REDAC / NAS Ops

Informational Deep Dive

Integrating Commercial Space operations into the NAS

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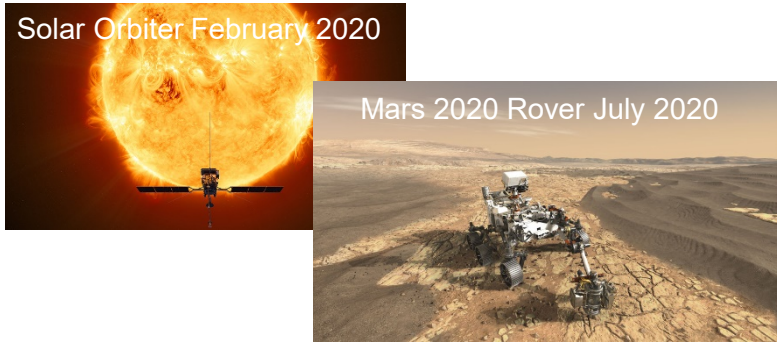
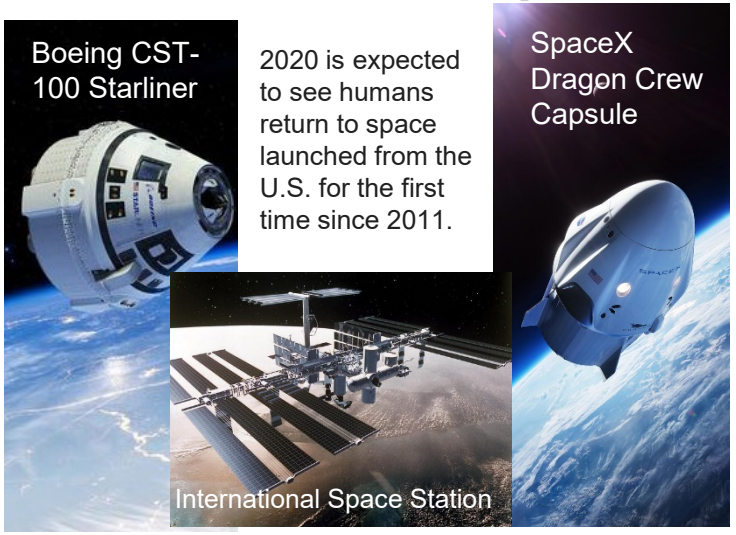
Industry Pulse – Macro View

Space Exploration



Several scientific exploration missions are scheduled for 2020 including the ESA/NASA sponsored Solar Orbiter and the NASA Mars 2020 Rover.

Humans in Space



2020 is expected to see humans return to space launched from the U.S. for the first time since 2011.

New Launch Vehicles

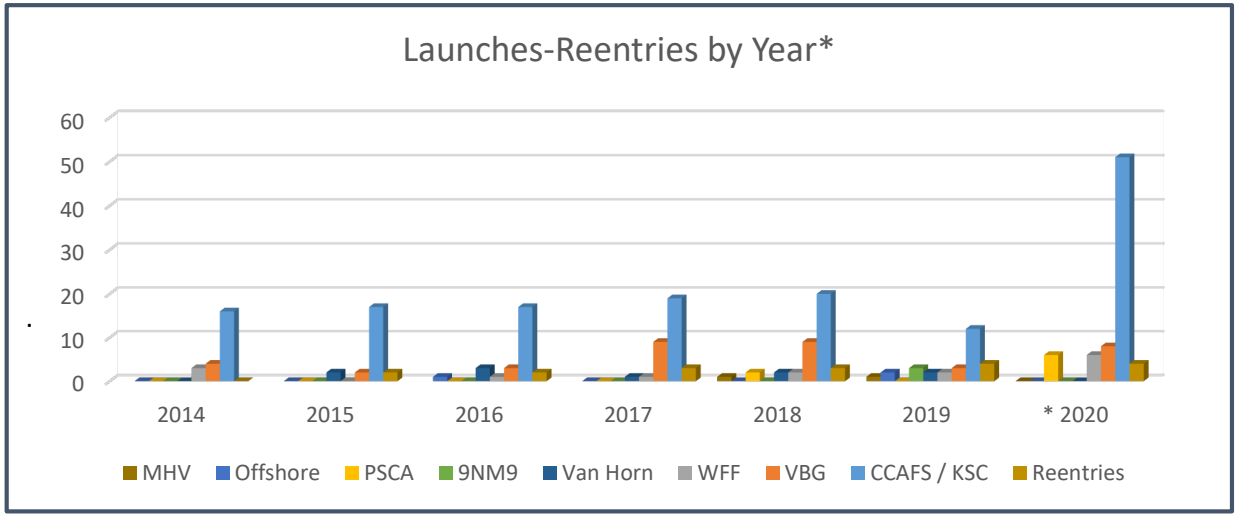
SpaceX is developing the Starship for interplanetary travel while Virgin Orbit and Firefly are expected to make their first operational launches in the small satellite arena.

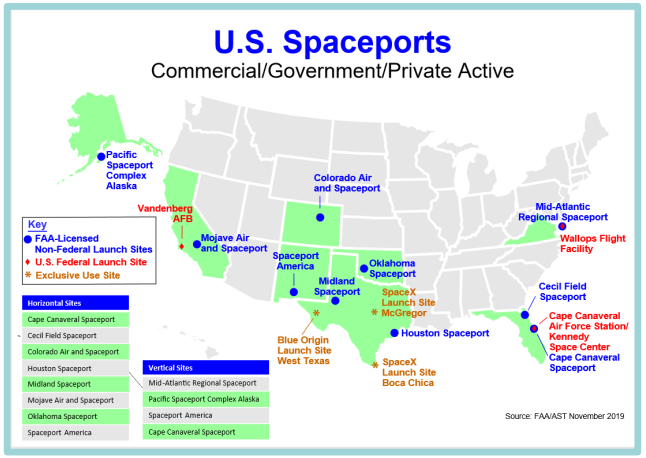
Technology & Communication

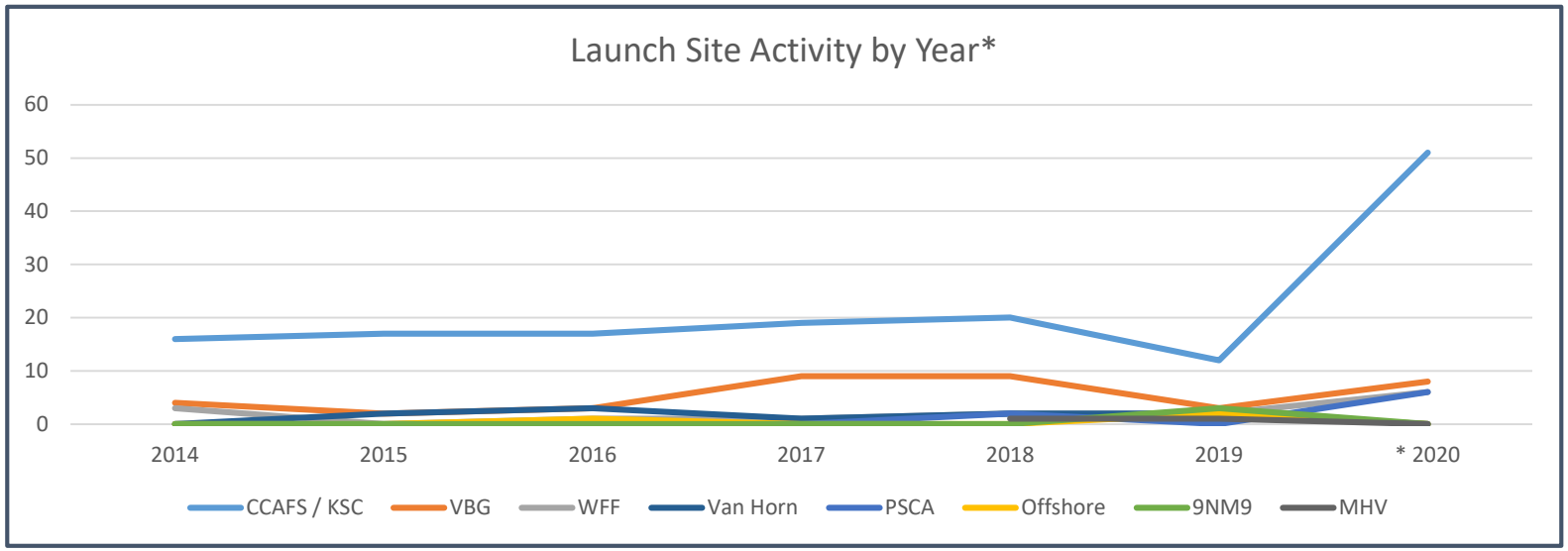
The SpaceX Starlink constellation is expected to provide worldwide internet and communications coverage with the eventual deployment of as many as 42,000 satellites.

SpaceX launches 60 of the small satellites at a time on its Falcon 9 and has scheduled 25 launches for 2020.

Industry Pulse – Operational Tempo

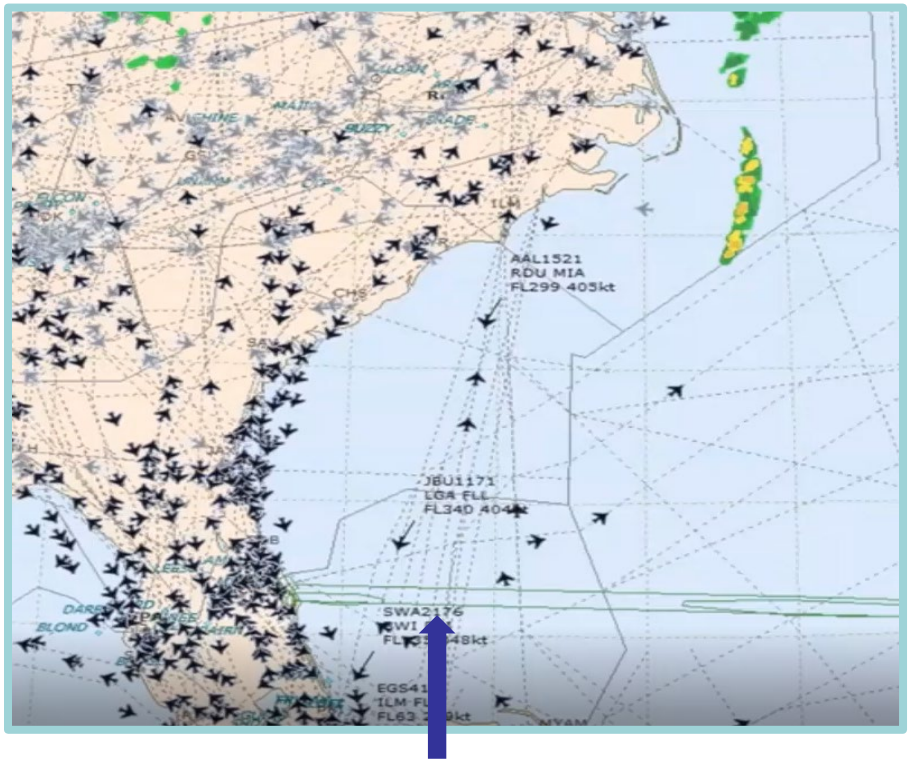






•* Projections for 2020 launches estimated where data is available

Current State

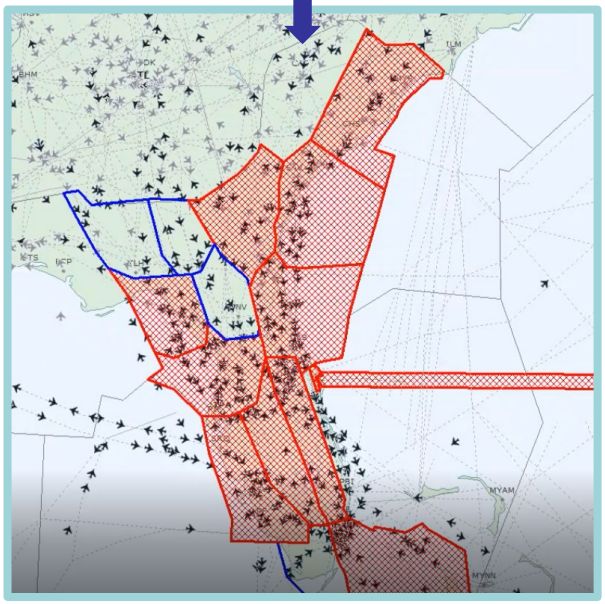


Atlantic routes are **closed over an hour before** the Aircraft Hazard Area is activated

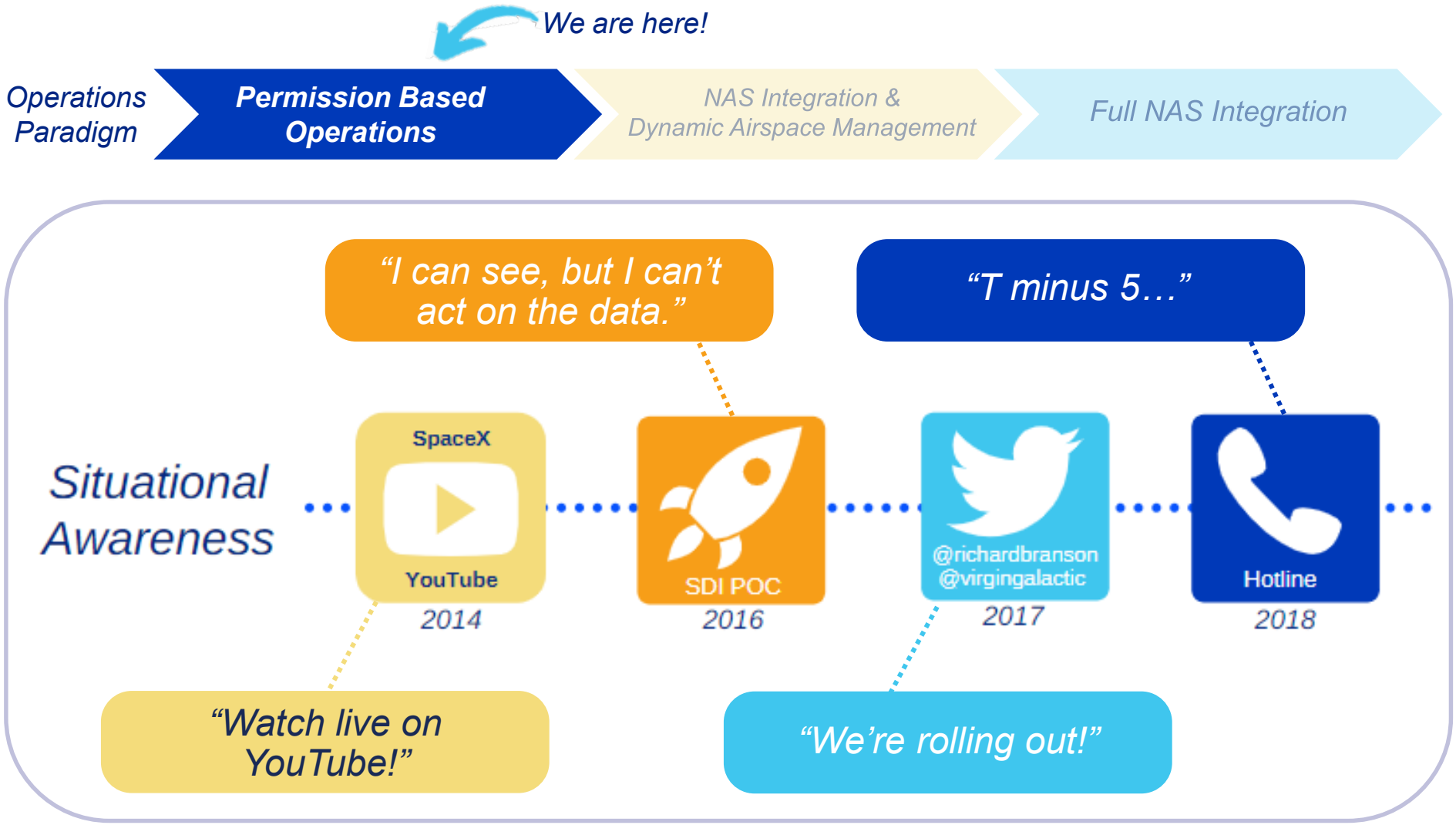
First southbound aircraft crosses a deactivated Hazard Area roughly **2.5 hours after** the launch operation

Lost capacity in the NAS

Inland sector alerts (in red) showing **high volume due to traffic rerouted** off the Atlantic Routes (ARs) due to a launch off of the Eastern Range.



Current State

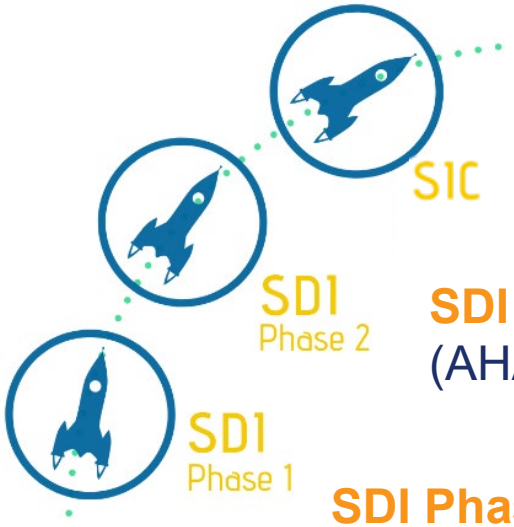


Commercial Space Integration into the NAS: Role of PMO

FAA Air Traffic Organization's Program Management Office (PMO) established a **Space Integration Team** within Air Traffic Systems (AJM-2), Decision Support Systems (AJM-22) to support **investment analysis, manage** and **oversee** the **integration** of commercial space operations into the National Airspace System (NAS).

This team currently manages the **Space Data Integrator (SDI) Phase 1**, and will absorb other space investment programs once they reach appropriate levels of maturity.

Commercial Space Integration into the NAS: Current Investments



Space Integration Capabilities (SIC) takes “space data” to Air Traffic Controller (ATC) automation systems

SDI Phase 2 provides faster Aircraft Hazard Area (AHA) generation

SDI Phase 1 is a foundational piece which allows to receive data from Launch and Reentry Operators (LROs) and provide it to Traffic Flow Management System (TFMS)

What is SDI Phase 1?

SDI Phase 1 is the **foundation** for integrating Commercial Space operations into the NAS.

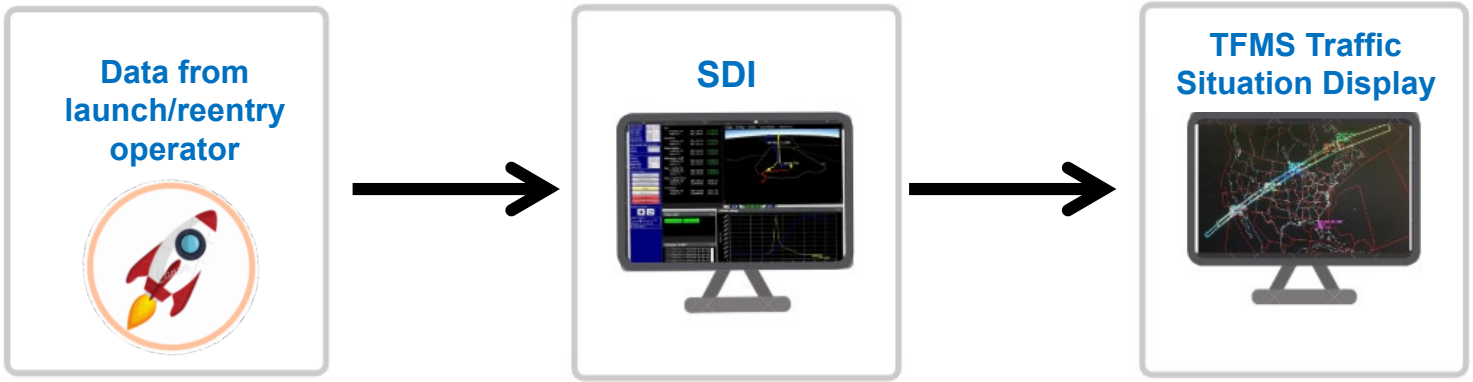
It provides an **operational prototype** which receives real-time data from Launch/Re-Entry Operators (LROs), processes and displays the data, and prepares the data for other NAS consumption (including the Traffic Flow Management System (TFMS)).

SDI data will be used by a team of FAA air traffic and aerospace experts known as the **Joint Space Operations Group (JSpOG)** at the Air Traffic Control System Command Center (ATCSCC) to dynamically manage the NAS.

Minimal Viable Product (MVP) deploying in August 2020 **with additional releases** over 2 to 3 years.

The SDI will allow the FAA to begin **integration** as well as **keep pace** with the increasing frequency and complexity of commercial launch and reentry operations.

The ultimate goal for SDI program is to subsume the SDI capability into an existing NAS system (TFMS).



Looking Ahead

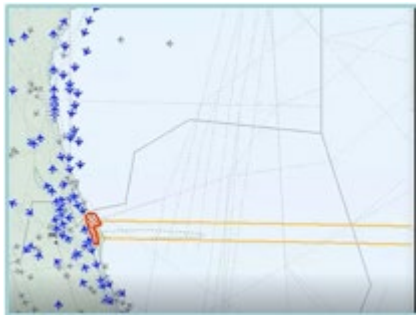
SDI MVP coupled with Time Based Procedures add real efficiencies to the NAS

PRESENT STATE

FUTURE STATE

Pre-Launch

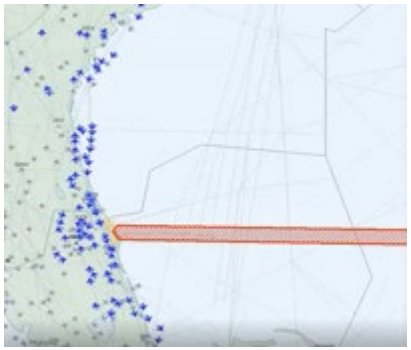
Increased inland sector traffic **congestion** due to sanitizing the airspace planned hazard areas

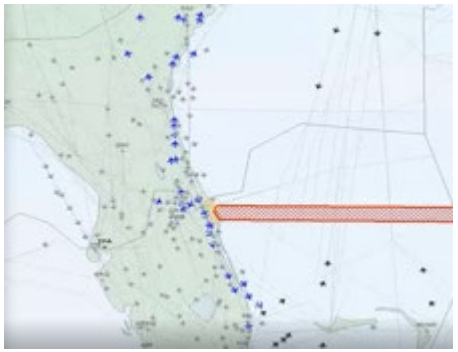


Time based procedures allow **more efficient use** of the Atlantic Routes for launches from the Eastern Range

During Launch

Atlantic routes **are closed** until well after the time frame of the hazard area has passed





Time based procedures allow **more** Atlantic routes can be **made available** based on timing and monitoring of the launch operation

Focus: FAA Administrator

Commercial Space is a top priority for the FAA and the Administrator, which was highlighted in a recent release of 'Straight From Steve':

- **Modernizing** and **simplifying** the way the FAA regulates and licenses commercial space operations, supports launches to be done more affordably, efficiency, and safely.
- SDI is the first of several new capabilities that uses data to more efficiently **integrate real time launch operations** with aviation operations into the NAS.
- These new capabilities allow for **dynamic**, yet **safe**, deconfliction of space vehicles and airlines.

STRAIGHT FROM STEVE

SDI – Accomplishments in FY2020

- **FAA is engaging with industry** and interested in partnership and collaboration opportunities.
- SDI program is in collaboration with several Launch and Reentry Operators (L/R Operators) to **onboard data exchange with SDI.**
- The SDI **Minimal Viable Produce (MVP)** is scheduled to be operational by August 2020.

Other ATO Initiatives: procedural and process improvements

- FAA is implementing **Time-based procedures** for launch operations at Cape Canaveral Air Force Base (CCAFSB/) and the Kennedy Space Center (KSC).
- The ATO has also begun engagement with the L/R operators to develop **Dynamic Launch and Re-entry Windows (DLRW).**
  - DLRW will allow the ATO to leverage triggers that exist in L/R operations to dynamically manage the NAS and further reduce impacts.

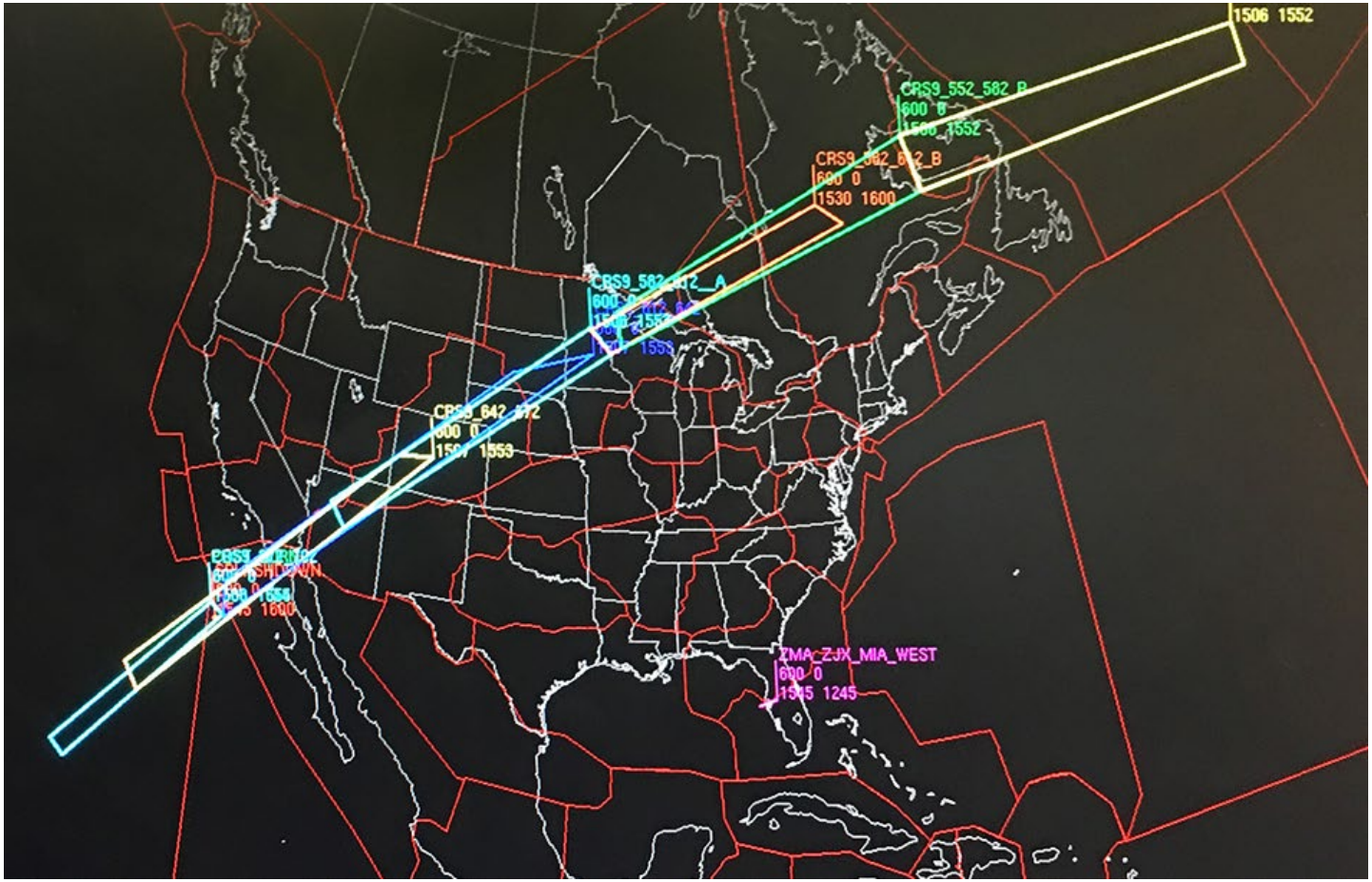
Questions?

Backup

SDI Display

Note: SDI image shown are notional

Aircraft Hazard Areas for Re-entry on TSD



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