E&E REDAC Subcommittee

Noise Research

Presented to: E&E REDAC Subcommittee

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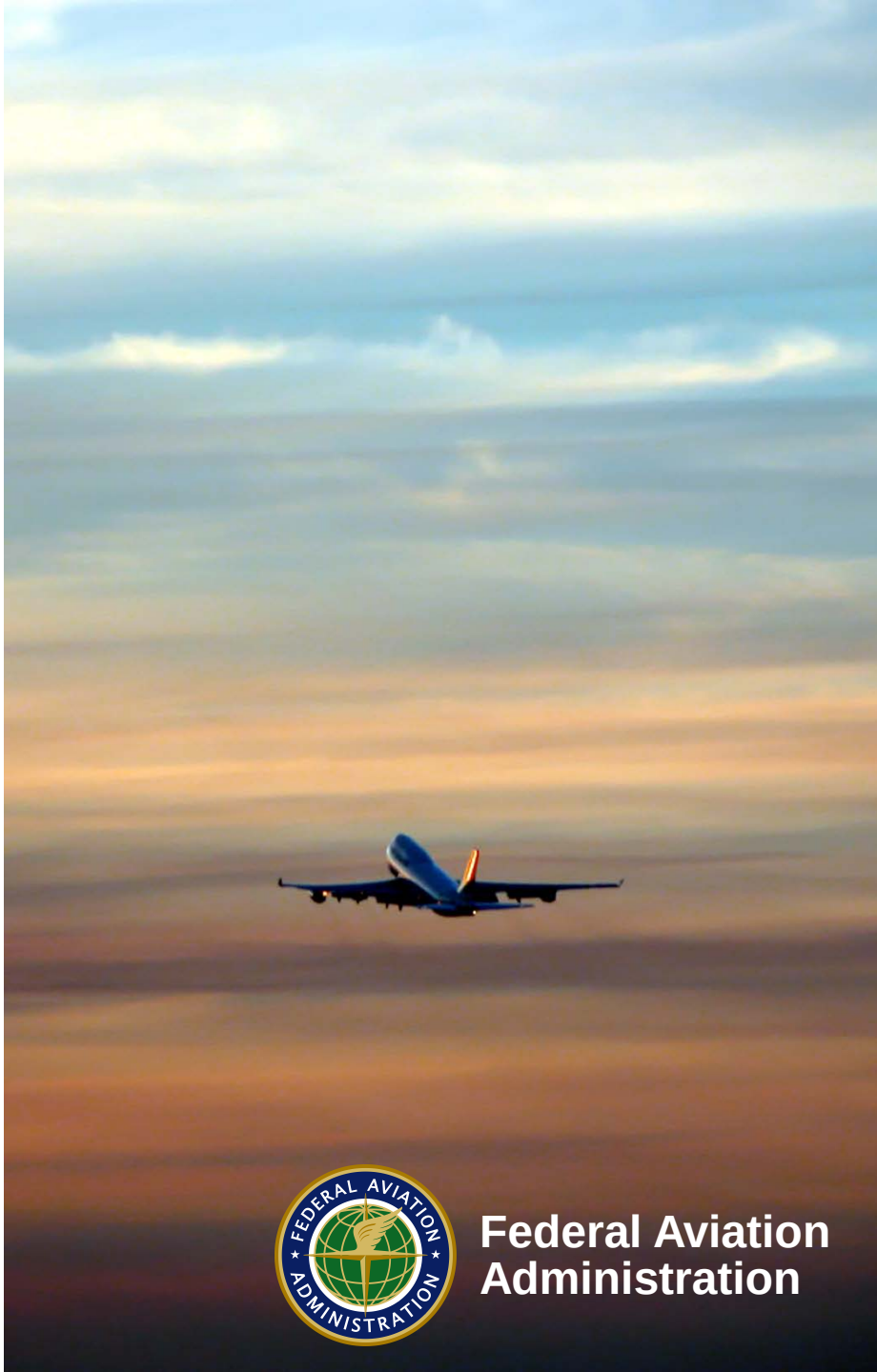
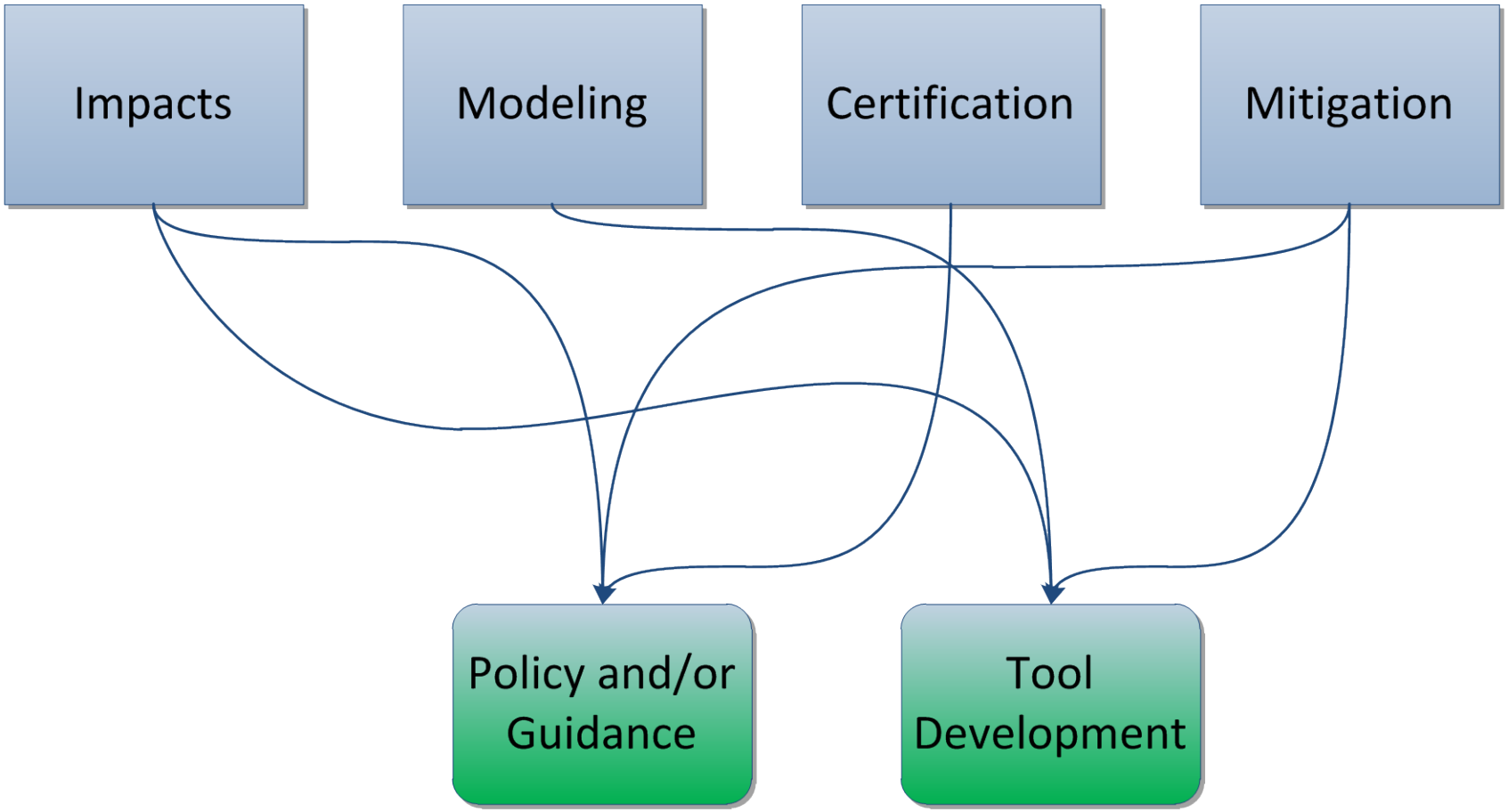
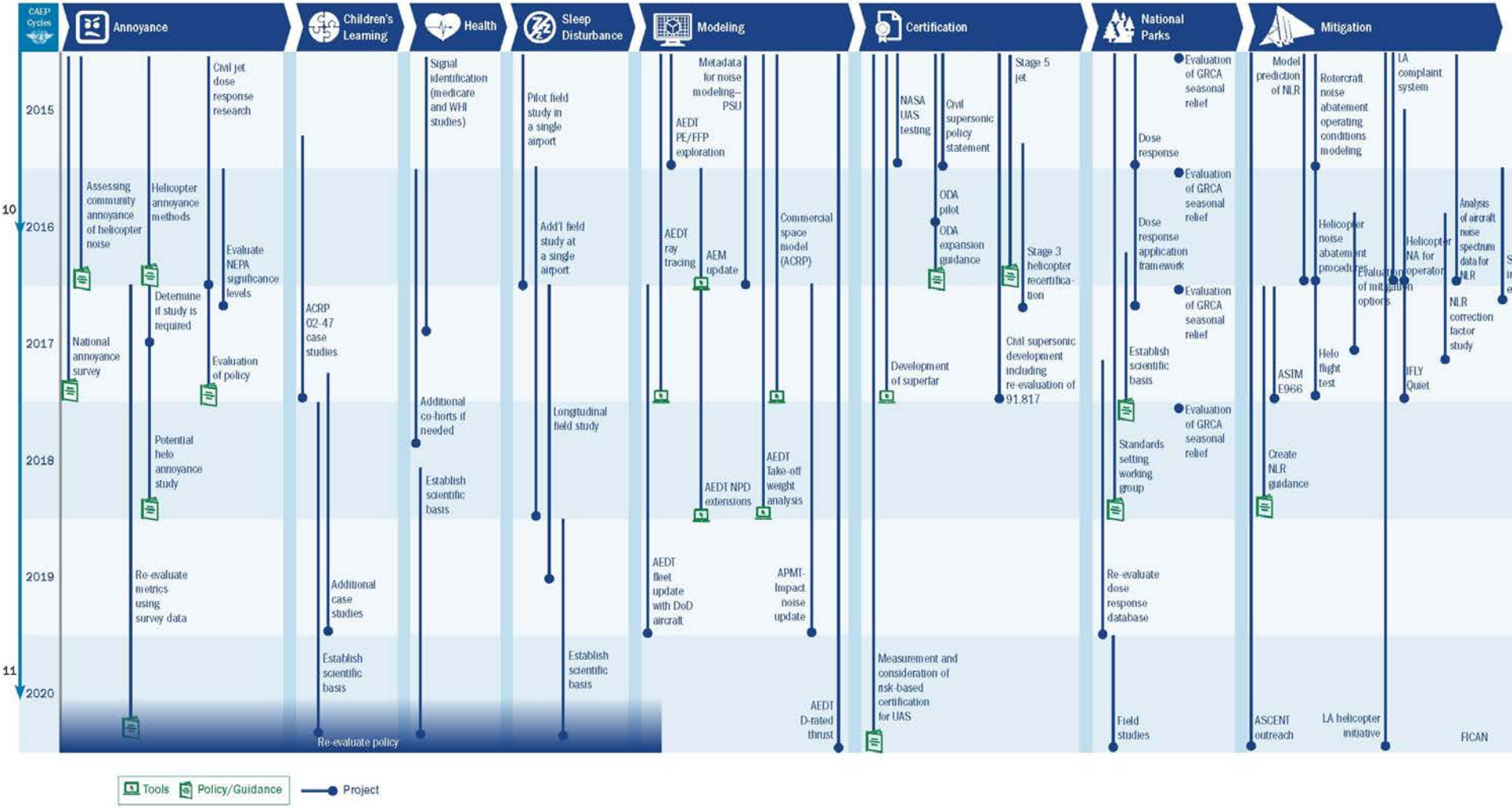


Outline

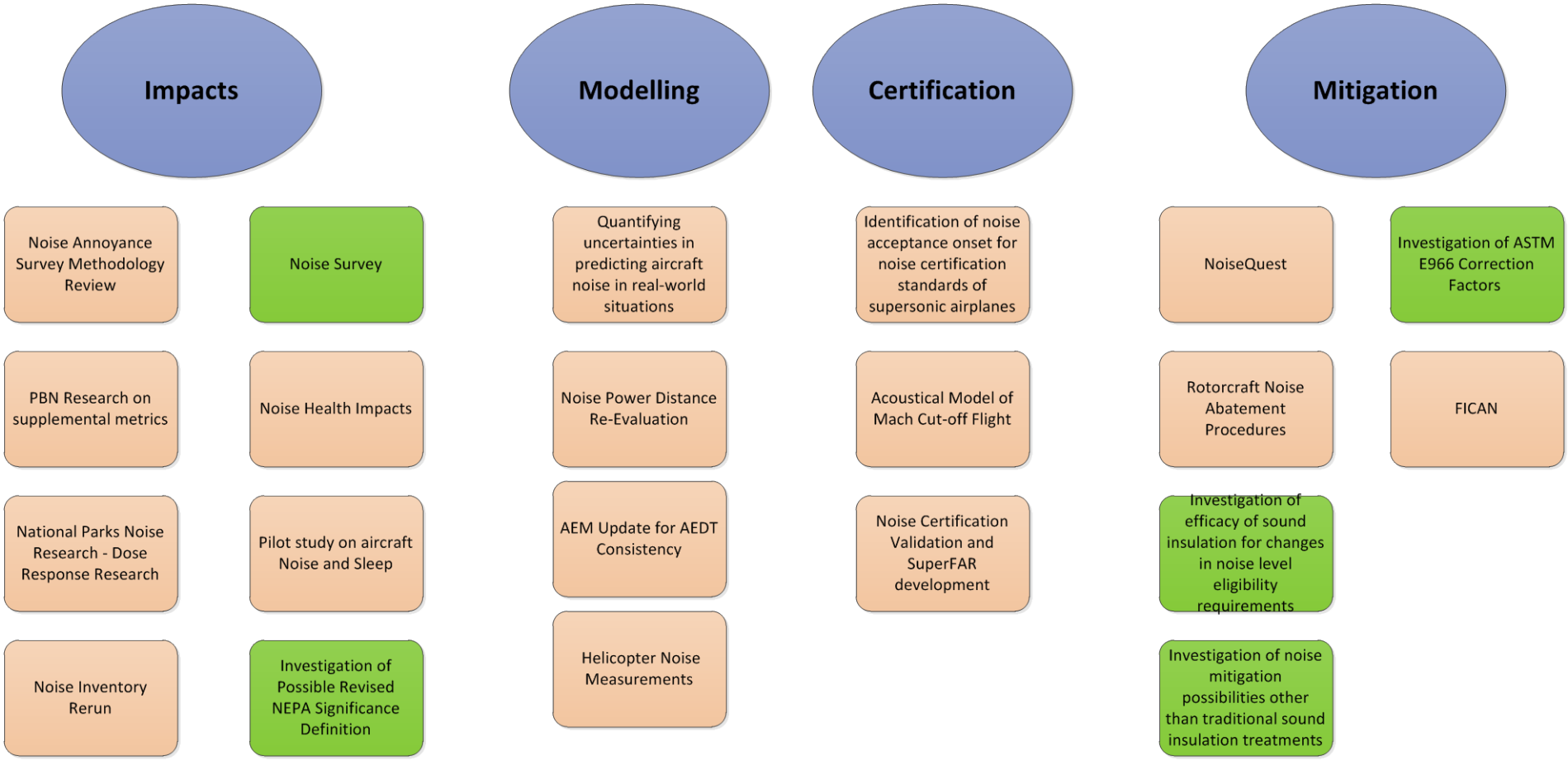
- **Noise Roadmap**
- **Aviation Noise Impact on Annoyance – Survey Update**
- **UAS – Certification and other Environmental Considerations**
- **Quantifying Noise Impacts and Tracking Noise Trends**

Goal of Noise Research




CAEP Cycles
Annoyance
Children's Learning
Health
Sleep Disturbance
Modeling
Certification
National Parks
Mitigation
2015
2016
2017
2018
2019
2020
10
11
Civil jet dose response research
Assessing community annoyance of helicopter noise
Helicopter annoyance methods
Evaluate NEPA significance levels
Determine if study is required
National annoyance survey
Evaluation of policy
Potential helo annoyance study
Re-evaluate metrics using survey data
ACRP 02-47 case studies
Additional case studies
Establish scientific basis
Re-evaluate policy
Signal identification (medicare and WHI studies)
Additional co-horts if needed
Establish scientific basis
Pilot field study in a single airport
Add'l field study at a single airport
Longtudinal field study
Establish scientific basis
Metadata for noise modeling–PSU
AEDT PE/FFP exploration
AEDT ray tracing
AEM update
AEDT NPD extensions
Commercial space model (ACRP)
AEDT Take-off weight analysis
AEDT fleet update with DoD aircraft
APMT-Impact noise update
AEDT D-rated thrust
NASA UAS testing
Civil supersonic policy statement
ODA pilot
ODA expansion guidance
Development of superfar
Measurement and consideration of risk-based certification for UAS
Stage 5 jet
Stage 3 helicopter recertification
Civil supersonic development including re-evaluation of 91.817
Evaluation of GRCA seasonal relief
Dose response
Dose response application framework
Establish scientific basis
Standards setting working group
Re-evaluate dose response database
Field studies
Model prediction of NLR
Rotorcraft noise abatement operating conditions modeling
Helicopter noise abatement procedures
Evaluation of mitigation options
Helo flight test
ASTM E966
Create NLR guidance
ASCENT outreach
LA helicopter initiative
LA complaint system
Helicopter NA for operator
IFLY Quiet
Analysis of aircraft noise spectrum data for NLR
NLR correction factor study
FICAN
Tools
Policy/Guidance
Project

FY16 Funded Projects



AEE Funded

APP Funded

Noise Survey Update

Noise Survey Status

- Survey and analysis is scheduled to be completed early 2017
- Survey is being completed in waves (both phone and mail). The first wave was mailed out on Fall 2015
- July 2016 Statistics:
  - Mail - 8,173 mail completes (target 10,000; 72% of goal)
  - Phone - 1,569 telephone completes (target 2,140; 73% of goal)
- At completion of survey and analysis, FAA will begin to consider policy implications
  - Consult with additional Federal Agencies and other stakeholders
  - Chance for public involvement

Related Research

- Impact of aviation noise such as sleep and cardiovascular disease
- Efficacy of sound insulation
- Alternative Noise Mitigation and Noise Abatement Processes
- Understanding potential NEPA thresholds

Many FY16 projects are geared toward supporting the updated policy decision on DNL 65 dB

UAS – Certification and other Environmental Considerations

Noise Certification

- **FAA has currently exempted UAS from noise certification**
  - Section 333 and Part 107
- **As rules continue, need to decide what will be the certification framework for all UAS**
  - For UAS of a certain size, current framework is infeasible from a flight perspective
- **Exploring a risk-based approach to noise certification**
- **Data is needed to develop new frameworks**

Environmental Challenges of UAS

- Clarity needed in roles and responsibilities regarding environmental considerations of UAS
- Necessary data and resources to comply with NEPA and other environmental laws
- Physical intrusion, annoyance, new aircraft type and privacy concerns usually become noise concerns
- Public Acceptance: Although many people have embraced the potential benefit of UAS, others have expressed concerns about the possible impact on the environment, on wildlife, on traditional cultural practices and on personal privacy

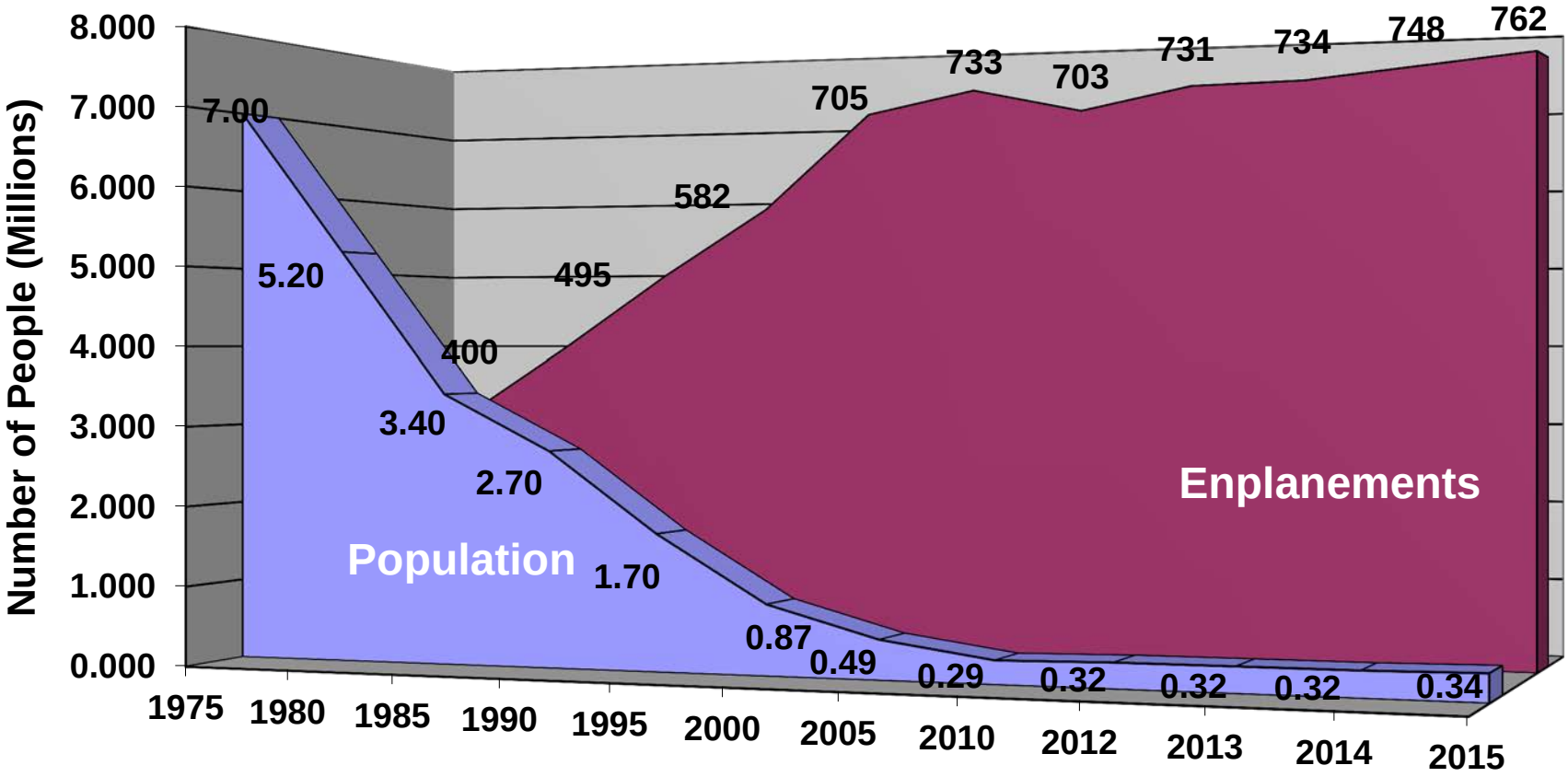
AEE Research on UAS

Task	2016	2017	2018	2019	2020	2021
Conduct Additional Measurments for a wide range of vehicle types						
Assess environmental impact consideration under NEPA						
Develop noise certification framework						
Consider risk-based noise standards for UAS						
Develop environmental analysis capability that is unique to UAS (i.e. specific NEPA guidelines or modeling capabilities for UAS)						

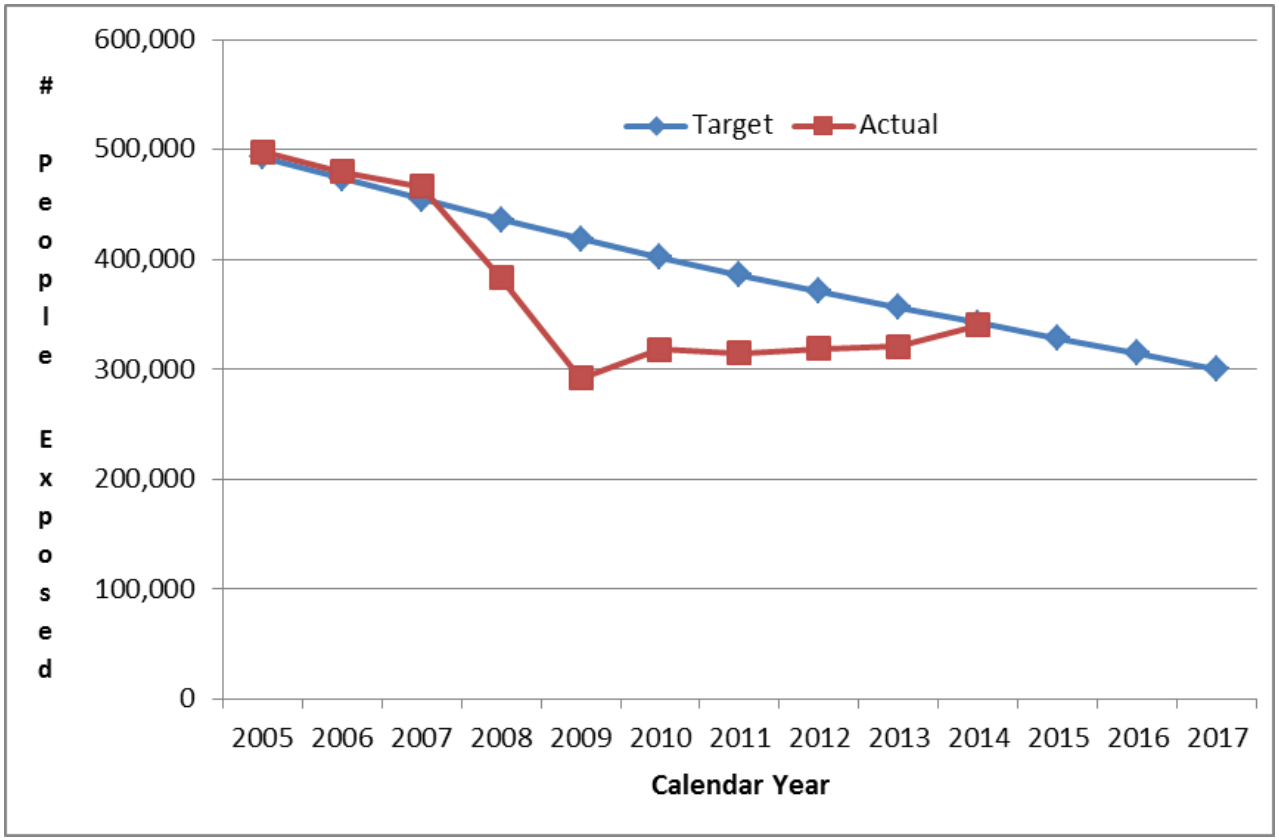
- **Data collection to determine UAS noise certification framework**
  - Examining weight limitations
    - Collaborating with ASSURE (UAS Center of Excellence) to test a UAS
    - Coordinating with Department of Defense (Air Force at Corning) to examine a scheme for low risk UAS
    - Leveraging NASA tests – have collaborated on two tests with them looking at equipment and procedures
- **Exploring potential for the need to model UAS**
- **Determine additional analysis to support NEPA and other environmental laws**

Quantifying Noise Impacts and Tracking Noise Trends

The Historical Record:
Order of Magnitude Noise Exposure Reduction Despite Traffic Growth



Noise Trend



FY Reporting	Cal Year	Target	Actual
2006	**2005**	493,000	498,000
2007	**2006**	474,000	480,000
2008	**2007**	455,000	466,000
2009	**2008**	436,000	383,000
2010	**2009**	419,000	292,000
2011	**2010**	402,000	318,000
2012	**2011**	386,000	315,000
2013	**2012**	371,000	319,000
2014	**2013**	356,000	321,000
2015	**2014**	342,000	340,000
2016	**2015**	328,000	
2017	**2016**	315,000	
2018	**2017**	300,000	

Increasing Noise Trend

- **Growth in operations, including nighttime operations**
- **Improved modeling**
  - Discussion this afternoon
  - Updated noise “decks” used for annual inventories
  - Improved runway usage information for some airports with the introduction of ASDE-X
  - Utilizing the latest versions of AEDT
- **Growth in population**

Noise Trends Beyond 2018

- **Examining current noise trend**
- **Leveraging Noise Trends and Goals Analysis (briefing later today)**
- **Reviewing forecasted growth**
- **Considering potential noise impacts, such as annoyance, sleep, and cardiovascular health**