FAA’s Focus On Technology and Implementation

Dr. John Scardina
Federal Aviation Administration
System Architecture and Investment Analysis

The FAA is Moving Forward with Modernization

- AIR-21 provides an improved operational and budgetary environment for the whole community
- New technologies are being fielded
  - LAAS and Safe Flight 21 are examples of our partnership with industry to move ahead
  - Free Flight Phase 1 and 2 - a commitment to service the demand to airports - enroute, terminal and surface.
  - System replacement of en route and terminal automation and infrastructure show our commitment to sustaining availability
- The NAS Architecture provides the blueprint to the future on the web

AIR-21

- Aviation Investment & Reform Act for the 21st Century
  - Safer Skies
  - Improve Competition
  - Preserve Environment
  - Support Small Communities and Large Airports
  - Reform the FAA

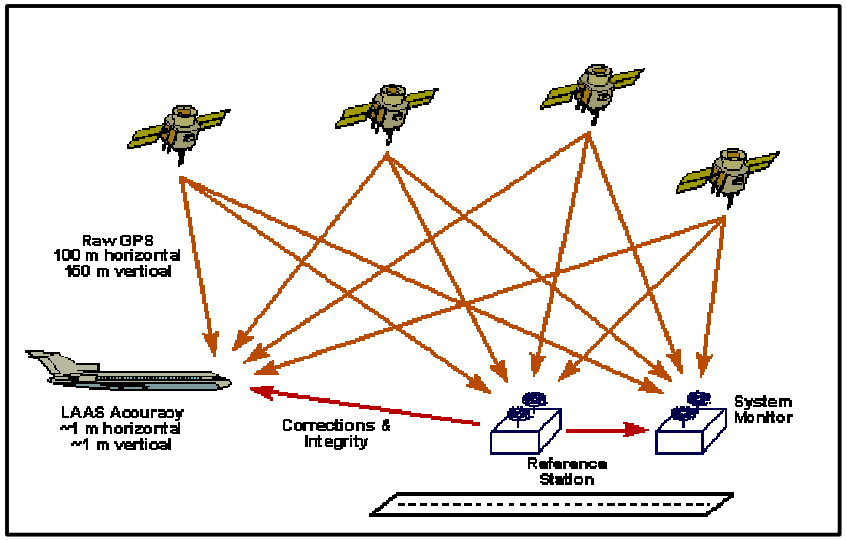
New Technologies

- Communications
  - FTI - integrated admin and ops, bandwidth on demand
  - NEXCOM - digital voice and data, recover spectrum
- Navigation
  - LAAS - Government Industry Partnership
  - WAAS - increased access to smaller airports without ILS - precision RNAV
- Surveillance
  - ATCBI-6 - beacon replacement
  - ASR-11 - digital technology
  - ADS-B - increased situational awareness, intent

New Technologies - continued

- Automation
  - FIS, TIS, CPDLC, SMA, SWIM - information for improved safety and efficiency
  - DSS Tools (FFP1, FFP2) - matching demand and capacity for improved efficiency
  - Infrastructure Sustain (DSR, Host, DARC, STARS, OASIS)
- Weather
  - ITWS - improved nowcast for hazardous weather conditions
  - WARP - integrated NAS weather, weather for DSS Tool algorithms
  - Airborne sensors - improved weather forecasts

Local Area Augmentation System (LAAS)



- Cost sharing between ATC, Vendors and Airports for improved navigation.

- LAAS System for CAT I & III is developed in three stages
  - Stage zero - develop standards and specifications
  - Stage one - industry builds, tests and fields systems
  - Stage two - FAA purchases LAAS installations for NAS operations

Safe Flight 21

- 9 Operational enhancements
  - FIS for SUA Status, Weather, Wind Shear, NOTAMS, PIREPS
  - Cost Effective CFIT Avoidance Through Graphical Position Display
  - Improved Terminal Operations in Low Visibility Conditions
  - Enhanced See and Avoid
  - Enhanced Operations for En Route Air-to-Air
  - Improved Surface Navigation

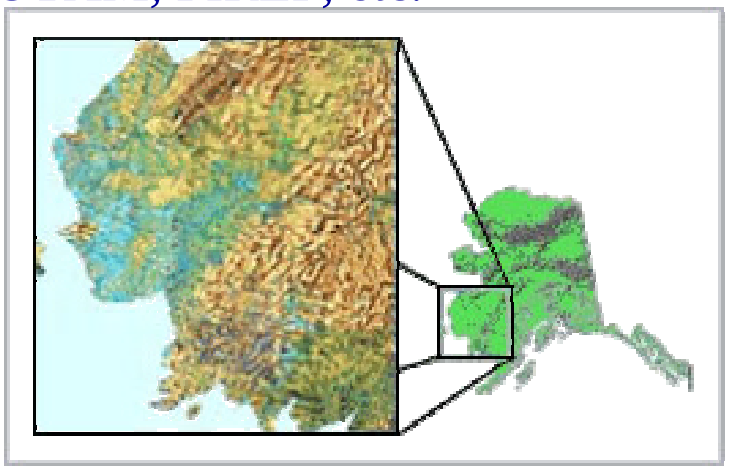
Safe Flight 21 - continued

- Enhanced Airport Surface surveillance for the Controller
- ADS-B for Surveillance in Non-Radar Airspace
- ADS-B to Enhance Radar and Automation Performance

- Cost sharing with the users - FAA provides ground systems and the users provide the avionics and display

Capstone (Alaska)

- Safety demonstration program
  - Targeting smaller aircraft and operators.
  - FAA is providing avionics and ground infrastructure.
    - IFR certified GPS navigation receiver
    - ADS-B transmitter/receiver
    - Multi-function color display
    - Moving map display with terrain advisory
    - Broadcast information : weather, NOTAM, PIREP, etc.



Free Flight Phase I

- Free Flight Phase I - Controller Tools
  - URET
    - Provides 20 minutes look ahead on potential aircraft-to-aircraft & aircraft-to-airspace conflicts with trial planning
  - TMA
    - Uses current and planned traffic flow information to schedule aircraft at the TRACON boundary to meet the capacity of the TRACON and destination airports. Increases both en route center and TRACON controller situational awareness
  - pFAST
    - Provides landing sequences and runway assignments. Increases TRACON controller and Traffic Management Unit situational awareness through its graphical displays, alerts, statistics, and reports

Free Flight Phase I - continued

- FFP1- Information and Strategic Decision Tools
  - SMA
    - sharing of terminal radar information with airline/ airports to improve local planning and management
  - CDM
    - NAS Status Information (NASSI), Ground Delay Program Enhancements (GDP-E), Coded Departure Routes, Collaborative Convective Forecast

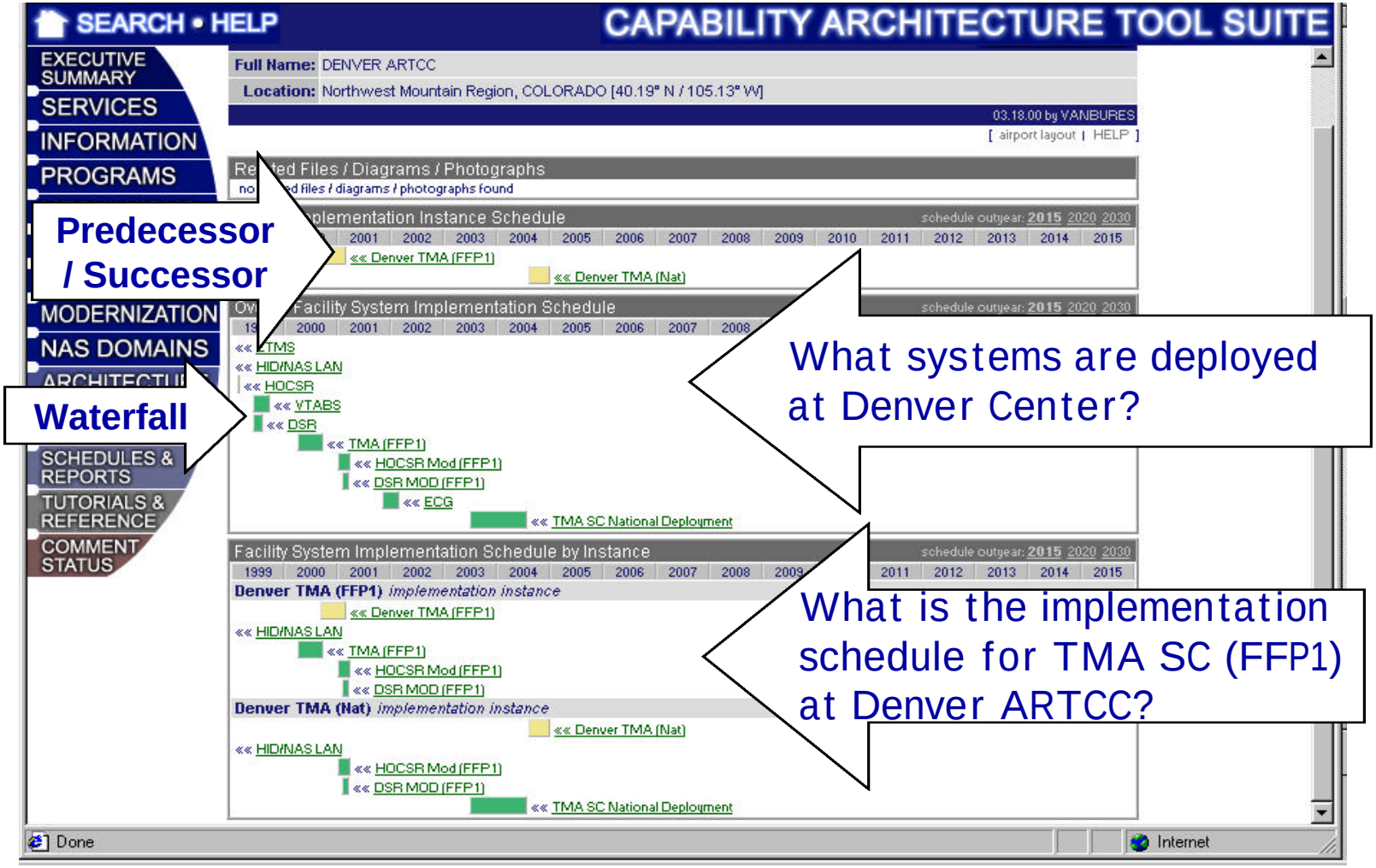
Free Flight Phase II

- Free Flight Phase II Goals-
  - National Deployment of FFP1 Controller Tools
  - Strategic Flow -
    - Additional enroute congestion management techniques - collaborative routings
  - Complete Development and Deployment of first spirals of additional functionality
  - Directed Research for new functionality - no gaps!
    - Surface Management System - building on success of joint demonstrations
    - Active FAST
    - Wake Vortex technologies
    - Multi-center traffic metering

Modernization of Infrastructure

- The FAA is modernizing we have replaced displays, computers, software, ...
  - Enroute
    - DSR
    - HOCSR
  - Terminal
    - ARTS II-E
    - STARS
  - Weather Sensors
    - More ASOS and AWOS
- Availability is up!

NAS Architecture via CATS -I



http://www.nas-architecture.faa.gov/cats