

William J. Hughes Technical Center

NextGen Test Bed Capabilities and Future Plans

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**Federal Aviation
Administration**



Outline

- NextGen Test Bed Purpose
- Concept and Big Picture
- NextGen Integration & Evaluation Capability (NIEC)
 - Capability Overview
 - Projects / Customers
 - Future Plans /Ideas

NextGen Test Bed Purpose

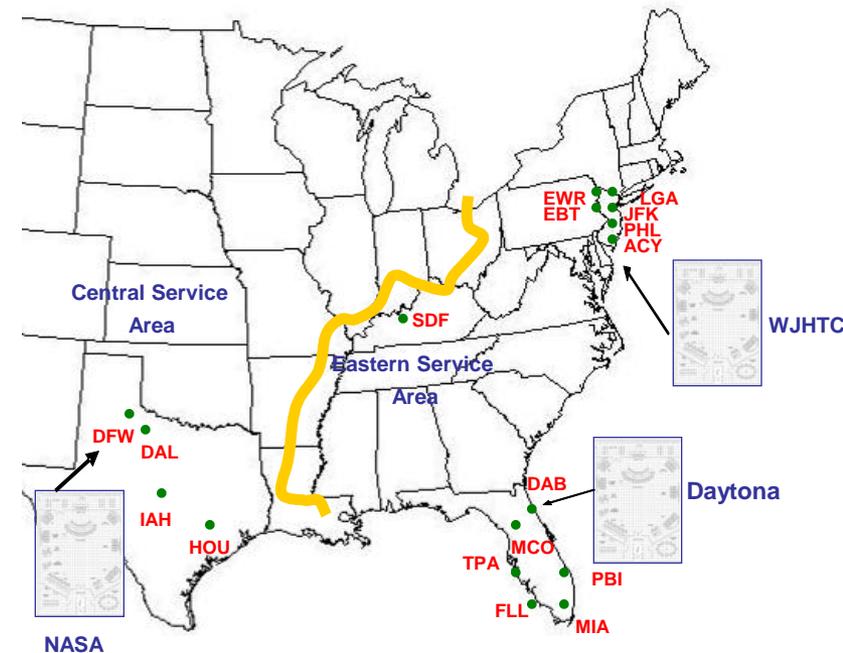
- Not just evaluate concepts and technologies...
 - Show that NextGen initiatives have “benefits”.
- Demonstrate and understand the benefits of operational improvements (OI’s) “early on”.
- Identify potential risks “early on”.
- Understand integration and interoperability issues.
- Fosters Gov’t and Industry partnerships in support of NAS demonstration activities.

NextGen Test Bed Concept

- Provide integrated, multi-domain NAS environment.
 - Part laboratory...to support evaluations
 - Modeling and Simulation Capabilities.
 - Part real world...to support actual demonstrations
 - Use real sites, real equipment and real airspace in a non-interfering manner.
 - Demonstrations to validate the simulations

NextGen Test Bed - Big Picture

- Three main components:
 - **Florida Test Bed**
 - DBIA Facility, Daytona, FL
 - ERAU Supported
 - Industry Partnerships
 - **Texas Test Bed**
 - NASA Facility, DFW, TX
 - Strong Terminal capabilities
 - **New York Test Bed**
 - WJHTC, Atlantic City, NJ
 - **NextGen Integration & Evaluation Capability (NIEC)**



NextGen Integration & Evaluation Capability (NIEC)

- Synergism of lab capabilities already at the Tech Center
- Rapid prototyping and simulation environment anchored by a new “Display Area”
 - Fast Time (Modeling)
 - Real-Time Human-in-the-loop
- NextGen technologies, concepts, and equipment can be integrated and evaluated
 - “Verification” operation & benefits
 - Prior to “validation” of benefits in real world demonstrations
- Good mix of legacy systems and new technologies
 - Supports “transition” to NextGen

NIEC Functional Concept Diagram (Big Picture)

External Facilities



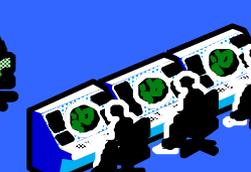

Remote Cockpit Simulators
- LaRC
- Ames

ATC Simulators
- Florida Test Bed
- Mitre
- NASA

Research Park

Key Internal Labs






ERAM Labs

STARS Labs

ATOP Labs

Common ARTS Labs

Voice Comm Labs

NIEC Display Area



UAS Simulation Area



NIEC Cockpit Simulator

Target Generation Facility (Aircraft Simulation)



Desktop SimPilots



Simulated RADAR (s)

ADS -B / TIS-B / FIS-B Service Delivery Simulator



TGF ATC Consoles

Fast Time Modeling Tools (Airspace) (Airports)

ADS-B Lab

NWEC Weather Lab
NNEW Services

Data Comm Lab and Infrastructure (Segment 1 & 2 Services)

SWIM Labs (Publish & Subscribe)

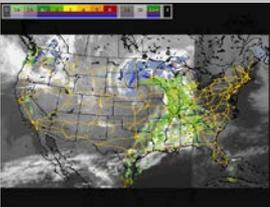
Traffic Flow Management Test Area



Tower Visualization System



ATC Simulation Consoles



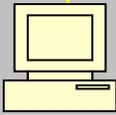
Weather Displays & Decision Tools



TMU Displays

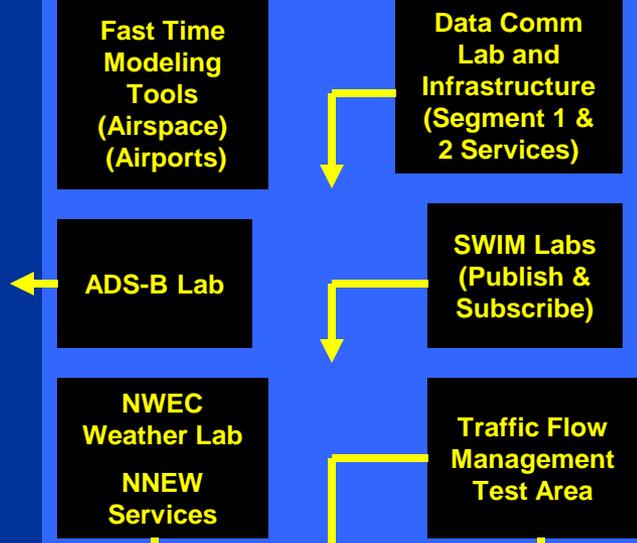
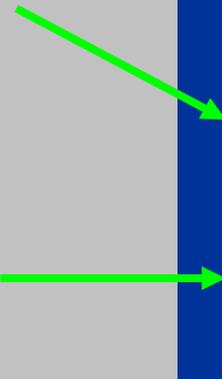


TMU Work Stations

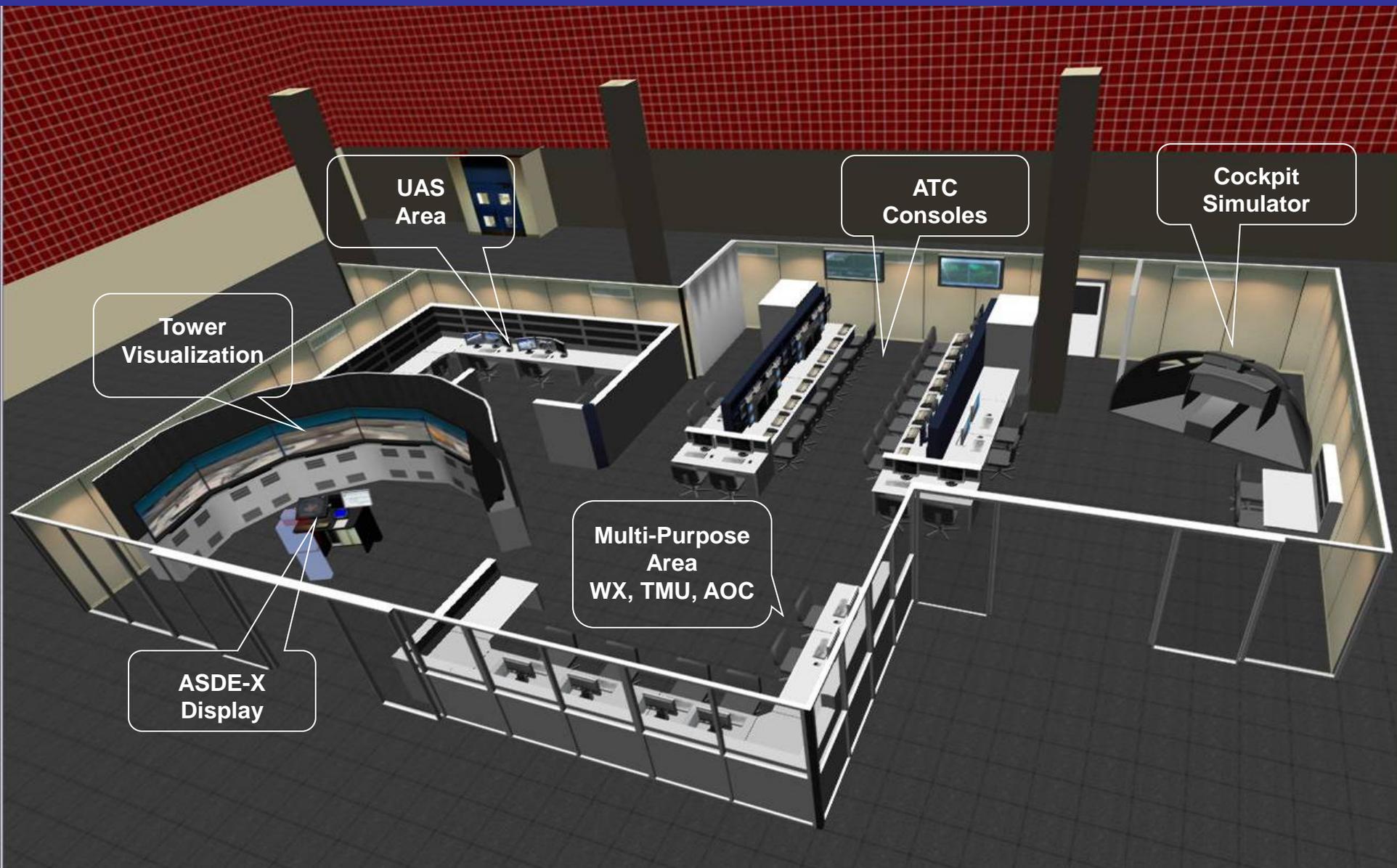


AOC

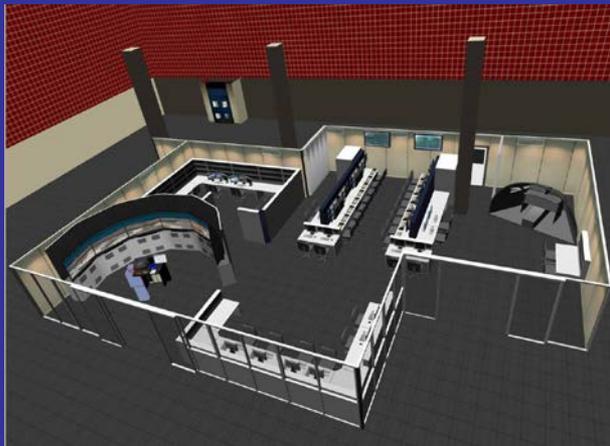
Aviation SimNet



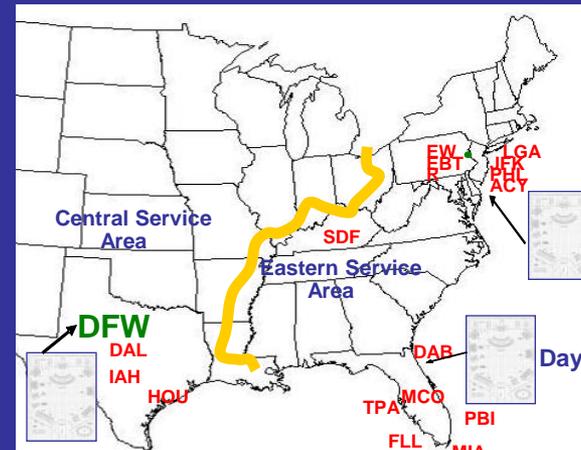
NIEC Display Area



Test Bed support to Staffed NextGen Tower (SNT) Project

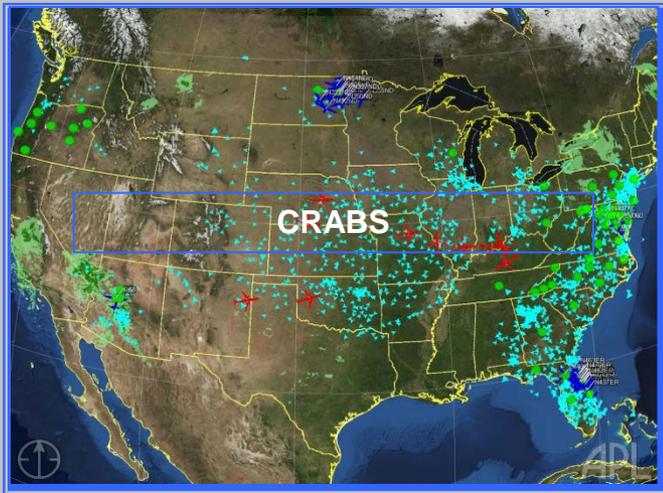


Simulation of **DFW** Tower in NIEC



Actual Demonstration at DFW

NIEC Support to UAS Simulation



Comprehensive Real-time Analysis of Broadcast Systems



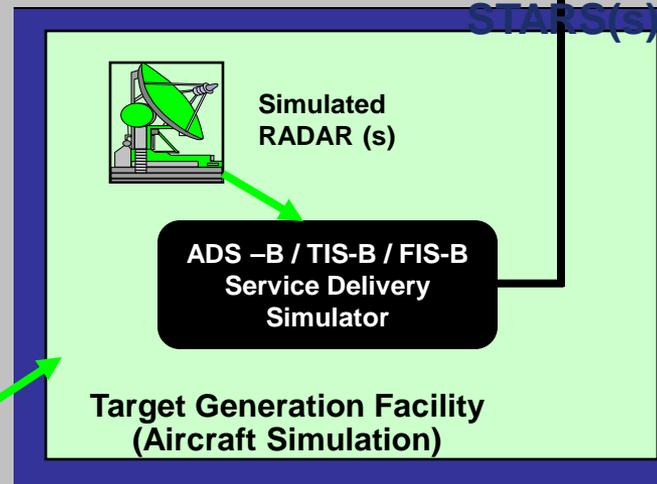
Cockpit Display of Traffic Information



R&D Display of Surveillance and Weather information



AAI Shadow-200 Control Station and Unmanned Aircraft Simulator

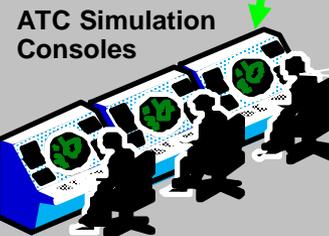


Key Internal Labs

ADS-B Lab

NWEC Weather Lab

NNEW Services



Evaluate Ground Based See & Avoid Concept



Future Plans / Ideas

- Formal NIEC Opening on January 28, 2010
 - Operational demonstration of capabilities
- Formal simulations for UAS and SNT projects to begin in Feb 2010
- Continuously Evolve
 - Ongoing meetings with SE's, SSC's and researchers to continuously refine needed capabilities
 - Input from Test Community
- Plans for Expansion
- Integrate with Other Test Beds
- Determine relationship to new Aviation Research Park
- Tech Center (AJP-7) to support the Demonstration Selection Group (DSG)

Questions?