National Transportation Safety Board

General Aviation Fixed-Wing Inflight Loss of Control Overview

Paul Cox

Senior Air Safety Investigator

A Long Title

What does it mean?

Why are we concerned?

Definitions

- “Fixed-wing” and “Inflight” are fairly easy to understand

- Definitions for “General Aviation” and “Loss of Control” can be somewhat problematic

For General Aviation

- Differences in international and U.S. definitions of GA
- U.S. government statistics collection criteria differ from what industry might consider GA

In the U.S.

- Agreement that GA includes
  - FAR Part 91 flights, Part 125 large airplane (non-airline) flights, Part 137 agricultural application flights, and non-military public use flights
- Part 121 and Part 135 scheduled airline flights are excluded as GA

In Addition

- Government entities separate “on-demand” Part 135 flights from GA in annual surveys of the GA fleet

- This presentation includes on-demand Part 135 as part of GA

U.S. Definition of LOC

- FAR/AIM: Not defined
- Pilot's Handbook of Aeronautical Knowledge: Not defined

GA Joint Steering Committee

CAST/ICAO Common Taxonomy Team definition:

"…an extreme manifestation of a deviation from intended flight path."

In Simpler Terms

- The airplane won’t go where the pilot wants it to go
- The airplane does go where the pilot doesn’t want it to go
- It’s a surprise when it happens

NTSB Common Conventions

- LOCI is known as a “defining event” that best describes the accident scenario
- LOCI generally involves an aerodynamically sound airplane; it may not be mechanically sound but is still controllable

Also Noteworthy

- In 2008 NTSB updated database coding; thus accidents presented here are from 2008 through 2014

- Results provided are for U.S. registered airplanes on U.S. soil

NTSB Data 2008-2014 (Inflight)

- **Total All Accidents: 9,751**
- **Total Fixed Wing Accidents: 8,730**
- **LOCI Fixed Wing Accidents: 1,518 (17.4% of all FW)**

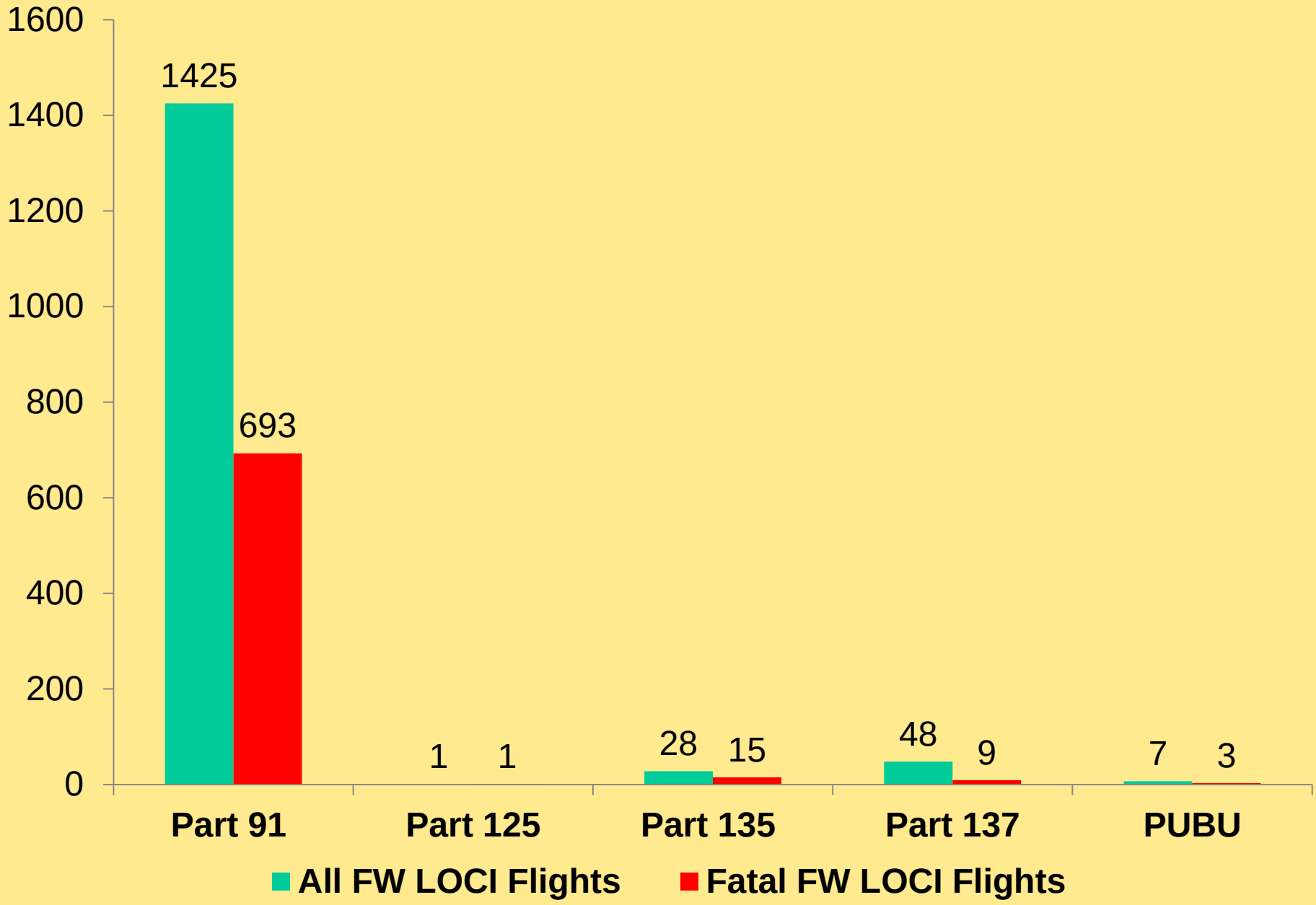
Fatal Fixed-Wing Accidents

- **Total fatal: 1,553**
- **LOCI fatal: 721**
  (46.4% of FW Fatal Accidents)

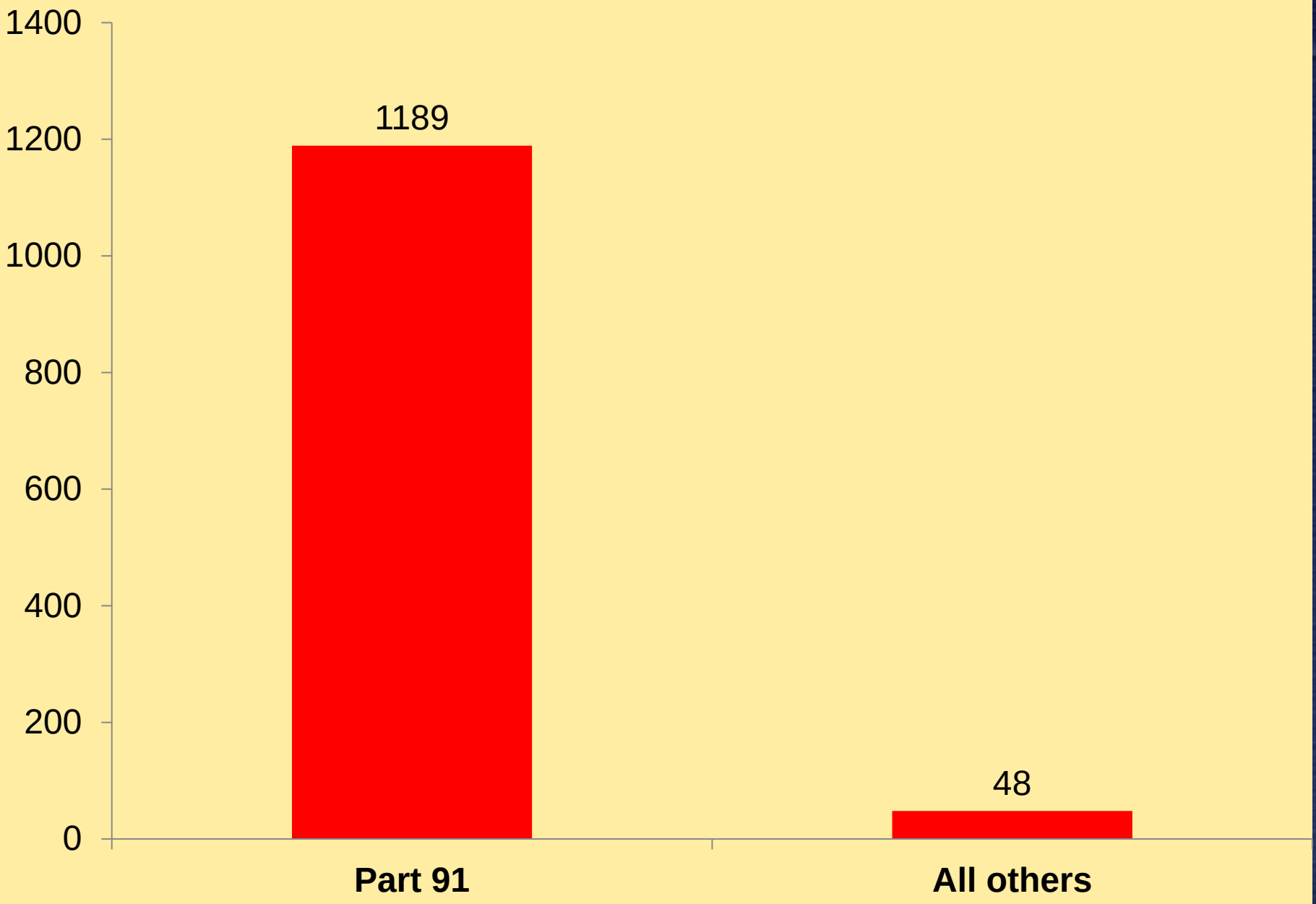
Number of Fatalities

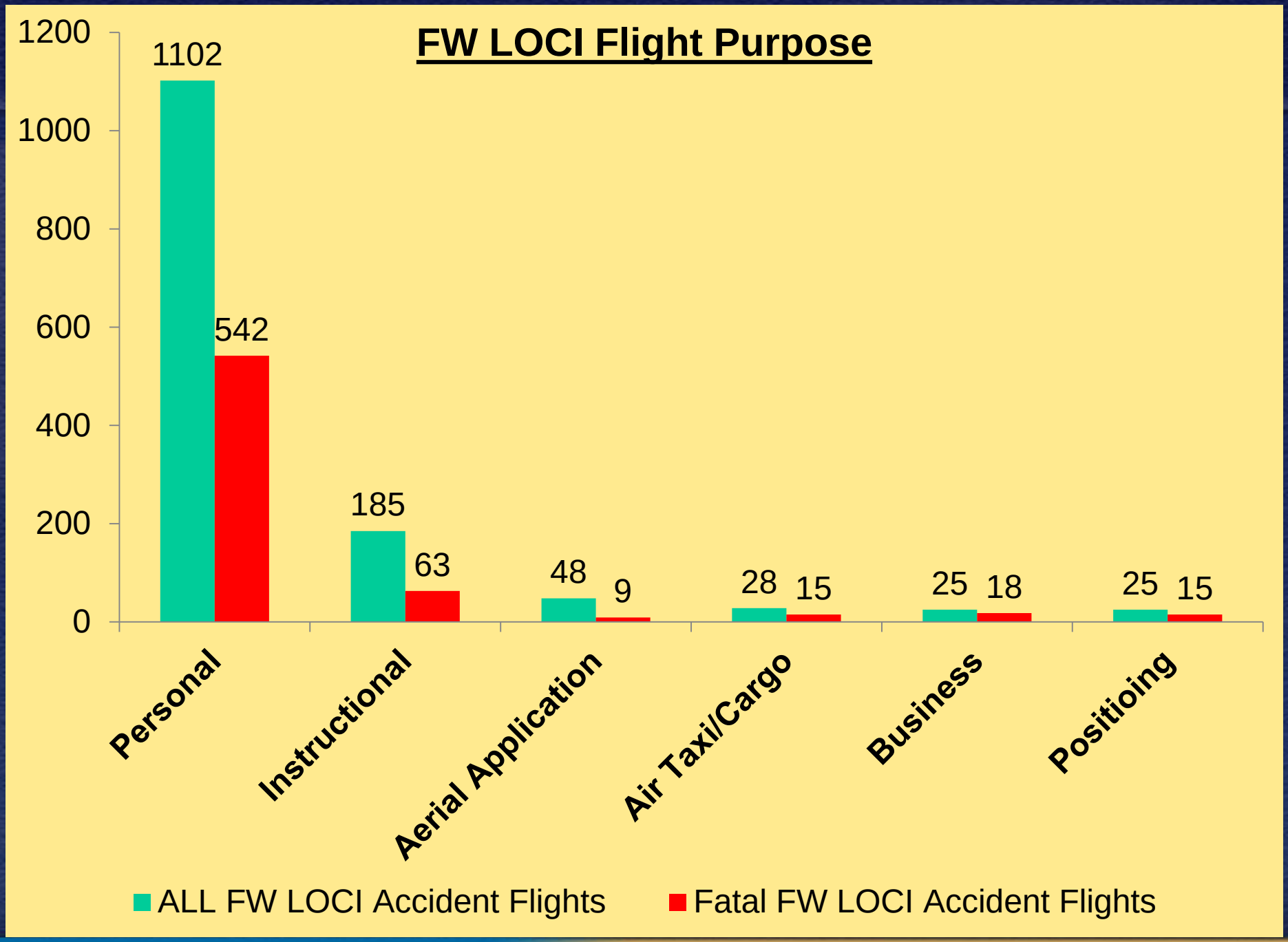
- **Total FW fatalities: 2,698**
- **LOCI FW fatalities: 1,237**
  (45.8% of FW Fatalities)

FW LOCI by FAR

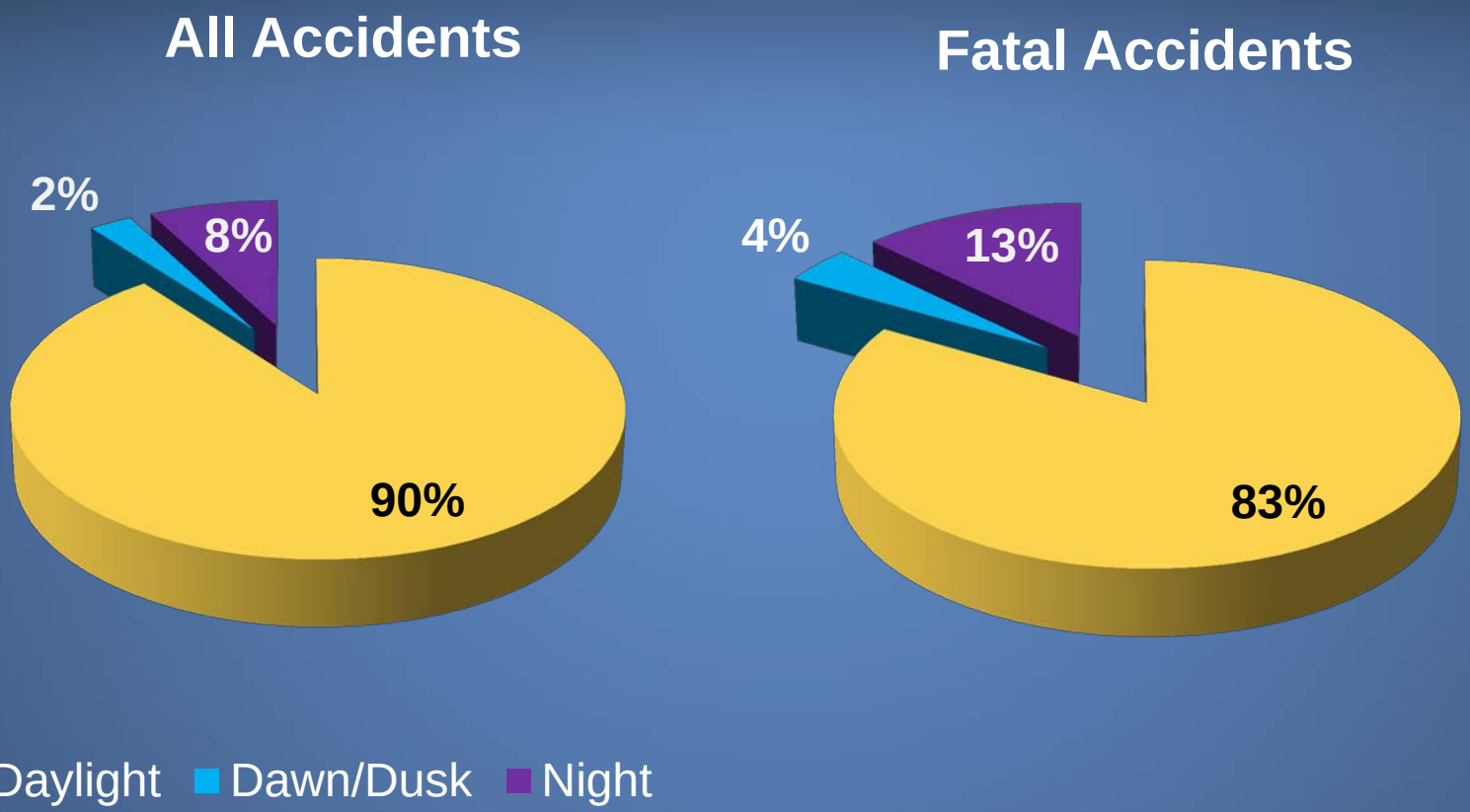


FW LOCI Fatalities

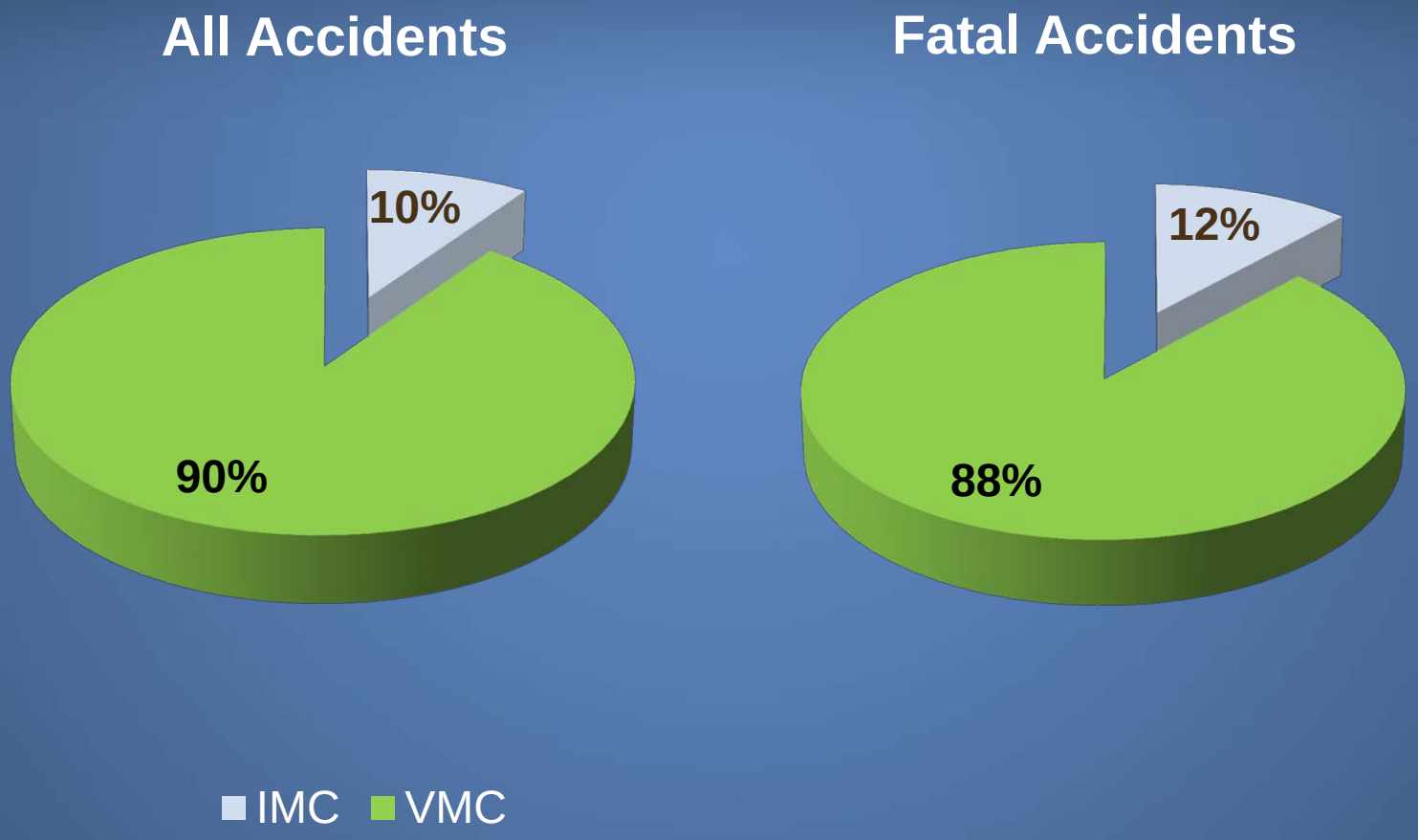



FW LOCI Flight Purpose
1200
1000
800
600
400
200
0
1102
542
185
63
48
9
28
15
25
18
25
15
Personal
Instructional
Aerial Application
Air Taxi/Cargo
Business
Positioning
ALL FW LOCI Accident Flights
Fatal FW LOCI Accident Flights

GA FW LOCI Light Conditions



GA FW LOCI Weather Conditions



What phases do they occur?

- Takeoff –To 35 feet/gear up selection
- Initial Climb – Takeoff to first power reduction or 1,000 feet above runway
- En Route - From end of Initial Climb through cruise, descent to VFR pattern altitude or 1,000 feet above runway elevation, whichever comes first (IFR: descent to IAF)

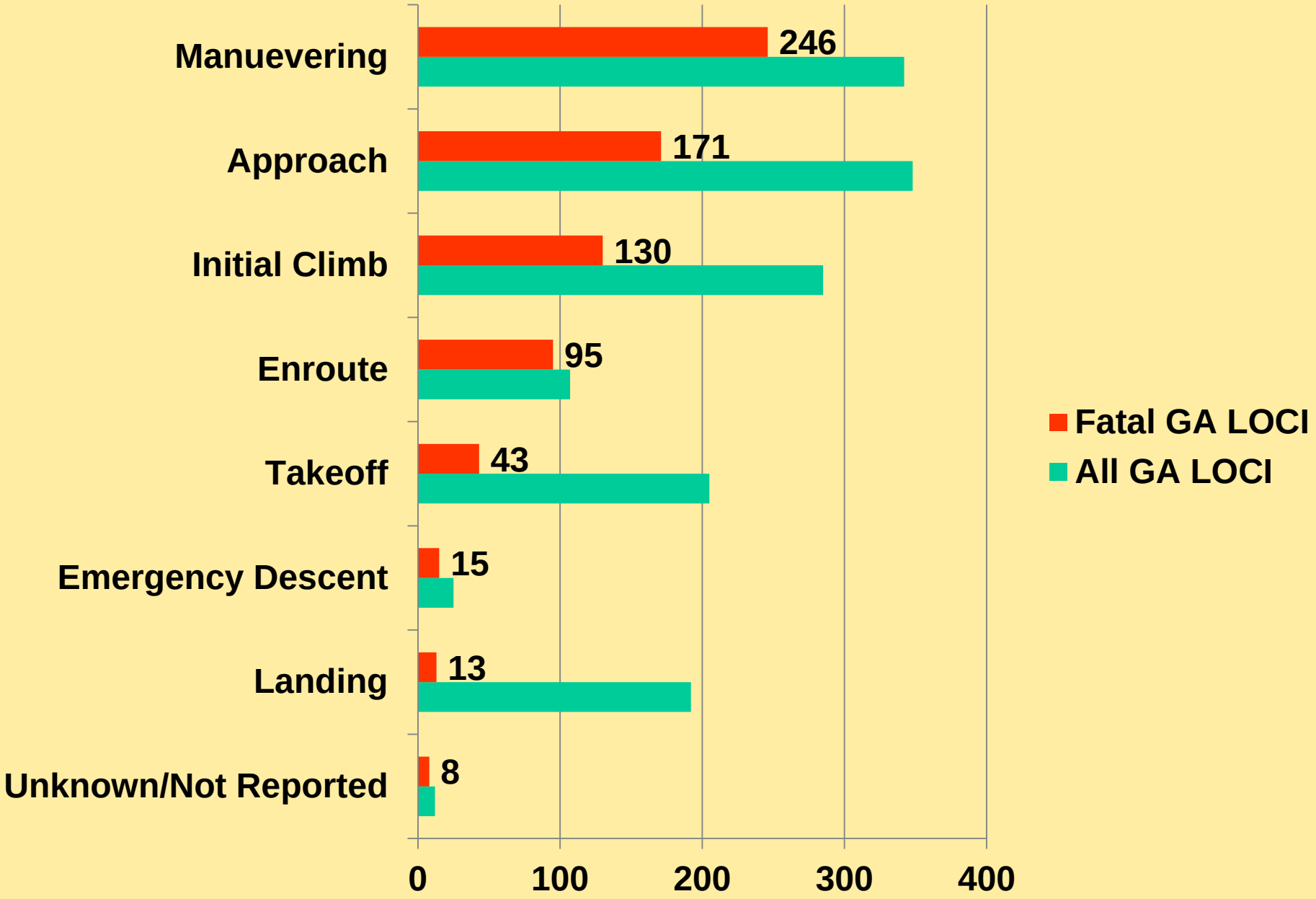
- Approach - From the point of VFR pattern entry, or 1,000 feet above the runway elevation, to the beginning of the landing flare. (IFR : IAF to landing flare)

- Landing - Beginning of the landing flare until aircraft exits the runway, comes to a stop on the runway, or when power is applied for takeoff in the case of a touch-and-go landing

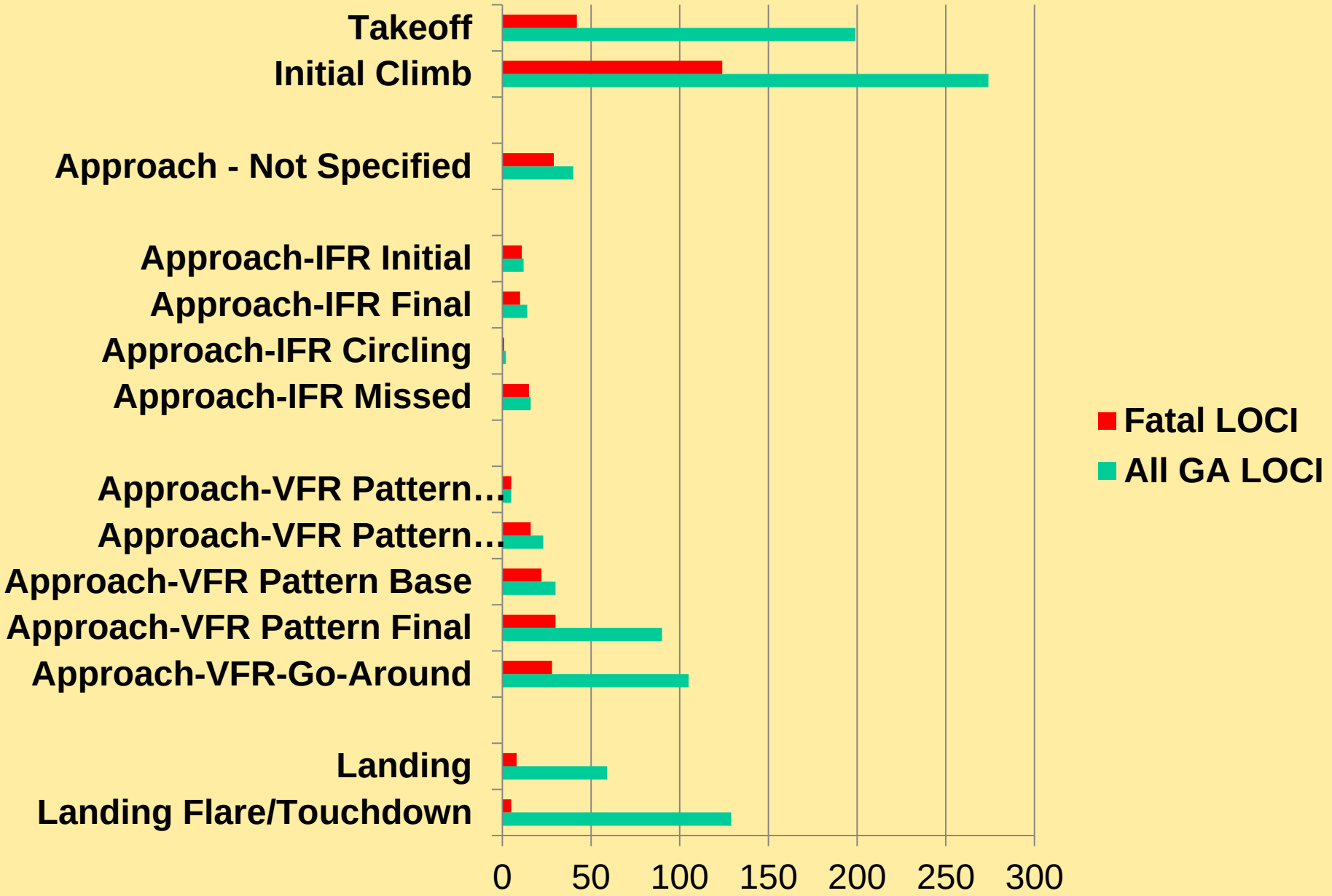
- **Maneuvering -** Low altitude/aerobatic flight operations

- **Missed Approach/Go-Around**
  - From the first application of power until the aircraft re-enters the sequence for a VFR pattern (go-around) or until the aircraft reaches the IAF for another IFR approach (missed approach)

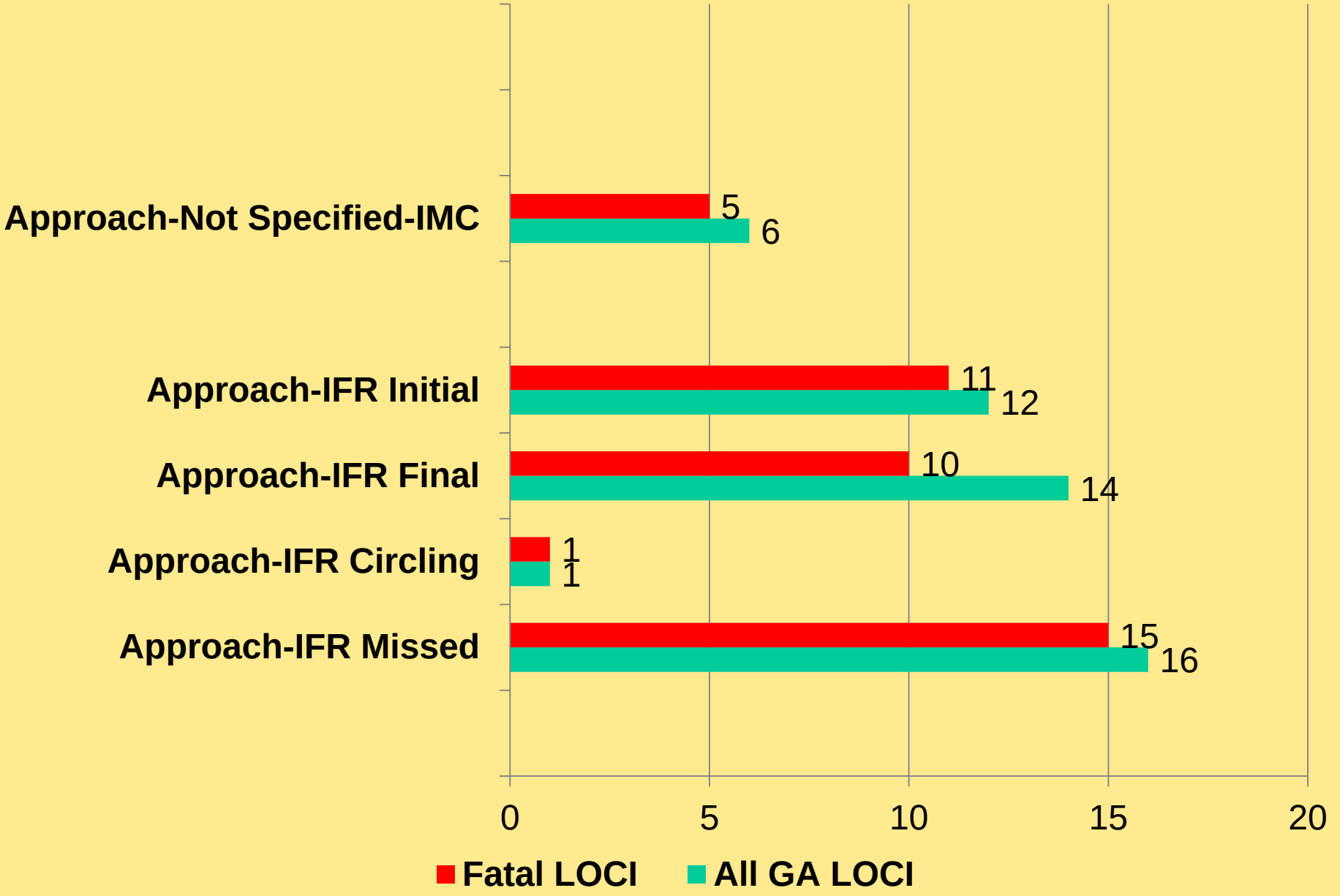
LOCI by Flight Phase 2008-2014



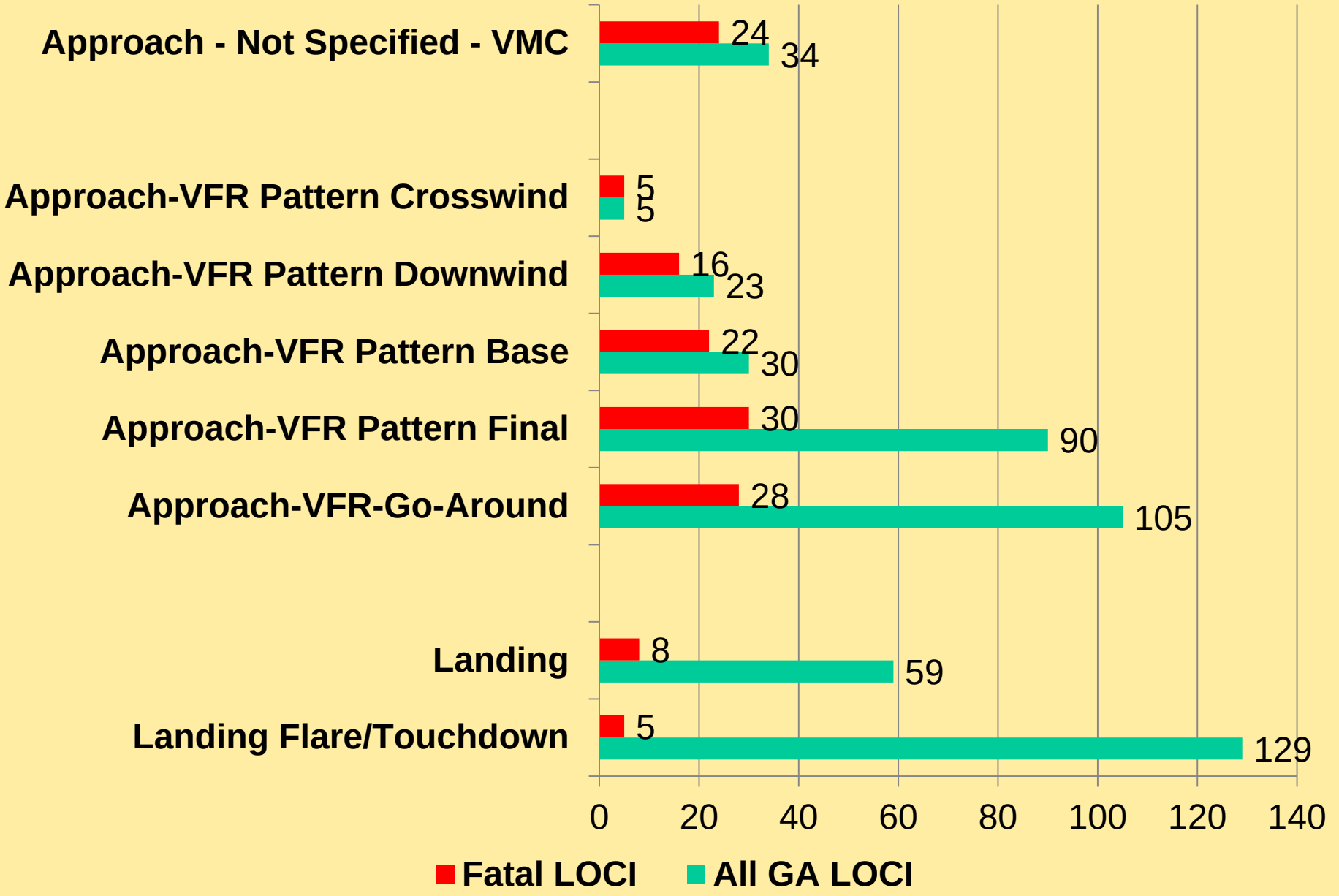
Airport FW LOCI



IFR/IMC Approach LOCI Airport



VFR/VMC LOCI Airport Approach



Conclusions

- LOCI counts for about 45% of all fatal GA FW accidents and fatalities
- Overwhelmingly Part 91, day, VMC operations
- Major flight phases of occurrence: Maneuvering, Initial Climb, and Approach

- Although a small number of all LOCI accidents, those in IMC conditions approaching an airport will most likely result in a fatal outcome

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