



Earl F. Weener, Ph.D.
Board Member

NTSB National Transportation Safety Board

NTSB

Most Wanted List

Pilot Impairment Risk Safety Seminar

NTSB Training Center

October 15, 2016

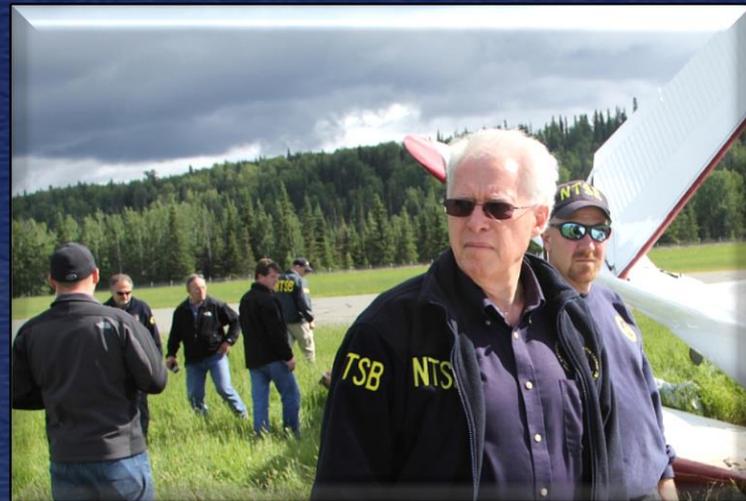
NTSB Mission

The NTSB is an independent U.S. Federal agency charged with:

- Determining the probable cause(s) of transportation accidents (aviation, rail, highway, marine & pipeline)
- Making recommendations to prevent their recurrence
- Conducting special studies and investigations
- Coordinating resources to assist victims and their families after an accident

NTSB's Multi-Modal Mandate

- Maintain congressionally mandated independence
- Conduct objective accident investigations and safety studies
- Perform fair & objective airman/mariner certification appeals
- Advocate safety – NTSB Most Wanted List, recommendations



NTSB 2016 Most Wanted List



- Disconnect from Deadly Distractions
- End Substance Impairment in Transportation
- Expand Use of Recorders to Enhance Transportation Safety
- Improve Rail Transit Safety Oversight
- Prevent Loss of Control in Flight in General Aviation
- Promote Availability of Collision Avoidance Technologies in Highway Vehicles
- Promote the Completion of Rail Safety Initiatives
- Reduce Fatigue-Related Accidents
- Require Medical Fitness for Duty
- Strengthen Occupant Protection

Gray Summit, MO – Bus/Truck/Tractor Crash



Distraction



Distraction



Distraction



2016 MWL - *Disconnect from Deadly Distractions*

A factor in all modes of transportation:

- Motor vehicle emphasis
 - Electronic devices within the vehicle
- Aviation emphasis
 - Sterile Cockpit
 - Appropriate use of PEDs
 - Manage distractions

End Substance Impairment

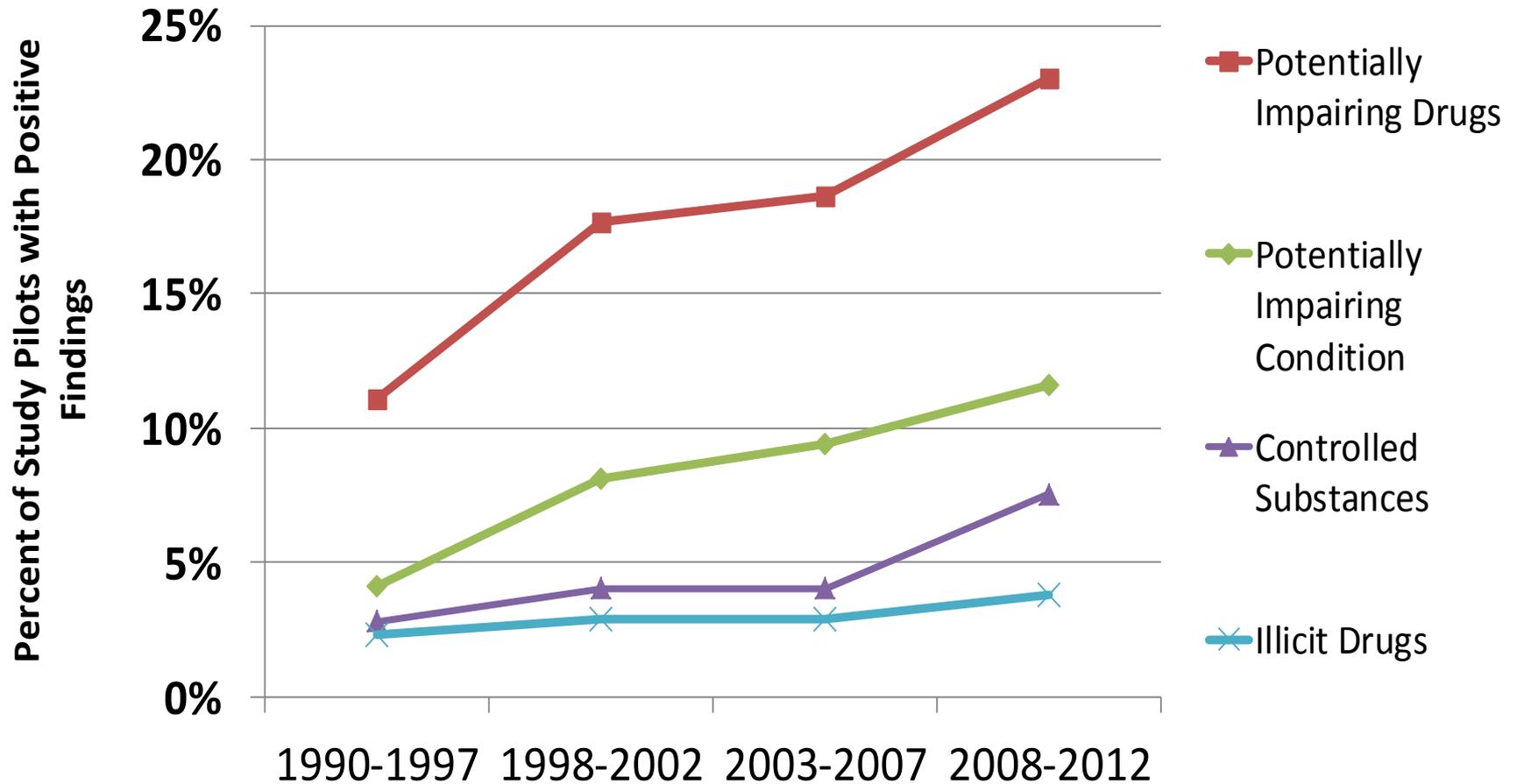


2016 MWL - *End Substance Impairment in Transportation*

A factor in all modes:

- Fatally injured pilots - potentially impairing drugs
 - 11% average 1990 - 1997
 - 23% average 2008 - 2012

Toxicology Findings by Category, 1990-2012



Most Common Drugs

- Sedating antihistamines
 - Most common category
- Diphenhydramine
 - Most common individual drug
 - Most common potentially impairing drug
 - Use INCREASING



Medical Fitness for Duty



Medical Fitness for Duty



2016 MWL – *Require Medical Fitness for Duty*

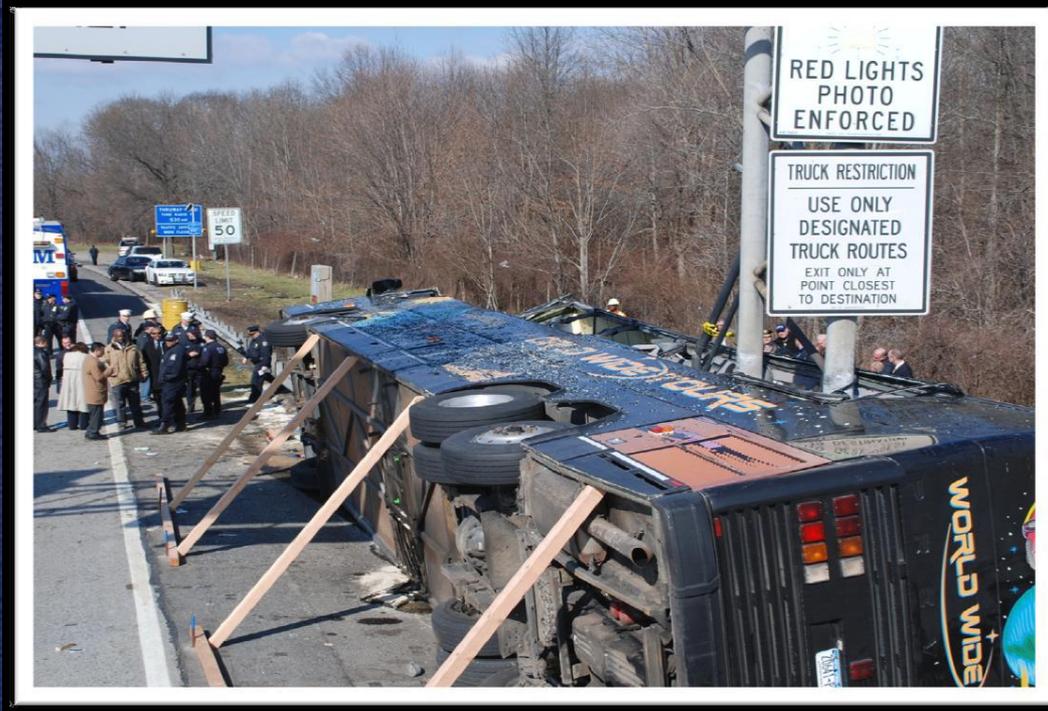
A factor in all modes:

- Airman Medical – fitness at exam point
 - Pilots must self-assess fitness
- Undiagnosed or unreported medical conditions pose threats
 - Obstructive Sleep Apnea
 - Diabetes
 - High Blood Pressure

Fatigue



Bronx Bus Crash, March 12, 2011



15 KILLED
17 INJURED

Cranbury, New Jersey, June 7, 2014



6 VEHICLES

21 PEOPLE

5 RECEIVED MINOR INJURIES

4 RECEIVED SERIOUS INJURIES

1 PERSON KILLED

2016 MWL - Reduce Fatigue - Related Accidents

A factor in all modes:

- 182 Major investigations (2001 – 2012)
 - 20% involved fatigue
- Need
 - Research, education, training
 - Technology development
 - Hours of service, on/off duty policies
 - Medical treatment of sleep disorders

2016 MWL – Strengthen Occupant Protection

A factor in all modes:

- Numerous investigations showed potential for reduced injuries & fatalities
- Need
 - Enhance survival space & ease of evacuation
 - Increased use of existing restraint systems
 - Shoulder harnesses for GA aircraft

Recorders



2016 MWL- Expand use of Recorders

A factor in all modes:

- Critical in accident investigation
 - Install crash resistant image recorders in smaller turbine powered aircraft
 - Install flight recorders in transport category and HEMS aircraft
 - Install inward & outward video cameras in trucks, busses, & trains
 - Use PED memory when available

2016 MWL – Promote Collision Avoidance Technologies (CAT) in Highway Vehicles

- Addresses human performance issues
 - Impairment
 - Fatigue
 - Medical conditions
 - **Distraction**
- Introduces new set of issues
 - False alerts
 - Over-dependence

Types of Crash Avoidance Technologies

- Alerts
 - Lane Departure Warning
 - Stationary Object Alert
 - Following Distance Alert
- Interventions
 - Automatic Emergency Braking
 - Active Steering Assist

Lessons Learned from Aviation

- Behavior can never fully be controlled
- Training often requires refreshing
- Technology may provide safeguard against human error

Loss of Control



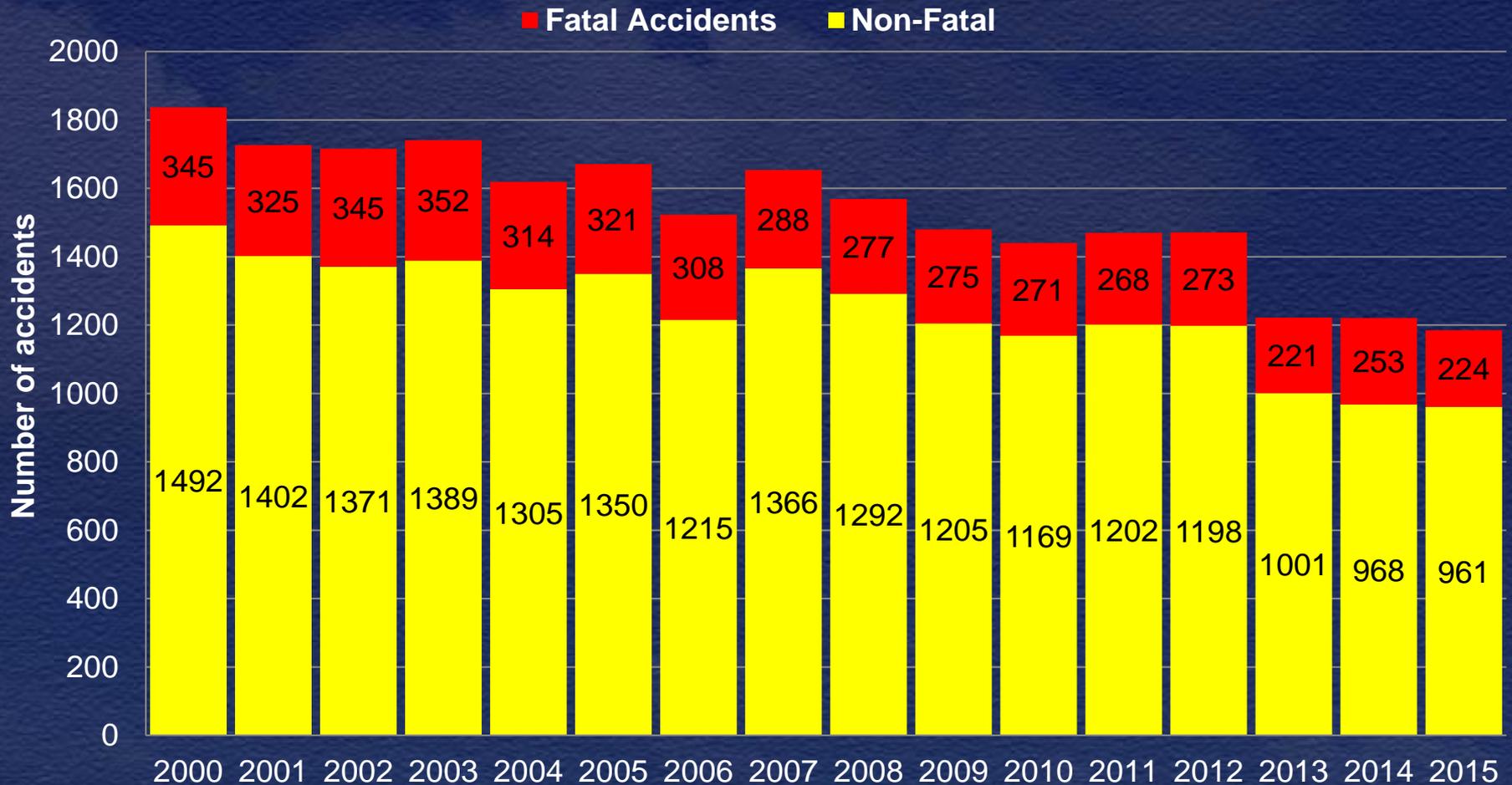
Loss of Control



2016 MWL – Prevent Loss of Control in Flight in General Aviation

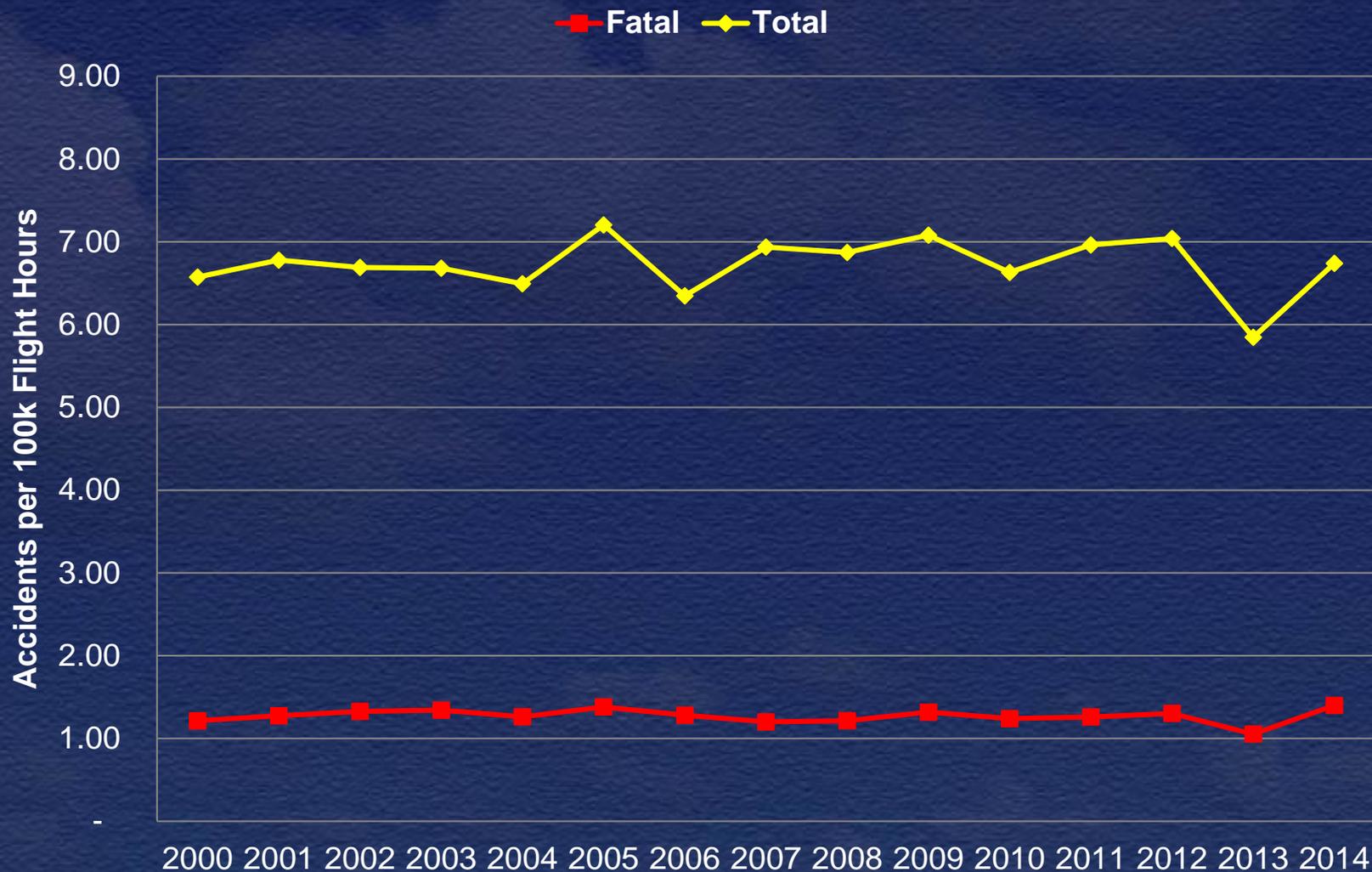
- More than 40% fatal GA accidents were LOC during 2004 – 2014
- Most deadly flight phases
 - Approach to landing
 - Maneuvering
 - Climb

All GA Accidents



*2015 Preliminary numbers

GA Accident Rates

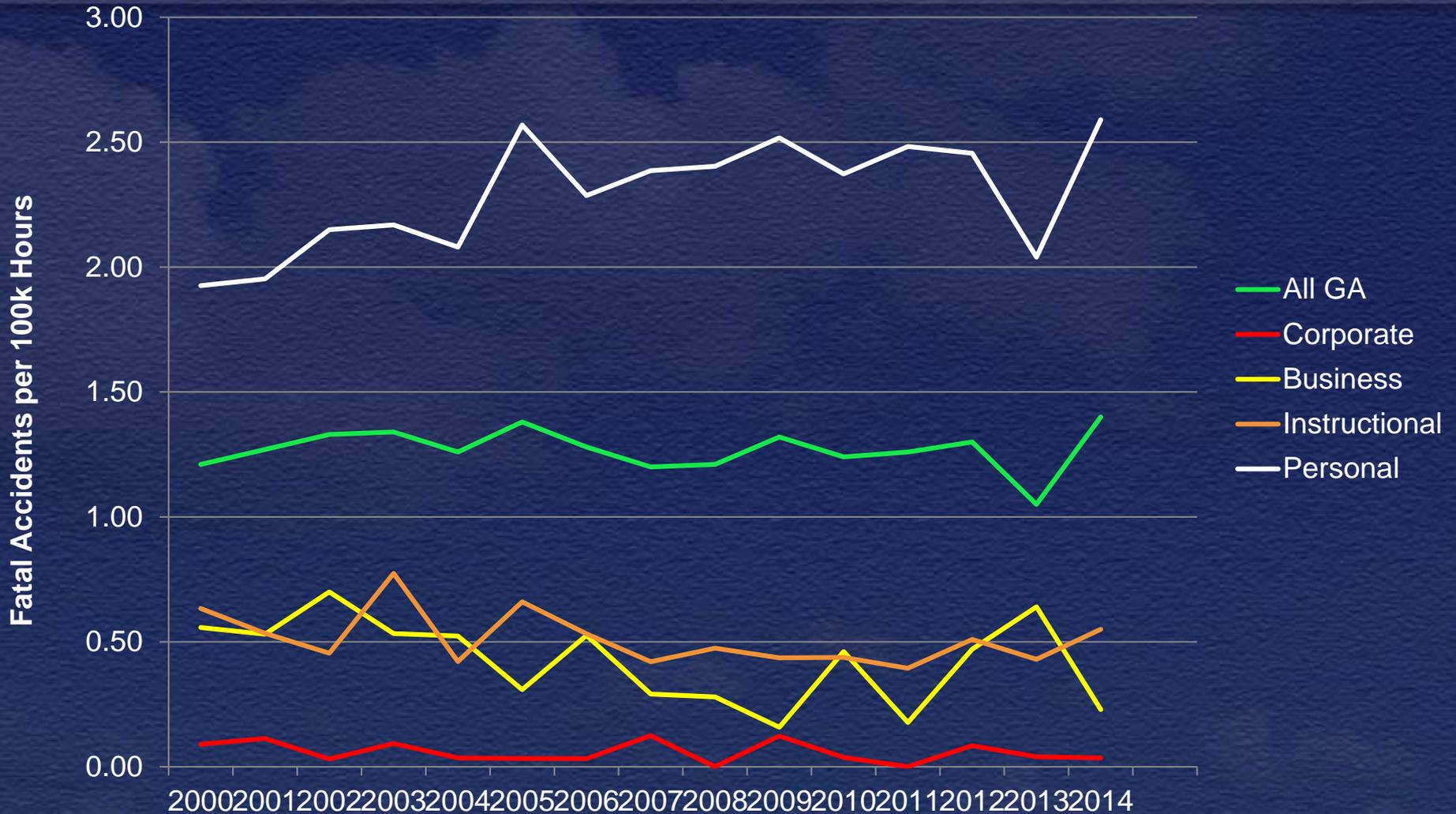


*The 2011 GA Survey is currently not available. FAA is actively engaged in re-calibration efforts and expect to have validated 2011 data published at a later date.

NTSB

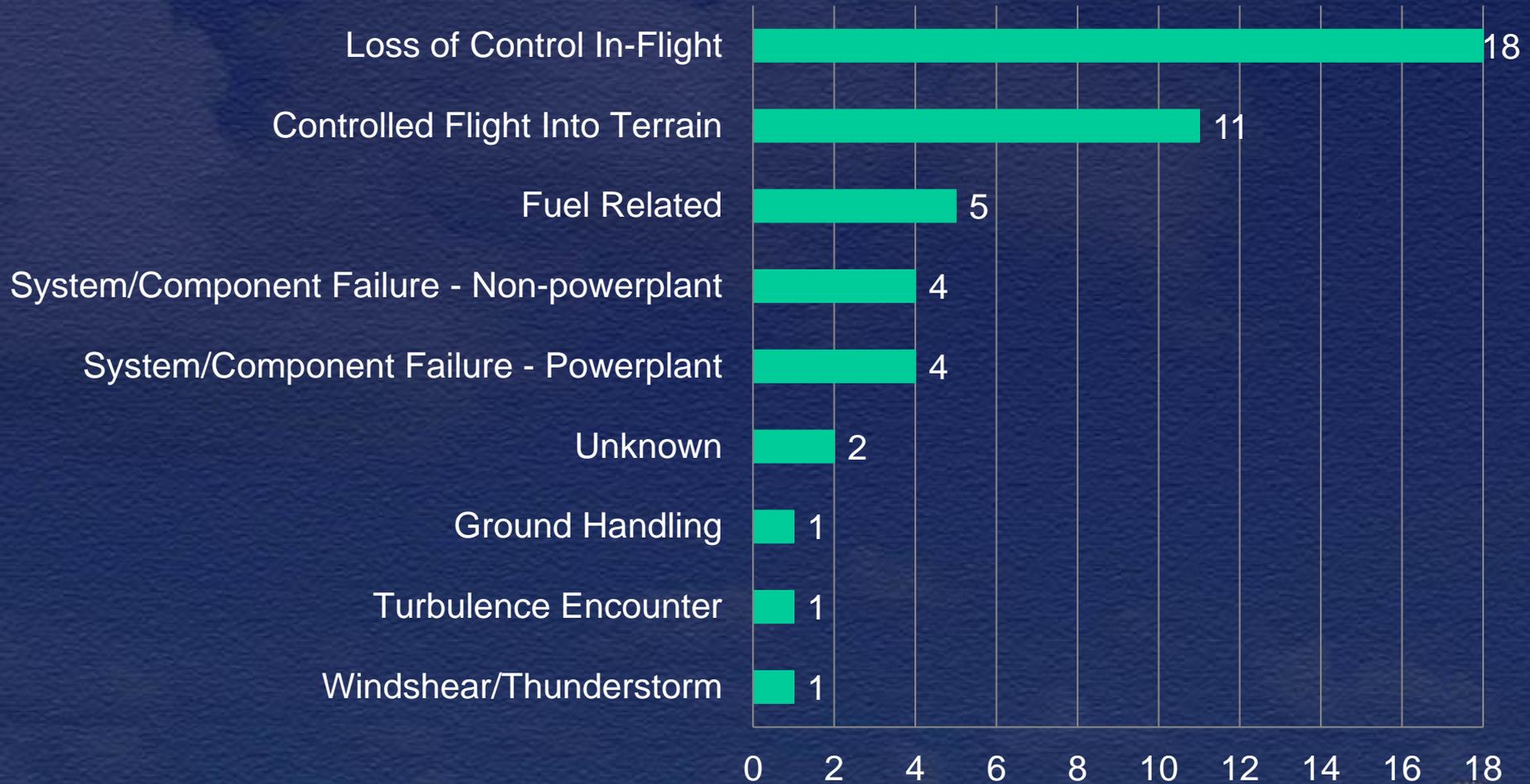


Fatal Accident Rates per 100k Flight Hours



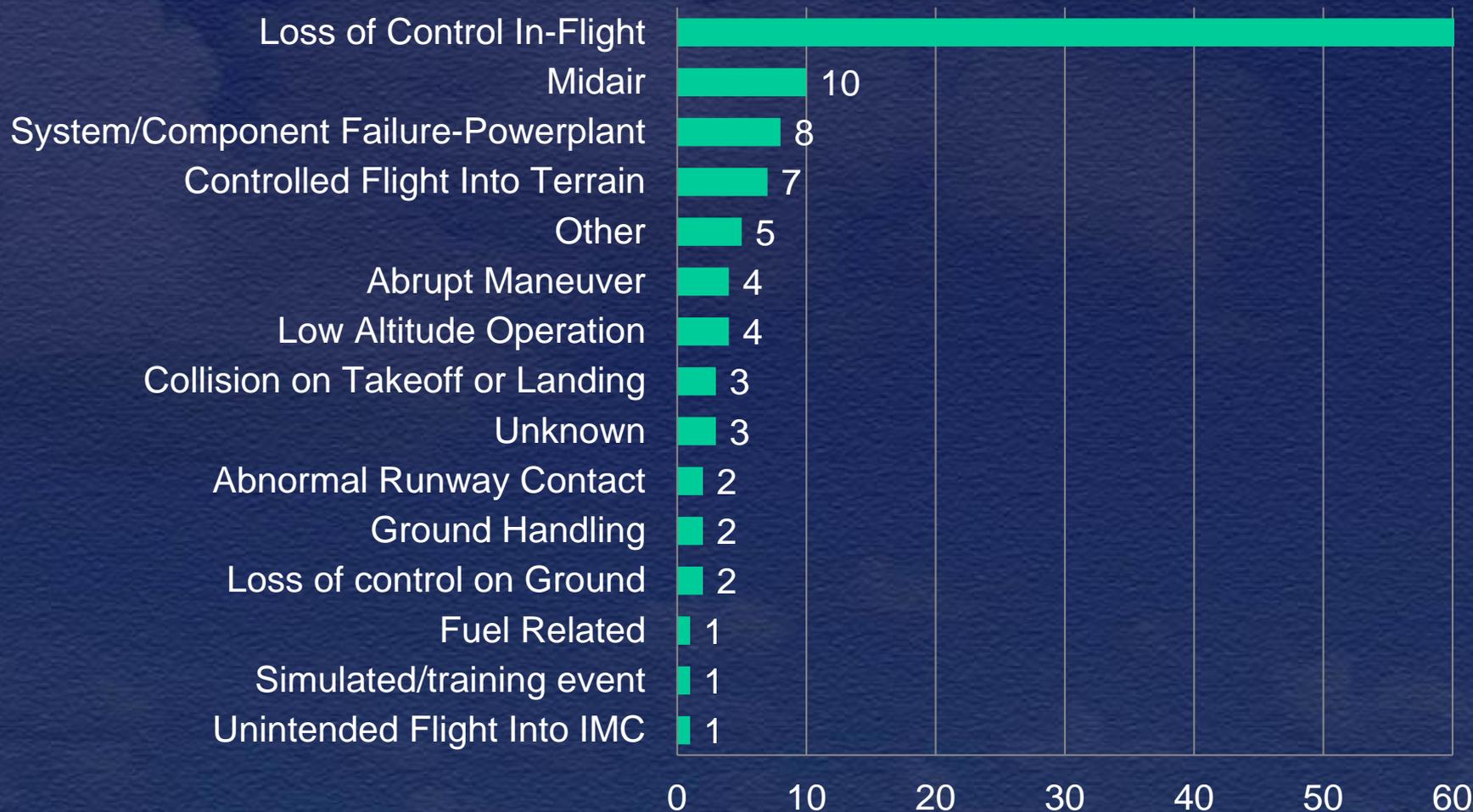
Business Flying, 2008-2014

Number of Fatal Accidents



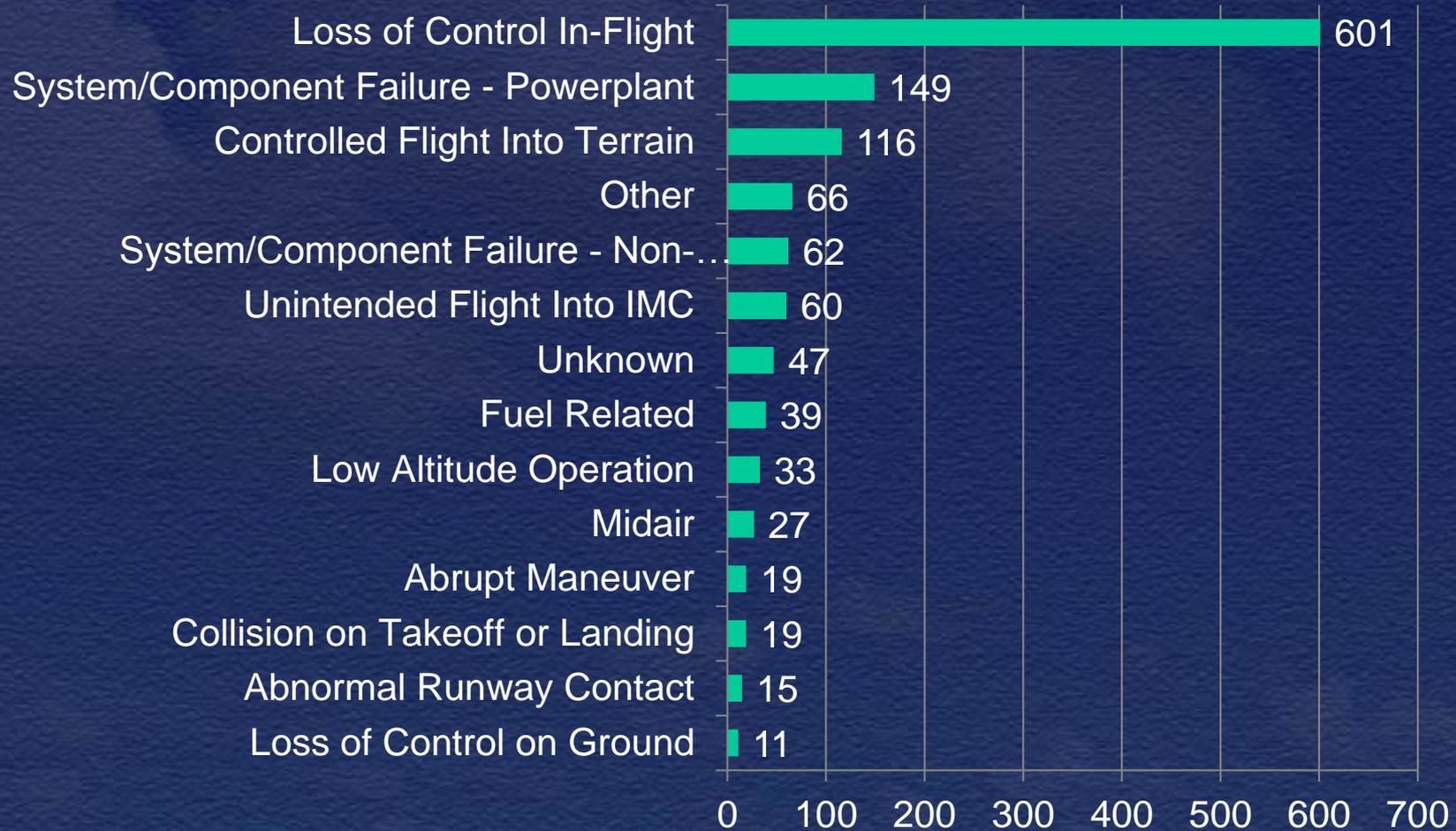
Instructional Flying, 2008-2014

Number of Fatal Accidents



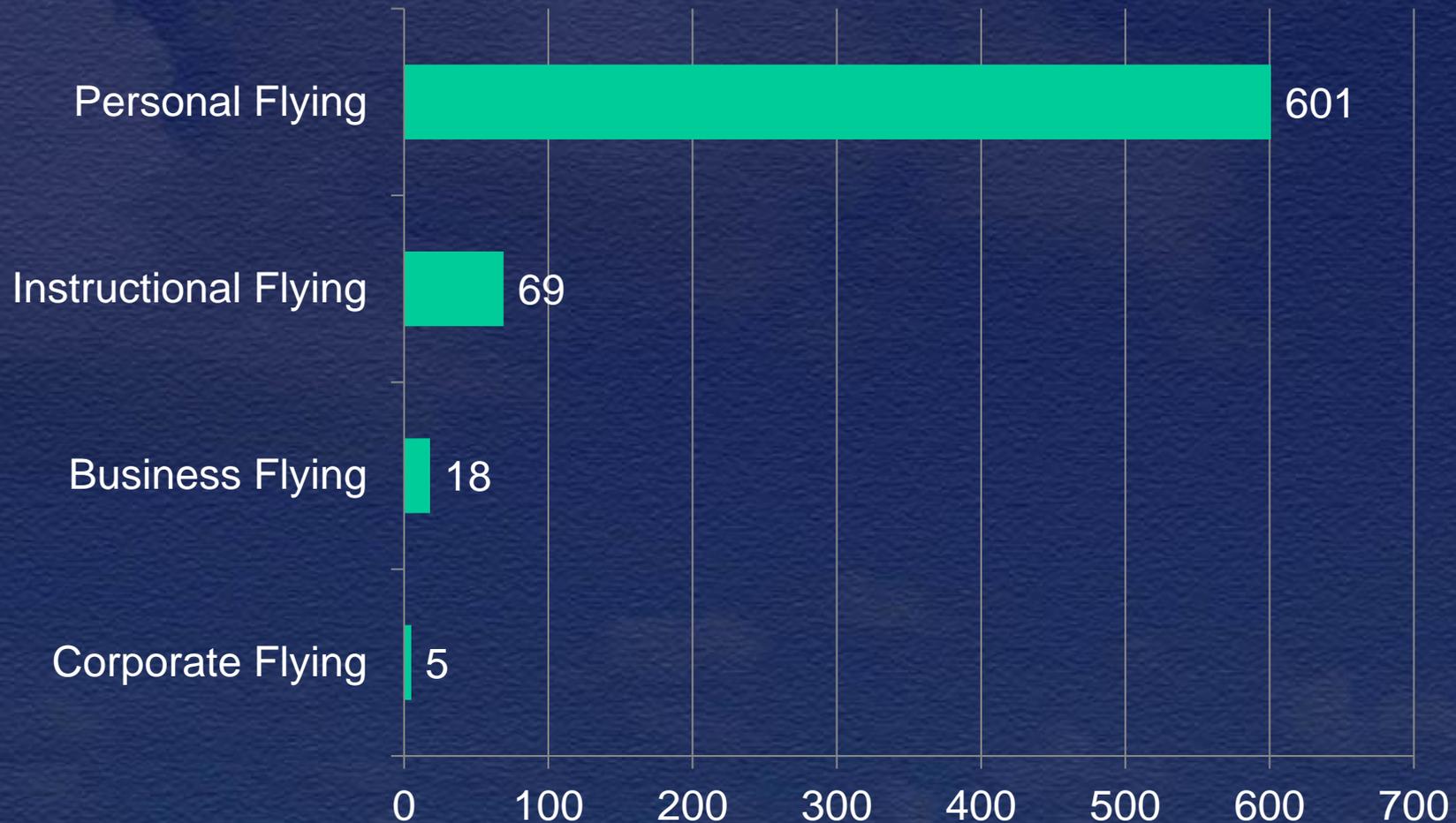
Personal Flying, 2008-2014

Number of Fatal Accidents



Loss of Control In-Flight, 2008-2014

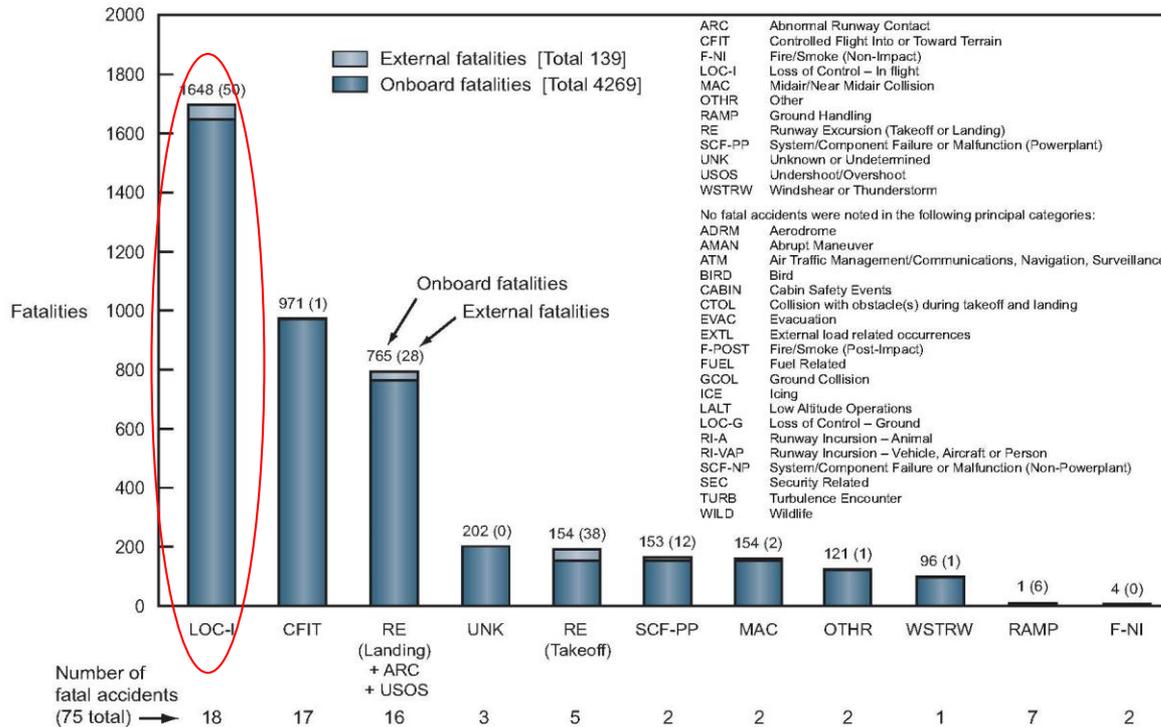
Number of Fatal Accidents



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/>



GA Joint Steering Committee

Steering Committee

Co-chairs – Steve Gottlieb (FAA/AVP)
Bruce Landsberg (AOPA/ASF)

Government – FAA (AFS, AIR, ATO, AAM & ARP)
– NASA (Research),
– NTSB (Observer)

Industry – GAMA, EAA, NBAA, NATA,
SAFE, LAMA & Insurance

- Strategic guidance
- Management/Approval of Safety Plan
- Provide direction
- Membership Outreach
- Provides linkage to ASIAS

Safety Analysis Team

Co-chairs: Corey Stephens (FAA)
Jens Hennig (GAMA)

Members: FAA, AOPA, EAA, GAMA, UAA, MFGs,
FAAST, NAFI, Insurance, Academia, SAFE

- Identify future areas of study/risk
- Charter safety studies
- Provide guidance and direction
- Draw data from various areas
- Develop a prioritized Safety Plan
- Develop metrics to measure effectiveness of safety solutions

Working Groups

(To include SMEs from various general aviation segments, depending on study)

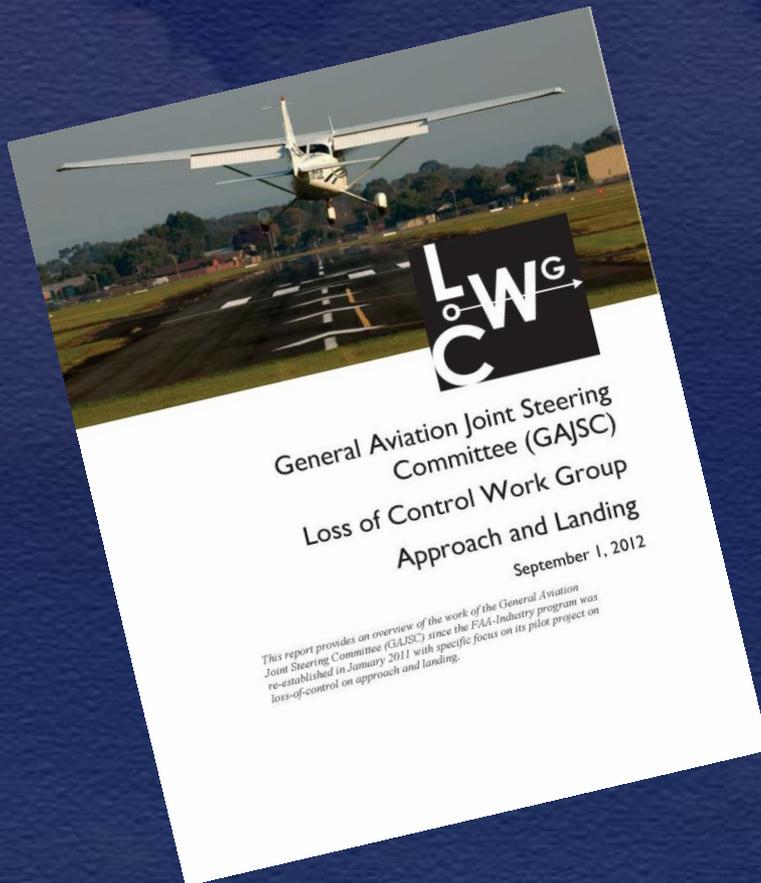
- Data analyses
- Safety enhancement
- Mitigation development

Loss-Of-Control Working Group

Safety Enhancements Identified

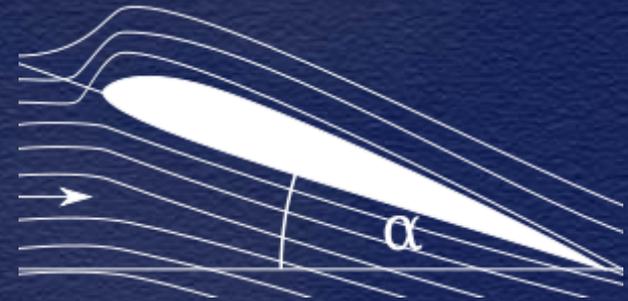
- AOA – New, Current, Retrofit
- Aeronautical Decision Making
- Stabilized Approach
- Single Pilot CRM
- Medication effects
- Weather Technologies
- Etc...

28 Safety Enhancements
plus
8 more with second study



Lower Cost AOA Displays

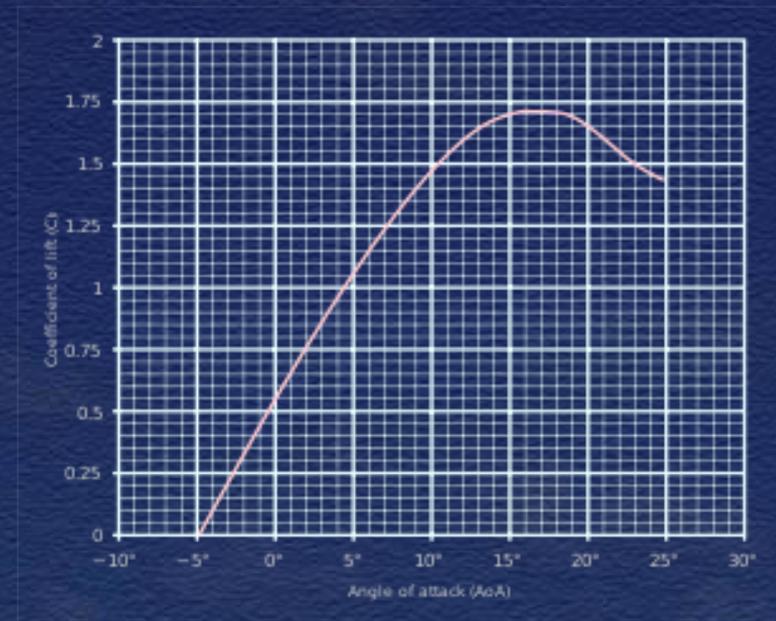
- Stall occurs at a specific Angle-of-Attack
 - But not necessarily at the same airspeed



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



FAA
installation
policy changed



CAST brings key stakeholders to cooperatively develop & implement a prioritized safety agenda

Industry

Government

AIA
Airbus
ALPA
APA
A4A
IFALPA
NACA
Boeing
GE*
RAA
FSF

IATA**
AAPA**
ATAC**
APFA**
ACI-NA**

* Representing P&W and RR
** Observer

**Commercial Aviation
Safety Team
(CAST)**

DOD
FAA

- Aircraft Certification
- Flight Standards
- Accident Investigation
- Air Traffic Operations
- Airports

NASA
ICAO**
EASA
TCCA
NATCA**
NTSB**



ASIAS Members

Commercial Air Carriers (46)

ABX Air	ExpressJet	PSA Airlines
Aerodynamics, Inc.	FedEx Express	Republic Airlines
Air Transport Intl.	Frontier Airlines	Shuttle America
Air Wisconsin Airlines	GoJet Airlines	Silver Airways
Alaska Airlines	Hawaiian Airlines	SkyWest Airlines
Allegiant Air	Horizon Air	Southern Air
Aloha Air Cargo	JetBlue Airways	Southwest Airlines
American Airlines	Kalitta Air	Spirit Airlines
Atlas Air	Mesa Airlines	Sun Country Airlines
Cape Air	Miami Air Intl.	Swift Air
CommutAir	Mountain Air Cargo	Trans States Airlines
Compass Airlines	National Airlines	United Airlines
Delta Air Lines	Northern Air Cargo	United Parcel Service
Empire Airlines	Omni Air Intl.	Virgin America
Endeavor Air	Piedmont Airlines	
Envoy Air	Polar Air Cargo	

Industry

A4A—Airlines for America	NACA—National Air Carrier Association
AIA—Aerospace Industries Association	NATCA—National Air Traffic Controllers Association
Airbus	RAA—Regional Airline Association
ALPA—Air Line Pilots Association	SAPA—SkyWest Airlines Pilot Association
APA—Allied Pilots Association representing Coalition of Airline Pilots Associations (CAPA)	SWAPA—Southwest Airlines Pilots' Association
Boeing	

General Aviation Operators (30)

Costco Wholesale*	NetJets
Eli Lilly	Northeastern Aviation Corp
Embraer Executive Jets	REVA
Flexjet	Vulcan, Inc.
Flight Options	XOJET
Gama Aviation	18 additional Operators*
Johnson & Johnson	

Industry

ACSF—Air Charter Safety Foundation	NBAA—National Business Aviation Association
Embraer	NJASAP—NetJets Association of Shared Aircraft Pilots
GAMA—General Aviation Manufacturers Association	
Gulfstream Aerospace	

Maintenance, Repair & Overhaul

AAR Aircraft Services	HAECO Americas
-----------------------	----------------

Government

AMC—Air Mobility Command	Naval Air Force Atlantic
FAA	USAF Safety Center
NASA	

Academia

University of North Dakota

*Newest Member

As of 22 August 2016

Safety Management System

- Safety Policy
- Safety Risk Management
- Safety Assurance
- Safety Promotion

Changes to Safety Culture

Reactive & forensic

- Whack-a-mole management
- Crisis safety management
- Silos of knowledge
- Data is collected



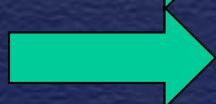
Risk-based & predictive

- Risk management
- Change management
- Data analysis and information sharing
- Data answers questions

Changes to Safety Culture

Reactive & forensic

- “Off with their heads”
- Safety organization responsible for safety
- Regulator is dictatorial and despised
- Safety expected by regulations



Risk-based & predictive

- Just culture
- Everyone responsible for safety
- Regulator is collaborative and respected
- Safety enhanced via voluntary initiatives



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

QUESTIONS OR COMMENTS?

