

Harmonizing Our Skies

ICAO Drone Enable 2022 U-AIM/GDM

**Extending, and Supplementing AIM “Single Source of Truth” Data,
for Strategic, Pre-Tactical, and Tactical UAS and AAM multiple operations
in Low-Level Airspace.**

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Our Evolution



7,000,000 lines of code
31 Years supporting aero & defense
700 aero & defense companies



Use for LLA

ANSP's have identified:

- Provision and exchange of existing aeronautical information data to low-level airspace users (such as recreational/commercial drone and UAM operators)
- Support for emerging high-altitude airspace users in their current form (data formats, accuracy, and applicability)

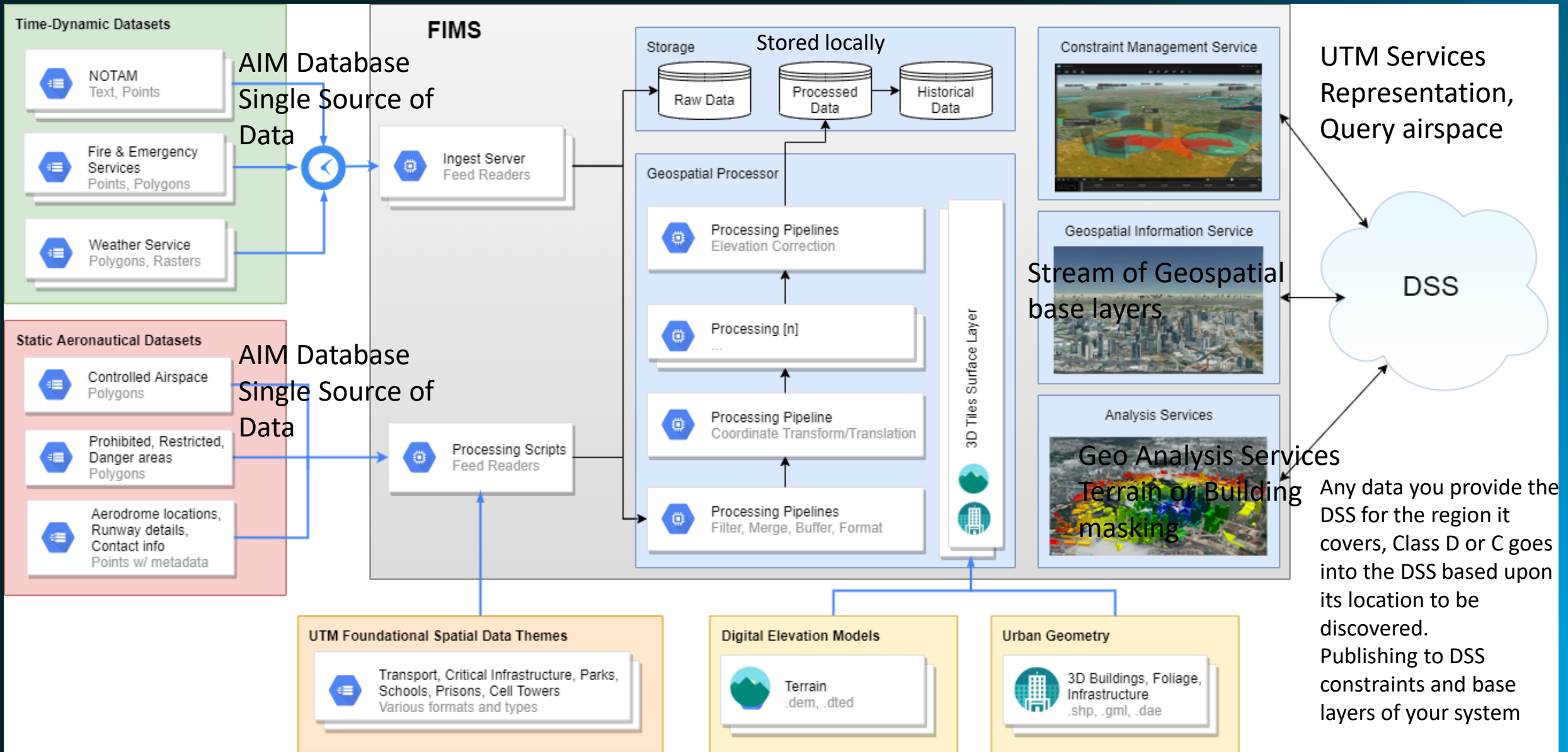
The Issues

- UAS operators face a unique set of challenges that cannot be addressed by traditional AIM alone. The operational environments that UAS inhabit, are highly detailed and time-dynamic.
- There are numerous natural and manmade threats to safe operations such as urban geometry, microscale weather, dynamic infrastructure, radio frequency [RF] interference, critical infrastructure, and emergency responder access to airspace
- Finally, the aeronautical data should utilise open-formats and be made available through RESTful APIs in accordance with emerging standards for USS-to-USS interoperability

U AIM/GDM system design considerations for UTM

- The core design challenges are; the ingest of varied datasets and the required extract, transform, load pipelines, scheduling of data ingest, and the definition of the resulting data topologies and interfaces to support an architecture
- The U AIM/GDM dataset will initially support the following FIMS UTM services: Airspace Authorization Service, Constraint Management Service, Discovery and Synchronization Service, Geographical Information Service
- An output pipeline will also need to be considered for submitting aeronautical data that is also equally relevant to Air Traffic Management (ATM) via the AIM system.

U AIM/GDM and Relationship to UTM



U AIM/GDM Data Types Evolution – Member State Specific

AIM Data

- U AIM/GDM acts as a proxy for AIM data and is refreshed from the Master AIM system on each Aeronautical Information Regulation and Control (AIRAC) cycle.
- The current AIXM data set is not complete for U AIM/GDM purposes. Supplementary data will be provided that includes:
 - Airspace hours of operation
 - Airspace purpose
 - Airspace status (restricted areas only)
 - Airspace group (restricted areas only)
 - Vertical Obstacle Database (VODB).

A number of data sets and documents are derived from AIM, and provide supplementary information for the benefit of U AIM/GDM. It is not expected the U AIM/GDM will process these directly. They include:

- ANSP Relevant Product Groups (various AIM data in Comma Separated Variables (CSV) form).
- ANSP Relevant Product Group (airspace shape files).
- Designated Airspace Handbook (DAH). If Available
- Electronic Aeronautical Information Publication (eAIP) (eventual replacement for existing AIM products).
- En-route Supplement

UTM Data

UTM data are the other data entities required for operation of the UTM ecosystem. Such data is managed directly on the U AIM/GDM and, as such, U AIM/GDM is the source of truth for such data. U AIM/GDM will provide facilities to allow data administrators to directly manage the data. UTM data consists of:

- Aerodrome Boundary Limit (ABL);
- Noise Threshold Map (NTM);
- Cumulative Noise Map (CNM);
- Automated Airspace Authorization Map (AAAM);
- Shared Airspace Representation.

U AIM/GDM/GDM will provide data that has been translated from the AIM data, into forms such as GeoJSON, including:

eAIP

- is a future product and not expected to be available in the near term, but will be employed at a later date.

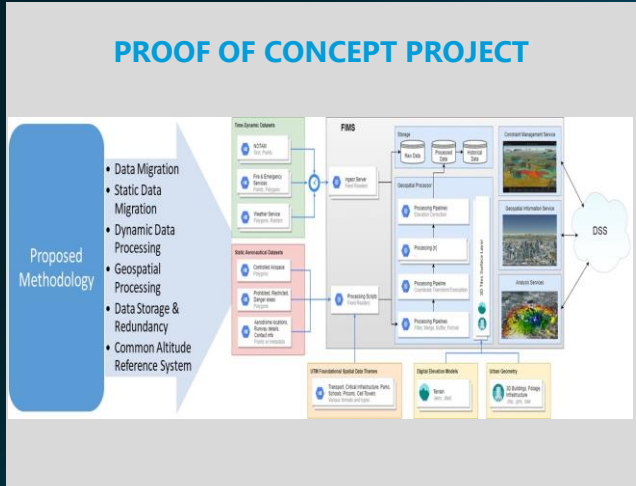
ANSP U-AIM/GDM Deployment steps - Roadmap

SCOPING PROJECT
 Review of existing aeronautical data sets and investigating potential conversion to a new UTM & UAM baseline data set and architecture

SCOPE of WORK/STUDY

- Analysis & Tailoring of Data Sets
- Identify Applicable Data Sets
 - Geoborders
- Recommendations & Proposed Methodology

PHASE 1 - Near Term



PHASE 2 – Medium Term

OPERATIONAL DEPLOYMENT

DIGITAL TWIN

ON DEMAND STANDARDIZED UTM & AAM, U-AIM/GDM SERVICE

PHASE 3 - TBD

Enabling BVLOS Operations in Low Level Airspace Environments

U-AIM Geospatial Data Management System

Scope of Work

Analysis & Tailoring of Data Sets

- **Tailoring Member State Aeronautical Information.** NavCanada will provide appropriate Product Groups A and AIM Airspace Handbooks for the review



Identify Applicable Data Sets

- Working with the UAS/UTM/AIM team, OneSky will identify what datasets from the Product Groups will be applicable to all Low Level Airspace users.



Geoborders

- **Geoborders.** A key focus of the review will be on geoborders to various airspace volumes. The geoborder description is the source of truth regarding the intended boundary, but in most cases an authoritative, machine readable, source of this data may exist through other authoritative sources. OneSky will identify that source and determine the methodology and level of effort to incorporate that authoritative data into the UTM dataset.



Recommendations

- **Modernized Format and Structure.** OneSky will, based on relevant technical rationale, recommend the most suitable modern file format and dataset structure, for the intended purpose. The dataset structure must be able to be easily expanded and modifiable as new datasets and/or data elements are added over time. This activity is expected to involve discussion with the UAS/UTM/AIM Program team regarding global approaches to UTM data management and to ascertain a suitable understanding of the intended UTM system architecture and UTM operating environment.



Propose a Methodology

- **Proposed Methodology.** Incorporating (b) through (d), OneSky will propose a detailed methodology to create a new baseline dataset and structure for UTM aeronautical information, expected level of effort, and expected schedule to complete.

Summary – U AIM/GDM

- Traditional Aeronautical Information data not sufficient for UTM
- AISP can provide baseline authoritative constraint data, but must be supplemented by additional datasets, i.e. parks, schools, government buildings, critical infrastructure, etc.
- High resolution and timely geospatial data is required before BVLOS in urban environments will be possible
- Critical for Automated Authorizations –UTM & UAM these systems must handle irregular time-dynamic volumes, driven by qualitative studies and real-time updates

