



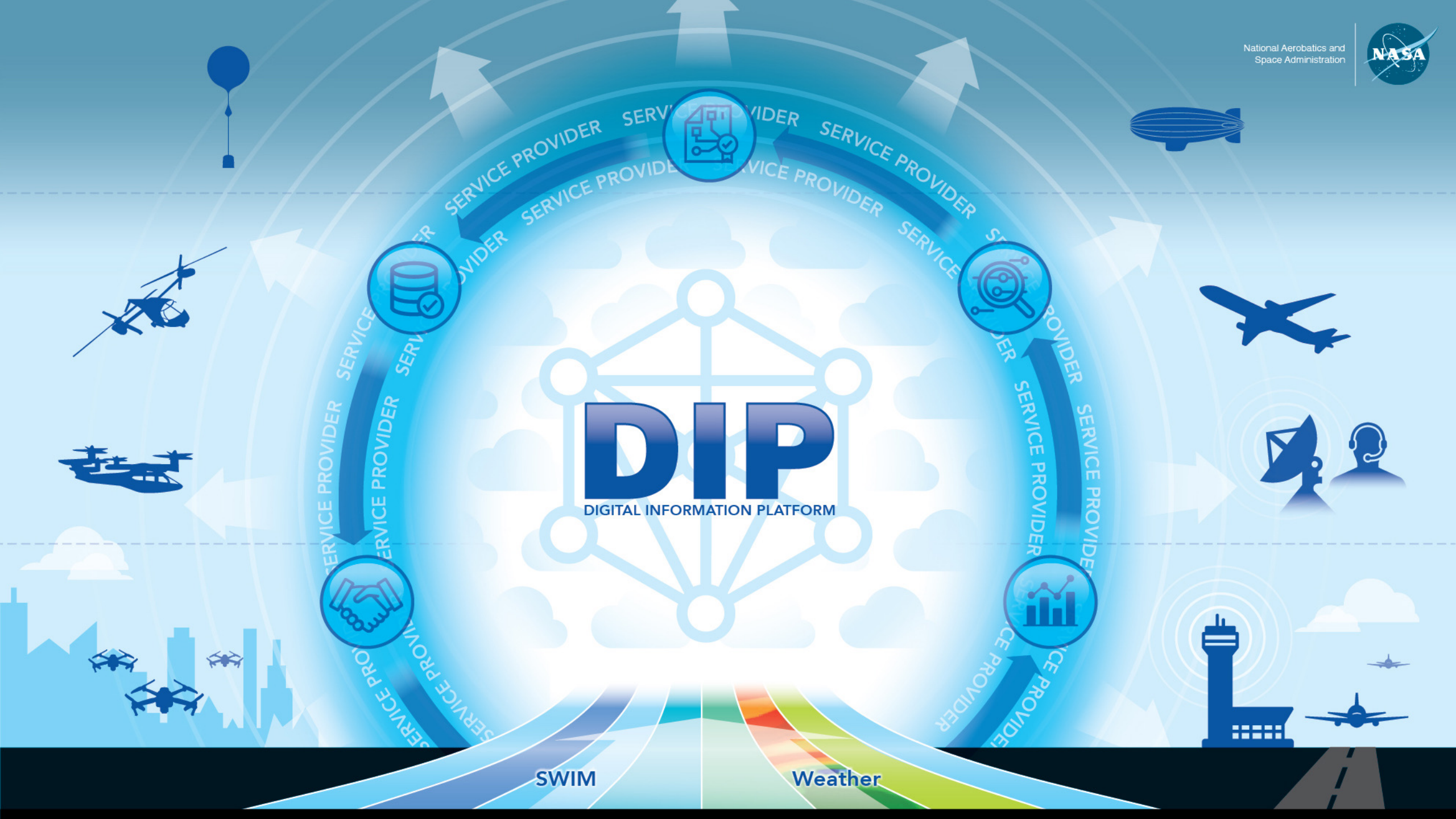
DIP

DIGITAL INFORMATION PLATFORM



SWIM

Weather





Ground Rules



- Please **turn off your mic and camera** (for bandwidth issue)
- There will be Q&A forum throughout the session and at the end
 - You may post questions in the chat box
- There will be no break
- **This session will be recorded**
 - Slides and recording will be posted on DIP home page after the event



Purpose of Sessions



- This session is to go over an aggregated summary of the responses received for the Digital Information Platform **Request for Information** (Notice ID: NARC21DIP-RFI)
- Question and Answer will follow each topic in the presentation



Agenda



- DIP Overview
- Partner Engagement Strategy
- Request for Information responses summary
 - Concept Input
 - Collaboration Interest
- Collaborative Demonstration Plan Overview
- Next Steps



Digital Information Platform (DIP) Overview



DIP Goal & Objectives



Accelerate transformation of the NAS through the development of a **foundation** for advanced, **data-driven, digital services** from **traditional operations** and **new entrants** to promote **cohesive decision making**

- **Stakeholder-Informed Platform:** Create a stakeholder informed requirements for a digital data platform to improve the deployment and access of services.
- **Validated Reference Implementation:** Develop a reference implementation of DIP to validate stakeholder-informed requirements
- **Data Needs for Services:** Evaluate a variety of services to identify data needs for the DIP architecture.
- **Demos with Partner Collaboration:** Coordinate demonstration with stakeholders of reference technologies, new service(s) and DIP framework
- **Recommend Processes:** Share best practices for sharing data and data handling among stakeholders in the DIP community



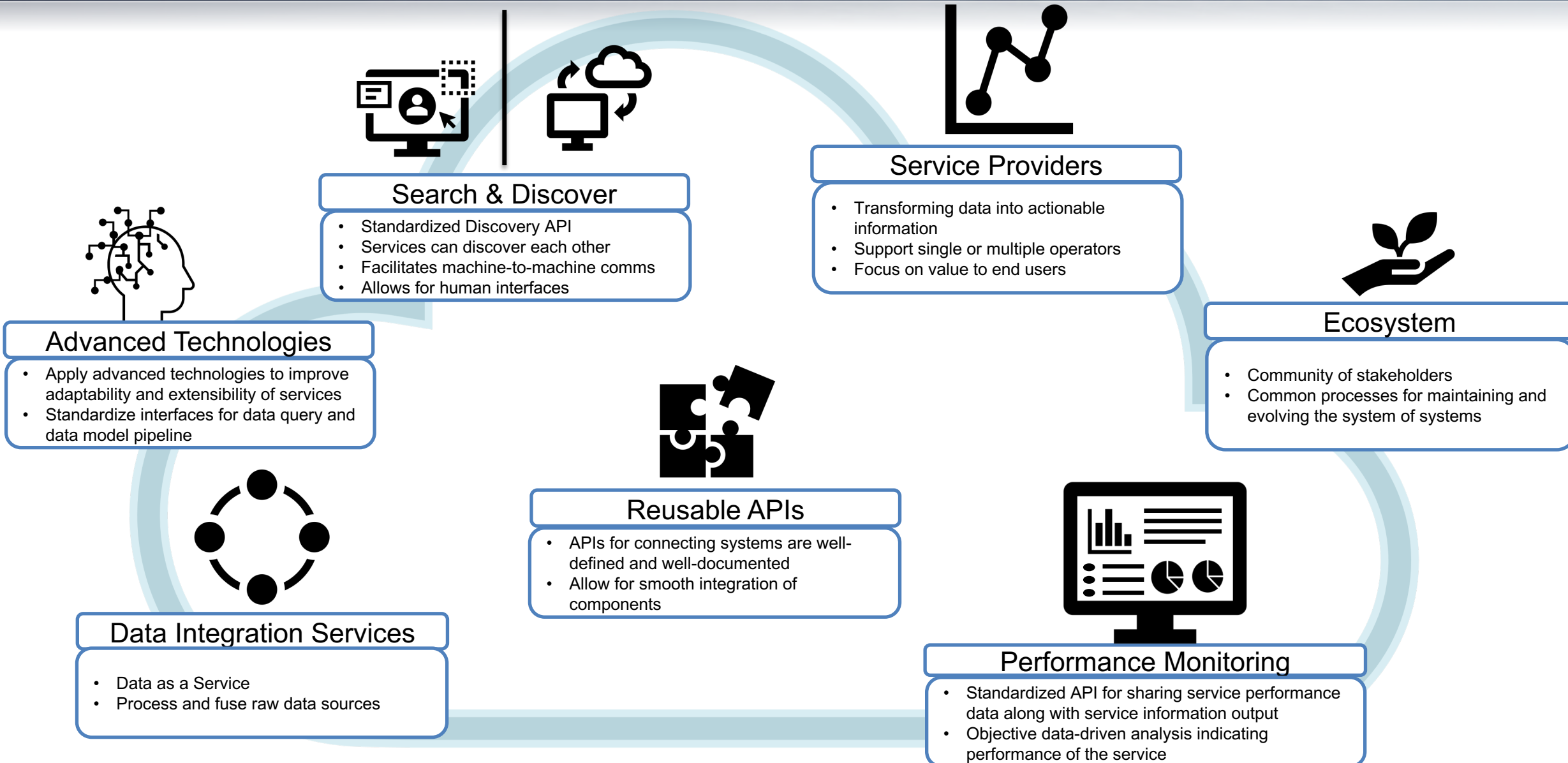
Motivation



- Current day ATM system is segmented by domain, operator groups and solution provider groups
 - A challenge for those who seek holistic (system wide) solutions
 - Very few understand all of the data producing systems and their artefacts
- Aviation community is trending towards wider range of operations types
 - New types of aircraft, and/or at a higher level of operational density
 - Complexity that require higher levels of synchronization
- Traditional ATM system was built in an era when rapid technologies were not available or common
 - Changing the large and complex system-of-systems in the NAS is an overwhelmingly complex integration challenge in which very few innovators can contribute
 - Technology advances—in cloud-based infrastructures and artificial intelligence, for example—that are converging to further streamline access and conduct airspace operations in a more collaborative, integrated, and seamless way

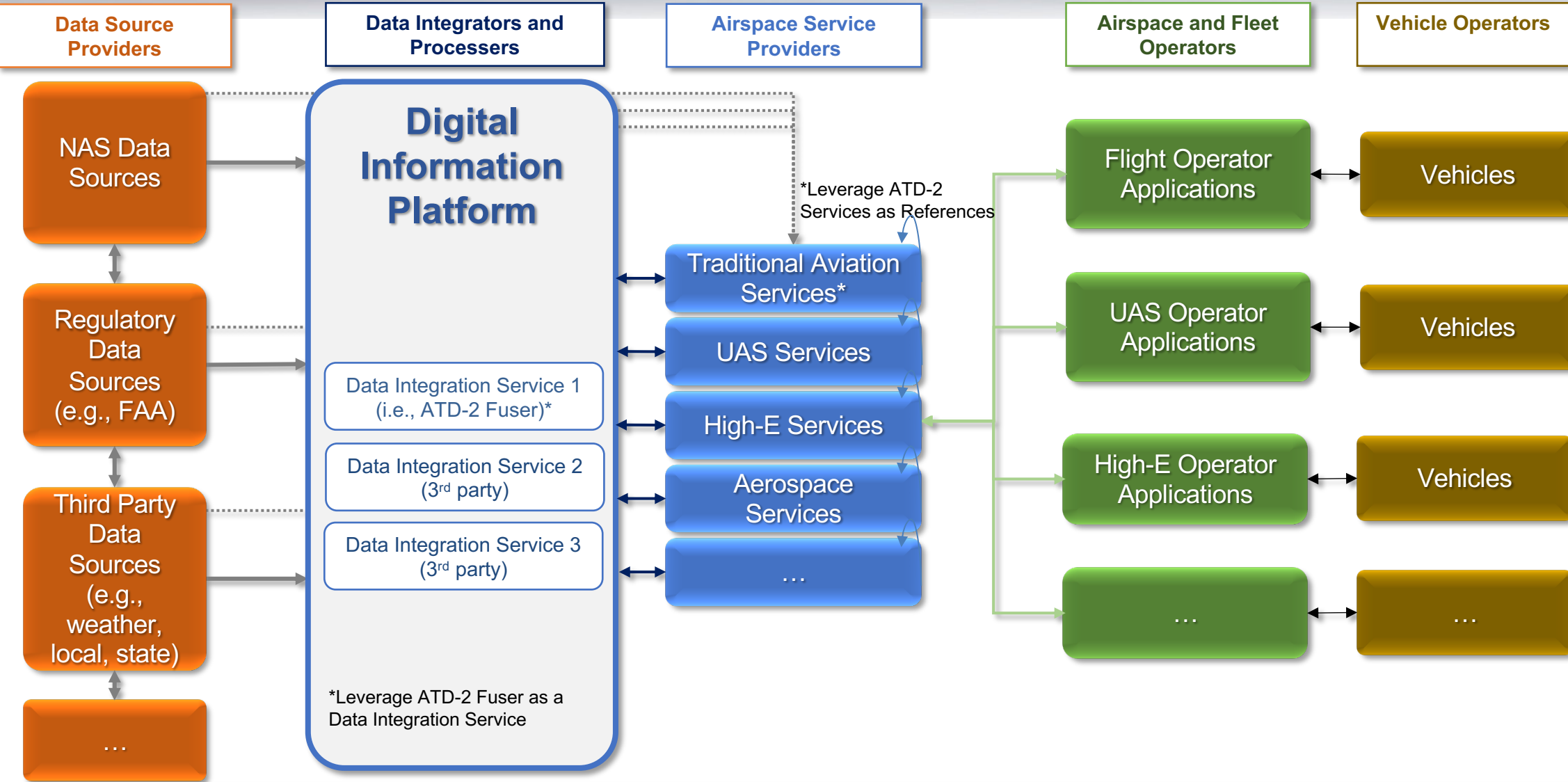


DIP Features





Notional Digital Information Platform



Common, simplified interface to integrated, processed information



Leveraging Previous ATD-2 Work



- Collaboration with SWIFT and CDM led NASA and Industry to realize that the SWIM-based services NASA used to build the ATD-2 system have value above and beyond their use in the ATD-2 Field Demo
- **Fuser**
 - Ingests voluminous air traffic data from disparate sources and intelligently organizes it to deliver the **right data, at the right time**
- **Fuser-to-Cloud Connection**
 - Connects NAS-wide Fuser to Consumers via Cloud
- **Re-Route Digitization Service**
 - Digital rerouting of departure flights that accounts for real-time demand/capacity imbalances and incorporates flight operator preferences via Trajectory Option Sets (TOSs)
 - multiple flight operators from multiple airports used the system to intelligently identify and execute reroutes in coordination with FAA traffic managers



DIP Technical Goals



- **Discoverable Data & Services** – easy to understand and find information and services
 - (e.g., get a full picture of a flight using DIP services without relying heavily on deep subject matter expertise to handle complex, real-time SWIM data)
- **Scalable Integration** – able to connect variety of data sources and data-driven services, including
 - Fused data services for real-time decisioning and collaboration
 - Post-operations analysis and understanding
- **AI/ML & other Advanced services**
 - Able to create machine learning or artificial intelligence models and data pipelines, for innovative ways to plan and understand operations (e.g., runway arrival prediction model)
 - Standardize data API to be more data-science friendly
- **Adaptability/Configurability** – ability to adapt and configure DIP services for
 - Re-using and connecting one or more services to align with a specific operator's needs (e.g., integration with specific operator scheduling or planning systems)
 - Learning and adapting one or more advanced AI/ML services (e.g., customizing models for specific region)
- **Trust** – trust the data services, with secure access for producers and consumers of services

Improve the access and usability of NAS data services for operator decision support tools and for collaborative decision making among all NAS users



Partnership Engagement



Benefits of Participating



- **Define and Contribute**
 - Be an Industry Contributor to drive the data services architecture
- **Develop and Showcase**
 - Develop capabilities early and Participate in demonstrations
 - Be a Data Champion for your organization
- **Spur Efficiency and Growth**
 - Collaborate with NASA to drive standardization of new data and new services

Have a **VOICE** in DIP design and be **EARLY** to adopt



Partnership Approach

Leverage Existing Partnerships from ATD-2

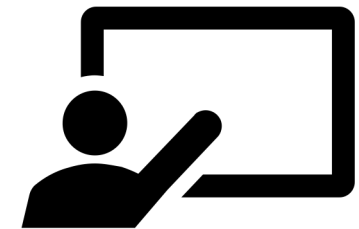


Publish RFI & ACOs to expand Industry Engagement



Collaborative Workshops & Demos with Partners

Opportunities for partners to collaborate on standards definition and validate concept and demonstrate their services and capabilities as contribution to DIP ecosystem





Who Should Participate



AIRSPACE/FLEET OPERATORS

Service Consumers
 Airlines
 Airports
 UAS Ops
 AAM Ops
 Space Ops
 FAA
 Research Orgs



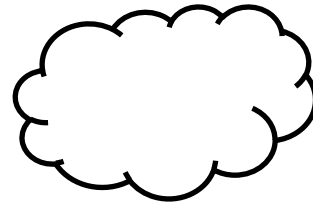
DATA INTEGRATORS

Industry
 Academia



PLATFORM HOST

Public Cloud
 Private Cloud



SERVICE PROVIDERS

Service Developers
 Industry
 Academia



DATA SOURCE PROVIDERS

FAA Sources/SWIM
 Airline
 Airport
 Vehicle
 Weather

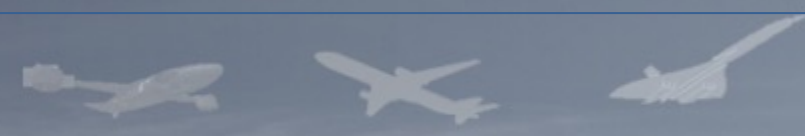




RFI Response Overview



RFI Information and Schedule



- ✓ **Mar 24, 2021** - RFI Published (NARC21DIP-RFI)
 - <https://beta.sam.gov/opp/72937e9b69834a708b216cbb3540699e/view>
- ✓ **April 14, 2021** - RFI Info Session held on
 - Information session slides: <https://nari.arc.nasa.gov/atmx-dip>
 - FAQs: <https://nari.arc.nasa.gov/atmx-dip>
- ✓ **May 14, 2021** – RFI Responses deadline
- ✓ **July 8, 2021** – NASA Internal RFI Summary briefing
- **Upcoming**
 - **July 29, 2021** – RFI Summary outbrief to A4A
 - **August 2021** – RFI Summary outbrief to broader aviation community
 - **October 2021** - Announcement of Collaboration Opportunity (ACO) with template agreements attached



Who responded to RFI?



Demographic	Examples	Count
Flight operator	Conventional (4), UAS/UAM/AAM (3)	7
New entrants	Helipads/vertiports, USS, PSU, UAS test site, operations support, UAS services, Autonomous UAS operations, state gov.	10
Service provider	Aviation services, standardized APIs, ML predictions, flight matching, vertiports network management, consulting, weather data translation, high-fidelity simulation, audit service, metrics, aircraft separation assurance, cloud-based ATM solutions, data science	27
Data Integration Service provider	Historical data, data security, field data integration, SWIM data fusion, fuser(-like) ref. implementation, fusion of surveillance data	13
Cloud/Infrastructure	Cloud-hosting, Data pipeline, streaming analytics	6

37 Total RFI Responses Reviewed



Input Requested from RFI Responses

- **Concept Input**
 - Needs / Challenges
 - Data / Service Needs
 - Use Cases
 - Adoption Requirements & Anticipated Obstacles for Adoption
- **Collaboration Interest**
 - Partner Contributions
 - NASA Contributions Needed
 - Feasibility of Collaboration
 - Prior / Current Collaborations

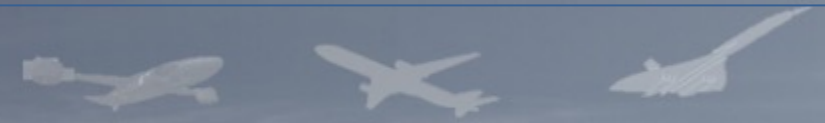


RFI Response Summary

Concept Input



Eye-catching Quotes



- "Analysts spend too much time gathering, cleaning, structuring, fusing, and organizing data"
- "Struggle to consume/extract meaning from SWIM, weather, and other feeds"
- "Need to bridge gaps between data silos to allow commercial planning, revenue management, and operations to work together as a team"
- "Flight matching across different data sources is a challenge"
- "Unified information formats, types, units, and information compatibility remains a significant problem"
- "Scale, speed, and security should be DIP main data concerns"
- "Need for "once and for all" aggregated, validated, and redistributed surveillance data"
- "Data is available but not shared by the FAA; Data is shared by the FAA, but not machine readable"
- "NASA should consider multiple data integrators, each specific to a set of data items or geographic area (e.g., airport or airspace region)"



Needs / Challenges



Data Integration / Accessing	Data Availability	Irregular Operations
<ul style="list-style-type: none">• Disparate data formats and sources and use of different terms for the same data in multiple feeds• Access to data, security and unique interfaces from large numbers of data sources• Integrating multiple data sources into a single source of data for broader consumption, reporting, and analytics• Processing the complex XML schema• Inconsistent understanding of weather information for decision making• Difficulty in fusing data for analytical and operational needs• Handling large volumes of data so that time-sensitive data is not stale upon arrival• Fusing weather data and air traffic data• Data access through SCDS for operationalizing the data• Targets misidentified and correlated with wrong flight ids in SWIM feeds• Scale, speed, and security• Restricted access of SWIM data by reporting teams due to security environments	<ul style="list-style-type: none">• Lack of readily accessible and comprehensive historical data• Low-quality/fidelity or outdated data• Open-source data lacks fidelity• SWIM feed lacks gate assignments and airline schedules• Mode-S codes not available for many of SWIM feeds• Air navigation elements, especially airport surface, are not available centrally• Lack high fidelity airport demand figures and instead rely on static scheduled information for part 121 traffic only• Lack or equivalent use of terms to express weather uncertainty	<ul style="list-style-type: none">• Data gaps that preclude accurate predictive models to anticipate IROPs• Lack of NAS-wide visibility for ATC employed playbooks during IROPs• Need AI/ML service for IROP event clustering/visibility using historical NAS-wide data• Contextualizing aviation weather information to NAS ATM impact for managing uncertainty and building predictive services for decision making



Data Needs

Weather

- **Mentioned by almost every respondent**
- Encompasses **very broad range** of data
- **Traditional** weather data: Real-time radar / forecasts from, e.g., NOAA
- **Wind**: High-altitude (for high-E operations), turbulence monitoring / prediction, urban canyon
- **Micro-weather** for UAM/UAS: Wind shear in urban areas, rerouting based on weather and aircraft capabilities
- **Merging** of hyperlocal and mesoscale weather information
- **Airlines mention specific value-added weather services**

Surveillance

- **Many mentions of surveillance, including several of ADS-B specifically, and encompassing both traditional and new entrants, e.g., ADS-B security and coverage for low altitude flights**
- One specifically mentions “**once and for all**” aggregated, authoritative surveillance data, encompassing both traditional and new-entrant aircraft
- Many respondents mention needs for UAS/UTM surveillance. Some respondents mention **proprietary infrastructure for surveillance of UAS/UTM.**

Other data related inputs

- Aviation-related **geospatial data**, e.g., obstacles, terrain, population, noise restrictions
- Static and dynamic **airspace configuration**, e.g., airport configuration, taxiway/runway closure, flight procedures
- **Data dictionary**, documentation on calculations, input sources, **preferred connection method**
- **Evaluate data quality** from data sources, effectiveness of data directives, and other business logic
- **Communication infrastructure** for UAM/AAM: Maps of cell phone coverage or GPS coverage, or data on power outages that affect communication



Takeaway / Comments / Questions?

- Airlines experiencing difficulties in accessing, integrating, fusing SWIM data in order to make the information usable for analytical and operational use
- Lack of readily accessible and comprehensive high quality historical data
- Importance of integrating weather data for better impact prediction and decision making (for both traditional and emergent operations)
- Need for data-driven accurate predictive model for managing IROPs
- Need for a mechanism to protect/safeguard proprietary data of flight operators
- Compatibility and fusion of all different surveillance data sources, including low-altitude surveillance for UTM/UAM/AAM operations
- Top data needs are weather and surveillance



Service Needs



NAS Efficiency	Disruption Prediction / Mitigation	NAS Simulation and Playback	Noise Monitoring
<ul style="list-style-type: none"> • A service similar to TFMS Flight or Fuser which allows an operator to query for data related to a single flight • A service that returns the current NTML/route restrictions and prediction of how those restrictions will impact arr/dep into a TRACON • Expanded digital reroute service to include route validation for operators to submit routes • A fused service for airport info including ITWS, STDDS, airport configuration, flow programs, NTML/route restrictions, and arr/dep volumes 	<ul style="list-style-type: none"> • Predict disruptions in advance to minimize impact • Characterize impact of IROP, either proactively or retroactively • Cluster IROPs by cause 	<ul style="list-style-type: none"> • ATM simulation: useful for more high-level traffic management. Simulating the impact of disruptions or TMIs, both for prediction and retrospective analysis • Physics-based simulation: Useful for simulating the flight dynamics of individual aircraft. Optionally photorealistic, for synthesizing photographic data, or for visualization 	<ul style="list-style-type: none"> • Noise limitations imposed by authorities (local, state, FAA, etc.) • Prediction of noise generated by scheduled routes



Use Cases (1)

Traditional Services

- **IROP event characterization** and constraint response through statistically valid clustering and classification of historical data
- **IROP strategic planning**: probabilistic prediction constraint service
- **IROP tactical management**: predictive delay and alternative evaluation service
- Regular operations **efficiency service**
- **ATC throughput modeling** to determine capacity by assessing forecasted WX and NOTAMs
- ATC throughput decision support tool to proactive airport reductions using probabilistic WX
- **Flight time prediction** tools (ETA, ETD, taxi time, etc.)
- Current **NTML/route restrictions** and impact on arr/dep into a TRACON
- Digital route service that includes a route validation for operators
- Fuser service to **predict taxi time, runway, arr/dep fixes, and preferred route**
- A service that allows the operator to **query for data related to a single flight**
- **NAS metering impact prediction** and collaborative scheduling
- Digital NOTAM implementation
- Schedule and block time **optimization**

Emergent Services

- **Connecting and merging of flight data** between crewed and uncrewed operations for safety, SA, and to enable more flights
- **Strategic deconfliction** across the NAS and all its stakeholders
- **Micro-weather prediction** service for safe UAS/UAM/PAV operations
- **Commercial space airspace closure** collaboration and impact analysis
- UAM **noise-impact routing** service
- UAM **wind alerting and rerouting** service
- **Weather guidance** service for Upper Class E traffic management
- Quantify and evaluate performance of **cell-based communication** options and limitations
- **Compatibility and fusion of all different surveillance data sources**, particularly low-altitude surveillance
- Prove and demonstrate safety use cases for low altitude flights
- Mature **AAM environment interacting with conventional** air traffic **with weather-induced disruption**
- BVLOS autonomous and AAM operations for real-time tactical and strategic decision making with aid of **dependable and secure access to timely, accurate, trustworthy data and services**



Use Cases (2)

Platform Services

- Security monitoring and control for sensitive data
- Security monitoring and control for DIP usage
- Apply ML technique to continuously evaluate data quality from data sources and effectiveness of data directiveness and other business logic
- Analyze traffic, attendance, number of downloads, data usability, or data request vs. data download ratio
- Research question: whether a single platform should accommodate diverse needs or multiple distinct platforms would be appropriate?
- Use cases that will be used to identify requirements and evaluate DIP platform designs
- Data pipelines, real-time analytics, stream analytics
- Security, regionalization, pipeline integration



Takeaway / Comments / Questions?

- Characterization of IROPs through statistically valid clustering/classification of historical NAS-wide data
- Services to support strategic and tactical route decision under IROPs through predictive analytics with weather uncertainty taken into consideration
- Expanded digital reroute service to include route validation for operators to submit routes to ATC
- Flight time predictions, Accurate runway configuration, delay, and taxi prediction models
- ML technique to continuously evaluate data quality from data sources and effectiveness of data directiveness and other business logic
- Being able to run simulations of different TFM initiatives on current and previous events
- Micro-weather prediction service and noise-impact route service for UAS/UAM operations
- Fusion of all different surveillance data; low-altitude; AAM interacting with traditional air traffic



RFI Response Summary

Partner Contributions and Adoption Requirements



Partner Contributions (1)



Traditional Service Providers

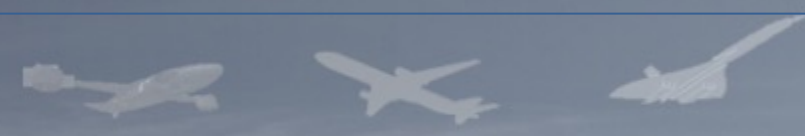
- SME input to understand and validate DIP needs
- Provide advanced big data/AI/ML solutions built on historical data to predict future events
- Apply AI/ML modules on-top of DIP data to demonstrate benefits of the platform
- Provide Fuser, ML pipeline, deep learning, wind miles, sector complexity ML applications
- Share model outputs such as ATC throughput model results, associated predicted delays by flight
- Test and validate components of DIP including interfaces, services, data inputs, and outputs
- Provide expertise on ATM, operations, data science, etc. based on specific project needs
- Develop a proof-of-concept demonstration of real-time alerts from DIP-sourced data feeds
- Trajectory prediction services for TBO
- Share data and applications based on SWIM developed services
- Leverage existing data products (using SWIM) and reporting apps

Emergent Service Providers

- Provide SME support to understand needs and validate concepts from the USS perspective
- Share data and define data elements upon which services can be built
- Provide notional / working framework of emergent NAS operator routes for UTM, UAM, AAM
- Provide HW (air traffic receivers and drone trackers) and server SW, including access to data streams
- Provide high-fidelity simulators to test and develop UAS platforms; can be integrated as data source for DIP
- Define reporting and performance requirements for data information and services to characterize against expectations
- Provide a UAS testing environment for concepts that may need verification
- Provide expertise on security set up for sensitive data
- Technical information exchange on requirements and architectures for services
- Micro-weather forecast services for UAS/UAM/PAV operators
- UAS detection and tracking, conflict detection, and route pathfinding services



Partner Contributions (2)



Data Providers	Platform Providers
<ul style="list-style-type: none">• "As a mass data user and generator, we have the potential to contribute and/or advise from a data source provider"• Provide forecast convective weather data via API• Share data of all pre-validated routes: Playbook routes, Coded Departure Routes (CDR's), IFR Preferred Routes, North Atlantic Tracks, any future routes validated for use by UAS, UAM and AAM operations, space transportation, balloon and supersonic/hypersonic flight• Supply supplemental data as an authoritative SDSP and airspace sensor data• Provide TFMS data elements to be integrated with DIP• Integrate data to DIP, such as flight plans, surveillance, FLIFO-type info, basic schedules, flight milestone predictions	<ul style="list-style-type: none">• Provide a framework for DIP to NASA for internal use or public use version for collaborative use• Contribute to cloud services, AI/ML services, co-develop specific services for aviation needs• Develop demonstrations of Secure Cloud Native Data Analytics (SCNDA) platform (cloud provider agnostic) in collaboration with NASA that ingests, transforms, analyzes, and allows users to consume data• Reference implementations for automated metadata collection, data governance, data and service catalog, and metadata models• Assistance in designing, configuration, and implementing the attribute-based access control system that will also integrate with data and service APIs



Areas of NASA Contributions Needed

Areas of NASA Contributions Needed

- Concept of Operations
- Development of DIP reference implementation
- Establish data sharing processes and procedures for shared services through open standards organizations and/or private-public collaboration
- Test and validate requirements and technologies developed under DIP
- Access to SMEs and researchers involved with DIP concepts, technologies
- Provide cloud hosting or related technology services, including big data, shared information and/or data-driven services
- Access to available relevant test environments for simulation and live demo platforms
- Access to available relevant data from DIP research
- Access to available necessary air traffic data
- Access to available relevant third-party government data (local/state/federal)
- Facilitate data/information sharing agreements between NASA and parties to make services viable



Takeaway / Comments / Questions?

- Provide SME inputs to understand and validate DIP concepts
- Provide and share current/future operations needs and pain points to current system
- Test and validate components of DIP including interfaces, services, data inputs/outputs
- Assist with helping define schemas and data normalization associated with designing storage for the data repository
- Assist with data analysis and modeling in support of making predictions in the selected use cases.
- Assist with defining API endpoints with regard to the required/optional parameters and definitions of the response
- Share data and applications based on SWIM developed services



Adoption Requirements/Obstacles/Business Priority



Adoption Requirements / Obstacles	Business Priorities
<ul style="list-style-type: none">• It is hard to support unfunded collaboration• Identification and approval of business case ROI opportunities to invest in the DIP collaboration• Information security requirement for data safeguarding• Future ownership of IP rights• Collaborative S/W development/integration projects can be difficult to orchestrate• Risk associated with providing proprietary data or internally developed logic to the community• Unfamiliar with the format of the data in the DIP. May need help digesting the data• Fuser was designed for a particular purpose and may not be appropriate for general use. Suggest alternate data integrators• Need for pre-operational and ongoing feedback-based V&V, consistency in V&V approach• Ensure quality customer experience by making sure data-fusion rules don't conflict• Apprehensive about providing proprietary data or logic to the community without a solid understanding of how it would be used and who would have access	<ul style="list-style-type: none">• Identify MVP – smallest technical scope with highest values• Leverage mature use cases in order to minimize development cost• What commercial and licensing terms are envisioned once services are acceptable TRL and become “production-ready”?• Weighing how broadly the learnings or logic can be applied to other use cases• Need to understand path for long-term maintenance of DIP• Understanding revenue models - DIP needs to plan for how to address issues related to charging users for services• Business subscription model for data and predictive analytics• Company plans to monetize the services they develop; DIP needs to plan for how to address this



Feasibility and Prior / Current Collaborations

Feasibility of Collaboration

- Will likely need an opportunity to receive funding for participation
- How does NASA intend to sell/license partner provided data and services?
- Access to NASA data sources and source code to read the data
- Access to NASA DIP team to test the data from the DIP
- Framework is already in production mode for both public and cloud-based DIP implementation
- IP, liability, and indemnity need to be addressed in SAA
- Equal access to the data from other collaborators
- Collaboration could be more efficient and begin much sooner if avenues were established that did not require a formal agreement
- Depends on agreement of IP protection and how the agreement will be executed among partners from a data sharing perspective
- Suggests connections to the DIP platform via the Cloud providers and leverages industry APIs
- Data and services exchanged in both directions are safeguarded only for the trial and used by trial participants

Prior / Current Collaboration

- 2021 NASA iTech Cycle 1 Forum winner
- Current NASA contractor in ATM research
- ATMSDI, ATD-1, TCL4 USS SAA submitted to NC2 ACO2
- Team member of "Cloud FMS Phase I NASA contract
- NASA is currently receiving Flight Status by Airport API
- Many respondents are or have been working with NASA through SBIR contracts
- Supported NASA's Office of Chief Information Officer Application Program
- Providing HW & SW to LaRC for air traffic detection and drone tracking
- Participating NASA's AAM ACO3 program
- Two Google Cloud environments have been granted an Authority to Operate (ATO)
- Strong connection/partnership with NASA
- Currently collaborating with NASA on ATD-2, ATM-X, AAM, SBIRs
- Actively participating in ATD-2
- Currently working with NASA to help define UTM roles
- Contributed to Worldwind program
- Contributed to ATD-2 formulation



Takeaway / Comments / Questions?

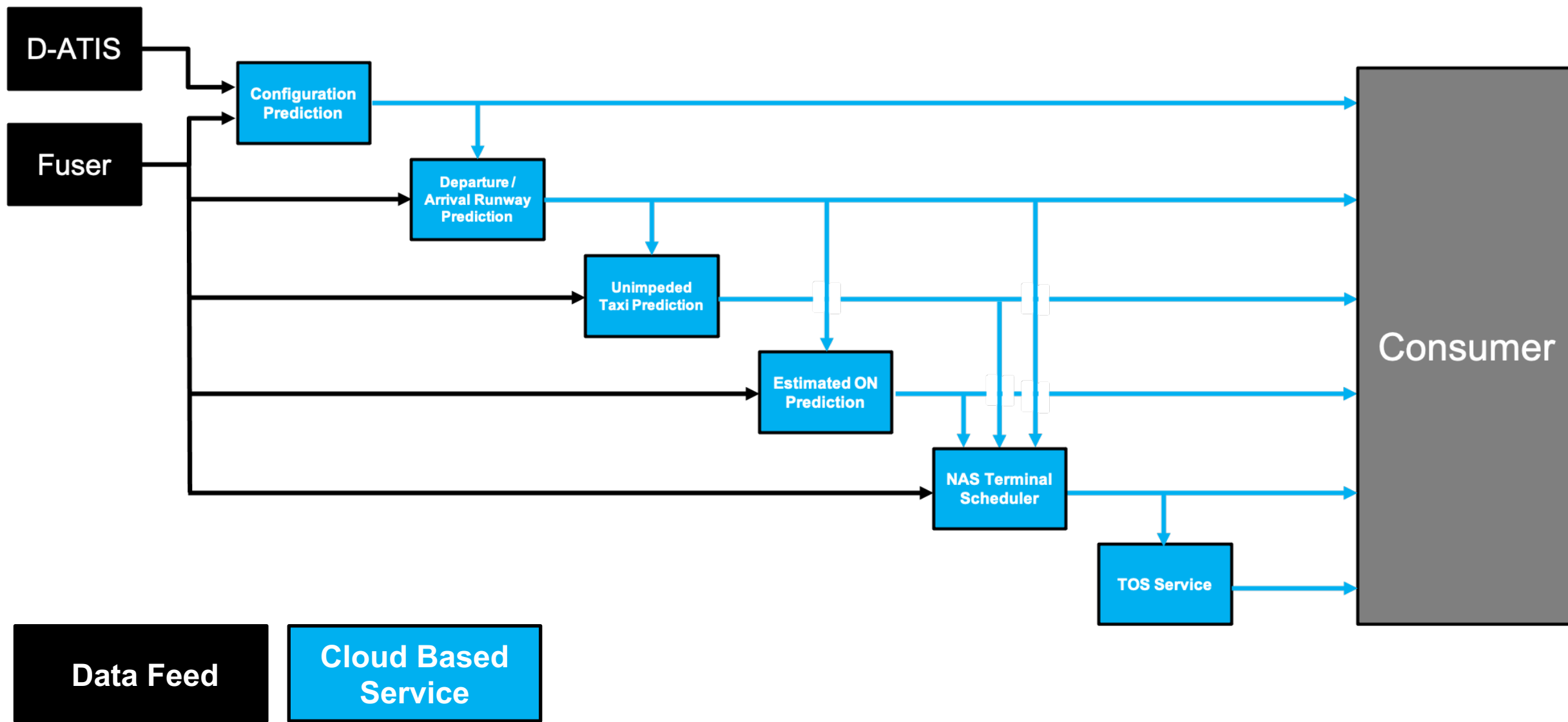
- Need to consider time involved to reach a minimal viable product that would allow to airline partners evaluate the benefits with their end users
- Risk associated with providing proprietary data or internally developed logic to the community
- Participation depends on agreement of IP protection and how the agreement will be executed among partners from a data sharing perspective
- Motivate service providers to participate by protecting IPs and addressing their business priorities (e.g., selling / licensing partner provided data)



Collaborative Demonstration Overview



Reference Implementation of TOS-related microservices





High Interest Services

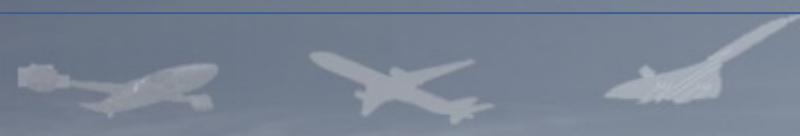


Service	Description
NAS-wide Wind Miles Prediction	Flight estimates due to wind NAS-wide, industry standard for wind miles
NAS-wide TMI Service	Publish TMIs with data indicating delay impact for the span of each flight
Weather Data Integration Service	Fusing of weather data and/or micro-weather data with value-added processing to support probabilistic weather models
IROP Disruption Management	Predict weather-related interruptions, characterize impact of disruption
Surveillance Data Integration Service	Fusing of various surveillance data sources such as ADS-B and other sources needed by UAM/UAS for avoidance of conventional aviation flights
Expansion of TOS	Digital rerouting of terminal departures that incorporates flight operator request enhancements
NAS simulation and Playback	Run simulation for proactive decision making and retrospective analysis of disruptions and TMIs
EOBT Generation Service	Earliest Off Block Time generation service to publish pushback time based on variety of inputs
Surface Congestion Prediction	Use ML to forecast/predict when arrival and departure banks is most likely to lead to excess congestion with lead time to act
Noise Monitoring	Predict noise impact of planned routes compared to noise regulations

Services geared towards: Efficiency | Predictability | Reliability
Balance variety, capability, and feasibility



Next Steps



- Schedule
 - May 14 – RFI Responses Deadline
 - July 8 – NASA-Internal RFI Summary briefing
 - July 29 – RFI Response Summary outbrief to A4A
 - August 2021 – RFI outbrief to broader aviation community
 - October 2021 - Announcement of Collaboration Opportunity (ACO) with template agreements attached
- Please email to ARC-DIP-EXT@mail.nasa.gov for questions or comments
- Visit <https://nari.arc.nasa.gov/atmx-dip> for more information regarding DIP sub-project and future events



Thank you for joining!



High Interest Services: Selection Criteria

Selection Criteria	Criteria Parameters
Improves airspace efficiency	Service would improve the operational efficiency of the NAS
Improves airspace predictability	Service would have to improve the accuracy of predictions for NAS operations
Improves airspace reliability	Service would improve meeting flight schedule performance by avoiding or anticipating delays
Data processing	Service supports data processing on the DIP platform. Prediction, Data aggregation, Decision-making or Interface
Number of services enabled	Potential benefit of early adoption the service would have on other future service development activities
New data type	If the service adds a new data type to ensure scalability of DIP requirements and understand level of effort
New data source	If the services needs a new data source to ensure scalability of DIP requirements and understand level of effort
New data interface	If service requires modification to the interface connectivity to ensure scalability of DIP requirements and understand level of effort
Service User type	Characterize categorically into different airspace operation scenarios to ensure scalability of DIP requirements. Traditional airlines, UAM, UAS, Non-aviation user, Airport Operator
Operation Type	Characterize categorically into which community would benefit from the service. ATM operations, CTM operations, UTM operations, Space Launch operations
Level of Effort	Evaluate the complexity of the required developmental effort to achieve the services desired end state



Leverage Existing Partnerships from ATD-2

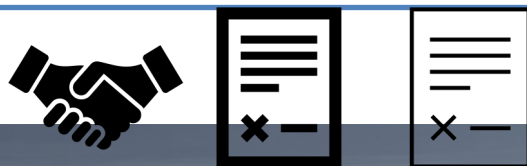


Publish RFI & ACOs to expand Industry Engagement



Collaborative Workshops & Demos with Partners

Opportunities for partners to collaborate on standards definition and validate concept and demonstrate their services and capabilities as contribution to DIP ecosystem





DIP RFI Respondents

