Air Traffic Control Towers and New Technology to Booster Aviation
Colorado Remote Air Traffic Control Tower Project
David Ulane - Director
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Mission & Vision Statements

Our Mission

The mission of the CDOT Division of Aeronautics is to support Colorado’s multi-modal transportation system by advancing a safe, efficient, and effective state-wide air and space system through collaboration, investment and advocacy.

Our Vision

The vision of the CDOT Division of Aeronautics is to be the leading air and space organization by enhancing the efficiency, economic benefit, and sustainability of Colorado’s air and space system through funding, innovation, education, and pioneering initiatives.
Why are We Doing This at KFNL?
The Future of Air Traffic Control

Northern Colorado Regional Airport
Distributed Camera System

180° Camera Array
360° Camera Array
180° Camera Array
Why at Northern Colorado Regional Airport?

“The lack of an ATCT increased operational risk while flying into and out of FNL, and was a factor in our decision to discontinue service to the airport.”

“If the [remote tower] concept at FNL [is] implemented as described, this would cause Allegiant to seriously look into the immediate possibility of re-initiating service at FNL.”
About More Than Just Air Traffic Control
COLORADO Remote Tower PROJECT TIMELINE

- **Project Timeline**

**System Installation Began**
- **AUG 2018**
- Cameras Installed & Control Facility Remodling Began

**Phase 0**
- **OCT-DEC 2018**
- Preliminary installation, evaluation, and testing

**Air Traffic Control Begins**
- **JAN-MAY 2019**
- FAA Site Acceptance
  - FAA site acceptance testing & final system optimization

**Phase 1**
- **NOV 2019**
- Airspace is controlled by mobile air traffic control tower & system testing begins

**Phase 2**
- **JAN 2020**
- Airspace is controlled by Remote Tower

**Phase 3**
- **TBD 2020**
- FAA Certification

- **TBD 2021**

**FEDERAL AVIATION ADMINISTRATION**
Remote Tower Project

THE PROJECT
The Colorado Remote Tower Project pioneers the next generation of air traffic control technology. This test project is the first to combine visual/camera input and radar/radar-based input, allowing for control of air traffic at airports from a remote location. The result of this project will enhance safety and efficiency at airports, while also reducing the construction and operating costs of a traditional air traffic control tower.

THE AIRPORT
The Northern Colorado Regional Airport (FNL) located in Loveland, Colorado was chosen as the initial test facility for the Colorado Remote Tower Project. FNL is Colorado’s busiest non-towered airport with a wide mix of fixed-wing and helicopter traffic, making this airport an ideal test facility for remote air traffic control technology.

THE PARTNERS
The Colorado Remote Tower Project is made possible through a strong public/private partnership developed between the Colorado Department of Transportation’s Division of Aeronautics, Federal Aviation Administration (FAA), National Air Traffic Controllers Association (NATCA) Northern Colorado Regional Airport, and Senptide Technologies.

THE TECHNOLOGY
The Colorado Remote Tower Project will employ leading-edge technology that will be the first in the U.S. to meld both ground-based visual/camera data with aircraft radar/air traffic data. This high-tech array will provide an enhanced level of efficiency and safety, while dramatically reducing the costs associated with the construction and staffing of a traditional air traffic control tower.

THE LATEST
Stay up-to-date with the latest developments on the installation and testing of the Colorado Remote Tower Project.
Leesburg Remote Tower Program

NASAO 88th Annual Convention
10 Sept 2019

Matt Massiano, Saab Sensis Corporation
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Agenda

• Remote tower concept

• Features and Benefits

• US launch in Leesburg, VA
Provide ATC Tower Services From Anywhere

Remotely (or Locally) Controlled Airport

Remote Tower Center (RTC)
Remote Tower “Crows Nest”

- 14 high-definition (HD) cameras
- Pan/tilt/zoom (PTZ) electro-optical cameras (30x)
- Pan/tilt infrared (IR) camera
- Signal light gun (SLG)
- Microphones
- Pressurized camera house with “AirBlade” mitigates:
  - Rain, snow, hail, moisture and dust
  - Temperature extremes
  - Sunlight
  - Insects and birds
- Size: ~ 5’ diameter x 8’ height
“Airblade” at Work
RTC Controller Working Position

- Weather Overlay
- Voice Switch
- Electronic Flight Strips
- Radar
- Flight Data
- "Out the Window" View
- Airfield Lighting Control
- PTZ Camera Control
- Optional Features

"Out the Window" View
World’s 1\textsuperscript{st} Remote Tower Center (RTC) (Sundsvall, Sweden)

1\textsuperscript{st} Remote Airport (Örnsköldsvik) commissioned April 2015

2\textsuperscript{nd} Remote Airport (Sundsvall) commissioned in November 2017

3\textsuperscript{rd} Remote Airport (Linköping) to follow in 2019
Primary Benefits vs. Conventional ATCT

- Lower capital and O&M costs
- Shortened schedule for site design and deployment
- Smaller footprint for more flexible siting
- Enables remote and consolidated tower operations
Beyond Cost Savings

- Overlay local weather
- Track birds, drones etc.
- Outline runway, taxiway etc.
- Overlay radar/ADS-B data
- Enhance visibility in adverse conditions
- Night vision with IR cameras
U.S. Launch Project at Leesburg

- Goals for Leesburg Executive Airport (JYO)
  - Reduce delays for IFR traffic
  - Provide greater safety margins for VFR traffic
  - Aid Special Flight Rules Area (SFRA) operations

- Strategy
  - Establish rTWR demonstration system at JYO
  - Obtain FAA approval and certification for basic VFR tower services at Leesburg
  - Demonstrate potential benefits to NAS

- Partnership established 2014
  - Virginia SATSLab, Inc. (VSATS)
  - Leesburg Executive Airport
  - Saab Sensis
  - Advisory partners… FAA, DOAV and NATCA
Leesburg Executive Airport (JYO)

- JYO
  - Non-towered operations in Class E/G airspace
  - 2nd busiest non-towered airport on eastern seaboard
  - 2nd busiest GA airport in VA
  - Designated GA reliever for Washington-Dulles International Airport (IAD), ~ 9 miles southeast

- Operational Profile
  - ~ 115,000 operations/year
  - 250 based aircraft
  - Over 40% of aircraft commercially-operated (e.g., rentals, business owners, flight schools)
Leesburg Project Status

- **rTWR Initial Operating Capability (IOC) Phase 3a...** started Jun '18
  - FAA Validation and Verification (V&V): Hazard Monitoring and Control Tower Service
  - ATS requirements for non-radar rTWR configuration

- **V&V Phase 3b...** Spring ‘19
  - Combined CLNC / GND / LOC positions
  - rTWR failure modes

- **Continued rTWR IOC Phase 3c**
  - Operate from **new RTC facility**
  - STARS tower display V&V

- **Phase 4**
  - FAA **Type Certification**
  - FAA **Site Commissioning**
  - FAA **Advisory Circular**
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