

Digital Flight

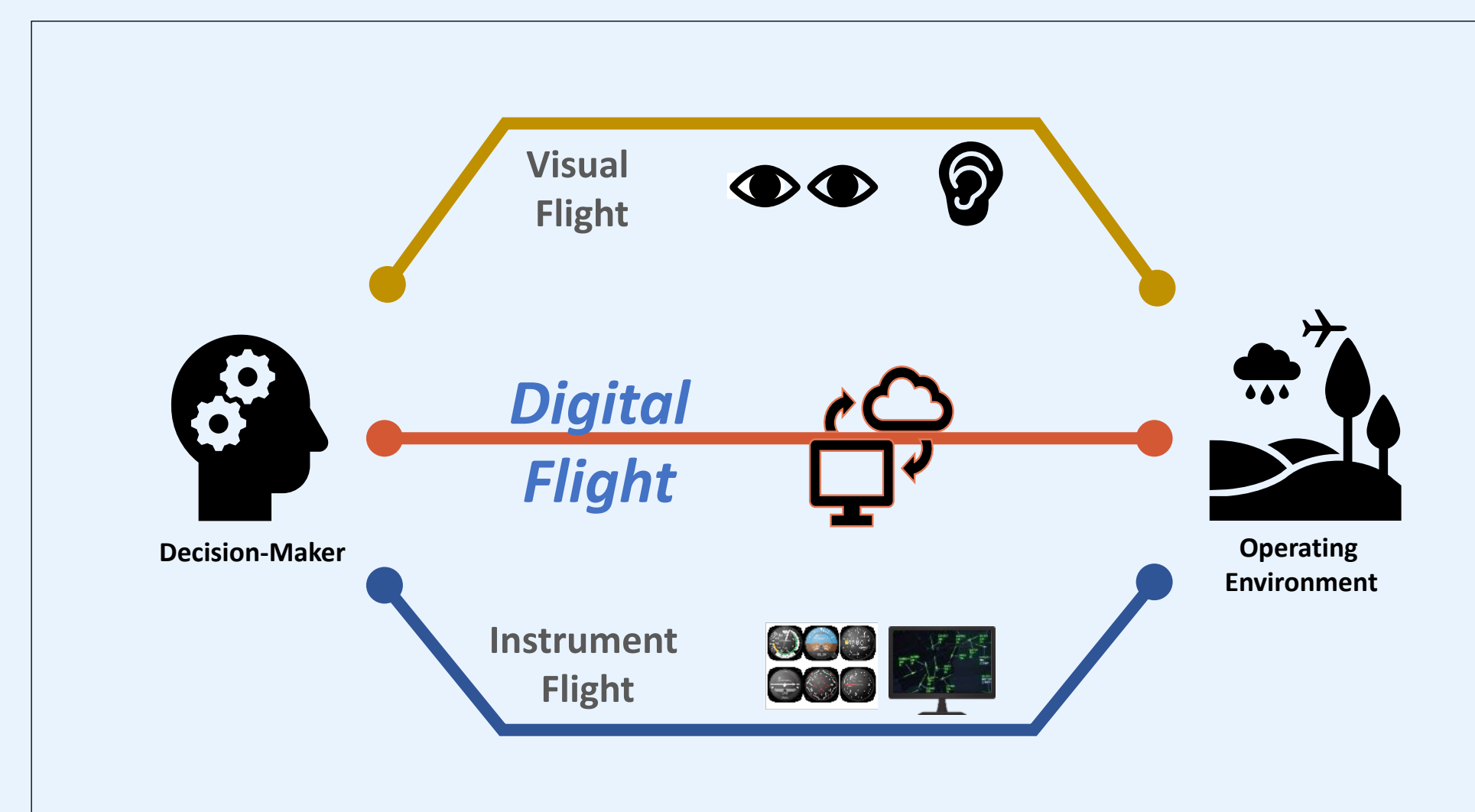
CAS Research towards “Sky for All” Vision of Cooperative and Highly Automated Operations

Challenge

Aviation is approaching tremendous change, with new technologies and new aircraft types driving diverse new operational missions.

Current visual and instrument flight operations depend on human situation awareness for safety, especially hard for unmanned aircraft.

We’re exploring a potential new operating mode that uses digital data, processing, and cooperation to empower aviation’s growth. We call it digital flight.



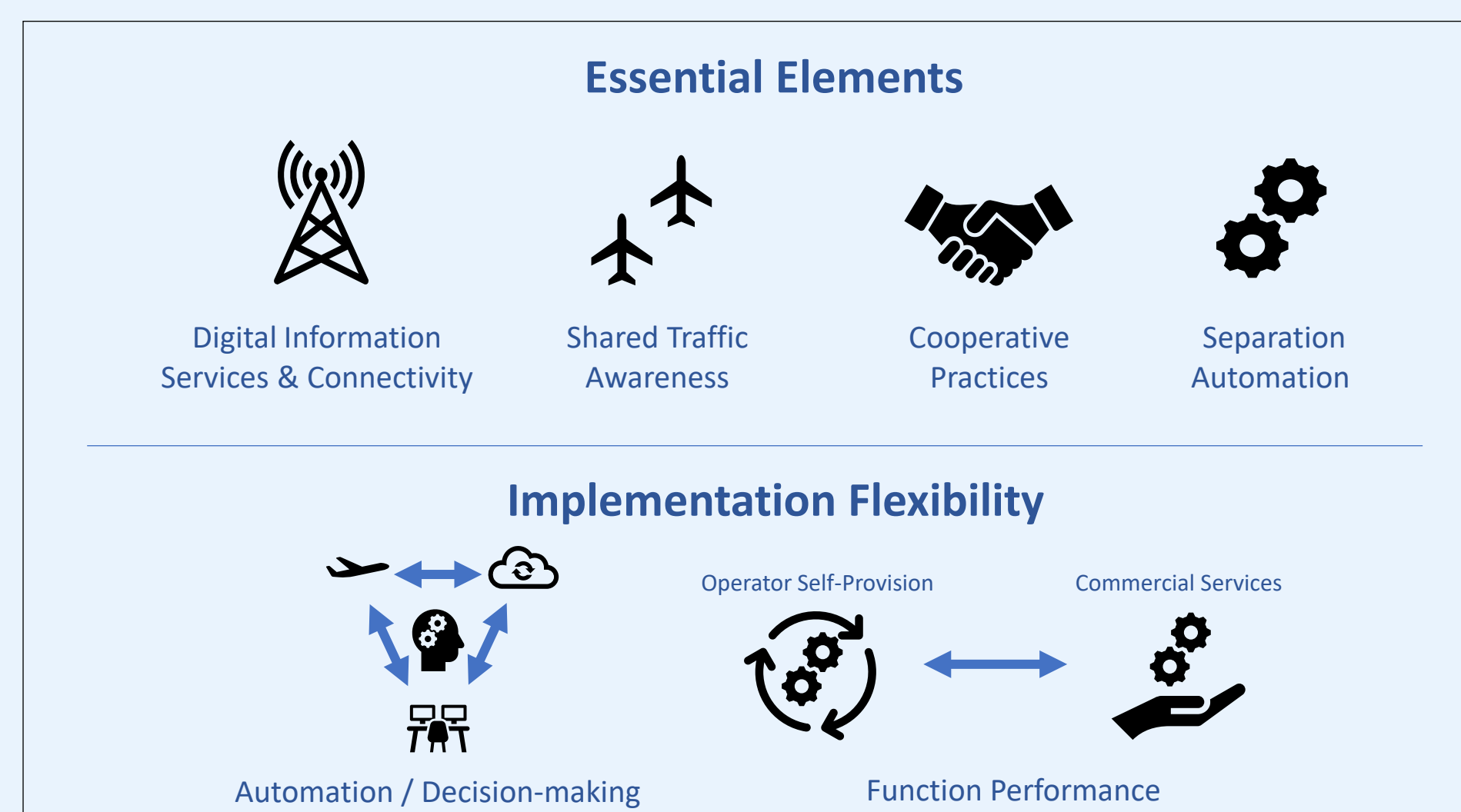
New operating mode for 21st Century operators

Expected Impacts

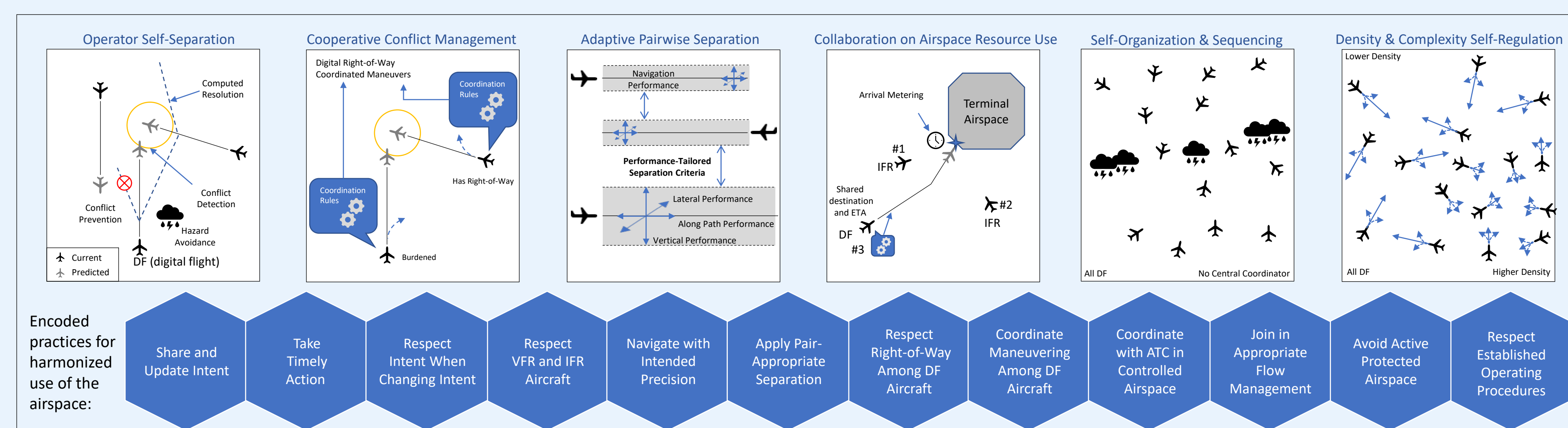
The transformative potential of digital flight is big:

- Enabling increasing diversity of flight operations, including highly automated flight
- Scaling to high tempos and densities
- Improving flight flexibility and predictability
- Increasing airspace access and growth

With safe operations at scale, digital flight could lead to greater efficiencies, new mission capabilities, and emergent markets for aviation to serve the public.



Foundational elements for cooperative digital flight



Candidate capabilities and operating practices for cooperative, highly automated, digital flight operations

Proposed Solution

- A new cooperative, highly-automated operating mode
- Backward compatible, coexisting with IFR and VFR
- Flight operations conducted by reference to digital elements (information, connectivity, separation automation)
- Builds on FAA vision of info-centric national airspace system
- Available in all airspace classes and to all airspace user categories who can satisfy performance requirements

Results

NASA’s Convergent Aeronautics Solutions (CAS) Project is exploring the desirability, viability, and feasibility of this new “digital-native” operating mode. Industry has responded with great interest and has begun to organize towards building consensus on the vision and crafting an action plan for future digital flight operations.

Next Steps

Communities working on diverse airspace innovations such as unmanned aircraft, urban air taxis, and high-altitude platforms are each exploring the benefits of a digital operating mode. Digital flight may help to harmonize these communities and accelerate industry-wide advancement.

Partners and Stakeholders

- FAA and NASA ARMD Programs and Projects
- RTCA and other standards bodies
- Aircraft operators (new entrants and traditional)
- Technology developers and service providers
- Pilots, controllers, dispatchers, operations specialists

