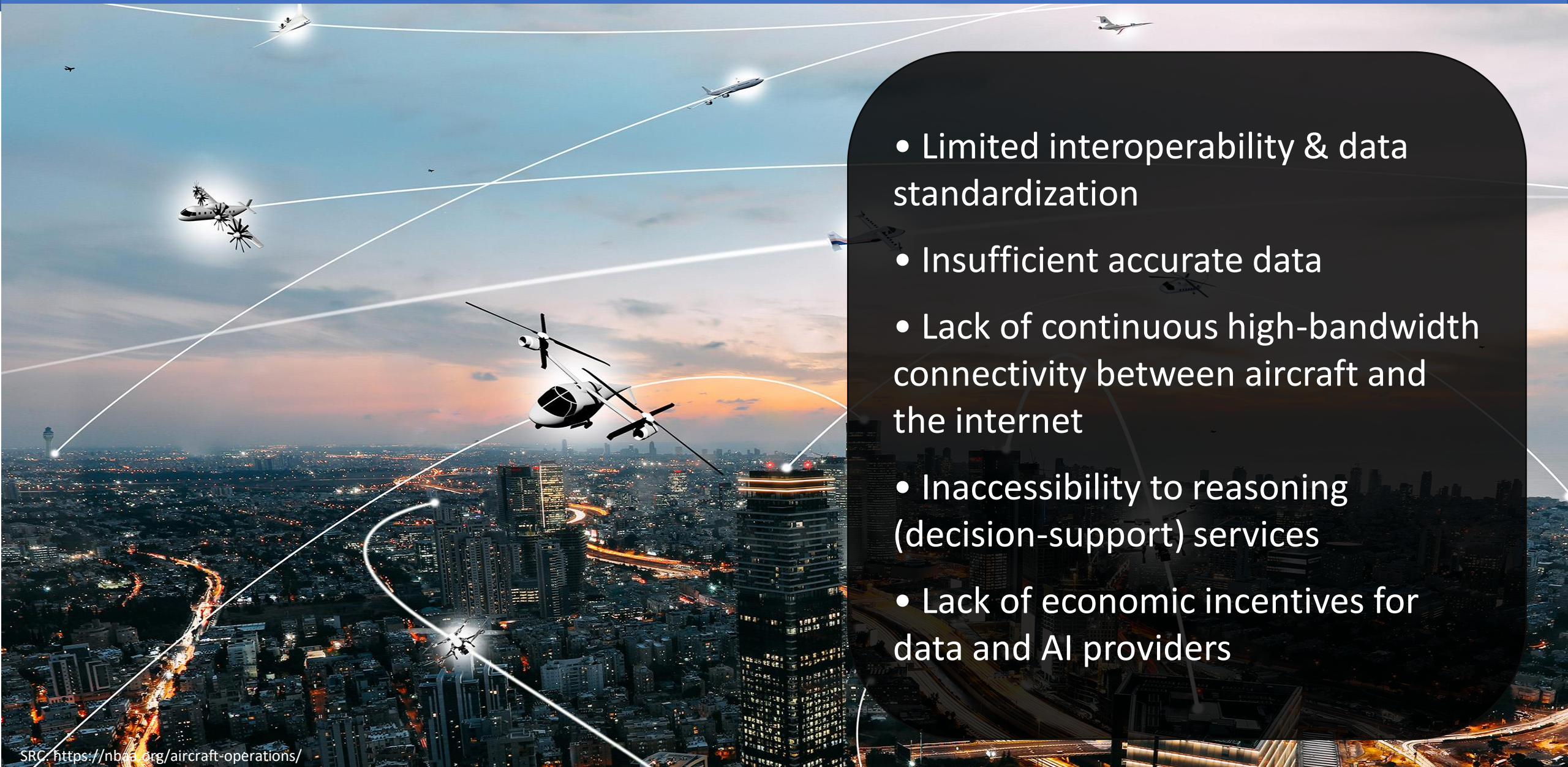
National Aeronautics and Space Administration(NASA)
Transformative Aeronautics Concepts program (TACP)
Convergent Aeronautics Solutions (CAS) Project
Data and Reasoning Fabric (DRF) Team
December 2023

Advanced Air Mobility Needs

A thriving AAM ecosystem will require decisions based on diverse and dynamic data, including vehicles, airspaces, weather, infrastructure, smart cities, payload, as well as customer data.

Advanced Air Mobility Barriers



- Limited interoperability & data standardization
- Insufficient accurate data
- Lack of continuous high-bandwidth connectivity between aircraft and the internet
- Inaccessibility to reasoning (decision-support) services
- Lack of economic incentives for data and AI providers

SRC: https://nbaa.org/aircraft-operations/

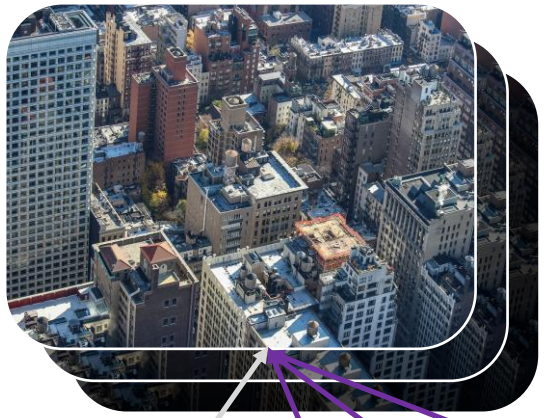
Evolving Complexity of the Info-Centric NAS (ICN)

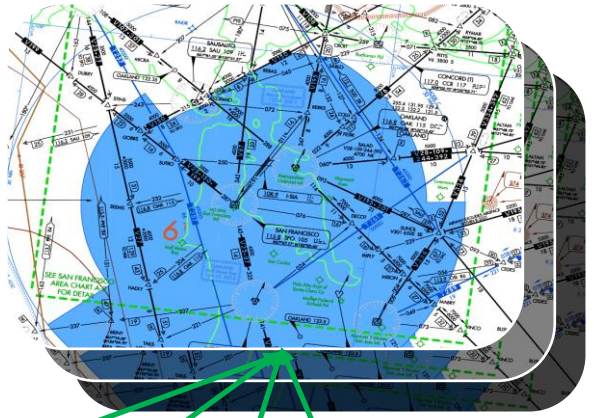
Aerospace Service Users

PLANNING

OPERATIONS

PERFORMANCE





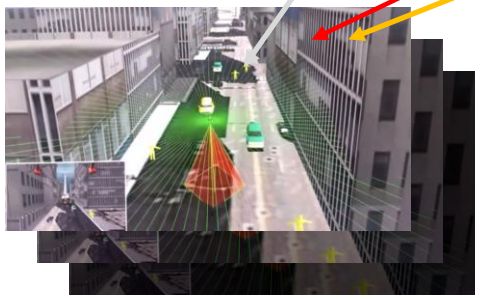
CASE-BY-CASE DATA
- DISCOVERY
- AGGREGRATION
- VETTING
- DATA/$ TRANSACTIONS

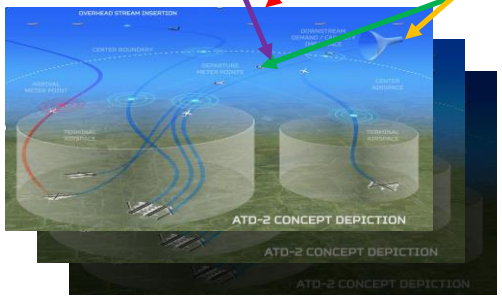
City "A" Planner

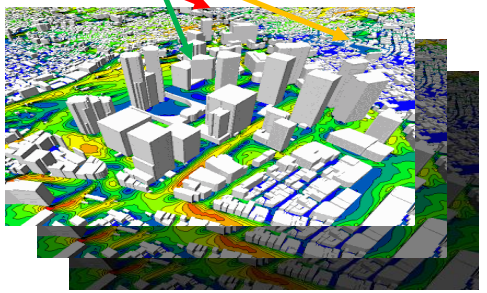
Package-As-Service Provider "A"

Mobility-As-Service Provider "U"

City "L" Planner







SMART AIRSPACES

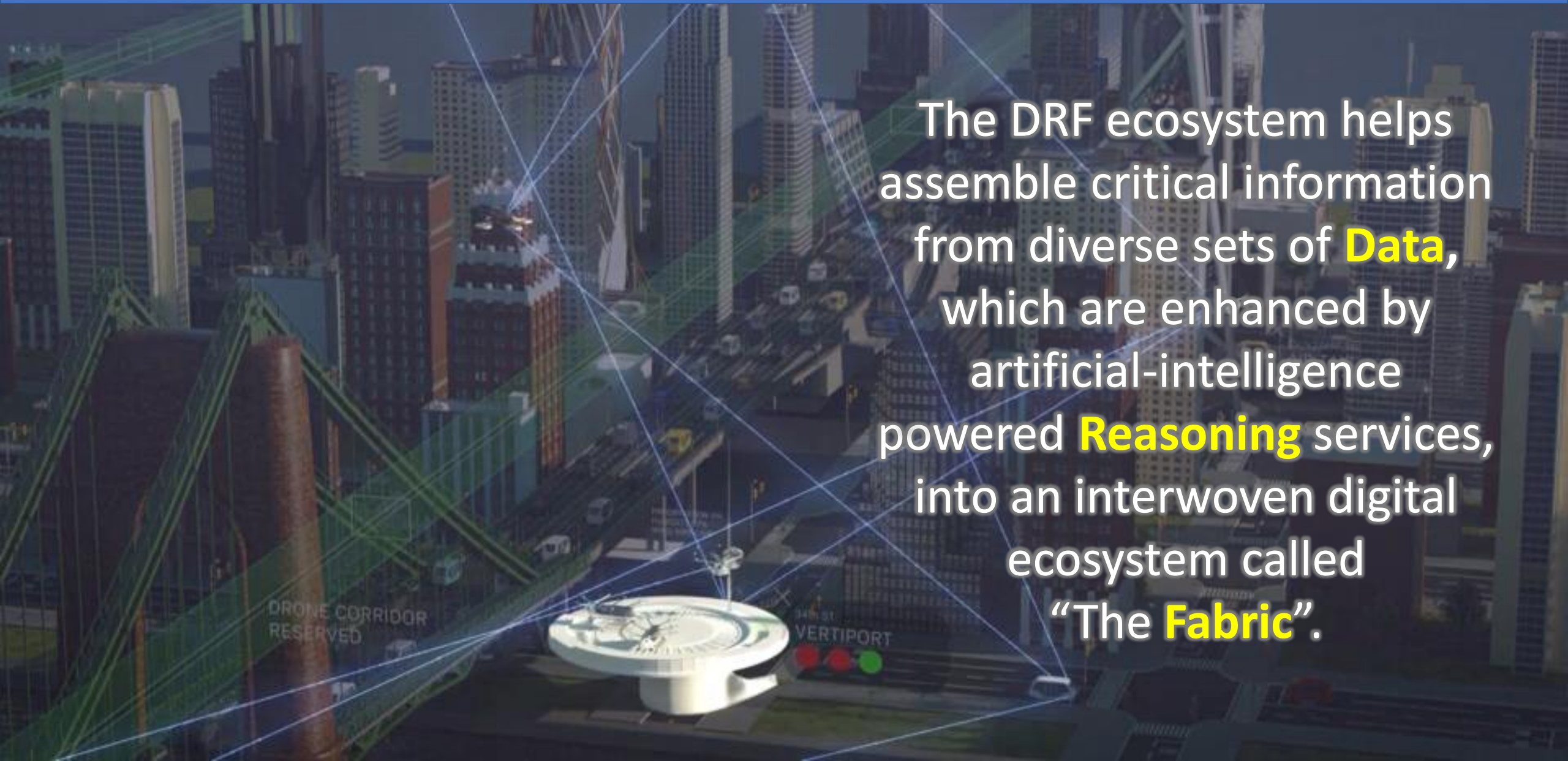
SMART CITIES

REGULATORY

MICRO-WEATHER

Data & Reasoning Services

Solution: Data & Reasoning Fabric (DRF)

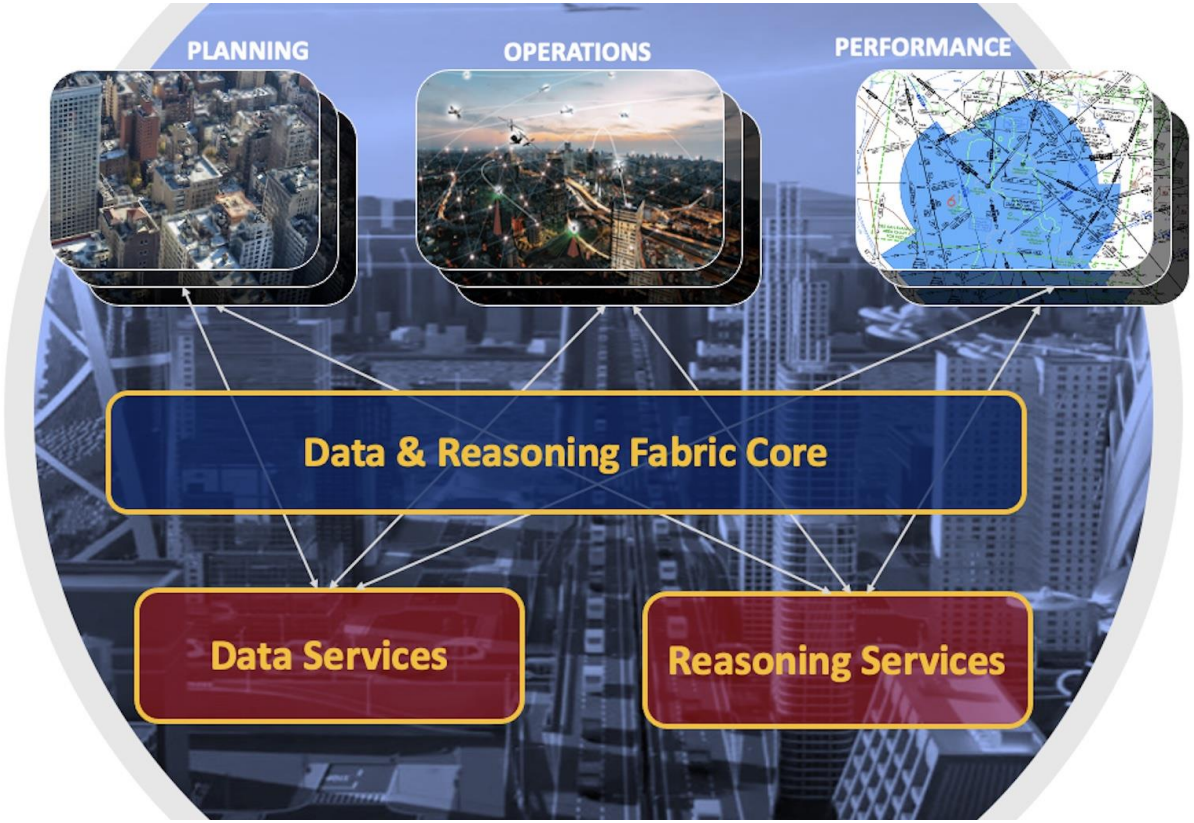


The DRF ecosystem helps assemble critical information from diverse sets of **Data**, which are enhanced by artificial-intelligence powered **Reasoning** services, into an interwoven digital ecosystem called "The **Fabric**".

Solution: Data & Reasoning Fabric (DRF)

DRF is envisioned to provide access to data and AI-driven decision support tools to:

- Enhance monitoring and operational efficiency
- Reduce barriers to entry
- Enhanced data control for participants
- Flexible exploration, evaluation, and collaborative utilization of data and AI through system-wide interoperability framework and data exchange standards
- Incorporate comprehensive security measures
- Disseminate, manage, and implement operational policies through a multi-level regulatory framework.



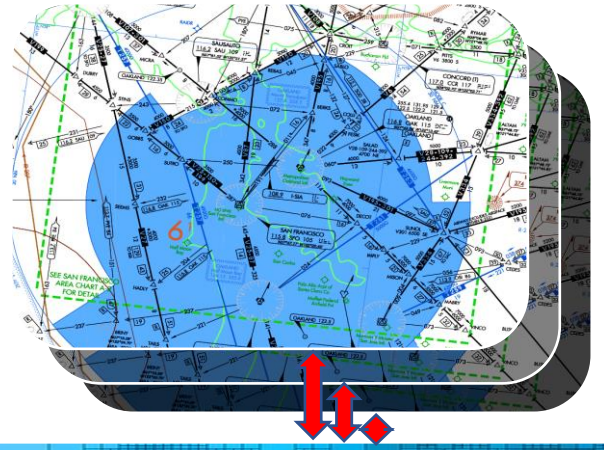
Data & Reasoning Fabric in the ICN

Service Providers

PLANNING

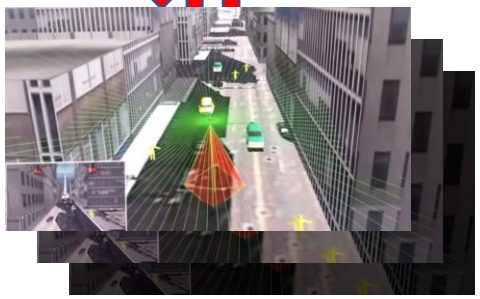
OPERATIONS

PERFORMANCE

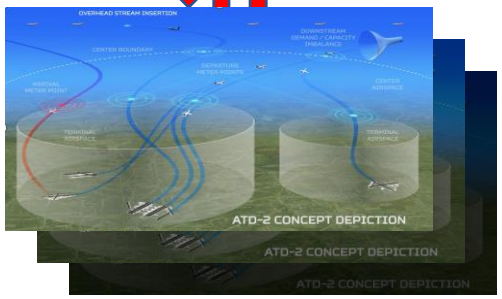


DATA & REASONING FABRIC

ENABLE EFFICIENT AND PERVASIVE DATA DISCOVERY, AGGREGRATION, AND DATA/$ TRANSACTIONS, IN ORDER TO ENABLE A DATA AND REASONING SERVICE EXCHANGE FOR AAM ENVIRONMENTS

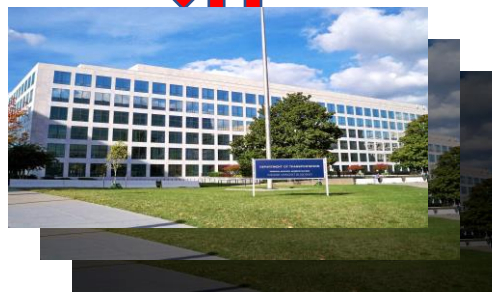


SMART VEHICLES

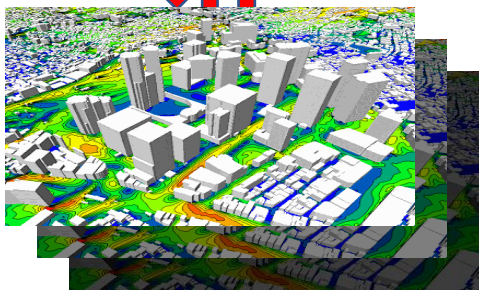


SMART AIRSPACES

SMART CITIES



REGULATORY



MICRO-WEATHER

Data & Reasoning Services

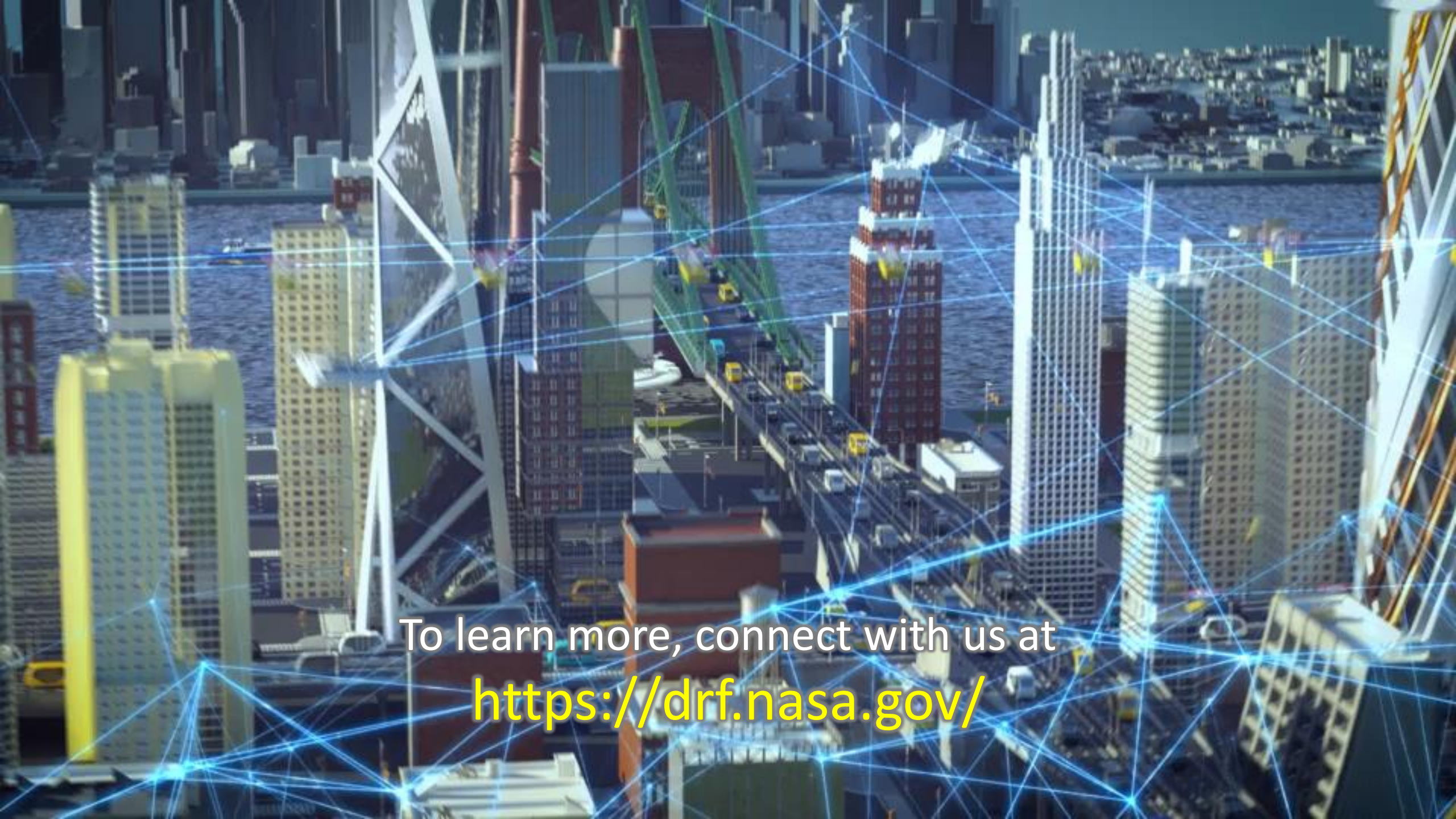
Data & Reasoning Fabric Benefits

Infrastructure

Policy & Regulation

Business Model

SRC: https://nbaa.org/aircraft-operations/


To learn more, connect with us at
https://drf.nasa.gov/

https://drf.nasa.gov