

Assessing Risk for Emerging Entrants - UTM

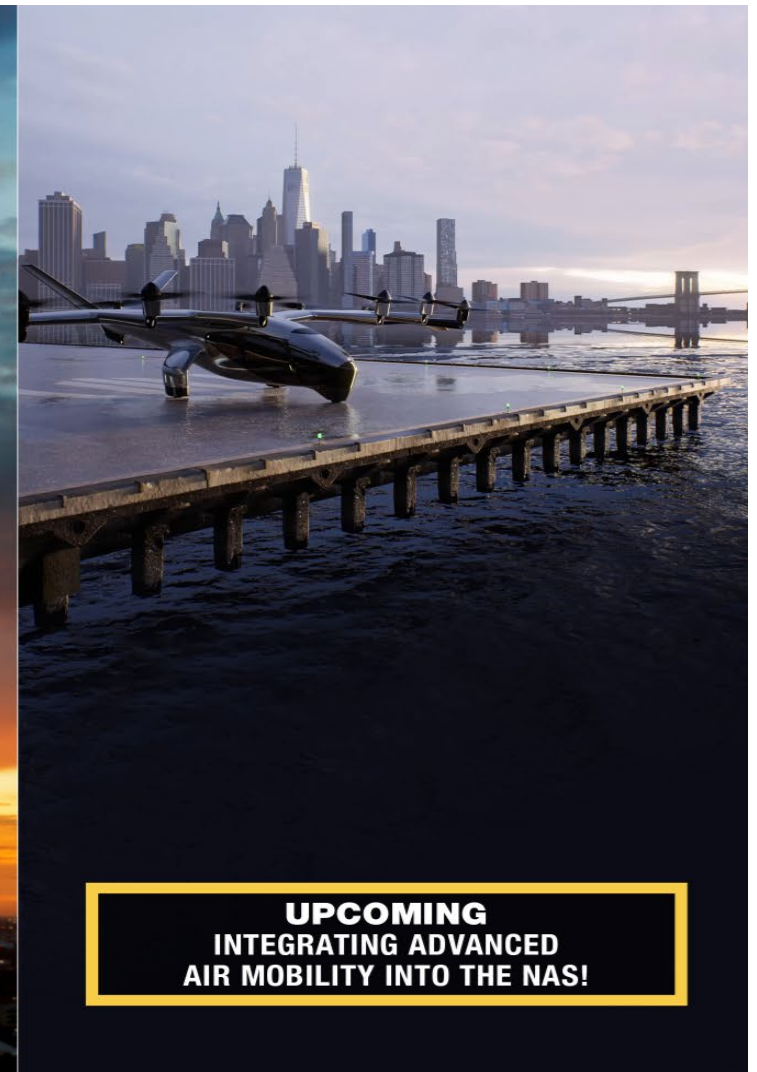
Beyond Visual Line of Sight Operational Requirements



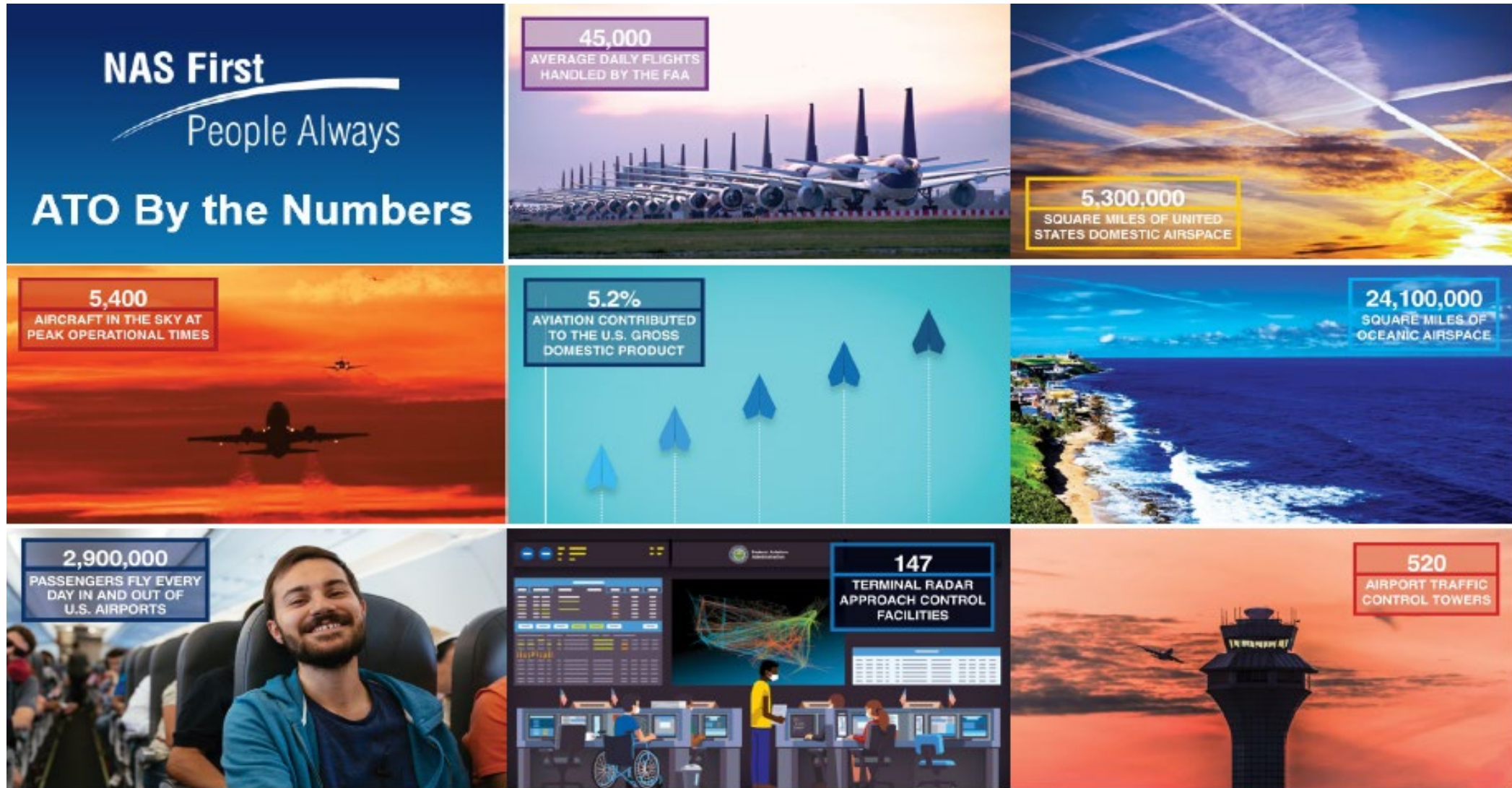
**Federal Aviation
Administration**

**Michael R. Beckles
Director, Policy
Air Traffic Organization**

Air Traffic Organization – By the Numbers



Air Traffic Organization – By the Numbers



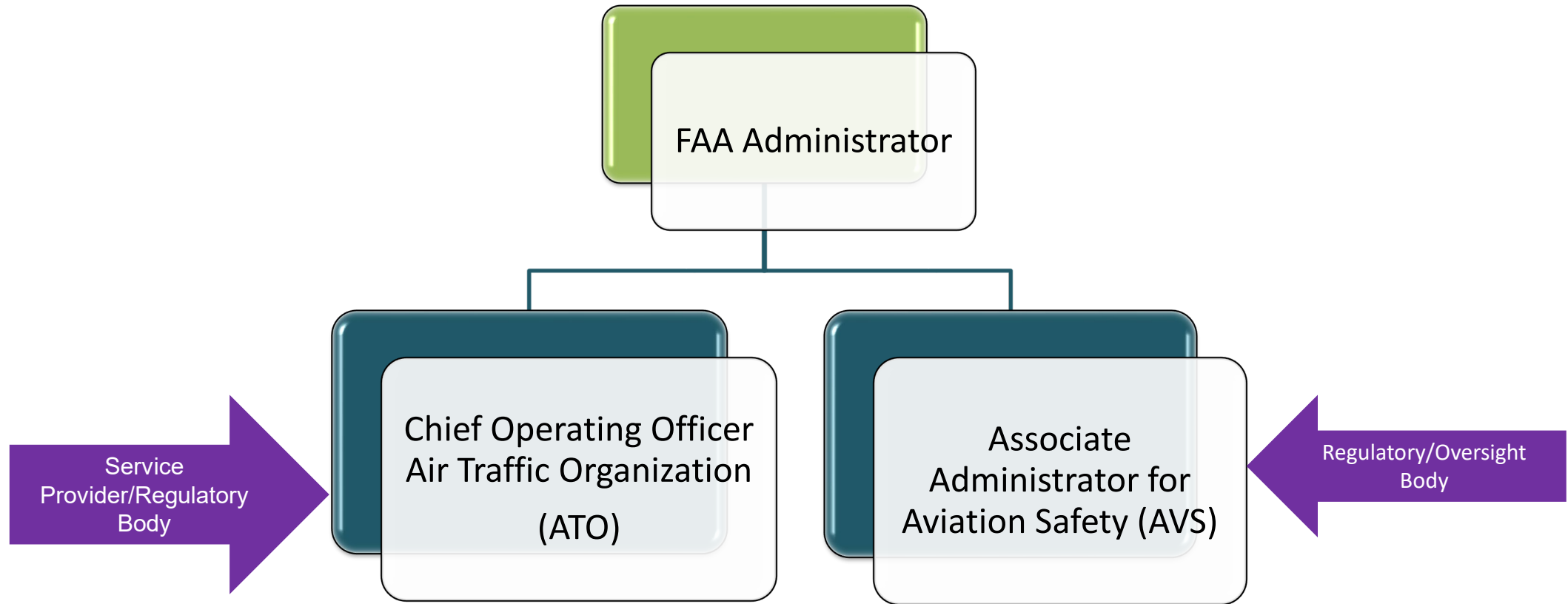
14 CFR § 91.113 - Right of Way Rules Except Water Operations



General. When weather conditions permit, regardless of whether an operation is conducted under instrument flight rules or visual flight rules, vigilance shall be maintained by each person operating an aircraft so as to ***see and avoid*** other aircraft. When a rule of this section gives another aircraft the right-of-way, the pilot shall give way to that aircraft and may not pass over, under, or ahead of it ***unless well clear***.



U.S. State System and Functions



Waivers and Airspace Authorizations

FAA FORM 7711-1 UAS COA Attachment
2020-CSA-5213-COA-TS

Page 1 of 14

DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION CERTIFICATE OF WAIVER OR AUTHORIZATION	
ISSUED TO	Public Agency – North Dakota Department of Commerce Part 91
ADDRESS	Northern Plains Unmanned Aircraft Systems Test Site (NPUASTS) 4149 University Ave, Grand Forks, ND 58202
This certificate is issued for the operations specifically described hereinafter. No person shall conduct any operation pursuant to the authority of this certificate except in accordance with the standard and special provisions contained in this certificate, and such other requirements of the Federal Aviation Regulations not specifically waived by this certificate.	
OPERATIONS AUTHORIZED Operation of the NGC Firebird and General Atomics Reaper Unmanned Aircraft System (UAS), in Class D and E airspace, at or below 17,999 Mean Sea Level (MSL), at or to the northwest of Grand Forks AFB, under the jurisdiction of Grand Forks AFB Airport Traffic Control Tower (ATCT), Grand Forks AFB Radar Approach Control (RAPCON), and Minneapolis Air Route Traffic Control Center (ARTCC). See provisions and attachment(s).	
LIST OF WAIVER REGULATIONS BY SECTION AND TITLE 14 CFR §91.113(b) Right-of-way rules: Except water operations.	
STANDARD PROVISIONS 1. A copy of the application made for this certificate shall be attached and become a part hereof. 2. This certificate shall be presented for inspection upon the request of any authorized representative of the Federal Aviation Administration, or of any State or municipal official charged with the duty of enforcing local laws or regulations. 3. The holder of this certificate shall be responsible for the strict observance of the terms and provisions contained herein. 4. This certificate is nontransferable.	
Note—This certificate constitutes a waiver of those Federal rules or regulations specifically referred to above. It does not constitute a waiver of any State law or local ordinance.	
SPECIAL PROVISIONS Special Provisions Nos. A thru J, inclusive, are set forth on the reverse side hereof.	
The certificate is effective from June 9, 2020 to June 8, 2022 and is subject to cancellation at any time upon notice by the Administrator or his/her authorized representative.	

- With no pilot onboard, UAS flown within U.S. domestic airspace must obtain a waiver to operate within the national airspace system (NAS)
- A waiver is also required when the pilot cannot maintain visual line of sight with the UAS (Beyond Visual Line of Sight)
- Waivers and authorizations under Part 91 and in some instances under Part 107 (sUAS) are reviewed and approved by the Air Traffic Organization, with AVS coordination
- Proponents submit these waivers through automated intake systems
- This process is long and arduous and requires a large amount of resources to gain an approval



UAS BVLOS Aviation Rulemaking Committee (ARC)

UNMANNED AIRCRAFT
SYSTEMS
BEYOND VISUAL LINE OF SIGHT
AVIATION RULEMAKING
COMMITTEE

MARCH 10, 2022

FINAL REPORT

- It is widely understood that the safety and efficiency benefits of commercial Uncrewed Aircraft Systems (UAS) are significant.
- Notwithstanding the benefits, current FAA regulations do not enable the domestic UAS industry to scale and achieve meaningful results from those benefits.
- The current rules and policies do not reflect the competencies needed to safely operate highly automated UAS, which hinders the ability to expand UAS BVLOS operations.



§ 14 CFR Part 108 - Unmanned Aircraft Systems Operations Using Special Airworthiness



Federal Aviation Administration
Air Traffic Organization
Mission Support Services, Strategy Directorate, Enterprise Portfolio

Unmanned Aircraft Systems (UAS)
Traffic Management (UTM) Strategic Roadmap



August 2023

- Normalize Beyond visual line of sight (BVLOS) operations in a new proposed part 108
- Changes to Right-of-Way (ROW) rules as proposed in the BVLOS Aviation Rulemaking Committee (ARC) report
- New BVLOS rating for Remote Pilot Certificates
- Creation of a new operating certificate for compensation or hire with economic authority
- Use of 3rd Party Suppliers



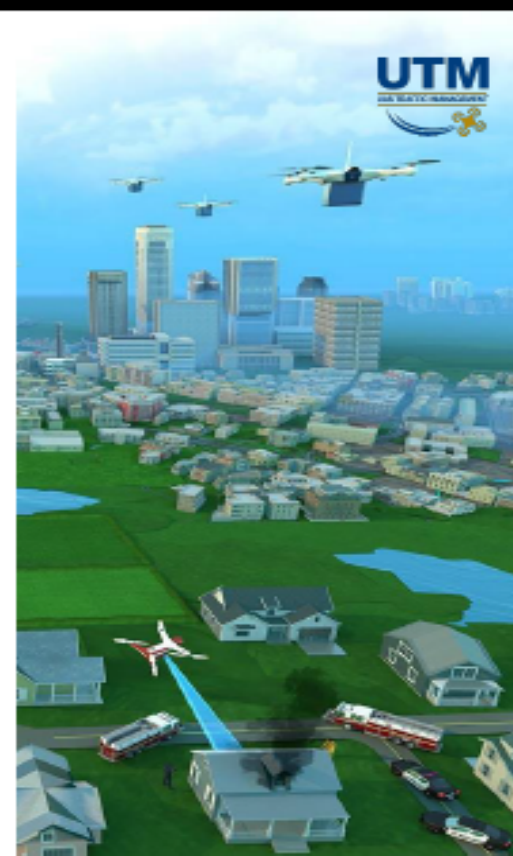
UAS Traffic Management - UTM

UAS Traffic Management

Overview

UAS Traffic Management (UTM) is a community-based, cooperative ecosystem that is separate from, but complementary to, the FAA's Air Traffic Management (ATM) system

- Enables multiple drone operations conducted beyond visual line-of-sight (BVLOS) and below 400 ft AGL, where air traffic services are not provided
- Leverages industry's ability to supply services under FAA's regulatory authority where these services do not currently exist
- Uses a distributed information network and data exchange to support safe operations – operator to operator, vehicle to vehicle, and operator to the FAA



UAS Traffic Management - UTM

Scope



- UTM Key Site Operational Evaluation will leverage a federated network, industry-proposed standards in support of operations beyond visual line of sight (BVLOS), and performance requirements in order to inform policy and rulemaking
 - Collaborate with industry to validate content, formats, and messaging
 - Define performance metrics
 - Develop guidance material to support implementation of the standard(s)
 - Manage conflicting operations in accordance with relevant UTM standard(s) and business rule development
- Develop partnerships with operators and UAS Service Suppliers (USSs) at a key site
 - FAA will support participants in attaining the necessary exemptions to operate BVLOS using UTM services (i.e., strategic conflict detection and conformance monitoring)



UAS Traffic Management - UTM

UTM Key Site Goals



Leverage Public-Private Partnership for UTM Implementation



Show UTM is Safe and Effective



Build Public Acceptance for UTM-Enabled BVLOS



Advance UAS Integration Efforts



Catalyze a Durable and Enduring Ecosystem



Influence Future Policy through Data and Findings



UAS Traffic Management - UTM

Data Collection



Data Exchanges as Data Sources

- UAS Operator - USS
- USS - USS
- USS - FAA

ASTM UTM USS Interoperability API

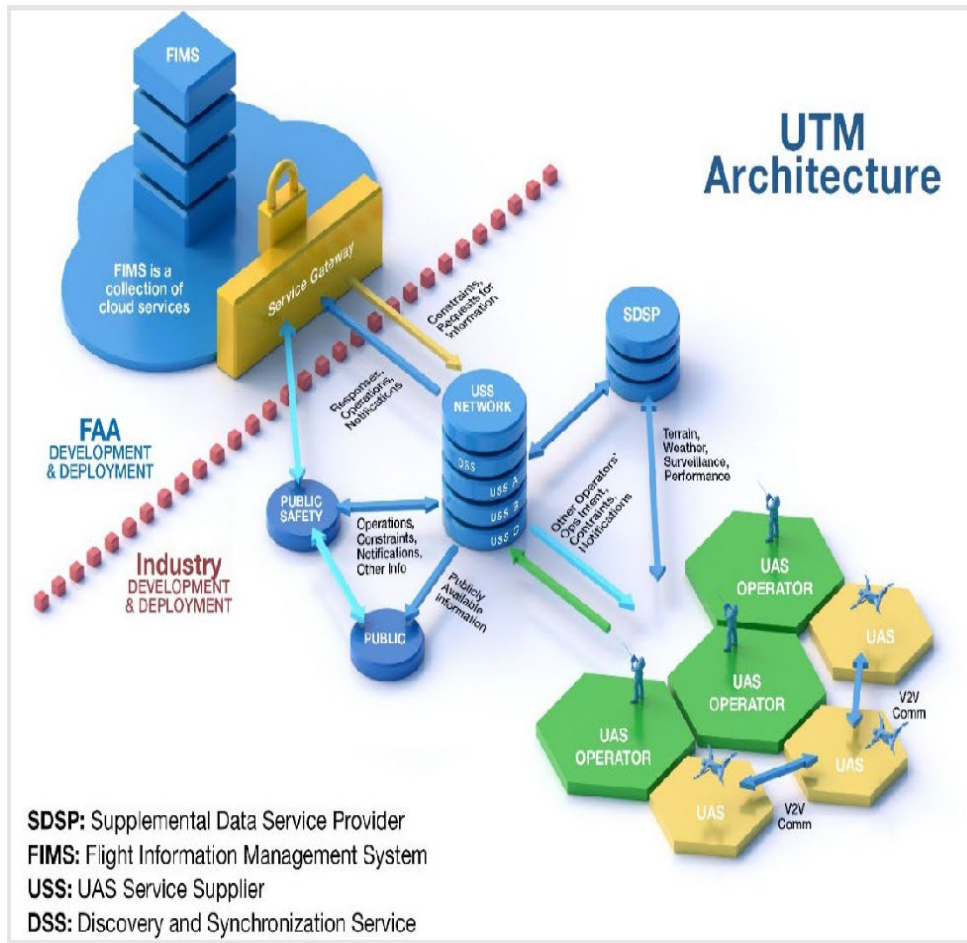
- The API that supports the ASTM USS Interoperability Standard is used to collect data that is exchanged within the USS Network. Data to be captured from the API includes:
 - Operational Intent
 - Constraints
 - Vehicle Telemetry (if requested during off-nominal state)

Conflict Resolution Data

- Negotiation information associated with adherence to business rules for conflict resolution



Use of Technology to Enhance Approvals



- Demarcation between the FAA and industry responsibilities.
- A core component of the architecture is the Flight Information Management System (FIMS).
- FAA data sources for info exchange purposes include sUAS registrations, airspace authorizations, operational waivers, and constraints such as NAS airspace restrictions.

Drone Integration Strategy



Safety Management

- 1 Identify and conduct activities to support scalable, interoperable services and data exchange opportunities
- 2 Develop a federated enterprise framework of informational assets that will support the drone integration strategy mission and principles
- 3 Standardize and promote the requirements for safety management systems (SMSs) to enhance the information needed to establish an acceptable level of risk for drones in the NAS



Regulatory

- 4 Design a multifaceted regulatory approach that will support scalable and adaptable rules that will enable BVLOS operations



Technology

- 5 Enhance approval processes to enable more efficient and timely access to airspace



Drone Stakeholder Engagement

- 6 Enhance community adoption and assimilation of drone integration
- 7 Promote and support drone industry workforce development
- 8 Develop FAA workforce training to implement and manage an integrated NAS



Security

- 9 Develop a plan to allow the introduction of routine drone operations in the NAS while maintaining public and national security



Exemptions to Rulemaking – Data Collection

Proponent	Category	Request	Questions for the Public	Data Collection	Rulemaking Usage
Operator 1	Shielded Operations	Exemption updates purpose to allow for powerline/pipeline inspection across US (previously limited to R&D and OSE/OSD)	<ul style="list-style-type: none"> • Conceptual use of shielded – how to specify acceptable applications • Is 100' above/20' lateral the appropriate offset? 	<ul style="list-style-type: none"> • Manned Encounters • Navigation performance 	<ul style="list-style-type: none"> • Inform risk/complexity of including shielded flight rules in 108 • Quantify economic value
Operator 2	3 rd party services	Exemption allows use of Network to adhere to ROW under 91.113	<ul style="list-style-type: none"> • Public interest in services rendered by XYZ being recognized under FAA 2018 Reauth Sec 377 • Risk-based review of service compliance documentation 	<ul style="list-style-type: none"> • Service outages /availability • Operator errors 	<ul style="list-style-type: none"> • Inform service qualification standards (Parts of DO-381/365) • Inform operator usage standardization • Inform proposed well clear volume • Quantify economic value (cost and benefit)



Exemptions to Rulemaking – Data Collection

Proponent	Category	Request	Questions for the Public	Data Collection	Rulemaking Usage
Operator 3	BVLOS Package Delivery	Exemption request allows for use of Ground Based Surveillance System in lieu of VOs	<ul style="list-style-type: none"> • Acceptability of high level DAA criteria being used by UPSFF/Raytheon • Acceptability of well clear volume of 2000'/250' • Associated Elements – declaration of Ground Based Surveillance 	<ul style="list-style-type: none"> • Manned Encounters • Loss of Well Clear/NMAC • Flight hours 	<ul style="list-style-type: none"> • Inform Ground Based Surveillance qualification standards (Parts of DO-381/365) • Inform service usage standardization • Inform proposed well clear volume • Inform likelihood considerations for intended airspace

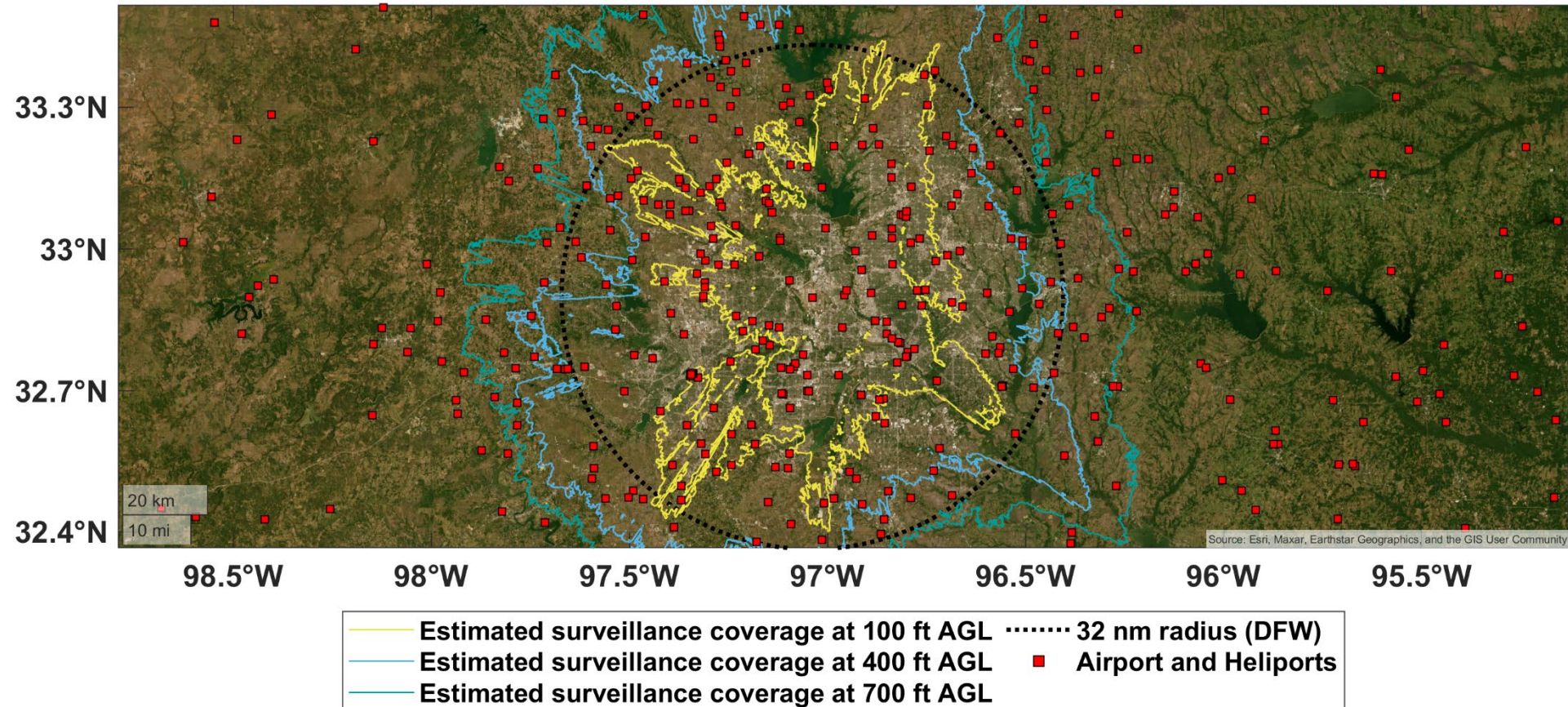


Exemptions to Rulemaking – Data Collection

Proponent	Category	Request	Questions for the Public	Data Collection	Rulemaking Usage
Operator 4	BVLOS Package Delivery	Exemption request allows for use of DAA system in lieu of VOs	<ul style="list-style-type: none">• Acceptability of high level DAA criteria being used by ABC• Acceptability of detecting only certain non-cooperative• Associated Elements – Acceptable requirements for RPIC control and monitoring	<ul style="list-style-type: none">• Manned Encounters• Loss of Well Clear/NMAC• Flight hours	<ul style="list-style-type: none">• Inform proposed well clear volume• Inform Aircraft Based DAA qualification standards• Inform non-cooperative traffic detection policy



Use of Operational Radar and ADS-B Data



Data Informed Safety Risk Management



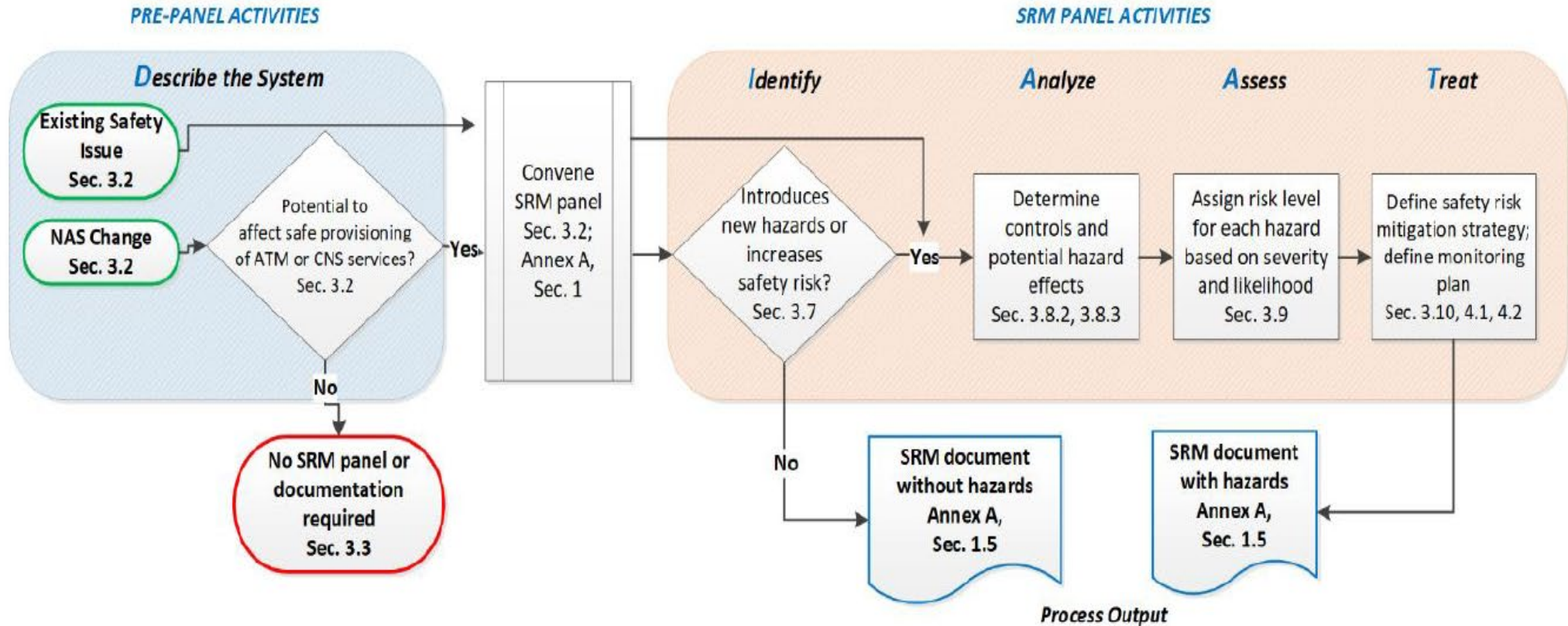
SAFETY RISK MANAGEMENT ASSESSMENT OF
WING BVLOS DELIVERY OPERATIONS
WITHOUT VISUAL OBSERVERS INSIDE THE
DFW MODE C VEIL

HAZARD	SEVERITY	LIKELIHOOD	RISK LEVEL
Unable to Detect and Avoid ADS-B transmitting Aircraft	Catastrophic	Extremely Remote	Medium Risk ⁸
Unable to Detect and Avoid Aircraft that are not transmitting ADS-B	Catastrophic	Extremely Remote	Medium Risk ⁹

Severity \ Likelihood	Minimal 5	Minor 4	Major 3	Hazardous 2	Catastrophic 1
Frequent A	[Green]	[Yellow]	[Red]	[Red]	[Red]
Probable B	[Green]	[Yellow]	[Yellow]	[Red]	[Red]
Remote C	[Green]	[Green]	[Yellow]	[Yellow]	[Red]
Extremely Remote D	[Green]	[Green]	[Green]	[Yellow]	
Extremely Improbable E	[Green]	[Green]	[Green]	[Green]	[Yellow]



ATO Safety Risk Management Process



SM ICG Guidance (Skybrary)

- **Does the SM ICG see a role in addressing safety for Emerging Entrants?**
- **Does the SM ICG plan to develop guidance for Service Providers/Regulators on Emerging Entrants?**



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Questions?



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