

ADS-B EQUIP NOW!

faa.gov/go/equipadsb



EQUIP 2020

Date: November 28, 2017

General Aviation Equipage Work Group Briefing

Presented by:

Co-Chairs Bobby Nichols, FAA & Jens Hennig, GAMA with
Hank Cabler, Jim Marks & Anna Allen



**Federal Aviation
Administration**

Equip 2020 Efforts & Issues

Equip 2020 Efforts

- First meeting was in November 2014 and has met 16 times
 - Equip 2020 currently meets quarterly; next meetings December 12, 2017 and March 21, 2018
 - Consistent attendance of approximately 100 subject matter experts from FAA and industry (operators, manufacturers, associations)
- Worked with ANG/AOC to revamp online presence – created single web site for all ADS-B related info: <https://www.faa.gov/nextgen/equipadsb/>
- Set the stage for General Aviation rebate (resulting in 12,482 rebate reservations)
- Consistently reported status of ADS-B program from both a programmatic and equipage installation and performance monitoring standpoint
- Identified issues with ADS-B Service Availability Prediction Tool (SAPT) and integration with flight planning and procedures
- Beginning work to integrate FAA and Industry timelines for implementation of new ATC operations procedures and policies
- NPRM in process proposes to eliminate the requirement to make application for RVSM Authorization if aircraft equipped with ADS-B Out meeting 14 CFR § 91.227 (and meets other RVSM requirements)

Equip 2020 Efforts/Exemption 12555

- Developed an approach for the use of existing GPS receivers as ADS-B Out position sources for a defined transition period; became basis for Exemption 12555
 - To date: 14 domestic/34 foreign airlines using exemption
 - Find all info here: <https://www.faa.gov/nextgen/equipadsb/exemption/>
- Removed/revised ambiguous/confusing regulatory guidance (installation, certifications, acrobatic operations, non-powered aircraft, etc.)
 - AC 90-114A, change 1, “Automatic Dependent Surveillance – Broadcast Operations”, issued March 7, 2016
 - AC 20 165B, “Airworthiness Approval Automatic Dependent Surveillance – Broadcast Out Systems, issued December 7, 2015
 - Technical Paper AFS-360-2017-1(Rev 0, 09/25/2017) Installation of ADS-B Out Equipment
 - Special Light-Sport Aircraft ADS-B “Out” Certification ACE-100 Issued on 11-Feb-2015
 - Legal interpretation concerning definition of an “electrical system” with respect to ADS-B, January 5, 2017

Equip 2020 Ongoing Issues

- Beginning discussions on how to tackle Call Sign Mis-Match and ADS-B Non Performing Equipment
- Outreach to rotorcraft
- Dual Frequency Multi-constellation (DF/MC) GNSS receivers, equipment availability and evolving MOPS
- Privacy
 - Looking at USG need to “hide in plain sight”
 - Resurrecting BARR program to give cooperate leadership necessary privacy
- Engagement with DoD
 - Developed/coordinated MOA for mission accommodation and ADS-B equipage
 - Provides framework/common terminology for ATC facilities to include in LOAs/MOAs
- Plan to modify guidance in 8900.1 and AC 91-45D to accommodate acrobatic operations

SBS Strategy Update

Service Delivery Points for ATC Separation Services

	FY10 – FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19	Operational
En Route	6	4	12	2	N/A	N/A	N/A	N/A	24 of 24
Terminal	19	27	17	5	13	24	1 of 28	22	106 of 155
Surface (Advisory)	16	10	9	0	1	1	1	5	37 of 43
Oceanic	0	0	0	1	1	1	0	0	3 of 3

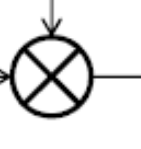
ATC Spacing Services

Ground-Based Interval Mgmt - Spacing (GIM-S) (En Route only)

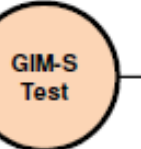
2011 - 2014



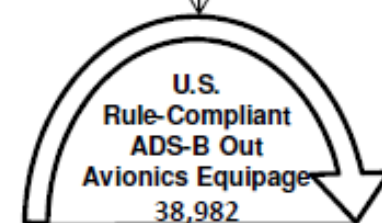
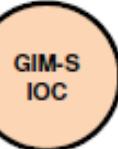
2013 - 2014



2014



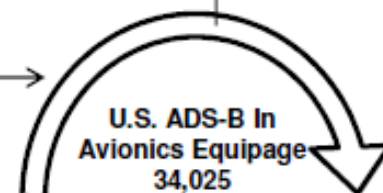
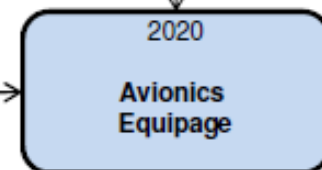
2014



Flight Deck Based Interval Mgmt - Spacing (FIM-S)

In Trail Procedures (ITP)

Traffic Situation Awareness with Alerts (TSAA)



*TIS-B
FIS-B
ADS-R*

Pilot Advisory Services

	FY14-FY17	FY18 – FY19	Total
Baseline Deployment (2008 – 2014)	Complete		
Alaska Expansion Deployment	Complete		
Service Expansion Deployment (ASSC and Gulf of Mexico* Service Volumes)	3	0 of 6	3 of 9

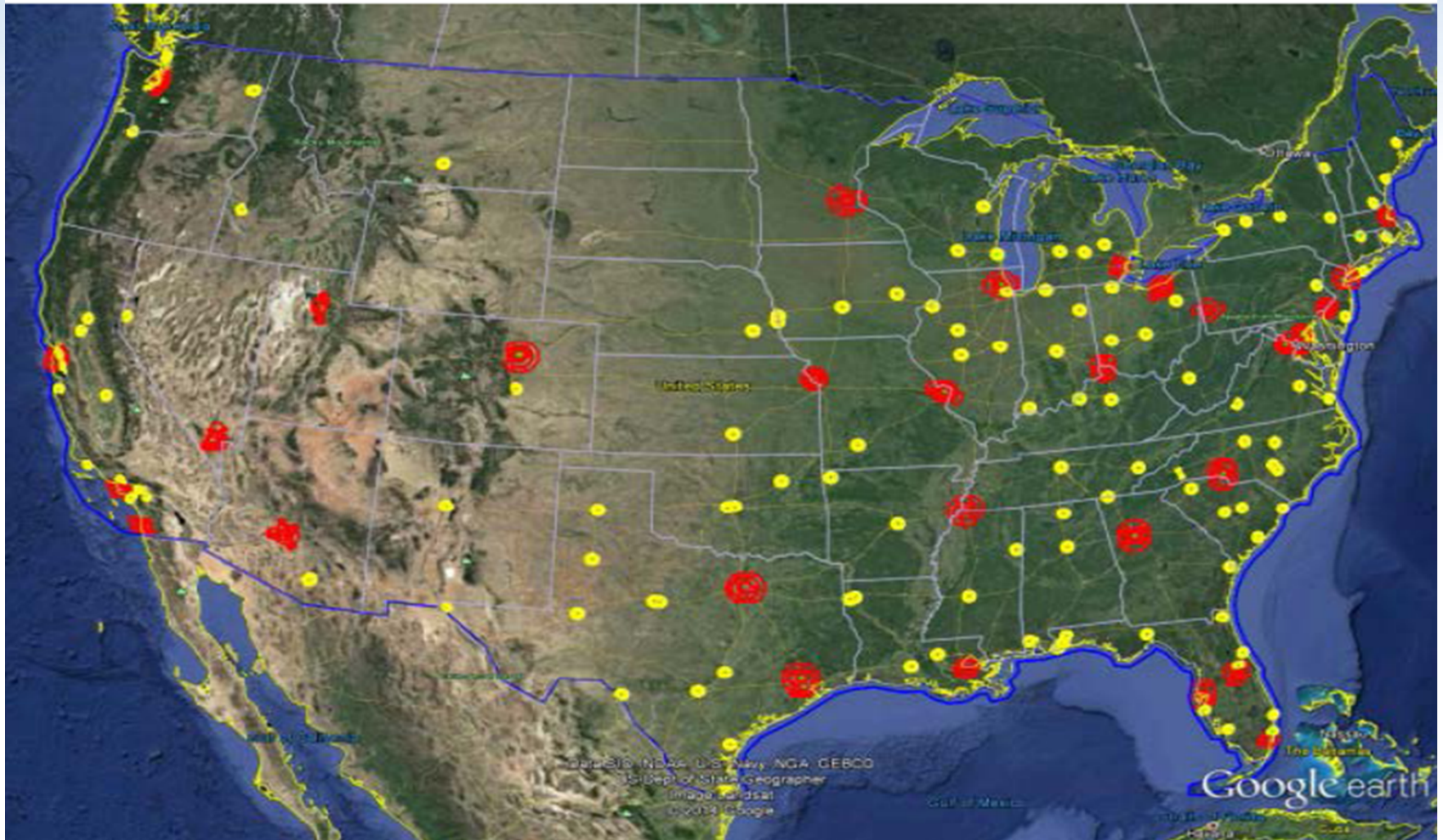
In Process

Complete

*Pilot services not provided in Mexican Service Volumes

As 11-01-2017

Rule Airspace Below 10,000 ft



FIS-B Products: Available Now

Product	Update Interval	Transmission Interval
AIRMET	As available	5 minutes
Convective SIGMET	As available, then at 15-minute intervals for 1 hour	5 minutes
METAR/SPECI	1 minute (where available); as available otherwise	5 minutes
NEXRAD Reflectivity (CONUS)	5 minutes	15 minutes
NEXRAD Reflectivity (Regional)	5 minutes	2.5 minutes
NOTAMs-D/FDC	As available	10 minutes
NOTAMS-TFR	As available	10 minutes
PIREP	As available	10 minutes
SIGMET	As available, then at 15-minute intervals for 1 hour	5 minutes
SUA Status	As available	10 minutes
TAF/AMEND	6 hours (+/- 15 minutes)	10 minutes
Temperature aloft	12 hours (+/- 15 minutes)	10 minutes
Winds aloft	12 hours (+/- 15 minutes)	10 minutes

FIS-B Products: New

Product	Update Interval	Transmission Interval
Center Weather Advisory	As available	10 minutes
Cloud Tops	30 minutes	15 minutes
Graphical-AIRMET	As available	5 minutes
Icing, Forecast Potential	60 minutes	15 minutes
Lightning Strikes	5 minutes	5 minutes
Turbulence	1 minute	15 minutes

Equipped Operations – Heat Maps

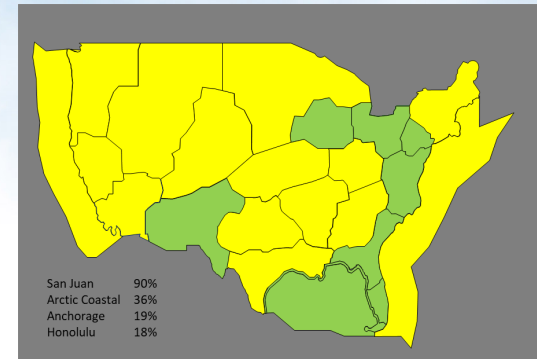
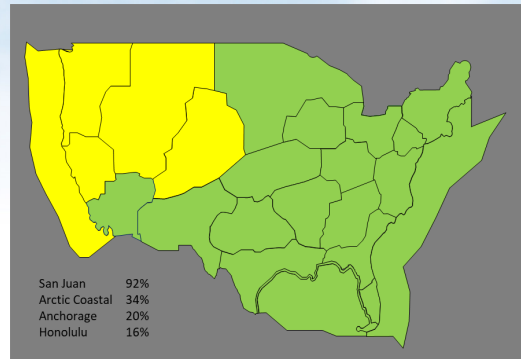
Percent ADS-B Out V2

June 2017

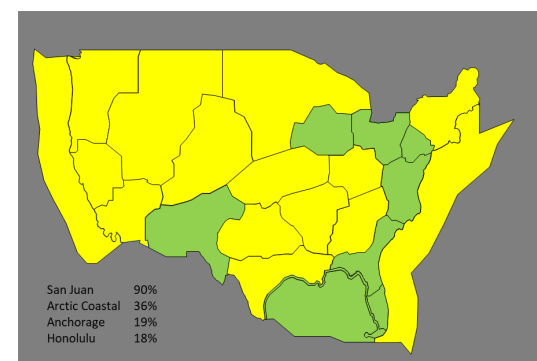
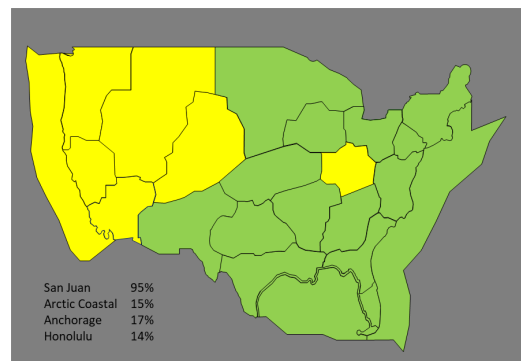
to

Sep 2017

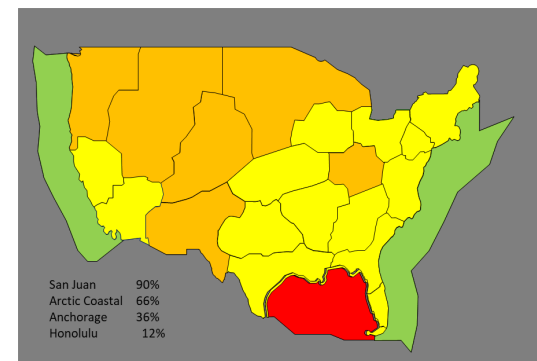
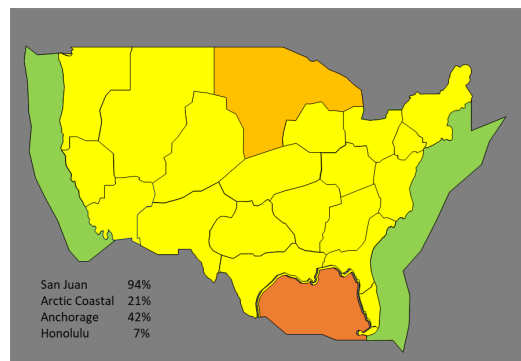
Class A



Class E Rule Airspace



Class E Non-Rule Airspace

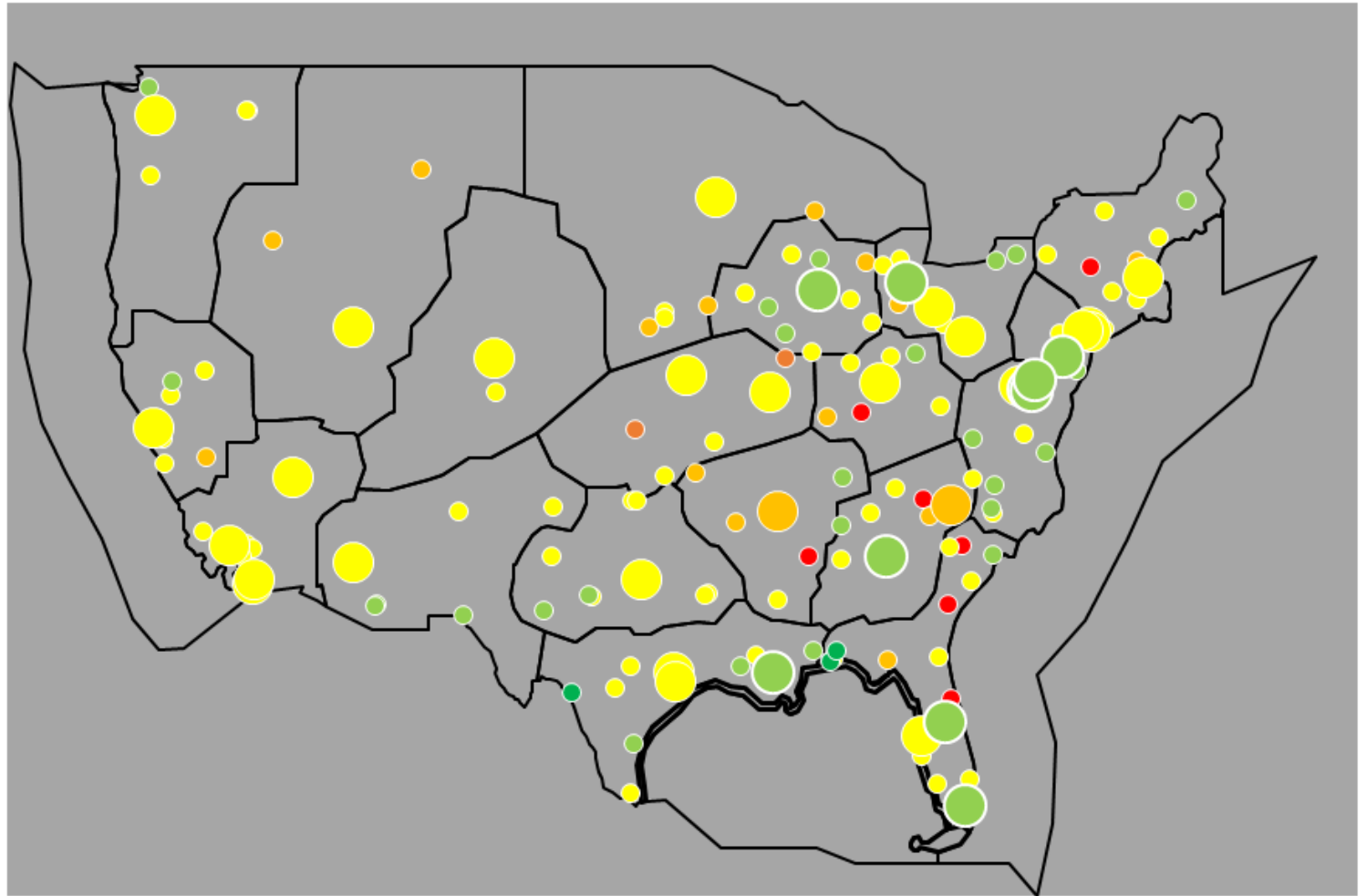
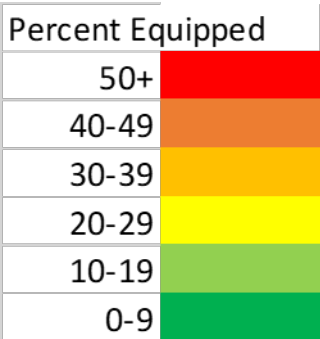


Percent Equipped

50+	
40-49	
30-39	
20-29	
10-19	
0-9	

Equipped Operations – Heat Maps

September 2017(Class B with Mode C Veil and Class C airports) V2



ADS-B Equipage & Avionics Performance Update



Nov 2017 Equipage(good install) Monitoring

Rule Driven

ADS-B Out Aircraft Detected by FAA network

Category	As of 1-Oct 2017 (ATAT)	As of 1-Nov 2017 (ATAT)	Monthly Increase		% of estimated fleet equipped^, as of 1-Nov-2017
All Link Version 2	37,147	38,982	1,835	4.94%	
1090ES	30,805	32,589	1,784	5.79%	
UAT	5,529	5,569	40	0.72%	
Dual	813	824	11	1.35%	
US General Aviation (includes EXP & LSA)	30,989	32,499	1,510	4.87%	20.3% - 32.5%
US Air Carrier**	1,329	1,409	80	6.02%	23.5% - 28.2%
Intl General Aviation*	2,226	2,344	118	5.30%	
Intl Air Carrier	793	820	27	3.40%	
U.S. Military & U.S. Special Use	31	144***	***	***	

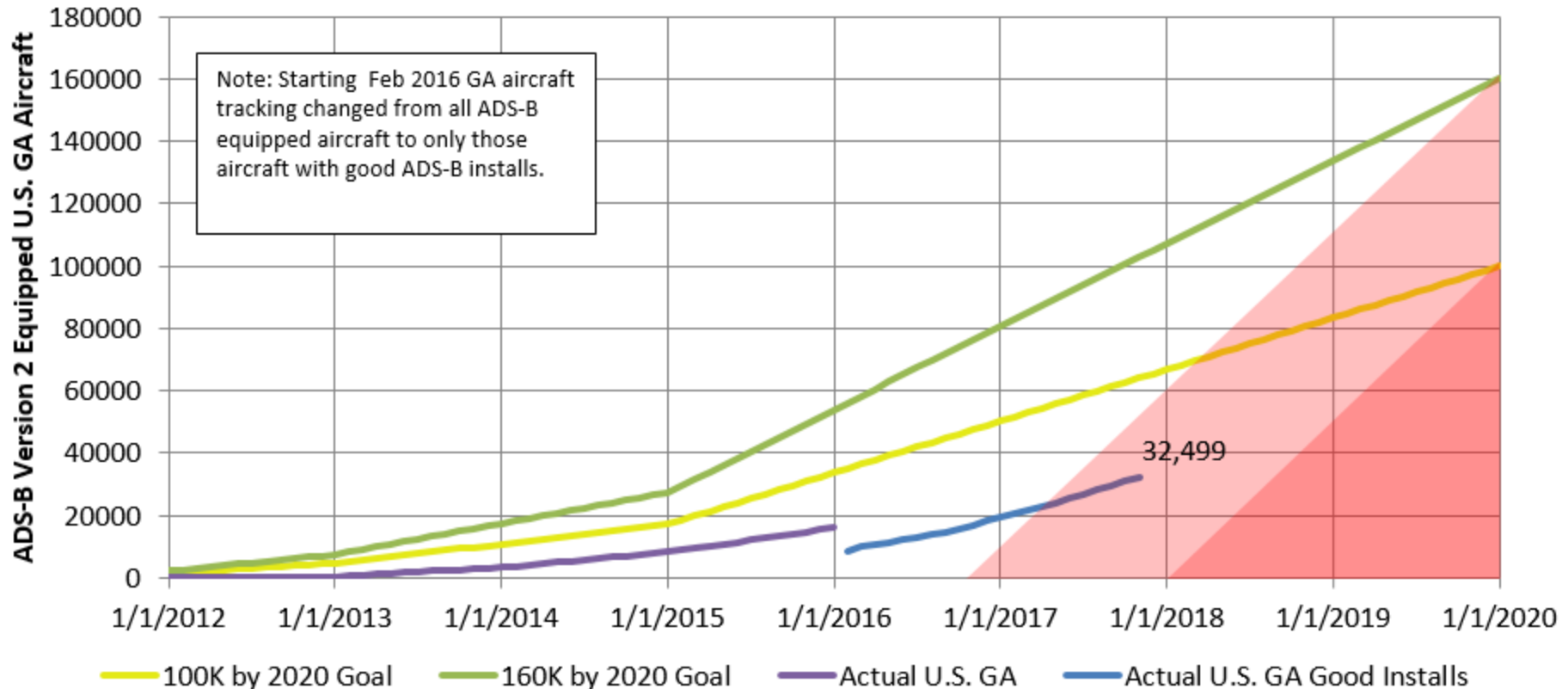
*Aircraft incorrectly reporting outside US ICAO block are included in Intl GA count.

^percentage range based on estimates of 5,000-6,000 US air carrier aircraft and 100K-160K US general aviation aircraft
ATAT – The ATAT was used to generate these numbers starting on June 1, 2016

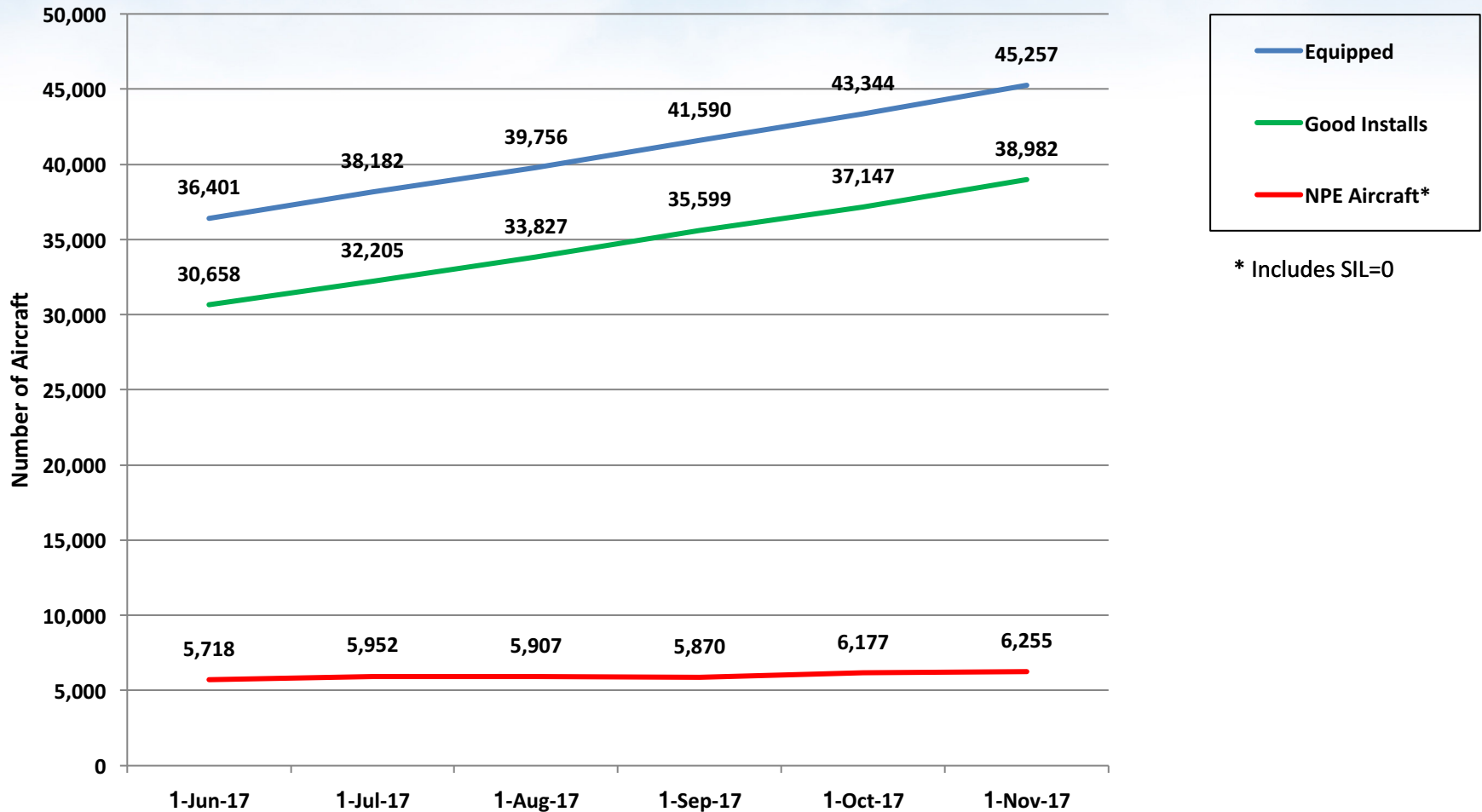
** Horizon was added to this list on October 1, 2017

*** Starting Nov 2017, filtering for Mil & Special Use was adjusted to include as good aircraft with Flight ID issues

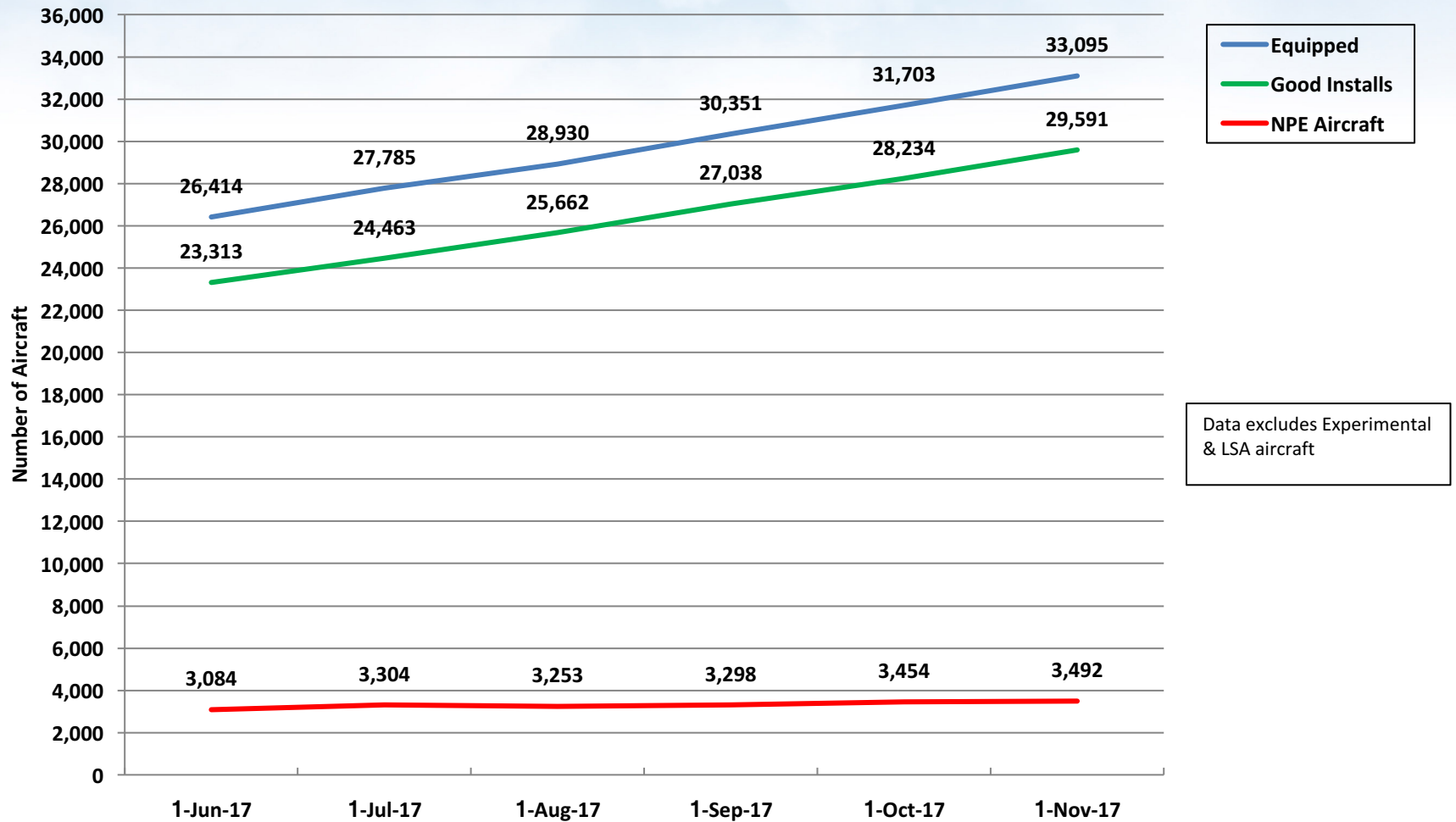
ADS-B Out Version 2 Equipage U.S. General Aviation (good installs) (including Exp & LSA aircraft) Actuals vs 100K and 160K by 2020 Goals



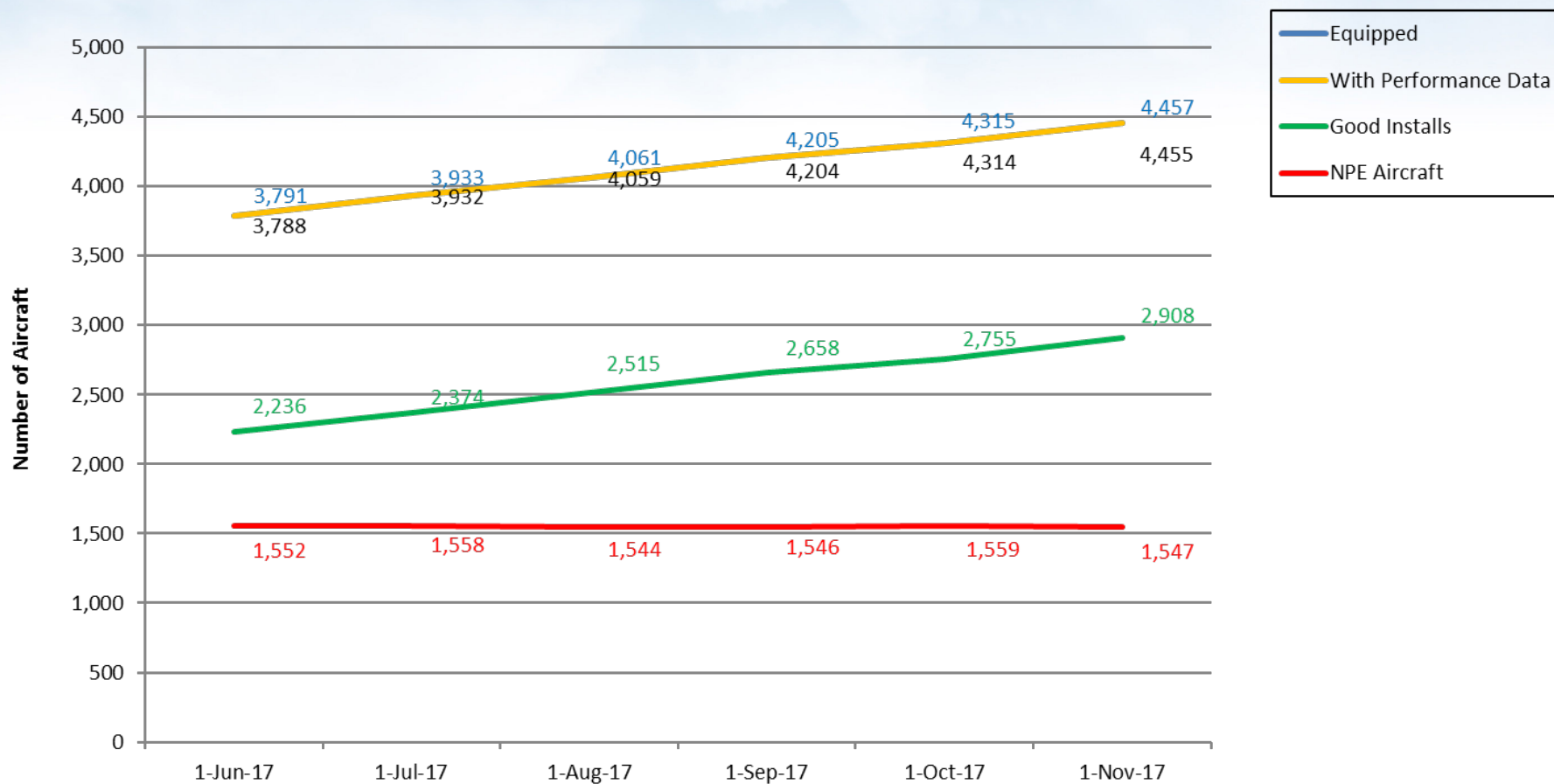
All US Aircraft Equipage & Avionics Performance



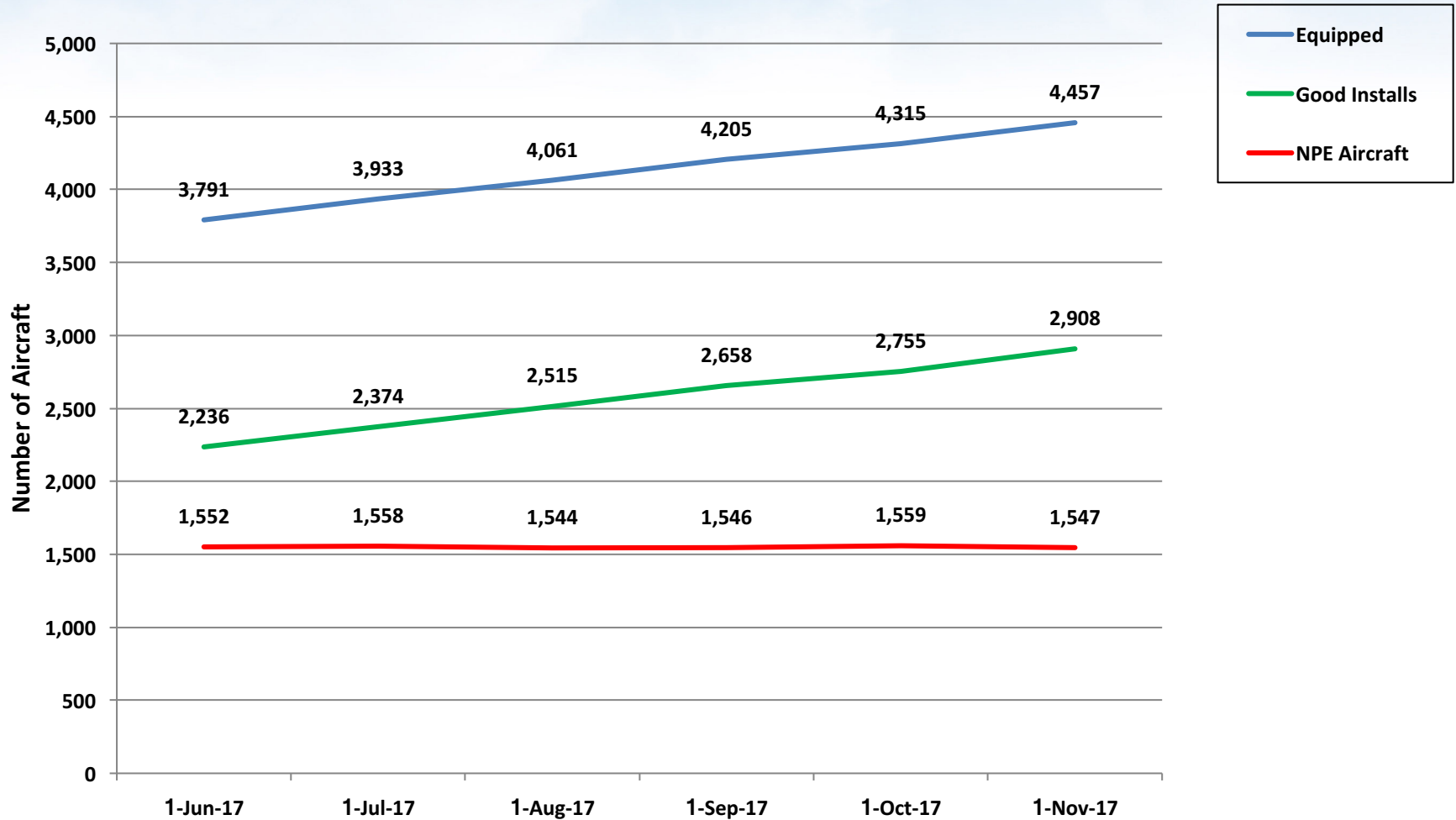
US GA Fixed-Wing Equipage and Avionics Performance



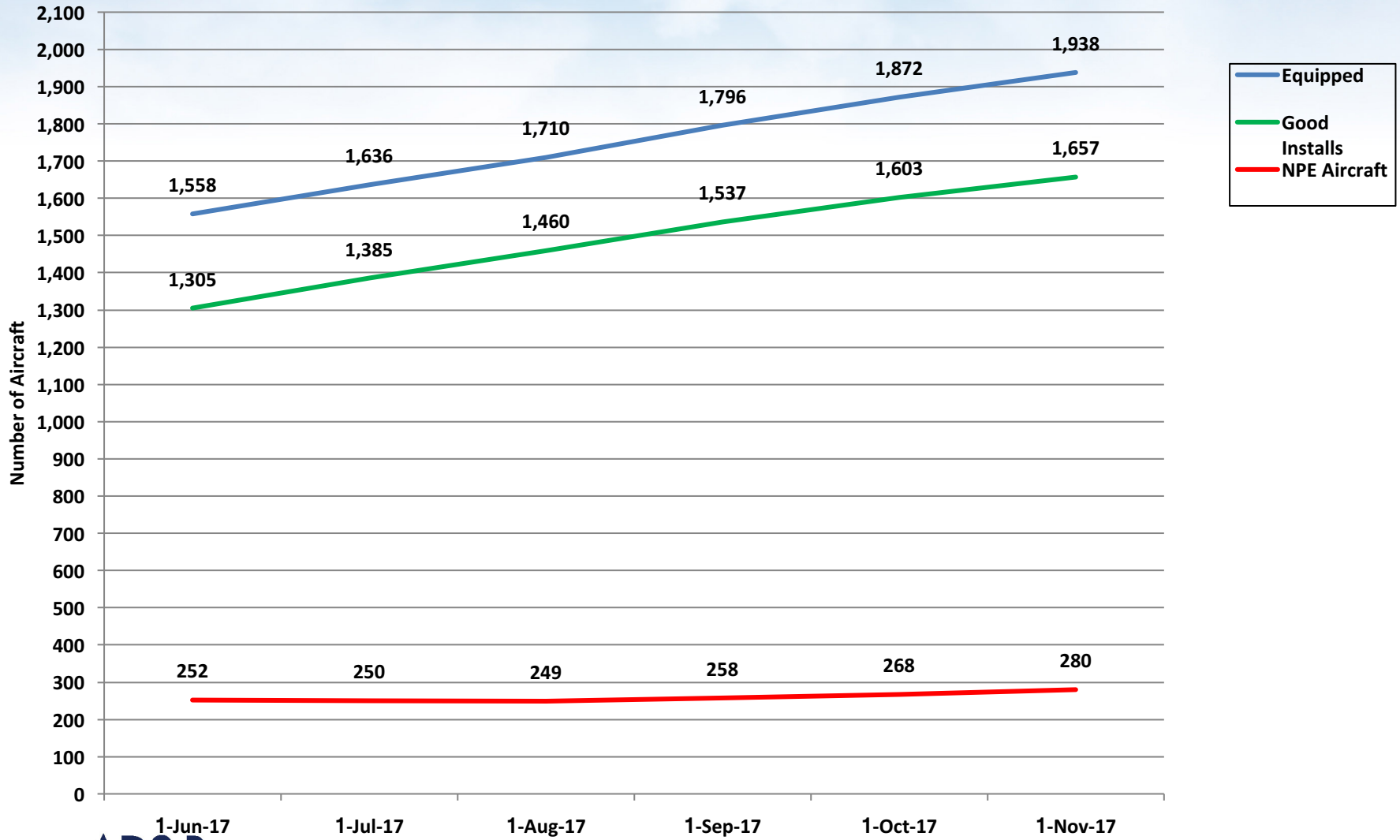
USA Exp and LSA Aircraft Equipage and Avionics Performance



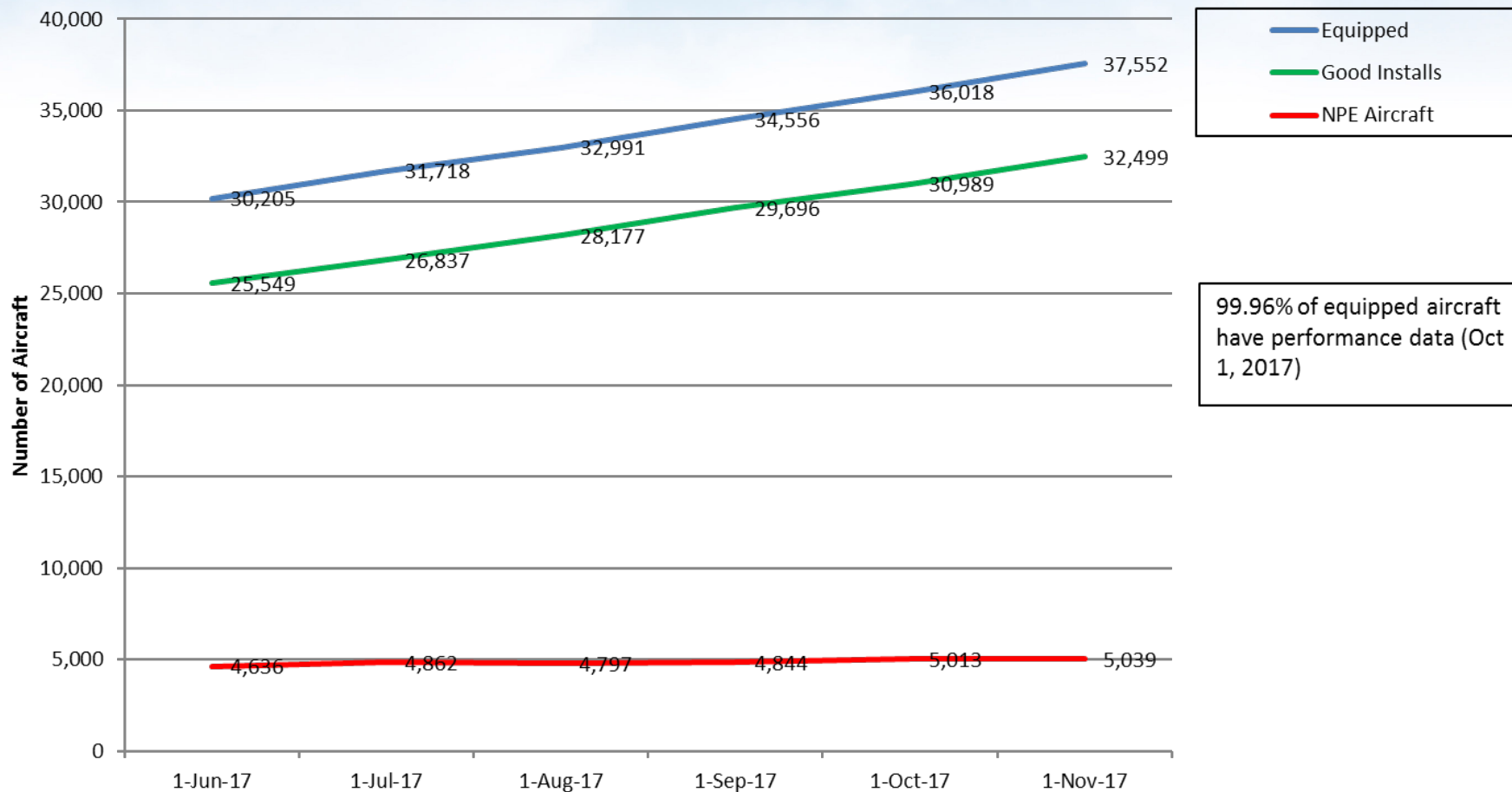
USA Exp and LSA Aircraft Equipage and Avionics Performance



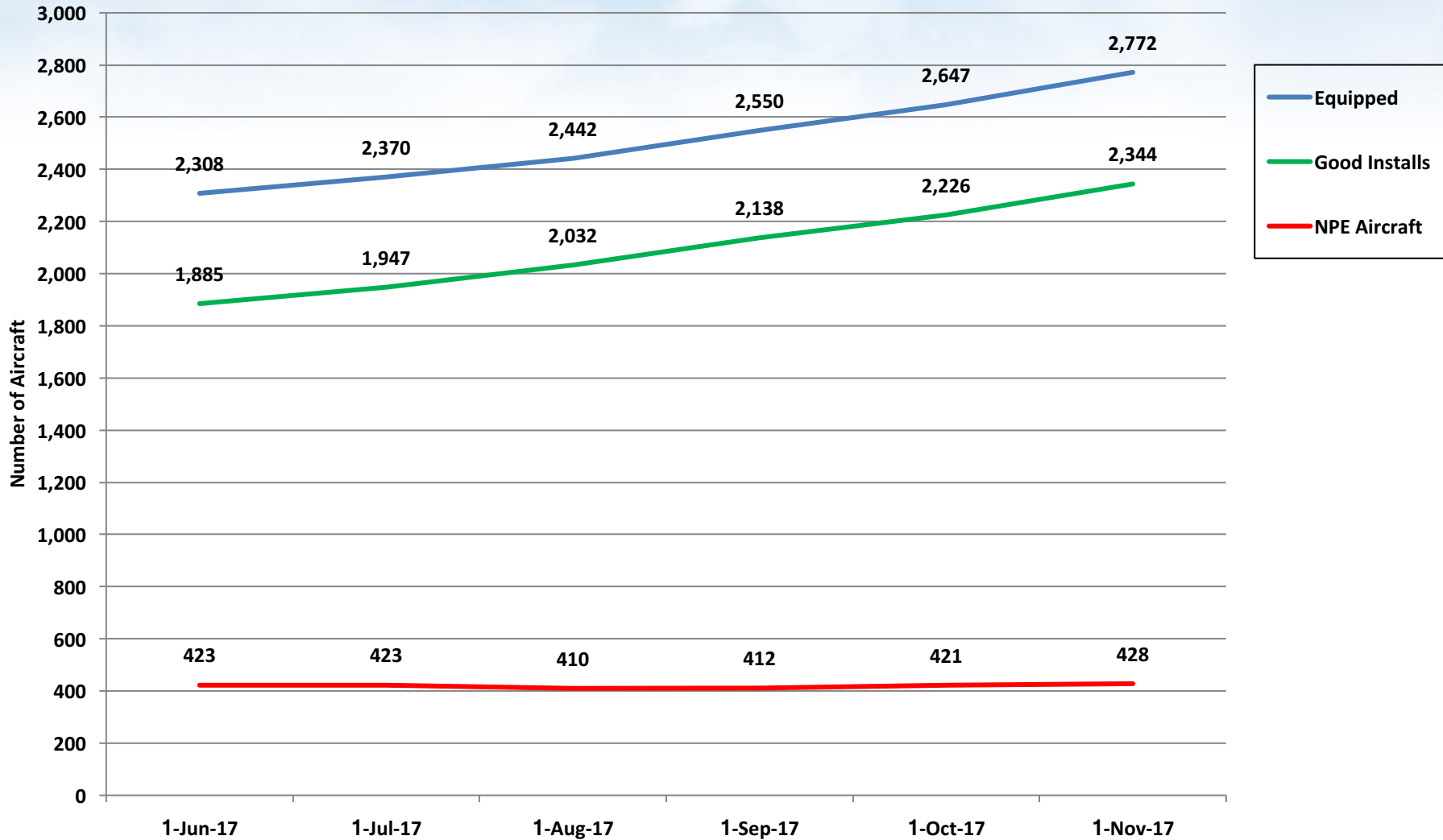
US Rotorcraft Equipage & Avionics Performance



USA GA + (includes Exp & LSA) Aircraft Equipage and Avionics Performance

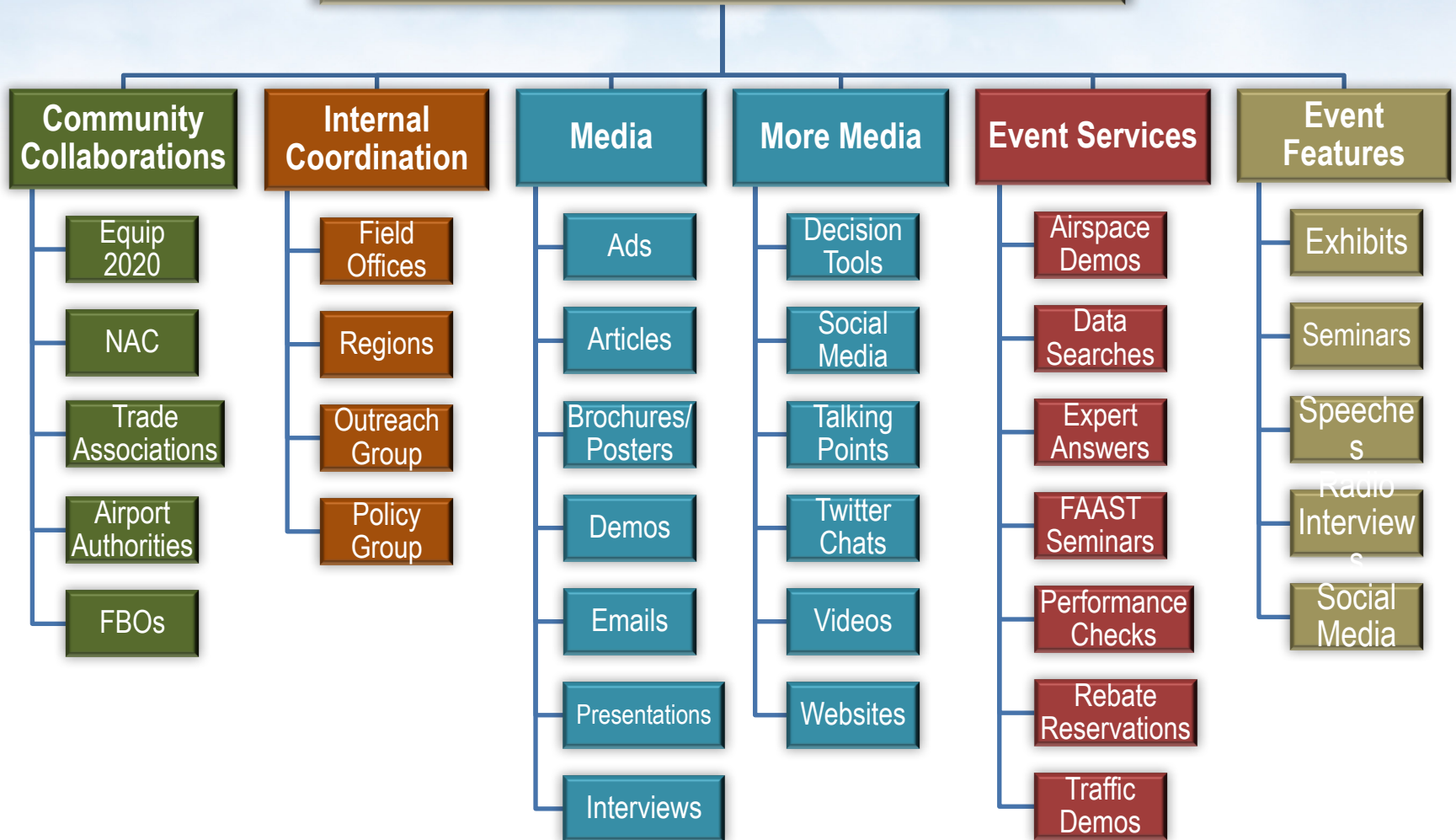


International GA Equipage & Avionics Performance



Outreach: FY 2017 Wrap UP & FY 2018 Strategies

FAA Outreach Activities & Features



Web Site Dedicated to ADS-B Information

NextGen

Delivering
Partnering
Measuring - Performance Snapshots
NextGen Works
Phases of Flight
Equip ADS-B
Rebate
Research
Installation
Capabilities
FAQs
Resources
Community Involvement

FAA Home • NextGen • Equip ADS-B

NextGEN Equip ADS-B

By January 1, 2020, you must be equipped with ADS-B Out to fly in most controlled airspace. Federal Regulations 14 CFR 91.225 and 14 CFR 91.227 contain the details.

Learn more about the \$500 equipage rebate available now.

LOCATION: EQUIP ADS-B
TAKE: 1
SCENE: 1
DIRECTOR: J. H.
CAMERA/PAUL: A. H. / 3L

0:00 / 1:07

Research
What you need based on where you fly

Installation
Things to consider before, during, and after

Capabilities
What you can do with ADS-B technology

Questions about equipping? Please contact us: adsb@faa.gov

Find Equipment
[FAA Certified Equipment](#) [Equipment Search Tool](#)

faa.gov/go/equipadsb

FAA FY 2017

- **ADS-B Outreach**
 - Continued outreach to GA aircraft owners and operators with all the communications tools available to the agency
 - Improved our tactics with more social media and direct messaging
 - Promoted the rebate, benefits, installation challenges, performance checks, and the web site
 - Provided executive affirmation of the mandate
- **Communication Tools Included**
 - Web site, social media, print media, email, presentations, handouts, exhibitions, performance checks, meetings, webinars, seminars, speeches, and our first twitter chat
- **New Tools Included**
 - Handouts, web ads, posters, articles, emails, real-time social media

GA Response to Outreach

- Engaged Owners
 - Have responded well to our collective outreach, as indicated by their improved knowledgeable and decisiveness, but
 - Many are continuing to wait for lower cost solutions, and
 - Some continue to need support for owners beginning their search in smaller numbers
- Outreach to Business Aviation Operators
 - This is an important segment of industry that typically operates GA aircraft at a high frequency
 - Our outreach will benefit from a better understanding of the needs of communities operating under FAR Parts 135, 136, 137, and 141

Intermediary Stakeholder Value & Challenges

- Intermediaries Are Excellent Partners
 - They are able to communicate effectively with our target audience
- Intermediaries Have Their Own Limitations
 - Limited resources
 - Competing priorities
 - Limited knowledge of the mandate, our collective efforts, the potential impact
- Intermediate Stakeholders Are Valuable
 - We place a high value on the role of these stakeholders
 - We offer familiarization, a simple message, and turnkey outreach products

FAA FY 2018

- ADS-B Outreach Strategies Include Continuing
 - Maximize the use of FAA communications tools
 - Continued coordination with industry trade representatives
 - Direct outreach to GA and BA
- Our Priorities Include
 - Reaching less engaged and at-risk owners
 - Increasing collaboration with intermediary stakeholders (trade associations, state governments, airport operators, FBOs, maintenance facilities, flight training organizations)

Helping GA & BA

- States, Airports, Businesses
 - Aviation officials are encouraged to engage and energize state airport councils & airport operators to get involved in outreach
 - Airports can share FAA information with their businesses
 - Businesses and airports can promote awareness
- Our Ask
 - We are enlisting your help to get information out directly or through intermediaries to aircraft owners and operators
 - Together we can help the aviation community comply with the mandate and reap the benefits of ADS-B technology

Downloadable Ads/Posters/Flyers/Post Cards

www.faa.gov/nextgen/equipadsb/resources/downloads/

— ADS-B —
EQUIP NOW!

SEE and be
SEEN



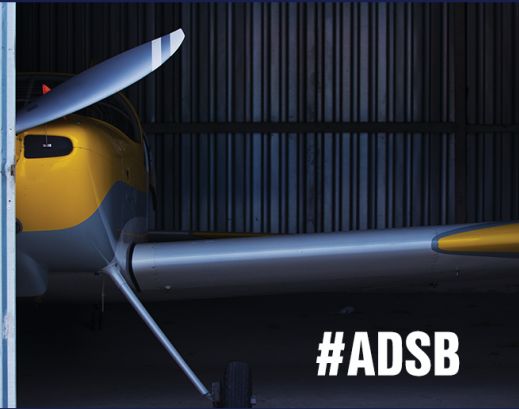
#ADSB

LEARN MORE AT faa.gov/go/equipadsb

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DON'T GET
LEFT IN THE
HANGAR



#ADSB

LEARN MORE AT faa.gov/go/equipadsb



Group Discussion

- How can we get information to your members?
- What are the impediments to equipage?
- How can the FAA help?