State of Washington Joint Transportation Committee Evaluation of Washington State Patrol's Cessna Aircraft Fleet

JTC Presentation

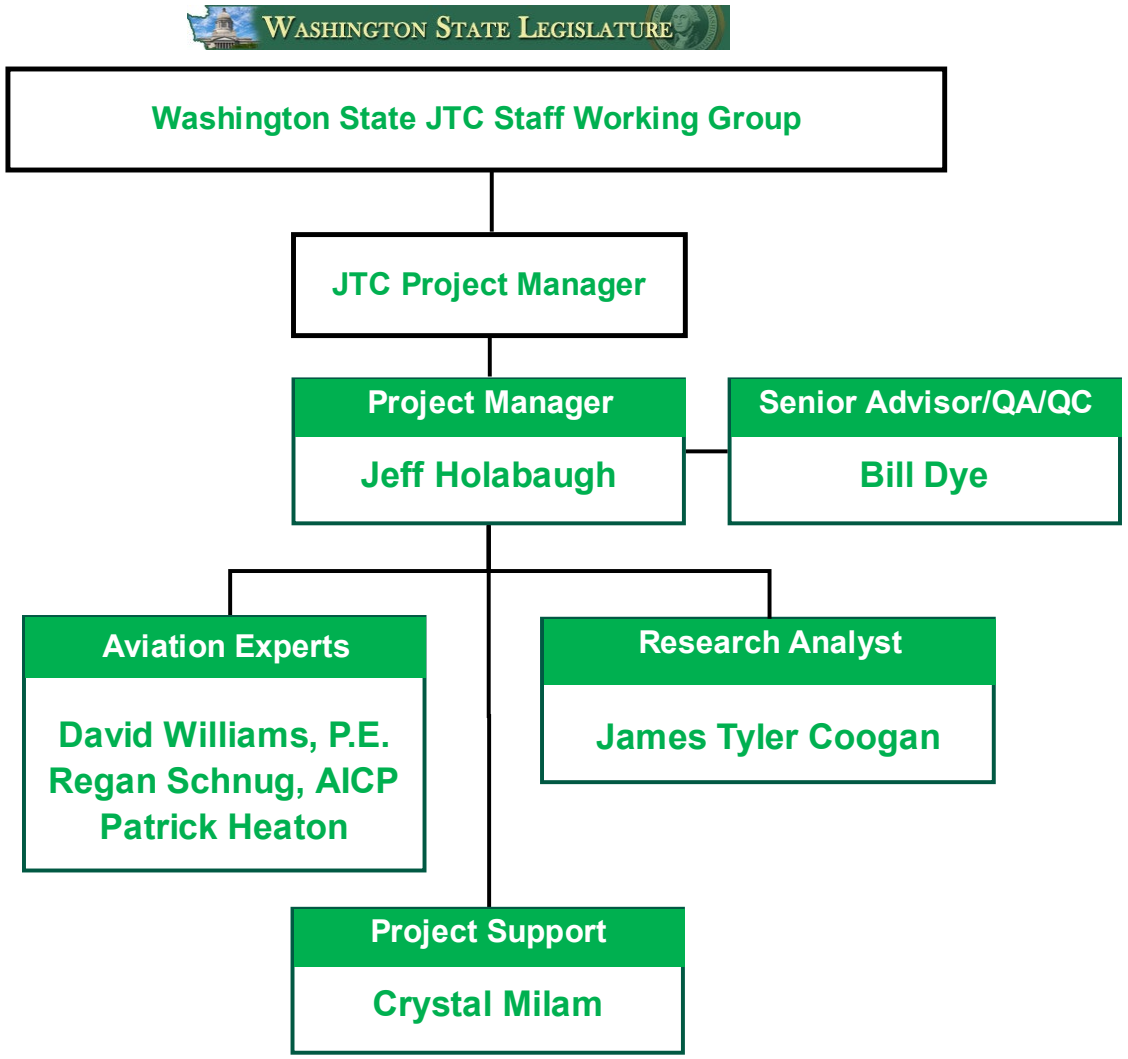
Tuesday, November 15, 2022

DYE MANAGEMENT GROUP, INC.

in conjunction with

Kimley»Horn

Project Team Introductions



Project Objectives

- Evaluate WSP aviation fleet replacement request considering other options for fleet modernization

- The DMG team:
  - Assessed the current use and performance of the aircraft and need for replacement
  - Evaluated timing of needed replacement of the aircraft
  - Evaluated the feasibility and costs of using aircraft powered by alternative fuel
  - Reviewed other potential technologies, including unmanned aerial vehicles, to achieve some or all of the aviation section's mission

WSP Aviation Section Missions: Traffic Enforcement

- Traffic enforcement
  - Target Zero Aerial Patrols (TZAP) highway safety program
    - Use 206 aircraft to conduct statewide day and night aerial patrols targeting collision causing violations
    - Supports Washington State DOT's Target Zero Safety Plan

TZAP and Traffic Mission Summary

2021 TZAP and Traffic Missions	
DUI Arrests	37
Aggressive Driver Apprehension Traffic Stops	1,276
Other Violations Stopped (e.g., Speed, Reckless, Drugs)	1,791
Suspect Searches/Containment	102
Pursuit Involvement	70
Calls for Service	820

WSP Aviation Section Missions: Non-Traffic Enforcement

- Transportation (governor, other state officials)
  - Beechcraft King Air also used for transport
  - Approximately 40 percent of 182 missions are transport
- Assist local law enforcement
  - Drug and marijuana grow enforcement
  - Medical and emergency support including search and rescue
  - Surveillance including demonstration/protest observation
  - Lojack
- U.S. Navy operations/missions
- Training

Benefits of FLIR-enabled Missions

- FLIR-enabled aircraft enable both day and nighttime missions
- Provides aerial support to state and local law enforcement, including pursuit management
  - Enhances public safety by reducing high speed chases
  - Supports the reduction in speeding and dangerous/drunk drivers
- Supports search and rescue functions
- Supports U.S. Navy operations/missions

Current WSP Fleet

Aircraft	Mission	Limitations
(3) Cessna 182	Transport/Traffic/ Training	Cannot accommodate FLIR cameras Limited to daytime traffic operations Limited to only designated roadway sections with painted lines
(2) Cessna 206	Forward-Looking Infrared (FLIR) enabled Missions	Currently 4 day/week coverage Not optimal for transport or training missions
		High purchase cost for FLIR equipment Adds significant weight to airframe

Airframe Replacement Standards

- 10,000 hours is a generally accepted target for replacement. After that:
  - Resale value significantly declines
  - Increased maintenance costs and/or downtime risk
  - Aircraft components deteriorate with age
- WSP Fleet at or approaching 10,000 hours
  - Planes currently under 10,000 hours are expected to reach that level of use by the recommended replacement schedule
  - 18 – 24-month lead time to procure aircraft

Findings from Current State Assessment

- Current fleet approaching end of useful life
  - Increased risk of significant downtime as the aircraft age
- Mix of aircraft fits WSP mission
  - 206s:
    - FLIR equipment enables night missions
    - Night missions currently conducted from Wednesday-Saturday
  - 182s:
    - Flight training
    - Transport and daytime traffic enforcement

Key Recommendations Informing Fleet Replacement

- Increase ability to conduct FLIR missions from 4 to 7 days per week
  - This requires replacing some 182s with 206s
- 10,000 hour target timeframe for replacement
  - Substantial decrease in resale value after 10,000 hours
  - Also, aircraft components deteriorate with age

WSP Original Request

- Replace current Cessna fleet with (5) new 206 aircraft over five years
- Equip each 206 with its own Forward Looking Infrared (FLIR) camera Replace (2) cameras with (5) new FLIR cameras
- Total request* = $10,840,411

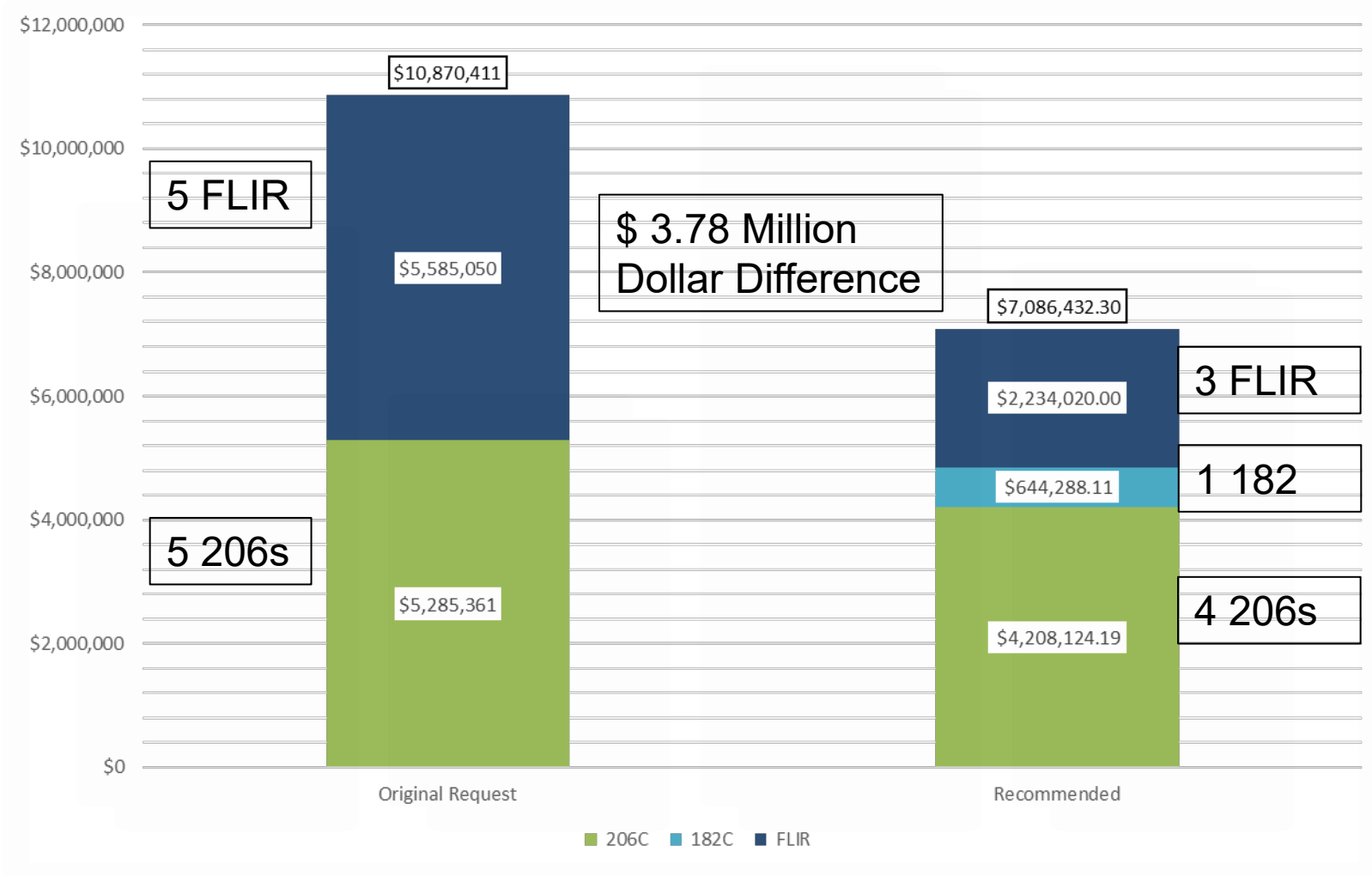
*Adjusted to remove financing mechanism

Recommend Fleet

- Change fleet composition:

Current Fleet	WSP Request	Recommendation
3 Cessna 182		1 Cessna 182
2 Cessna 206 with 2 FLIR	5 Cessna 206 with 5 FLIR	4 Cessna 206 with 3 (movable) FLIR

Original WSP Request and Recommended Fleet Cost Comparison



*Original request adjusted to remove financing mechanism

Recommended Fleet Advantages

Recommendation enables:

- Daily and more frequent FLIR-enabled aerial missions
  - Current fleet supports 4-day per week FLIR-enabled missions
  - Assumes one 206 aircraft will be down for maintenance at any given time
- Sufficient capacity of FLIR cameras to support daily FLIR-enabled aerial missions
- Continued ability to deliver the transport and training missions
- Mitigated risk of obsolescence of existing cameras

Recommended Replacement Schedule

- Purchase four new 206 models over 5 years
- (3) FLIR camera units
- Replace remaining 182 in 2028

Item	FY2024	FY2025	FY2026	FY2027	FY2028	Resale Value	GRAND TOTAL
Cessna 206	$2,210,000	$0	$1,172,295	$0	$1,243,687	(377,716.49)	$4,248,265
Cessna 182	$0	$0	$0	$0	$734,957	(130,810.19)	$604,147
FLIR Camera and Equipment	$2,234,020	$0	$0	$0	$0	$0	$2,234,020
GRAND TOTAL	$4,444,020	$0	$1,172,295	$0	$1,978,644	(508,526.68)	$7,086,432

Risks of Not Replacing Aircraft and Cameras

- Increased maintenance costs:
  - Increased downtime for aircraft maintenance
  - Decreased availability of parts for older planes
- 18-month to 24-month lead time to procure new aircraft; delaying procurement may exacerbate that risk
- Decreased resale value for existing aircraft as hours increase
- Risk of obsolescence in keeping older cameras (originally purchased in 2015)

Alternative Fuels and Electric Aircraft – Purpose

- Assess whether alternative technologies such as alternative fuels and electric aircraft could be viable alternatives to use for WSP's current aircraft or fuels
- Examine the benefits, limitations, and overall feasibility of emerging sustainable aviation fuel (SAF) technology and electric aircraft technology

Alternative Avgas Options Available				
Fuel Name	**Provider**	**Service Status/Estimated Service Entry Date**	**Approved for use?**	
			C182	**C206**
UL91	AirBP	In service in Europe	Yes	No
UL94	Swift Fuels	In service at select U.S. airports	Yes	No
G100UL	General Aviation Modifications, Inc. (GAMI)	FAA approved – Entering production in 2022	Yes	Yes

Alternative Fuels- Recommendations

- WSP should not plan to use new unleaded aviation fuels or SAF as a substitute for current fuels in the near term (next 3 years) due to:
  - Lack of availability
  - Operational constrains to source the fuel
  - Likely to see increased costs
- WSP should monitor availability of unleaded aviation fuel alternatives and use them once they become routinely available
- When available, WSP can encourage fuel providers at Olympia Airport to source these fuels

Electric and Hydrogen Aircraft Findings

Eviation Alice

Pipistrel Velis Electro

Beta Technologies ALIA-250c

Wisk Aero Cora

Electric and Hydrogen Aircraft Recommendations

- WSP should not pursue the purchase of electric aircraft or propulsion systems at this time
- Aircraft currently in service, or expected to be approved for service in the near future, do not meet the requirements for WSP's missions
- WSP should reevaluate electric aircraft options during each aircraft replacement cycle
- These aircraft are rapidly evolving and suitable aircraft may be released for service by 2028

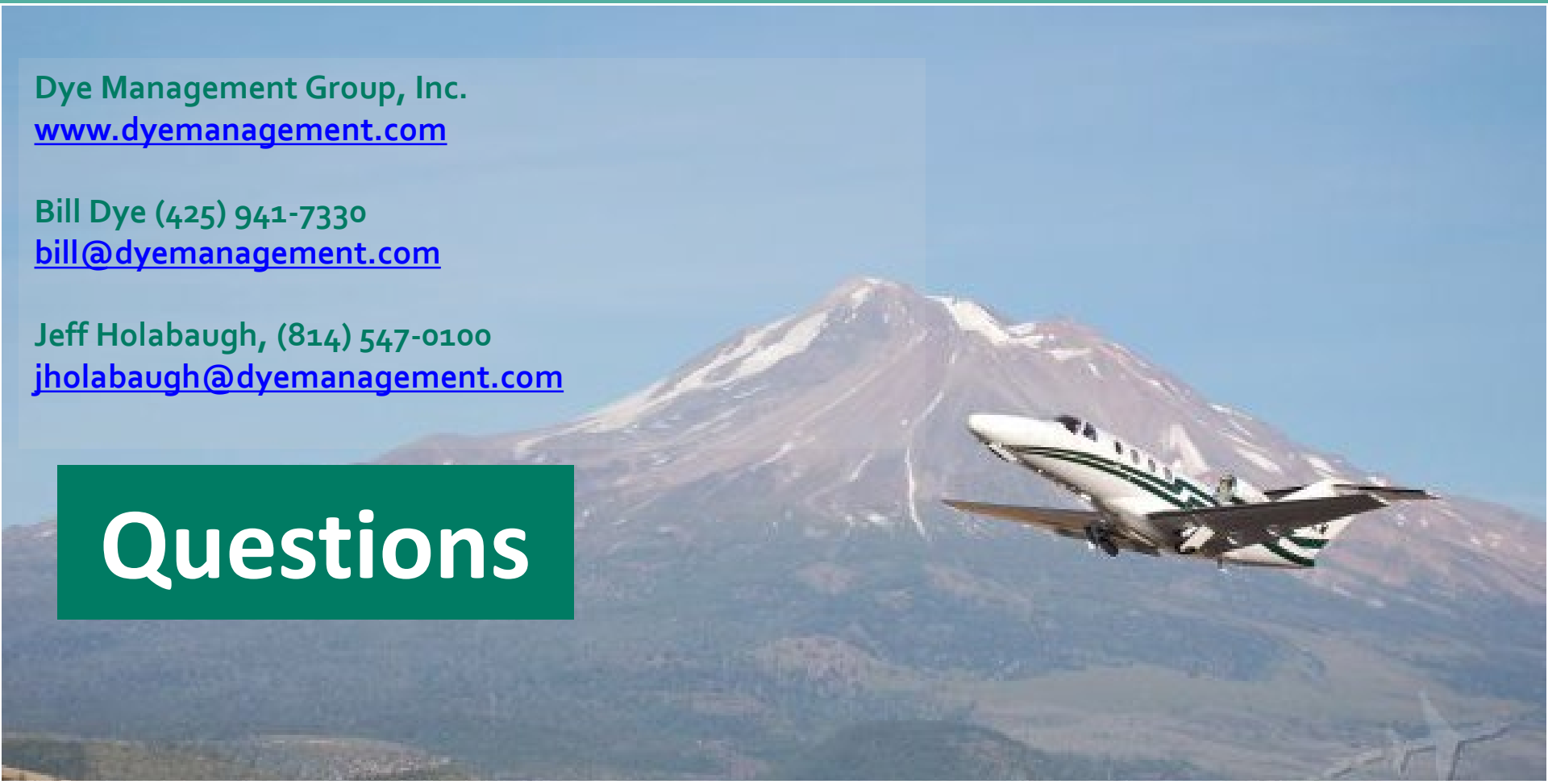
Review of Innovative Technologies Purpose

- Assess whether Unmanned Aerial Systems (UAS or “drones”) operations could be considered a viable alternative for conducting any WSP missions
- Evaluate the opportunities and/or limitations of commercial/civil UAS technology for the use in completing WSP missions

Review of Innovative Technologies – Summary of UAS Recommendations

- WSP should not acquire UAS as an alternative solution
- Commercially-available UAS do not have the battery life, speed, or payload capacity needed to complete these missions
- Also, FAR Part 107 rules limit the mission capability of commercial/civil UAS
- WSP should monitor UAS technology to determine whether it develops the operational capacity required to conduct WSP missions

Questions?



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Questions