

Aviation R&D Landscapes

Presented to: Human Factors Subcommittee

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**Federal Aviation
Administration**

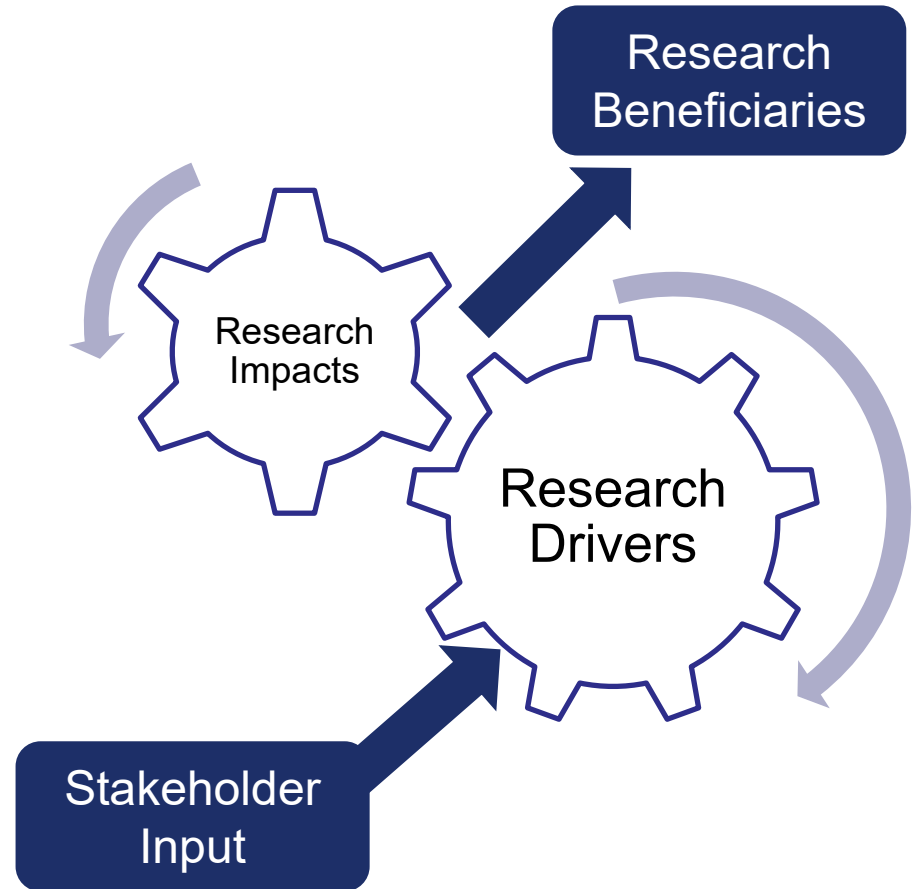
What is a Landscape?

- **A Landscape is a collection of research drivers that provides information about their potential impacts to the industry.**
 - Research Drivers
 - A force or motivation that stimulates R&D investment
 - Impacts
 - Industry Objectives
 - Emerging Technologies
 - Envisioned Operations



Objectives

FAA R&D Landscaping is an aviation industry-focused view of research drivers that may result in impacts to industry objectives, emerging technologies and envisioned operations.



Developing the R&D Landscapes

- A document will be produced to effectively communicate the Aviation Industry Landscape.
- Research drivers and their impacts must be understood and will be described within the context of each of the 6 research domain areas.



Derivation of Drivers

Strategic Interest

- a) NAS Infrastructure
- b) Smart Systems
- c) Certification & Regulation
- d) NAS Operational Information Exchange
- e) Cybersecurity
- f) Space Operations
- g) Workforce

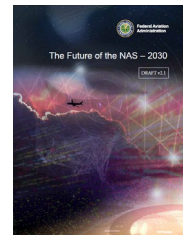
FAA NAS Horizons



FAA's Strategic Initiatives

- a) Make aviation safer and smarter
- b) Deliver benefits through technology and infrastructure
- c) Enhance global leadership
- d) Empower and innovate with the FAA's people

Future of the NAS - 2030



Goals

- a) NextGen Evolution
- b) Benefits of the Future NAS
- c) Delivering Improved Services
- d) Seamless Integration
- e) Meeting New Challenges

DoT Strategic Plan

- a) Safety
- b) Infrastructure
- c) Innovation
- d) Accountability



TRB Critical Issues in Transportation

Issues

- a) Transformational Technologies and Services
- b) Serving a Growing and Shifting Population
- c) Energy and Sustainability
- d) Resilience and Security
- e) Safety and Public Health
- f) etc.



Example Research Drivers

Supersonic Flight

Urban Air Mobility

Non-Traditional NAS Access Points

Space Operations

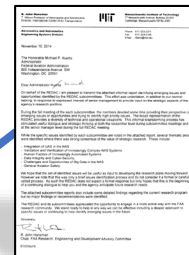
Electric Propulsion

Future Fuel Technologies

Artificial Intelligence

Remote/Virtual Technologies

REDAC Emerging Issues



ACARE – Strategic Research & Innovation Agenda

Challenges

- a) Meeting societal and market needs
- b) Industrial leadership
- c) Environment and energy supply
- d) Ensuring safety and security
- e) Prioritizing research, testing, and education



R&D Landscape Process

- **Team composed of FAA research domain leads, MITRE, ANG-E4 and senior management**
 - R&D Landscape team formed and initiated on October 31, 2018.
 - Bi-weekly team meetings, with additional research domain specific meetings as needed.
- **Tasks involved:**
 - Develop structure for data collection
 - Ensure traceability of research drivers to source documentation



Research Domain Leads

R&D Research Domain Areas

Airport Technology

Aircraft Safety Assurance

Digital Systems & Technologies

Human and Aeromedical Factors

Environment & Weather Impact Mitigation

Aviation Performance & Planning

Research Domain Leads

Michel Hovan, ANG-E2
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Kenneth Allendoerfer, ANG-E2 Carla Hackworth, AAM (CAMI)
Stacey Zinke, AAM (CAMI) Dan Herschler, ANG-C1

Jim Hileman, AEE
Randy Bass, ANG-C6
Warren Fellner, ANG-C6

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Research Landscapes and Planning

Aviation Industry

Landscapes

Research Drivers

A force or motivation that stimulates R&D investment.

Impact Analysis

What is the driver impact on industry objectives, emerging technologies or envisioned operations?

FAA

Planning

FAA Research Portfolio

By research domain:
prioritized research projects
w/FAA's role
(Lead, Watch, Participate)

National Aviation Research Plan (NARP)

Documented approach for achieving FAA's research goals/objectives

Execution

Research

FAA's research serving to meet FAA NARP objectives

Results

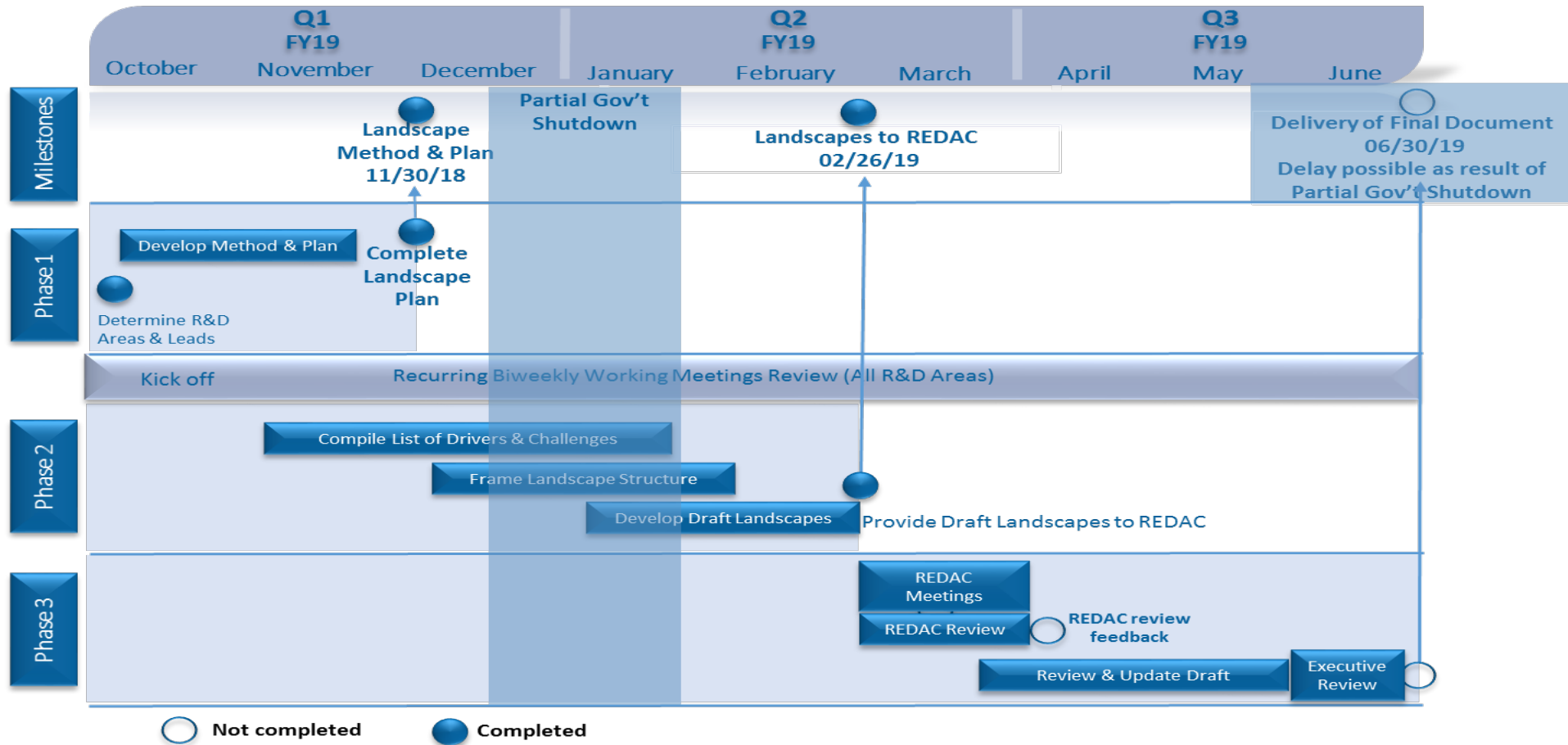
Research Outputs

Results of FAA's research and Technology Transfer



Federal Aviation Administration

Landscape Schedule



Subcommittee Scope

Objective/Purpose

- Help FAA understand the aviation industry's strategic focus (drivers).

Aviation Industry Landscape

- The R&D Landscapes Workbook (provided under separate cover) contains:
 - A list of 25 research drivers related to industry-based emerging technologies
 - Worksheets related to each driver containing a set of questions

Federal Aviation Administration
Research & Development Landscapes
2020 - 2030

Research, Engineering and Development
Advisory Committee (REDAC)

Sub-Committee Workbook for:



Subcommittee Task

- **Review the driver list and identify any missing items.**
- **For drivers pertaining to your subcommittee provide the following within the workbook:**
 - Identify the characteristics or individual components of each driver and the timeframe to maturity.
 - Identify if the driver presents challenges that the FAA should pay attention to.
 - Identify entities (academia, government, or industry) that are currently conducting work related to this driver.
- **Separate from F&Rs, provide subcommittee Workbook input to the DFO's prior to the full REDAC meeting on 4/11.**
- **Be prepared to summarize during the full REDAC meeting on 4/11.**

