Federal Aviation Administration
Research & Development Landscapes
2020 - 2030

Research, Engineering and Development Advisory Committee (REDAC)

Sub-Committee Workbook for:
Aircraft Safety

Table of Contents

General Instructions

In the context of your REDAC subcommittee:

- Review the list of research drivers on the following page and identify any missing items that you feel are relevant. Blank pages are provided in the back of the workbook for the Subcommittee to include these additional drivers.
- Using the list of research drivers on the following page, identify the ones that are relevant to your Subcommittee.
- Then, using the attached sheets (one for each research driver that you've identified), please provide feedback on the following:

    a. Identify the characteristics or individual components of each driver and the timeframe to maturity.

    b. Identify if the driver presents challenges that the FAA should pay attention to.

    c. Identify entities (academia, government or industry) that are currently conducting work related to this driver.

    Provide any additional context that you believe is relevant.

Research Drivers

1. Supersonic Flight
2. Urban Air Mobility
3. Growth of Mixed Operations (Piloted, Autonomous, Unmanned)
4. New Mission Types
5. Non-Traditional NAS Access Points
6. Space Operations
7. Enable Routine Small UAS Operations Beyond Visual Line of Sight (BVLOS)
8. Autonomous ground service equipment at airports
9. Aircraft Command and Control Using Automation and Remote Sensing Technology
10. New Vehicles or their Components Which Make Use of New Technologies, Software, or Materials
11. Certification using New Technologies, Standards, or Processes
12. Remote/Virtual Technologies
13. Advances in Electric or Hybrid Electric Propulsion
14. Future Fuel Technologies
15. New Technologies to Airport Pavement Infrastructure and Design
16. Information Assurance and Security for All Operations (cyber-security)
17. Big Data Analytics and Techniques
18. Human-Machine Teaming and New Technology Interfaces
19. Artificial Intelligence
20. Increased Connectivity by Cyber-Physical Systems (Internet of Things Technologies)
21. Crowd Sourcing Weather Data
22. Advancement in Position, Navigation, & Timing Technology
23. Risk-Based Decision-Making techniques and analytics
24. Infrastructure Resiliency and Continuity of Operations
25. New Medical Technologies and New Substances (Medications, Drugs, Etc.)

Research Driver

1	Supersonic Flight

Identify the characteristics or individual components of each driver and the timeframe to maturity.

Characteristics or Individual Components	Time Period

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.

Research Driver

2	Urban Air Mobility

Identify the characteristics or individual components of each driver and the timeframe to maturity.

Characteristics or Individual Components	Time Period

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.

Research Driver

3	Growth of Mixed Operations (Piloted, Autonomous, Unmanned)

Identify the characteristics or individual components of each driver and the timeframe to maturity.

Characteristics or Individual Components	Time Period

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.

Research Driver

4	New Mission Types

Identify the characteristics or individual components of each driver and the timeframe to maturity.

Characteristics or Individual Components	Time Period

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.

Research Driver

5	Non-Traditional NAS Access Points

Identify the characteristics or individual components of each driver and the timeframe to maturity.

Characteristics or Individual Components	Time Period

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.

Research Driver

6	Space Operations

Identify the characteristics or individual components of each driver and the timeframe to maturity.

Characteristics or Individual Components	Time Period

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.

Research Driver

7	Enable Routine Small UAS Operations Beyond Visual Line of Sight (BVLOS)

Identify the characteristics or individual components of each driver and the timeframe to maturity.

Characteristics or Individual Components	Time Period

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.

Research Driver

8	Autonomous ground service equipment at airports

Identify the characteristics or individual components of each driver and the timeframe to maturity.

Characteristics or Individual Components	Time Period

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.

Research Driver

9	Aircraft Command and Control Using Automation and Remote Sensing Technology

Identify the characteristics or individual components of each driver and the timeframe to maturity.

Characteristics or Individual Components	Time Period

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.

Research Driver

10	New Vehicles or their Components Which Make Use of New Technologies, Software, or Materials

Identify the characteristics or individual components of each driver and the timeframe to maturity.

Characteristics or Individual Components	Time Period

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.

Research Driver

11	Certification using New Technologies, Standards, or Processes

Identify the characteristics or individual components of each driver and the timeframe to maturity.

Characteristics or Individual Components	Time Period

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.

Research Driver

12	Remote/Virtual Technologies

Identify the characteristics or individual components of each driver and the timeframe to maturity.

Characteristics or Individual Components	Time Period

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.

Research Driver

13	Advances in Electric or Hybrid Electric Propulsion

Identify the characteristics or individual components of each driver and the timeframe to maturity.

Characteristics or Individual Components	Time Period

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.

Research Driver

14	Future Fuel Technologies

Identify the characteristics or individual components of each driver and the timeframe to maturity.

Characteristics or Individual Components	Time Period

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.

Research Driver

15	New Technologies to Airport Pavement Infrastructure and Design

Identify the characteristics or individual components of each driver and the timeframe to maturity.

Characteristics or Individual Components	Time Period

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.

Research Driver

16	Information Assurance and Security for All Operations (cyber-security)

Identify the characteristics or individual components of each driver and the timeframe to maturity.

Characteristics or Individual Components	Time Period

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.

Research Driver

17	Big Data Analytics and Techniques

Identify the characteristics or individual components of each driver and the timeframe to maturity.

Characteristics or Individual Components	Time Period

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.

Research Driver

18	Human-Machine Teaming and New Technology Interfaces

Identify the characteristics or individual components of each driver and the timeframe to maturity.

Characteristics or Individual Components	Time Period

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.

Research Driver

19	Artificial Intelligence

Identify the characteristics or individual components of each driver and the timeframe to maturity.

Characteristics or Individual Components	Time Period

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.

Research Driver

20	Increased Connectivity by Cyber-Physical Systems (Internet of Things Technologies)

Identify the characteristics or individual components of each driver and the timeframe to maturity.

Characteristics or Individual Components	Time Period

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.

Research Driver

21	Crowd Sourcing Weather Data

Identify the characteristics or individual components of each driver and the timeframe to maturity.

Characteristics or Individual Components	Time Period

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.

Research Driver

22	Advancement in Position, Navigation, & Timing Technology

Identify the characteristics or individual components of each driver and the timeframe to maturity.

Characteristics or Individual Components	Time Period

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.

Research Driver

23	Risk-Based Decision-Making techniques and analytics

Identify the characteristics or individual components of each driver and the timeframe to maturity.

Characteristics or Individual Components	Time Period

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.

Research Driver

24	Infrastructure Resiliency and Continuity of Operations

Identify the characteristics or individual components of each driver and the timeframe to maturity.

Characteristics or Individual Components	Time Period

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.

Research Driver

25	New Medical Technologies and New Substances (Medications, Drugs, Etc.)

Identify the characteristics or individual components of each driver and the timeframe to maturity.

Characteristics or Individual Components	Time Period

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.

Research Driver

26	

Identify the characteristics or individual components of each driver and the timeframe to maturity.

Characteristics or Individual Components	Time Period

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.

Research Driver

27	

Identify the characteristics or individual components of each driver and the timeframe to maturity.

Characteristics or Individual Components	Time Period

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.

Research Driver

28	

Identify the characteristics or individual components of each driver and the timeframe to maturity.

Characteristics or Individual Components	Time Period

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.

Research Driver

29	

Identify the characteristics or individual components of each driver and the timeframe to maturity.

Characteristics or Individual Components	Time Period

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.

Research Driver

30	

Identify the characteristics or individual components of each driver and the timeframe to maturity.

Characteristics or Individual Components	Time Period

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.
