

# The National FAA Safety Team Presents

## Aeronautical Decision Making (ADM) Top-Up

Presented to: WAFC and Friends

By: Stephen Bateman, CFI

Date: January 11th, 2021

**January Topic of the Month**

**Produced by AFS-850**

**National FAASTeam**



**Federal Aviation  
Administration**



# Welcome

- **Sponsor Acknowledgment – WAFC, AOPA, FAASTeam, Baltimore FSDO**
- **You know where the restrooms are!**
- **Please - MUTE your microphone**
- **WINGS Credit: Yes...but give me a day or two...**
- **In-and-out...no time for questions, but send email:**
  - **steve.bateman@aopa.org**

FAA Safety Team | Safer Skies Through Education  
FAASTeam



Federal Aviation  
Administration

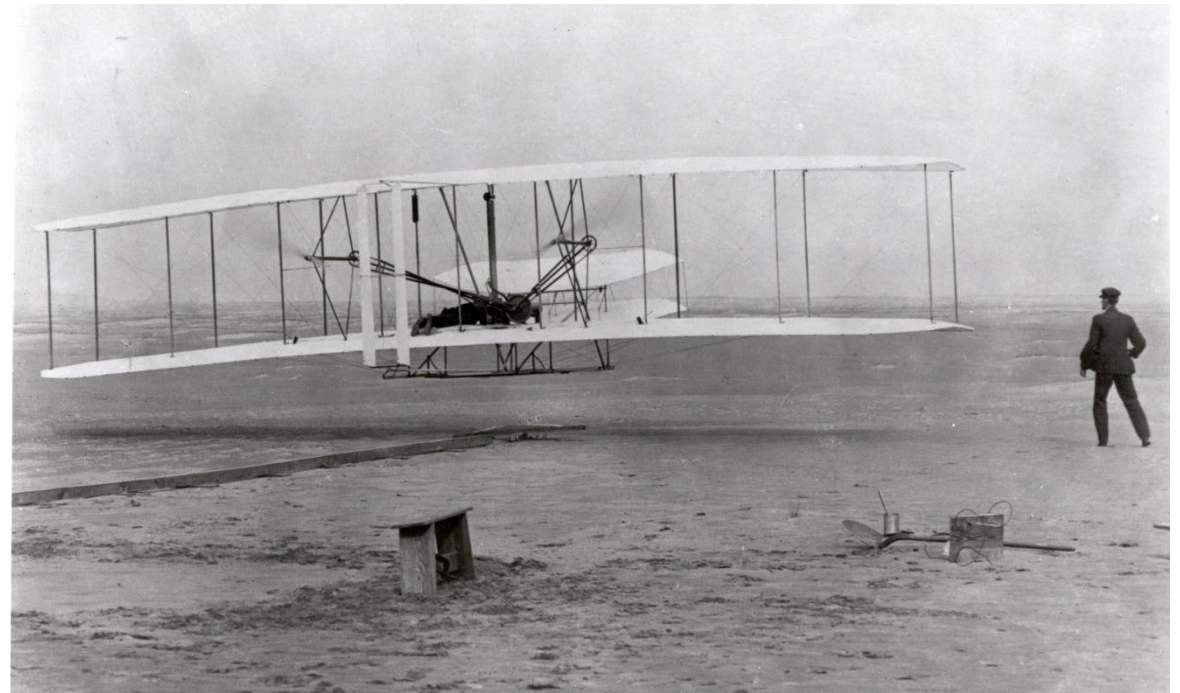
# Overview

- **ADM – An important part of airmanship**
- **Risk management is part of the ACS – so check rides, flight reviews, etc.**
- **Why we need to understand ADM**
- **Safety benefits of ADM**
- **Present & future ADM methodologies and technologies**
- **Safety Resource Management (SRM)**



# It has always been risky...

- Aeronautical Decision Making – A process used by pilots to consistently determine the best course of action in response to a given set of circumstances.
  - Continuous process from preflight to tie down.



## Fatal airplane crash Nov 8<sup>th</sup>, 2020:

The pilot took off in the dark from a private runway in heavy fog and moments later collided into the side of an adjacent hill.

The pilot was declared dead at the scene due to injuries sustained in the crash.

**Mechanical?** May be...but may not have been an issue if not in fog

**Cause:** Pilot's **decision** to take-off in fog



# The Need for ADM:

- **Staying Alive**
- **Regulatory**
- **Human Factors (decision making)**
- **Understanding (our) risk, for *this* flight**
- **Pre-Flight**
- **In-Flight**
- **Post-Flight**
  
- **No-Go/Go Decision**
- **Stop/Continue Decision**



# Mindset, Hazards and Personality

- **Understand your groove**
  - Type-A?; Recognition seeker? The best pilot ever? Take-a-look-er?
- **What's your risk tolerance bias *as of right this pre-flight minute?***
- **Remember the 5 Hazardous Attitudes?**
- **How do they show themselves with you?...Yes, you!**
- **Taking off in a single-engine aircraft in below IFR minimum conditions (no immediate return to base) is...?**

# FAR 91.103

- Know all there is to know...
- KW-FRAT (knowledge-based flight risk assessment time)

**K** = Known issues – NOTAMs, TFRs, etc.

**W** = Weather

**F** = Fuel management

**R** = Runways of intended use

**A** = Alternatives

**T** = Take-off and landing distances (aka density altitude)





# Making Good Aeronautical Decisions

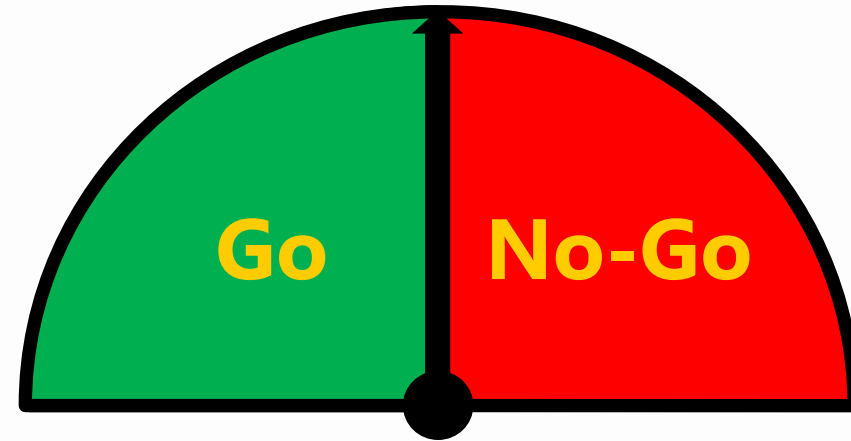
- 1. Hey, Siri. Shall we go or not?**
- 2. Fire 'er up and take a look...**
- 3. Use a Go-ometer**
- 4. Use proven ADM techniques and tools!**



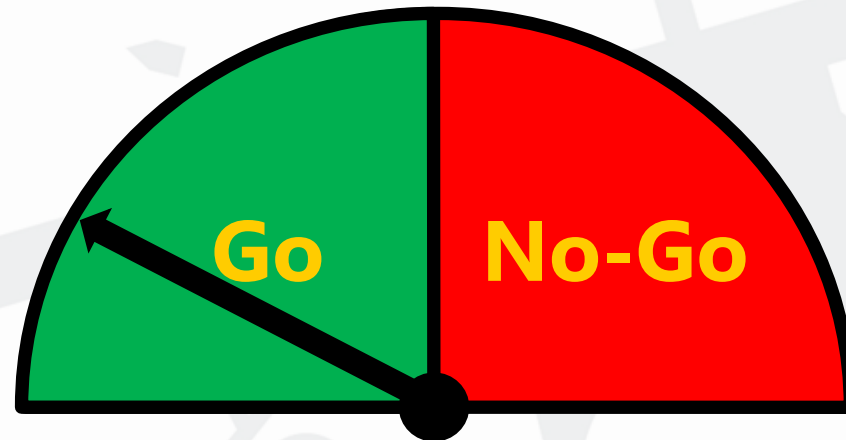
# What's On Your Go-ometer?

***\$19.99 special offer***

Is it a 50:50 decision?

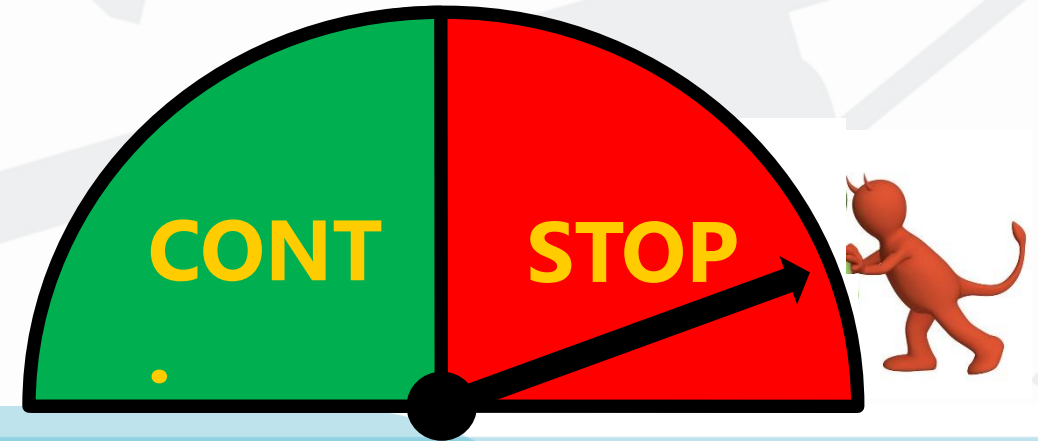
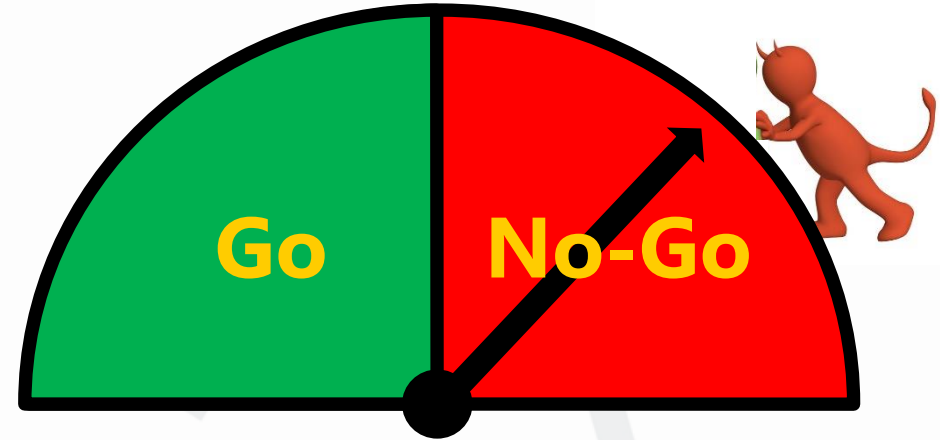


No – highly biased towards Go



# What's On Your Go-ometer?

- No-Go until proven otherwise
- Same for stop or continue decisions
- Watch for the devil...



Fire 'er up and let's take a look...

**What's the best tool for handling in-flight situations?**

**The pre-flight!**

***“To avoid making bad decisions in the air, make good ones on the ground”***



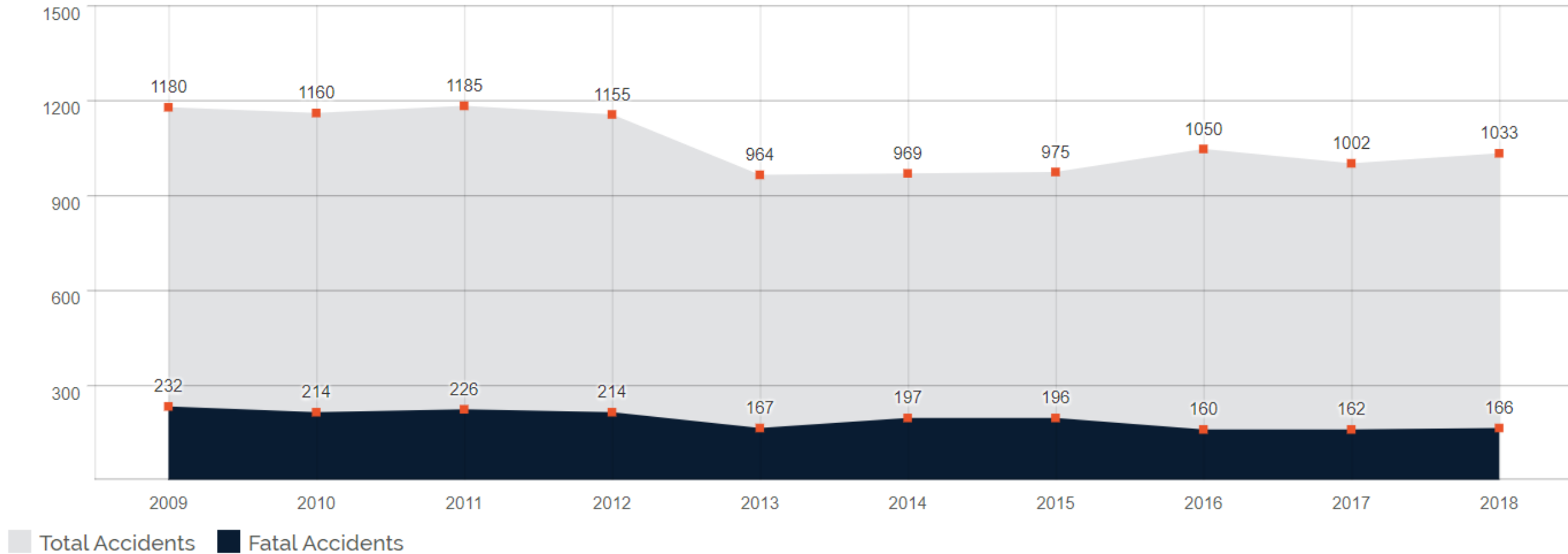
# Why We *Must* Care About This...



# Bet it all on red...Or...Let's play a game of chicken...

Figure 1.2: General Aviation Accident Trends 2009-2018

2018 Non-commercial fixed-wing

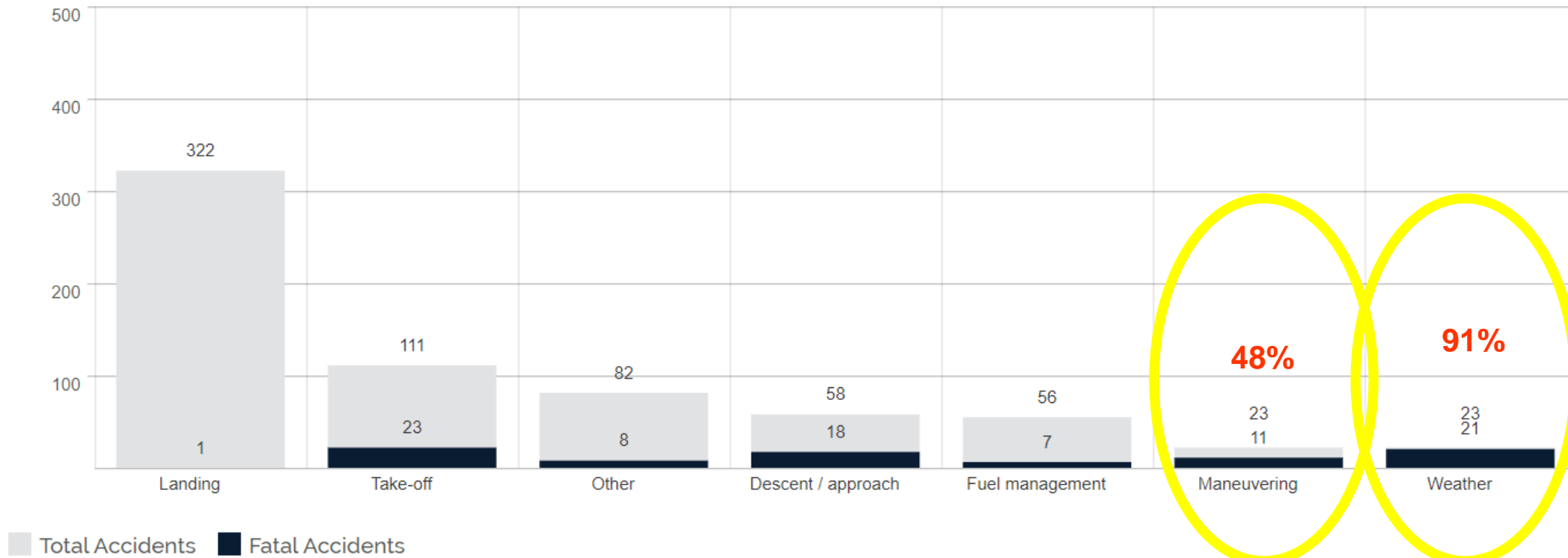


# Types of Accident

## Choose your accidents wisely

Figure 1.11: Types of pilot-related accidents

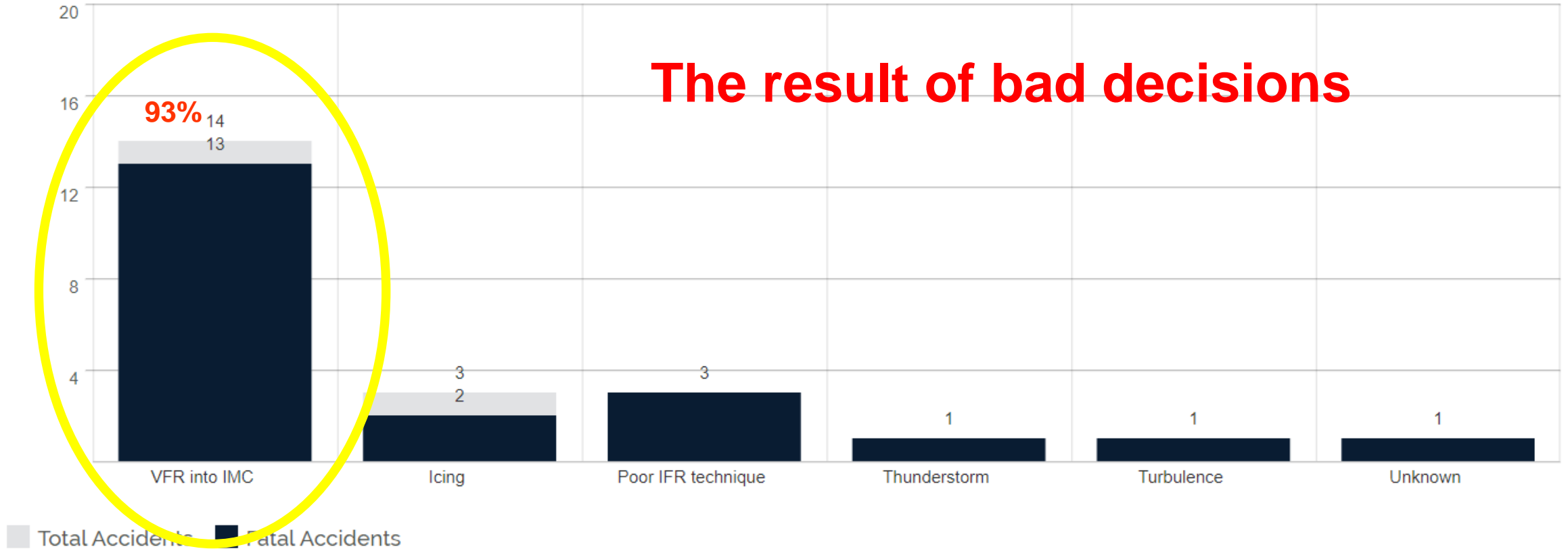
2018 Non-commercial fixed-wing



# Weather Related Accidents

Figure 1.7.2: Types of weather accidents

2018 Non-commercial fixed-wing





# ADM Techniques and Tools...



# A Good In-Flight Starts With...A Good Pre-Flight

- **So, what is *your* first pre-flight action?**



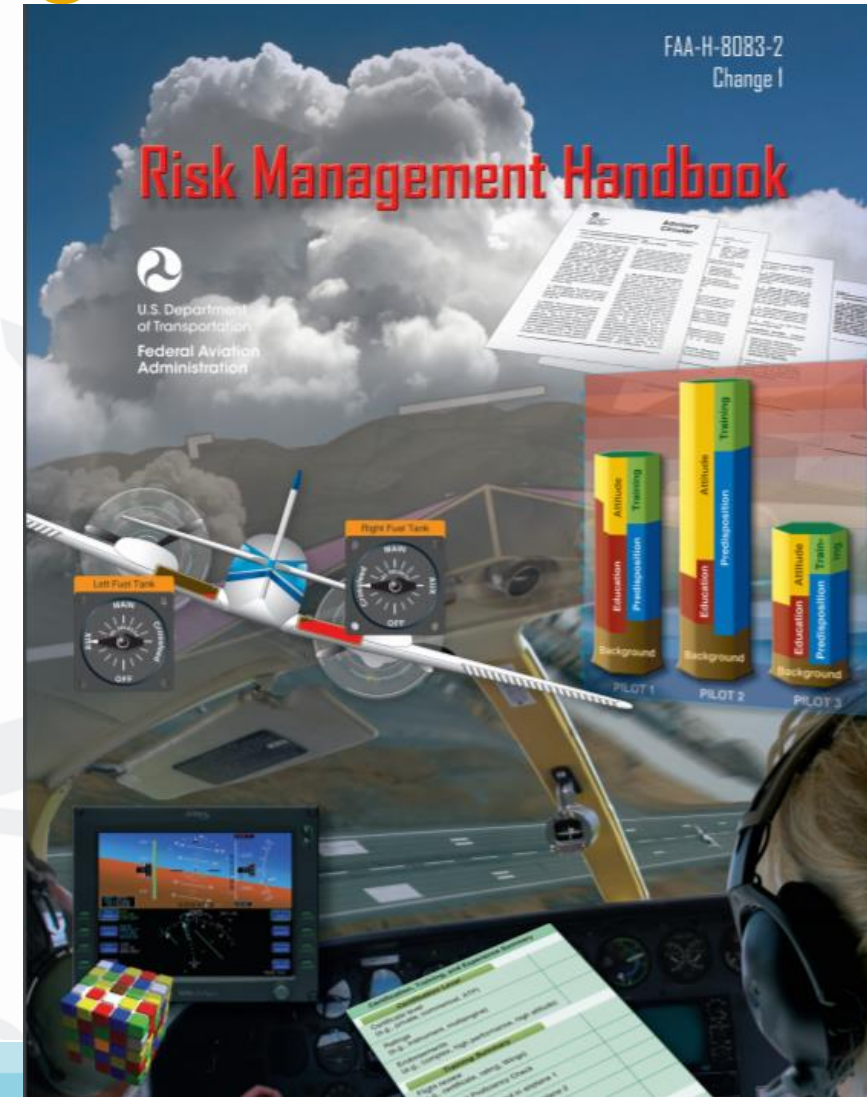
# PAvE Before and During Every Flight

- **PAvE is an all-in-one check**
- **Pilot (IM SAFE), Aircraft, Environment, External)**
- **Only works if you are honest**
  
- **Do it in all phases:**
  - Pre-flight
  - Taxi
  - Take-off
  - Climb
  - Cruise
  - Descent
  - Approach
  - Landing
  - Taxi



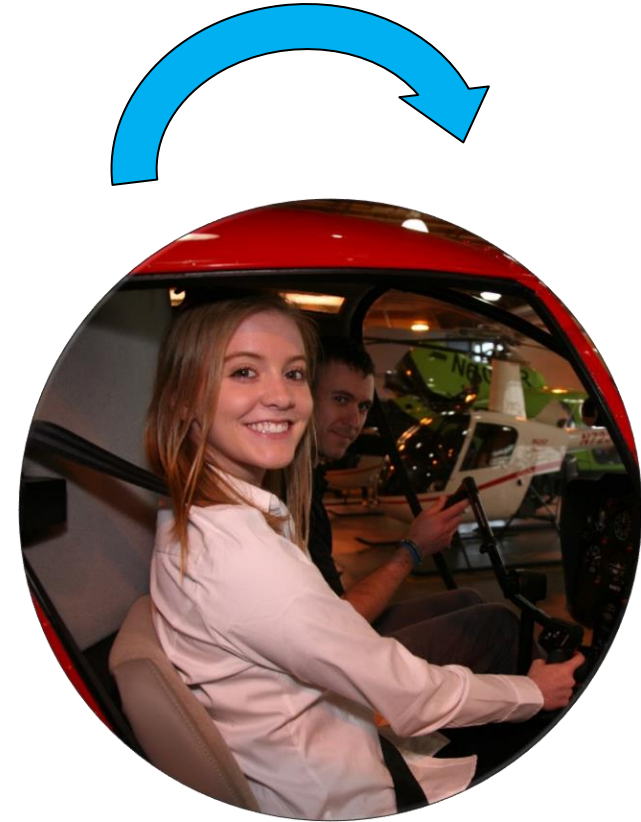
# Tools to Help With Decision Making

- **ADM is the *systematic approach to the mental process...***
- **FRAT – Flight Risk Assessment Tools**



# 3 P Model

- **Perceive**
  - #1: Look where you are going...
  - Gather all relevant information



# 3 P Model

- **Perceive**
  - Gather all relevant information
- **Process**
  - Analyze information and determine best course of action



# 3 P Model

- **Perceive**
  - Gather all relevant information
- **Process**
  - Analyze information and determine best course of action
- **Perform**
  - Implement the chosen course of action



# DECIDE Model

- **D**etect change (or identify problem)
- **E**stimate significance (of the change)
- **C**hoose the (best) objective or outcome
- **I**dentify options (that meet objective or desired outcome)
- **D**o best option
- **E**valuate (the outcome—if the outcome is not what is desired then go around again)





# It is Common Sense—I Don't Need a Model

These models give you:

1. **Structure...** *"A systematic approach to the mental process of..."*
2. **Stages to help come to a decision/action**
3. **Alternatives:** Recognize that it might not work the first time—you now have more information to make a better-informed decision
4. **Time:** Helps you **SLOW DOWN** and consider, rather than poke-and-hope at a solution



# ADM Terminology...

- **Risk Management:**
  - Systematic approach to identify hazards, assess the degrees of risk and determine the best course of action
- **Hazard:** *A current condition that could lead to unintended consequences*
- **Risk:** *Future, uncontrolled impact of a hazard*
- **We fly...there will always be some risk...how much is “okay”?**
- **Ways to mitigate risk**
  - Experience (not complacency)
  - Personal limits and minimums
  - Tools to guide us through the thought process (not a crutch...)



# Learn about ADM

- FAA – Risk Management Handbook
- AC 60-22 Aeronautical Decision Making
- Magazines: FAA Safety Briefing, Aviation Safety, IFR Magazine, IFR Refresher...
- Aviation Safety Reporting System (ASRS...”the NASA report...”)
  - More than GOOJF...learn!
  - *CALLBACK*
  - <https://asrs.arc.nasa.gov/publications/callback.html>



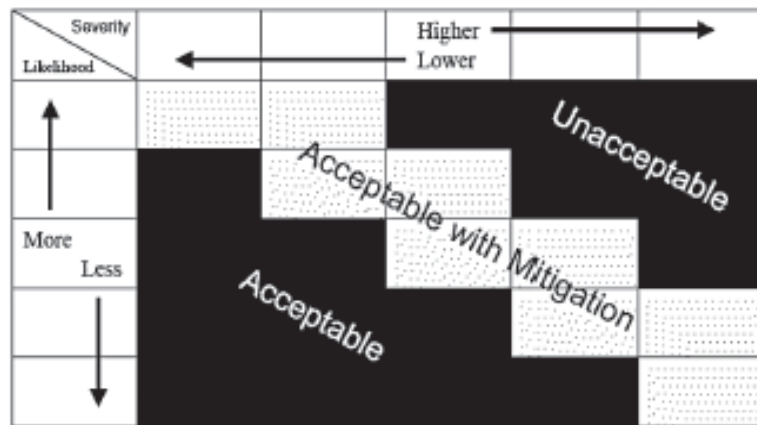
# ADM Tools

- **Aviate, Navigate, Communicate**
- **Situational awareness (uh...what's it doing now...?)**
- **Don't fight the crocodile (listen/feel the airplane)**
- **PAvE (identify hazards)**
- **IM SAFE**
- **IM AIR**
- **Stop, think, analyze, act**
- **3 Ps (Perceive, Process, Perform)**
- **5 Ps (Plan, Plane, Pilot, Passengers, Programming)**
- **FRAT (evaluate the impact of hazards)**



# FAAST FRAT

- Flight Risk Assessment Tool
- FRAT usefulness depends on your attitude...
- Can't cover all possible flight hazards
- Useless if you cheat
- Safety Risk Management – 101
  - Recognize the severity of a risk FOR YOU and THIS FLIGHT



Pilot	Time in Type	Low	Moderate	High
VFR	<100	5 to 15	15 to 20	>20
VFR	>100	15 to 20	20 to 25	>25
IFR	<100	20 to 25	25 to 30	>30
IFR	>100	25 to 30	30 to 35	>35



# FAAST FRAT

- Navigate to FAASafety.gov
- Click on Resources then click on Library



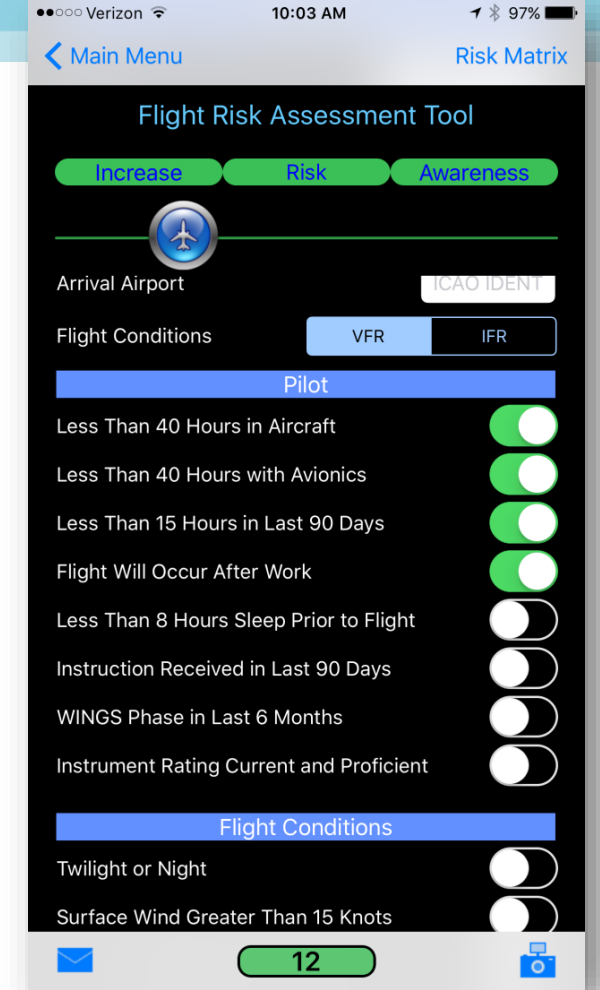
• [https://www.faasafety.gov/gslac/ALC/lib\\_categoryview.aspx?categoryId=31](https://www.faasafety.gov/gslac/ALC/lib_categoryview.aspx?categoryId=31)

A screenshot of the FAA Safety Team website. The top navigation bar includes 'Home' and 'About the FAASafety Team'. Below this is a search bar and a main navigation menu with tabs for 'Activities, Courses, Seminars &amp; Webinars', 'Maintenance Hangar', 'Pilots', 'Resources', and 'Page Help'. The 'Resources' tab is active, and a dropdown menu is open, listing options such as 'About the FAASafety Team', 'FAASafety Team Directory', 'FAQ', 'Library', 'News', 'Notices', 'Online Resources', 'RSS Web Feeds', 'Search', 'Support', and 'Training Providers'. A large red arrow points to the 'Library' option in this menu. The main content area features several sections: 'Featured Courses' with links to 'DC Special Flight Rules Area', 'Weather Wise: VFR into IMC', and 'Avoiding Loss of Control'; 'Hot Topics' featuring the 'WINGS Pilot Proficiency Program' by AVEMCO; 'Upcoming Seminars'; 'AMT Awards Program'; 'WINGS AC 61-91J'; 'Instructor Portal'; and 'WINGS Achievements'.



# FRAT Apps

- **Available for mobile devices**
  - Search for FRAT in your mobile App store
  - They will NOT give you the answer
  - Use as a tool to gain awareness
- **Not so much the presented result but the thought process behind your interpretation of the results**



# Crew Resource Management (CRM)





# ATC, Flight Dispatch, Flight Following & Flight Service



# Automation Resources



# Preflight Resources



# Flight Service Online Portal

- Access at [www.1800wxbrief.com](http://www.1800wxbrief.com)
- “Official” briefing
- One stop shop...
- Can it be any easier...?
  - Weather products
  - Flight plan your route
  - Click to get a briefing – magic!
  - Then call a briefer for more details, questions, etc.
  - File and verification of acceptance

FlightService 1800wxbrief Better Briefings, Safer Flights

Home Pilot Dashboard Weather Flight Planning & Briefing Airports UAS Account Links Help Logout

Welcome FRED I STAHL Fri Sep 16 13:27:15 EDT | 17:27:15 Z

Optimize your experience Learn & Register

ACAS EasyActivate™ EasyClose™ Close Reminders ATC Notices SE-SAR Provide information for improved service My Aircraft

Activate, Close, Amend, Cancel, and View Alerts for your Flight Plans here Last updated at 17:26Z

No current flight plans

Weather and Airport Conditions Edit Favorites

U.S. WEATHER DEPICTION U.S. SURFACE ANALYSIS 12 HR SURFACE PROG 24 HR SURFACE PROG

Click Weather Graphic to enlarge

Plain Text [What's this?](#)

KFDK Airport Brief  KMRB Airport Brief  KIAD Airport Brief \*Aircraft ID: N617FL

Airport	Condition	METARs	Density Altitude
KFDK	VFR	KFDK 161647Z 12005KT 10SM BKN042 BKN055 24/15 A3031	1213 ft
KMRB	VFR	KMRB 161653Z 13006KT 10SM OVC037 22/14 A3027 RMK AO2 SLP247 T02220139	1334 ft
KIAD	VFR	KIAD 161652Z 10007KT 10SM FEW024 BKN040 BKN055 23/13 A3028 RMK AO2 SLP250 T02330128	1115 ft

Airport	TAFs
KFDK	No data available for airport
KMRB	TAF KMRB 161721Z 1618/1718 14005KT P6SM BKN040 FM170400 00000KT P6SM BKN045 FM170700 00000KT 6SM BR BKN015 FM171500 17005KT P6SM BKN025
KIAD	TAF KIAD 161721Z 1618/1724 13006KT P6SM BKN050 FM170500 VRB03KT P6SM SCT020 BKN035 FM171500 18005KT P6SM BKN035 FM171800 18006KT P6SM BKN045

Airport	NOTAMs
KFDK	FDK 16/02008 KFDK AIRSPACE SEE FDC 1/1155 ZDC FLIGHT RESTRICTIONS TFR 1602091925-1701312359EST
KMRB	MRB 16/08021 KMRB OBST TOWER LGT (ASR 1236173) 392531.30N0775706.40W (2.0NM NE MRB) 704.1FT (234.9FT AGL) OUT OF SERVICE 1608210426-1609200426

FEDERAL AVIATION ADMINISTRATION Federal Aviation Administration

# Passengers



- **Set Pax. Expectations**
  - Preflight brief
  - Safety items
  - Sterile cockpit
- **Give them jobs to do**
  - Traffic lookout
  - Chart holder
  - Checklist reader
  - Zoo-keeper



# In-flight Resources



# Tablet Apps



Look—a nice day for this flight!

The screenshot displays a flight planning application interface. At the top, the time is 11:54 AM on Friday, November 6. The main menu includes options for 'U.S. VFR sectional', 'FPL', 'Settings', 'Maps', 'Weather', and 'Star'. A search bar is located in the top right corner. Below the menu, a table shows flight details for a route from KAST to KPDT. The table has columns for 'FROM', 'TO', 'DIST', 'TIME', 'WIND', 'LEG', 'REMAINING', and 'ETA'. The flight details are as follows:

FROM	TO	DIST	TIME	WIND	LEG	REMAINING	ETA
KAST	KPDT	213 nm	2h12m	9.8 g	213 nm	8.8 g	2h12m

The map shows a flight path from KAST to KPDT. A menu is open, listing various data layers and tools:

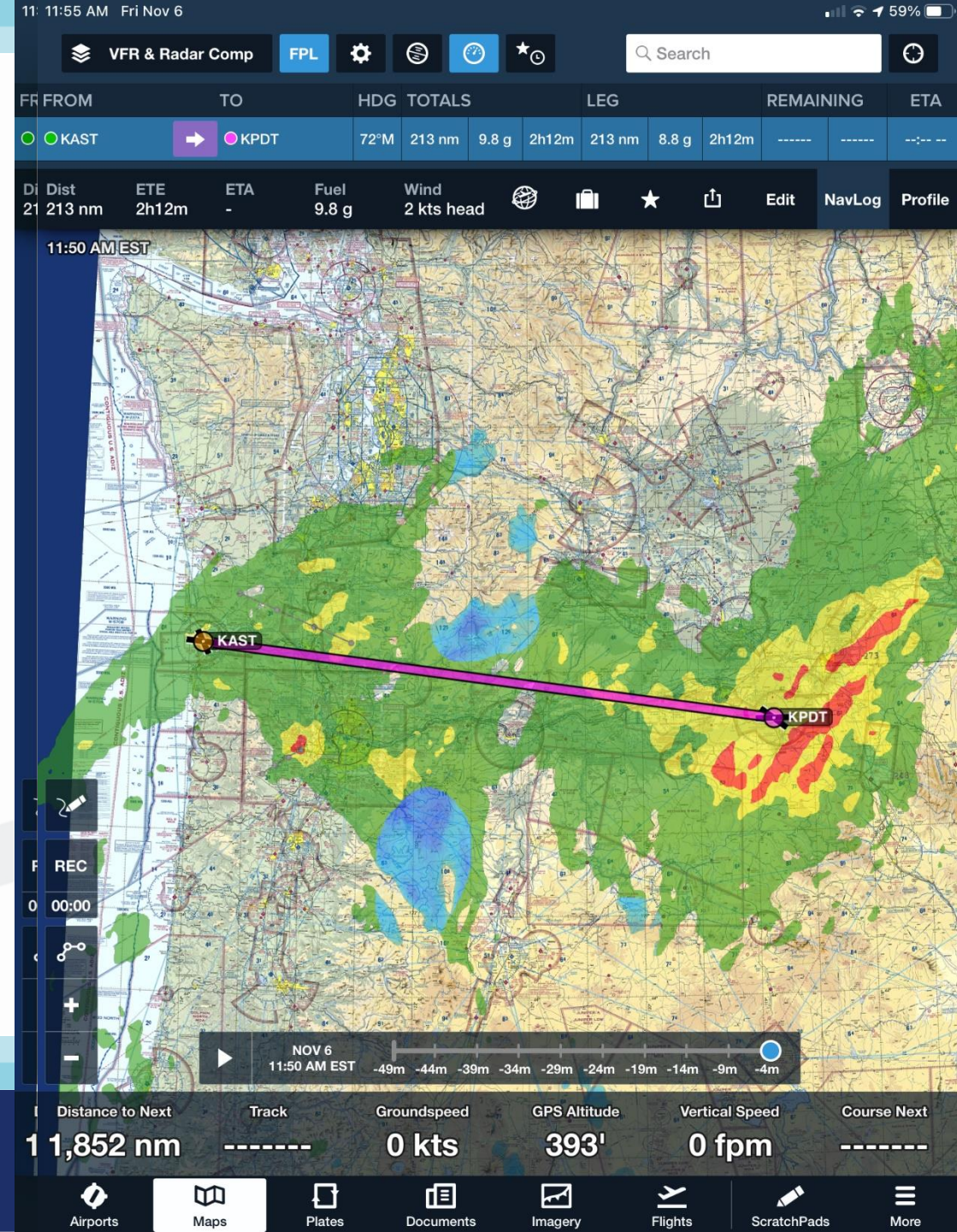
- Aeronautical
- Street Map
- Aerial Map
- U.S. VFR sectional (selected)
- U.S. IFR (low)
- U.S. IFR (high)
- U.S. IFR (planning)
- U.S. IFR (ocean)
- U.S. VFR (flyway)
- Radar (Composite)
- Radar (Lowest Tilt)
- Enhanced Satellite
- Color IR Satellite
- Icing (US)
- Icing (Global)
- Turbulence (US)
- Turbulence (Global)
- Surface Analysis
- Hazard Advisor
- Traffic
- AIR/SIGMET/CWAs
- TFRs
- Flight Category
- Surface Wind
- Winds Aloft
- Dewpoint Spread
- Temperature
- Visibility
- Ceiling
- Sky Coverage
- PIREPs
- Lightning
- Obstacles
- User Waypoints
- Fuel: 100LL

At the bottom, flight data is displayed: Distance to Next: 1,852 nm; Fuel: Jet A; Groundspeed: 0 kts; GPS Altitude: 394'; Vertical Speed: 0 fpm; Course Next: -----.



Look—a nice day for this flight!

Oh...turn on the RADAR layer



# Autopilot systems



- AP Maintenance
- Practice with all modes & functions
- Don't neglect hand flying skills



# Flight Reviews

- Move beyond the tedious one hour of ground and one hour of stalls and slow flight...
- Expect your next flight review to include demonstration of your:
  - Knowledge
  - Skill
  - Risk Management
- Recognize these? The trifecta of the Airman Certification Standards



# ADM Resources



RENEW

AOPA CREDIT CARD

MEMBERSHIP

TRAVEL

PILOT RESOURCES

NEWS & MEDIA

TRAINING & SAFETY

Home > Training & Safety > Air Safety Institute > Safety Centers > Aeronautical Decision Making

## SAFETY CENTERS

Aerodynamics

Aeromedical

Aeronautical  
Decision Making

Stress Scale

Aircraft Ownership  
and Maintenance

Aircraft Systems  
and Avionics

Back to Your  
Roots

Collision  
Avoidance

Emergency  
Procedures

Flight Instruction

Flight Planning  
and Preflight

Fuel Management

Icing and Cold  
Weather Ops



## AERONAUTICAL DECISION MAKING

Poor decision making is the root cause of many—if not most—aviation accidents. Good decision making, on the other hand, is about avoiding the circumstances that lead to really tough choices. The goal is very simple: Learn to make good choices every time you fly. This Safety Center brings together relevant safety courses and quizzes to help you hone this single most important safety skill.

### Online Courses

- [Do the Right Thing](#)
- [Weather or Not: Thunderstorm Challenge](#)

### Videos

- Risk Management Handbook FAA-H-8082-2
- AC 60-22 Aeronautical Decision Making
- FAA P-8740-69 Aeronautical Decision Making
- AOPA ASI ADM courses and quizzes

# Proficiency

**“Proficiency does not come on its own. It is defined as a deep competence in terms of knowledge, skill, (aptitude) and experience through practice and education.**

**It is the ability to act with determined results”**

RADEK WYRZYKOWSKI, EAA MANAGER OF FLIGHT PROFICIENCY. EAA SPORT PILOT, JANUARY 2021



# Proficiency and Peace of Mind

- Fly regularly with your CFI
- Perfect Practice
- Document in WINGS



# Thank you for attending

- You are vital members of our GA safety community

