

NTSB 2021-2022



2021-2022 MWL Board Meeting

#### **Staff Presenters**

- Dolline Hatchett
  - Director, Office of Safety Recommendations and Communications
- Dana Schulze
  - Director, Office of Aviation Safety
- Jim Ritter
  - Director, Office of Research and Engineering
- Robert Molloy
  - Director, Office of Highway Safety
- Morgan Turrell
  - Director, Office of Marine Safety
- Robert Hall
  - Director, Office of Railroad, Pipeline, and Hazardous Materials Investigations





#### **Staff Presenters**

- Kathleen Silbaugh
  - General Counsel
- Jeff Marcus
  - Chief, Safety Recommendations Division
- Chris Wallace
  - Chief, Government & Industry Affairs Division
- Nicholas Worrell
  - Chief, Safety Advocacy Division
- Stephanie Shaw
  - Safety Advocate, Safety Advocacy Division









Office of Safety
Recommendations and
Communications

Dolline Hatchett, Director

Criteria	Description
Level of Validation	<ul> <li>Each proposed safety item is backed by at least one open safety recommendation and any combination of the following:</li> <li>NTSB products (investigation reports, safety alerts, safety studies, special investigation reports, or reiterated recommendations) that have the same or similar findings as they relate to causes, contributing factors, and risk</li> <li>External reports and data that support the safety item</li> </ul>
Level of Action	<ul> <li>Insufficient or inadequate safety action has been taken, such as:</li> <li>Inadequate efforts by affected stakeholders and recommendation recipients to eliminate or reduce the safety deficiency</li> <li>Unsatisfactory responses to NTSB recommendations</li> <li>The length of time since the safety item was first communicated</li> </ul>





Criteria	Description
Level of Risk and Consequence	<ul> <li>The safety item addresses the following components:</li> <li>Size and scope of the problem/safety issues</li> <li>High likelihood of similar occurrences in future</li> <li>Severity or consequences would be high if a similar occurrence took place (e.g., large proportion of the public would potentially be affected, high potential for fatalities and serious injuries)</li> <li>Potential for involvement of hazardous materials or extensive damage to property or the environment</li> </ul>
Potential Benefit from Focused NTSB Advocacy	<ul> <li>Focusing on the safety item would receive a potential safety benefit if implemented because of either of the following:</li> <li>A high level of urgency exists for action on the item, such as a mandated implementation deadline or an emerging technology issue.</li> <li>The NTSB's unique voice on this item and attention from placement on the MWL has a high potential to propel the implementation of recommendations</li> </ul>









Proposed Safety Item:
Office of Aviation Safety

Dana Schulze, Director

#### Proposed Safety Item

Require and Verify the
Effectiveness of Safety
Management Systems in All
Revenue PassengerCarrying Aviation
Operations

#### The Four SMS Components Safety Policy Safety Assurance Establishes senior management's Evaluates the continued commitment to continually effectiveness of implemented risk improve safety; defines the control strategies; supports methods, processes, and the identification of organizational structure new hazards Policy needed to meet safety goals Safety Risk Safety Promotion Management Includes training, Safety Promotion Determines the need for, communication, and and adequacy of, new other actions to create a or revised risk controls based positive safety culture within all on the assessment of acceptable levels of the workforce risk

(Source: FAA)





# Require and Verify the Effectiveness of Safety Management Systems in All Revenue Passenger-Carrying Aviation Operations

- Preventable accidents involving Part 135 and Part 91 revenue passenger-carrying operations continue to occur
- Widespread adoption of safety management systems (SMSs) by aircraft operators could have a positive impact
- To improve Part 135 and Part 91 safety, we should encourage operators to voluntarily implement such systems while simultaneously urging the FAA to require them





#### Level of Validation: Data and Research—Reports

- Aviation Accident Report: Collision with Terrain Promech Air, Inc. de Havilland DHC-3, N270PA, Ketchikan, AK (June 2015)
- Aviation Accident Report: Collision with Terrain,
   Hageland Aviation Services, Inc. dba Ravn Connect Flight
   3153, Togiak, AK (October 2016)
- Aviation Accident Report: Departure From Controlled Flight Trans-Pacific Air Charter, LLC, Teterboro, NJ (May 2017)
- Aviation Accident Report: Inadvertent Activation of the Fuel Shutoff Lever and Subsequent Ditching, Liberty Helicopters Inc., Operating a FlyNYON Doors-Off Flight, New York, NY (March 2018)
- Aviation Accident Report: Rapid Descent into Terrain, Island Express Helicopters Inc., Calabasas, California (January 2020)
- Aviation Investigation Report: Enhance Safety of Revenue
   Passenger-Carrying Operations Conducted Under Title 14 Code
   of Federal Regulations Part 91 (March 2021)



Ketchikan, AK, 2015



New York, NY, 2018





#### Level of Validation: Data and Research— Recommendations

- 40 public operators of EMS helicopters implement SMS (A-09-98)
- States, Commonwealth of Puerto Rico, and District of Columbia develop and implement a comprehensive SMS for aircraft operators (A-14-105) and arrange for an audit (A-14-106)
- FAA require all 14 CFR Part 135 operators to establish an SMS (A-16-36)
- FAA review the Safety Assurance System and develop and implement procedures needed to identify 14 CFR Part 135 operators that do not comply with standard operating procedures (A-16-41)





#### Level of Validation: Data and Research— Recommendations

- FAA require all commercial air tour operators, regardless of their operating rule, to implement an SMS (A-19-28)
- Recommendations specific to operators (A-19-36 and -38, A-20-25, A-21-7 and -8)
- FAA require SMS for revenue passenger-carrying operations and provide oversight (A-21-9, -10, -13, -14)





#### Level of Action: Insufficient Action

- Although some progress has been made, the FAA has taken limited action on SMS-related recommendations.
- A-16-35, -36, and -41 are currently classified Open– Unacceptable Response.
- Our earliest open safety recommendation related to this item was issued in 2009.





#### Level of Risk and Consequence

- Without FAA oversight of those programs, our investigations have found they are ineffective.
- Participation in the FAA's voluntary program is low.





#### Potential Benefit from Focused NTSB Advocacy

- The NTSB's unique voice on this item and attention from placement on the MWL has a high potential to propel recommendation implementation.
- It can influence aviation operators to play a role by voluntarily implementing SMS now, scalable to their operation.









Proposed Safety Items:
Office of Research and
Engineering

Jim Ritter, Director

#### **Proposed Safety Items**

- Safety Item 1: Install Crash-Resistant Recorders and Establish Flight Data Monitoring Programs
- Safety Item 2: Protect Vulnerable Road Users through a Safe System Approach
- Safety Item 3: Implement a Comprehensive
   Strategy to Reduce Speeding-Related Crashes





### Safety Item 1: Install Crash-Resistant Recorders and Establish Flight Data Monitoring Programs

- Crash-resistant recorder systems that provide cockpit images and audio allow firsthand observation of flight conditions leading up to an accident.
- Flight data monitoring (FDM) recorders are used by operators to monitor their flight operations and proactively identify hazards and mitigate safety risks.





### Safety Item 1: Level of Validation—Data and Research

- Long history of aviation accidents where the investigations were hindered by a lack of cockpit information
- NTSB first recommended that FAA require cockpit image recording for Part 121 aircraft in 2000 (superseded in 2015 by A-15-07 and -08 in 2015)
- NTSB recommended that FAA require cockpit image recording on all turbine-powered aircraft in 2013 (A-13-12 and -13)





### Safety Item 1: Level of Validation—Data and Research (cont.)

- Safety Recommendation Report: Install Flight Data, Audio, and Image Recorder Systems on all Turbine-Powered Helicopters (2020)
- Recommendations A-20-27 to -30 called for helicopter manufacturers to install cockpit image recorders on their aircraft





## Safety Item 1: Level of Validation—Data and Research (cont.)

- Recommendations A-16-34 and -35 to FAA:
  - Require all 14 CFR Part 135 operators to install FDM devices and then require (-35) FDM programs



Akron, OH, 2015





#### Safety Item 1: Level of Action

- Lack of progress by FAA on cockpit image recorders:
  - FAA cited difficulty in conducting cost-benefit analyses, retrofit problems, and privacy and security concerns as barriers to rulemaking. Three out of four recommendations are classified Open—Unacceptable Response.
- Responses from manufacturers on cockpit image recorders:
  - Initial responses received from 5 out of 6 helicopter manufacturers
  - Recommendations to 4 out of 5 manufacturers are classified Open— Acceptable Response; other is Open—Unacceptable Response





#### Safety Item 1: Level of Action (cont.)

- FDM:
  - FAA has focused on voluntary efforts; postponed its plan to survey operators
  - Both NTSB recommendations on FDMs are classified Open—Unacceptable Response





#### Safety Item: Level of Risk and Consequence

- Lack of image recorders on aircraft and lack of crash-resistant recording systems on smaller aircraft were identified as issues many years ago. Numerous investigations lacked critical recorded information.
- Lack of FDM programs also continues to be an issue in our investigations.





### Safety Item 1: Potential Benefit from Focused NTSB Advocacy

- Recent high-profile accidents involved aircraft without recorders, where image recorders could have aided investigation, or where FDM could have helped prevent the accident.
- Cockpit image recorders meeting survivability requirements are available now and can be incorporated at relatively low cost.
- NTSB can encourage manufacturers and operators to voluntarily install cockpit image and FDM recorders.





## Safety Item 2: Protect Vulnerable Road Users Through a Safe System Approach

 Pedestrian, bicyclist, and motorcyclist fatalities are increasing as a proportion of overall traffic fatalities in the US.

We need a Safe System approach.





### Safety Item 2: Level of Validation—Data and Research

- NTSB reports and research literature
- Proposing recommendations focused on the following:
  - roadway, infrastructure, and vehicle design to prevent crashes
  - increased use of protective equipment to mitigate injuries





#### Safety Item 2: Level of Action

- Limited implementation of our safety recommendations for vulnerable road users
- More than a quarter of the recommendations proposed have received unacceptable responses





#### Safety Item 2: Level of Risk and Consequence

- More than 12,000 vulnerable road user fatalities in 2019 (pedestrians, bicyclists, and motorcyclists combined).
- Vulnerable road users are much more susceptible to injury or death in the event of a crash.
- Without significant action, the likelihood that these trends will continue is very high.





## Safety Item 2: Potential Benefit from Focused NTSB Advocacy

- Congress has considered draft legislation in the past year to improve pedestrian and bicyclist safety.
- Action on the recommendations in this proposal may also lead to safety improvements in emerging technologies, such as automated driving systems.





### Safety Item 3: Implement a Comprehensive Strategy to Reduce Speeding-Related Crashes

- Speeding is one of the most common highway crash factors in the US.
- Speed increases crash risk in two ways:
  - 1) increases the likelihood of being involved in a crash
  - 2) increases the severity of injuries sustained by all road users in a crash
- NTSB has issued numerous reports and recommendations to reduce traffic deaths related to speeding.





### Safety Item 3: Level of Validation—Data and

Research

- NTSB reports and research literature
- Recommendations focused on speeding countermeasures
  - Alternative approaches for setting speed limits
  - Vehicle technologies for reducing speeding
  - Local, high-visibility speed enforcement activities
  - Automated speed enforcement
  - National public awareness campaign







#### Safety Item 3: Level of Action

- Slow progress implementing recommendations has delayed the adoption of proven and emerging speeding countermeasures.
- More than a quarter of the recommendations proposed have received unacceptable responses.





#### Safety Item 3: Level of Risk and Consequence

- There were more than 9,000 speeding-related crash fatalities in 2018 and 2019.
- Speeding-related crash fatalities are not limited to the drivers and passengers of the speeding vehicles.
- Without significant action, the high number speedingrelated crashes is likely to continue.





### Safety Item 3: Potential Benefit from Focused NTSB Advocacy

- The current level of emphasis on speeding as a national traffic safety issue is lower than warranted.
- Current federal aid programs do not ensure that states fund speed management activities at a level commensurate with the national impact of speeding on fatalities and injuries.
- There are no nationwide programs to increase public awareness of the risks of speeding.









Proposed Safety Items:
Office of Highway Safety

Robert Molloy, PhD, Director

## Overview of Proposed Safety Items

- Safety Item 1: Require Collision-Avoidance and Connected-Vehicle Technologies on All Vehicles
- Safety Item 2: Prevent Alcohol- and Other Drug-Impaired Driving
- Safety Item 3: Eliminate Distracted Driving





## Safety Item 1: Require Collision-Avoidance and Connected-Vehicle Technologies on All Vehicles

- Most (94 percent) crashes are caused by driver error.
- Collision-avoidance systems (CASs) and connected vehicles (CVs) can prevent these crashes.
- These systems are not standard or available on a large portion of vehicles, especially commercial vehicles.





## Safety Item 1: Level of Validation—Data and Research

- Highway Accident Report: School Bus and Truck Collision at Intersection Near Chesterfield, NJ (February 2012)
- Highway Special Investigation Report: The Use of Forward Collision Avoidance Systems to Prevent and Mitigate Rear-End Crashes (May 2015)
- Highway Accident Report: Motorcoach Collision with Combination Vehicle after Traffic Break on Interstate 10, Palm Springs, CA (October 2016)
- Highway Accident Report: Collision Between a Sport Utility Vehicle Operating with Partial Driving Automation and a Crash Attenuator, Mountain View, CA (March 2018)



Palm Springs, CA, 2016 (Source: California Highway Patrol)





## Safety Item 1: Level of Action

- Insufficient or inadequate safety action
  - NHTSA has been slow developing performance standards.
  - FCC has substantially shrunk the communication spectrum assigned for CV technologies.
- Length of time this has been an issue
  - First recommended collision avoidance technology in 1995
  - Issued recommendation for FCC to set aside frequencies for collision-avoidance technology





#### Safety Item 1: Level of Risk and Consequence

- There were over 36,000 fatalities in 2019.
- CASs could address about 80 percent of these crashes.
- Without these technologies, we will continue to see over 100 fatalities a day.





# Safety Item 1: Potential Benefit from Focused NTSB Advocacy

- Critical time in V2V technology development
- NHTSA is looking to revise the new car assessment program
- Most manufacturers are committed to this technology





# Safety Item 2: Prevent Alcohol- and Other Drug-Impaired Driving

- Driving under the influence is a leading cause of traffic fatalities.
- Each year, over 10,000 people are killed in drunk-driving crashes.
- With cannabis legalization and the opioid crisis, addressing drug impairment remains critically important.
- As many as one in five drivers test positive for a potentially impairing drug.
- A recent NHTSA study found drug use among hospitalized drivers has increased during the pandemic.





## Safety Item 2: Level of Validation—Data and Research

- Highway Special Investigation Report: Wrong-Way Driving (December 2012)
- Highway Safety Report: Reaching Zero: Actions to Eliminate Alcohol-Impaired Driving (May 2013)
- Highway Accident Report: Truck-Tractor Semitrailer
   Median Crossover Collision with Medium-Size Bus on
   Interstate 35, Davis, OK (September 2014)
- Highway Accident Report: Pickup Truck Centerline Crossover Collision with Medium-Size Bus on US Highway 83, Concan, TX (March 2017)
- Highway Accident Report: Collision Between Pickup
   Truck with Trailer and Group of Motorcycles, Randolph,
   NH (June 2019)



Randolph, NH, 2019 (Source: New Hampshire State Police)





## Safety Item 2: Level of Action

- Insufficient or inadequate safety action
  - Only Utah has enacted .05-percent legislation.
    - Four states introduced legislation.
  - 28 states do not have all-offender interlock requirements.
  - Several drug testing recommendations are classified unacceptable.
- Length of time this has been an issue
  - Last decade, alcohol-impaired fatalities have consistently remained around 10,000.
  - Nearly a decade since we issued .05-percent, all-offender interlocks, and drug-testing recommendations.





#### Safety Item 2: Level of Risk and Consequence

- Over 10,000 fatalities from alcohol-impaired drivers
- Over 1,000 children died in impaired-driver crashes
- We will continue to lose over 27 people a day to these crashes
- We will continue to underestimate the effects of drugged driving





## Safety Item 2: Potential Benefit from Focused NTSB Advocacy

- States are moving forward on .05 and we often testify in support of the legislation.
- Standardized drug-testing protocols are reaching final stages.
- NTSB advocacy will be critical to ensure these protocols are disseminated to the states.
- This is an opportunity to advocate for the effective adoption of emerging drug-testing technologies (e.g., oral fluid).





#### Safety Item 3: Eliminate Distracted Driving

- Distracted driving results in over 3,000 fatalities annually.
- Drivers continue to use portable electronic devices (PEDs) while driving.





## Safety Item 3: Level of Validation—Data and Research

- Highway Accident Report: Highway-Railroad Grade Crossing Collision, Rosedale, MD (May 2013)
- Highway Accident Report: Collapse of the Interstate 5
   Skagit River Bridge Following a Strike by an Oversize
   Combination Vehicle, Mount Vernon, WA (May 2013)
- Highway Accident Report: Collision Between a Sport
   Utility Vehicle Operating with Partial Driving Automation
   and a Crash Attenuator, Mountain View, CA (March
   2018)
- Highway Accident Report: Collision Between Vehicle Controlled by Developmental Automated Driving System and Pedestrian, Tempe, AZ (March 2018)



Mountain View, CA, 2018 (Source: Witness S. Engleman)





## Safety Item 3: Level of Action

- Insufficient or inadequate safety action
  - No state bans all PED use.
  - Montana and Missouri do not ban texting.
- Length of time this has been an issue
  - NTSB issued first PED recommendation two decades ago
  - NTSB recommended banning PED use for all drivers a decade ago





#### Safety Item 3: Level of Risk and Consequence

- Over 3,000 lives lost annually
- Lives lost to distracted drivers has not decreased over the last decade





# Safety Item 3: Potential Benefit from Focused NTSB Advocacy

- NTSB has established strong working relationships with advocacy groups.
- NTSB has been instrumental in testifying for legislative actions over the last decade.
- Technology to reduce distracted driving is rapidly progressing.









# Proposed Safety Items: Office of Marine Safety

Morgan Turrell, Director

#### Proposed Safety Items

- Safety Item 1: Improve Marine Fire-Detection and Extinguishing Systems
- Safety Item 2: Improve Fishing Vessel Safety





# Safety Item 1: Improve Marine Fire-Detection and Extinguishing Systems

- MS and RE fire investigations
- Passenger vessels





## Safety Item 1: Level of Validation—Data and Research

- Marine Accident Report: Fire Aboard Rollon/Roll-off Passenger Vessel Caribbean Fantasy, Atlantic Ocean, Northwest of San Juan, PR (August 2016)
- Marine Accident Report: Fire on Board US Small Passenger Vessel Island Lady, Pithlachascotee River near Port Richey, FL (January 2018)
- Marine Accident Report: Fire aboard Small Passenger Vessel Conception, Santa Barbara, CA (September 2019)
- Several marine accident briefs (MABs)



Santa Barbara, CA, 2019





#### Safety Item 1: Level of Action

- Operators need to:
  - perform risk
     assessments on the
     fixed-system water
     supply.
  - revise crew training and require demonstrated proficiency.



San Juan, PR, 2016 (Source: US Coast Guard)





#### Safety Item 1: Level of Action

- USCG needs to require:
  - detection in unoccupied spaces
  - small passenger vessel detectors in all accommodation spaces
  - Interconnected detectors





#### Safety Item 1: Level of Risk and Consequence

- Fire is a severe risk to marine safety
- Passenger vessels
- Caribbean Fantasy
- Island Lady, 1 fatality
- Conception, 34 fatalities



Port Richey, FL, 2018





# Safety Item 1: Potential Benefit from Focused NTSB Advocacy

- Draw attention to the serious risk to the public
- Achieve action by the vessel operators
- Encourage action by the US Coast Guard (necessary to effect the greatest change)





#### Safety Item 2: Improve Fishing Vessel Safety

- Fishing accident fatalities
- Stability, crew training, and competency





## Safety Item 2: Level of Validation— Data and Research

- Fishing Safety Forum
- Destination sinking
- MABs
- USCG and OSHA data



Crab pots that the *Destination* was carrying during its stopover at Dutch Harbor.

(Source: Ocean Rover crewmember)





#### Safety Item # 2: Level of Action

- Recommendations to USCG remain open
  - Stability
  - Crew competence
  - Safety training



While in King Cove on February 12, 2017, Sandra Five crewmembers examine the ice that accumulated during their transit from St. Paul Island.





#### Safety Item 2: Level of Risk and Consequence

- Estimated 58,000 commercial fishing vessels
- 702 fishing vessels have been lost in casualty since 2010
- In the past 20 years (since 2010):
  - 805 fatalities
  - 164 missing
  - 2,122 injured
- Average 40 fatalities a year, 8 missing, and 100 injured





# Safety Item 2: Potential Benefit from Focused NTSB Advocacy

- USCG is interested in fishing safety
- Two serious accidents recently involving fishing vessels:
  - Scandies Rose (Alaska)
  - Emmy Rose (Massachusetts)
- Addressing fishing vessel stability and crew training can help save lives









Proposed Safety Item
Office of Railroad, Pipeline and
Hazardous Materials Investigations

Robert Hall, PE, Director

## Proposed Safety Item

Improve
Pipeline Leak
Detection and
Mitigation

#### This safety item includes 3 elements:

Equip Gas
Transmission
Lines with
Rupture-Detection
Technology

Install Automatic Shutoff Valves and Remote-Control Valves in Natural Gas Transmission Lines

Install Methane Detectors in all Residences with Natural Gas Service





#### Level of Validation—Data and Research

- NTSB Safety Study: Effects of Delay in Shutting Down Failed Pipeline Systems and Methods of Providing Rapid Shutdown (December 1970)
- Pipeline Accident Report: Texas Eastern Transmission Corporation Natural Gas Pipeline Explosion and Fire, Edison, NJ (March 1994)
- Pipeline Accident Report: Pacific Gas and Electric Company Natural Gas Transmission Pipeline Rupture and Fire, San Bruno, CA (September 2010)
- Pipeline Accident Report: Building Explosion and Fire, Silver Spring, MD (August 2016)
- Pipeline Accident Report: Atmos Energy Corporation Natural Gas-Fueled Explosion, Dallas, TX (February 2018)



San Bruno, CA, 2010





#### Level of Validation Continued

Two investigations highlight this issue:

- Building Explosion and Fire, Silver Spring, Maryland (August 2016)
- Atmos Energy Corporation
   Natural Gas-Fueled
   Explosion, Dallas, Texas
   (February 2018)



Silver Spring, MD, 2016





#### Level of Action

#### **Transmission Pipelines**

- NTSB issued the first safety recommendations related to the use of leak-detection equipment and automatic shutoff valves (ASVs) and remote shutoff valves (RSVs) 50 years ago
- 2020 PHMSA NPRM, "Valve Installation and Minimum Rupture Detection Standards," failed to adequately address this issue

#### **Distribution Systems**

- Methane detectors exist commercially, past sensitivity levels were not consistent and false alarms made them ineffective
- NFPA and ICC are developing industry standard for methane detectors





## Level of Risk and Consequences

## Pipeline Leak Detection and Mitigation

- Severe consequences
   nationwide across distribution
   and transmission pipelines,
   particularly in densely
   populated areas
- Response times will continue to be excessive without uniform leak-detection installation, ASVs, and RSVs

#### **Residential Methane Detection**

- Millions of residences across the US with gas service could be impacted
- High consequence of an explosion/fire
- Potential for loss of life and extensive property damage





#### Potential Benefit from Focused NTSB Advocacy

## Pipeline Leak Detection and Mitigation

- Persistent and urgent issue that has seen minimal progress in 50 years
- Significant updates to PHMSA regulations and industry mindset needed

#### **Residential Methane Detection**

- Needs to be addressed as soon as possible due to the high risk to residents
- Currently, no requirement exists because the codes have yet to require methane detectors
- Industry standard still being developed for fire and building codes





#### Proposed 2021–2022 Most Wanted List as adopted

Require and Verify the Effectiveness of Safety Management Systems in all Revenue Passenger-Carrying Aviation Operations	Prevent Alcohol- and Other Drug- Impaired Driving
Install Crash-Resistant Recorders and Establish Flight Data Monitoring Programs	Eliminate Distracted Driving
Protect Vulnerable Road Users Through a Safe System Approach	Improve Passenger and Fishing Vessel Safety
Implement a Comprehensive Strategy to Eliminate Speeding-Related Crashes	Improve Rail Worker Safety
Require Collision-Avoidance and Connected-Vehicle Technologies on All Vehicles	Improve Pipeline Leak Detection and Mitigation





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Staff	Staff
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