

NASA's System-Wide Safety Project

System-Wide Predictive Analytics and Continuous Learning for In-time Aviation Safety Management Systems (IASMS)

Challenges

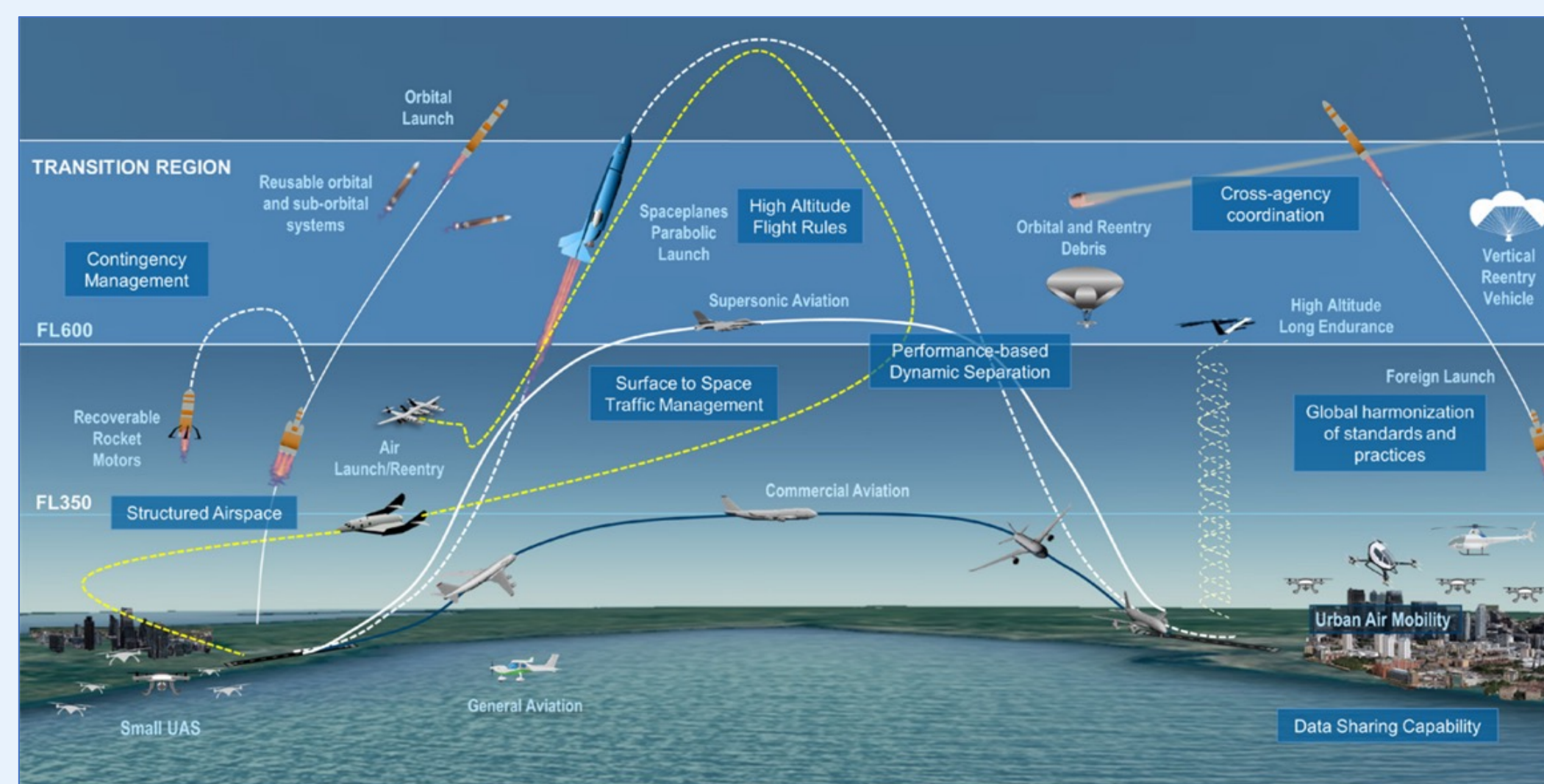
- To develop and demonstrate integrated risk management capabilities to monitor terminal area operations using data analytics and predictive models.
- To develop new technologies that identify emerging risks before an accident occurs, not after.
- To develop data science/machine learning techniques that can use dissimilar types of data to get a more comprehensive picture of risk than is possible with any single type of data.

Expected Impacts

- Methods to improve risk management and safety assurance processes by proactively identifying risks and causal factors before an accident/incident occurs.
- Augmenting the safety management system in use today to become increasingly proactive and timely and assure safety of the National Airspace System.

Proposed Solution

- Develop tools for:
 - ✓ Identifying and characterizing operational risks prior to incident occurrence
 - ✓ Monitoring a variety of data and integrating them for analysis
 - ✓ Evaluating risk mitigation strategies to proactively assure safety of operations
 - ✓ Determining causal and contributing factors to identify risks



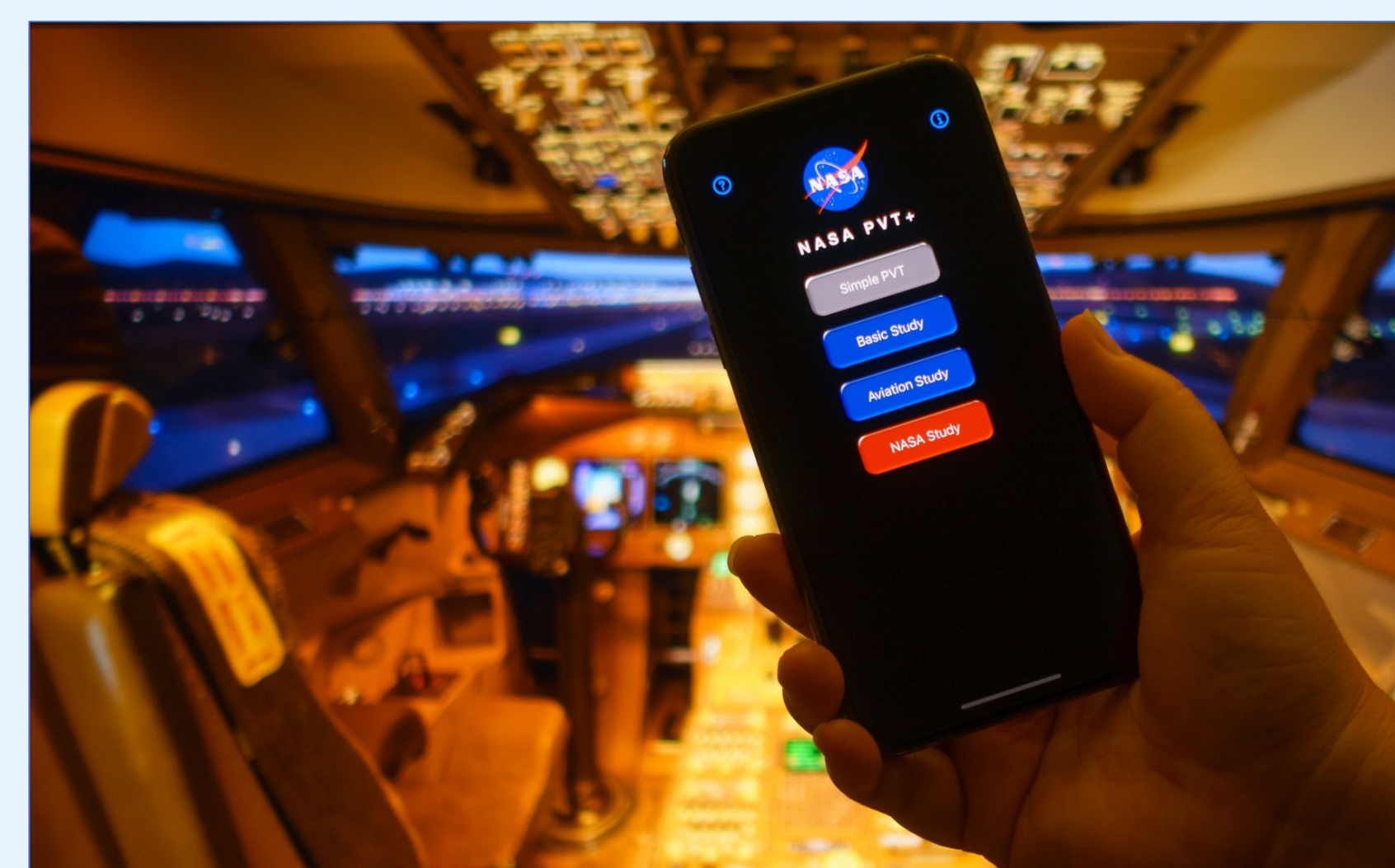
Operations within the National Airspace System continue to grow in scale and complexity.



Research augments existing SMSs through proactive risk identification and characterization.



NASA researchers are working to understand how flight crews maintain/enable safe operations.



NASA developed app for pilots to monitor their level of alertness.

Results

- Risk prediction algorithms and visualization prototype developed and tested with operational data.
- Preliminary feedback from airline dispatchers received.

Next Steps

- Risk prediction algorithms have potential for application to advanced air mobility operations.
- Next steps in the research include developing risk identification and prediction methods for full airspace.

Partners and/or Participants

- NASA Missions – Solutions support the NASA Aeronautics Research Mission Directorate (ARMD) Strategic Thrust 5: “In-Time System-Wide Safety Assurance”
- Federal Aviation Administration
- Commercial Organizations & Industry Partners
- Airlines