



National Transportation Safety Board

Agricultural Labor Bus and Truck-Tractor Collision

St. Marks, Florida
July 2, 2016



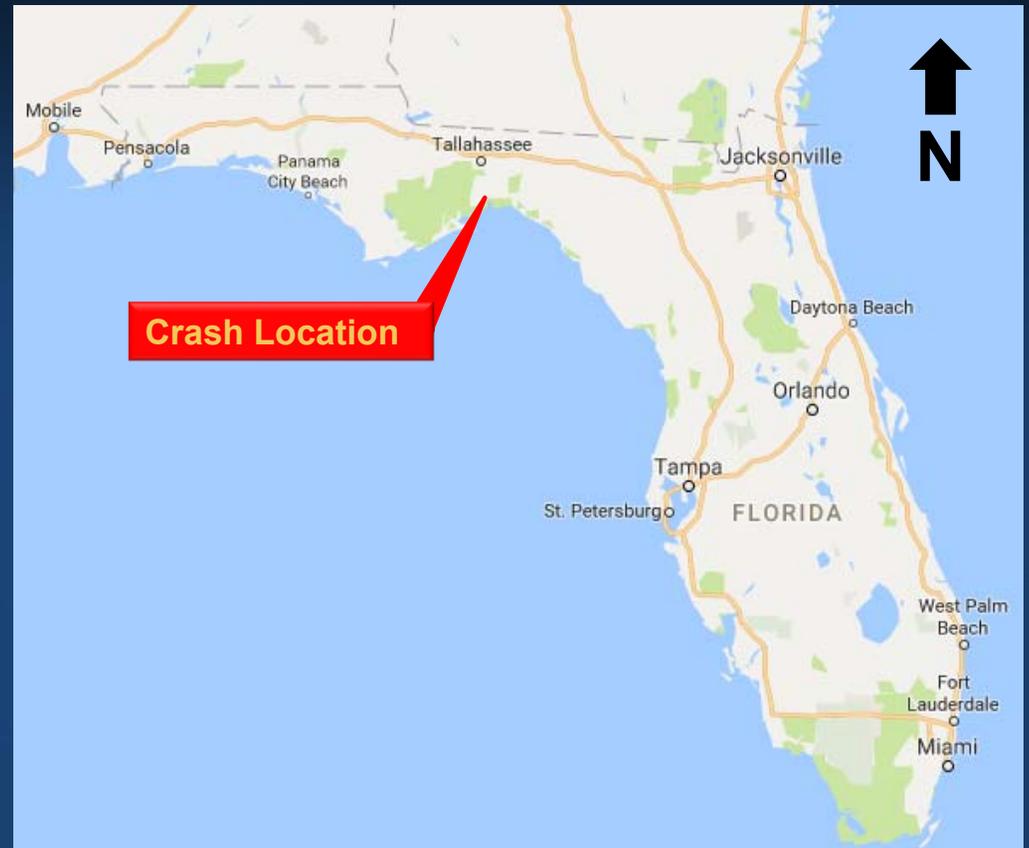
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Crash Overview

Jennifer Morrison
Investigator-in-Charge

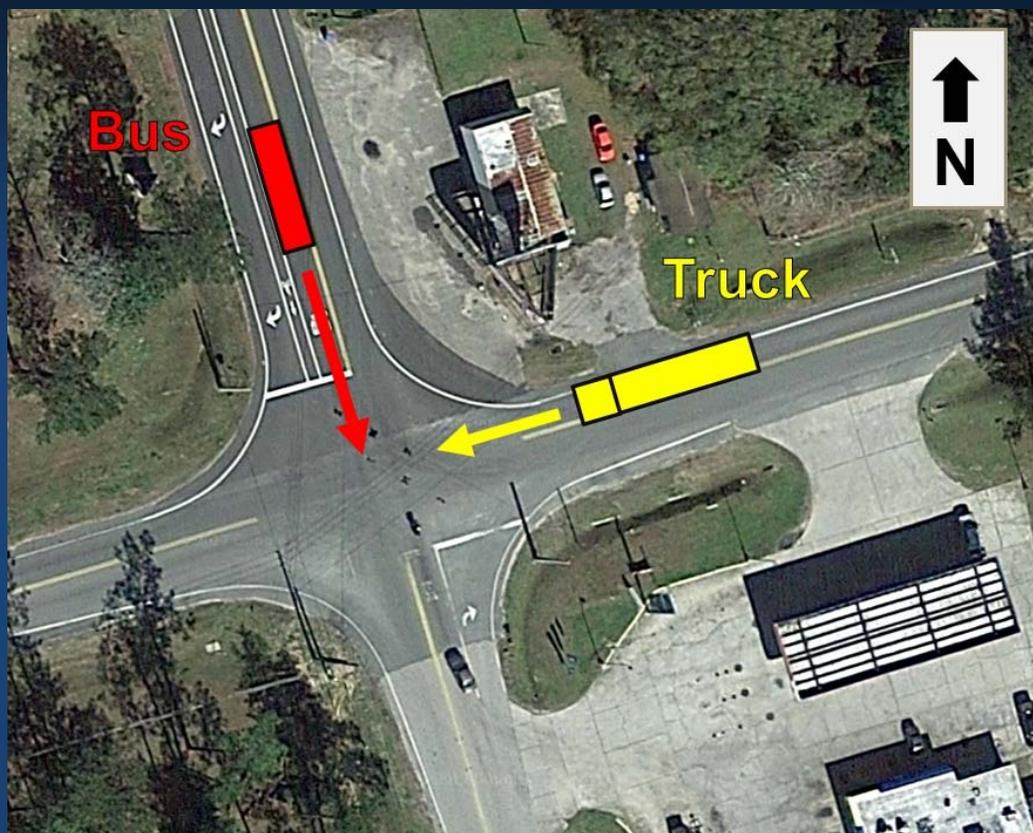
Crash Overview

- Saturday, July 2, 2016
- 5:16 a.m.
- 1979 Blue Bird bus
- 2005 Freightliner truck-tractor
- Rural intersection
- Postcrash fire
- 4 fatal
- 30 injured



Crash Overview

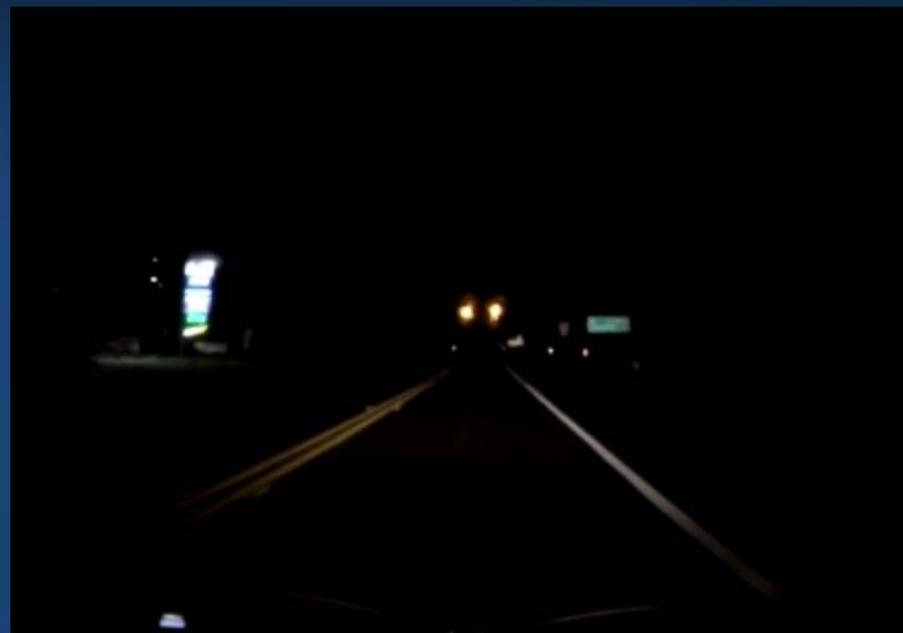
- Bus heading south on SR-363
- Truck heading west on US-98
- Speed limit 45 mph



Bus Approach to Intersection



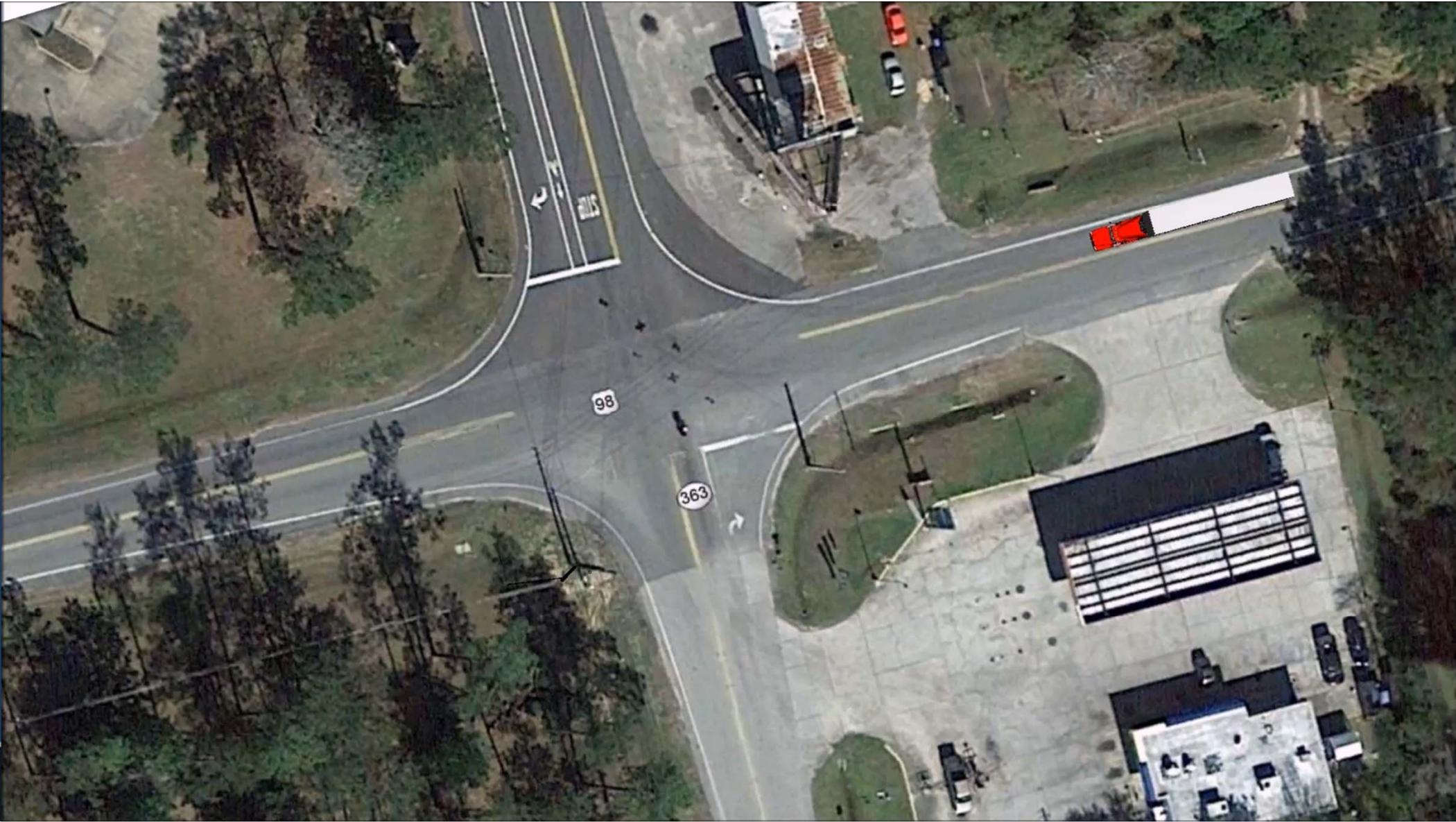
Truck Approach to Intersection



Video Evidence and Crash Simulation

- Bus – 46 mph
- Truck – 44 mph





Vehicles at Final Rest



Source: Florida Highway Patrol

On-Scene Staff

- Jennifer Morrison, Investigator-in-Charge
- Rafael Marshall, PhD, Human Performance
- Michael Fox, Motor Carrier Operations
- David Rayburn, Highway Factors
- David Pereira, Vehicle Factors
- Ronald Kaminski, Survival Factors
- Gary Jordan, Intern

Report Development Staff

- Donald Karol, Project Manager
- Debbie Stocker, Writer-Editor
- Julie Perrot, Safety Recommendations
- Shane Lack, Simulations
- Ivan Cheung, PhD, Data and Mapping
- Dr. Mary Pat McKay, MD, Medical Factors
- Nancy McAtee, Fire Specialist
- Katy Chisom, Transportation Disaster Assistance
- Terry Williams, Media Relations

Parties to Investigation

- Florida Highway Patrol
- Florida Department of Transportation
- US Department of Labor
- Federal Motor Carrier Safety Administration

Safety Issues

- Bus driver performance
- Agricultural worker transportation safety
- Intersection safety
- Heavy truck fuel tank integrity
- Truck occupant protection

Additional Investigations

Little Rock, Arkansas
November 6, 2015, 6-fatal



Ruther Glen, Virginia
June 17, 2016, 6-fatal





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Driver Performance

Rafael Marshall, Ph.D.

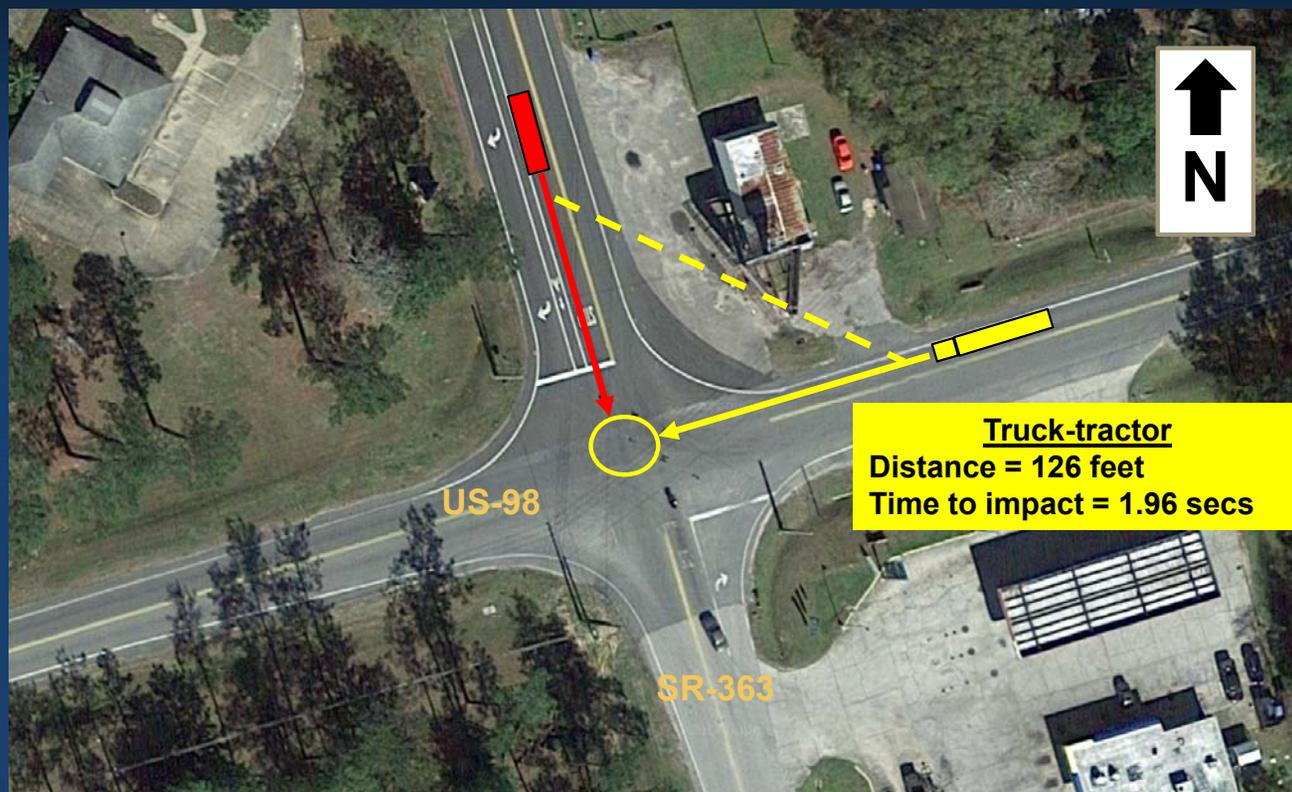
Overview

- Truck driver
 - Background
 - Sight distance and reaction time
- Bus driver
 - Background
 - Unfamiliarity with route
 - Fatigue

Truck Driver

- 55-year-old male
- New York Class A CDL
- Current medical certificate
- Worked for Verity Van Lines since 1988

Truck Driver Exclusions



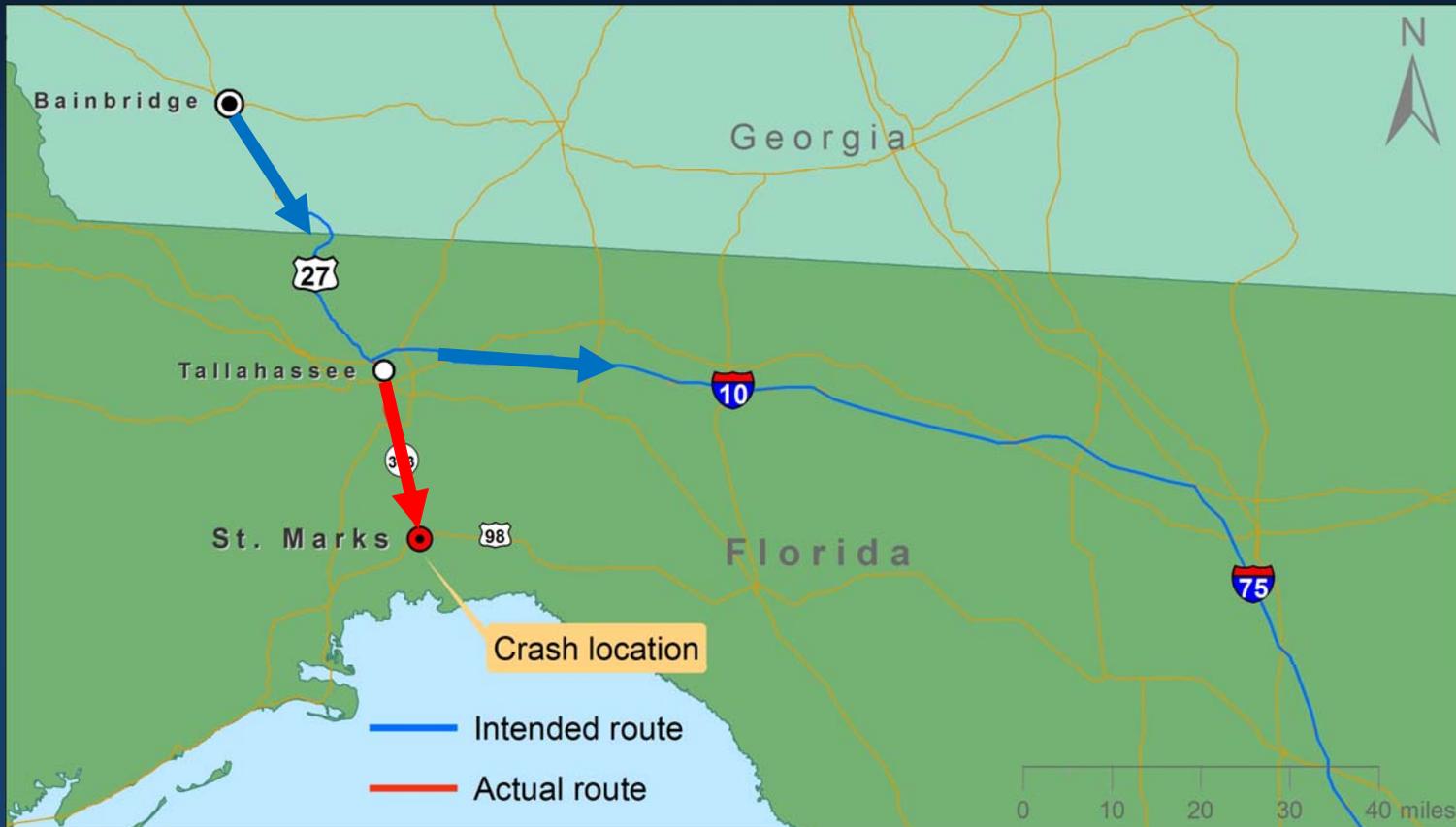
Bus Driver

- Background
- Unfamiliarity with route
- Fatigue and inattention
- Fatigue in Little Rock and Ruther Glen

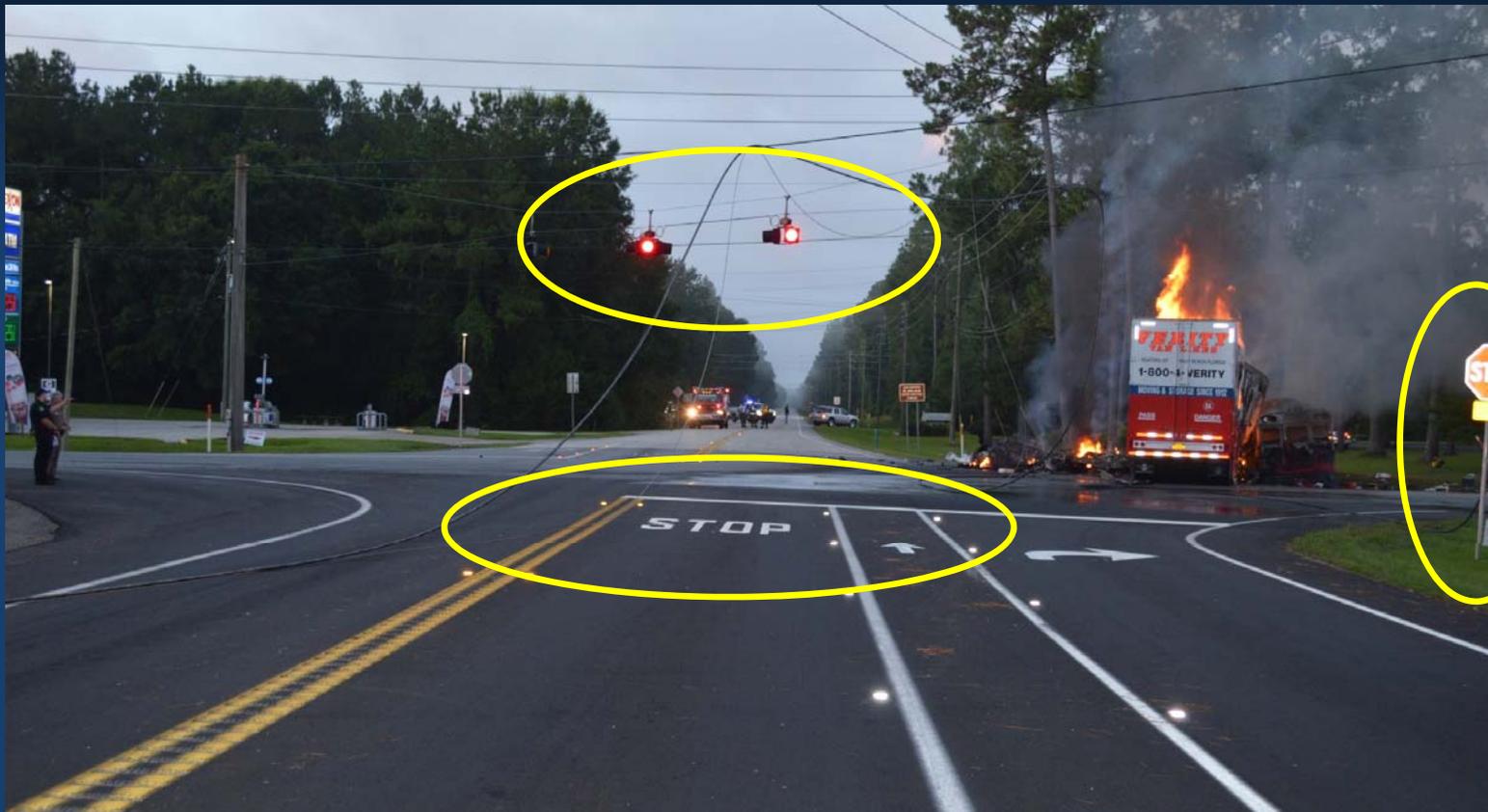
St. Marks Bus Driver Background

- 56-year-old male
- Florida Class B CDL
- Current medical certificate
- Joined Billy R. Evans in April 2016
- First time in Bainbridge, Georgia

Unfamiliarity with the Route



Approach to Intersection



Bus Driver Fatigue

- “Always sleepy” due to early wake schedule and work in corn fields
- Had a maximum of 4.5 hours sleep prior to crash trip
- Crash occurred during a circadian low

Fatigue in Little Rock and Ruther Glen

- Little Rock
 - Driver on duty for 14 hours
 - Crash occurred at 12:55 a.m.
- Ruther Glen
 - Driver on duty for 17.5 hours
 - Crash occurred at 12:35 a.m.

Summary

- Truck driver had no time to avoid crash
- Bus driver was unfamiliar with route
- Bus driver inattentive due to fatigue
- Driver fatigue key factor in Little Rock and Ruther Glen crashes



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Agricultural Worker Transportation Safety

Michael Fox

Overview

- Strengthen FMCSA New Entrant Program
- Improve DOL processes
- Increase collaboration of FMCSA and DOL
- Develop best practices
- Initiate motorcoach industry outreach

FMCSA Oversight

- Billy R. Evans Harvesting, Inc.
- Passed new entrant safety audit in 2005
- Post-crash CR:
 - No driver qualification files, no drug and alcohol testing, no hours-of-service oversight, and missing vehicle maintenance records
 - Declared an imminent hazard and placed out-of-service on July 29, 2016

Little Rock, Arkansas, and Ruther Glen, Virginia

- No interventions with FMCSA prior to crashes
- Post-crash CR identified noncompliance with:
 - Hours of service
 - Drug testing
 - Driver training
 - Maintenance records

Previous NTSB Safety Recommendations

- Loraine, Texas (H-03-2): Document safety plan and pass knowledge test of safety regulations
- Doswell, Virginia (H-12-31): Review safety management cycle to identify safety risks and maintain effective safety assurance program

DOL Wage and Hour Division

- Migrant and Seasonal Agricultural Worker Protection Act (MSPA): wages, housing, and transportation for agricultural workers
- Farm labor contractors (FLC)
- DOL post-crash investigation: failing to provide safe transportation, failing to obtain insurance, and transporting workers without authorization

DOL Wage and Hour Division

- Has enormous responsibilities with limited resources
- Regulates 9,800 FLCs
- Is not trained to enforce vehicle safety regulations
- Has limited training in safety regulations
- Could use an audit or review to improve processes

Collaboration and Roadside Enforcement

- FMCSA and DOL share:
 - CR results
 - New Entrant Program data
 - Roadside inspection data
- Improve data-driven enforcement strategies in line with seasonal harvesting
- Federal and state targeted roadside inspection

State Programs

- Michigan, Florida, and California have developed programs for agricultural transportation
- Driver qualification, hours-of-service compliance, vehicle standards, and registration
- California vanpool program

Motorcoach Industry Outreach

- The American Bus Association and United Motorcoach Association could initiate outreach to agricultural workers
- Offer FLCs safe, reliable, and authorized carriers

Summary

- Strengthen New Entrant Program
- Collaboration between FMCSA and DOL
- Industry best practices
- Motorcoach industry outreach



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Intersection Safety

David S. Rayburn

Overview

- Pavement improvement project
- Transverse rumble strips
- Intersection safety countermeasures
- Unsignalized intersection safety

Pavement Improvement Project

- Project timeline:
 - March 23: Transverse rumble strips removed
 - June 3: SR-363 repaved
 - July 2: Crash
 - July 8: Transverse rumble strips reinstalled
- Transverse rumble strips designed to alert drivers to unusual traffic conditions

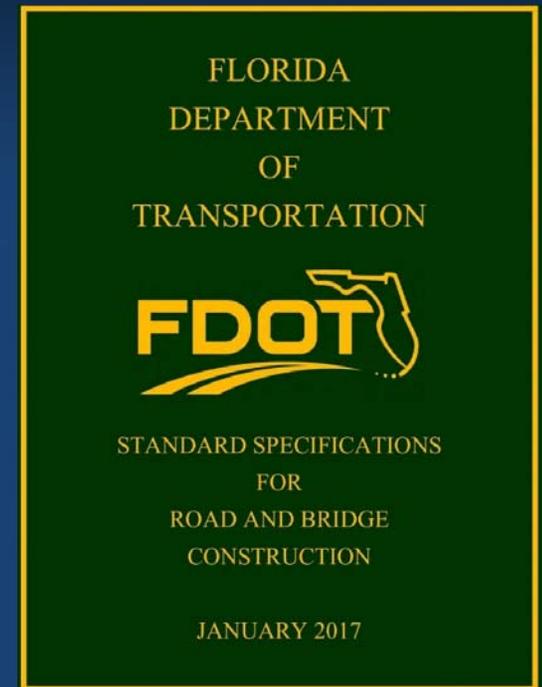


Transverse Rumble Strips

- Testing of transverse rumble strips:
 - Noticeable increase in vibrations
 - No noticeable increase in sound level
 - Clearly visible retroreflective strips
- Transverse rumble strips may have alerted bus driver if in place at time of crash

FDOT Construction Specifications

- Construction contract did not include:
 - Provisions for temporary rumble strips
 - Requirements for reinstallation of transverse rumble strips
- Revisions to FDOT's *Standard Specifications for Road and Bridge Construction* are needed



Intersection Safety Countermeasures

- FHWA and state resources
- *Unsignalized Intersection Improvement Guide (UIIG)*
- Countermeasures to improve safety:
 - Conspicuity enhancements
 - Intersection conflict warning system (ICWS)
 - Intersection lighting and traffic control signals
 - Geometric design improvements

Unsignalized Intersection Crash Problem

- 45,000 people killed in intersection crashes (2010–2015)
- 30,000 (more than 66%) of these fatalities occurred at unsignalized intersections
- Intersections present increased opportunity for conflict
- Side impacts often result in fatal or serious injuries
- Safe system approach to roadway engineering needed

Safe System Approach

- Based on Swedish Vision Zero
- FHWA systemic approach
 - Analysis of systemwide data
 - Identification of risk factors
 - Large-scale deployment of countermeasures
- Outreach to local transportation agencies

Summary

- Transverse rumble strips may have alerted bus driver
- Additional safety countermeasures are needed
- Crashes at unsignalized intersections are a nationwide problem
- Safe system approach needed to reduce crashes at unsignalized intersections



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Heavy Vehicle Fuel Tank Integrity

David Pereira

Overview

- Truck-tractor fuel tank specifications and vulnerability
- Right side-mounted fuel tank breach
- Improvements in heavy vehicle fuel tank integrity

Fuel Tank Specifications

- Side-mounted fuel tanks
- 150-gallon capacity each
- Constructed of 1/8-inch aluminum
- 7 ft long, 2 ft diameter
- Mounted behind front axle
- Held in place by three steel straps



Fuel Tank Vulnerability



Fuel Tank Breach



Heavy Vehicle Fuel Tank Integrity



Right side fuel tank



Left side fuel tank

Orland, California

- April 10, 2014
- Truck-tractor collided with motorcoach
- 10 fatal, 39 injured
- Catastrophic rupture of truck tractor's side-mounted fuel tank



Heavy Vehicle Fuel Tank Integrity

- Fuel tank design standard not changed in 50 years
- Opportunities for effective fuel tank protection:
 - Relocation inward
 - Protective shields
 - Stronger materials
 - Bladders or double-walled tanks
 - Alternate frame rail designs

Summary

- Failure of the truck-tractor's right side-mounted fuel tank resulted in truck driver fatality
- Side-mounted fuel tanks are vulnerable in collisions
- Additional fuel tank integrity standards are needed



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Seat Belt Usage

Ronald Kaminski

Overview

- Seat belt usage
- Florida seat belt use law

Seat Belts

- Bus:
 - Equipped with lap belt for driver - worn
 - No passenger seat belts
- Truck:
 - Equipped with lap and shoulder seat belts – not worn
 - Unrestrained driver found unresponsive in front passenger seat area
 - Driver would have likely survived had he been restrained

Seat Belt Laws

- Florida has primary enforcement seat belt use law, but large trucks are exempt
- Federal law requires all commercial vehicle drivers to wear seat belts when available
- 2015 NHTSA study: unbelted large truck drivers are 3 times more likely to suffer fatal or incapacitating injuries

Summary

- Bus driver restrained by seat belt
- Truck driver and passenger unrestrained
- Truck driver likely died in postcrash fire
- Primary enforcement seat belt use laws are effective

