



NTSB National Transportation Safety Board

General Aviation Safety, NTSB Perspective and Role



Teterboro User Group
March 18, 2015

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Member, NTSB

NTSB Mission

The NTSB is an independent US federal agency charged with determining the probable cause(s) of transportation accidents, making recommendations to prevent their recurrence, conducting special studies and investigations, and coordinating resources to assist victims and their families after an accident.

Topics

- General Aviation Accident Trends
- Most Wanted List – 2015
 - Distractions
 - Substance Impairment
 - Fitness for Duty
 - Loss of Control
 - Procedural Compliance
- NTSB Mission
- NTSB Investigations

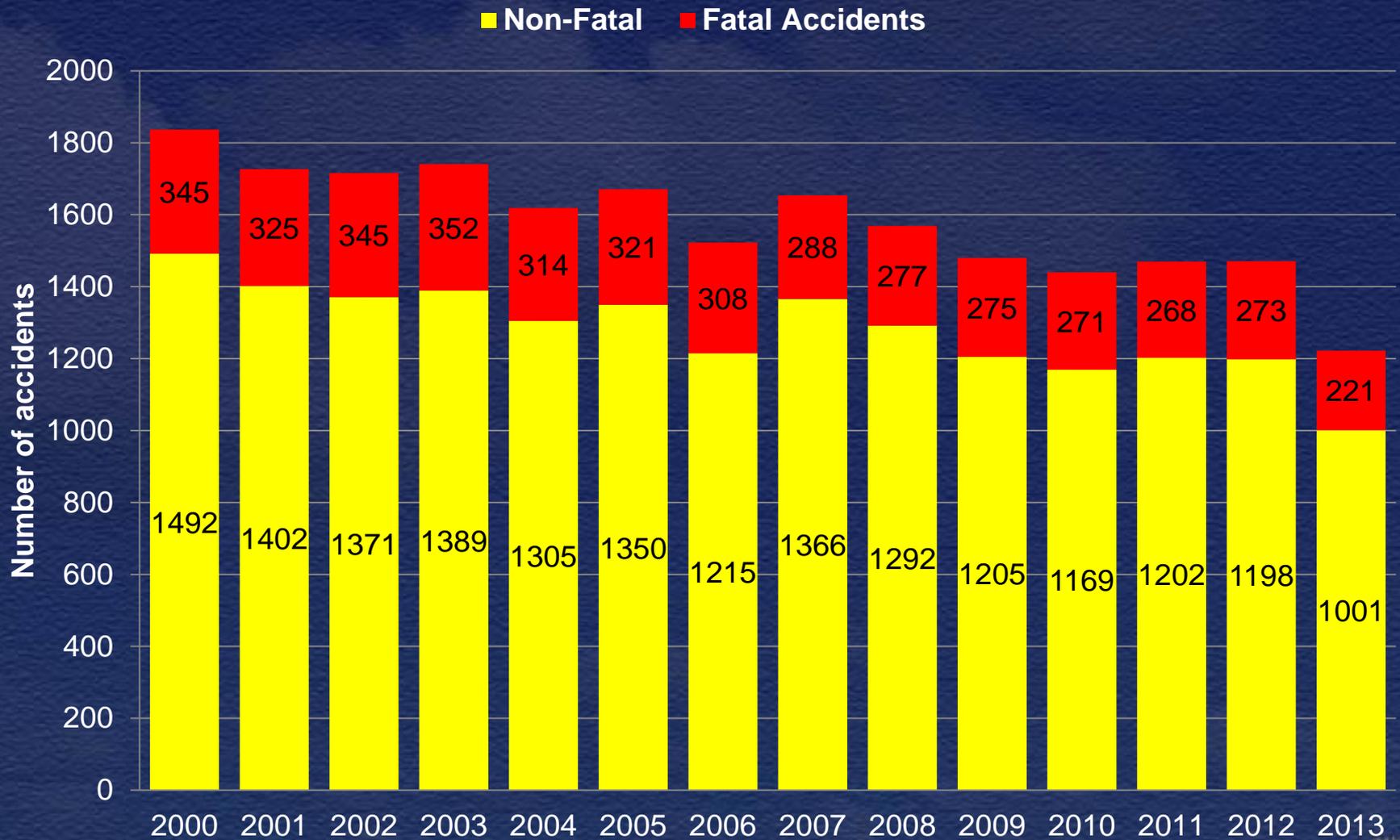
Accident Statistics - 2013

- 1,297 Total Accidents (Down from 1,539 in 2012)
 - 236 Fatal Accidents
 - 429 Fatalities
- 1,222 General Aviation Accidents
 - 221 Fatal Accident
 - 387 Fatalities
- 52 Part 135 Accidents
 - 13 Fatal Accidents
 - 33 Fatalities

Preliminary Accident Statistics - 2014

- 1,297 Total accidents
 - 257 Fatal accidents
- 1,112 General Aviation Accidents
 - 234 Fatal Accidents
 - 365 Fatalities
- 38 Part 135 Accidents
 - 7 Fatal Accidents
 - 18 Fatalities
- 36 Accidents Business/Corporate

All GA Accidents

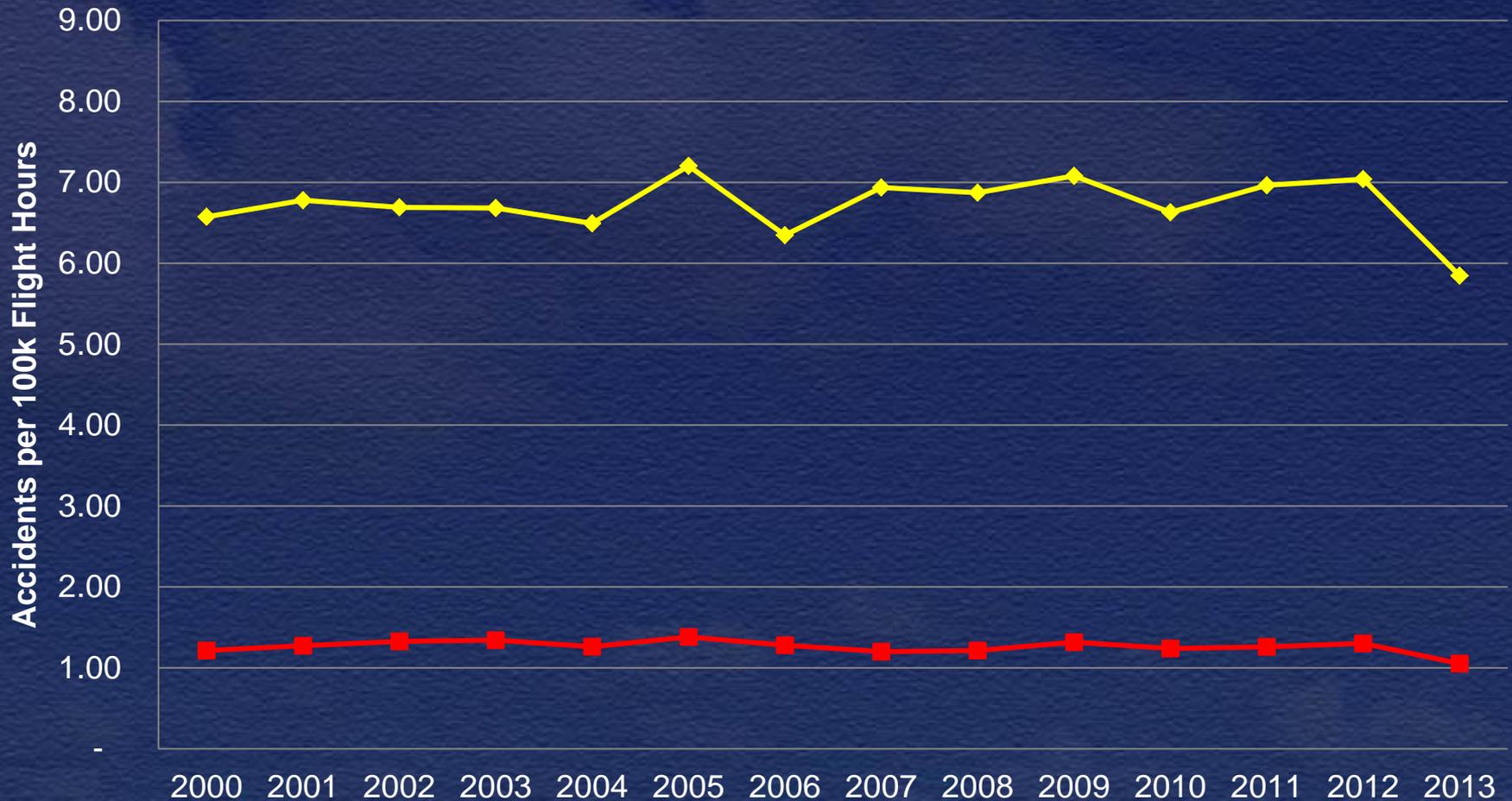


GA Accident-involved Fatalities



GA Accident Rates

Fatal Total

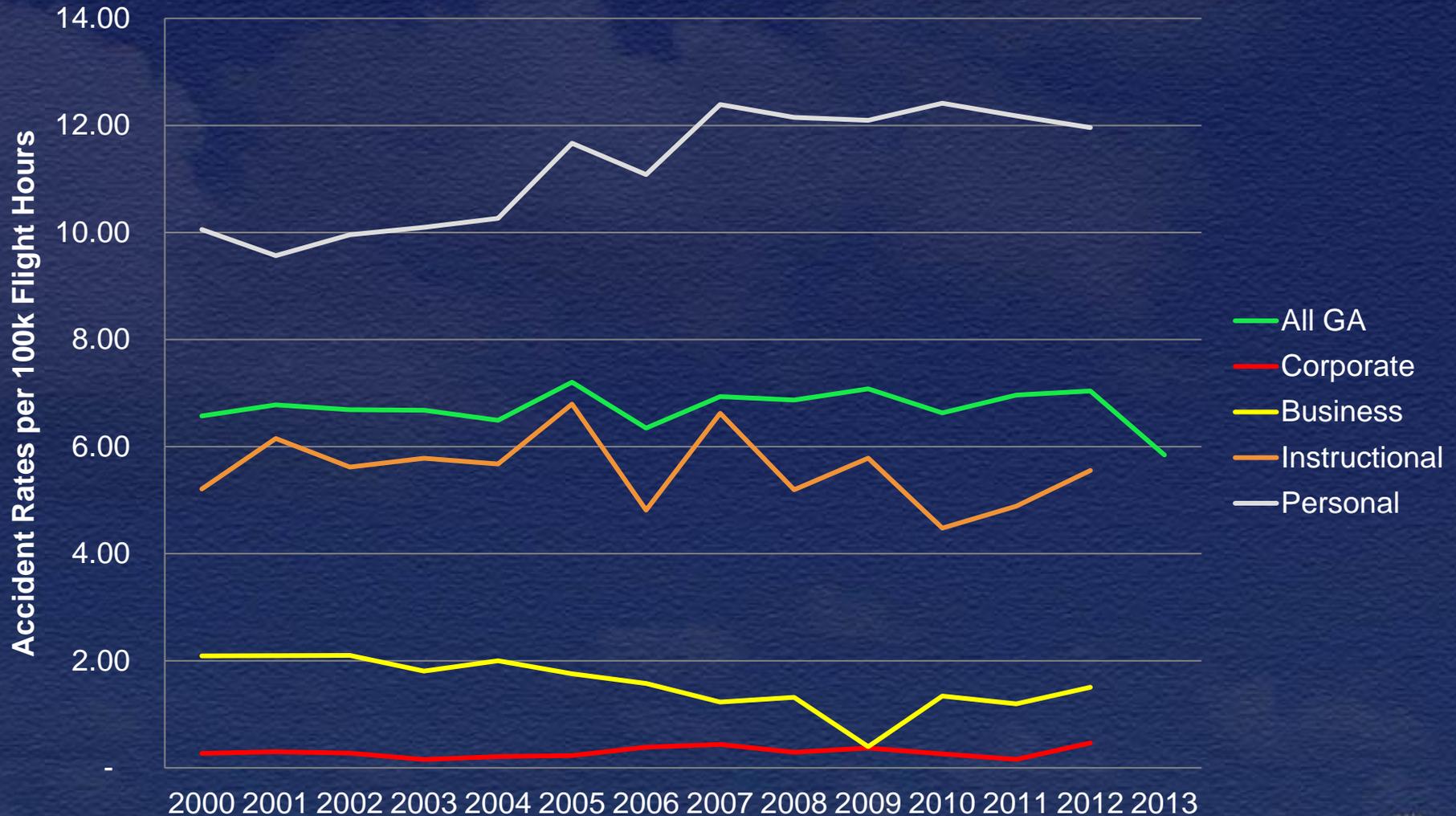


*The 2011 GA Survey is currently not available. FAA is actively engaged in re-calibration efforts and expect to have validated 2011 data published at a later date.

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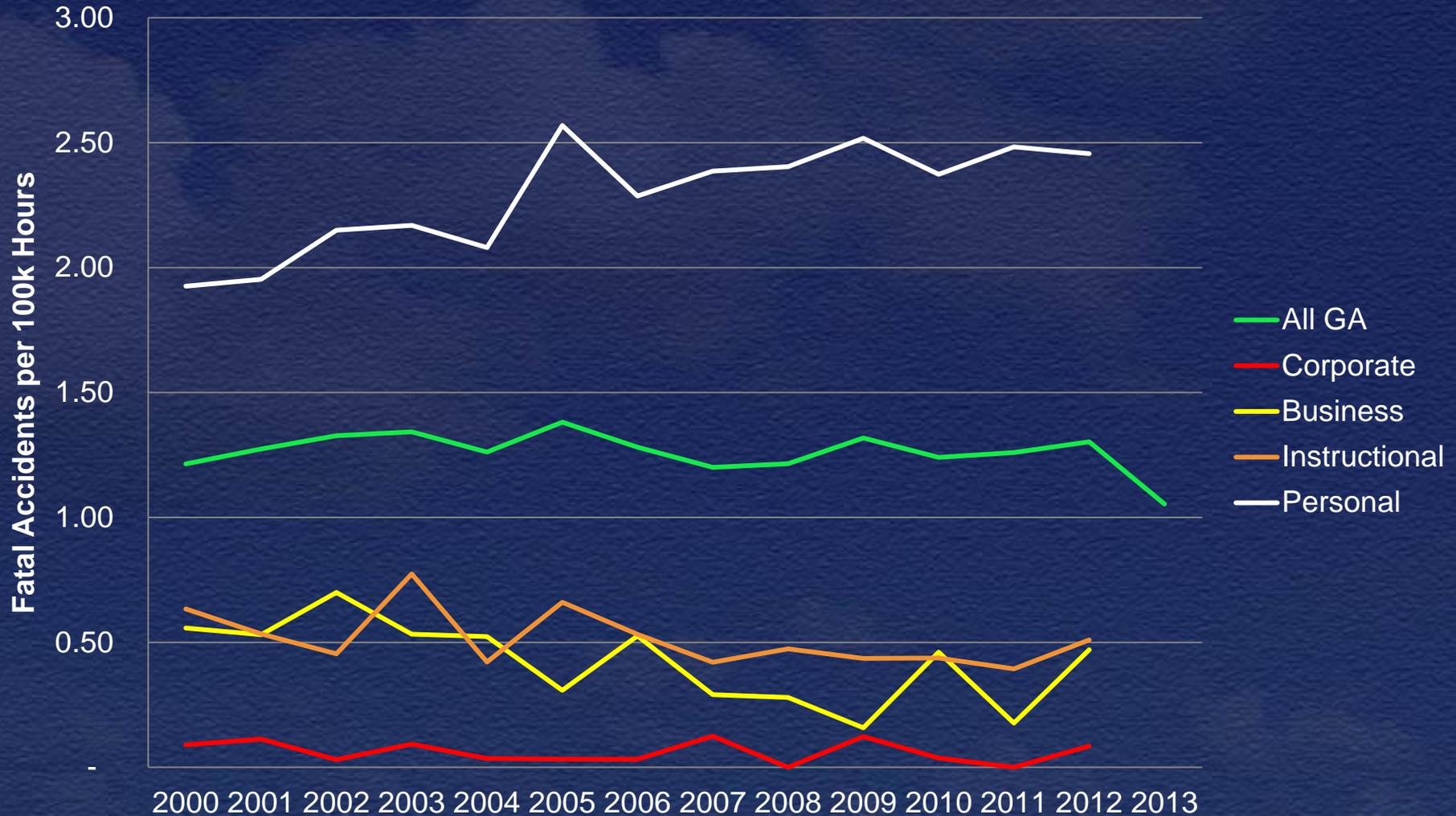
Accident Rates per 100k Flight Hours



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Fatal Accident Rates per 100k Flight Hours



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Defining Fatal Accident Events

All Part 91 GA 2008-2012

- Loss of Control in Flight
- System/Component Failure – Powerplant
- Controlled Flight into Terrain
- Collision with Terrain/Object (non-CFIT)
- VFR Encounter with IMC
- System/Component Failure –
Non-Powerplant

Why GA on the Most Wanted List?

- NTSB investigates approximately 1500 GA accidents per year over the last decade
- Overall GA accident rate flat
 - Has improved little over the last decade
 - Airline accident rate decreased more than 80%
- Personal flying accident rate
 - Increased 20% over last 10 years
 - Fatal rate increased 25% over that period
- ***GA safety needs attention***

NTSB 2015 Most Wanted List



- Disconnect from Deadly Distractions
- End Substance Impairment in Transportation
- Enhance Public Helicopter Safety
- Implement Positive Train Control in 2015
- Improve Rail Tank Car Safety
- Make Mass Transit Safer
- Prevent Loss of Control in Flight in General Aviation
- Require Medical Fitness for Duty
- Strengthen Commercial Trucking Safety
- Strengthen Procedural Compliance

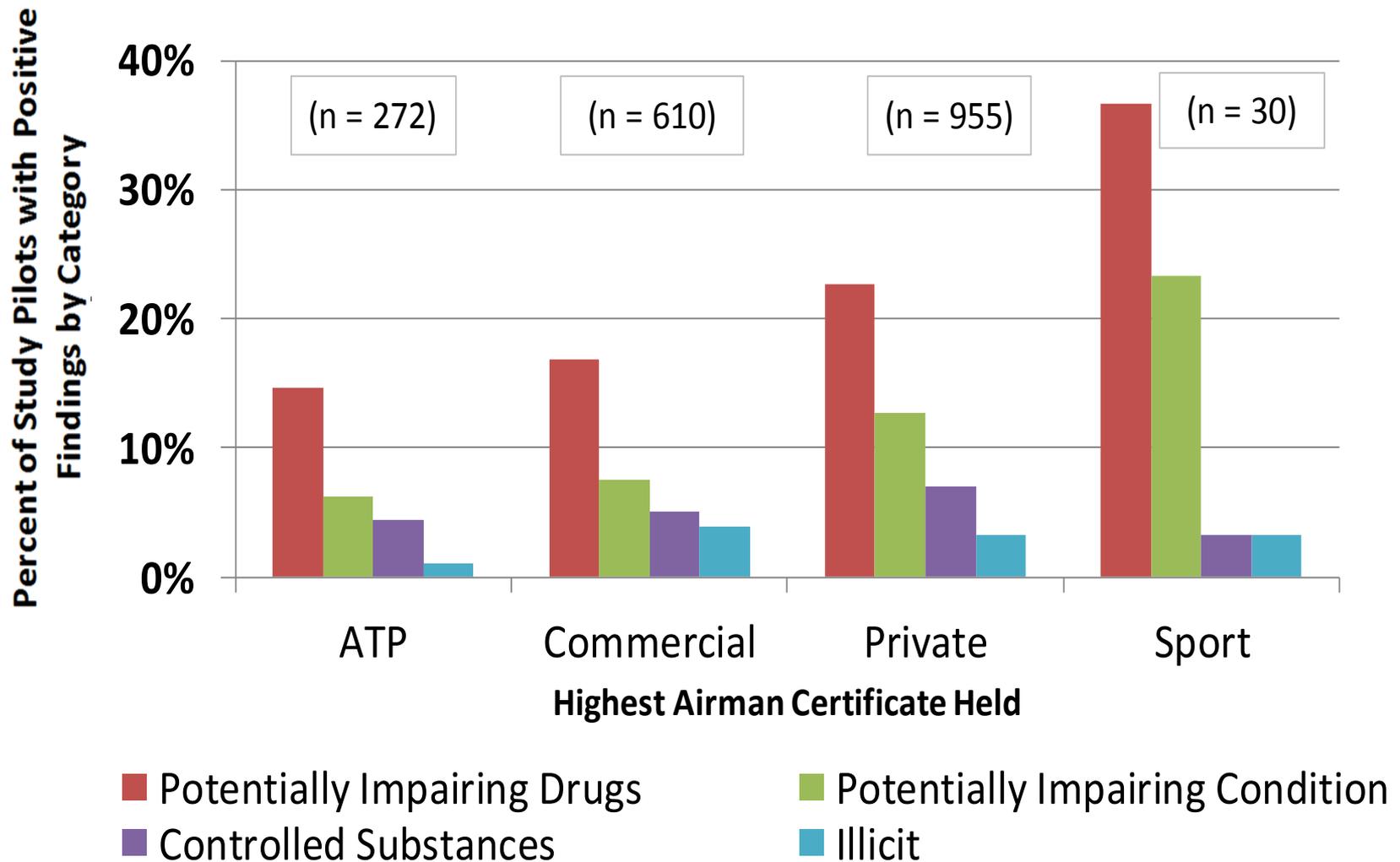
2015 MWL - Distractions

- *Disconnect from Deadly Distractions*
 - A factor in all modes of transportation
- Aviation emphasis
 - Sterile Cockpit
 - Appropriate use of PEDs
 - Manage distractions

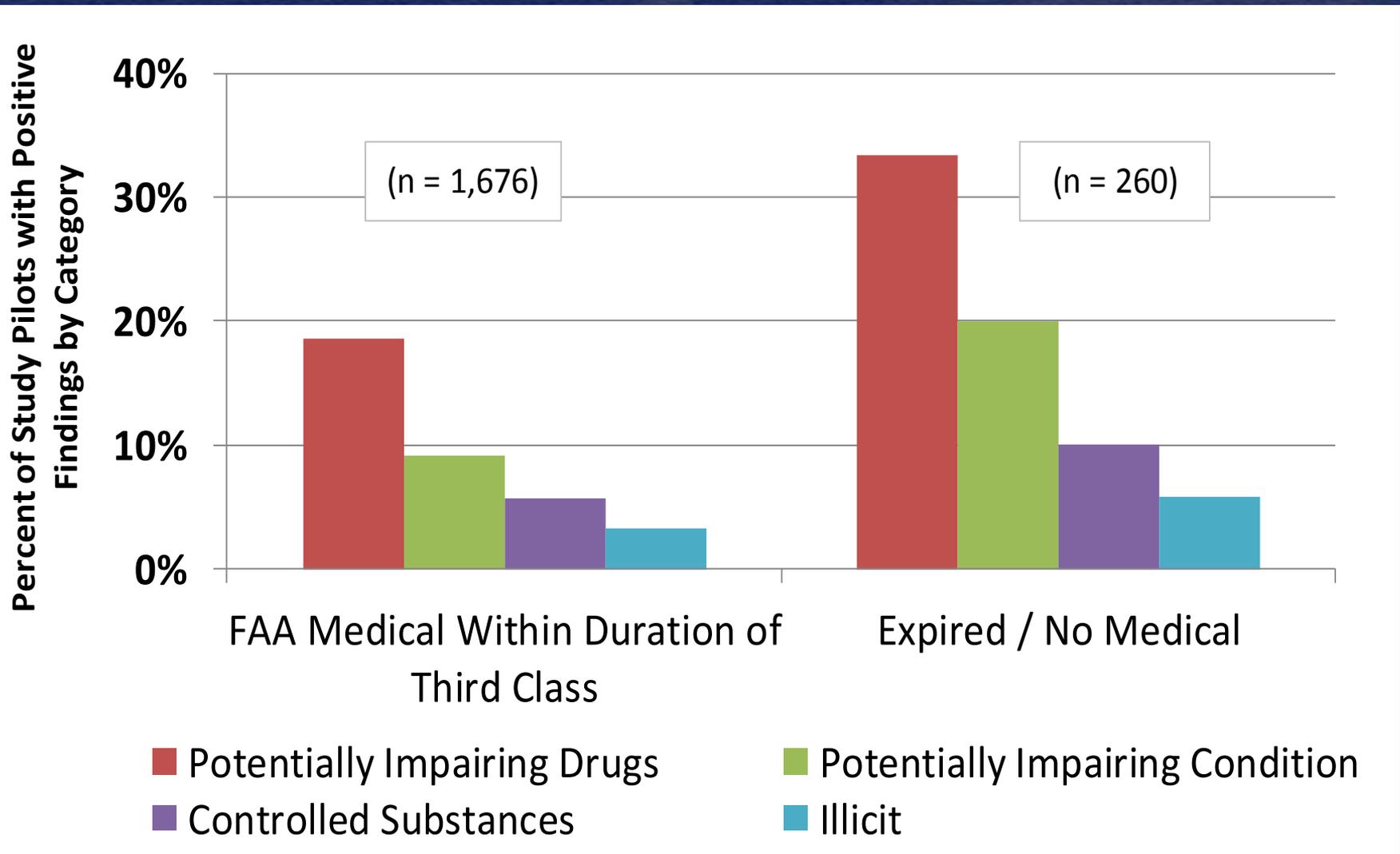
2015 MWL - Impairment

- *End Substance Impairment in Transportation*
 - A factor in all modes
- Fatally injured pilots - potentially impairing drugs
 - 11% average 1990 - 1997
 - 23% average 2008 - 2012

Toxicology Findings by Certificate, 2005-2012



Toxicology Findings by Medical, 2005-2012



Medical Resources for Pilots

- FAA Publications
 - *Medications and Flying*
 - *Guide for Aviation Medical Examiners*
- Aircraft Owners and Pilots Association (AOPA)
 - Member resources

Medical Resources for Pilots

- General Aviation Joint Steering Committee (GAJSC)
 - 2013 Letter to pilots
 - 2014 Initiatives
 - Drug database
 - Training course

2015 MWL – Fitness for Duty

- *Require Medical Fitness for Duty*
 - A factor in all modes
- Airman Medical – fitness at exam time
- Pilots must self-assess fitness
 - Need for appropriate flight preparations
- Focus on medical conditions
 - Example – Obstructive Sleep Apnea
- Enhance medical knowledge

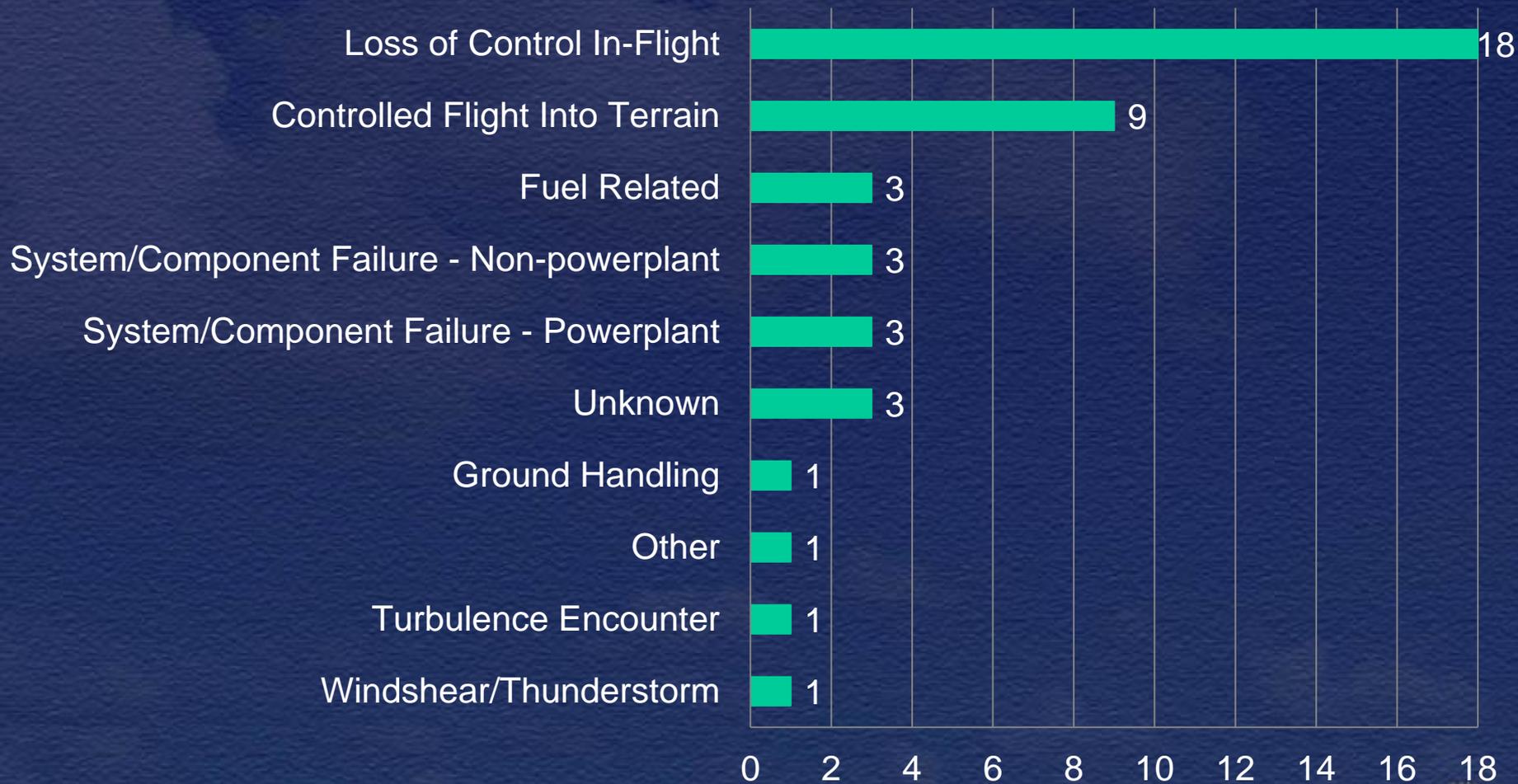


2015 MWL – Loss of Control

- *Prevent Loss of Control in Flight in General Aviation*
- More than 40% GA accidents were LOC during 2001 – 2011
- Most deadly flight phases
 - Approach to landing
 - Maneuvering
 - Climb

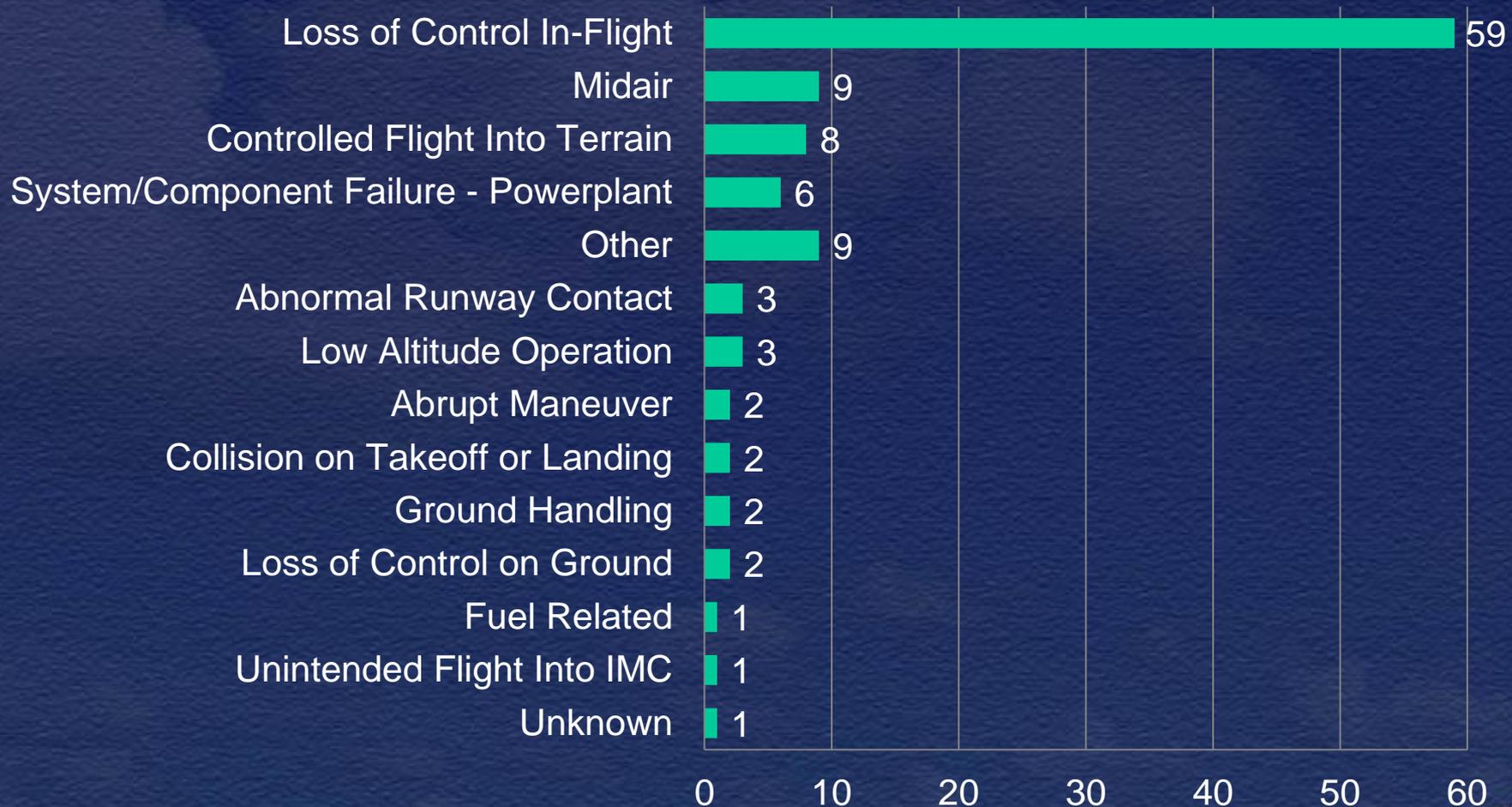
Business Flying, 2008-2013

Number of Fatal Accidents



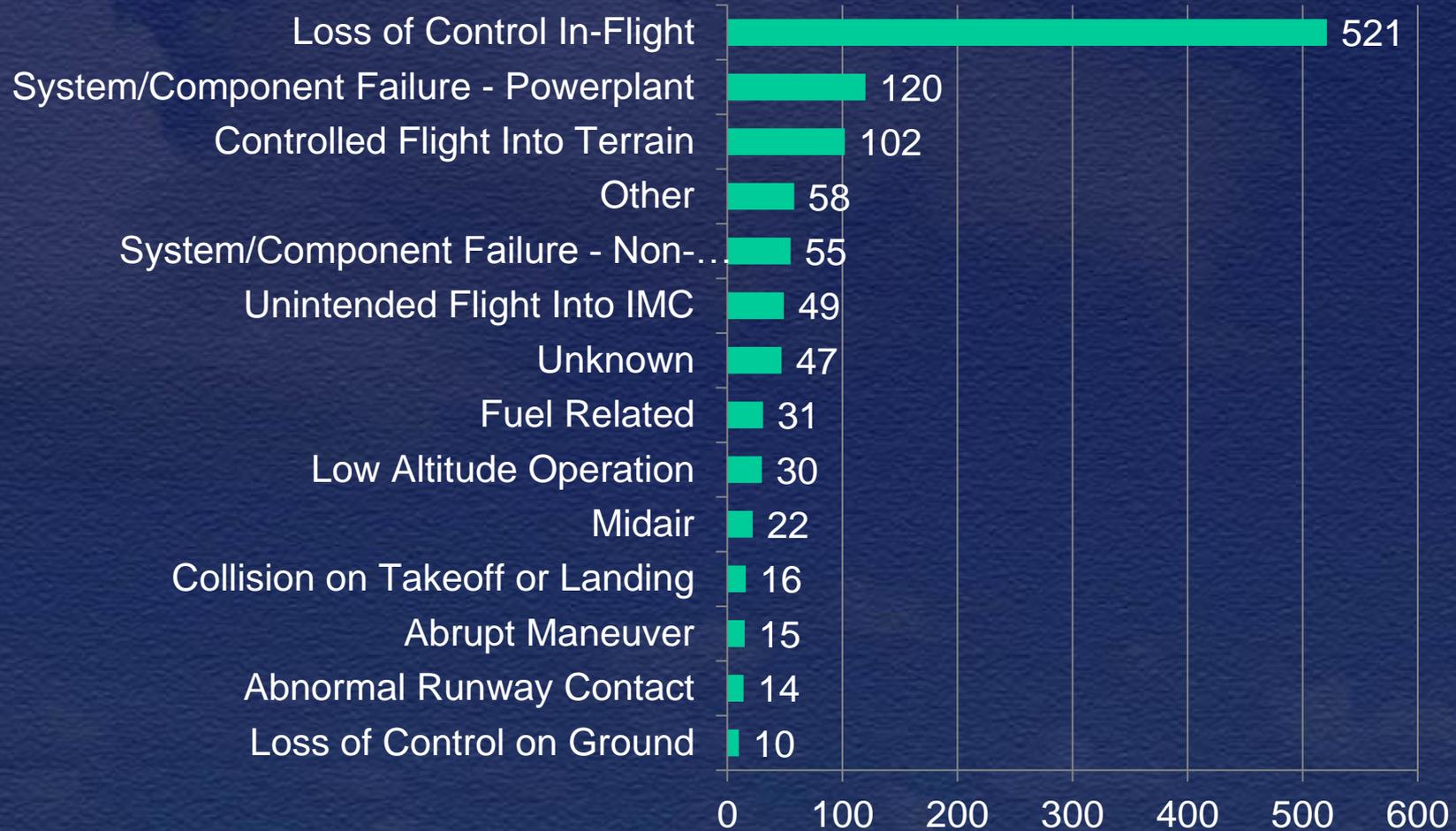
Instructional Flying, 2008-2013

Number of Fatal Accidents



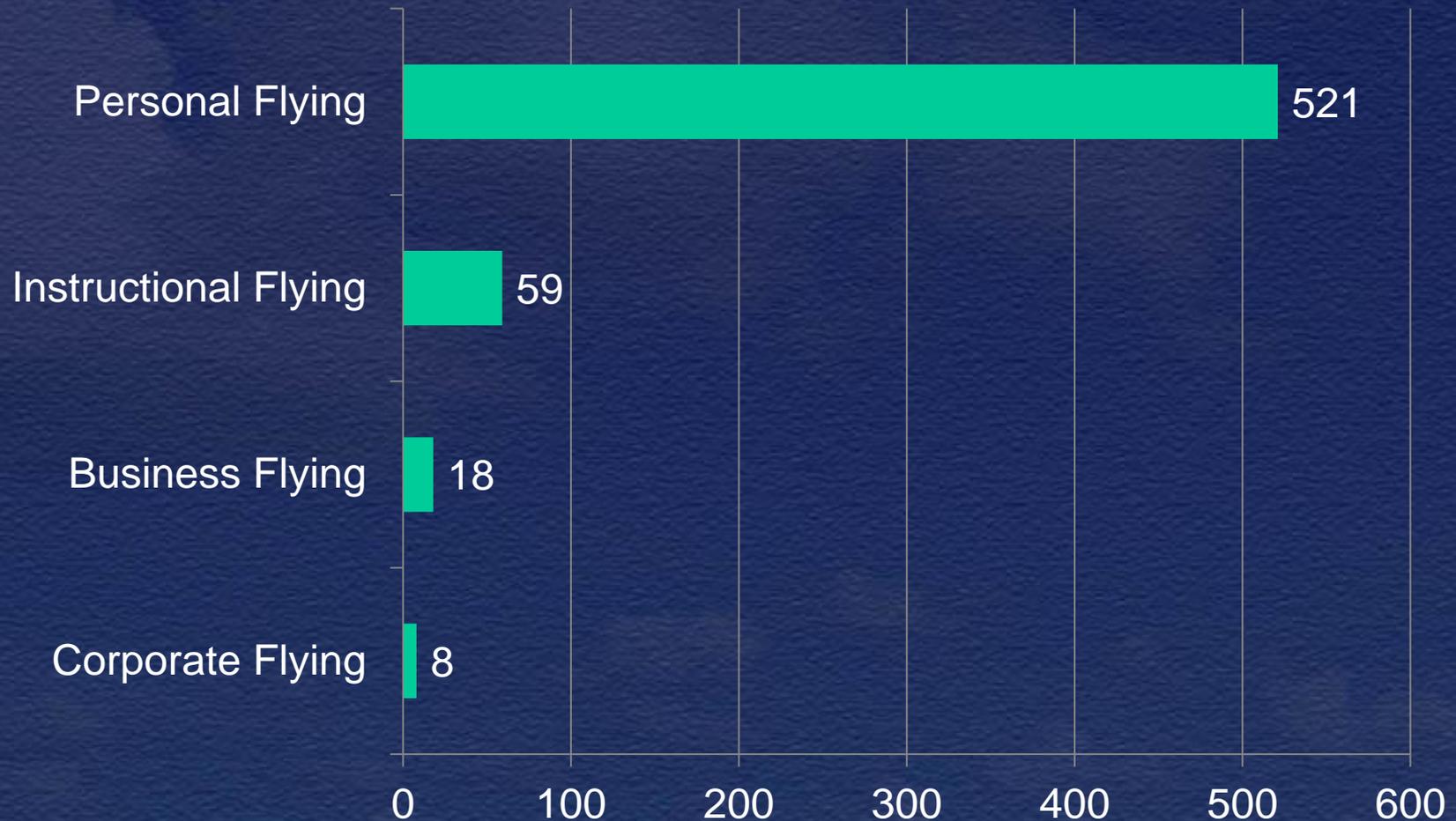
Personal Flying, 2008-2013

Number of Fatal Accidents



Loss of Control In-Flight, 2008-2013

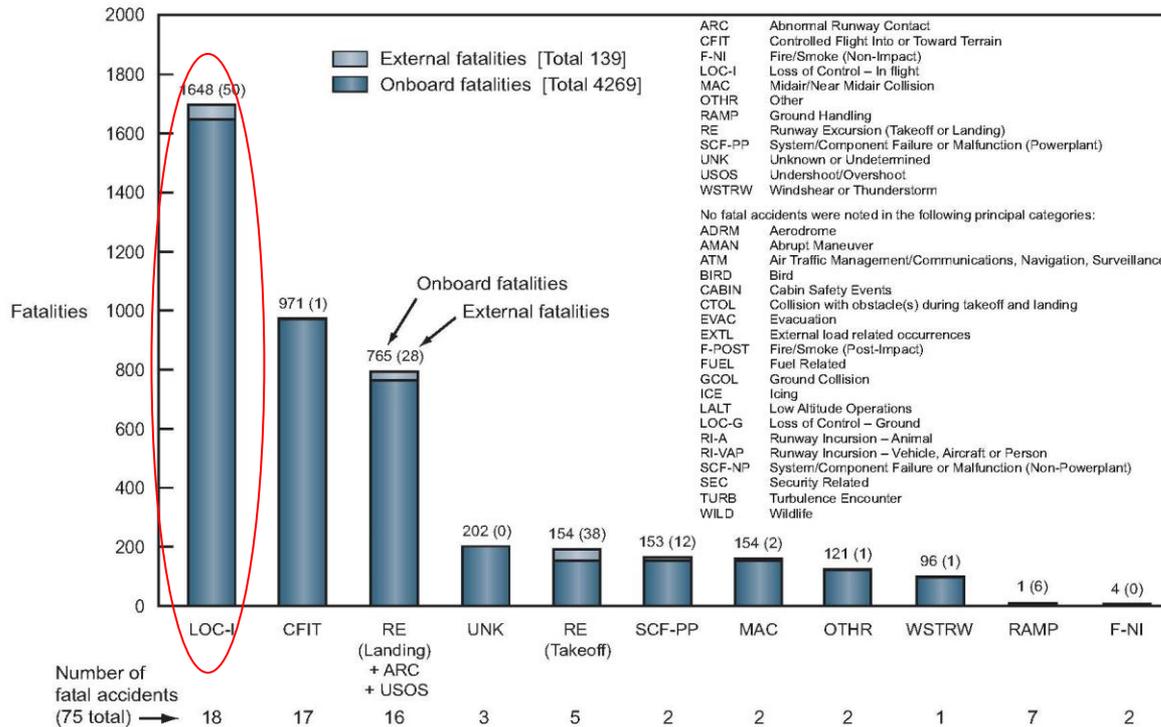
Number of Fatal Accidents



Boeing Annual Statistical Summery

Fatalities by CAST/ICAO Common Taxonomy Team (CICTT) Aviation Occurrence Categories

Fatal Accidents – Worldwide Commercial Jet Fleet – 2003 Through 2012



Note: Principal categories as assigned by CAST.

For a complete description of CICTT Aviation Occurrence Categories, go to: <http://www.intlaviationstandards.org/>



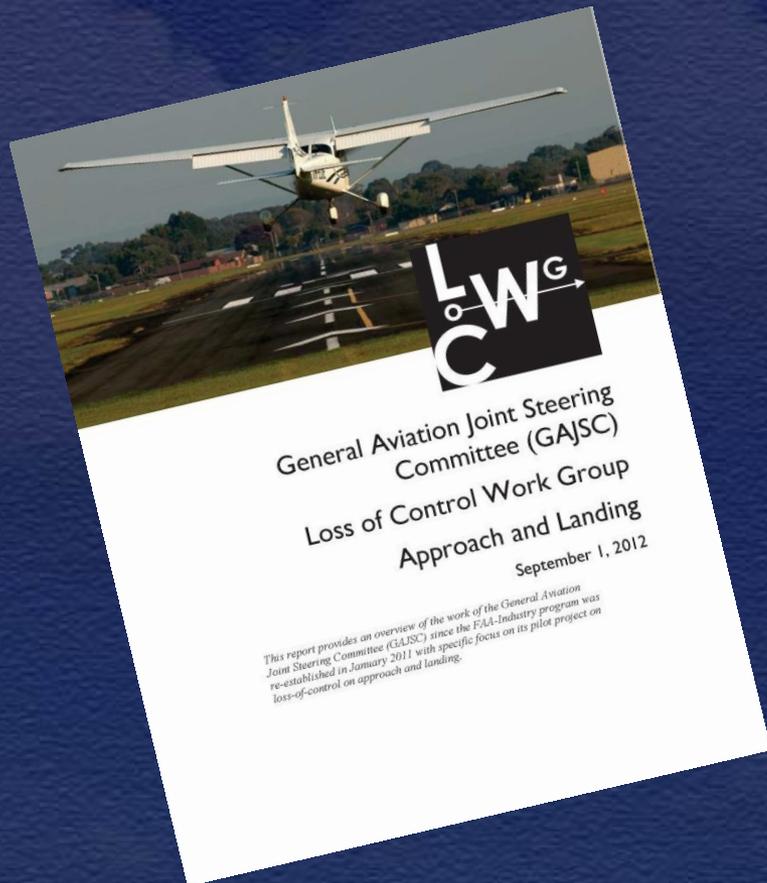
Primary category of accidents

| | |
|----------------------|-------|
| Personal flying | – LOC |
| Instructional flying | – LOC |
| Business flying | – LOC |
| Corporate flying | – LOC |
| Airline flying | – LOC |

Loss-of-control Working Group

Safety Enhancements Identified

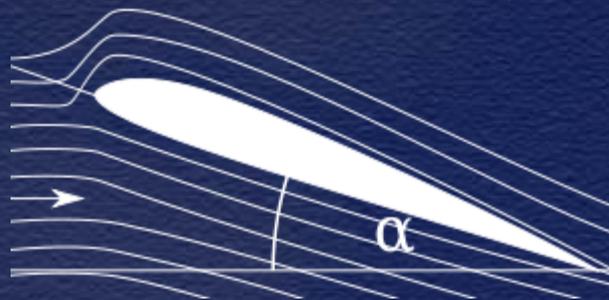
- AOA – New, Current, Retrofit
- Aeronautical Decision Making
- Stabilized Approach
- Single Pilot CRM
- Medication effects
- Weather Technologies
- Etc...



28 Safety Enhancements

Lower Cost AOA Displays

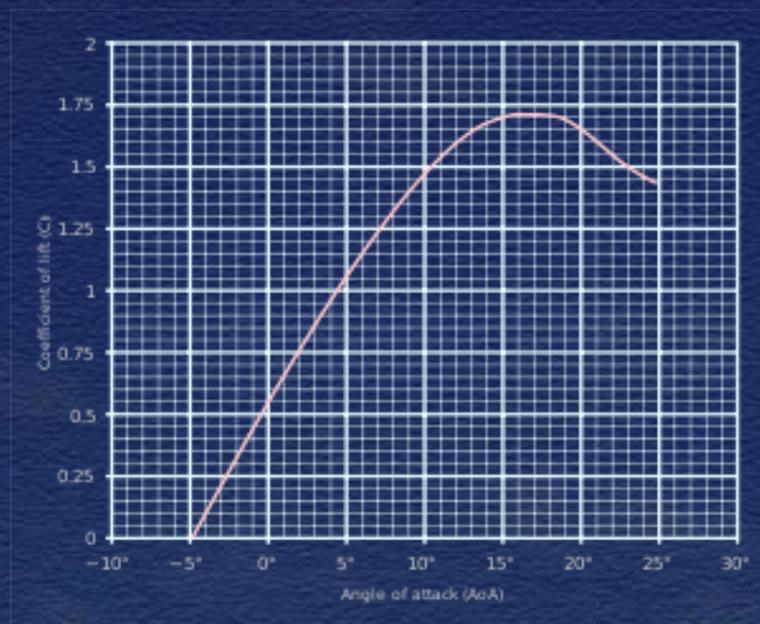
- Stall occurs at a specific Angle-of-Attack
 - But not necessarily at the same airspeed



First of AOA indicators built to ASTM stds and installed as a minor mod



FAA installation policy changed

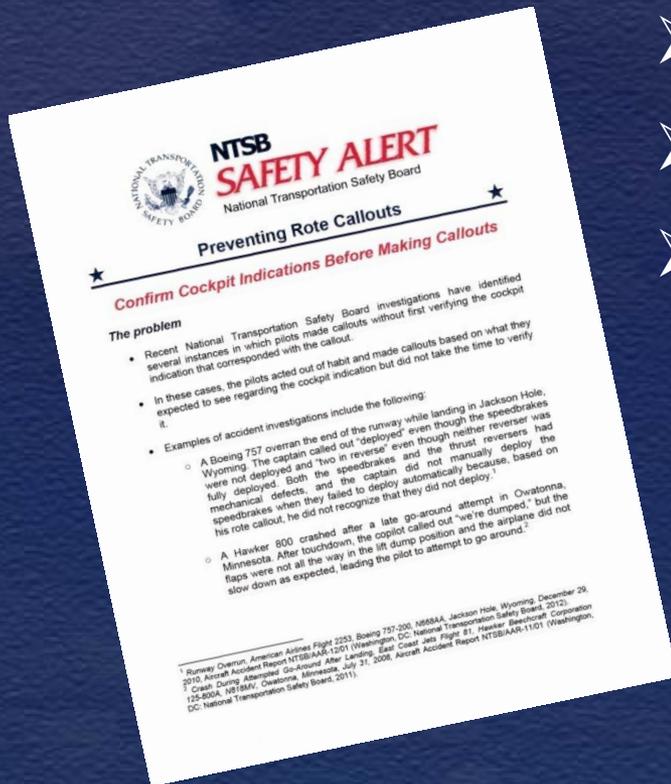


Stall Recovery

- Reduce the angle-of-attack below stall AOA (Max CL)
 - Push over to eliminate stall warning
- Level wings
- Adjust thrust
 - Avoid overspeed and high G levels
- Pitch back to level flight
- Don't try to “***Power out of a stall***”

NTSB Safety Alerts

- Preventing Aerodynamic Stalls
- Reduced Visual References
- Is Your Aircraft Talking to You
- Risk Management for Pilots
- Risk Management for Mechanics



2015 MWL – Procedural Compliance

- ***Strengthen Procedural Compliance***
 - More than a dozen related commercial aircraft accidents in last ten years
 - Equally applicable to corporate and business operations
 - Implement well developed procedures
 - Train to the procedures
 - Emphasize and reinforce operations to the procedures



NTSB - Improving Transportation Safety



NTSB Structure

- The Board
 - Chairman
 - Vice Chairman
 - 3 Members
- Multi Mode
 - Aviation
 - Railroad
 - Highway
 - Marine
 - Pipeline and Hazardous Materials



The Mission

The National Transportation Safety Board 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 – railroad, highway, marine and pipeline -- and determining the probable cause of the accident.

The NTSB also participates in investigations conducted by other countries when U.S. aviation safety interests are involved.

Lubbock, TX – ATR 42-320 Cargo Aircraft



Gray Summit, MO – bus/vehicle/truck crash



Port Arthur, TX – Eagle Otome Tank Ship



Washington, DC – Washington Metro Transit System



NTSB Responsibilities

- Determines Probable Cause based on investigation
- Issues recommendations aimed at preventing future accidents.
- Conducts safety studies.
- Conducts Forums and Symposiums on safety topics.
- Acts as U.S. accredited representative on foreign aviation accident investigations under the provisions of the International Civil Aviation Authority (ICAO) agreements.

NTSB Responsibilities cont'd

- Maintains official civil aviation accident database.
- Evaluates the effectiveness of emergency responses to hazardous materials accidents.
- Provides family assistance following accidents.
- Acts as an administrative appeals court for actions concerning airmen, air carriers and mariners.



Investigation Process

- An NTSB “Go-Team” is dispatched from Washington headquarters to major transportation accidents.
- A full “Go-Team” for a major accident typically includes the following:
 - Board Member
 - Investigative-In-Charge (IIC)
 - Technical specialists
 - Public Affairs/Government Affairs officers
 - Family Affairs Specialists

Arrival On Scene



Arrival On-Scene

- Coordinate with local law enforcement authorities
- Establish our investigative resources at the accident site
- Establish an NTSB Operations Center
- Coordinate with Law Enforcement Command Post
- Confirm security arrangements
- Coordinate biohazard precautions with local authorities

Organization On-Scene

- Conduct an organization meeting
- Managed by the IIC
- Designed to:
 - Coordinate the investigative groups and the overall investigation
 - Identify NTSB participants
 - Establish and organize groups
 - Designate parties and party coordinators if appropriate
 - Specify Rules of Conduct of the NTSB investigation

Briefings

- Provided for both Press and Family (if applicable)
 - Factual information is reported to the media and families at least daily in briefings
 - The NTSB Board Member or IIC are the sole spokespersons for the investigation

Post On-scene



- Additional fact-finding work — including laboratory testing
- Analysis of the factual data
- Development of findings
- Probable Cause

Board Meeting

- The Board Members conduct a public meeting to discuss and approve a final report on the accident. The final report includes conclusions, a statement of probable cause, and recommendations.



Recommendations

- Safety recommendations are a major product of the Safety Board.
- Each Safety Recommendation:
 - Describes the action the board recommends.
 - States the safety need to be satisfied.
 - Designates the party or person expected to take action.

NTSB Office of Aviation Safety



All Civil Aviation Accidents
Fatal
Non-Fatal
Midair
Public-Use



Foreign Accidents of US
Carriers

Foreign Accidents of US
Manufacture or Design

Injury or Death of US Citizens

Nationwide NTSB Staffing



Just over 400 Employees
(All modes)

140 Employees (Aviation)

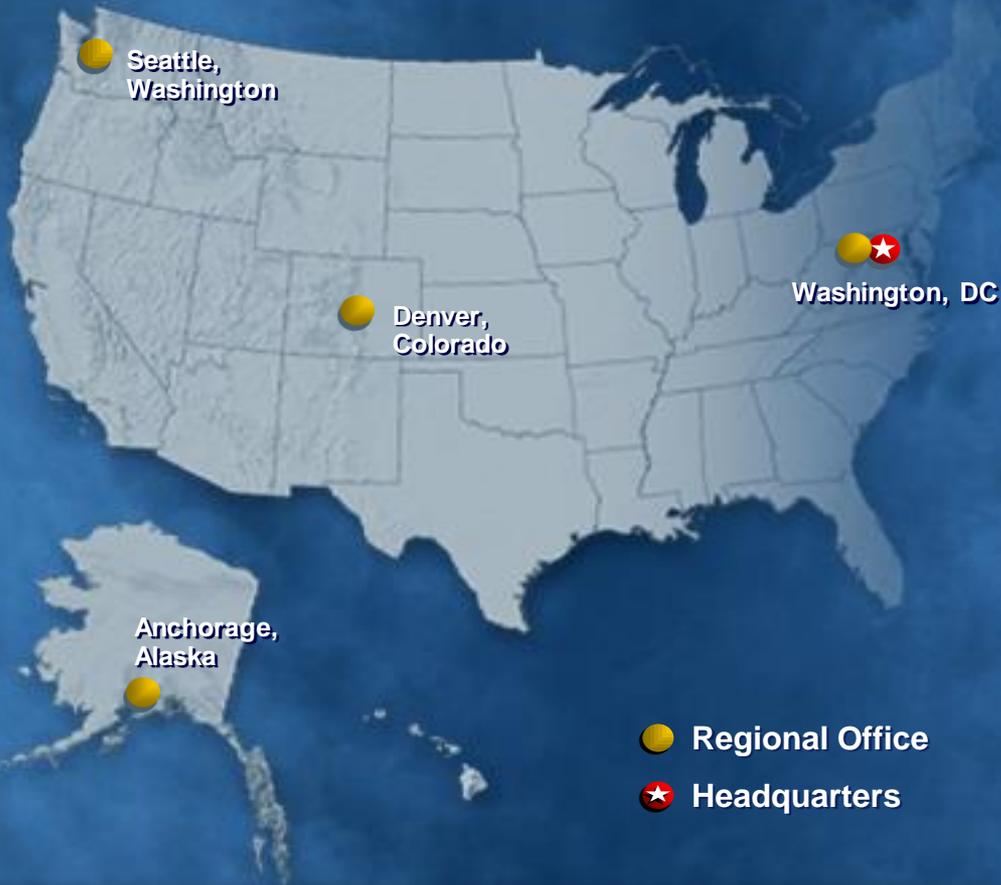
4 Regional Aviation Offices

50 Regional Aviation
Investigators

6 (AS-10) Majors
Investigators



The Office of Aviation Safety



- ◆ **The Office of Aviation Safety is composed of about 100 investigators. About half of the positions are located in the headquarters office and the other half divided among the regional offices.**



NTSB Headquarters L'Enfant Plaza

Laboratories

- CVR & FDR
- Materials (Met Lab)

NTSB Management

- Board Members
- Senior Staff
- Go-Team

NTSB ROC

- 24 / 7 Coverage



24 hr Accident Notification

WWW.NTSB.GOV

NTSB Response Operations Center

844-373-9922

NTSB Response Operations Center 844-373-9922



“Data Collection” Accident Investigation

- Known circumstances
- No fatalities
- Pilot interview
- Investigator will not travel
- No mechanical issues
- No Preliminary Report



“Limited” Accident Investigation

- No fatalities
- Pilot interview
- Investigator may not travel to the scene
- Mechanical issues



“Field” Accident Investigation

- Fatalities (Crew/Pax)
- Investigator will travel to scene
- Transportation Disaster Assistance (TDA) if required



“Field Major” Investigation

- Multiple Fatalities
- Strong Public / Media Interest
- NTSB “Go Team” with a NTSB Board Member
- Transportation Disaster Assistance (TDA)



“Major” Investigation

- Large 121 Carriers
- Full “Go Team” with NTSB Board Member
- Transportation Disaster Assistance (TDA)

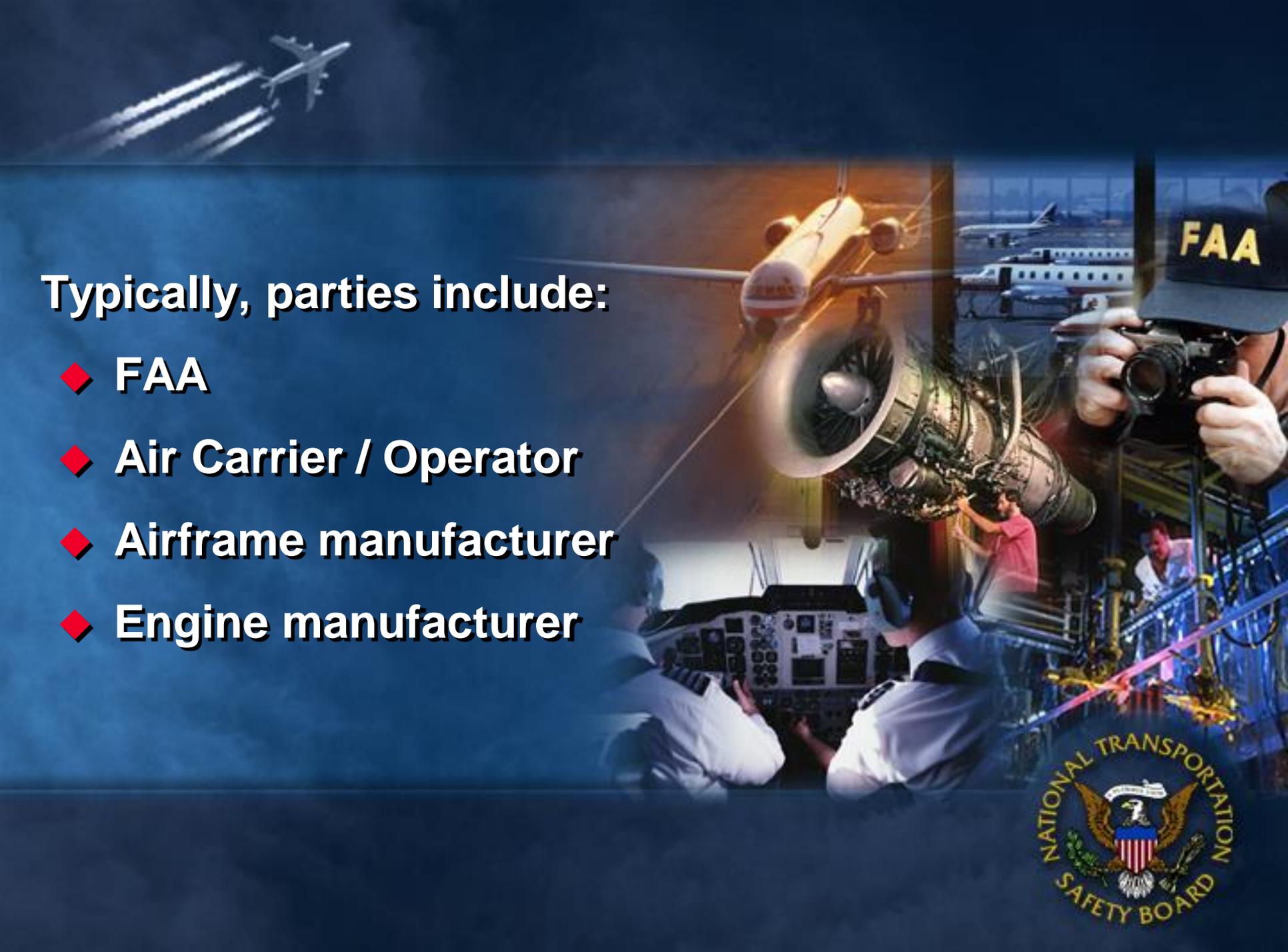




The Party Process

The Safety Board investigates more than 1,500 aviation accidents and incidents a year and about 500 rail, highway, marine and pipeline accidents. With only about 400 employees, the NTSB accomplishes this task by leveraging its resources and designating parties to its investigations.





Typically, parties include:

- ◆ FAA
- ◆ Air Carrier / Operator
- ◆ Airframe manufacturer
- ◆ Engine manufacturer





Absolutely no news media, company media relations, attorneys, consultants, or insurance personnel are permitted to participate in any phase of the investigation, including meetings



What happens now?



Initial Notification Information

What to expect

First Hour:

- Operator management contact
- Who, what, when, and where?
- State Troopers, U.S. Air Force (RCC), Coast Guard, Park Service

Second Hour:

- Travel itinerary
- FAA investigator responding
- Airframe / Engine Air Safety Dept.
- Offer party status



Regional Investigative Team



Regional Investigative Team

- **NTSB Investigator**
Investigator-In-Charge (IIC)



Regional Investigative Team

- NTSB Investigator
Investigator-In-Charge (IIC)
- FAA Investigator
Not the operator's POI or PMI



Regional Investigative Team

- NTSB Investigator
Investigator-In-Charge (IIC)
- FAA Investigator
- Airframe Investigator



Regional Investigative Team

- NTSB Investigator
Investigator-In-Charge (IIC)
- FAA Investigator
- Airframe Investigator
- Engine Investigator



Party Member Expectations

- Undivided Attention
On scene – 3 days
Component testing - Travel
Interviews
- Operational Experience
Chief Pilot, Director of Safety
Insight into corporate culture
- Team Player
Able to work in groups, as a team member

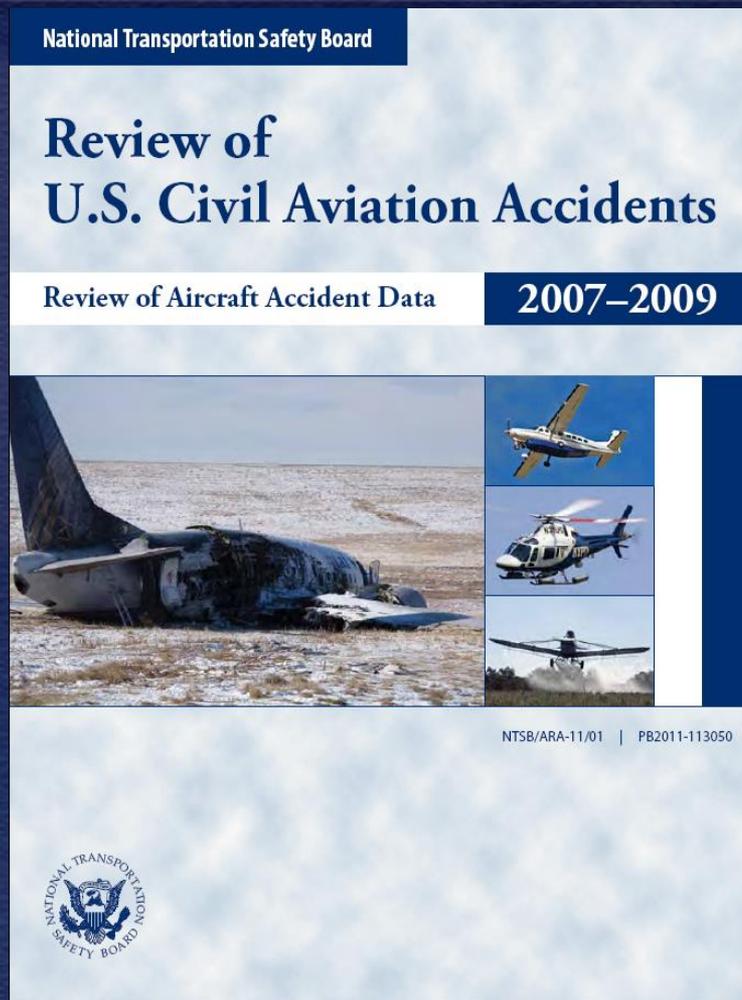


Alfred Sheinwold

“Learn all you can from the mistakes of others. You won’t have time to make them all yourself”

Accident Investigations

- NTSB accident files are on-line
- Many recent accident Dockets are on-line
 - Factual reports,
 - Interviews
 - Photographs
- www.nts.gov



<http://www.nts.gov/doclib/reports/2011/ARA1101.pdf>

Douglas Adams

“Human beings, who are almost unique in having ability to learn from the experience of others, are also remarkable for their apparent disinclination to do so.”



NTSB