



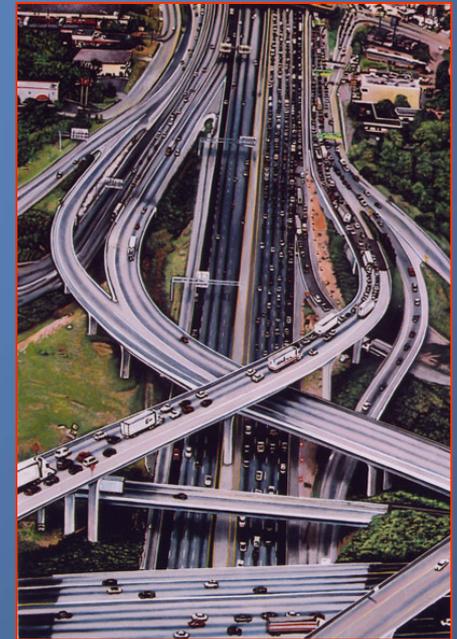
**National  
Transportation  
Safety Board**

# **The NTSB's Role in Improving General Aviation Safety**

Robert L. Sumwalt, III



NTSB is an independent federal agency, charged by Congress to investigate transportation accidents, determine probable cause, and issue safety recommendations.







Our greatest virtues:  
Independence  
Credibility

# The Board



Mark Rosekind



Chris Hart



Debbie Hersman



Robert Sumwalt



Earl Weener





Our biggest strength:  
Our experienced staff

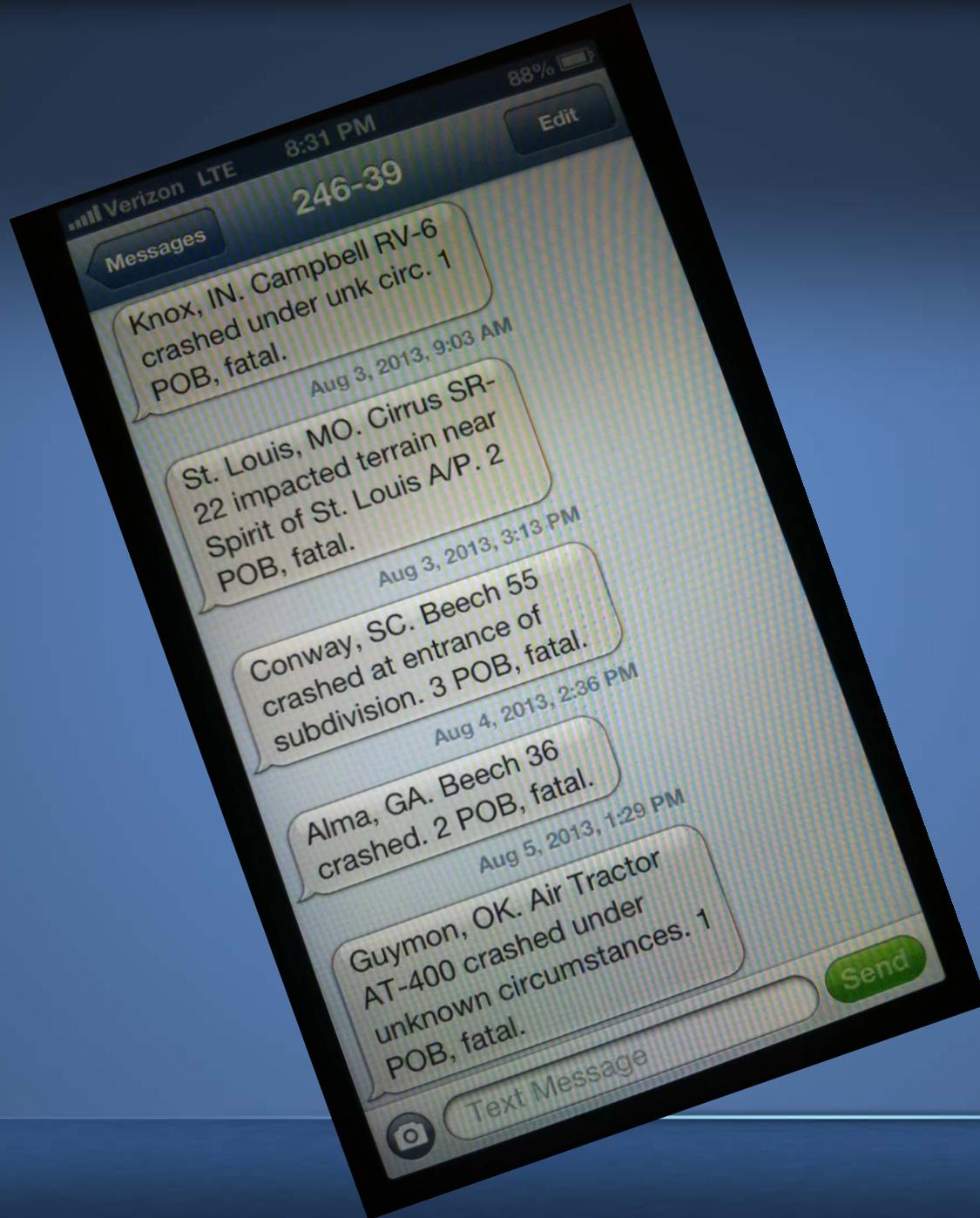


**NTSB**





NTSB



Messages

246-39

Knox, IN. Campbell RV-6  
crashed under unk circ. 1  
POB, fatal.

Aug 3, 2013, 9:03 AM

St. Louis, MO. Cirrus SR-  
22 impacted terrain near  
Spirit of St. Louis A/P. 2  
POB, fatal.

Aug 3, 2013, 3:13 PM

Conway, SC. Beech 55  
crashed at entrance of  
subdivision. 3 POB, fatal.

Aug 4, 2013, 2:36 PM

Alma, GA. Beech 36  
crashed. 2 POB, fatal.

Aug 5, 2013, 1:29 PM

Guymon, OK. Air Tractor  
AT-400 crashed under  
unknown circumstances. 1  
POB, fatal.

Send

Text Message



NTSB



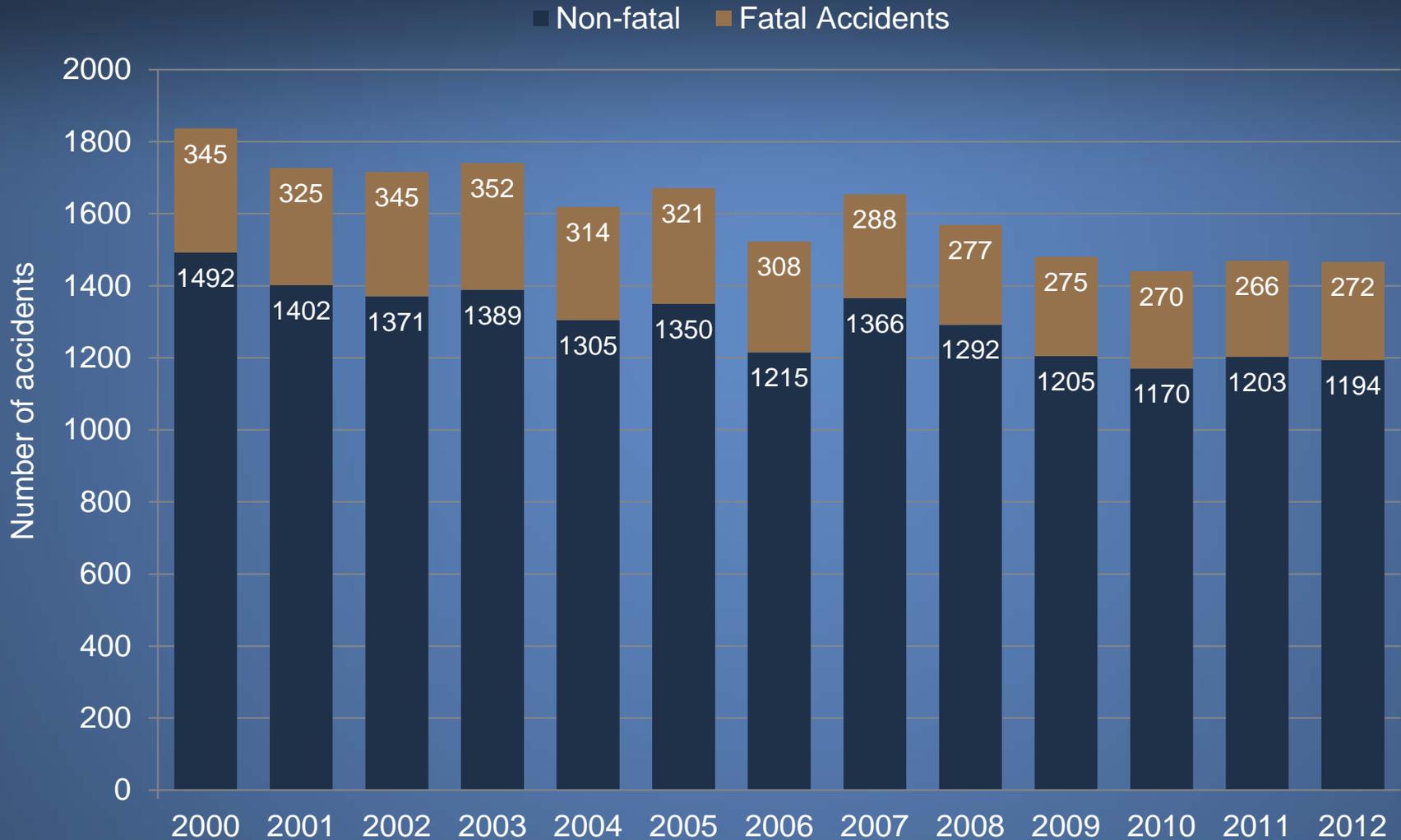
Our mission:  
Prevent Accidents  
Reduce Injuries  
Save Lives

# 2014 NTSB Most Wanted List

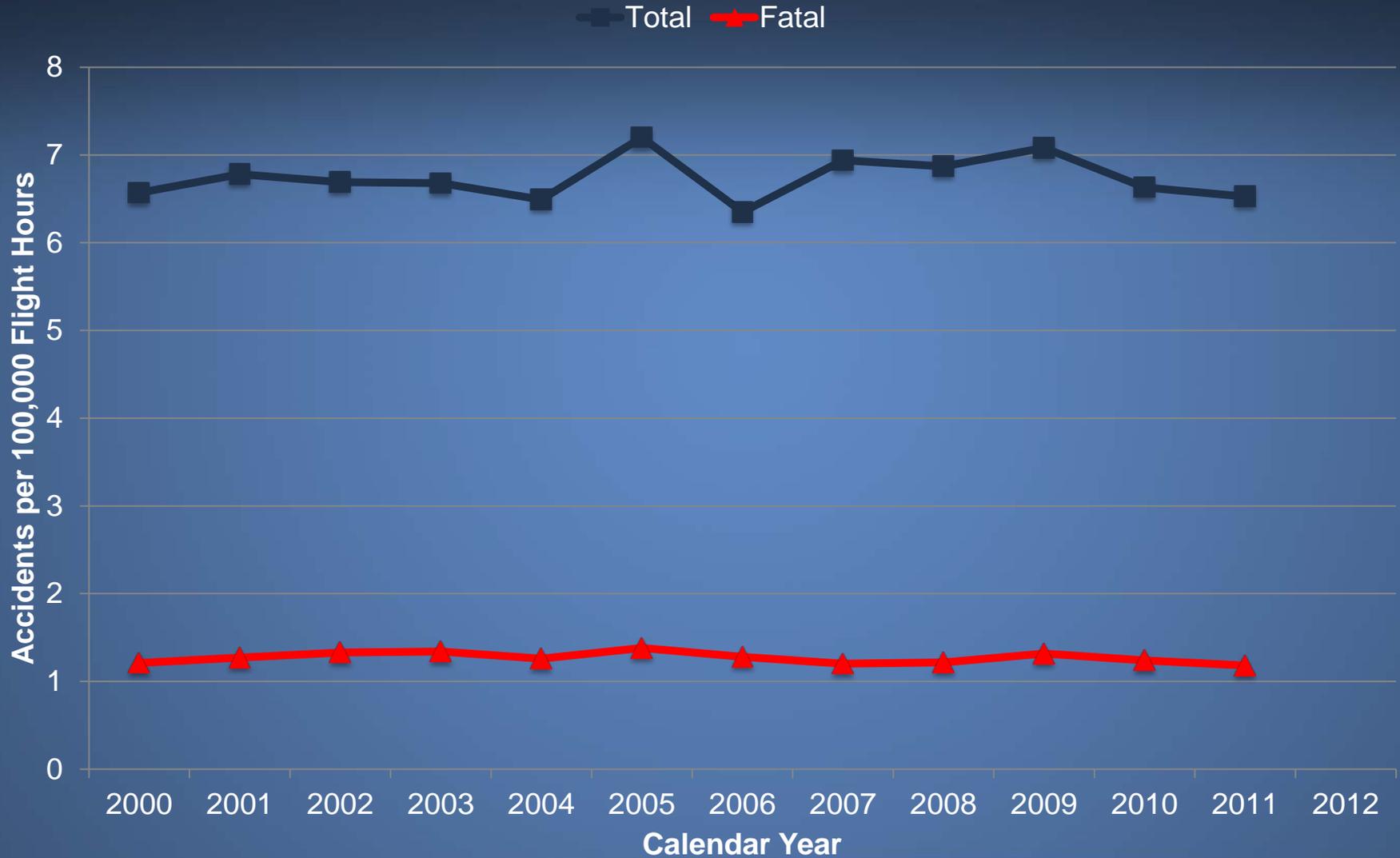


- Helicopter safety
- GA hazardous weather
- Distractions in transportation
- Fire safety
- Occupant protection
- Passenger vessel safety
- Substance-impaired driving
- Pipeline safety
- Positive Train Control
- Rail Mass Transit

# All GA Accidents



# GA Accident Rates



On a normalized basis of flight hours flown, the GA accident rate is 40 times greater than for U.S. scheduled air carriers.



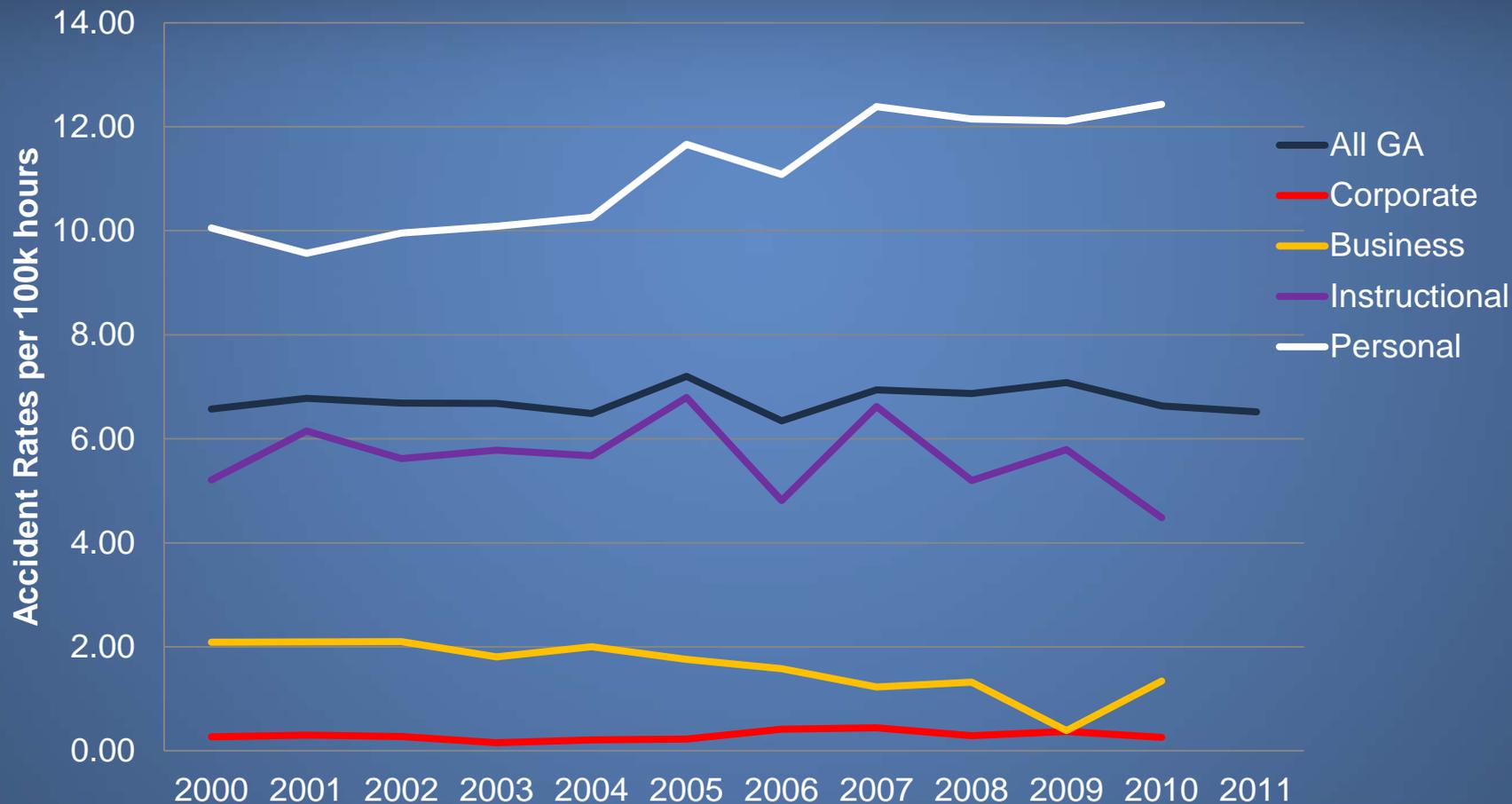
# What is General Aviation?





# Accident Rates per 100k Flight Hours

Accident Rates per 100k Flight Hours  
2000-2011



# Defining Fatal Accident Events All 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



# Business Flying, 2008-2012

## Number of Fatal Accidents



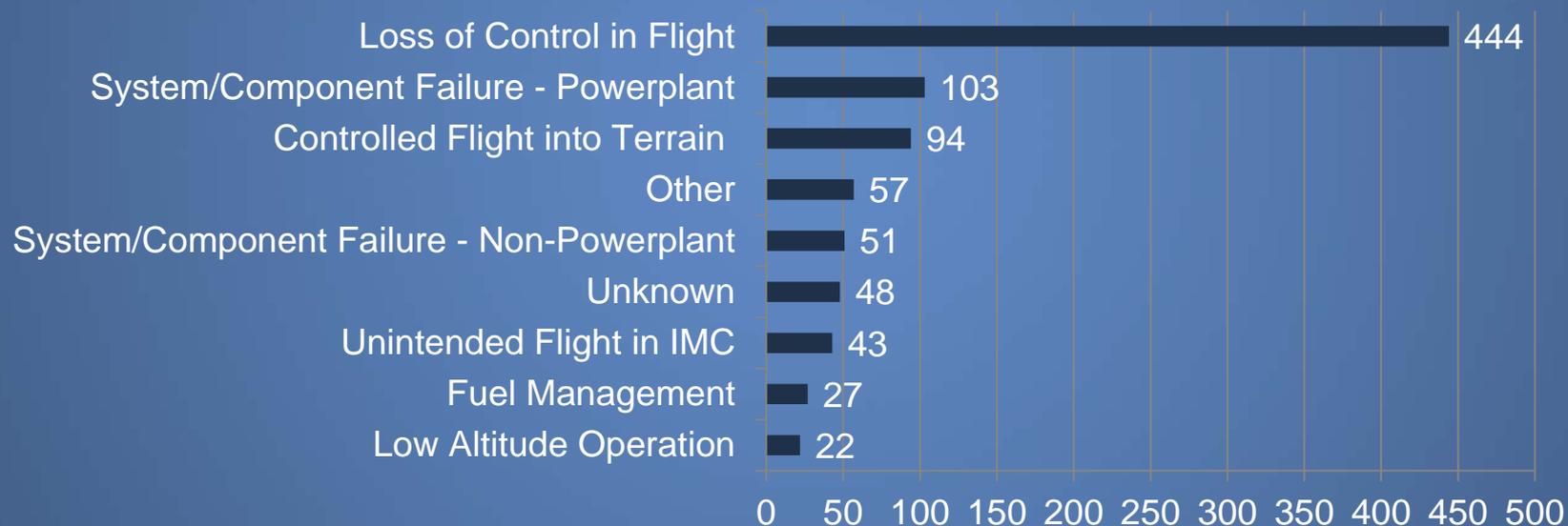
# Instructional Flying, 2008-2012

## Number of Fatal Accidents



# Personal Flying, 2008-2012

## Number of Fatal Accidents



# NTSB's Recent GA-related Activities

## 2010

- Study of Introduction of Glass Cockpit Avionics into Light Aircraft

## 2011

- Study of Airbag Performance in GA Restraint Systems
- Placed GA Safety on NTSB's Most Wanted List



# NTSB's Recent GA-related Activities

2012

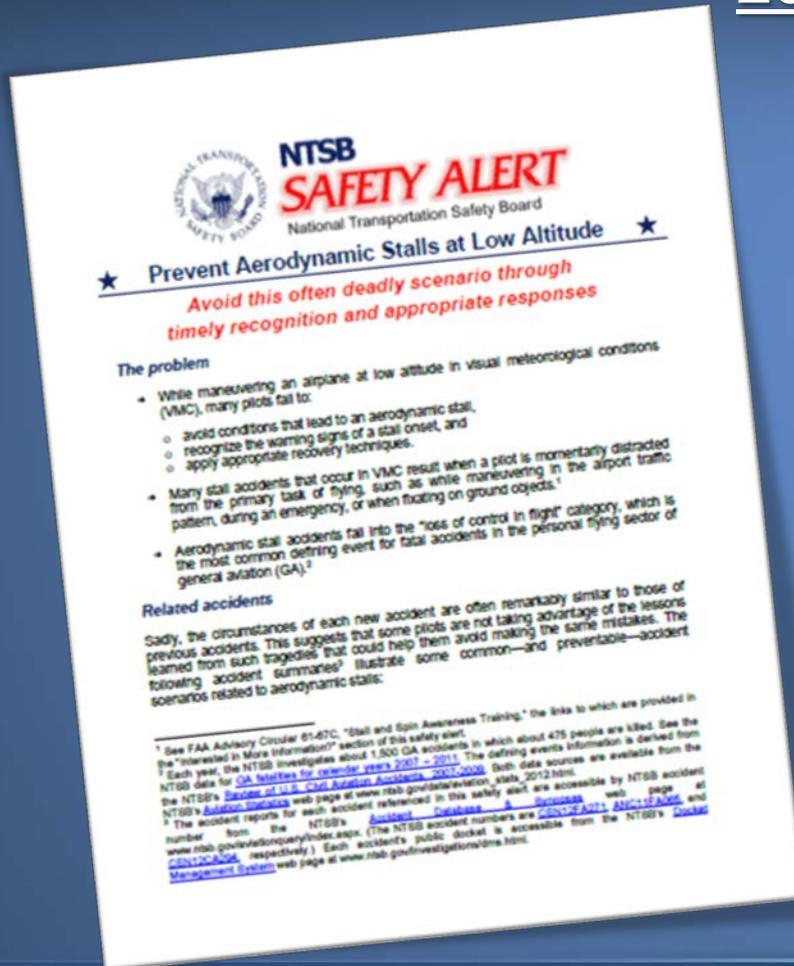
- Held a public hearing on Air Races and Air Show safety
- Conducted a forum on GA safety
- Held forum on GA Search and Rescue
- Conducted a study on Experimental Amateur-Built aircraft
- GA on Most Wanted List



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# NTSB's Recent GA-related Activities

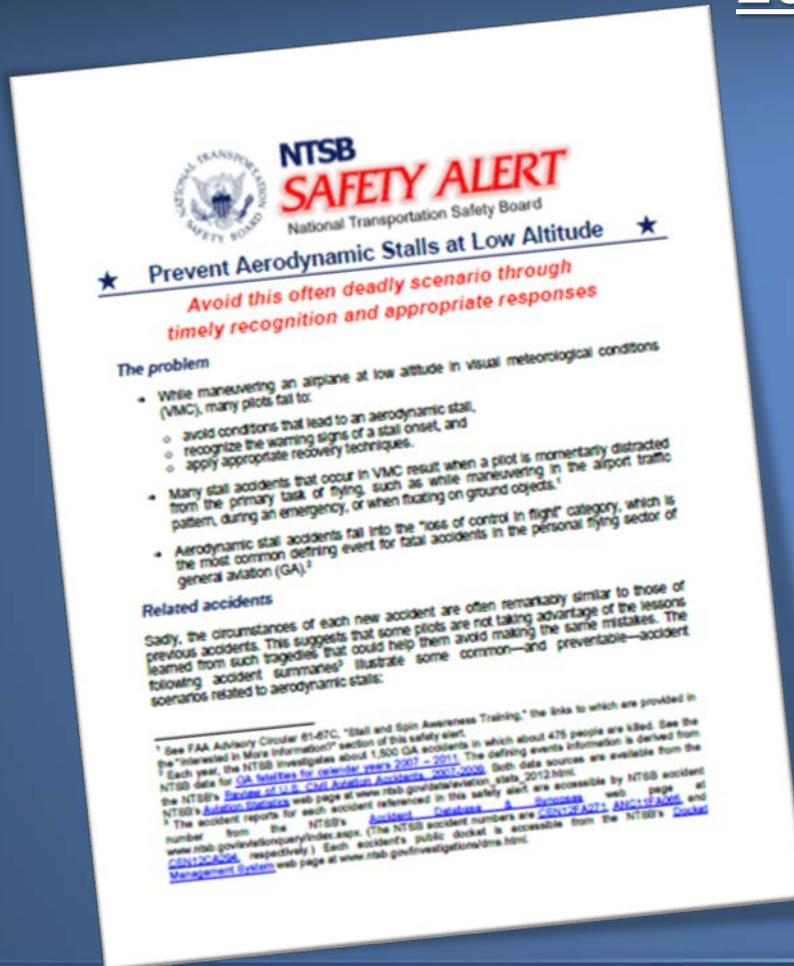
2013



- Is your aircraft talking to you?
- Reduced visual references.
- Loss of control.
- Risk management for mechanics.
- Risk management for pilots.

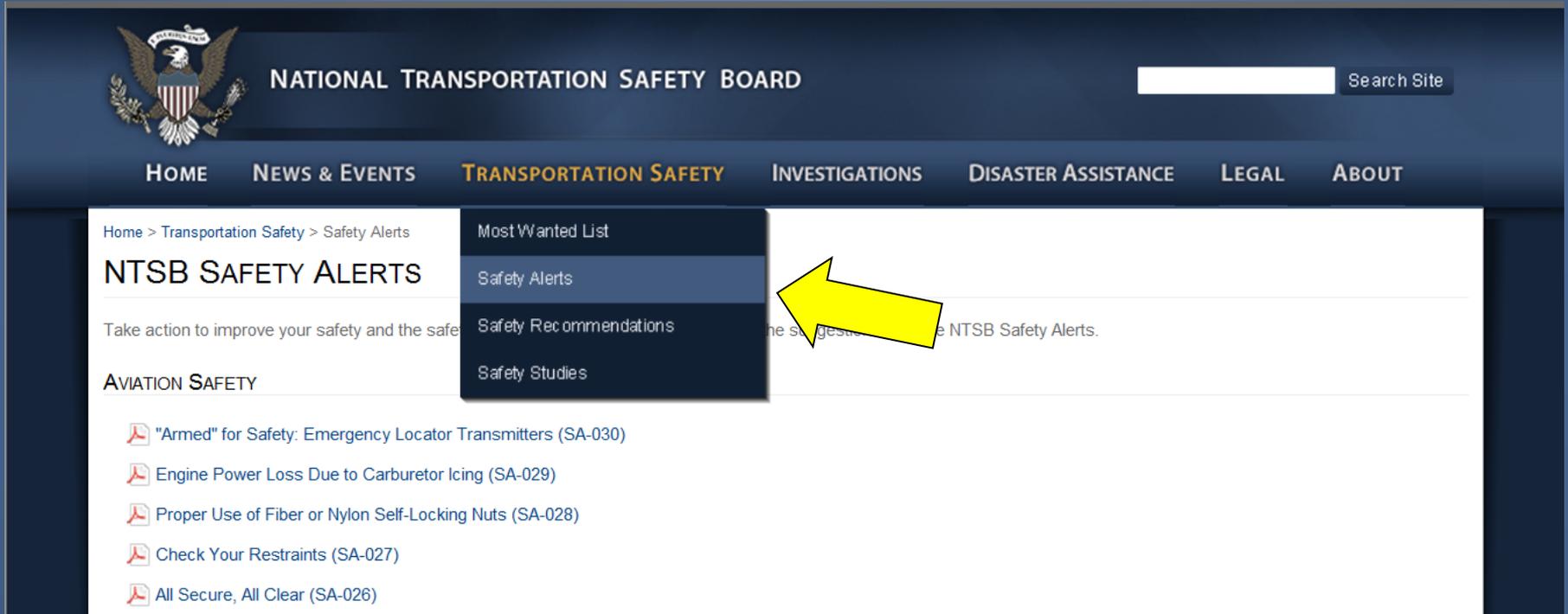
# NTSB's Recent GA-related Activities

2013



- Check Your Restraints
- Engine Power Loss Due to Carburetor Icing
- "Armed" for Safety: Emergency Locator Transmitters
- All Secure, All Clear (securing items in the aircraft cabin)
- Proper Use of Fiber or Nylon Self-Locking Nuts

# WWW.NTSB.GOV



The screenshot shows the NTSB website header with the logo on the left and a search bar on the right. The navigation menu includes 'HOME', 'NEWS & EVENTS', 'TRANSPORTATION SAFETY', 'INVESTIGATIONS', 'DISASTER ASSISTANCE', 'LEGAL', and 'ABOUT'. The 'TRANSPORTATION SAFETY' menu is expanded, showing options: 'Most Wanted List', 'Safety Alerts', 'Safety Recommendations', and 'Safety Studies'. A yellow arrow points to the 'Safety Alerts' option. Below the menu, the page content includes a breadcrumb trail 'Home > Transportation Safety > Safety Alerts', the heading 'NTSB SAFETY ALERTS', a sub-heading 'AVIATION SAFETY', and a list of safety alerts with document icons: 'Armed' for Safety: Emergency Locator Transmitters (SA-030), Engine Power Loss Due to Carburetor Icing (SA-029), Proper Use of Fiber or Nylon Self-Locking Nuts (SA-028), Check Your Restraints (SA-027), and All Secure, All Clear (SA-026).

# NTSB's Recent GA-related Activities

2013

## Five Foes of GA Safety Videos





### NTSB News

NTSB Announces its 2014 Most Wanted List.

Press Release More Information



The NTSB is an independent Federal agency charged by Congress with investigating every civil aviation accident in the U.S. and significant accidents in other modes of transportation-railroad, highway, marine and pipeline. [more >](#)



News @ NTSB [Social media icons]

Tweets [Follow button]

NTSB @NTSB Most Wanted List. Preserving a Safe Path Home [wp.me/p1IQdj-A2](#) Show Summary

NTSB @NTSB 11h Preliminary report on the Jan. 5 crash of a Canadair CL-600 in

The Safety of  
Experimental Amateur-Built Aircraft



Safety Study  
NTSB/SS-12/01  
PB2012-917001



National  
Transportation  
Safety Board

# Experimental Amateur-Built (EAB) Aircraft



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# As part of the study...



- NTSB investigators traveled to every EAB aircraft accident that occurred in 2011 in the US.
- 227 aircraft involved



# EAB Accidents are over-represented

- EAB aircraft represent nearly 10% of the US GA fleet
  - These aircraft account for approximately 15% of all GA accidents
  - 21% of fatal GA accidents

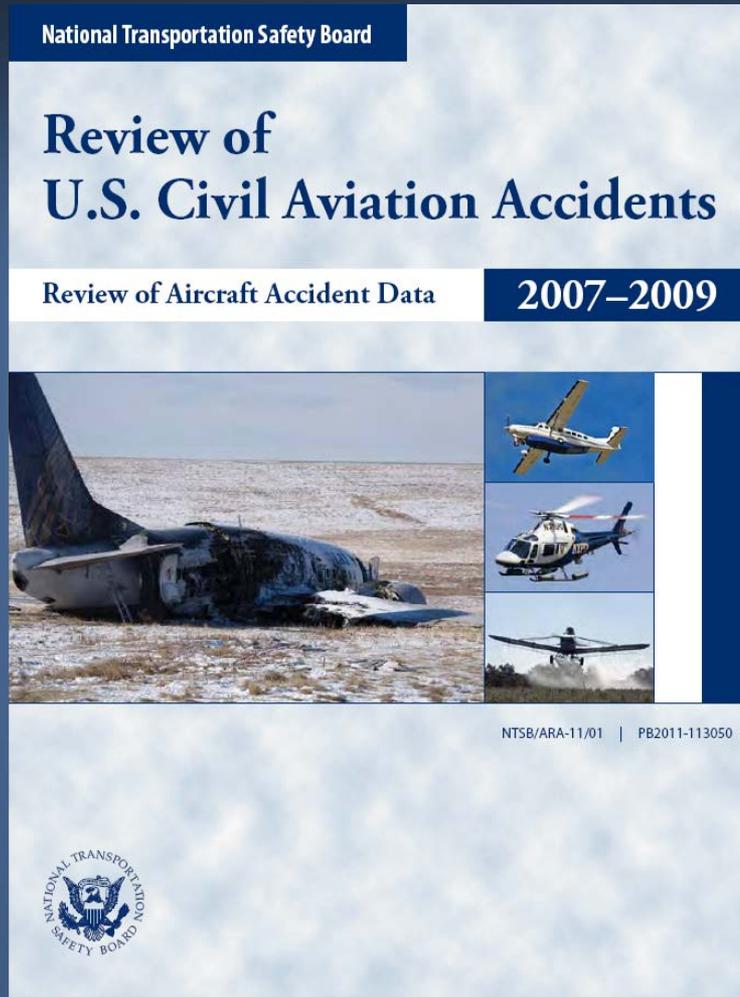


# EAB Study Concluded with:

- 16 Findings
- 16 Recommendations
  - 12 to FAA
  - 4 to EAA



# 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)

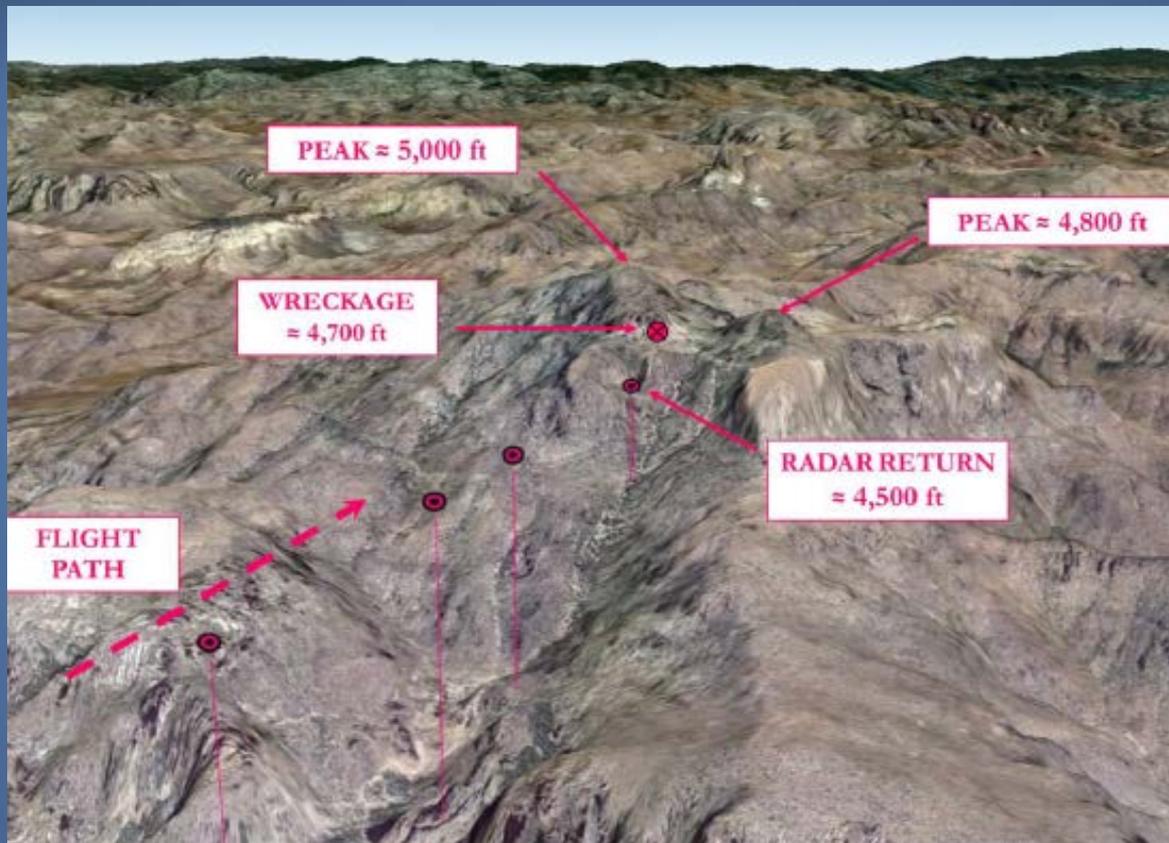
<http://www.nts.gov/doclib/reports/2011/ARA1101.pdf>

# Apache Junction, Nov. 23, 2011





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Main Wreckage



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# Probable Cause

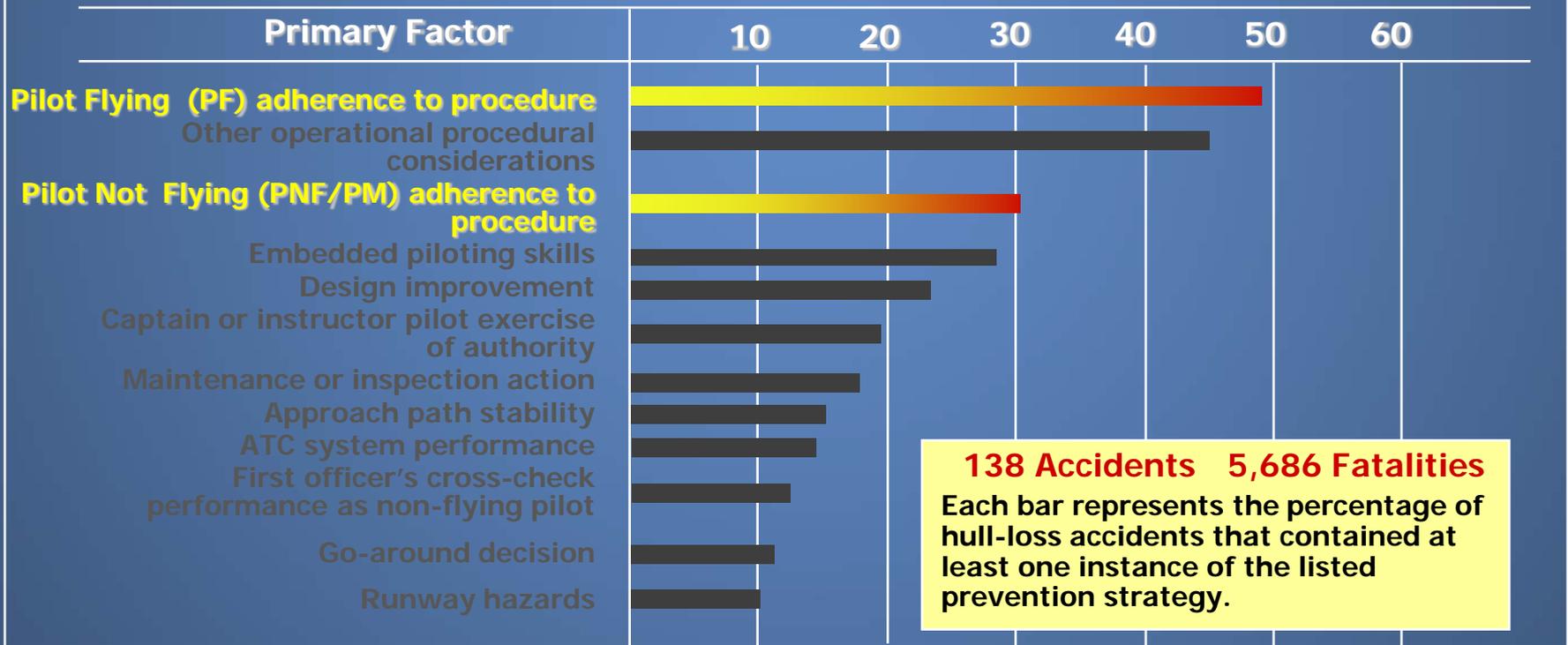
- The pilot's failure to maintain a safe ground track and altitude combination for the moonless night visual flight rules flight, which resulted in controlled flight into terrain.
- Contributing to the accident were the pilot's complacency and lack of situational awareness and his failure to use air traffic control visual flight rules flight following or minimum safe altitude warning services.
- Also contributing to the accident was the airplane's lack of onboard terrain awareness and warning system equipment.



# Accident Prevention Strategies

## Hull-loss Accidents over 10 Year Period

### Percentage of Accidents



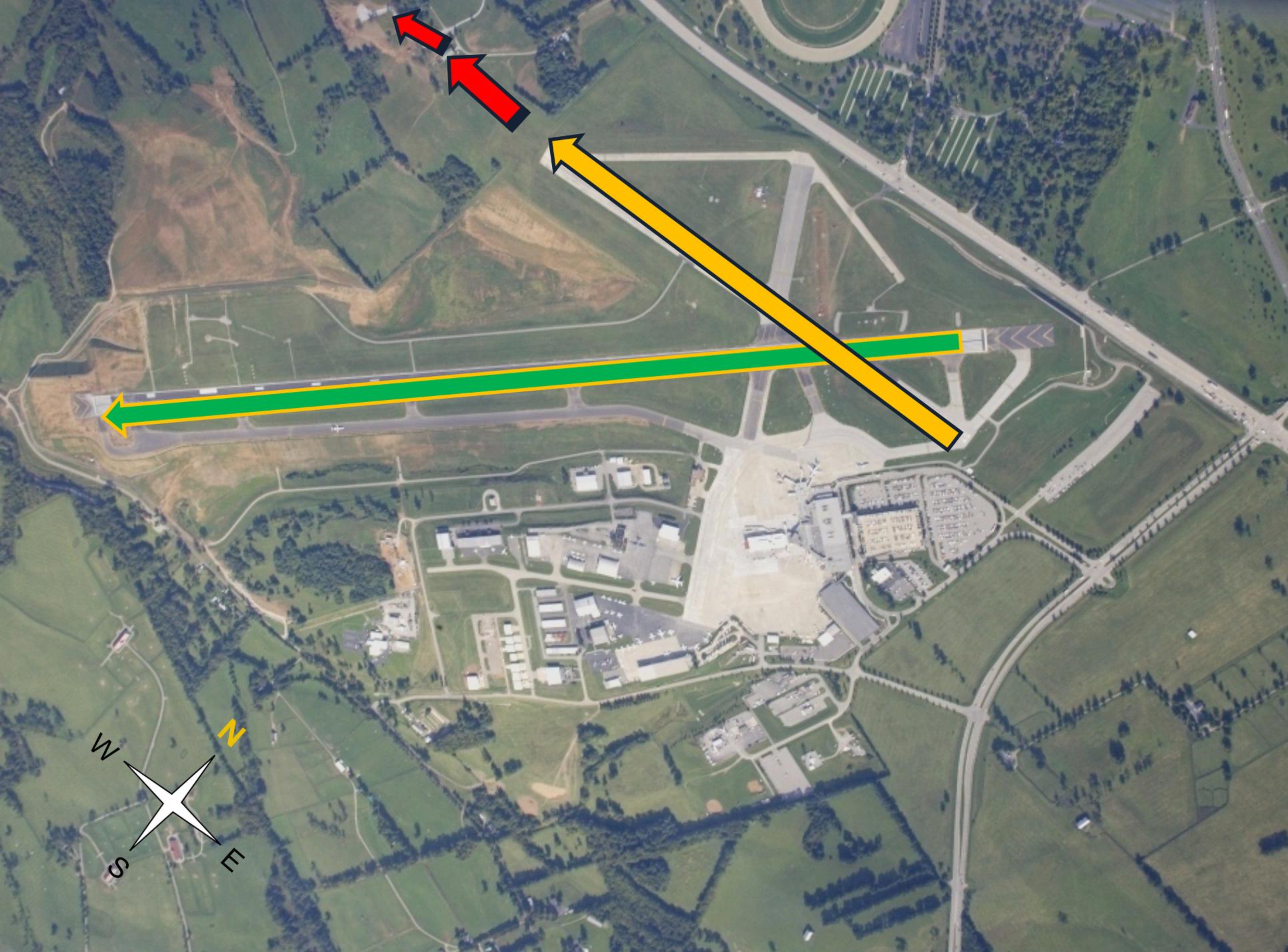
Source: Boeing study of accident prevention strategies

# Comair Airlines Flight 5191

## Lexington, Kentucky

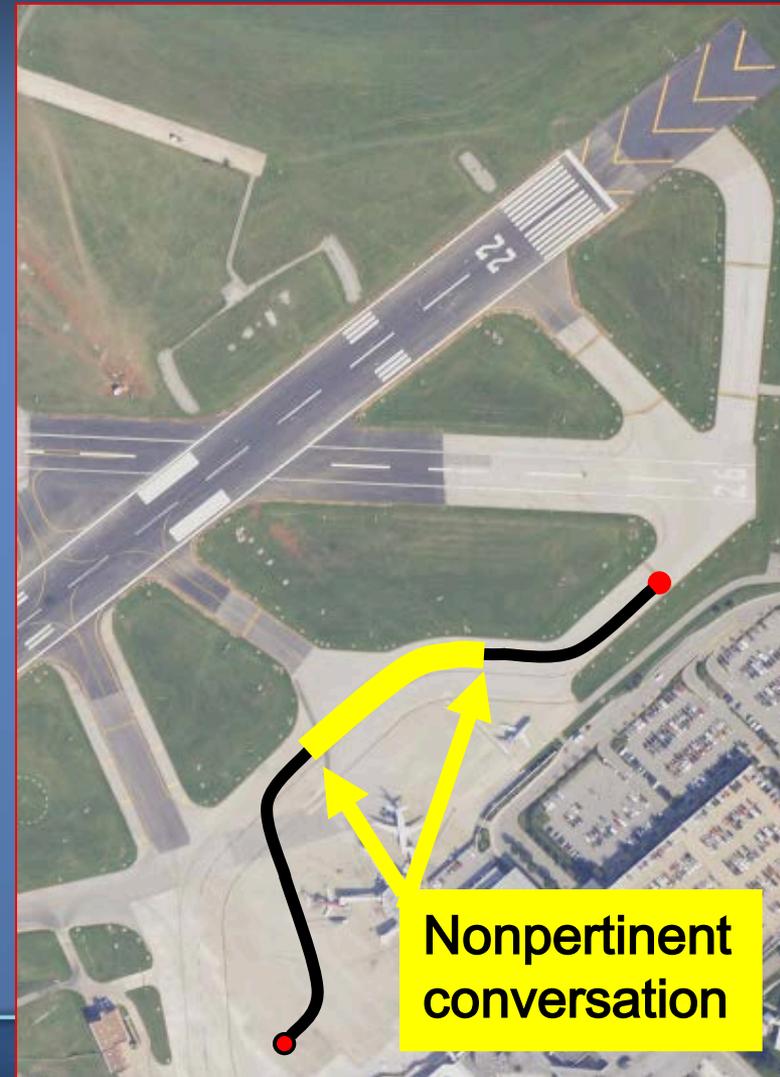
- Bombardier CRJ
- 49 Fatalities
- First officer severely injured
- Wrong runway attempted takeoff





# Crew Actions

- Noncompliance with sterile cockpit rule
  - 40 of the 150 seconds during taxi were violations of sterile cockpit rule
- Distraction likely contributed to loss of positional awareness



# NTSB Finding

- “The flight crew’s noncompliance with standard operating procedures, including the captain’s abbreviated taxi briefing and both pilots’ nonpertinent conversation, most likely created an atmosphere in the cockpit that enabled the crew’s errors.”





**US Airways Express  
January 19, 2010  
Charleston, WV**



# Probable cause

- “...the flight crewmembers’ unprofessional behavior, including their non-adherence to sterile cockpit procedures by engaging in non-pertinent conversation, which distracted them from their primary flight-related duties and led to their failure to correctly set and verify the flaps.”



# Intentional non-compliance leads to other problems

- LOSA data revealed that, compared to crews who followed SOPs, crewmembers who intentionally deviated from procedures:
  - averaged making three times more errors
  - mismanaged more errors
  - found themselves in more undesired aircraft situations.



# Pinnacle Airlines Flight 3701

## Jefferson City, Missouri



- October 14, 2004
- Bombardier CL-600-2B19
- Repositioning flight
- Both flight crewmembers killed



# What the investigation discovered

- Intentional activation of stall warning
- Swapping crew seats
- Rudder mishandling
- Climb to FL 410
  - “have a little fun”
- Automation mismanagement
- Airspeed loss, stall, loss of control, double engine failure
- Did not fully disclose real problem with ATC



# NTSB's Probable Cause

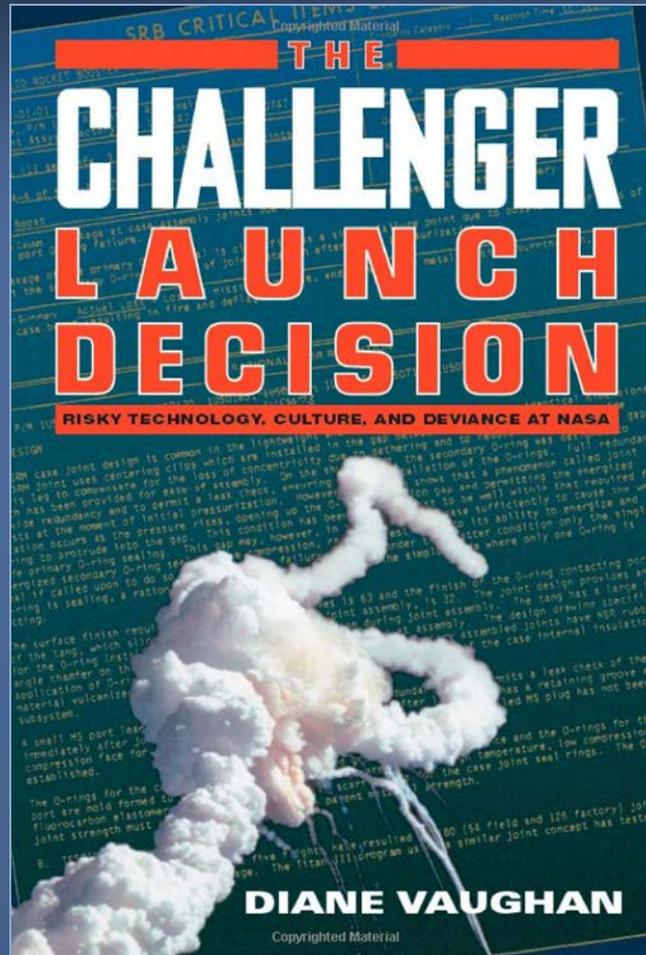
- “the pilots’ unprofessional behavior, deviation from standard operating procedures, and poor airmanship, which resulted in an in-flight emergency from which they were unable to recover...”





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# Avoid “Normalization of Deviance”



- Normalization of Deviance: When not following procedures and taking “short cuts” and becomes an accepted practice.



# Avoid Selective Compliance



- “That is a stupid rule.”
- “I don’t have to comply with that one.”





# National Transportation Safety Board