

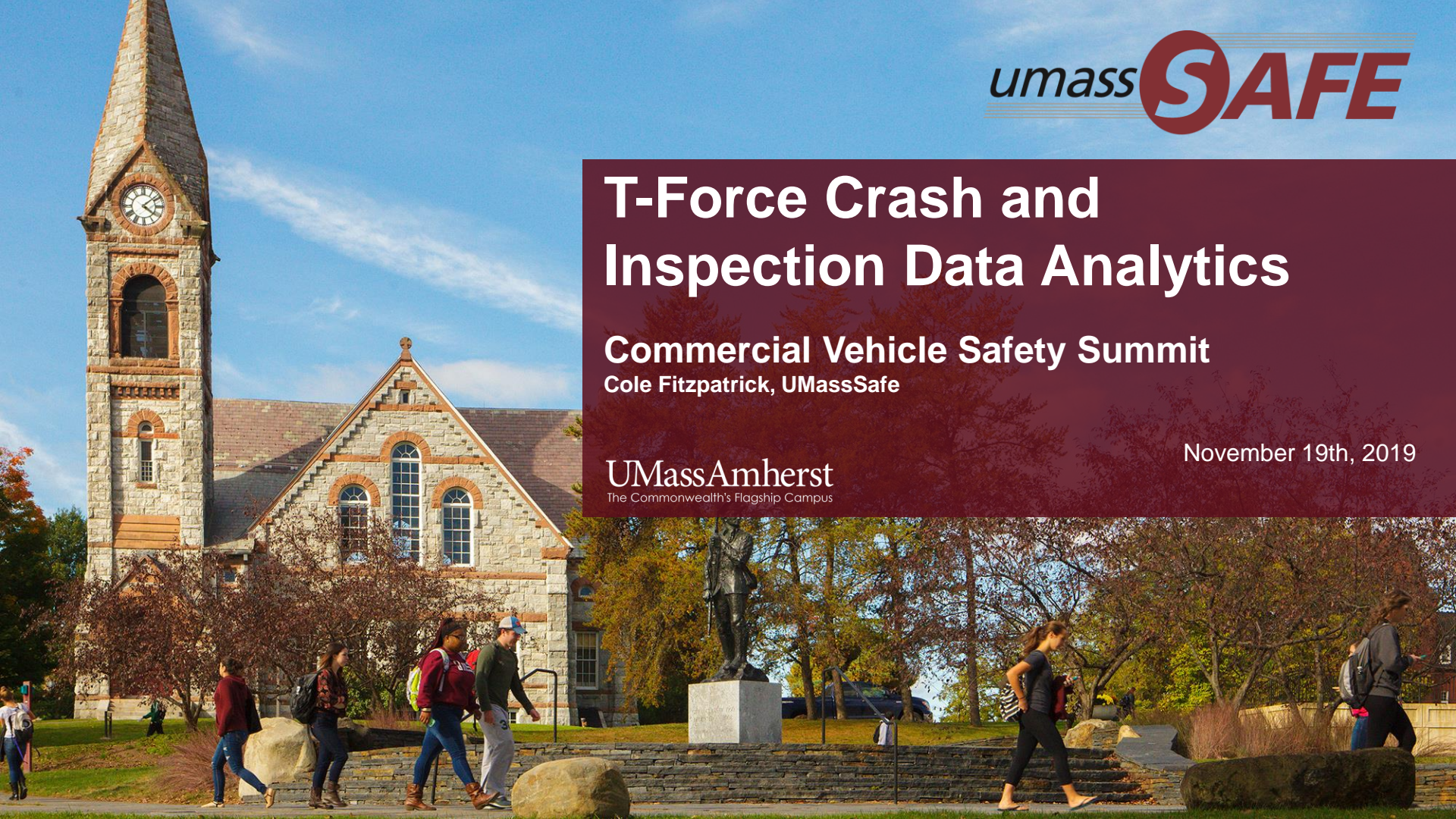


# T-Force Crash and Inspection Data Analytics

Commercial Vehicle Safety Summit  
Cole Fitzpatrick, UMassSafe

UMassAmherst  
The Commonwealth's Flagship Campus

November 19th, 2019



**TForceAnalytics.org**

# T-FORCE ANALYTICS

## INSPECTION DASHBOARDS



Custom region and trooper analysis

## CRASH DASHBOARDS



Interactive data visualization and mapping

## CRASH RISK EXPLORER



Crash risk assessment based on an array of situational characteristics



# Inspections: All CMVs

State:  ▾ 
 Troops/Barracks:  ▾ 
 Vehicle Type:  ▾ 
 Year:  ▾ 
 Calendar/Fiscal:  ▾

**4,937**  
CMV INSPECTIONS

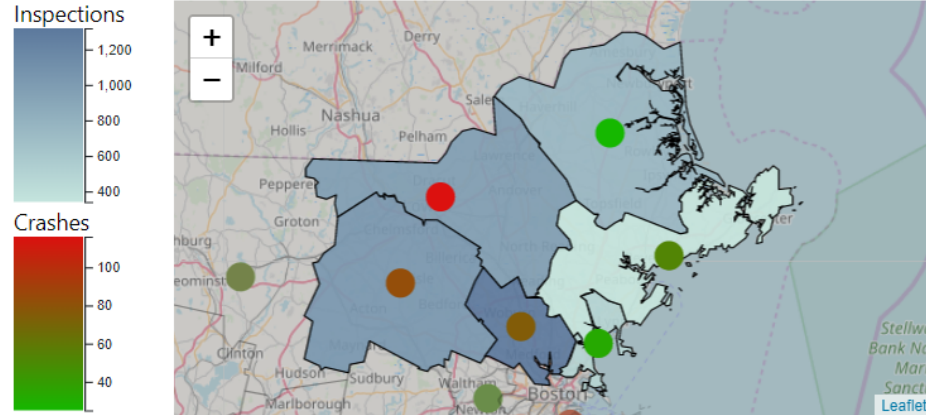
**1,318**  
CMV OOS INSPECTIONS

**26.70%**  
CMV OOS RATE

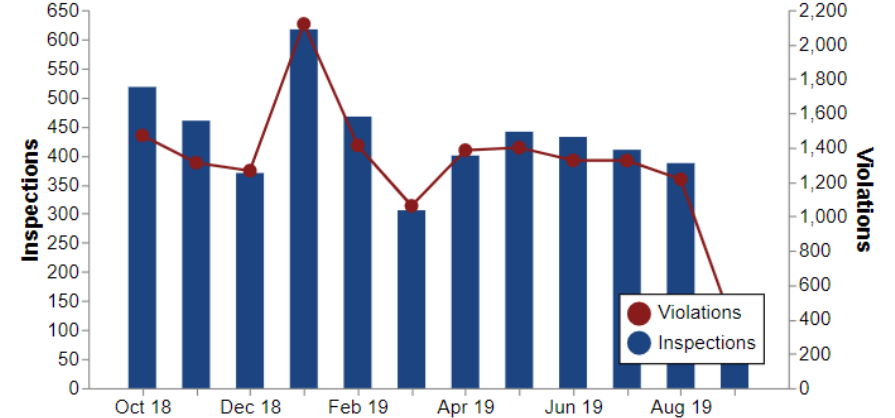
**15,635**  
CMV VIOLATIONS

**3.17**  
CMV VIOLATIONS /  
INSPECTION

## Inspections Compared to Crashes



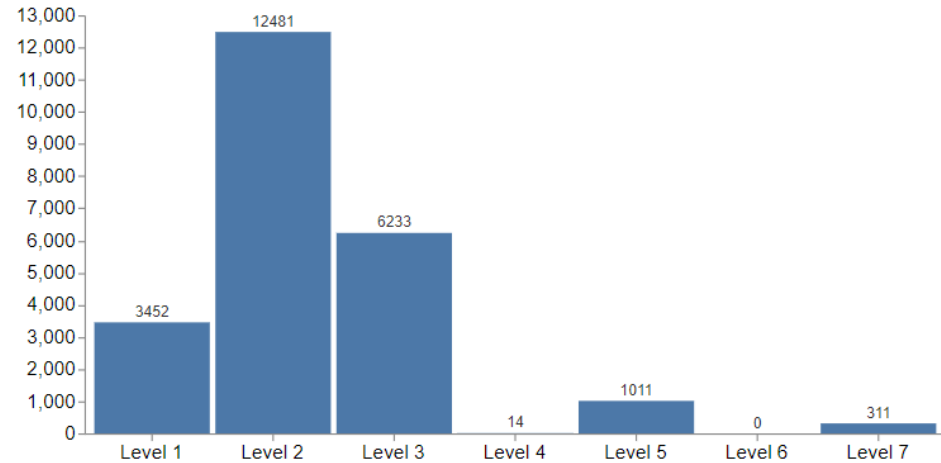
## Inspections Over Time : Troop A



# Inspections: All CMVs

State: MA ▾
 Troops/Barracks: All ▾
 Vehicle Type: All CMVs ▾
 Year: 2019 ▾
 Calendar/Fiscal: Fiscal ▾
 [Reset](#)

## Number of Inspections by Level



## Top Carriers - Violations per Inspection

Carrier	Violation Rate
A	27
C	25
A	25
H	24
C	24
L	23
L	23
F	23
T	23
C	22

## Top Violations

Violation	Count
Violation of Local Laws - Explain:	6864
Inoperable Required Lamp	6447
No/discharged/unsecured fire extinguisher	2643
Not marked in accordance with regulations	2496
Failing to use seat belt while operating a CMV	2448
Operating a CMV without proof of a periodic inspection	1928
Operating a property-carrying vehicle without possessing a valid medical certificate.	1890
INTRASTATE CARRIER Operating a commercial motor vehicle in intrastate commerce without an active USDOT number when required.	1824
INTRASTATE CARRIER Operating a commercial motor vehicle in intrastate commerce without an active USDOT number.	1824
No medical certificate in driver's possession	1559



# Inspections: Trooper

State: MA Troops/Barracks: All Vehicle Type: All CMVs Year: 2019 Calendar/Fiscal: Fiscal Reset

1,478  
CMV INSPECTIONS

427  
CMV OOS INSPECTIONS

28.89%  
CMV OOS RATE

5,610  
CMV VIOLATIONS

3.80  
CMV VIOLATIONS /  
INSPECTION

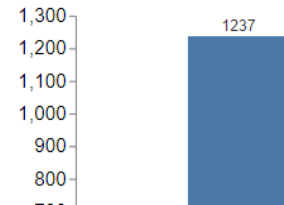
## Troopers [\[Clear Selection\]](#)

Code	Name	Inspections	OOS Inspections	Violations
TPR		1478	427	5610
TPR		1462	351	4274
TPR		1425	511	4293
TPR		1326	134	2592
TPR		1285	233	3424
TPR		1178	382	4751
TPR		1166	461	5271
TPR		1124	262	1536
TP J		1107	311	5466
TPR		1096	277	2807
TPR		1086	287	2639
TPR		1069	301	3273
TPR		1025	212	2238
TPR		1009	153	2424
TPR		989	197	2764
TPR		988	364	3009
TPR		980	209	1842
TPR		934	201	2556

## Violations for TPR

Violation	Count
Inoperable Required Lamp	1589
Violation of Local Laws - Explain:	558
Failing to use seat belt while operating a CMV	353
No/discharged/unsecured fire extinguisher	321
No or defective lighting devices or reflective material as required	229

## Inspection Levels for TPR



# Inspection: Mapping

## Filters

[Reset](#)

### Hot Topics

- All HazMat Result of Crash
- Traffic Enforcement

### Year

### Month

### Day

### Hour

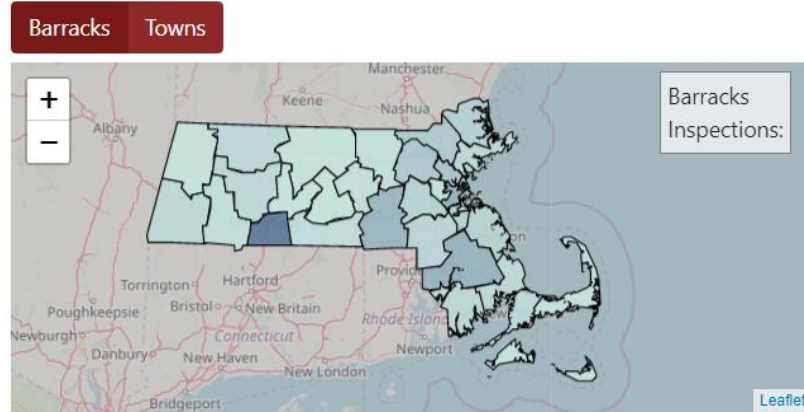
### Vehicle Type

### Troop/Barrack

- ▶ **Inspection Level (All)**
- ▶ **Resulting OOS (All)**
- ▶ **Resulting Violation (All)**
- ▶ **Interstate/Intrastate (All)**
- ▶ **GVWR (All)**
- ▶ **Duration (All)**

### Carrier

### Location



## Data Preview

[\[Download Full Dataset\]](#)

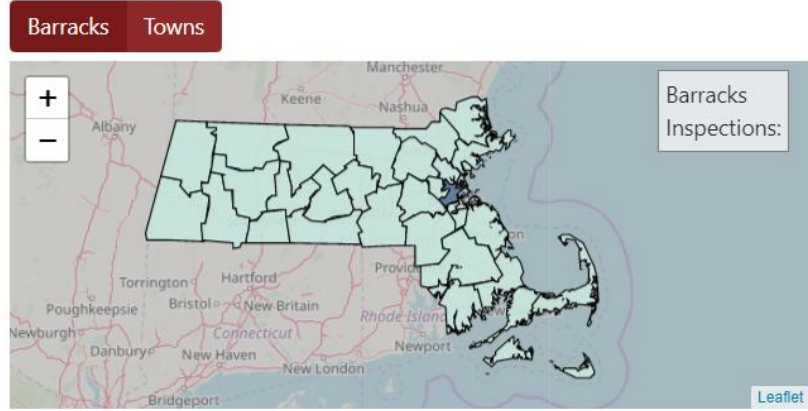
DATE	LOCATION	CARRIER
Thu March 07, 2019	ARLINGTON	
Sun March 10, 2019	HAVERTHILL	
Wed March 13, 2019	TAUNTON	
Wed March 13, 2019	BOSTON	
Wed March 13, 2019	BOSTON	



# Inspection: Mapping

## Filters

Reset



## Hot Topics

- All
- HazMat
- Result of Crash
- Traffic Enforcement

## Year

2019 x +3

## Month

February x

## Day

Sat x +1

## Hour

All

## Vehicle Type

Bus

## Troop/Barrack

All

## Data Preview

[\[Download Full Dataset\]](#)

DATE	LOCATION	CARRIER
Fri February 17, 2017	BOSTON	<input type="text"/>
Fri February 17, 2017	BOSTON	<input type="text"/>

- ▶ Inspection Level (All)
- ▼ Resulting OOS (1 Selected)
  - [\[Select All\]](#) | [\[Deselect All\]](#)
  - Any
  - Driver
  - Vehicle
  - None
- ▶ Resulting Violation (All)
- ▶ Interstate/Intrastate (All)
- ▶ GVWR (All)



INSPECTION DETAILS	
Date	Saturday, February 18, 2017
End Time	08:44:00
Vehicle Type	B
Trooper Name	
Trooper Badge #	
Barracks	H-4
Inspection Level	2
Driver OOS Violations	N
Vehicle OOS Violations	Y
OOS Violations	Y
# Violations	2
# Driver Violations	0
# Vehicle Violations	2
Result of Crash	N
Traffic Enforcement	N
HazMat	
Interstate/Intrastate	N
GVWR	17000
Duration (minutes)	20
Location	LOGAN
Carrier	<input type="text"/>

# Crash: Overview

State: 
 Troops/Barracks: 
 Vehicle Type: 
 Injury Severity: 
 Year: 
 Calendar/Fiscal:

1,598  
CMV-INVOLVED  
CRASHES

25  
CMV-INVOLVED  
FATAL CRASHES

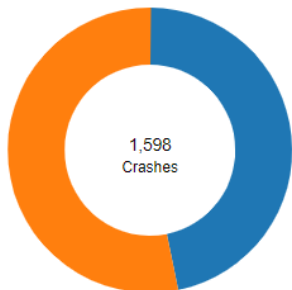
26  
CMV-INVOLVED  
FATALITIES

31.25%  
CMV FATAL CRASHES /  
ALL FATAL CRASHES

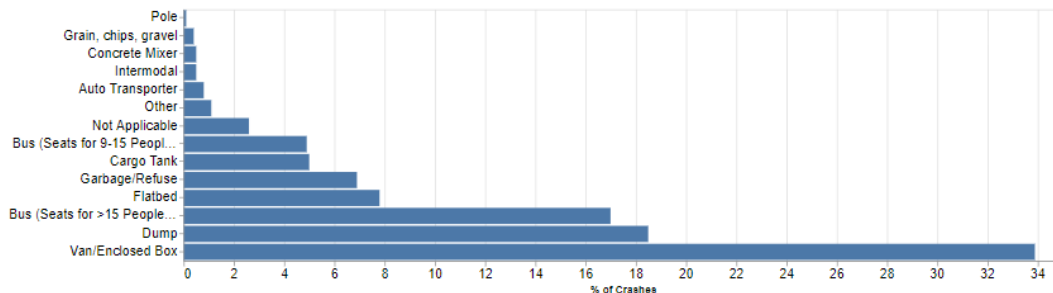
1.56%  
CMV FATAL CRASHES /  
ALL CMV CRASHES

## Local/State Police Breakdown

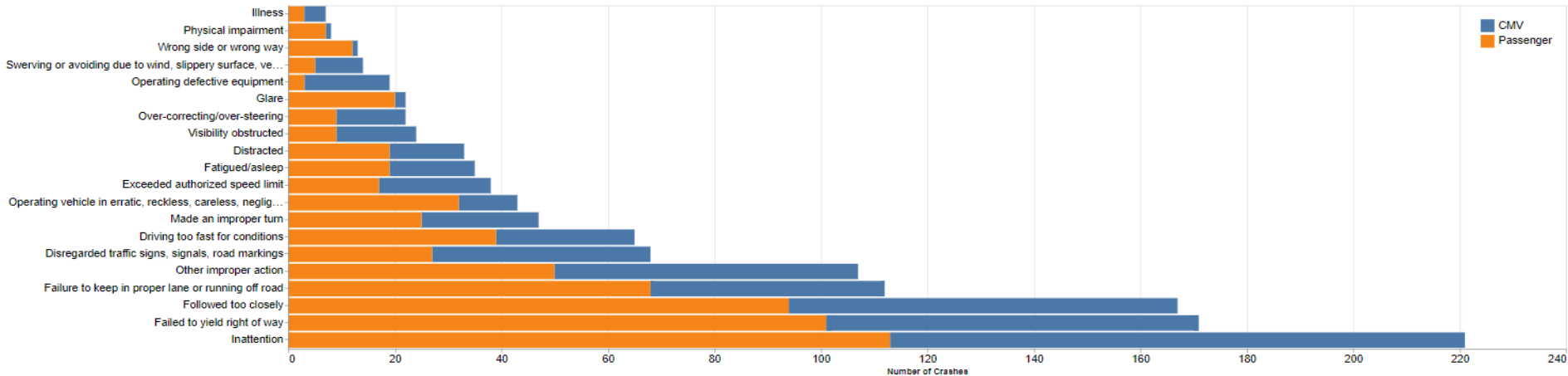
● State  
● Local



## Cargo Body Type Crash Frequency



## Driver Contributing Code in CMV-Involved Crashes



## Top Routes

Route	Count
I 90	58
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 Carriers with Contributing Factors

Carrier	Count
[REDACTED]	13
[REDACTED]	3
[REDACTED]	3
[REDACTED]	3
[REDACTED]	2
[REDACTED]	2
[REDACTED]	2
[REDACTED]	2
[REDACTED]	2

# Crash Trends

State: MA ▾ Troops/Barracks: All ▾ Injury Severity: All ▾ Calendar/Fiscal: Fiscal ▾ [Reset](#)

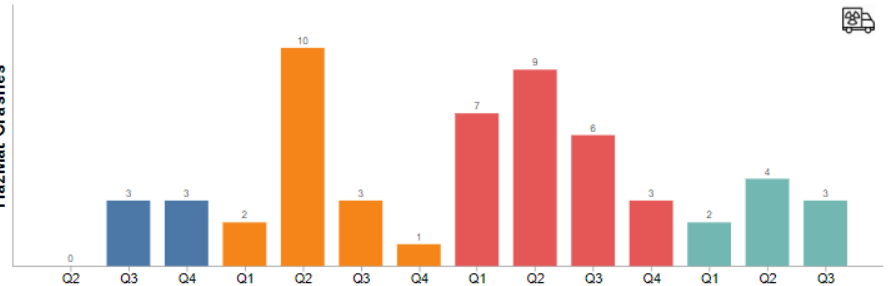
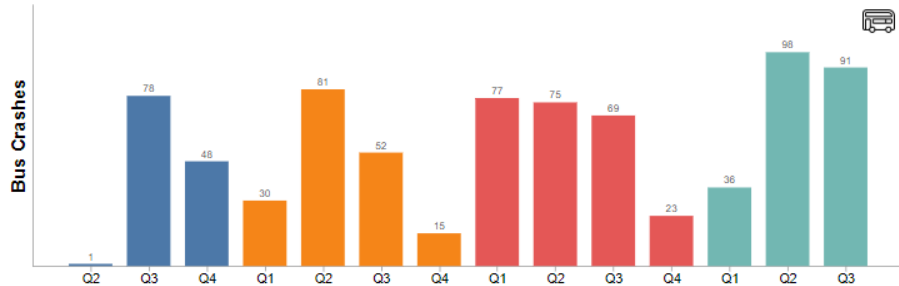
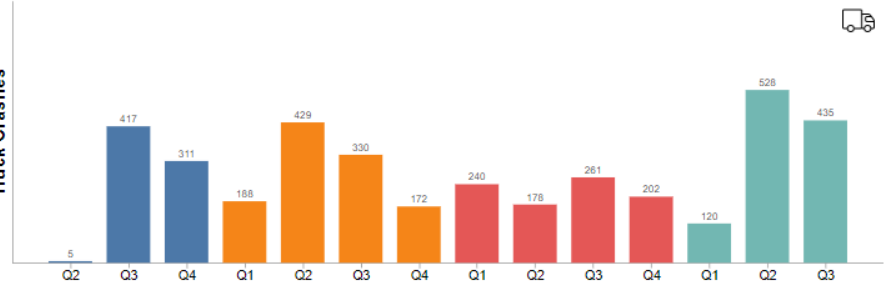
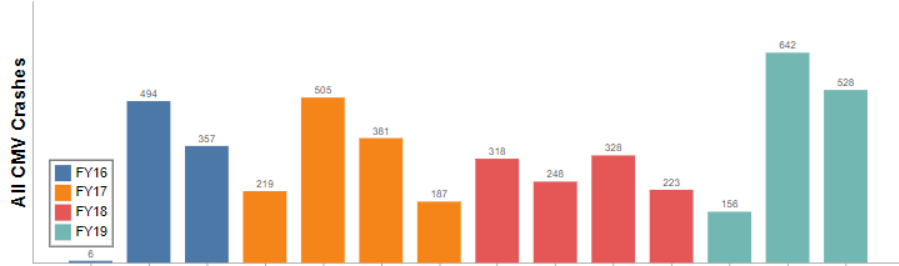
**4,605**  
CMV-INVOLVED  
CRASHES

**83**  
CMV-INVOLVED  
FATAL CRASHES

**87**  
CMV-INVOLVED  
FATALITIES

**15.51%**  
CMV FATAL CRASHES /  
ALL FATAL CRASHES

**1.80%**  
CMV FATAL CRASHES /  
ALL CMV CRASHES





# Crash: Temporal Factors

State: MA ▾ Troops/Barracks: All ▾ Vehicle Type: All CMVs ▾ Injury Severity: All ▾ Year: 2019 ▾ Calendar/Fiscal: Fiscal ▾ Reset

1,598 CMV-INVOLVED CRASHES

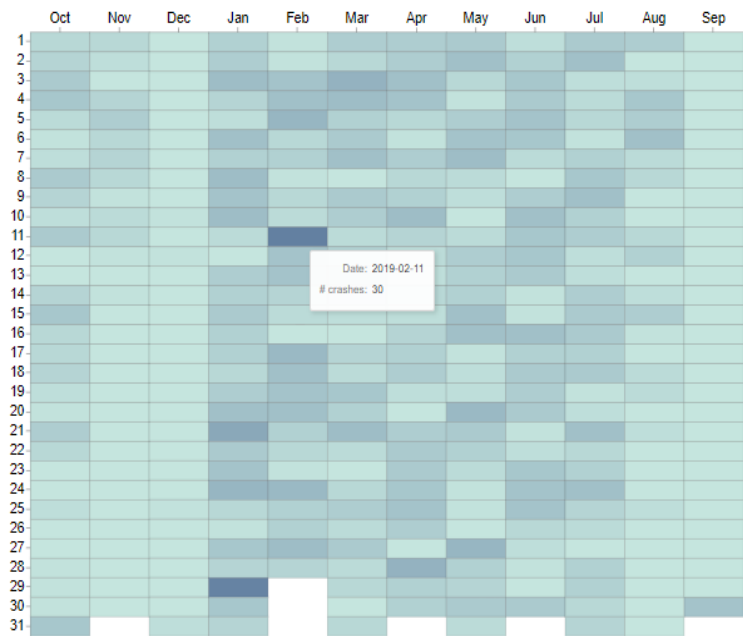
25 CMV-INVOLVED FATAL CRASHES

26 CMV-INVOLVED FATALITIES

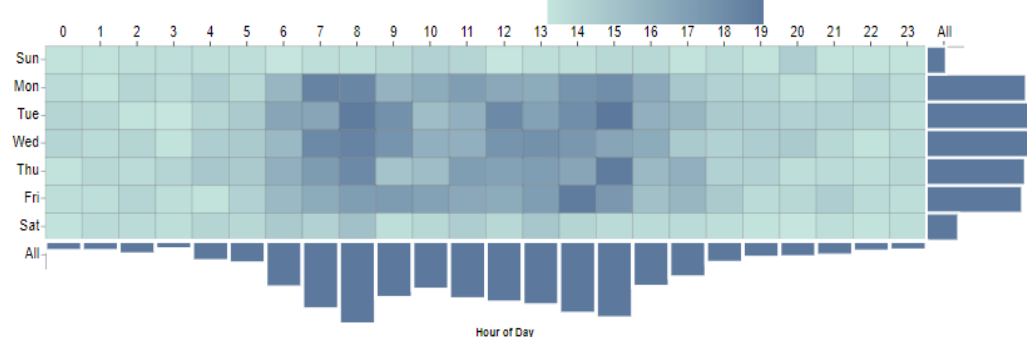
31.25% CMV FATAL CRASHES / ALL FATAL CRASHES

1.56% CMV FATAL CRASHES / ALL CMV CRASHES

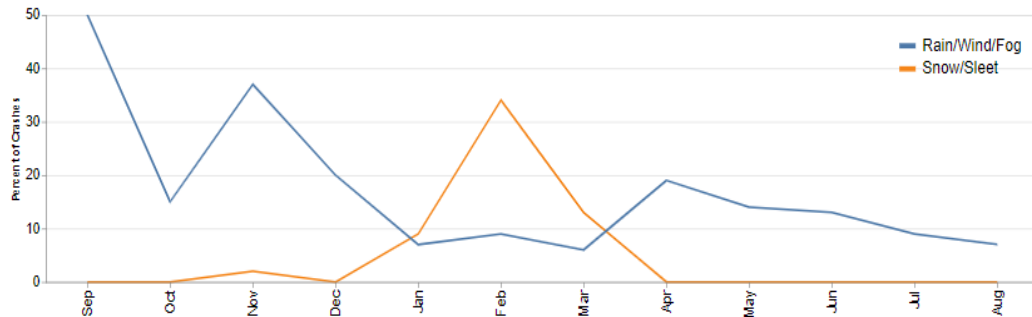
## Fiscal Year at a Glance



## Week at a Glance



## Weather Effects



# Crash: Mapping

## Filters

### Hot Topics

[All](#)
[Non-Motorist](#)
[Younger Driver](#)
[Older Driver](#)
[Rollover](#)
[HazMat](#)
[Work Zone](#)
[Distraction](#)

[Alcohol/Drugs](#)
[Multi-CMV](#)
[Resulting Inspection](#)
[Citation Issued](#)
[Resulting OOS](#)
[Fatal](#)

### Year

2019 x

### Month

All

### Day

All

### Hour

All

### Vehicle Type

All CMVs

### Troop/Barrack

All

### Carrier

All

### Route

All

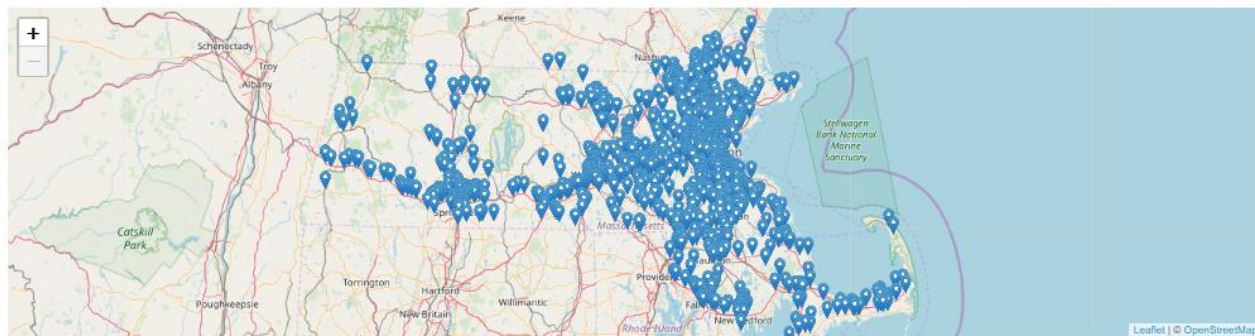
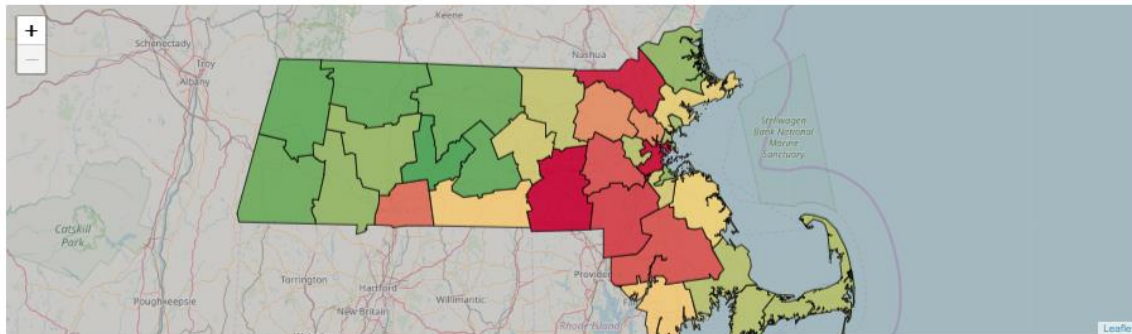
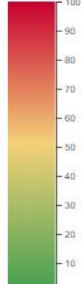
- [Crash Severity \(All\)](#)
- [Trafficway Description \(All\)](#)
- [Manner of Collision \(All\)](#)
- [Weather \(All\)](#)
- [Driver Contributing Code \(All\)](#)
- [Driver License Restrictions \(All\)](#)
- [Interstate/Intrastate \(All\)](#)
- [GVWR \(All\)](#)
- [Cargo Body Type \(All\)](#)

### Driver Age



Reset

### Crashes



## Data Preview

1359 Crashes

[\[Download Full Dataset\]](#)

DATE	LOCATION	INJURY SEVERITY	CARRIERS
Wed May 01, 2019		Other	



## Crash Details

CDS Crash Numb		County	NORFOLK
Crash Report Number	MA1003666968	Barracks	
Date (MM/DD/YYYY)	05/02/2019	Town	
Day of Week	Thursday	Street Location	RTE 24 NB @ EXIT 20A
Time	0640	Reporting Agency	MASS STATE POLICE
Severity		Officer Name & Badge Number	<input type="text"/>
Number of CMVs		Vehicle Configuration	Single-Unit Truck (3 or More Axles)
Number of Vehicles	1	Cargo Body Type	Van/Enclosed Box
Number of Fatalities	0	GVWR	More than 26,000 pounds
Number of Injuries	4	Registration State	MA
Towaway	1	Carrier Address & Town & State	<input type="text"/>
Resulting Inspection	0	Interstate/Intrastate	Interstate
Resulting OOS	0	Carrier Name	<input type="text"/>
Manner of Collision		USDOT Number	<input type="text"/>
Trafficway	Two-way, divided, positive median barrier	Driver State	
Roadway Junction		Driver License Class	B
Weather	Clear	Driver Cited	No
Road Surface	Dry	Driver Contributing Code	MA
Light Condition	Daylight	Hazmat Placard	No
School Bus Related		Hazmat 1 Digit	
Work Zone Related	No	Hazmat 4 Digit	
		Hazmat Name	



# Questions?



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