NTSB | National Transportation Safety Board

NTSB TRB Truck and Bus Update

Robert Molloy, PhD
Director, Office of Highway Safety
January 8, 2025

AVIATION • RAILROAD • TRANSIT • HIGHWAY • MARINE • PIPELINE • COMMERCIAL SPACE

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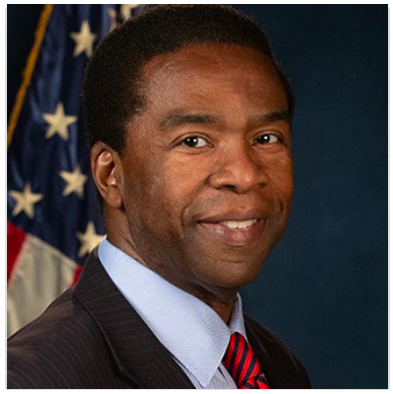

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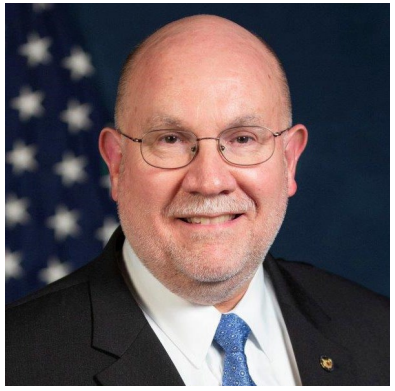

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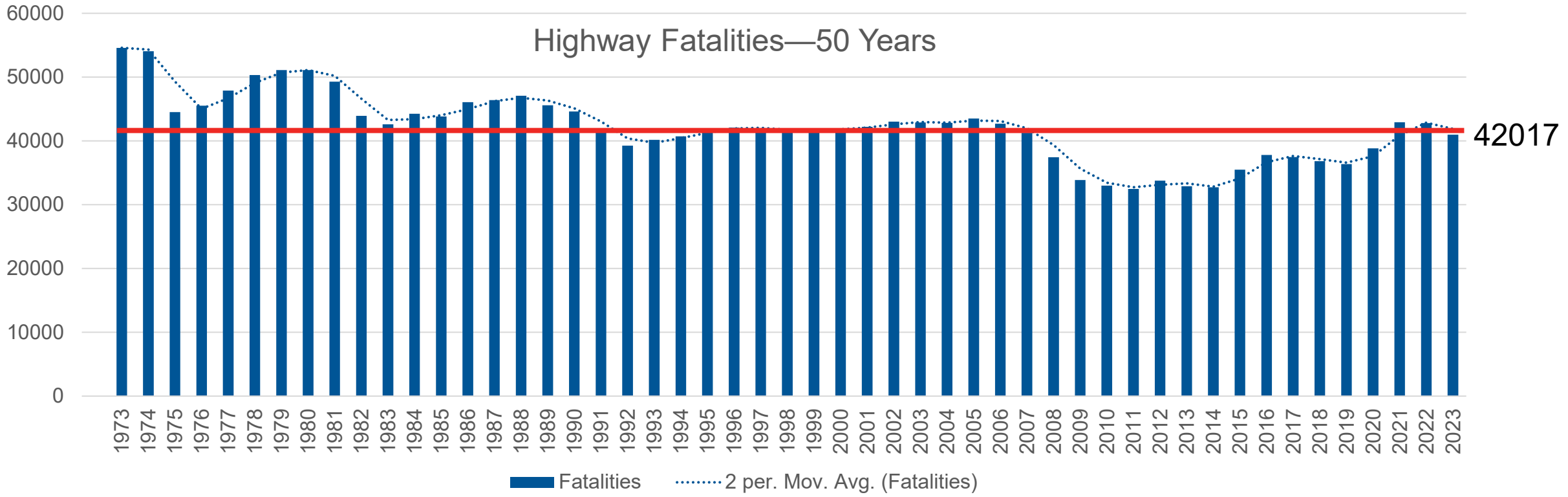
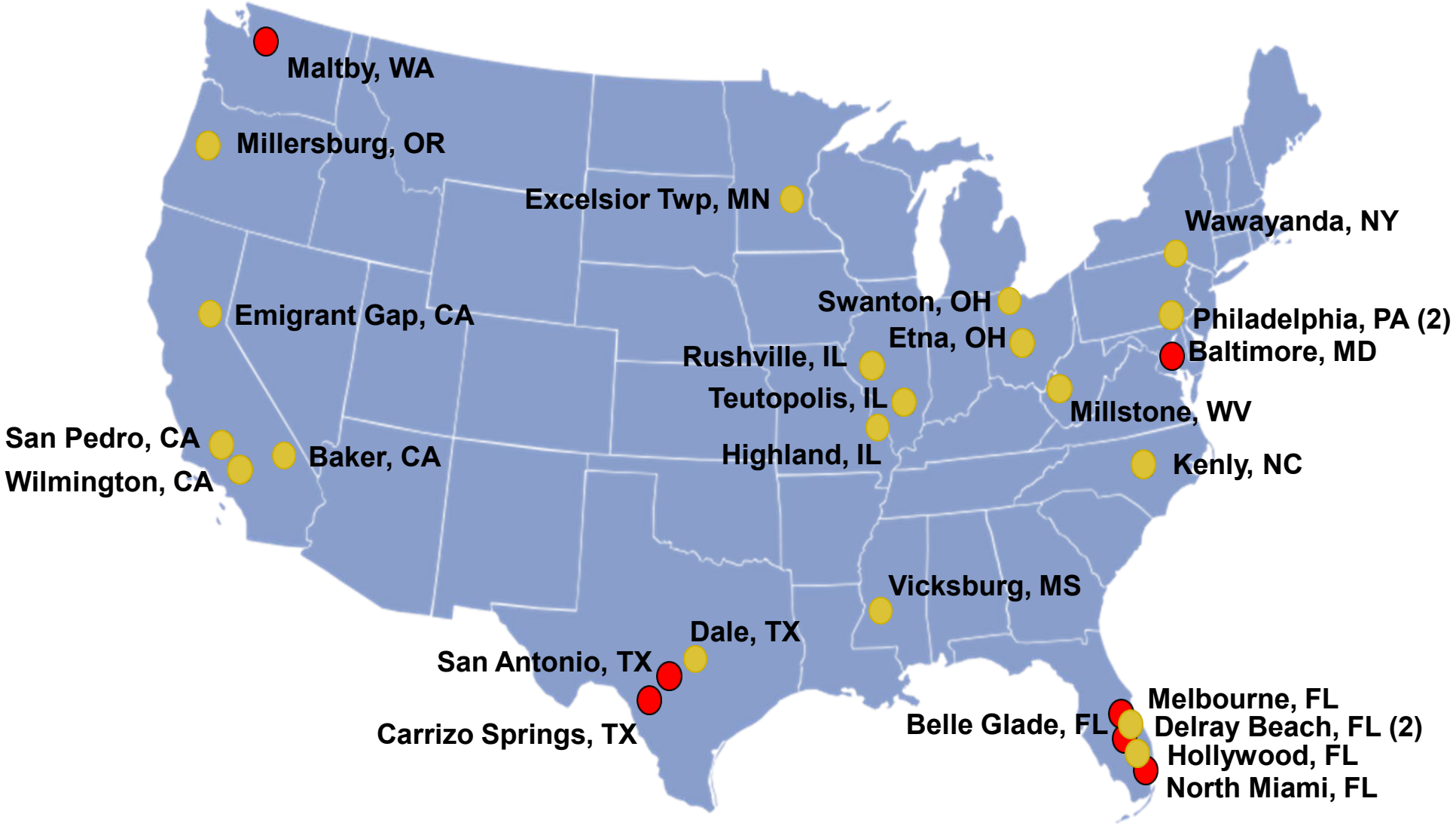
Changing Our Approach to Highway Safety



Ongoing NTSB Highway Investigations



Pittsburgh Bridge Collapse

- January 28, 2022, about 6:37 a.m.
- Structural failure and collapse
- Fell into Frick Park
- Dark with light snow
- Transit bus & 4 passenger vehicles
- Fifth passenger vehicle drove off abutment
- All injured transported by 8:26 a.m.
- Precautionary evacuation but no fire or explosion
- Emergency response excluded

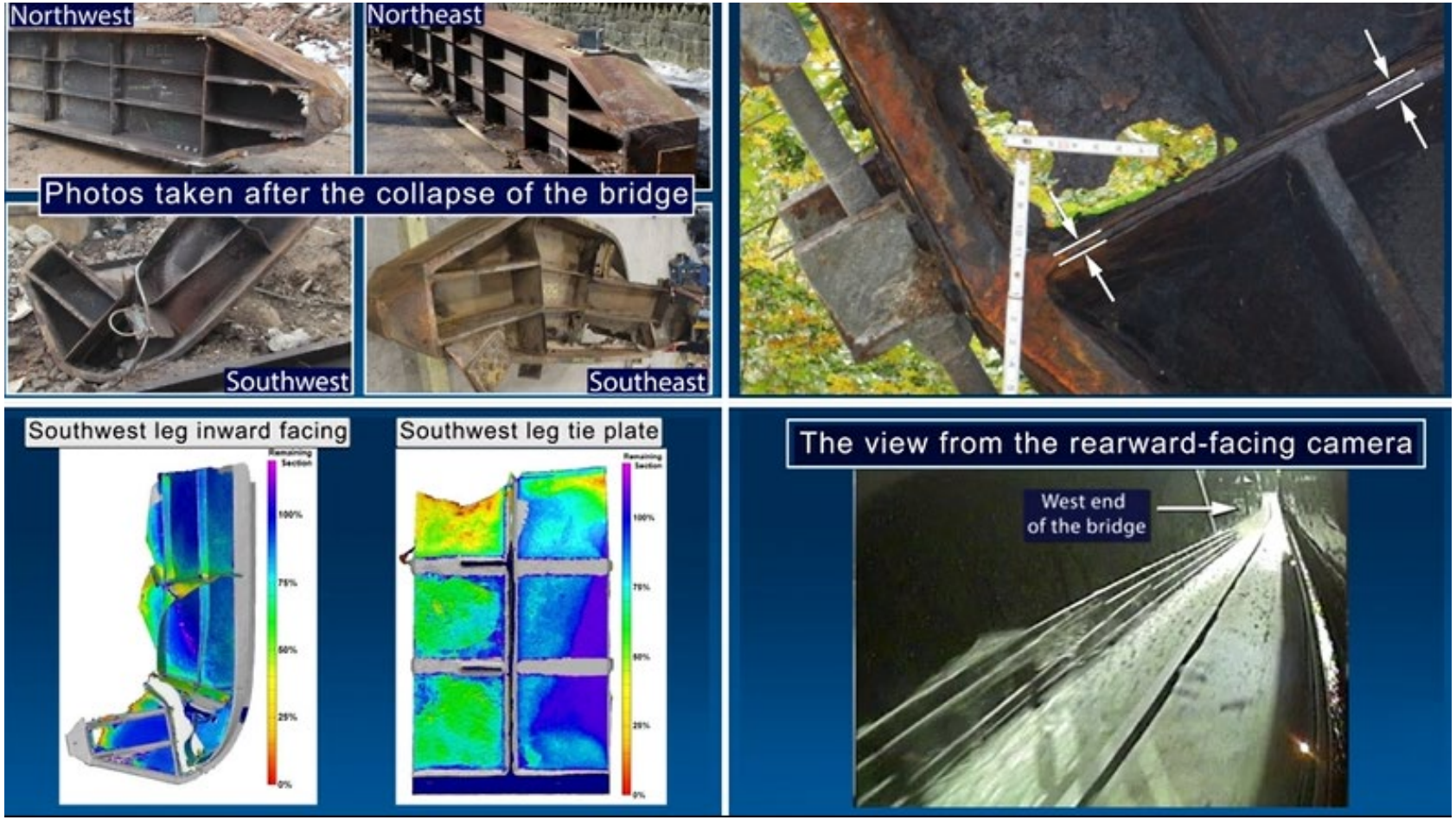
Fern Hollow Bridge Design

- Opened in 1973
- 447-foot-long, 64-foot-wide
- Uncoated weathering steel (UWS) bridge
- Three-span bridge with a rigid K-frame superstructure design type
- 26 tons posted weight limit
- Speed limit was 35 mph

Source: National Steel Bridge Alliance

Westbound Video Evidence

Bridge Failure Location Evidence



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Stiffeners on Southwest Leg

2013

Source: NBIS Inspection Report for Forbes Avenue Over Fern Hollow and Nine Mile Run, CDM Smith, September 2013

2021

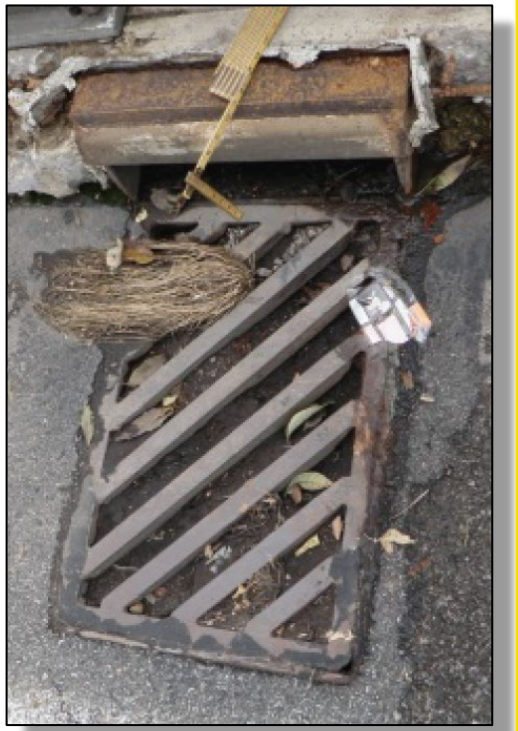
Source: NBIS Inspection Report for Forbes Avenue Over Fern Hollow and Nine Mile Run, Gannet Flemming, Inc., September 2021

Clogged Drainage Inlets

2005

Source: NBIS Inspection Report for Forbes Avenue Over Fern Hollow and Nine Mile Run, Wilbur Smith Associates, September 2005

2011



Source: NBIS Inspection Report for Forbes Avenue Over Fern Hollow and Nine Mile Run, Wilbur Smith Associates, September 2011

2017

Source: NBIS Inspection Report for Forbes Avenue Over Fern Hollow and Nine Mile Run, CDM Smith, September 2017

2021

Source: NBIS Inspection Report for Forbes Avenue Over Fern Hollow and Nine Mile Run, Gannet Flemming Inc., September 2021

What We Found: FCM Inspection Plans

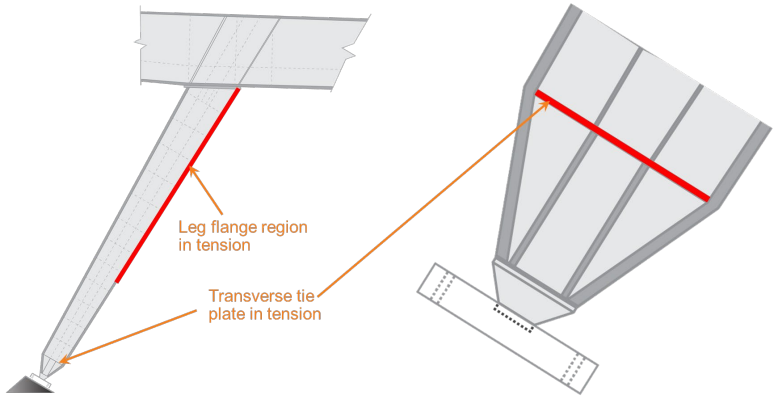
Bridge legs were not properly identified as fracture-critical

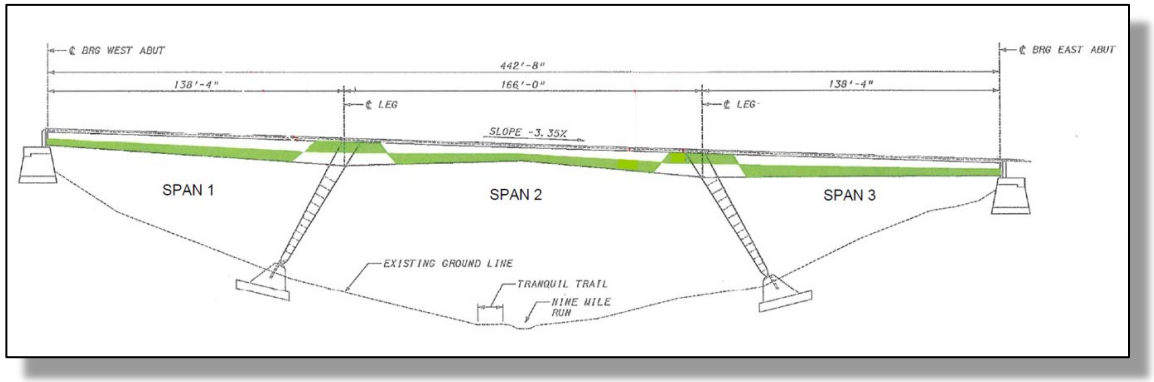
Bridge legs did not consistently undergo an in-depth FCM inspection

Maintenance and repair recommendations for the bridge legs were not assigned appropriate priority codes

Repairing the bridge legs could have prevented the collapse

The correct identification of FCMs is crucial

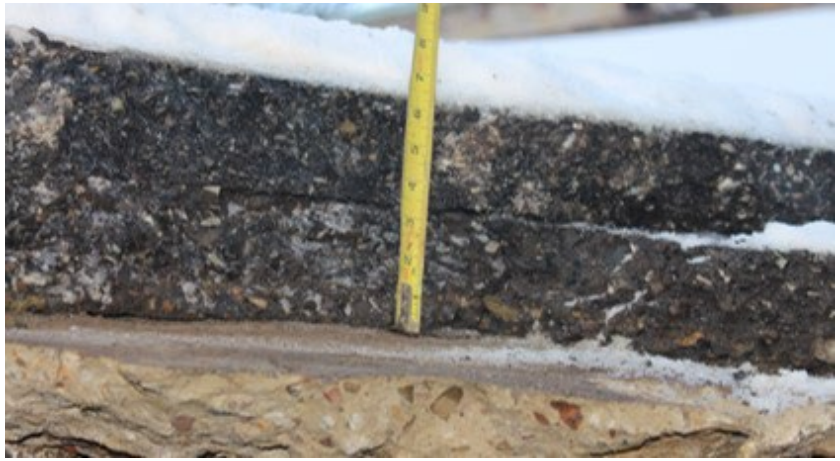




Source: Fatigue and Fracture Bridge Inspection Plan for Forbes Avenue Over Fern Hollow and Nine Mile Run, CDM Smith, January 2016

What We Found: Load Rating Deficiency

- The calculations and assumptions used in the 2014 load rating analysis overestimated the Fern Hollow Bridge's capacity
  - Wearing Surface Thickness
  - Load rating assumed an incorrect k-factor (Cross bracing not intact)
  - Distributed section loss length of the leg
- Had the correct calculations and assumptions been used, the bridge would have been closed



Fern Hollow Probable Cause

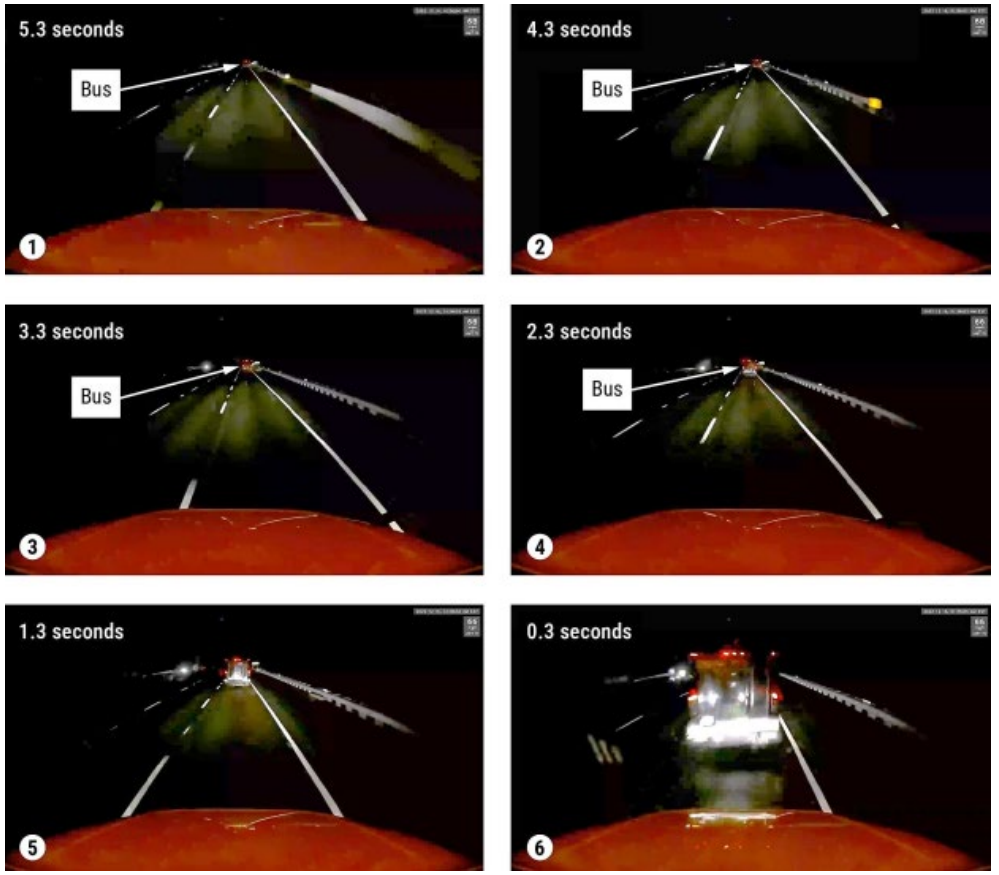
1. The failure of the transverse tie plate on the southwest leg of the bridge, a fracture-critical member (nonredundant steel tension member), due to corrosion and section loss
2. Resulting from the City of Pittsburgh's failure to act on repeated maintenance and repair recommendations from inspection reports.
3. Contributing to the collapse were:
    1. the poor quality of inspections,
    2. the incomplete identification of the bridge's fracture-critical members (nonredundant steel tension members), and
    3. The incorrect load rating calculations for the bridge.
    4. Insufficient oversight by the Pennsylvania Department of Transportation of the City of Pittsburgh's bridge inspection program.

Williamsburg Crash Investigation

- December 16, 2022, about 1:36 a.m.
- Interstate 64 in Virginia
- Truck traveling 65 mph ran into back of a party bus traveling 25 mph
- 3 bus occupants died, 9 sustained serious injuries, and 11 sustained minor injuries.
- The truck driver also sustained serious injuries

Source: Virginia State Police

Collision Sequence



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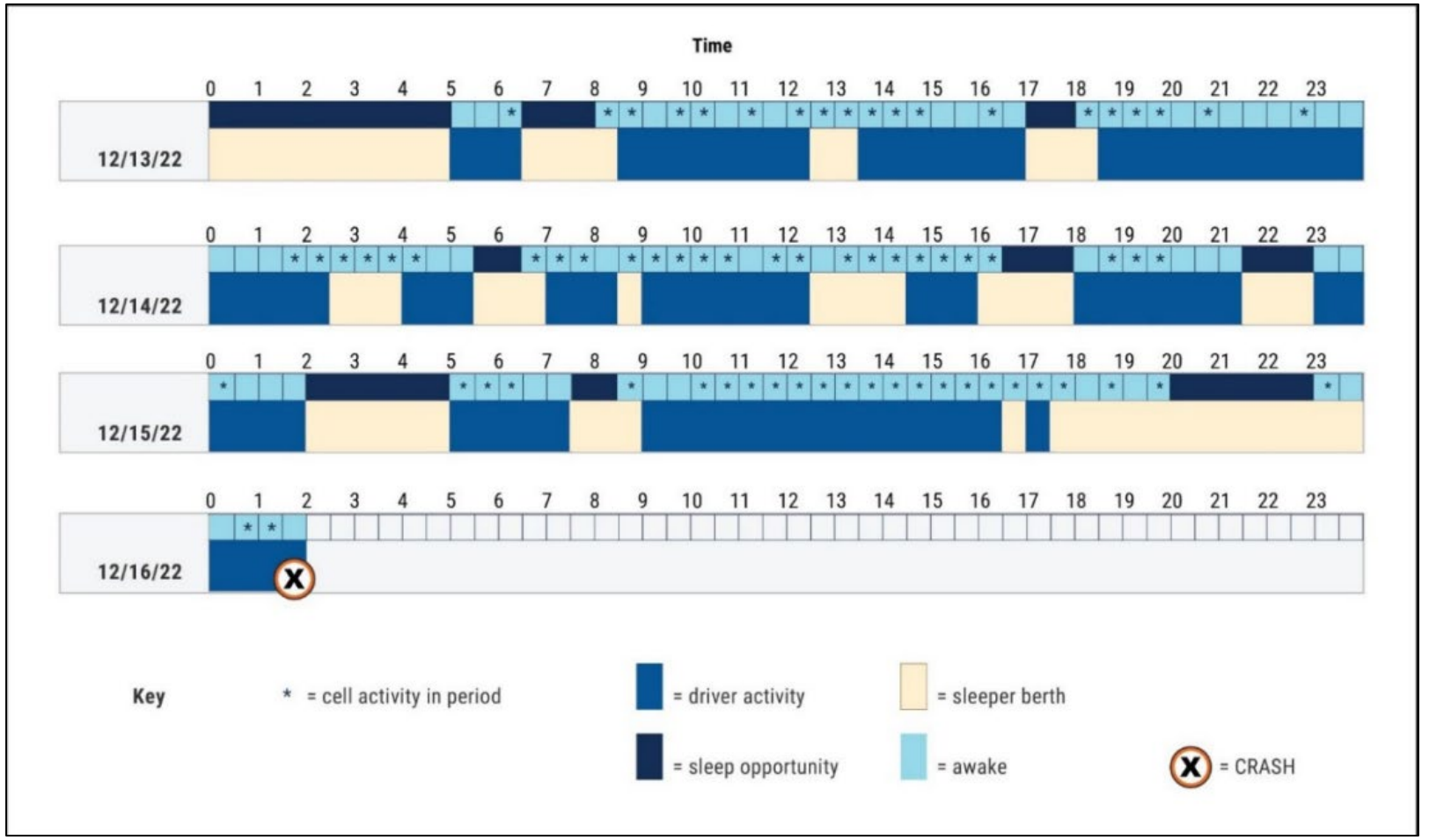
Truck Driver's 72 Hour History



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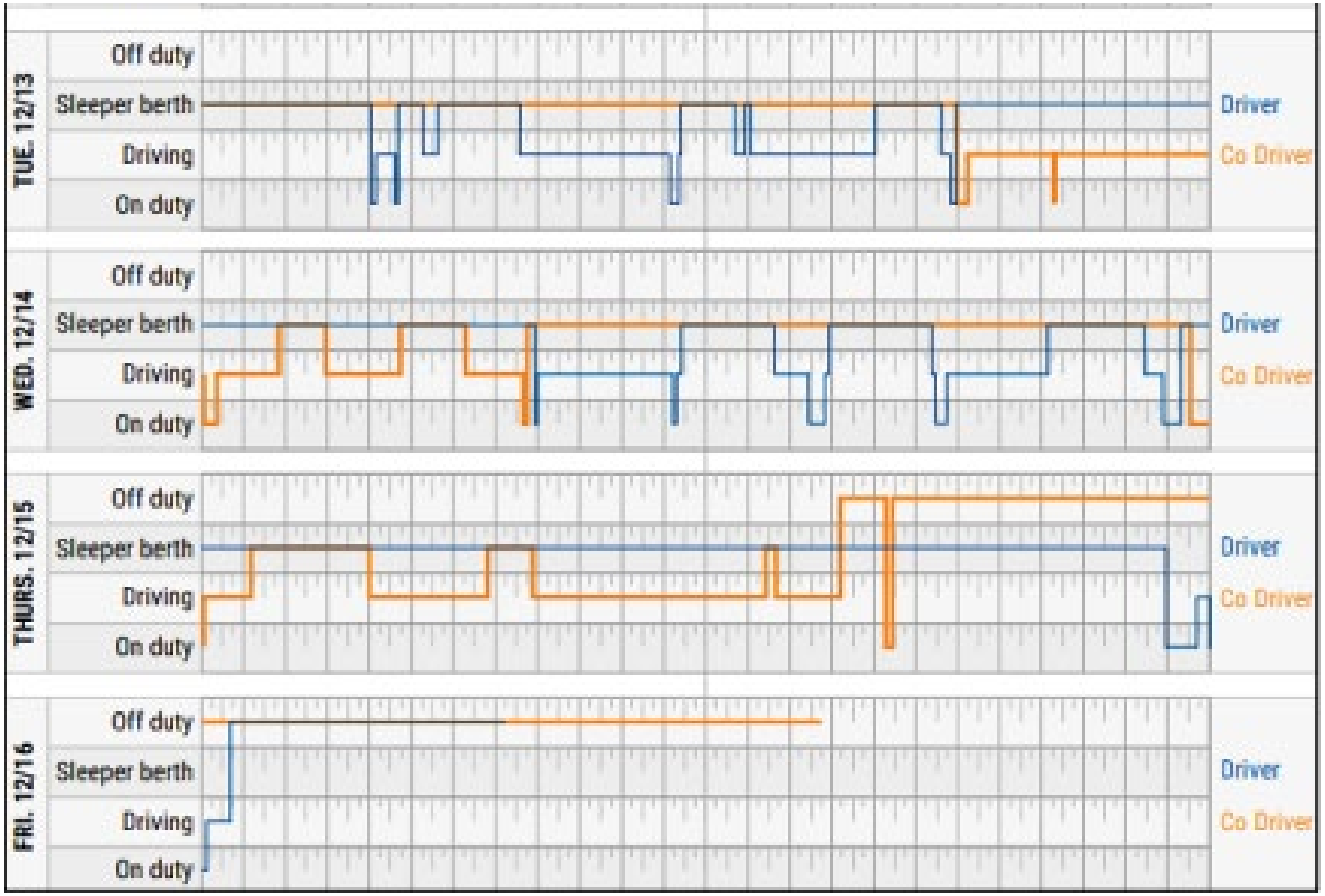
Truck ELD


TUE. 12/13
WED. 12/14
THURS. 12/15
FRI. 12/16
Off duty
Sleeper berth
Driving
On duty
Driver
Co Driver

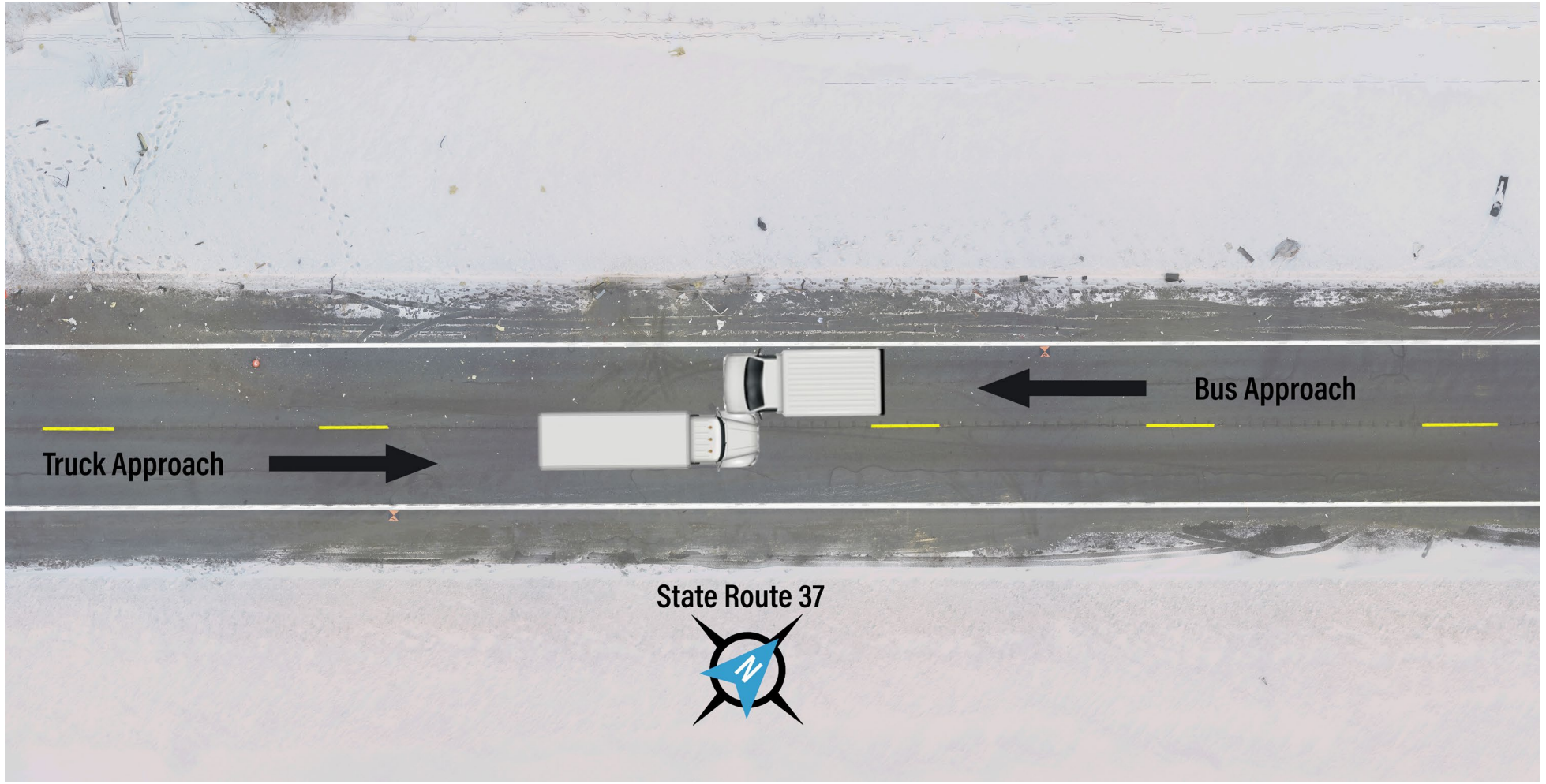
Williamsburg Safety Issues

- Inadequate safety culture of the truck motor carrier
  - Poor oversight of hours of service
  - Failure to manage the risk of driver fatigue
  - Lack of driver monitoring
- Commercial vehicle collision avoidance systems
- Inadequate safety management and oversight of the bus carrier
  - Unlicensed driver
  - Maintenance deficiencies
  - Inadequate state oversight

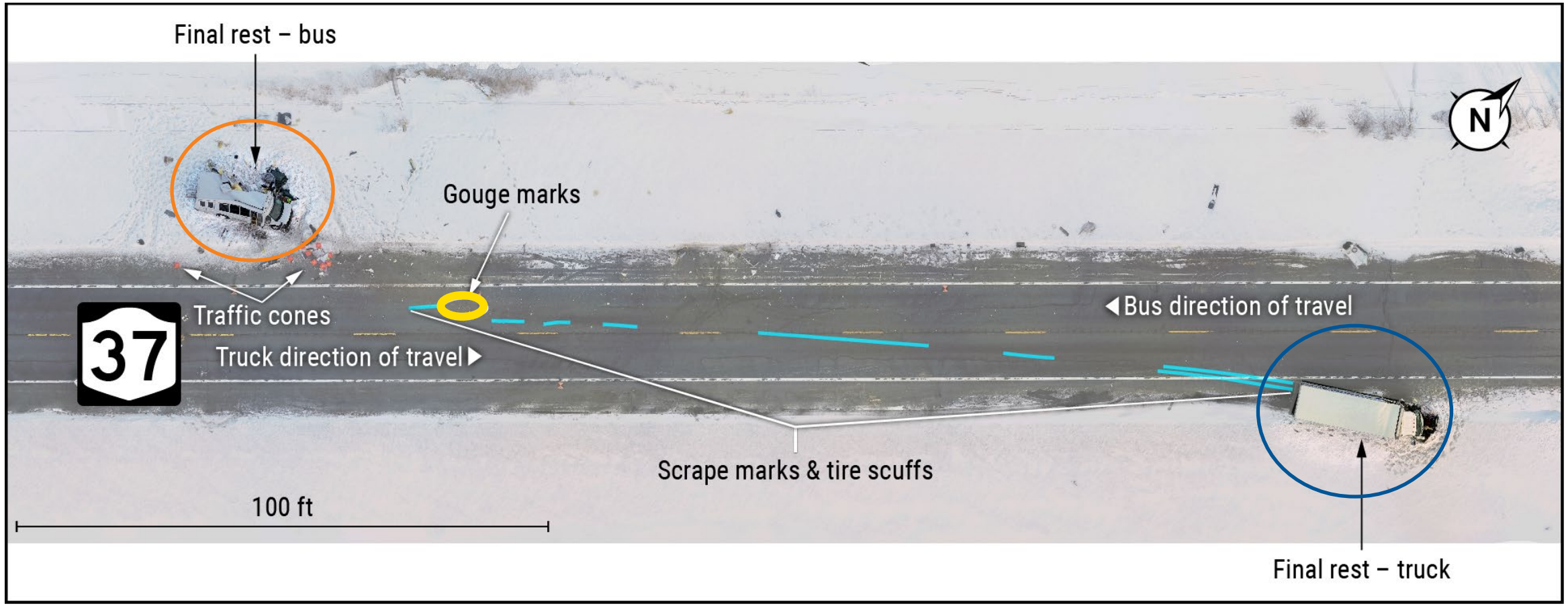
Louisville Crash Investigation

- January 28, 2023, about 6:00 a.m.
- LBFNY company bus Westbound SR-37
  - 2013 Chevrolet Express bus
  - ~53-54 mph
- Aero Global Logistics box truck Eastbound SR-37
  - 2021 Freightliner box truck
  - ~59 mph
- Roadway was wet, lane markings visible, light snow

Crash Sequence



Crash Sequence (Continued)

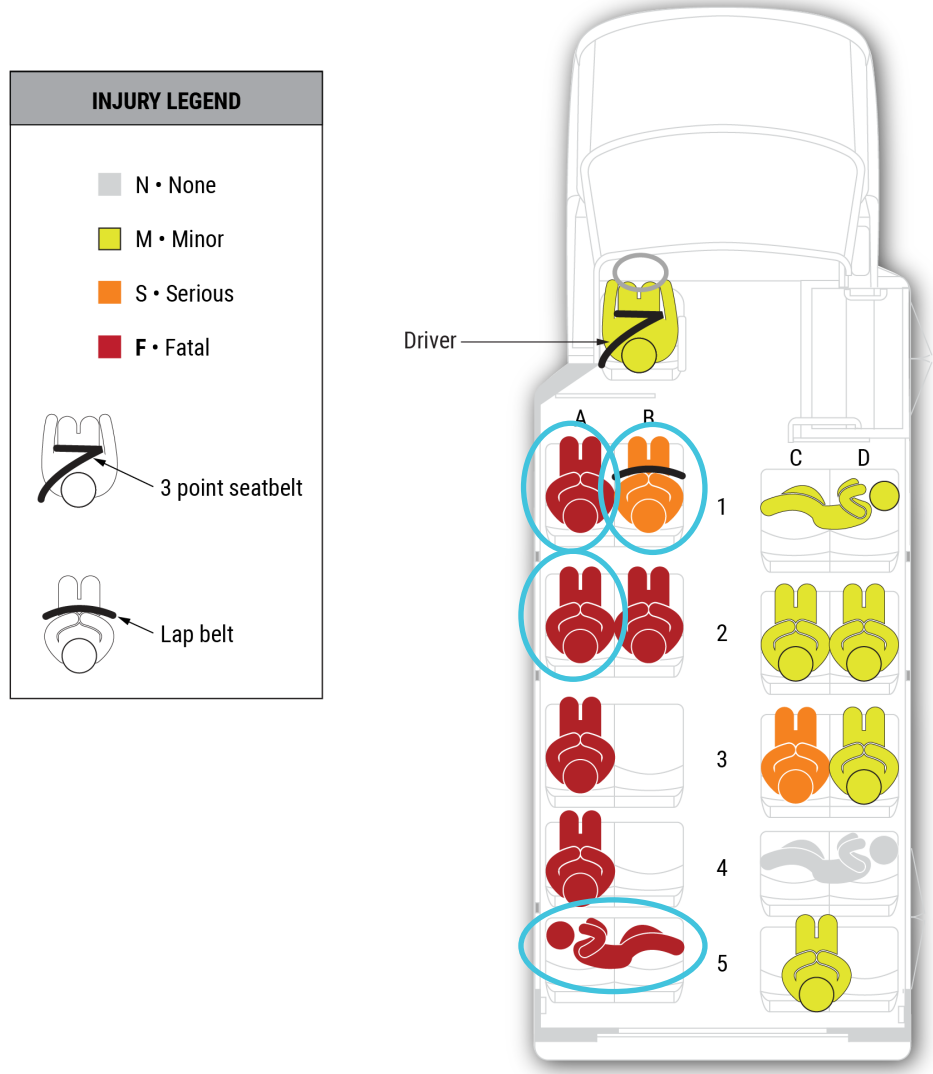


Roadway Evidence

Bus Intrusion and Integrity Loss

Bus Injuries

- Restrained driver – minor injuries
- Restrained passenger – serious head trauma
- Six fatalities
- Three unbelted ejected
- Multiple unbelted bus passengers displaced from their seats



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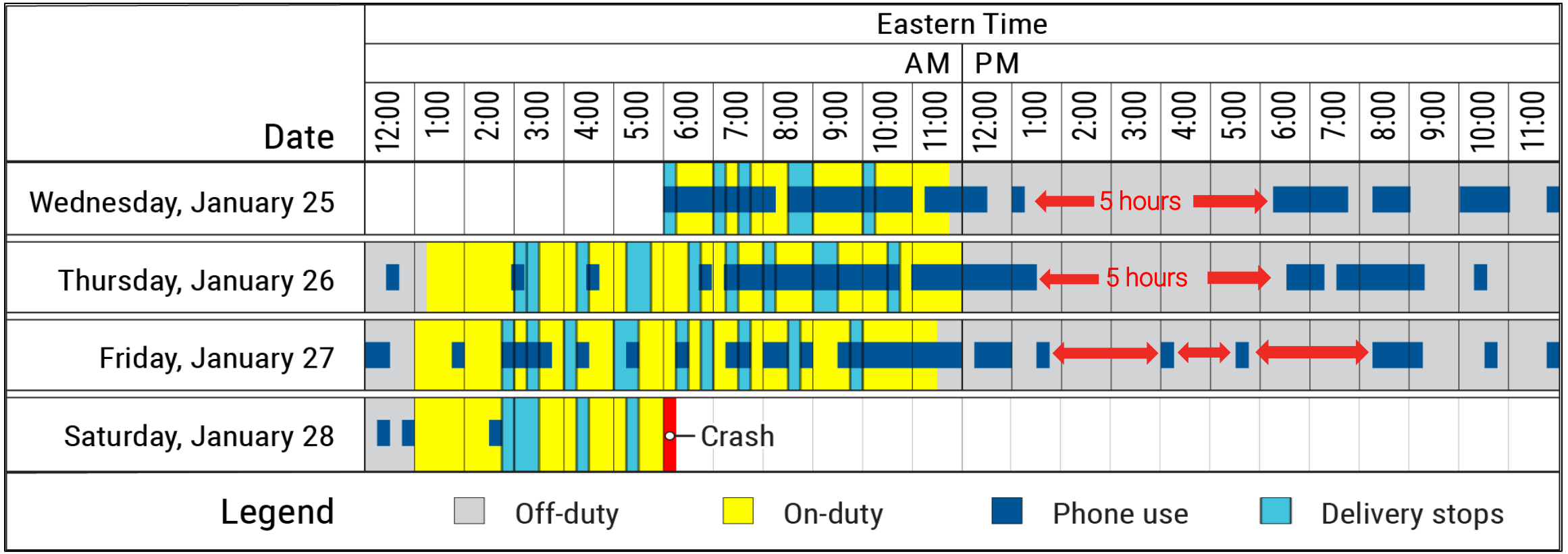

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Louisville Safety Issues

- Lack of seat belt use by the bus occupants
  - Access to belts
  - Use of belts
- Inadequate safety practices of the truck motor carrier (AGL)
  - Managing fatigue
  - Crash risk
- Deficient oversight of motor carrier operations by the FMCSA
  - Continuity of operations
  - Operating without authority

AGL Roadside Data vs. Compliance Review

February 2020

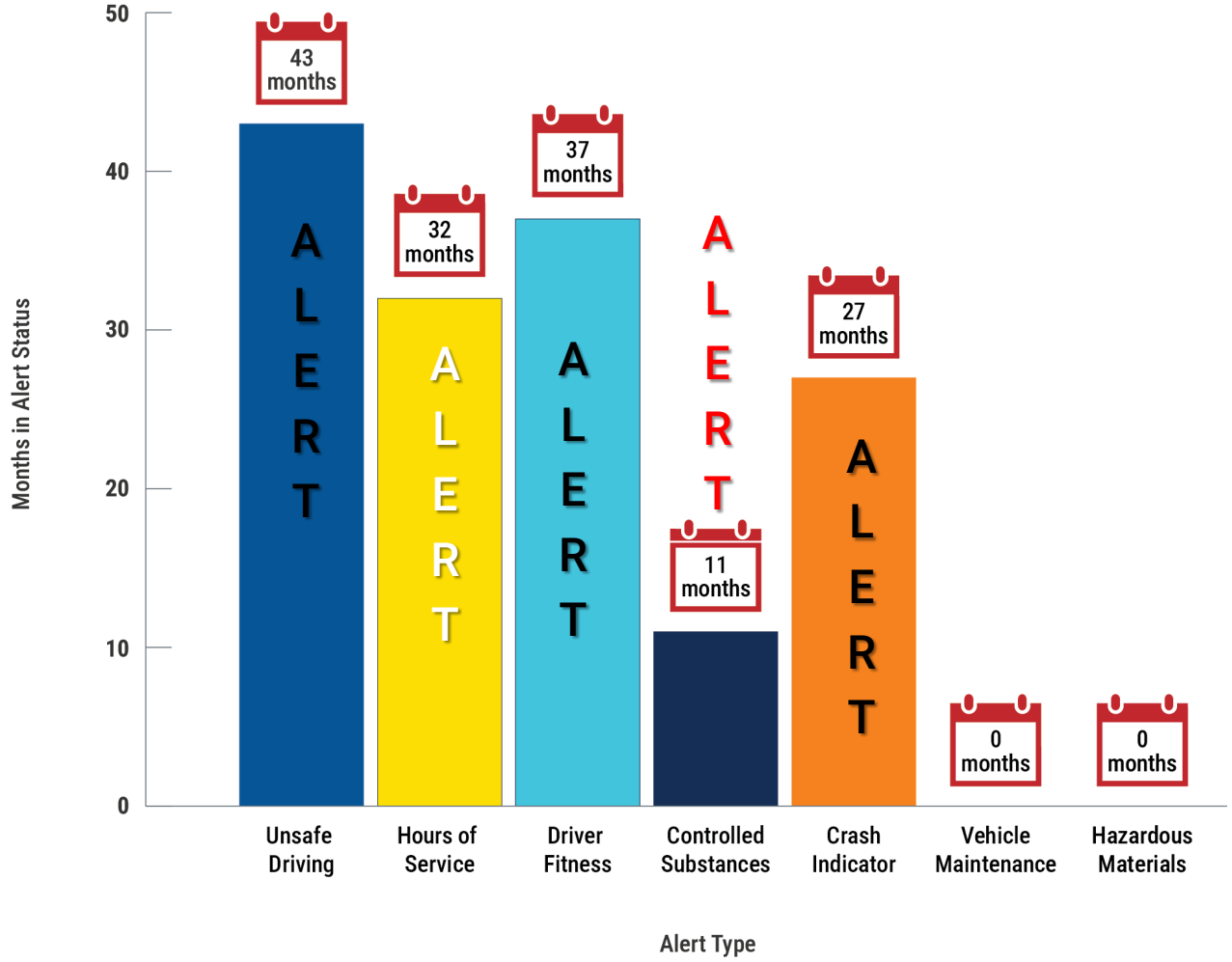
- SMS data = Moderate-Risk
- CR = Satisfactory safety rating

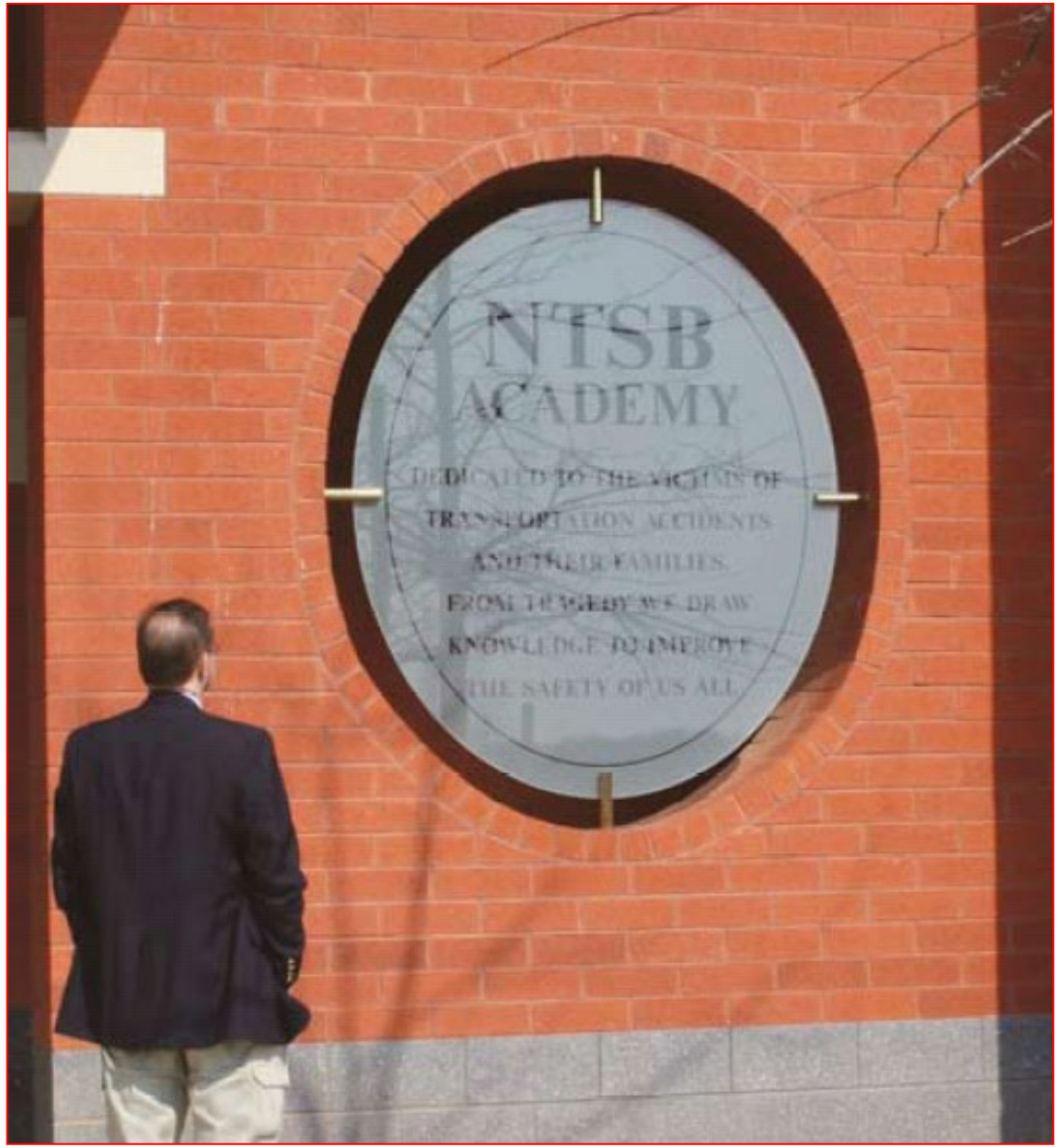
April 2021

- SMS data = Moderate-Risk
- CR = Unrated

June 2022

- SMS data = Risk
- CR = Satisfactory safety rating





"From tragedy we draw knowledge to improve the safety of us all."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