



National Transportation Safety Board

Florida Association for Pupil Transportation

Member Michael Graham

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AVIATION



HIGHWAY



MARINE



RAILROAD



PIPELINE

Our Mission

The NTSB is an independent Federal agency charged by Congress with **investigating** every civil aviation accident in the United States and significant accidents in the other modes of transportation – highway, marine, railroad and pipeline – and **issuing safety recommendations** aimed at preventing future accidents.

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BOARD MEMBERS AND STAFF

5 Board Members

- Chairman Robert L. Sumwalt
- Vice Chairman Bruce Landsberg
- Member Jennifer Homendy
- Member Michael Graham
- Member Thomas Chapman



Chairman
Robert Sumwalt



Vice Chairman
Bruce Landsberg



Member
Jennifer Homendy



Member
Michael Graham



Member
Thomas Chapman

- 400 staff (HQ, 4 Regional Offices, Training Center)

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US Transportation Fatalities in 2018¹ – by Mode

Total: 38,515²

Mode	Fatalities
Highway	36,560
Railroad	1,000
Marine	684
Aviation*	393
Pipeline	8
Other	262

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OFFICE OF HIGHWAY SAFETY

- Total staff of 30 - managers, investigators, writers, and support staff
- Crashes monitored 24-7 from NTSB's Response Operations Center
- Ready to "Launch" at a moment's notice



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NTSB INVESTIGATIONS

- NTSB's three teams of highway investigators launch to about 21 crashes per year
- Launch selection criteria
 - High public interest?
 - New or emerging issues?
 - Can we make a difference?
 - Do we have the resources?



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TYPES OF HIGHWAY INVESTIGATIONS

Valhalla, NY 2/2/18

Gray Summit, MO 8/8/18

Williston, FL 5/7/16

Orlando, CA 4/19/14

Minneapolis, MN 8/1/07

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BOARD MEETING

- Public meeting in Washington, DC
- Webcast
- Staff presentations
- Board member deliberations
- Official adoption of:
 - Report
 - Findings
 - Probable cause
 - Safety recommendations

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NTSB SAFETY RECOMMENDATIONS

- Safety recommendations are the Board's most important product
- Developed to remedy system, hardware, operational or policy failures identified during investigations or safety studies

"These safety recommendations, if acted upon, would prevent future tragedies similar to these."

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2019-2020 NTSB MOST WANTED LIST OF TRANSPORTATION SAFETY IMPROVEMENTS

- Increase Implementation of Collision Avoidance Systems in All New Highway Vehicles
- Ensure the Safe Shipment of Hazardous Materials
- Improve the Safety of Part 135 Aircraft Flight Operations
- Strengthen Occupant Protection
- Implement a Comprehensive Strategy to Reduce Speeding-Related Crashes
- Eliminate Distractions
- Reduce Fatigue-Related Accidents
- End Alcohol and Other Drug Impairment
- Require Medical Fitness – Screen for and Treat Obstructive Sleep Apnea
- Fully Implement Positive Train Control

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SCHOOL BUS SAFETY AT NTSB

- Safety of our kids is a top priority for the NTSB
- Everyday 500,000 buses carry more than 25 million students to and from school and school activities
- Protect and preserve public trust and parental confidence

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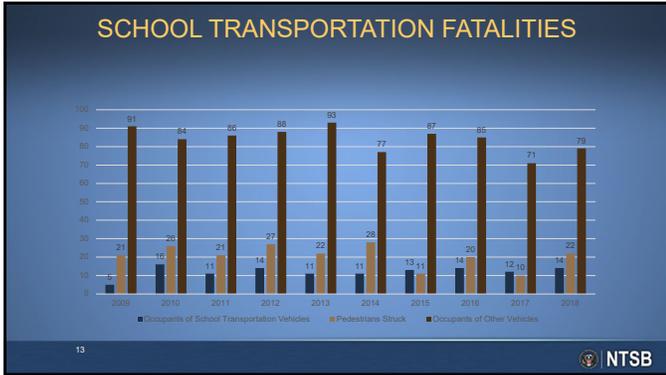
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SCHOOL BUS SAFETY RECORD

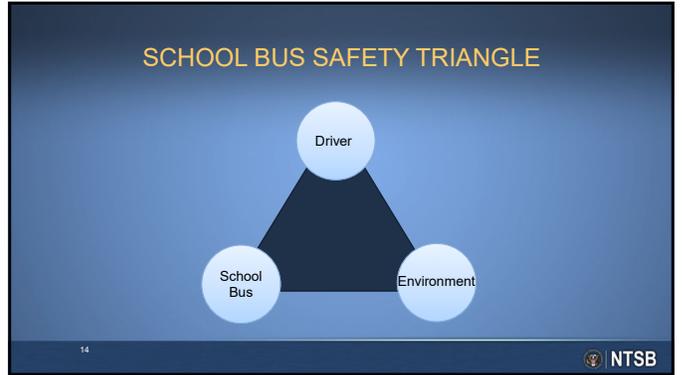
- 249 school-age children fatally injured from 2009-2018
 - 52 were school bus occupants
 - Compared to 35,000 annual highway fatalities
- Per NHTSA: 20x safer than a parent and 50x safer than a friend/sibling/driving him or herself to school

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- ### DRIVER
- Areas of Focus
 - Medical and Physical Fitness
 - Recent Investigations
 - Baltimore, MD
 - Oakland, IA
 - Relevant Recommendations
 - To FMCSA: Provide explicit guidance to encourage certified medical examiners to request a complete list of current medical conditions and medications when obtaining supplemental information from a commercial driver's treating health-care provider. (H-18-7)
 - To States: Revise your school bus driver requirements so that all drivers must pass a physical performance test on hiring and at least annually, and also whenever a driver's physical condition changes in a manner that could affect his or her ability to physically perform school bus driver duties, including helping passengers evacuate a bus in an emergency. (H-19-6)

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Oakland, Iowa

- December 12, 2017
- About 6:52 a.m.
- 480th Street
- 2004 school bus
- 2 fatal

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School Bus Driver Medical Conditions

- Held current medical certificate
- Chronic, ongoing conditions
 - Recurrent pain in back & both legs
 - Weakness in right leg
 - Use of cane/walker
 - Pain moving from sitting to standing
- Spinal fusion scheduled two days after crash
- Wife reported typical back pain, no other issues

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Physical Performance Tests (PPTs)

- Driver duties include assisting passengers
- PPTs assess ability to physically carry out normal and emergency duties
- RCSD instituted a PPT after the crash
- PPTs can identify drivers who may not be able to assist in an emergency

Standard #1 – Bus Steps Time: _____ Pass: _____ Fail: _____
 Measurement: With hand on rail, climb and descend bus steps 3 times in 30 seconds

Standard #2 – Entrance Door Pass: _____ Fail: _____
 Measurement: Repeatedly open and close service door 3 times

Standard #3 – Clutch and/or Brake Pedals Pass: _____ Fail: _____
 Measurement: Open and hold brake pedal a minimum of 3 seconds, 5 consecutive times. (For clutch, hold clutch pedal for the duration of the test)

Standard #4 – Accelerator to Brake Time: _____ Pass: _____ Fail: _____
 Measurement: Alternately activate accelerator and brake controls 10 times in ten seconds. (Note to examiner: Stress to do this as quickly as possible; a very short practice is allowed)

Standard #5 – Emergency Exit Time: _____ Pass: _____ Fail: _____
 Measurement: Starting in a seat belted position, with hands on steering wheel and looking at seatbelt. Release seat belt, walk (Do not run) to rear most exit with a door, open door, SIT and slide out within 20 seconds.
 (Note: Examiner will either sit in front of rear exit seat, or walk to the rear of the bus. Test is completed when the driver's feet touch the ground)

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SCHOOL BUS

- Safety Issues
 - Lap/shoulder belts
 - Fire suppression systems
 - Collision Avoidance Systems and Automatic Emergency Braking
- Recent Investigations
 - Oakland IA
 - Baltimore, MD/Chattanooga, TN
- Recommendations
 - To States: Enact legislation to require that all new large school buses be equipped with passenger lap/shoulder belts for all passenger seating positions in accordance with Federal Motor Vehicle Safety Standard 222. (H-18-10)
 - To NHTSA: Require all new school buses to be equipped with fire suppression systems that at a minimum address engine fires. (H-19-4)
 - To NHTSA: Require all new school buses to be equipped with collision avoidance systems and automatic emergency braking technologies. (H-18-8)

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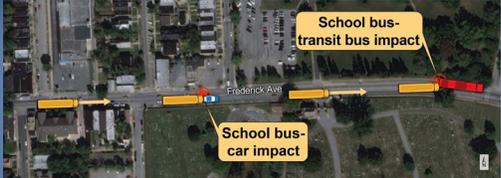
BALTIMORE, MARYLAND

- November 1, 2016, 6:30 a.m.
- 2015 IC school bus
 - 67-year-old driver, bus aide
- 2012 Ford Mustang
 - 51-year-old driver
- 2005 New Flyer transit bus
 - 33-year-old driver, 13 passengers



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CRASH SCENE & INJURY INFORMATION




Source: Maryland Transportation Authority Police

- Fatalities (2 bus drivers, 4 transit passengers)
- Serious injuries (5 transit passengers)
- Minor injuries (school bus attendant, 4 transit passengers, car driver)

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BALTIMORE SCHOOL BUS DRIVER

- Seizures since childhood
 - Sudden, unpredictable, neurologic episodes
 - Loss of consciousness, uncontrolled movements
- Incapacitated by a seizure led to crash
- Denied seizures to get medical card
- Fraudulently obtained CDLs
- Additional effort needed to increase referral of medically unfit drivers to MVA

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CHATTANOOGA, TENNESSEE

- November 21, 2016
- Single-vehicle school bus crash, rolled onto right side, impacted tree
- 2008 Thomas Built school bus
 - 24-year-old driver
 - 37 students
- 6 students killed, 26 serious to minor injuries
- School bus equipped with multiple systems capable of recording and transmitting event-related data



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VIDEO ANALYSIS, CRASH SIMULATION

- Bus at 52 mph
- 30-mph speed limit zone
- On cell phone
- Excessive speed resulted in loss of control



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CRASH PREVENTION TECHNOLOGIES

In both the Baltimore and Chattanooga investigations we determined that crash prevention technologies could have assisted the drivers and could have mitigated or prevented these crashes.

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BALTIMORE CRASH PREVENTION

- Collision avoidance systems mitigate or prevent crashes by detecting vehicles ahead
- Automatic emergency braking intervenes regardless of driver vigilance
- *With CAS and AEB, the school buses impact with the transit bus would not have occurred*



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CHATTANOOGA CRASH PREVENTION

- Electronic stability control evaluates and intervenes in loss of control events and ensures automatic emergency braking benefits
- 2015 FMVSS 136
 - **excludes school buses**
- 2017 Canadian CMVSS
 - **includes school buses**
- *ESC could have assisted in maintaining control & mitigated crash severity*



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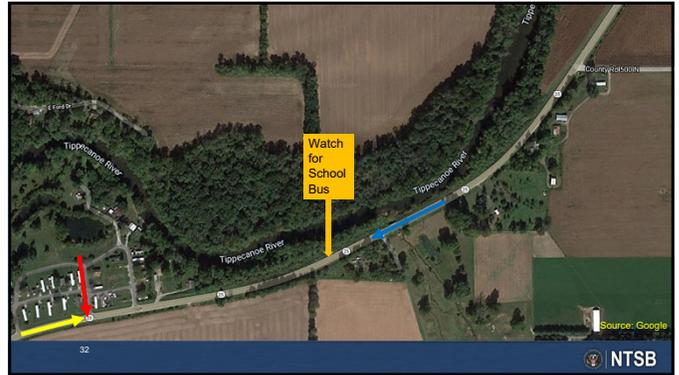
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ENVIRONMENT

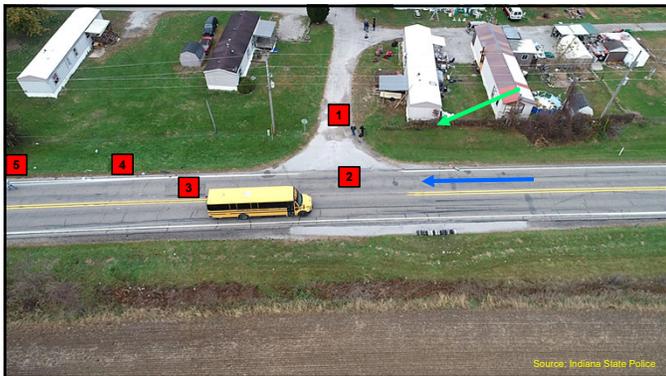
- Safety Issues
 - School bus routing
 - Illegal school bus passing
 - Modifying driver behavior
- Recent Investigations
 - Rochester, IN
- Recommendations
 - To States: Enact legislation to permit stop arm cameras on school buses to capture images and allow citations to be issued for illegal school bus passings based on the camera-obtained information. (H-20-12)
 - To School Bus Groups: Inform members to minimize the use of school bus stops that require students to cross a roadway (especially a high-speed roadway) and to, at least annually, and also whenever a route hazard is identified, evaluate the safety of their school bus routes and stops. (H-20-15)

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Probable Cause

- The pickup truck driver's failure to stop for the school bus for unknown reasons
- Contributing to the crash was the Tippecanoe Valley School Corporation's
 - Inadequate safety assessment of school bus routes that required student pedestrians to cross a 55-mph roadway, increasing the risk of injury during a collision
 - Failure to establish a clear policy for bus drivers to follow in determining when it is safe to signal students to cross the roadway

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Safety Issues

- Failure of other drivers to stop or otherwise respond when approaching a school bus with its warning lights on and stop arm extended
- Deficiencies in establishing safe school bus routes and stop locations
- Need for greater use of technologies to prevent collisions with, and mitigate injuries of, student pedestrians.

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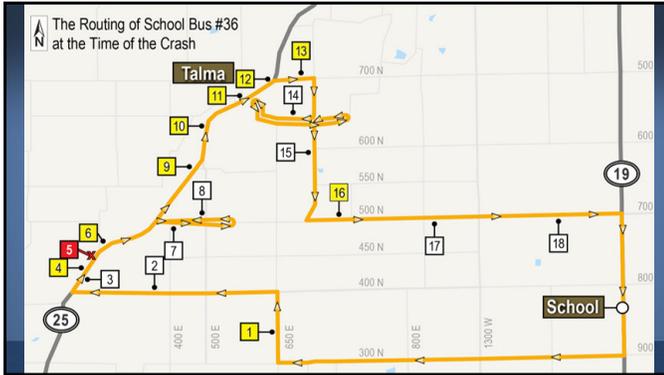
Statistics Involving Illegal School Bus Passings

- Unlawful to pass a stopped school bus in all 50 states
- Estimate Illegal school bus passings occur about **17 million times a year**

Source: NASDPTS Annual Survey (2018/2019)

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School Bus Route Recommendation

To NASDPTS, NAPT and NSTA:

- Minimize the use of school bus stops that require students to cross a roadway (especially a high-speed roadway)
- To, at least annually, and whenever a route hazard is identified, evaluate the safety of their school bus routes and stops (H-20-15)

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Modifying Driver Behavior

Education

- Service announcements (NHTSA)
- Back-to-school safety tips (NSC)
- School bus safety video (AAP)
- Public safety announcements
- State driving manuals

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Advance Warning Signs



1.8 miles prior to the stopped school bus



868 feet prior to the stopped school bus

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Modifying Driver Behavior

Enforcement

- Collaborative enforcement
- Enforcement campaigns
- Focused enforcement of school bus violations
- High-visibility enforcement

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Education and Enforcement Recommendations

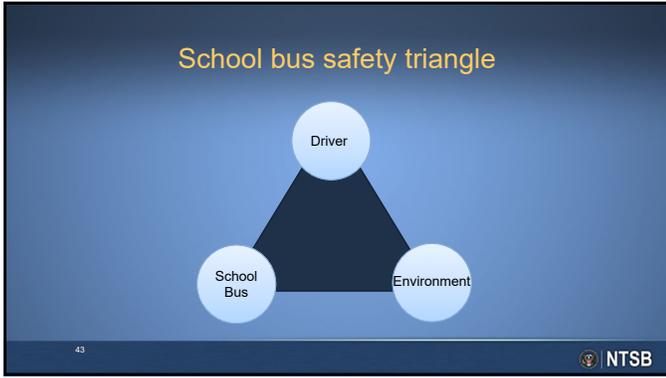
To NASDPTS, NAPT and NSTA:

- Coordinate with local law enforcement agencies to conduct educational and enforcement activities aimed at reducing illegal school bus passings (H-20-18)

To IACP, NSA, and NASRO:

- Work with local school districts to conduct educational and enforcement activities to reduce illegal school bus passings (H-20-19)

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