



# ***WEATHER REPORTING IN THE NAS: CURRENT AND FUTURE NEEDS***

**PANEL 2, PRESENTATION 1**

**WALTER COMBS / FAA**

# Sys Ops Flight Service Weather Camera Program

**WCAMs VWOS**  
**FPAW Spring Telecom**

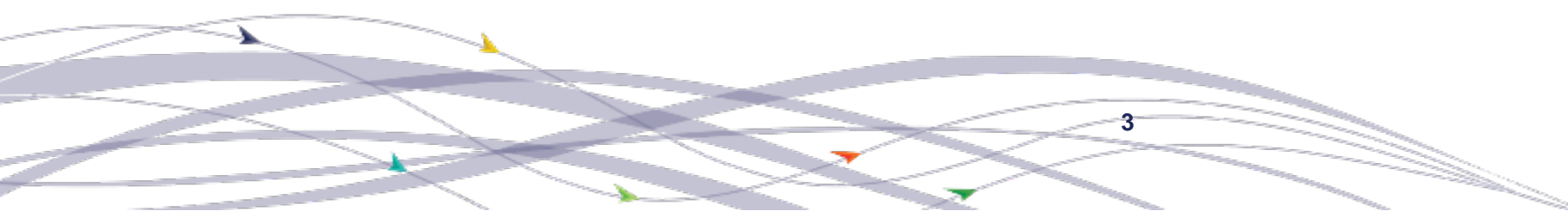
*Presenter: Walter Combs*

*To: FPAW*

April 15, 2020

# Agenda

- VWOS: Affordable Alternative to AWOS
- June, 2020: Initial Development and Test
- Sep 2020 - Jun 2021: Demonstration of Capability - 3 non-AWOS Alaska Airports
- Weather Camera Expansion Hawaii/CONUS





# An Affordable Alternative

**Flight**Service  
ATO SysOps



## The New “Silver Standard” - WCAMs VWOS

- Visual Weather Observation System (VWOS)
  - Modernized Weather OBS Platform
  - Non-certified, Supplemental Weather Observation Platform
  - Automated with Self-Validation, and Self-Reporting
  - Cost ~1/10th the cost of AWOS/ASOS
  - WCAMs PO is capable to install 100 systems over 5-years



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# 360 Degree WCAM

**FlightService**  
ATOSysOps

- Enhanced Airport Services
- 360 degree, Night Vision Enhanced, Pan/Tilt/Zoom
- Coupled with AWOS and VWOS systems - **The Whole Picture**
- Pilot situational awareness and Flight Management Services



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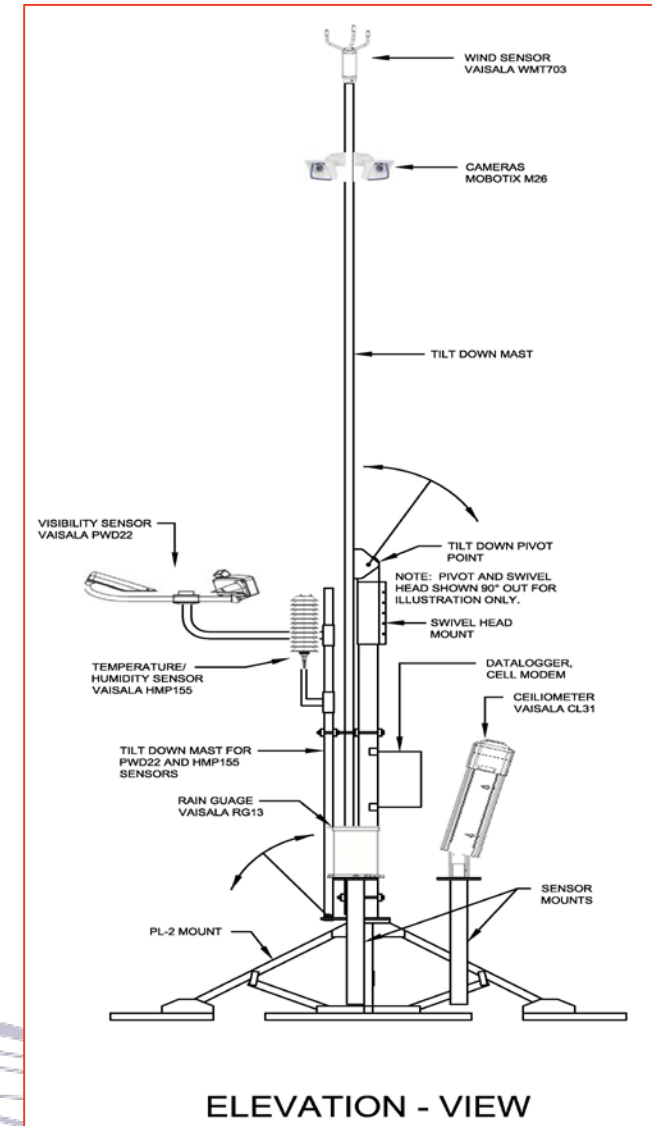


# VWOS Characteristics

FlightService  
ATO SysOps

## Visual Weather Observation System

- Weather Data outputs:
  - Camera images
  - Ceiling, Visibility, Pressure, Winds, Temps, Humidity, Rainfall, others
- Advisory Weather (non-certified)
- Enhanced Industry Standard Sensors
  - System self-checks for Accuracy
  - Self-reports sensor/data errors
- IP telecommunications
- Cloud Network Data-Processing
  - API's support data sharing

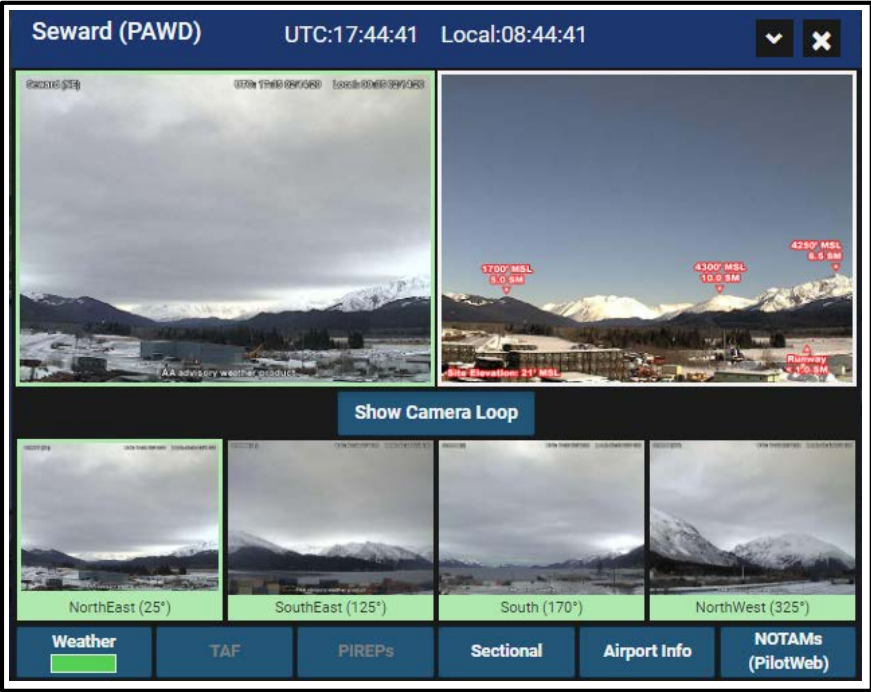


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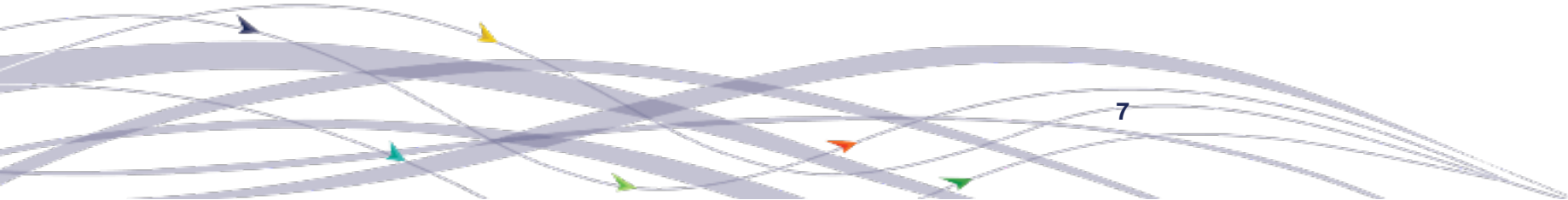
# WCAMs New Data Displays

Images + Textual Weather = The **WHOLE PICTURE**



(Trends)      (Current OBS)      (Forecasts)

Historical Observations	PAWD - Seward, Alaska	Area Forecast
	Current Observation Type - METAR: <b>PAWD/141653Z/AUTO/34010KT/10SM/OVC043/M10/M14/A2961/ RMK AO2 SLP027 T11001139 TSNO</b>	Type: AAG
Hours Ago 6 5 4 3 2 1	Time Observed: 2020-02-14 18:53z [18 minutes ago]	Future Hours 3 6 9 12 18 24
	Temperature: -10°C	
	Dew Point: -14°C	
	Pressure(Alt): 29.61 inches Hg	
	Winds: From NNW (340 degrees) at 10 knots	
	Visibility: 10 miles	
	Ceiling: 4300 ft AGL	
	Clouds: Overcast at 4300 ft AGL	
	Vert Visibility: missing	
	Weather: missing	
	Remarks: AO2 SLP027 T11001139 TSNO	



# ◀ WCAMs VWOS Benefits

- **Effective**
  - Accurate, Validated Weather Observation data
  - Supports Aviation Operations where METAR does not exist
- **Enables NWS Forecast products**
  - Enables/Improves Forecast Products - RTMA, TAF, LAMP, AAG
- **Low-Cost Installs and Operations**
  - Cost approximately 10% of an AWOS/ASOS
- **Responsive**
  - Capable to install > 20+ systems per year



# ◀ Test and Develop Project Plan

## VWOS - Initial Test and Development

- Palmer, Alaska
  - May 20, 2020: Hardware Installation
  - Jun - Sep, 2020: Operational Test and Data Comparison
    - Comparison - AWOS, VWOS, Flight Services
    - Flight Service operational review and inputs
    - Volunteer Pilot/Operator Participation

# Test and Develop Project Plan



## Operational Demonstration of Capability

### Demonstrate IFR Access Using WCAM-VWOS Services

➤ Sep 2020 - Jun 2021

- VWOS at three Alaska Airports (To be selected)
- Participants:
  - Volunteer Commercial Operators
  - FAA Flight Services, Dispatchers, Flight Followers
  - FAA Flight Standards
  - FAA Flight Procedures



# ◀ VWOS 2021 and Beyond

- **Develop VWOS Standards and Specifications**
  - FAA Operational Requirements for Usage
  - Expansion / Approvals outside Alaska and Hawaii
  - Performance-Based Sensor Requirements
  - Specification Transmittal to Industry participants
- **Develop VFR (silver std) Weather Data Network**
  - Data pathway similar to METAR Long-line
  - Make data immediately available for public consumption
  - Direct Data Feeds to NWS and Industry Providers

# Weather Camera Expansion



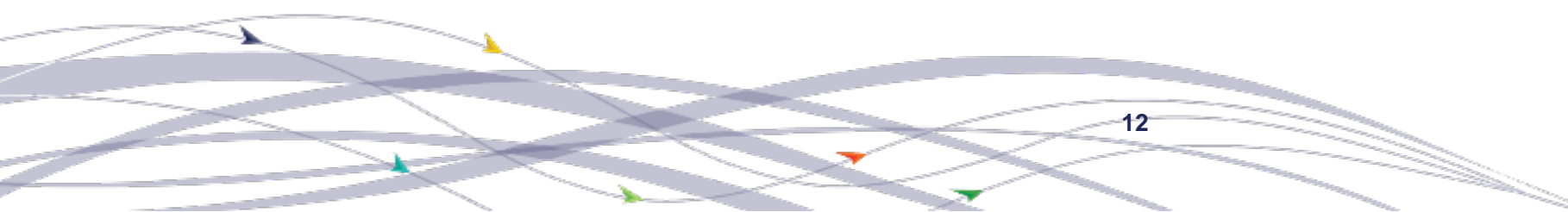
## **WCAM Expansion outside of Alaska:**

### **1. Hawaii - Install 23 Camera Systems**

- Use Congressional provided funds to install the first 10 sites
- Work with the CIT to identify future funds to complete the remaining 13 sites

### **2. CONUS - Integrate State DOT-owned camera images onto WCAMs website**

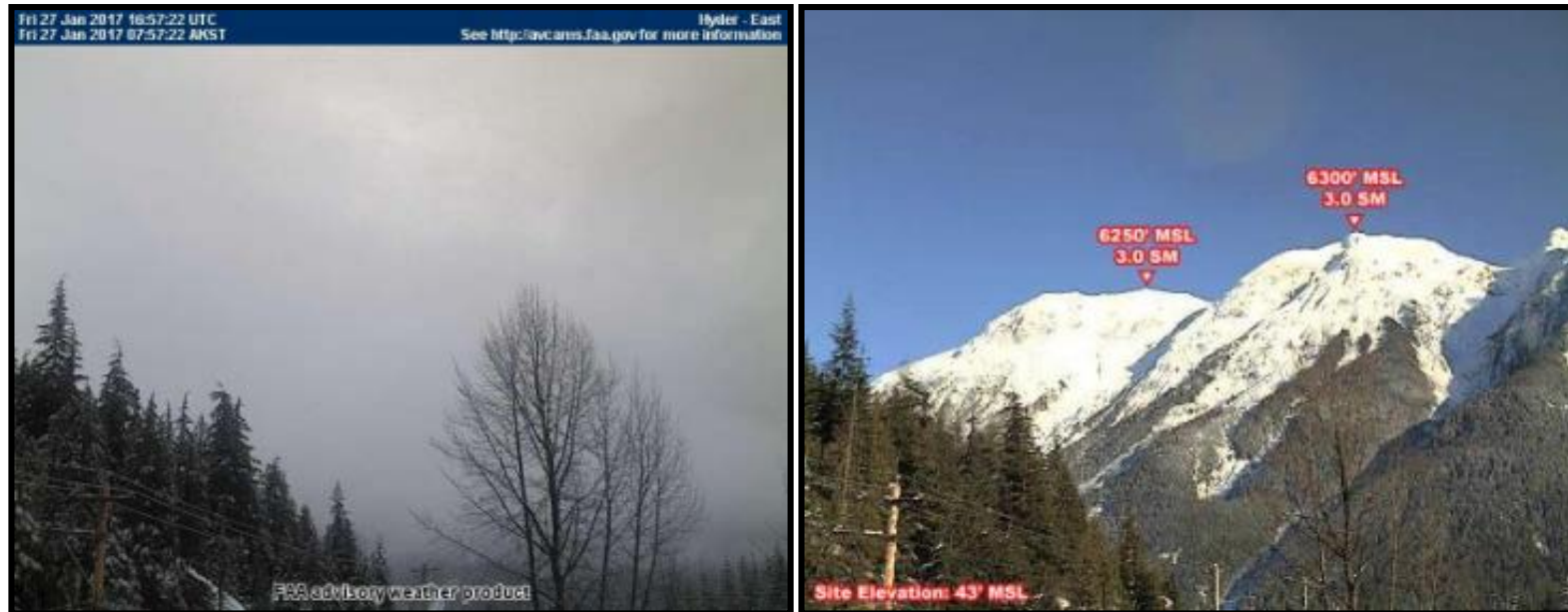
- Beginning with CODOT – Demonstrate operational capability
- Work with other state DOT's to expand camera Image Integration



# Definition of Program

***Look Before you Fly*** versus ***Fly out and take a look***

- *Improves pilot “Go/No-Go” decision making*
- *Reduces accidents, fatalities, and flight interruptions*



Current Image

‘Clear-Day’ Image

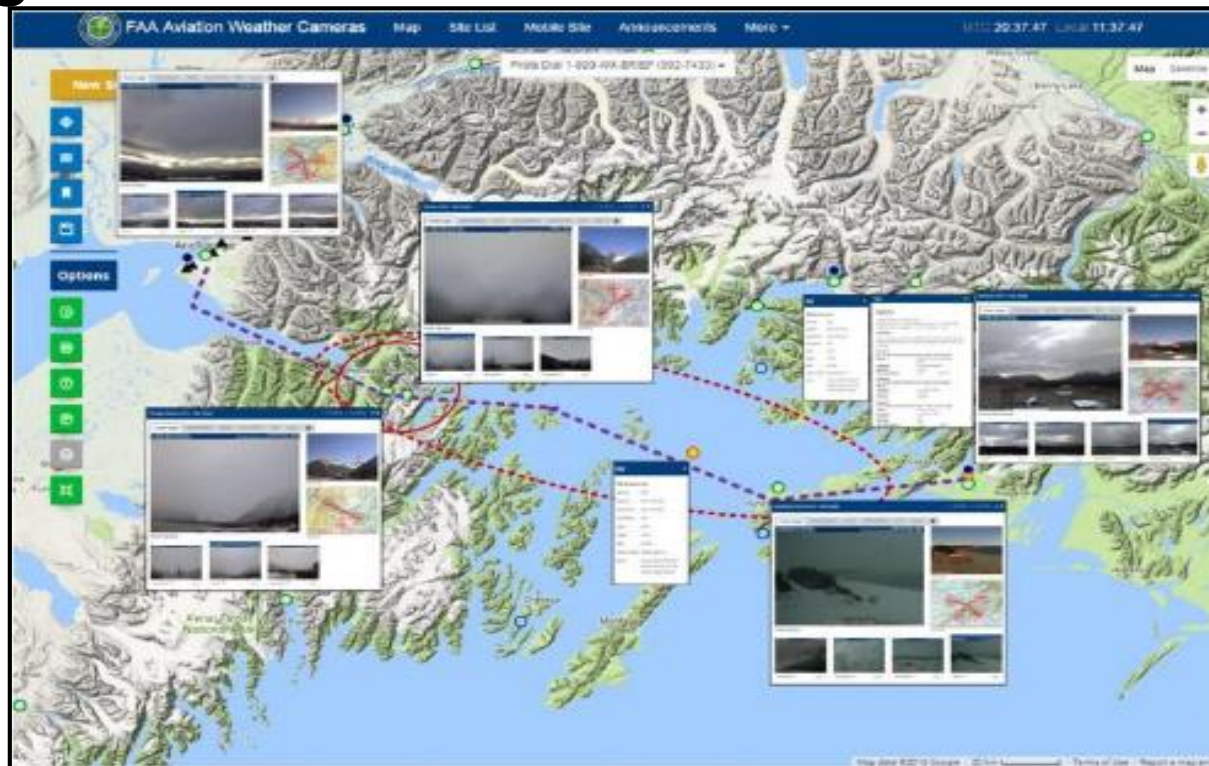


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# Definition of Program

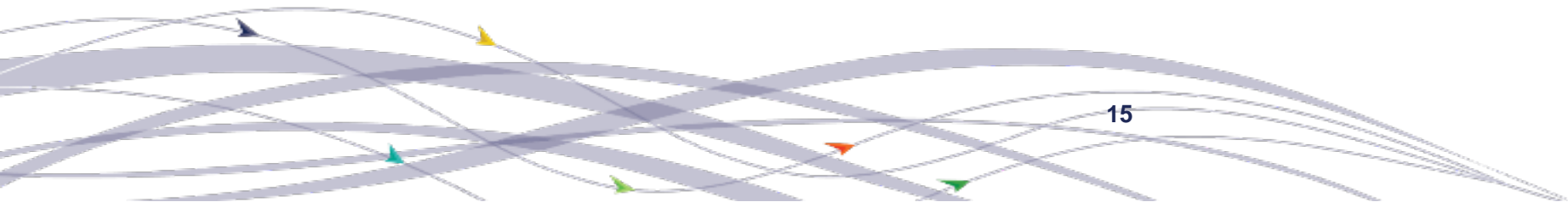
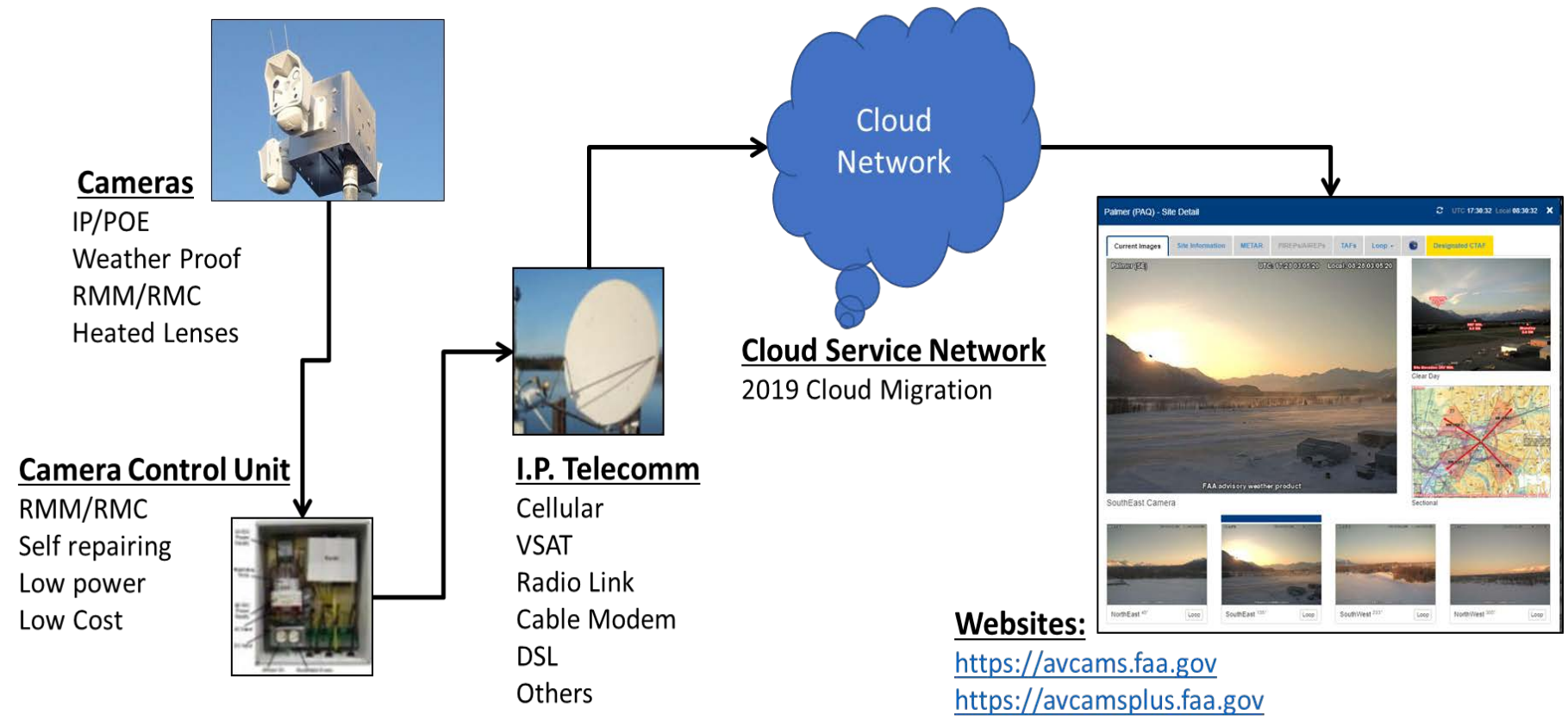
## *Route-based aviation data enhances flight-decision making*





# Definition of Program

## Weather Camera System Architecture



## NTSB Safety Recommendations – Aug, 2013

- **A-13-025 – Hawaii:** *Initiate an aviation weather camera program in Hawaii that includes the installation and maintenance of aviation weather cameras at critical locations in Hawaii. Establish public access to these aviation weather cameras' real-time imagery.*
- **A-13-026 – CONUS:** *Install and maintain aviation weather cameras in those mountain passes in the continental United States identified in its research as being high risk. Establish public access to these aviation weather cameras' real-time imagery.*
- **A-13-027 - Flight Service:** *Equip Flight Service Specialists responsible for Hawaii and the continental United States with the technical capabilities and training to provide verbal preflight and en-route briefings using aviation weather camera imagery.*

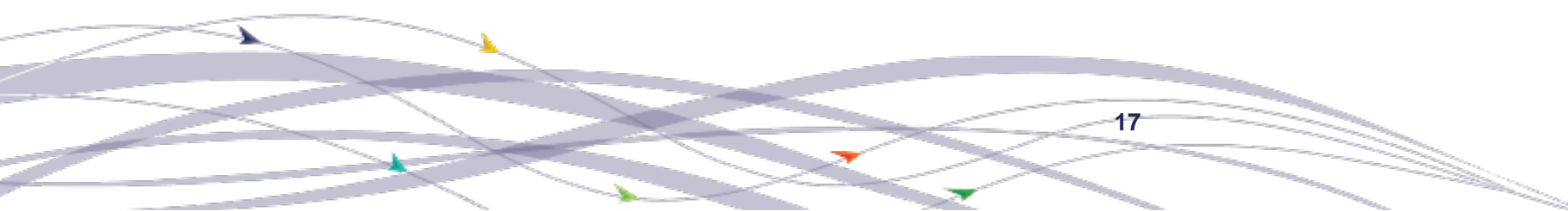
# Decision – Hawaii, Install 23 WCAM Systems



**Congress Provided \$1.8M – FY20 Funds**

**“Establish camera services outside of Alaska”**

- **Highest Priority – Hawaii, 23 Camera Locations identified as critical**
- **\$1.8M will complete ~10 Hawaii camera sites**
  - Install schedule: August 2020 – Sep 2022
- **\$2M additional funds required to complete the remaining 13 sites**



# Decision - Install 23 Hawaii WCAM Systems

Response to numerous weather-related aviation accidents and fatalities

- Engineering surveys conducted Mar 2014

- Existing infrastructure identified

- Easy access locations

- Most possess electrical power

- Implementation 2-years to complete





# Decision: CONUS - DOT Image Integration

**Flight**Service  
ATO SysOps

## *CONUS Image Integration:*

- *The most efficient method to expand WCAM services to the CONUS*
  - *State DOT's install and maintain camera systems*
  - *FAA integrates images onto its website making available to all NAS users*
  - *High value to all aviation user-groups – Safety and Efficiency*
- ***Already a proven successful concept***
  - *215 NAV Canada-owned camera sites - over the past 7 years*
  - *Proven: Very Low Effort, Very Low Cost*



# Decision: CONUS - DOT Image Integration



*State DOT's are already interested to participate*

- *Reaching out to WCAMs with interest*
- *Colorado State DOT Division of Aeronautics*
- *Montana, Wyoming, Oregon, Washington, California, New Mexico, and others*

## *CODOT / WCAM Cost Reimbursable Agreement*

- *WCAMs / CODOT installing Cams on 13 mountain AWOS sites*
  - *Technology Transfer to CODOT – robust camera systems and maintenance concepts*
- *CODOT owns and maintains*
- *First of Many*



# Next Steps

## *WCAM Future Business Case*

- *Jan 2021-23:*
  - *Install up to 100 additional camera systems in Alaska*
  - *Install up to 170 camera systems in CONUS Mountain States*
  - *Potential additional camera systems in Hawaii*

## Q and A

[Gordon.rother@faa.gov](mailto:Gordon.rother@faa.gov)

[Walter.combs@faa.gov](mailto:Walter.combs@faa.gov)



## ***LIVE DEMO: PALMER, AK VWOS***

**[HTTPS://FAA-AVIATION-DATA-PORTAL.GITHUB.IO/360-CAM/PANORAMA-VIEWER/?SITEID=96](https://faa-aviation-data-portal.github.io/360-cam/panorama-viewer/?siteid=96)**