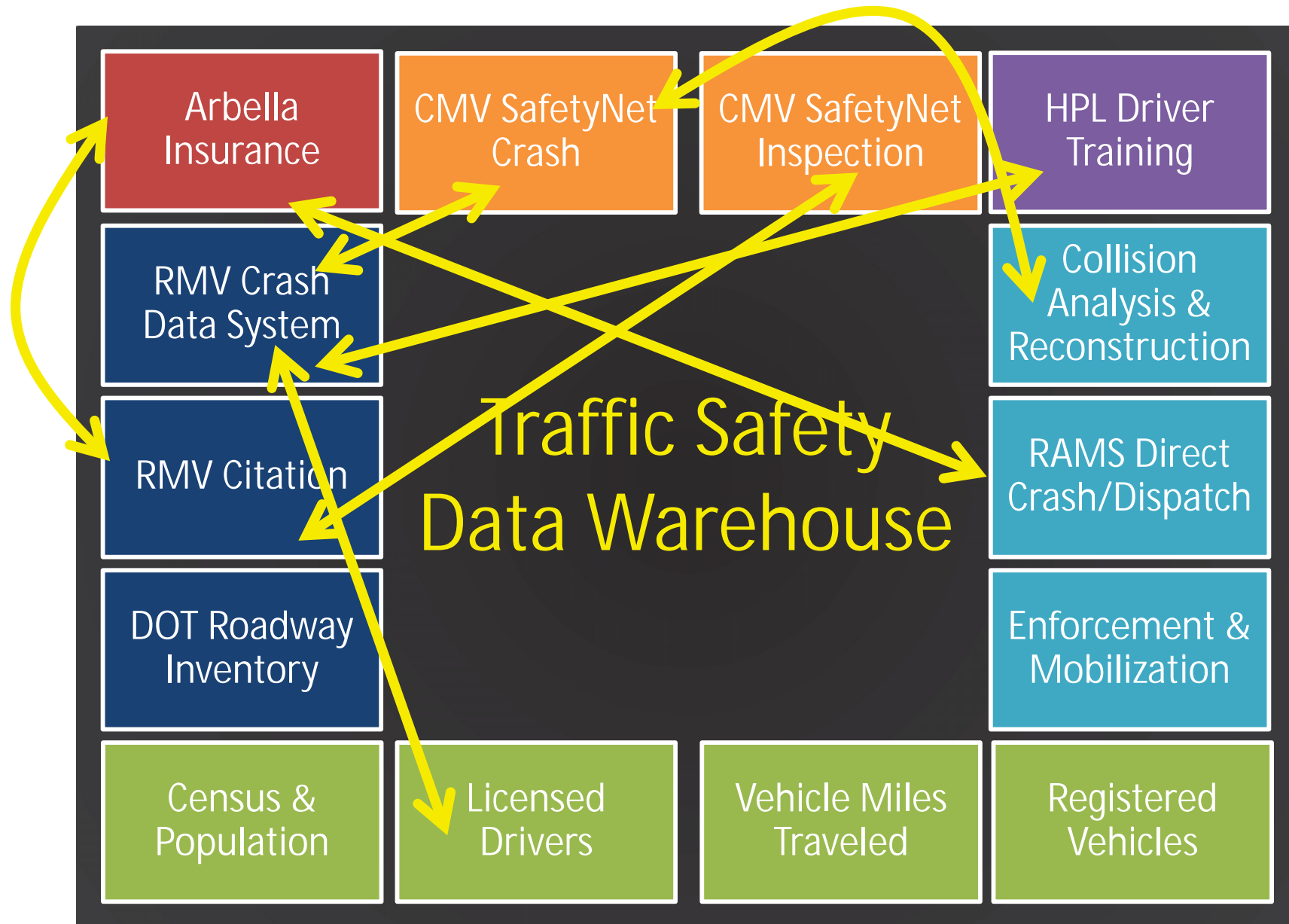
Data Quality Assessments

Strategic Planning Development

Curriculum Development & Online Training Creation

Traffic & Pedestrian Data Collection





What Resources/Skills Do Universities Have

Data Warehousing



Data Analysis



GIS Expertise



Training



Marketing/ Demographic Research



Problem Identification



Program Evaluation



Stakeholder Outreach



Event Organization



What Types of Services Can Universities Provide

Field Data Collection

CVSP Development

Grant Writing

Crash & Inspection
Data Analysis

Crash Mapping &
Spatial Analysis

Problem
Identification &
Visualizations

Online Resource
Toolkits

Curriculum
Development

Web-Based Data
Tools

Where To Find University Support

University Transportation Centers

University Departments

- Engineering
- Public Health
- Computer Science
- Criminal Justice
- Education
- Geographic Information Science and Technology
- Other Academic Departments

Traffic Records Coordinating Committees

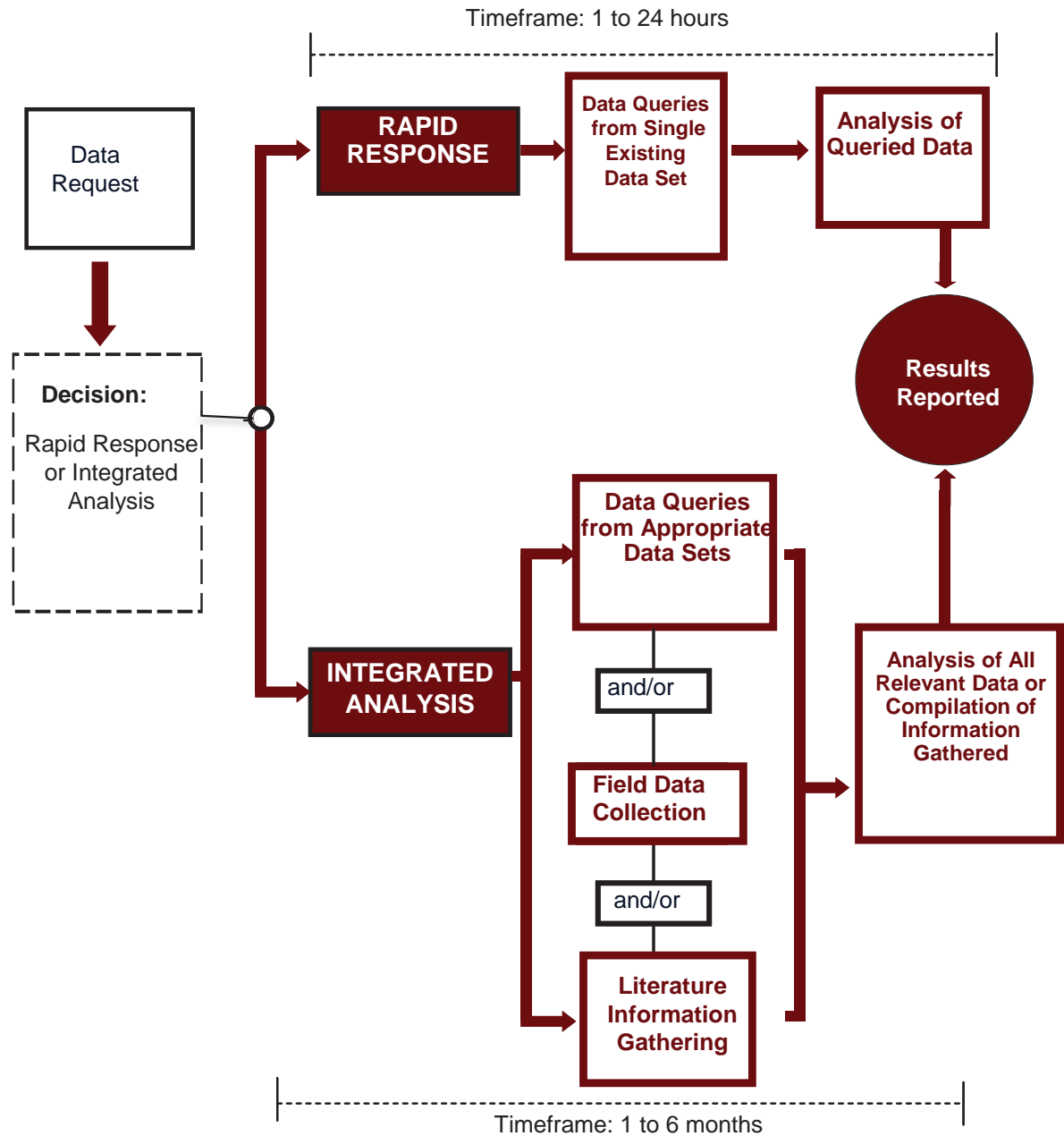
Professional Organizations/Conferences [Institute of Transportation Engineers (ITE), Crime Analyst Associations, Transportation Research Board, Lifesavers]

FMCSA Regional Offices

Other

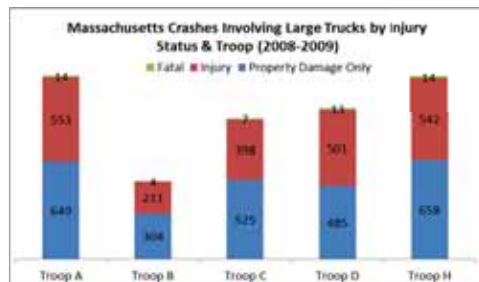
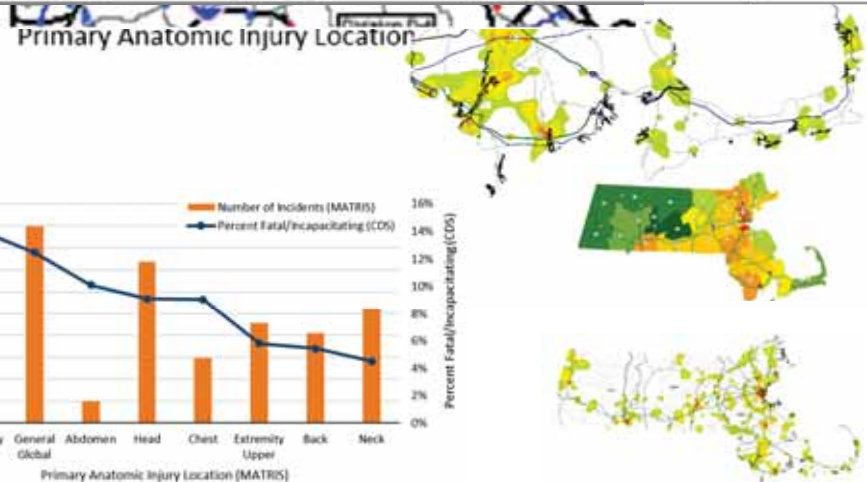
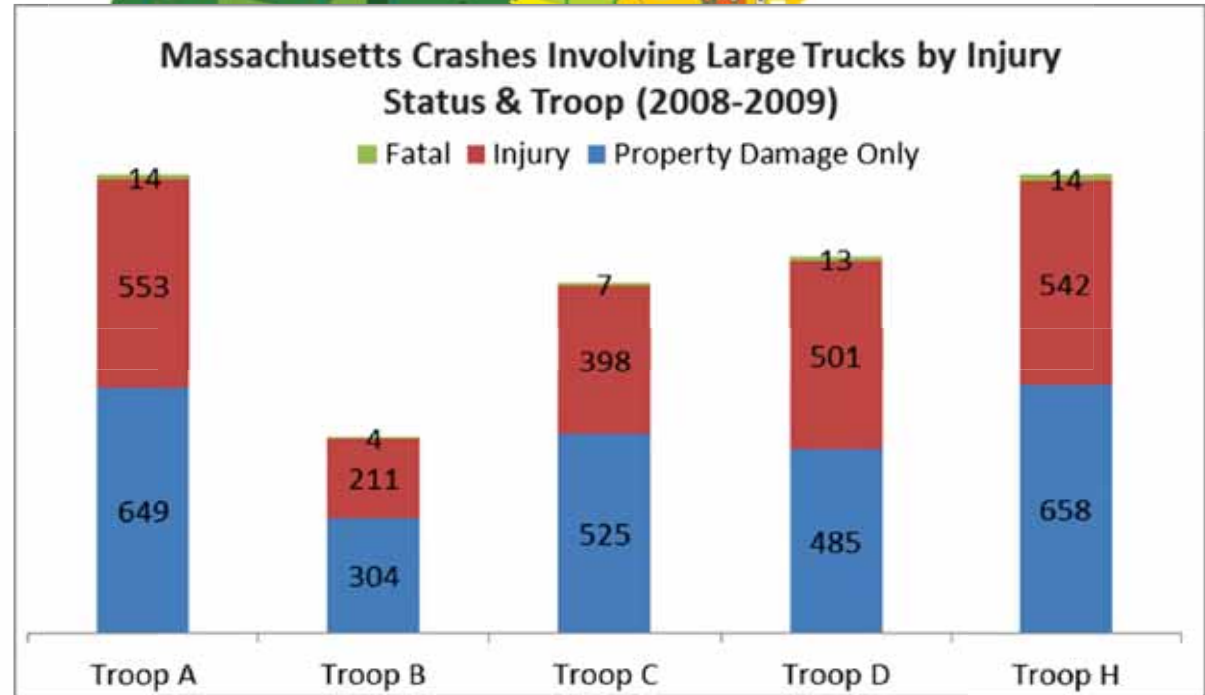
Technical Assistance Center

TS/TAC - Conceptual Framework



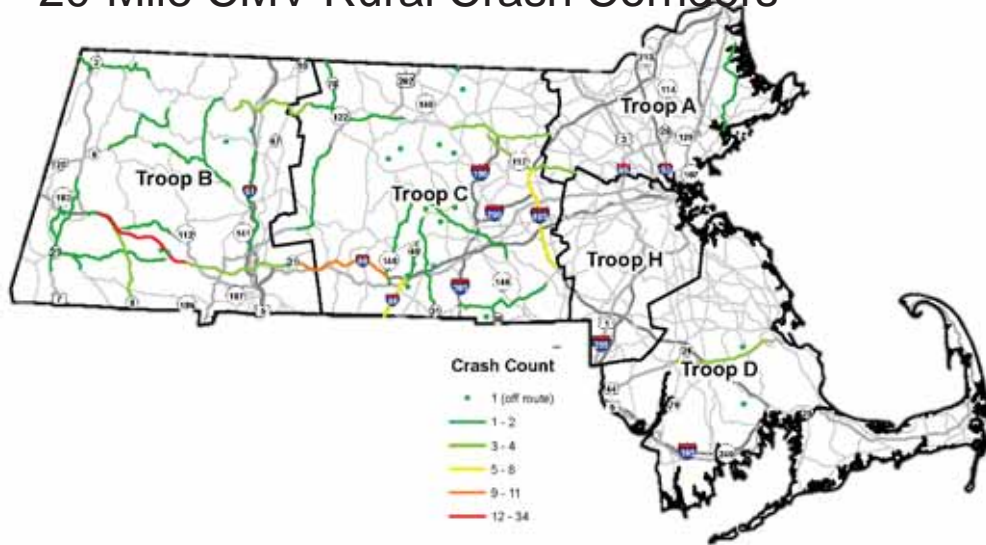
Commercial Vehicle Safety Plan

- Developed & implemented by MA State Police with support from UMassSafe
- Goals, Trend Analysis, Problem Identification, Crash Reduction Plan & Monitoring Plan
- Methodology has evolved over time based on feedback of agency usability and technology advancements

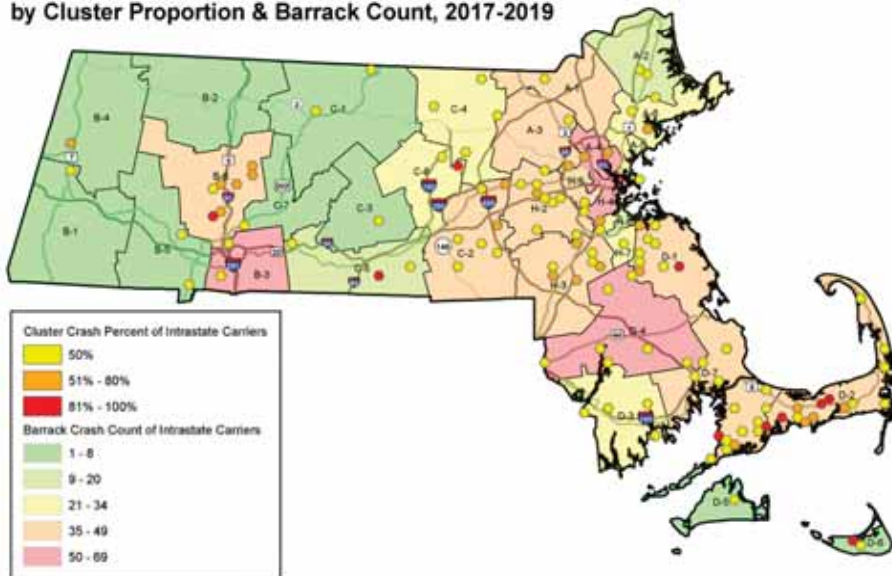


Using Data to Guide Safety Programming

20-Mile CMV Rural Crash Corridors



Massachusetts Intrastate Carrier CMV Crashes by Cluster Proportion & Barrack Count, 2017-2019

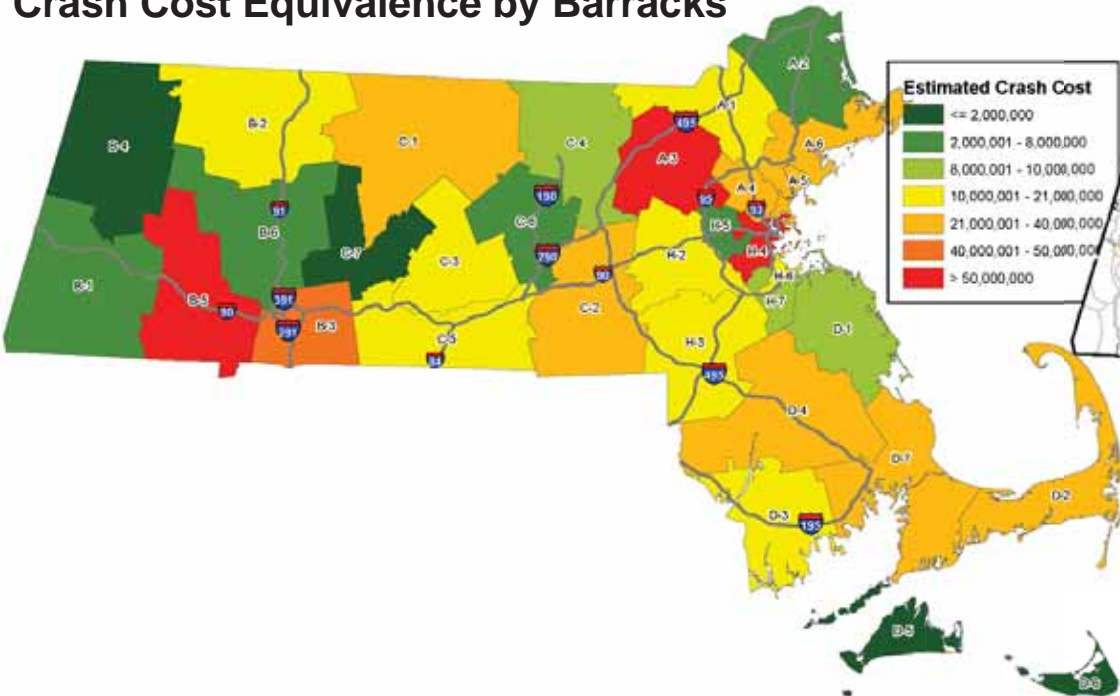


Problem Identification of Intrastate Carrier Crashes

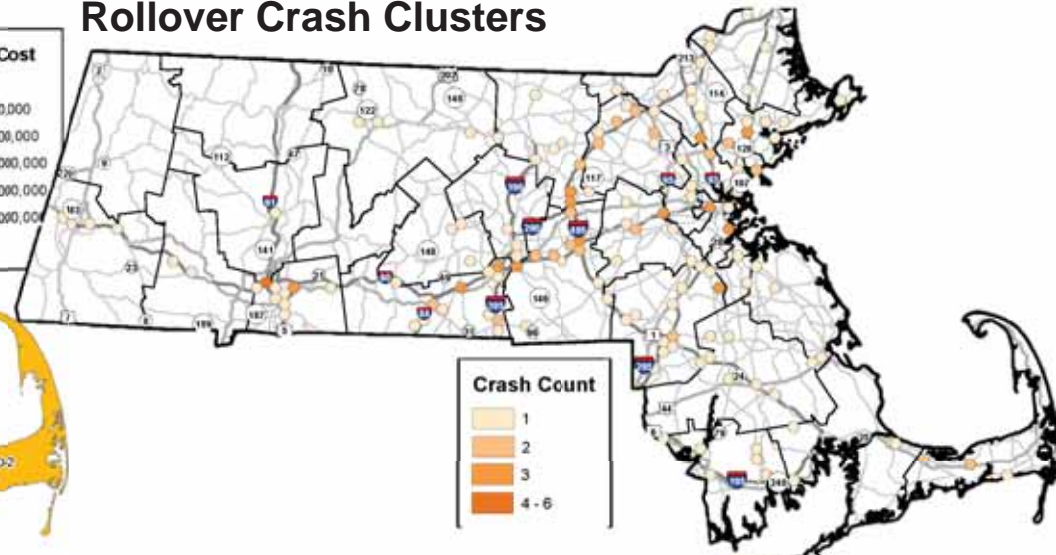
First Harmful Event	Intrastate	Interstate
Collision w/ motor vehicle in traffic	78.2%	78.6%
Collision w/ parked motor vehicle	6.1%	3.6%
Collision w/ guardrail	1.5%	3.1%
Overturn/rollover	1.6%	2.0%
Collision w/ pedestrian	2.0%	0.9%
Collision w/ bridge overhead structure	0.9%	1.5%
Collision with bridge	0.3%	1.3%
Collision with utility pole	1.4%	0.9%
Collision with tree	1.6%	0.9%
Collision with median barrier	0.2%	1.0%
Jackknife	0.1%	0.7%
Collision with embankment	0.4%	0.6%
Collision with curb	0.6%	0.4%
Collision w/ other light pole or other post/support	0.9%	0.4%

Using Data to Guide Safety Programming

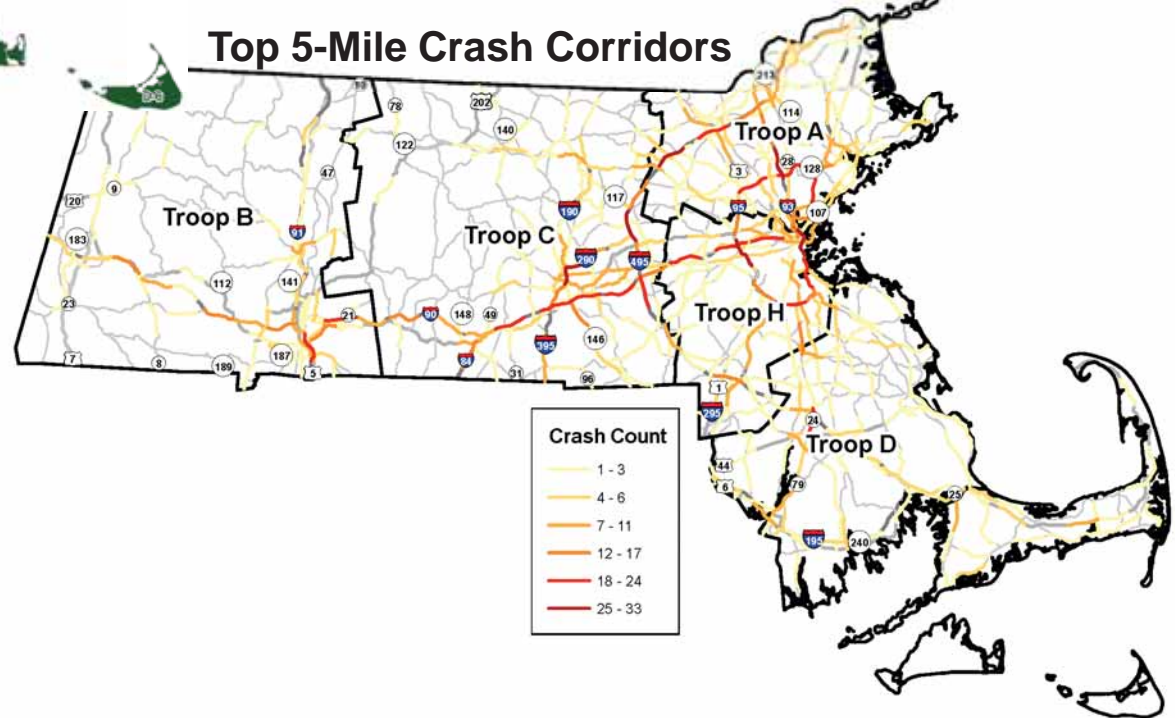
Crash Cost Equivalence by Barracks



Rollover Crash Clusters



Top 5-Mile Crash Corridors



Top 5-Mile CMV Crash Corridors

Crash Count	Route	Mile Marker	Troop
33	I-495	78-83	A
30	I-93	14-19	H
27	I-290	5-10	C
27	MA-128	8-13	H
26	I-495	64-69	C
26	I-93	28-33	A
24	M-128	21-26	A

Using Data to Guide Safety Programming

Crash Report: Driver Contributing Code	Passenger-Car Driver	CMV Driver
No improper driving	45.5%	55.1%
Unknown	13.3%	13.5%
Inattention	7.2%	5.6%
Failed to yield right of way	6.4%	3.4%
Followed too closely	4.6%	5.1%
Failure to keep in proper lane or running off road	4.6%	2.7%
Other improper action	3.8%	3.9%
Driving too fast for conditions	2.9%	2.1%
Operating vehicle in erratic manner	2.2%	1.0%
Disregarded traffic signs, signals, road markings	2.1%	2.1%
Made an improper turn	1.5%	1.1%
Distracted	1.1%	0.6%
Fatigued/asleep	0.9%	0.7%
Glare	0.9%	0.2%
Swerving or avoiding	0.7%	0.7%
Exceeded authorized speed limit	0.7%	0.6%
Over-correcting/over-steering	0.5%	0.5%
Visibility obstructed	0.4%	0.9%
Wrong side or wrong way	0.4%	0.2%
Physical impairment	0.4%	0.1%



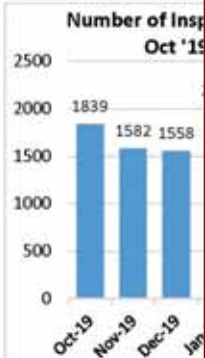
Management Reports



University of Massachusetts Amherst
Amherst, MA 01003
www.umasssafe.org

Massachusetts Commercial Motor Vehicle Management Report Inspections: Oct 2019 – May 2020 (data sourced as of 7/31/2020)

In order to conduct data-driven enforcement, the Massachusetts State Police Commercial Vehicle Enforcement Section examines the inspection and crash details of the most recent quarters for trends and anomalies. The following charts and tables depict the recorded SafeNet data to aid in the formation of directives for both inspection and traffic enforcement and the reconciliation of a



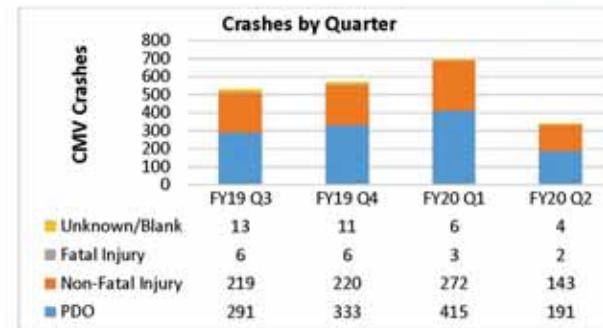
Inspection activity dropped due to state directives surrounding the pandemic.

Carrier	Inspection Rate
JANDJ TRUCKING	5
MTM AUTO TRANSPORT	5
SET LOGISTICS CO	5
BMT LOGISTICS LLC	3
ALDEN AND SONS CONCRETE FORMS	23

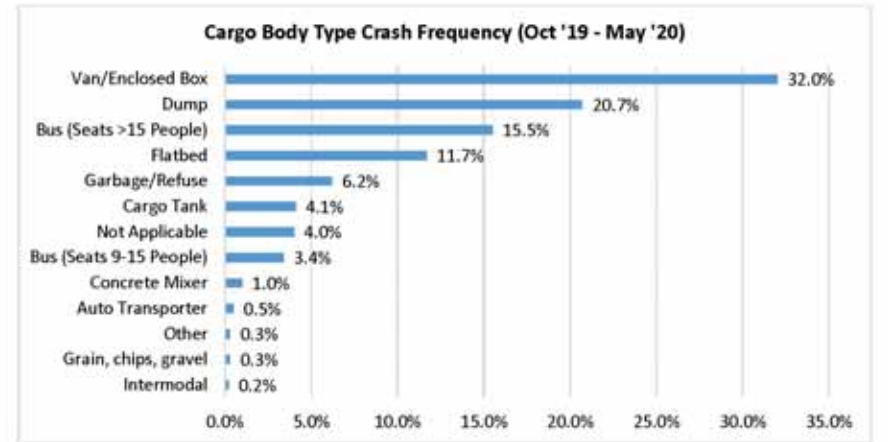
Top Routes (FY19)*	
Route	Crash Count
I 90	57
I 93	27
I 495	22
I 95	21
SR 24	13
I 91	13
I 290	11
I 195	7
US 3	7
SR 123	6

Top Violations for Vehicles Inspected (Oct '19 – May '20)	
Violation Description	Count
VIOLATION OF LOCAL LAWS	2489
INOPERABLE REQUIRED LAMP	2332
NOT MARKED IN ACCORDANCE WITH REGULATIONS	1034
OPERATING A PROPERTY-CARRYING VEHICLE WITHOUT POSSESSING A VALID MEDICAL CERTIFICATE	942
NO/DISCHARGED/UNSECURED FIRE EXTINGUISHER	922

Massachusetts Commercial Motor Vehicle Management Report Crashes: Oct 2019 – May 2020 (data sourced as of 7/31/2020)



Top Routes (FY19)*	
Route	Crash Count
I 90	57
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I 495	22
I 95	21
SR 24	13
I 91	13
I 290	11
I 195	7
US 3	7
SR 123	6



Top Carriers in Crashes with Contributing Factors: Oct '19 - May '20	
Carrier	Count
PVTA	5
ALLIED WASTE/REPUBLIC SERVICES	4
MERRIMACK VALLEY REGIONAL TRANSIT AUTHORITY	3
NEW ENGLAND ICE CREAM	2
DURHAM SCHOOL SERVICES	2

*Latest available data is for FY19 only

CMV Driver Distraction Pilot Project



Massachusetts State Police are strictly enforcing distracted driving regulations for commercial vehicle drivers.

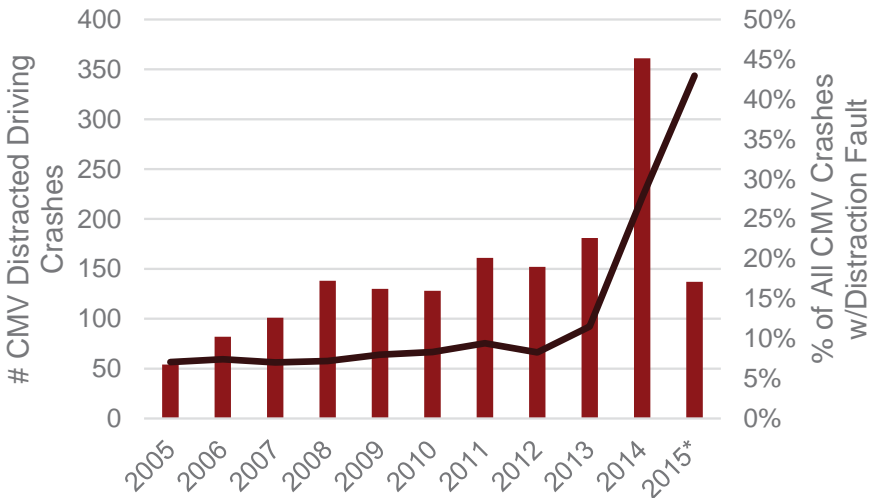
Commercial vehicle drivers are not allowed to use cell phones (only hands-free) or send, type, or read electronic messages while operating a motor vehicle. This includes use of the internet and text messaging.



Produced with funds from the Federal Motor Carrier Safety Administration



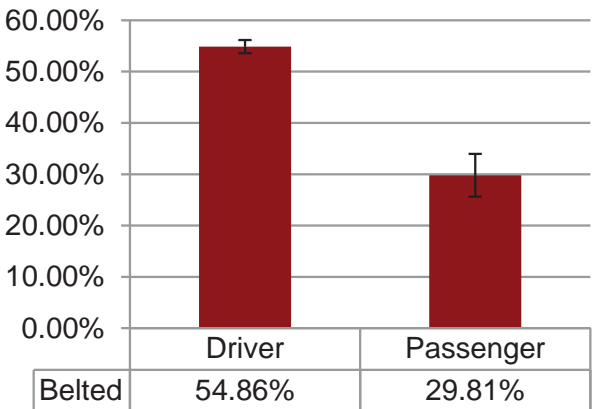
Massachusetts Crashes with CMV Driver Contributing Code of Inattention, 2005-2015



CMV Seat Belt Survey & Campaign



CMV Seat Belt Use Among Drivers and Passengers



Commercial Vehicle Enforcement Toolkit

Commercial Vehicle Enforcement Toolkit

Home | Crash Reporting | Traffic Stops | MA Crashes | Resources | About

Welcome to the Commercial Motor Vehicle Law Enforcement Toolkit

The Massachusetts Commercial Vehicle Enforcement Toolkit provides law enforcement personnel and other highway safety stakeholders with access to tools that can help reduce commercial motor vehicle (CMV) crashes in the Commonwealth, while assisting law enforcement with information for traffic stops, crash reporting and other highway safety issues. The toolbox includes materials on a variety of CMV issues such as commercial drivers licensing, interviewing truck driver during traffic stops, and hazardous materials. Click on the puzzle pieces for more topics. In addition, information on educational, enforcement and engineering countermeasures to prevent CMV crashes are provided. Crash data is shared, users can query the data with the interactive Commercial Vehicle Data Tool that enables them to identify trends and pinpoint crash information across the State.

The Toolbox will enable practitioners, including law enforcement personnel, State Agency staff and local cities and towns, to effectively review CMV issues, reporting and data quality challenges. It is a joint effort between the Massachusetts State Police Commercial Vehicle Enforcement Section (CVES or "Truck Team") and the University of Massachusetts Traffic Safety Research Program (UMassSafe).

- Crash Reporting
- Traffic Stops
- Officer Safety
- Crash Data Quality

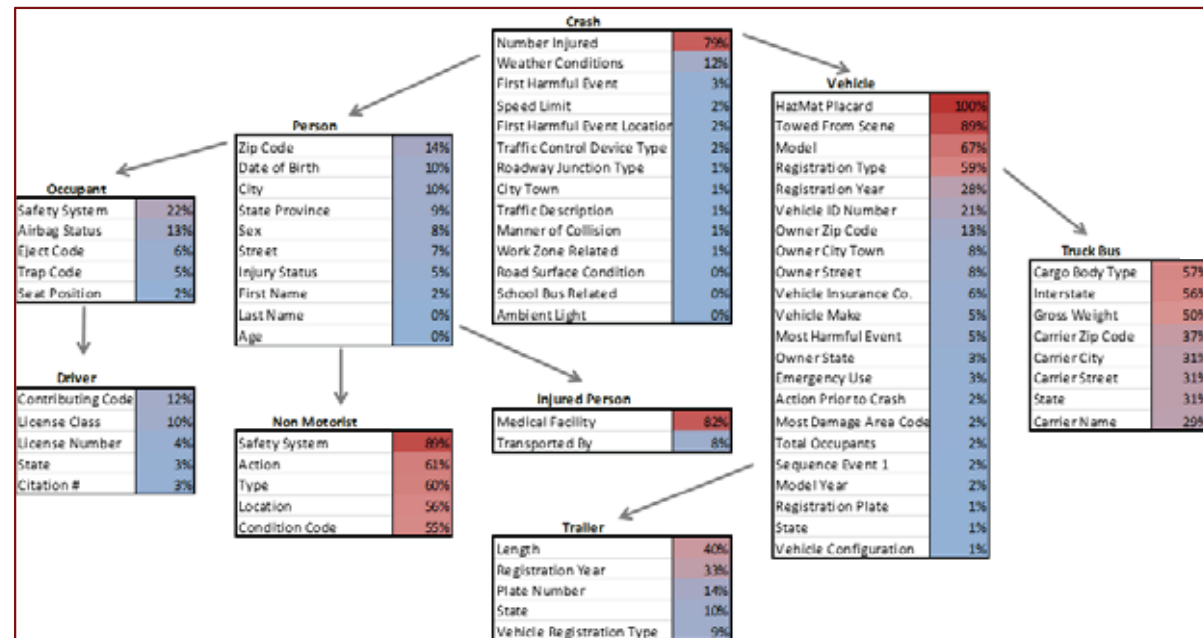
Commercial Vehicle Data Tool

Home | Crash Maps | Data Explorer | Data Quality

Data Quality Reports

Police officers complete crash reports and submit them to the Registry of Motor Vehicles (RMV) where they are entered into the Crash Data System (CDS). Crash reports specific to CMVs are then sent to the Massachusetts State Police Commercial Motor Vehicle Enforcement Section where they are entered into the Federal Motor Carrier Safety Administration (FMCSA) SafetyNet database.

This tool enables users to examine data quality issues specific to CMV crashes by town, troop and Massachusetts as a whole. Specifically, one can query which crash fields are completed and which are left empty within the crash report. In addition, a comparison of the completeness of those fields on the crash reports to that data in CDS and SafetyNet can help determine what data that is missing on crash reports is then researched and completed before they are entered into SafetyNet.



T-Force Toolkit

TRUCK ENFORCEMENT T-FORCE TOOLKIT

SAVE LIVES
Traffic Patrol Officers: Increase Bus/Truck Traffic Enforcement

Home | Fast Facts | Web Resources | Instructor Portal | Library | About

Fast Facts

Web Resources

Instructor Portal

UMassSafe • UMassSafe@ecs.umass.edu • www.ecs.umass.edu/UMassSafe
This material is based upon work supported by the Federal Motor Carrier Safety Administration under a grant/cooperative agreement

TRUCK ENFORCEMENT T-FORCE TOOLKIT

Participants' Guide

umass Safe

TRUCK ENFORCEMENT T-FORCE TOOLKIT

Instructors' Guide

umass Safe

Safe & Effective Traffic Stops:
Truck & Bus Traffic Enforcement
Classroom Training

University of Massachusetts
Traffic Safety Research Program
www.ecs.umass.edu/umasssafe
UMassSafe@ecs.umass.edu

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T-Force Analytics



Massachusetts Inspections: Trooper

Jurisdiction: Troop H x Vehicle Type: All CMVs Inspection Level: Select Time Range: C20 x

4,650 CMV INSPECTIONS | 1,326 CMV OOS INSPECTIONS | 28.52% CMV OOS RATE | 10,768 CMV VIOLATIONS | 2.32 CMV VIOLATIONS / INSPECTION

Troopers

Code	Name	Inspections	OOS Inspections	Violations
3275	TPR J. GRAY	753	263	2675
1882	SGT. J. SHEA	722	157	1107
1747	TPR P. POWELL	617	66	1136
3323	TPR JAMES MORRIS	523	164	1399
0004	WILLIAM BARRY	452	3	18
0887	SGT CHARLES DEVIN	388	126	1069
3185	TPR JEFFREY SULLIVAN	387	197	1096
3368	TPR GREGORY TURCO	197	111	777
3553	TPR MICHAEL CLEMENT	102	29	583
1006	DAVE DILAURO	102	10	29
0120	PCONNORS	67	2	22
0020	D PROUTY	48	10	82
3158	TPR V. NOE	43	6	75
3529	TPR PAUL ATEN	42	80	263
3737	TPR ANDREW AMARAL	39	13	99
3284	TPR PATRICK HAYNES	37	0	7
2398	TPR SC MAGUIRE	23	24	54
3362	TPR D. M. TAVARES	19	10	68
117	WAYNE A. LAWSON	14	2	10
3296	TPR C. KASZYK	12	8	26
2488	TPR JJ BATES	12	1	17
4015	JOHN O'ROURKE	10	3	32
3668	TPR DANIEL MORO	9	20	38
4165	TPR NICHOLAS LORENCO	7	9	41
190	TPR M. TUCKER	7	8	27
2646	TPR C. MANISCALCHI	4	0	1

Violation Summary

Violation	Count
Violation of Local Laws	1459
Inoperable Required Lamp	1060
No medical certificate in driver's possession	486
No/Discharged/Unrecharged fire extinguisher	478
Not marked	478
Lane Restriction	478
Operating a	478
Failing to use	478
Inoperable H	478
INTRASTATE vehicle in int	478
USDOT numl	478
Filtered: (All CMV)	478

Crash Risk Explorer

Weather: Precipitation: None, Wind: None/Light, Temperature (°F): 41-60

Date: Start: 2021-04-01, End: 2021-05-28

Traffic: Typical, Road Work: No, Inspection Activity: Typical

Crash Probability: 1.591% Annual Baseline: 1.478%

T-FORCE ANALYTICS

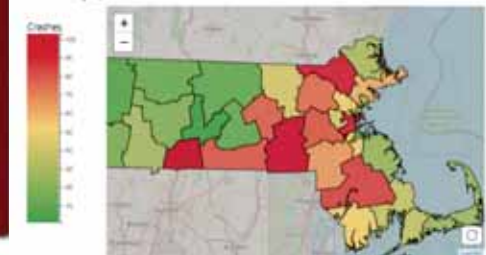
INSPECTION DASHBOARDS

Custom region and trooper analysis

CRASH DASHBOARDS

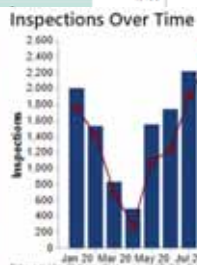
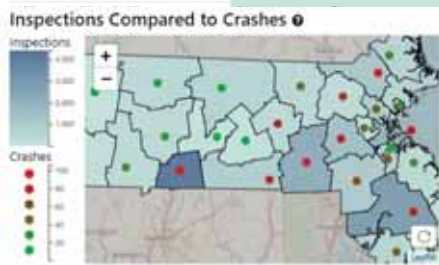
Interactive data visualization and mapping

Crash Map



Top Carriers with Contributing Factors in Crashes

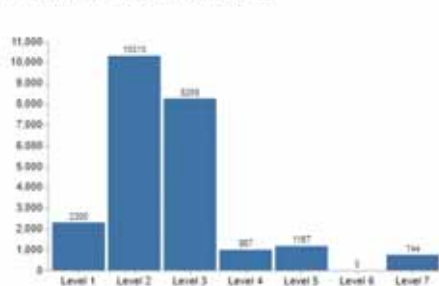
Carrier	# Crashes
BYDER	3
COSMOS GRANITE AND MARBLE	4
JRM HAULING AND RECYCLING SERVICES II INC	4
CASELLA WASTE MANAGEMENT OF MA INC	3
FIRST STUDENT INC	3
UETA	3
ALLIED WASTE SERVICES OF BOSTON OR REPUBLIC SERVICES OF BOSTON OR ALLIED WASTE SERVICES OF TYNGSBORO OR REPUBLIC SERVICE	3
DS/VA TRANSPORTATION INC	2
DAVID CURRYING	2
EXPRESS AUTO REPAIR LLC	2



UMassSafe - UMassSafe@UMass.edu - www.UMassSafe.org

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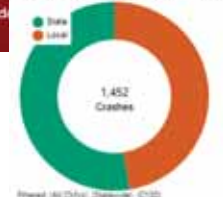
Number of Inspections by Level



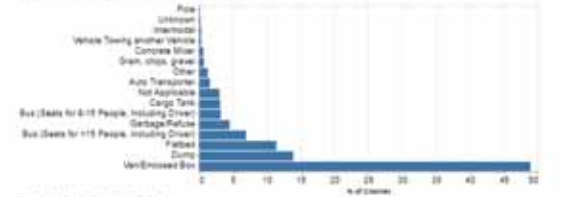
Top Carriers - Violations per Inspection

Carrier	# Inspections	Avg Violations per Inspection
ARTHUR STANLEY	1	31
DANIEL KELLER DEB PARADISE POOLS	1	31
ALCALA BROS	1	29
O M KIOLODZIE TRUCKING INC	1	29
BROOKS BUILDING LLP	1	27
ROADRUNNER'S LOGISTIC LLC	1	27
WF LANDSCAPE SERVICES	1	27
JK DELIVERY LLC	1	26
ZAQUQU FRANCISCO DA SILVA	1	26
MTM AUTO TRANSPORT INC	1	25

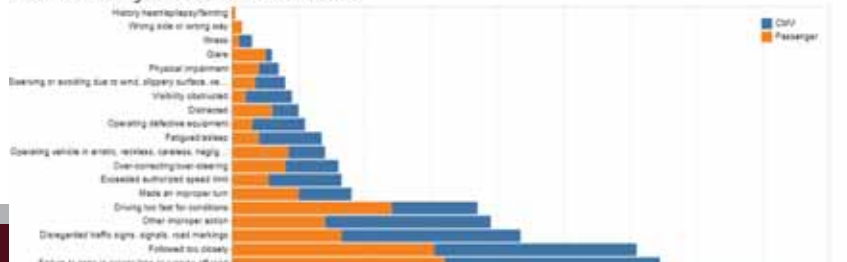
Local/State Police Breakdown



Cargo Body Type Crash Frequency



Driver Contributing Code in CMV-Involved Crashes



Crash E-Manual - Crash Report Data Dictionary

www.MassCrashReportManual.com

Massachusetts Law Enforcement CRASH REPORT E-MANUAL

Data Importance- Reporting Components- Data Dictionary- About- Search

Massachusetts Law Enforcement Crash Report E-Manual

Search the Data Dictionary

Search Data Dictionary...

Try these: [Traffic Device Functioning Code](#), [Nonstandard Action](#), [Nonstandard Location](#), [License Class - Transport Truck](#), [Safety System Used](#), [License/Operator Code](#), [Vehicle Make](#), [Truck or Bus](#), [Nonstandard Indicator Box](#)

Content filters: Search in field names, Search in dictionary, Exact matches

Filter by Categories: All Categories

This project was implemented by LIM Research and Highway Safety Division, MassDOT employees. The project was funded through the Massachusetts Executive Order.

Truck and Bus Section Criteria

Truck and Bus Section Criteria

Please answer the following questions to determine whether or not this section needs to be completed:

1. Did the crash involve:
- A truck that has a gross vehicle weight rating (GVWR) of more than 10,000 pounds or a gross combination weight rating (GCWR) of more than 10,000 pounds used in public highways?
 - Any vehicle with seating to transport nine (9) or more people, including the driver's seat?
 - Any vehicle displaying hazardous materials placard (regardless of weight)?

If No, then do not fill out this section.
If Yes,



Instructions:

Identify the type of carrier that was involved in the crash.

Definition:

The type of carrier that was involved in the crash.

Rationale:

The Federal Motor Carrier Safety Administration (FMCSA) has the authority to fine and sanction unsafe interstate (and some intrastate) truck and bus companies.

Code	Attribute	Definition
0	Intrastate	This attribute represents a motor carrier that operates entirely within the state and does not have the authority to engage in interstate commerce. Intrastate operators are not required to have a USDOT Number by the Federal Motor Carrier Safety Administration; however, some states do require that certain intrastate operators secure a USDOT Number.
1	Interstate	A commercial vehicle in the United States where the transit between the points of origin and termination does not occur entirely within the borders of the State of origin. A motor carrier that has authority to operate across state lines. Interstate operators are required to have a USDOT Number by the Federal Motor Carrier Administration.
2	Not in Commerce (Other Truck or Bus)	Personal rental vehicles (e.g., U-Haul, Ryder, Penske) that qualify by size (Over 10,000 lbs. GVWR/ GCWR) that are operated by a private individual. In these situations the rental company is not the carrier and should not be recorded.
3	Not in Commerce (Government)	Any government vehicle, whether it is operated by the local, State, or federal government. In most circumstances, the government-owned vehicle will not have a USDOT Number.
4	Other Operation/Not Specified	This attribute is used for a variable that is not addressed by the previous attribute options. If this attribute is used, an explanation in the narrative is recommended.



Understanding At-Risk Driving Attitudes & Behaviors



**Seeking Professional Drivers:
A Survey of Safety-Related
Experiences and Beliefs**

-Completely Anonymous
-Only Five Minutes



bit.ly/UMassCMVstudy



UMASS

CMV Driver Attitude & Behavior Survey

- Online self-reported survey of
- 20 multiple choice questions (~4 minutes)
- Aiming to quantify driver's attitudes/beliefs of risky behaviors
 - Sending a text message
 - Exceeding HOS regs
 - Driving after consuming alcohol & cannabis
- Results and recommended uses in CMV crash prevention at [Commercial Vehicle-Safety Technical Assistance Center \(CV-STAC\)](#)

Commercial Vehicle Safety Technical Assistance Center (CV-STAC)

cvstac.umasssafe.org

Online Resource Center

- Multi-agency Partnerships
- Safety Programming

Develop - Expand - Replicate

- Best Practice Guides
- Webinars
- Education Materials
- News Highlights



Previous Presentations

umass **SAFE**  

Partnership For Safety:

Distacted Driver Awareness Program

The California Trucking Association and the California Highway Patrol

Hotel Northampton
November 19, 2019

Distacted Driver Awareness Program -
D.R. Ike Iketani, The California Trucking Association and the California Highway Patrol



Driver Distraction in Commercial Vehicles

Driver distraction can take many forms - using a mobile device, adjusting an interface, and even fatigue can take driver's

Important Information

International Association of Police Chiefs: Law Enforcement's Role in Distracted Driving

FMCSA: Distracted Driving Guidelines

National Safety Council: Ending Distracted Driving is Everyone's Responsibility

National Conference of State Legislatures: Distracted Driving Cellphone Use

NHTSA: Evaluating the Enforceability of Texting Laws

FY24HP Project – CMV Safety Data Collaborative

T-Force Analytics

- Data Visualization maintenance & upgrades
- Data for 13 states
- Monthly data payloads

Regional Collaboration & Technical Assistance

- Development of Safety Data Collaborative
- Ad-hoc Analysis
- High Crash Corridor Mapping

Information Sharing

- What are the Needs?
- What is Working?
- What Can We Do Together?



Questions & Contact Information

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