

A Mission View of Aviation Wx Requirements

Mark Zettlemyer, NWS/JPDO

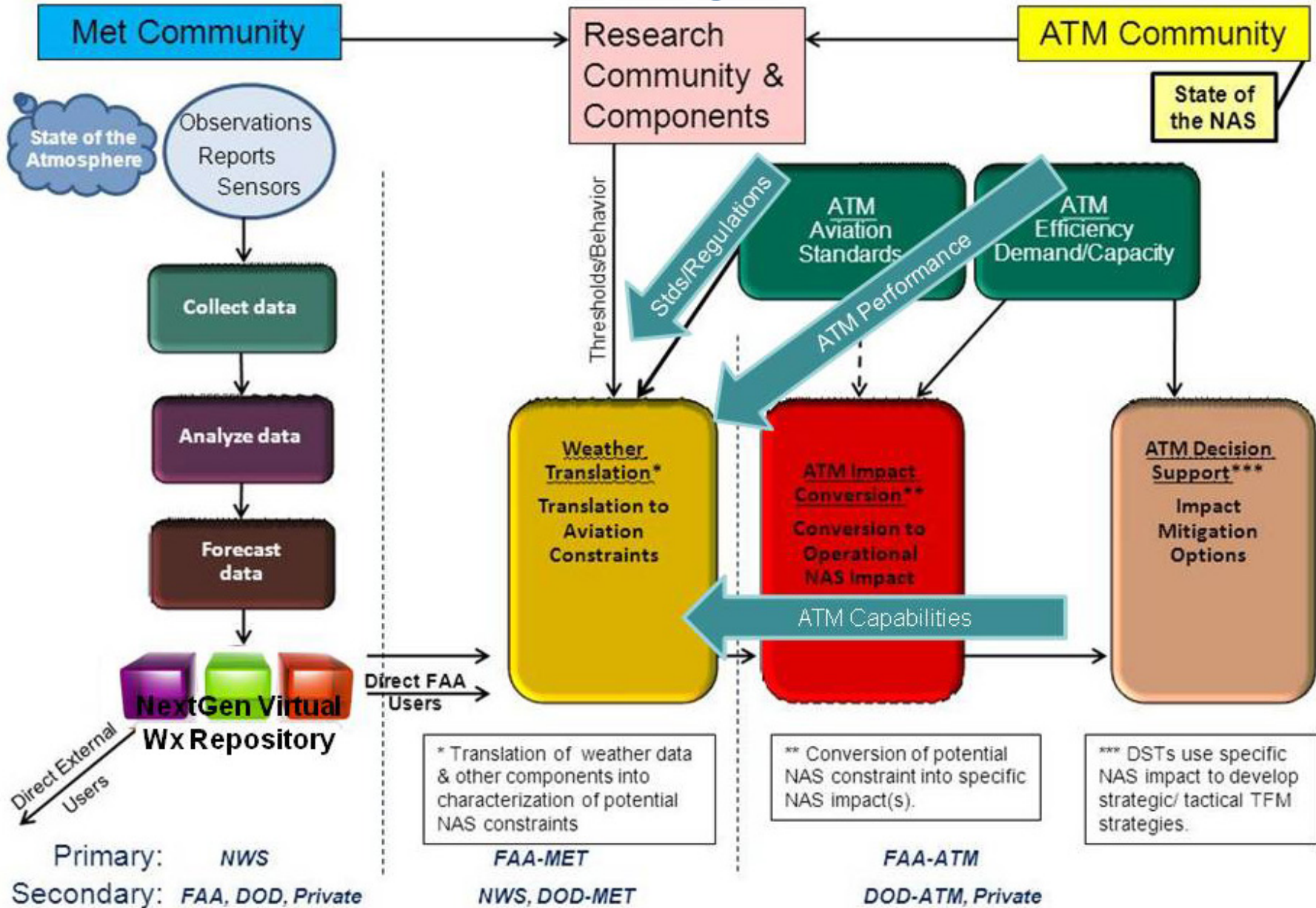
James Tauss, SENSIS

FPAW, July 24 2013

A Mission View of Aviation Weather Requirements

- Ketchup & Mustard – but with the entire burger
- DSTs and Weather Requirements
- The Pilot's View
 - Steve Hofmann, JPDO net-centric advisor
- Data Sharing

NextGen Wx Integration Concept



Not weather centric!

ATM Capacity & Performance

- Capacity=Demand–Wx–Special Use–Outages– ...
- ANSP goal: optimal ground, airport, sector and NAS performance *after* constraints are mitigated
 - Weather and weather translation not alone in CDM
 - Weather translation should be integral to guidance tools (e.g., Flight Schedule Monitor (FSM), 3D Path Arrival Management, Route Availability Planning Tool) ... but weather's inclusion is from nothing to “all in”

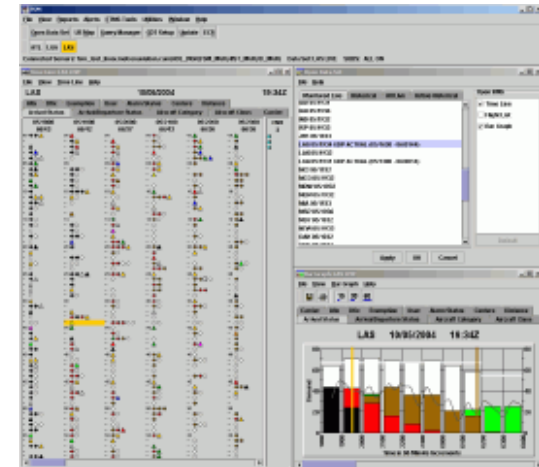
Can this affect how requirements are developed?

ATM Wx Requirements - Drivers

- **ATM performance need:** maximize remaining capacity while changing the uncontrollable to controllable
- Example Decision Support Tool: FSM
 - Purpose: common awareness of current and future demand vs capacity
 - Model and issue TMIs including GDPs, GSs, AFPs
 - Major functions (e.g., Rationing by Schedule, Ground Stop, AFP)

Operators and Ops Research should consider:

- Which functions should include what types of weather information and/or thresholds?
- What is the sensitivity of the function's algorithm(s) to the input weather data?
- Does wx info (of a certain accuracy) improve FSM's guidance?



ATC/Dispatch Example

- Weather support for managing terminal activities:
surface movement guidance

- Present and forecast weather
- Surface conditions
- De-icing activities
- Convection at and near the terminal



Information contributes (e.g.) to taxi occupancy time before entering the departure queue ... meet agreed-upon time performance for departing the terminal

Is weather in NASA's Surface TBO and Precision Departure tools? Are there plans to link to terminal configuration guidance tools? *-- just things to think about*

ATM Wx Requirements - Considerations

- What weather information does the DST need?
 - Should help establish operational priorities
 - Build in thresholds: below some value X , I don't care
- How accurate does that information have to be to generate DST output that optimizes performance?
 - If I'm off by RMS%, DST's guidance doesn't significantly change
- How mature is the DST? What more do I need to make a decision? ... *CDM WET and CDM*
- Plus one more: *what does the pilot/operator need?*

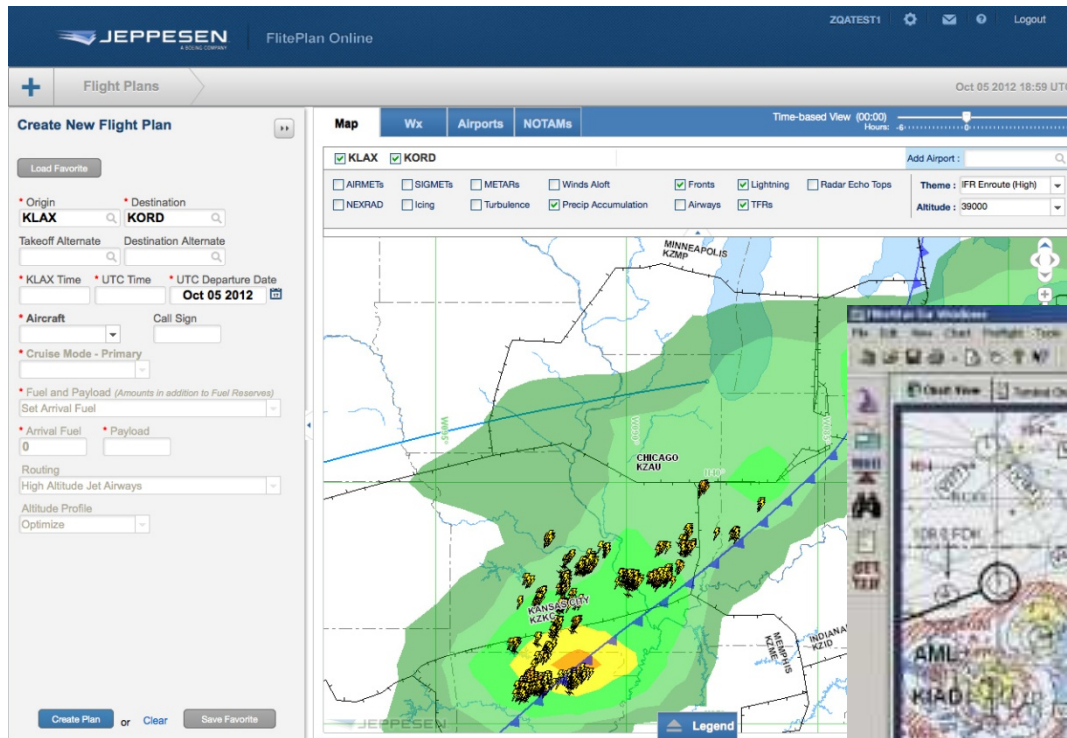
ATC's Customer – The Pilot



From Digital Aeronautical Information Vision

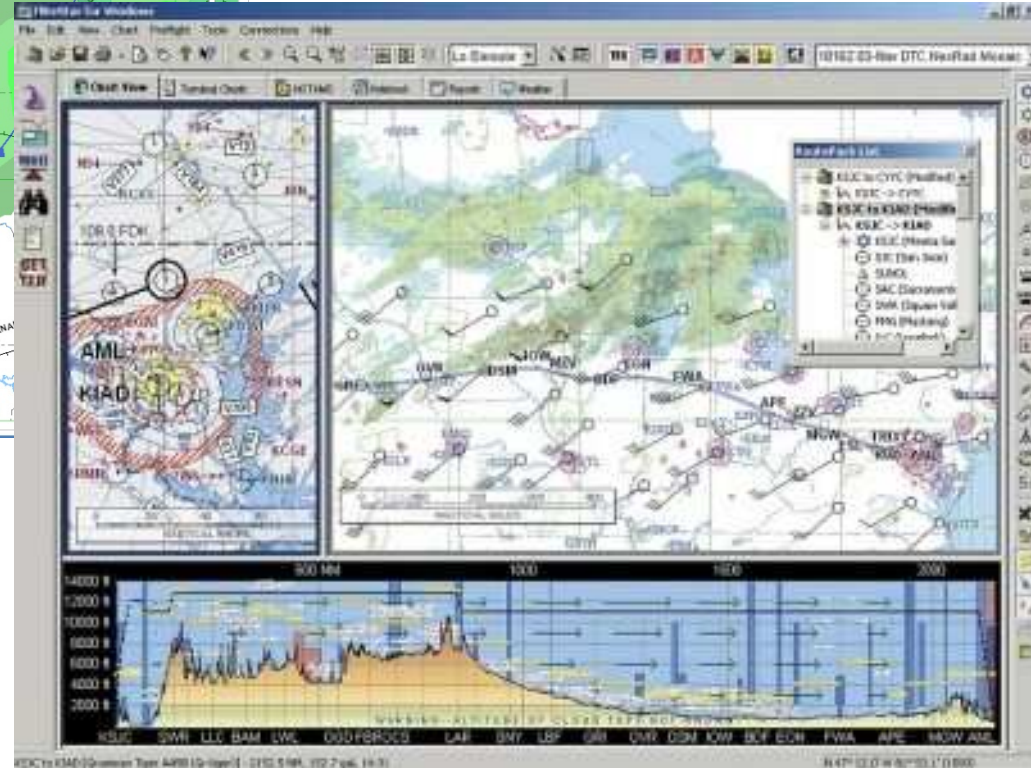


Today's User Tools



Jeppesen FlightStar

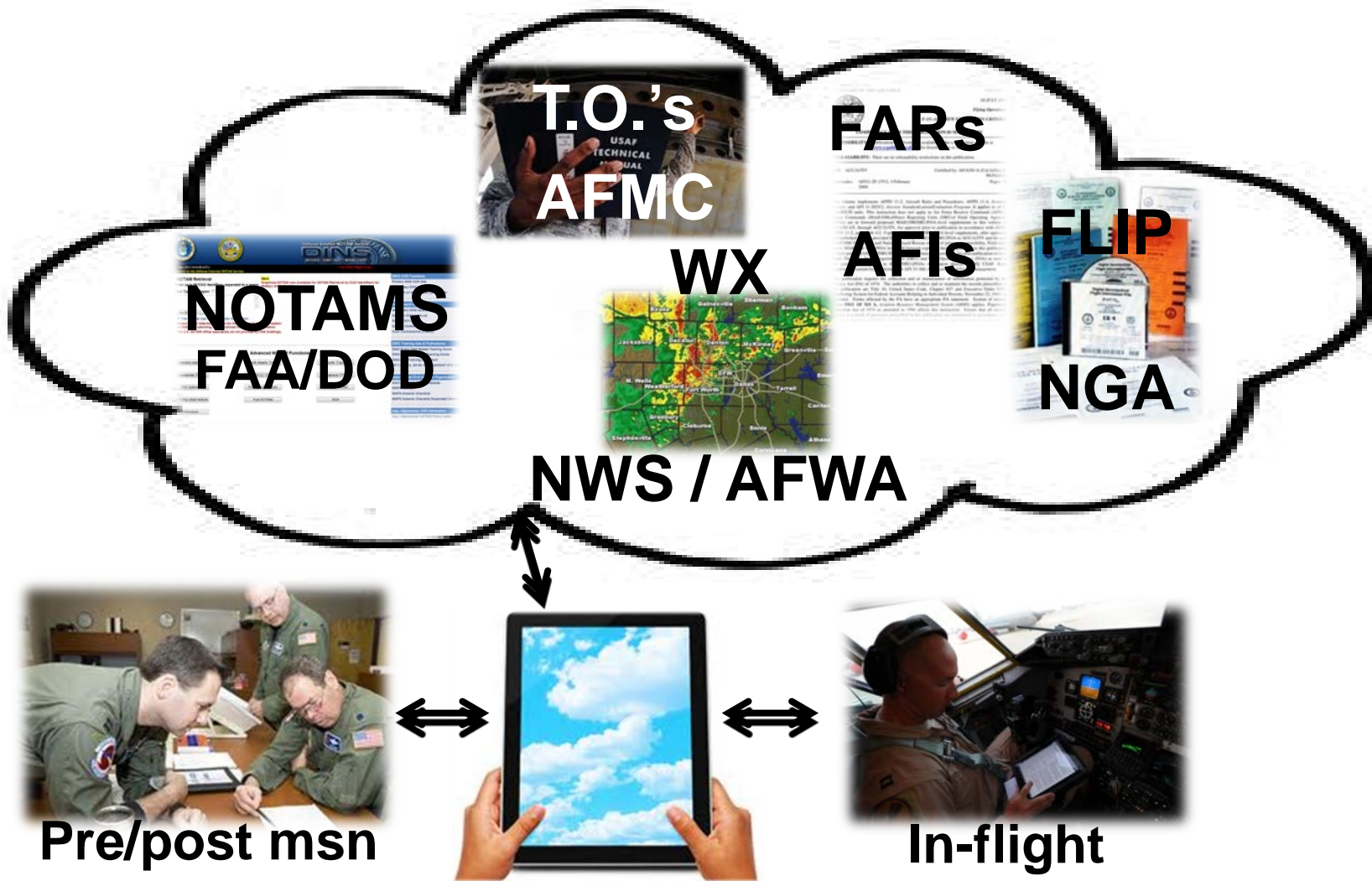
- TACs, winds, radar, more
- Planning to landing



Ops Research opportunity

Forecast vs experienced wx elements: what's the delta or tolerance for safe TBO? (surface/climb/enroute/descent)

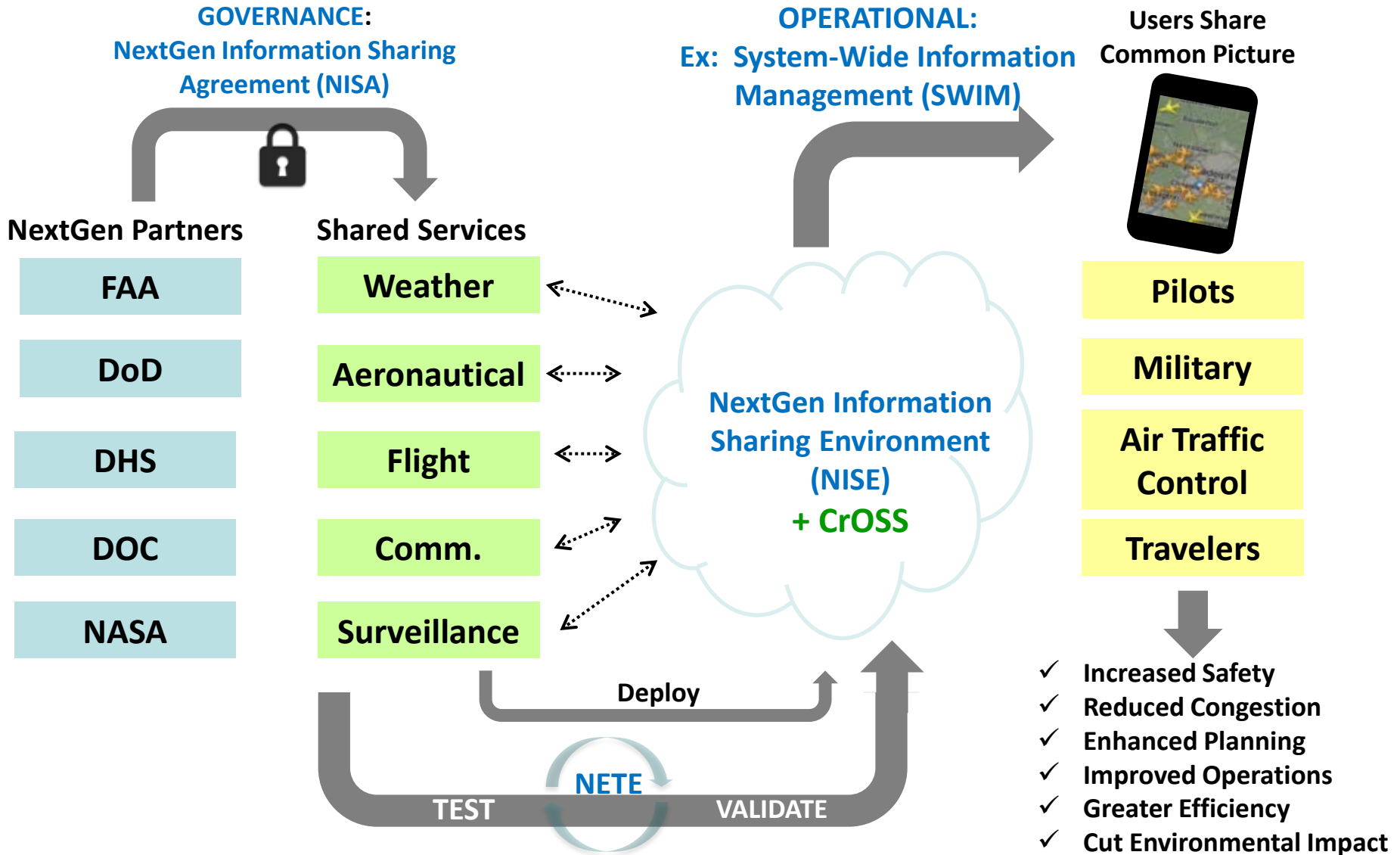
Autonomous / Customized Info for Mission / Platform



From Digital Aeronautical Information Vision



Shared Information Environment



Users with Common Needs

Span Domain, Mission, and Operational Improvement

Military



One Common Picture



Controllers

Tailored information matched to need



Weather



Communication



Aeronautical

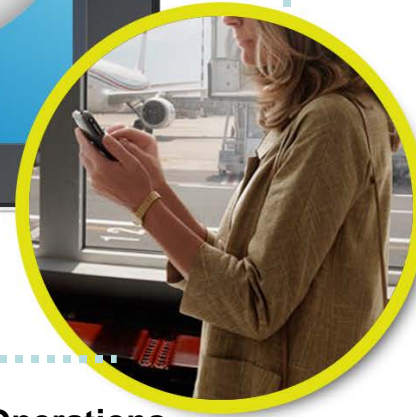


Flight



Surveillance

Pilots



Travelers

- Increased Safety
- Reduced Congestion
- Enhanced Planning
- Improved Operations
- Greater Efficiency
- Reduced Environmental Impact