Next Generation Air Transportation System (NextGen): Wx Integration

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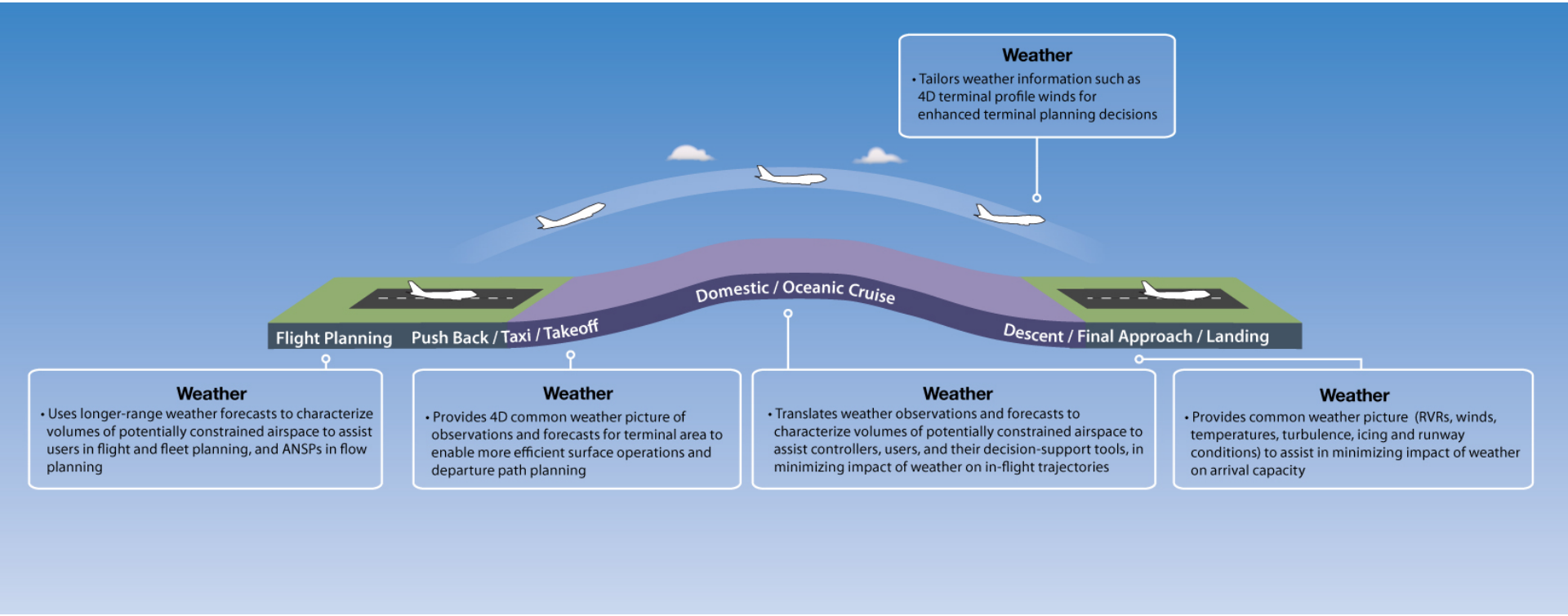
Outline

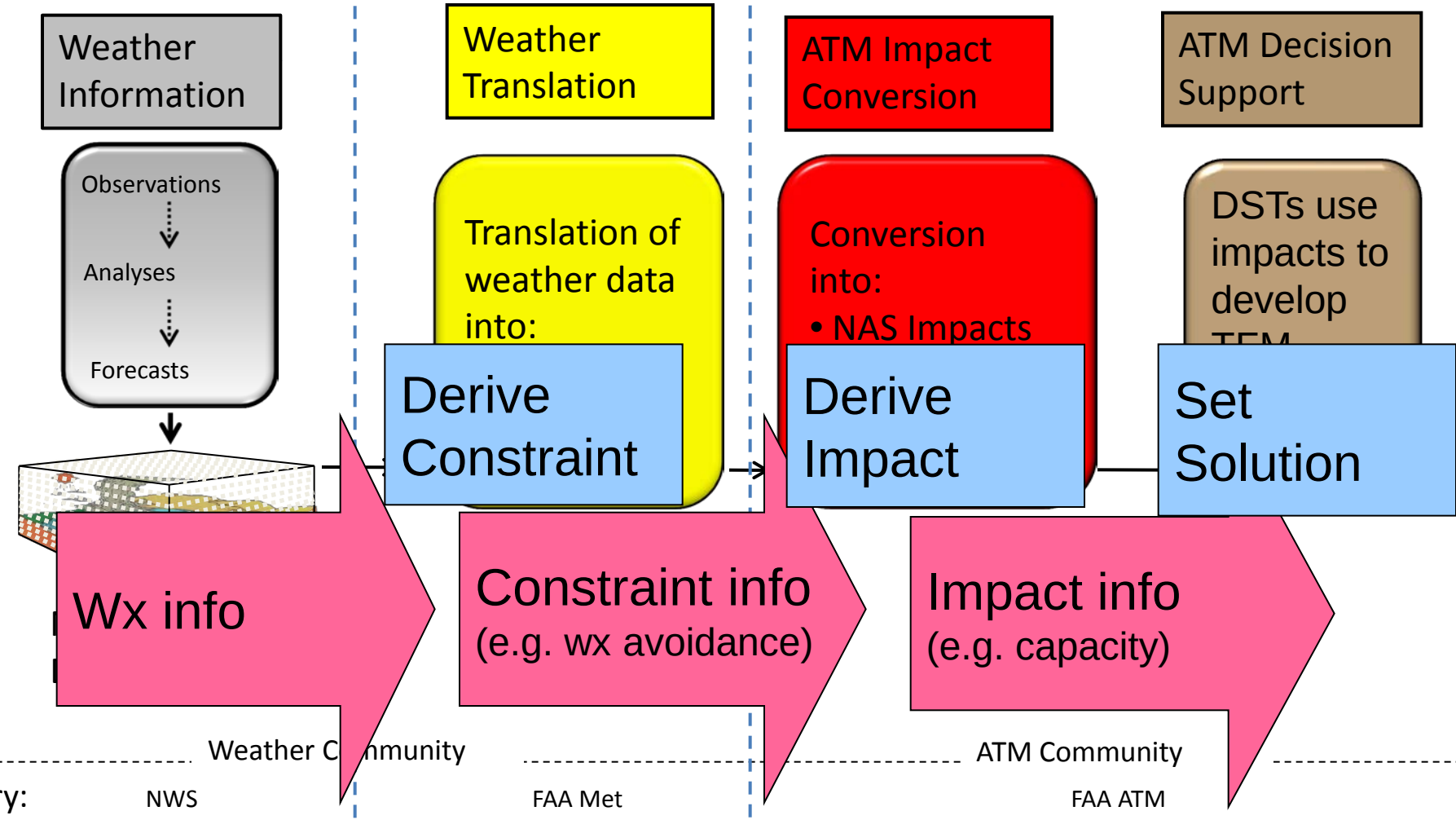
- NextGen Implementation Plan Portfolios
- Common Services & Infrastructure: Weather
- NextGen ATM-Wx Integration Concept
- Levels of ATM-Wx Integration
- Weather Translation Example
- ATM Impact Conversion Example
- Decision Support
- Integration Activities and Goals

NextGen Implementation Plan Portfolios

Common Services & Infrastructure Weather



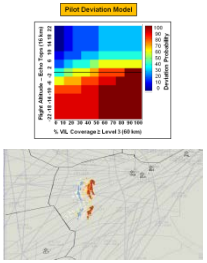
NextGen ATM-Wx Integration Concept



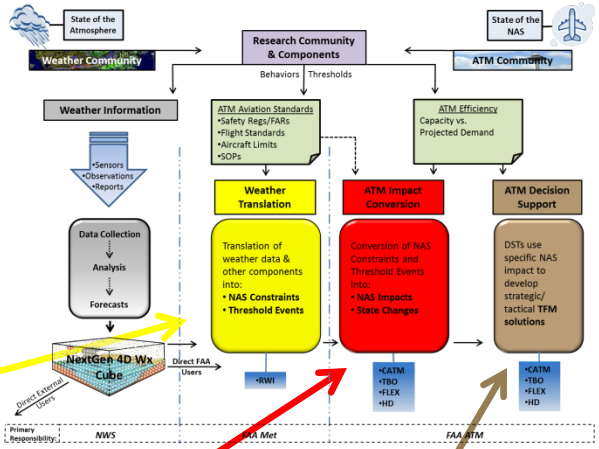
Levels of ATM-Weather Integration

- Level Zero – No integration

- Level One – “On-the-Glass”



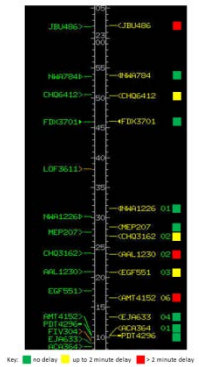
- Level Two – Translation



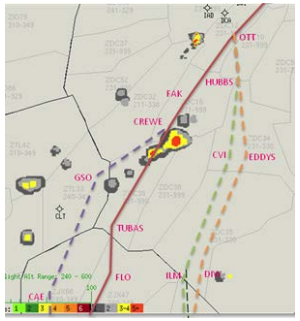
RESPONSIBILITY

WEATHER

ATM



- Level Three – Impact



- Level Four – Decision Support

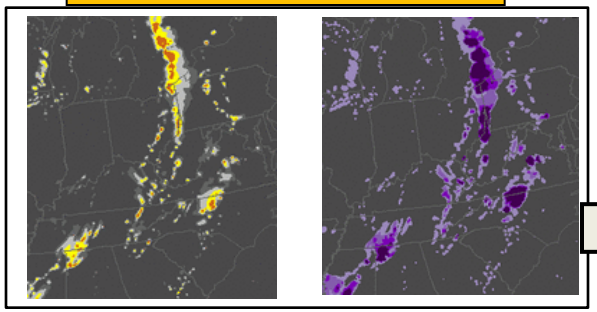
Weather Translation Example

- The process of taking weather data and combining it with other data elements such as pilot behavior models, safety regulations, operating thresholds, and historical demand information to identify potential constraints in NAS operations due to weather.
  - **NAS Weather Constraint**: a limitation on the ability of a given NAS element (e.g., air route, sector) to reach its desired level of service due to weather.

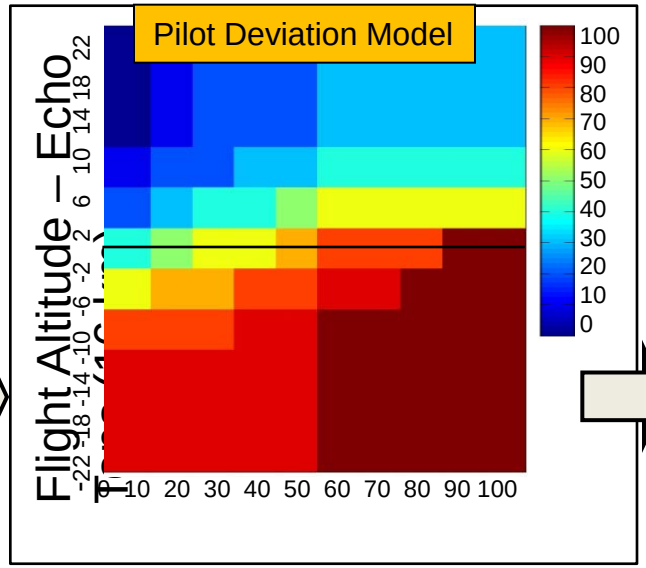
Weather Translation

Translation of weather data & other components into:
- **NAS Constraints**
- **Threshold Events**

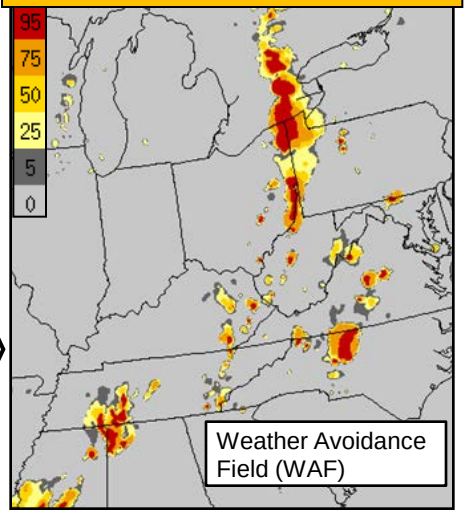
Improved Weather Forecast



Pilot Deviation Model



Forecasted Pilot Avoidance Regions

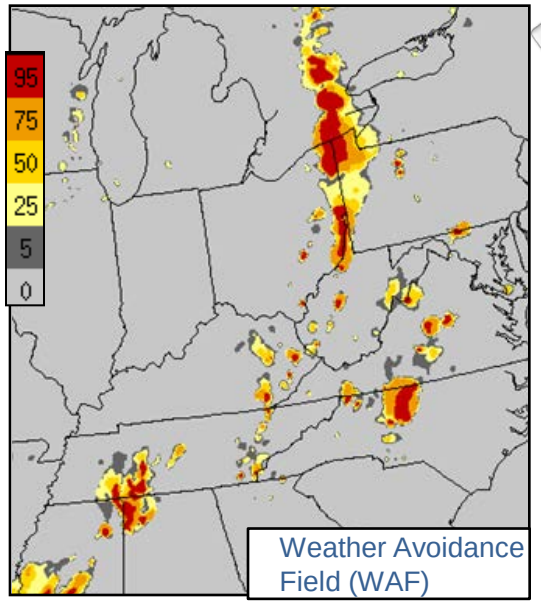


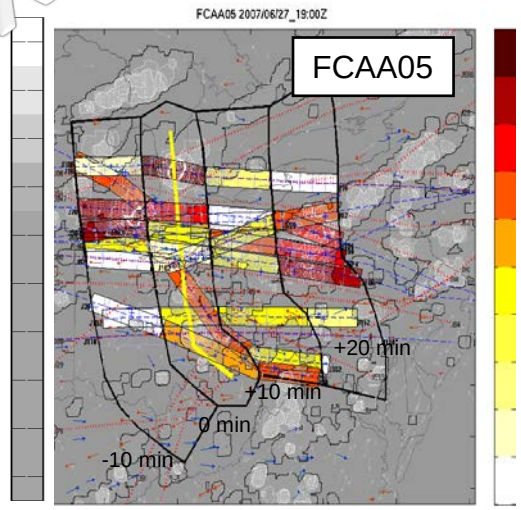
ATM Impact Conversion Example

ATM Impact Conversion

Conversion of NAS Constraints and Threshold Events into:
- **NAS Impacts**
- **State Changes**

- Using information from the weather Translation function, converts it into potential NAS impacts.





FCA Capacity Forecast Matrix

	11	12	13	14	15	16	17	18	19	20	21	22	23
11	81	96	78	38	72	85	78	68	40				
12		90	78	46	64	88	91	82	39	37			
13			89	57	71	76	88	84	66	28	20		
14				88	85	81	86	89	74	51	17	20	
15					96	88	85	90	70	47	16	19	49
16						90	61	65	68	28	6	13	30
17							77	67	69	63	20	9	17
18								78	61	54	59	19	3
19									50	36	29	33	20
20										30	10	13	16
21											11	5	7
22												6	4
23												8	6

Predicted Available A05 Capacity
< 75% < 50%

Decision Support

ATM Decision Support

DSTs use specific NAS impact to develop strategic/ tactical **TFM solutions**

- The fundamental goal of Decision Support is to provide overall NAS optimization.

  Impact data and state change information used to derive mitigation options to deal with capacity/demand imbalances and provide “what-if” capability for traffic managers – both in the strategic and tactical time frames.

Integration Activities and Goals

- Coordinating with Portfolios (e.g., CATM, Improved Surface Operations, TBFM) to identify Wx shortfalls
- The main goal of integrating weather into future decision support systems is to increase overall NAS efficiency by:
  - Standardizing the decision process and outcome (predictability)
  - Ensuring full and continuous use of enhanced/automated tools during weather events
  - Optimize use of airspace
  - Facilitating a more proactive approach to traffic management