



FAA Remote Tower Pilot Program

NextGen Technology Development
& Prototyping Division

Presented to: REDAC

Date: 3/15/23



Agenda

- RT Pilot Program Congressional Direction
- Concept Overview
- Current Remote Tower (RT) Evaluation Status
- Updated Remote Tower Pilot Program Approach
- Standards/Advisory Circular Development Status
- Business Case Development
- Summary



Congressional Direction

Congress directed the FAA to establish an RT pilot program to:

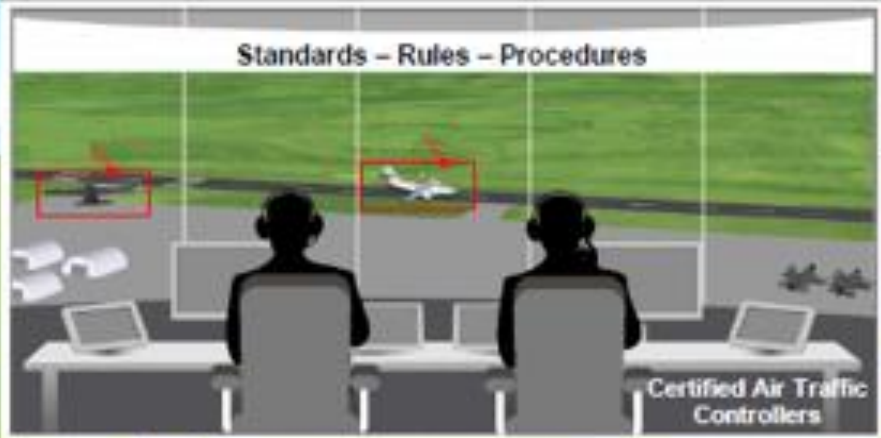
- **Evaluate technical and operational feasibility of applying RT technology in the NAS**
 - Conduct operational evaluations at select pilot sites to determine operational viability for use in the NAS
 - Initial sites are Class D, VFR airports, subsequent sites will evaluate system at more complex airports (e.g. multiple/crossing runways)
- **Establish minimum standards and a clear process for operational certification of RT**
 - Develop an Advisory Circular that defines the process to evaluate, Type Certify (i.e., System Design Approval), and Commission RTs
 - Develop associated technical system requirements/ standards
 - Create a Qualified Vendor System List (QVSL) of certified systems
- **Understand the business case of establishing and operating RTs in the NAS**
 - Comprehensive cost analysis to determine where RTs are a cost effective alternative to brick and mortar towers



Remote Tower Overview

Remote Tower Module

Standards – Rules – Procedures



Utilizing Existing NAS Systems



Radio & Phone
Communication



Weather
Information



Navigation
Systems



Flight
Information

Utilizing RT System Visualization Components for Provision of Air Traffic Services



Pan-Tilt-Zoom



Fixed Position
Camera System



Infrared Multi
Sensor Camera

Cameras on central mast
provide 360° view of
airport environment.

Remote Tower Center

Distributed cameras
supplement airport view.

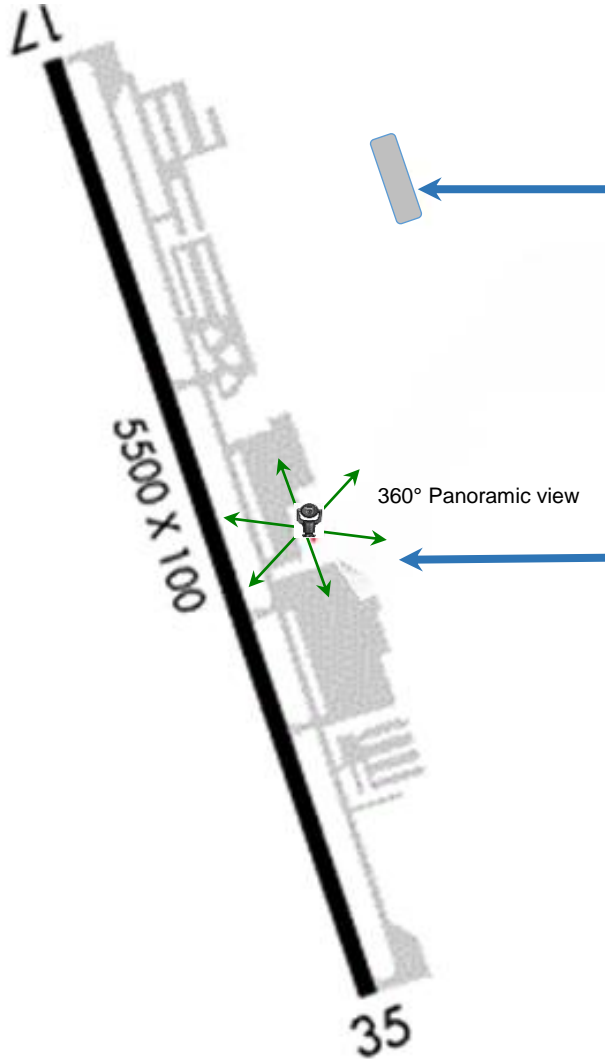


Current RT Concept Overview

- Current RT systems under evaluation consists of visual display a 360-degree and PTZ views of the airfield
- Controllers use RT (in place of the tower cab OTW view) in conjunction with existing items on the MEL, and other tower equipment (e.g., FDI/O) when applicable
- This change is transparent to the pilot; the RT provides the same tower services as those provided by a brick and mortar tower
- Initial applications
 - VFR towers in Class D/E airspace
 - Non-Federal Control Towers (NFCT) and sponsor-owned FAA Contract Towers (FCTs) where RT systems will be non-federally owned and maintained



Pilot Site #1: Saab Sensis RT at JYO



Remote Tower Module
(Equipment, console, and displays)



Remote Tower Center
(748 Miller Drive, Suite G-3
Leesburg, VA)

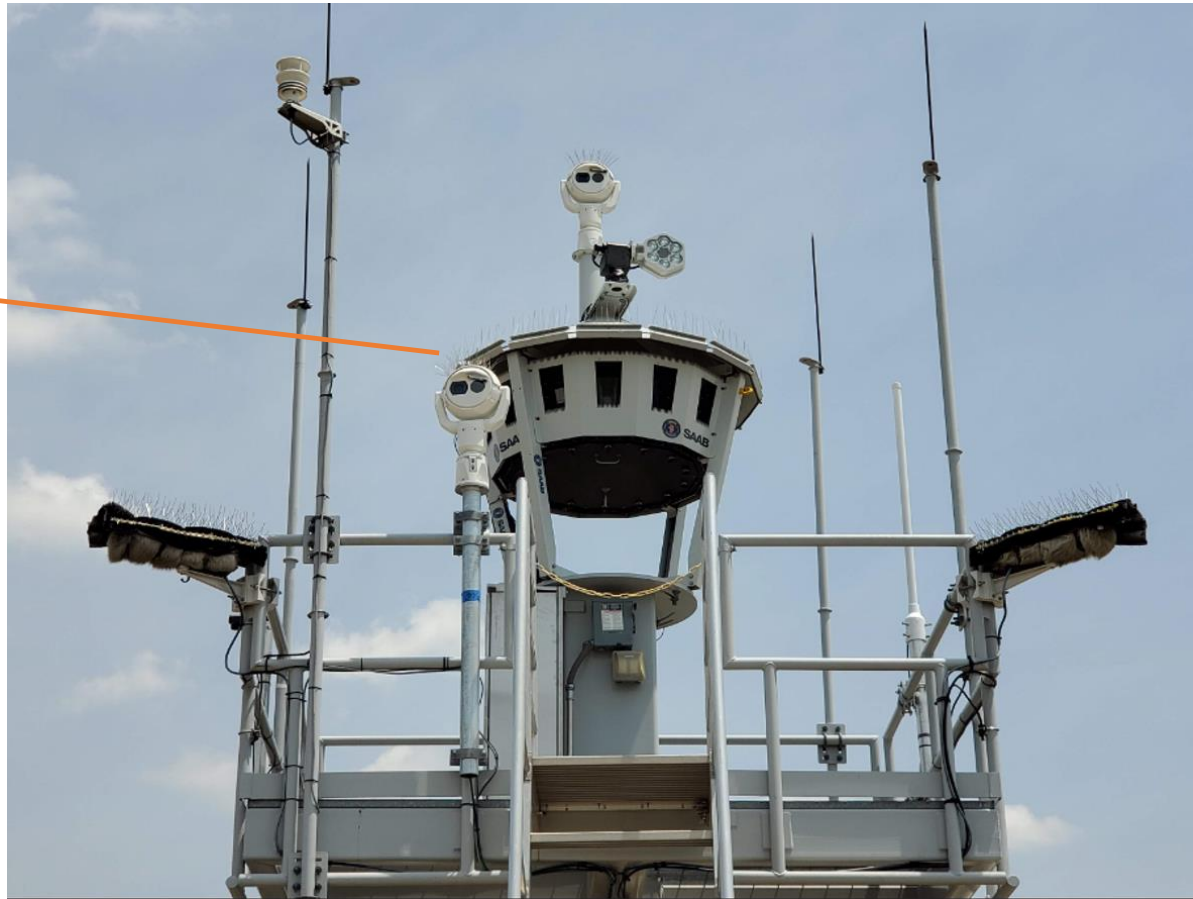


**Camera Mast on
JYO Terminal Bldg.**



Saab Sensis RT at JYO

On-Airport
Camera Mast



Saab Sensis RT at JYO

Video wall with 360-degree view



Zoomed in view with Binoculars & PTZ cameras

Equipped with additional ATCT equipment (e.g., radios)



JYO Evaluation Status

- 2016-2017: FAA conducted a series of passive and active RT evaluations*
- June 2018-September 2019: Industry-led Initial Operating Capability
- Jan-Sep 2020: RT Control Room relocated to a permanent off-airport facility
- December 2020: RT system Site Acceptance Testing (SAT) completed by vendor
- April 2021: JYO airport traffic control tower operations resumed use of RT system on April 26, 2021
- September 29, 2021: Air Traffic Services (AJT) decision on Operational Viability of the Leesburg vendor RT system
 - Controllers able to provide Visual Flight Rules (VFR) ATCT services in Class D airspace with the Saab, Inc. RT system configuration at JYO
 - Viability decision limited to airports like JYO with single runway of 5,500 x 100 feet or less in Class D airspace
- October, 2021 +: FAA system SDA activities

****Note: Multiple safety panels throughout the evaluations were convened to identify hazards, level of risk and appropriate risk mitigations to move into each phase of testing of the RT system***



Pilot Site #2: Searidge RT at FNL

Equipment Room



ATC Facility



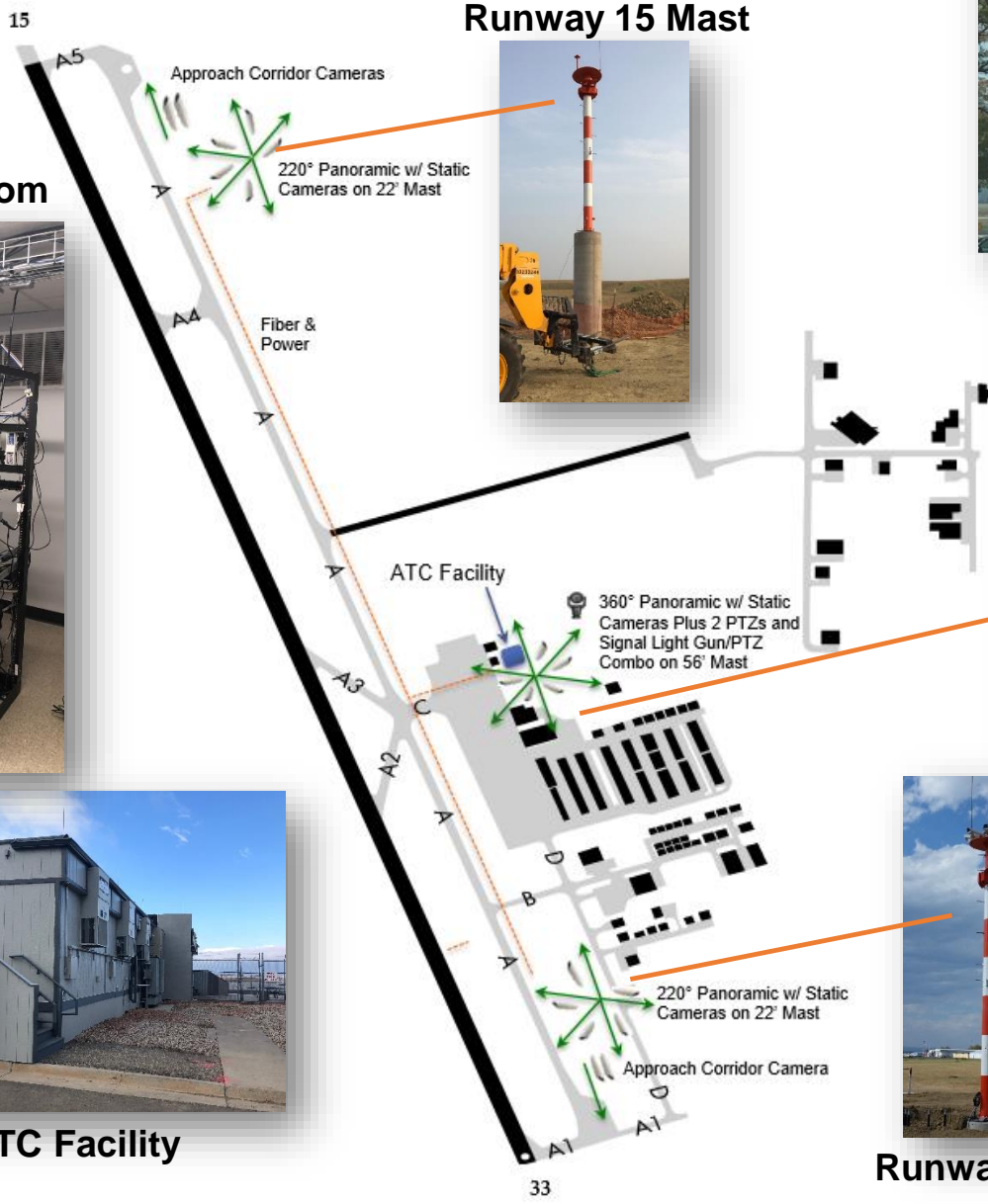
Runway 15 Mast



Center Mast



Runway 33 Mast



Searidge Technology RT at FNL

Video wall with 360 degree view



Three Controller Working Positions



FNL Evaluation Status

- **2018/2019:** Site preparation, installation, Phase 0 evaluations completed
- **2019:** System Optimized based on Phase 0 (RT passive/uncontrolled airport) evaluations) findings
- **March – April 2022:** In person Phase 1 data collection
 - 4 weeks of passive testing conducted
 - Multiple system deficiencies were identified through data collection phase
- **November 2022+:** FAA suspended Pilot Program activities at FNL and provided Searidge six months to demonstrate system deficiencies have been address and SDA intake documentation is complete
 - Searidge demonstration of select system updates planned for March 29-30



Updated Remote Tower Pilot Program Approach

Original

- FAA evaluates remote tower system at vendor/FAA selected location (one-system/one-site approach)
- FAA evaluations limited to site specific configuration/layout

New

- Centralized testing and evaluation at NARTP/ACY testbed
- Vendor must pass FAA Intake Process as outlined in the RT Advisory Circular
- FAA will commit resources for system installation and evaluation at the testbed only after vendors successfully complete FAA Intake Review process
- If vendor passes Intake they can proceed to the full System Design Approval (SDA) process, which includes passive system evaluations



Goals of New Evaluation Approach

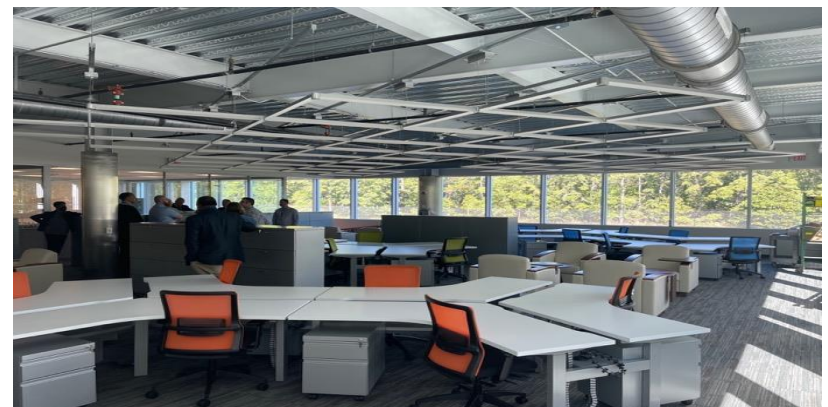
- Accelerates timeline in meeting goals of Congressional direction
- Provides more robust evaluation of vendors' systems at a single site/allow FAA to explore the environmental and operational bounds of the utility of RT systems
- Provides broader solutions to the RT marketplace in a timelier manner
- Reduces risk to FAA and airport sponsors in the case the vendor system cannot meet FAA standards



WJHTC Test Bed

- **September 2022:** Initial Site Survey conducted at William J. Hughes Technical Center and Atlantic City International Airport (ACY)
 - Identified space for the Remote Tower Center in the Lift Lab in National Aerospace Research and Technology Park, building 3
 - Identified potential locations for the Remote Tower Airport equipment on the airfield (i.e., Camera mast/tower)
 - Observed ACY tower operations to inform Test Plan development
- **December 13-14, 2022:** Subsequent Site Survey with Raytheon/Frequentis conducted to solidify requirements (e.g., power, communication, etc.)
- **Next Steps:**
 - Finalize requirements and engineering drawings
 - Contract with construction vendors
 - Commence construction

NARTP, Bldg. 3



Standards Development Status

➤ RT Advisory Circular (AC) and Associated Requirements

- AC provides vendors guidance on **SDA (TC)** and **Commissioning** processes for implementation of non-Federal RT systems; initial draft delivered in November 2019
- Technical requirements
 - **September 2020:** Operational Safety Assessment (OSA) panel
 - **March 2023:** Version 4 will be delivered

➤ Remote Tower Siting Process

- Process to determine the location/orientation and height of camera masts as well as location and size of display screens in controller facility
- Process modeled after current tower siting FAA order JO 6480.4
 - Prototyped a Remote Tower (camera) visibility tool, modeled after tower visibility analysis tool (VAT)
 - Developed a RT Preliminary Hazard List
 - Subsequent work underway to determine acceptable methods to simulate camera views for siting panel to assess hazards



Business Case Development Status

FAA considering the business case for 1) FCT from an FAA perspective and 2) a comprehensive business case from the airport sponsor perspective

➤ Business Case Model for inclusion into FCT program finalized in September 2021*

- This model only considers FAA incurred costs (FAA does not fund construction of RT or brick and mortar tower); therefore there is only slight FAA cost increase associated with annual inspections of the RT systems
- RT efficiency benefit analysis showed there was no difference in RT efficiency as compared to brick and mortar
- Data needed to calculate the RT safety benefit is very limited; therefore, FAA took a risk based approach and adjusted safety benefit slightly downward until more safety benefit data is available

**Note: RTs cannot be considered for FCT program until FAA certifies technology for use in the NAS*

➤ Comprehensive Business Case for Airport Sponsors

- Preliminary comprehensive cost analysis shows that RTs are likely a cost-effective alternative to brick-and-mortar for most airports, but it is site-specific

