



Small Unpiloted Aerial System (sUAS) - Assisted Aircraft Inspection

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Incorporation of sUAS into Aircraft Inspections

- Leverage advancing sUAS technology to conduct aircraft inspections.
- Enable faster inspection of hard-to-reach areas without the need for ground support equipment.
- Minimize aircraft downtime through sUAS automated inspections
- Minimize inspectors' unsafe exposure when working at heights
- Standardize inspection with more precise repeatability



Boeing's Role in Automated Aircraft Inspections

- Enhance customer success in minimizing inspection times.
- Provide safe work environments for mechanics.
- Establish human eye equivalency for sUAS-assisted inspections
- Assess and validate sUAS supplier systems, followed by revisions to maintenance documentation.
- Establish zonal GVI as the standard baseline for the development of conditional inspection methods.



Boeing sUAS Project Development

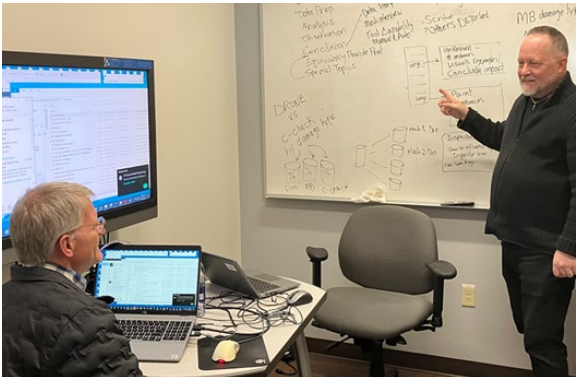
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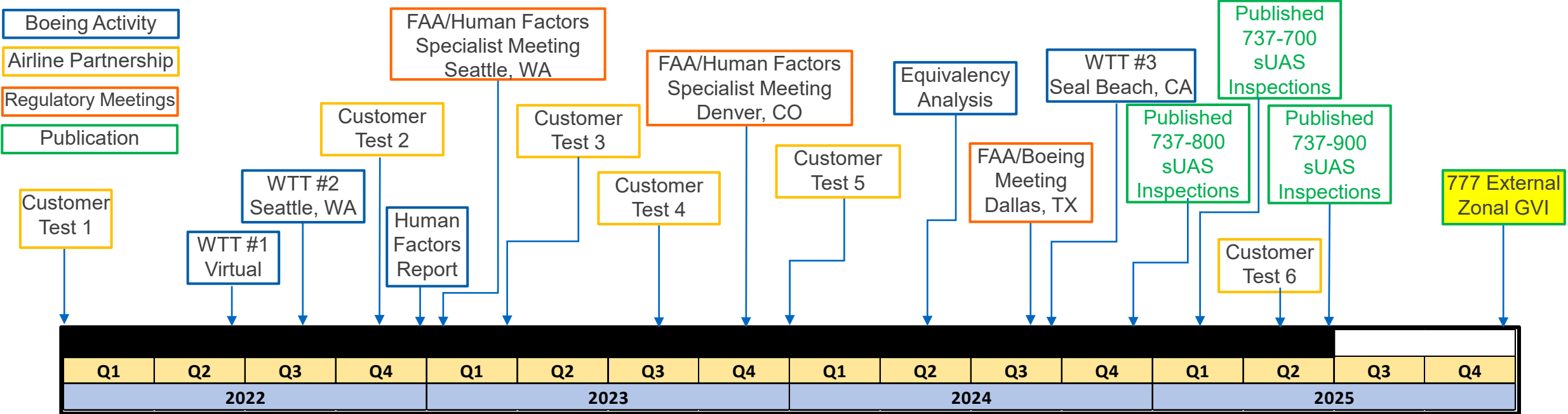
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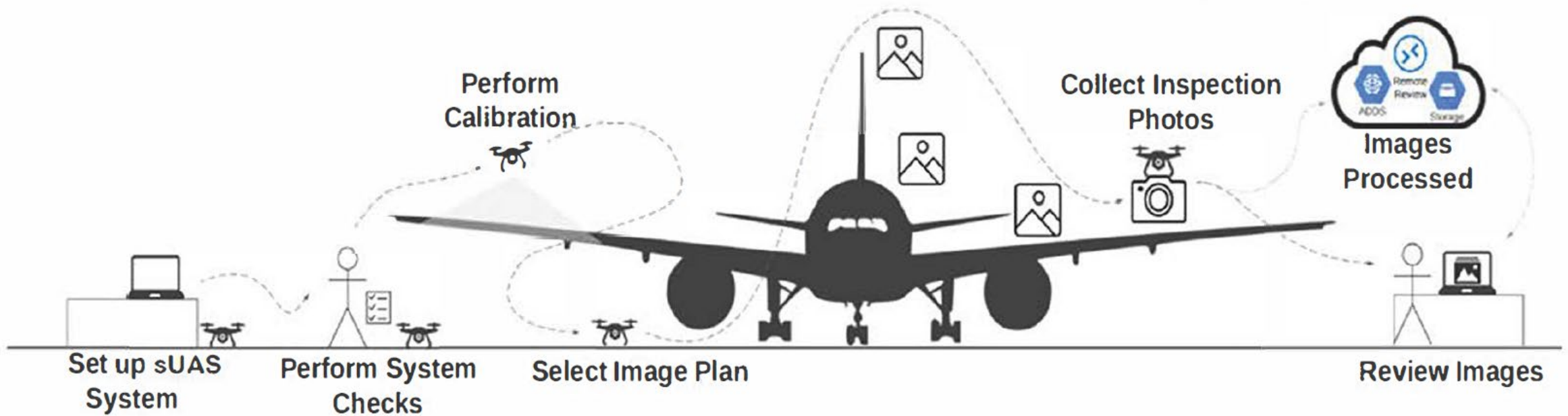
2024



2025



Autonomous Aircraft Inspection – Overview of the System



- Fully Automated inspection procedure
- Minimum human interaction; Setting up the system, selecting image plan and reviewing images
- Manually inspect any areas missed due to obstacles, GSE or ACCESS configuration.

Value of Automated Inspection

- Safety – Reduction of hazardous activities (working at heights using GSE)
- Efficient – Automated, consistent, reduced cost, access to challenging areas
- Sustainable – Faster inspection times, archived inspection history, reduced carbon footprint
- 50 percent savings (conservative number)

Current Pains



Manual inspection requires **special equipment and infrastructure**



Inspection process can **take hours** to complete



People and aircraft exposed to **safety risks** when using lifts or walking on aircraft



Captured images have **no associated location data nor technical information**



Traceability limited by **subjectivity** and incomplete records

Solution Gains



Autonomous UAS follows a flight plan in an unstructured environment



Autonomous inspection takes **less than an hour** for most tasks



Autonomous flight safer, more accurate, and faster than manual flight



Images tagged with location data and connection to technical data

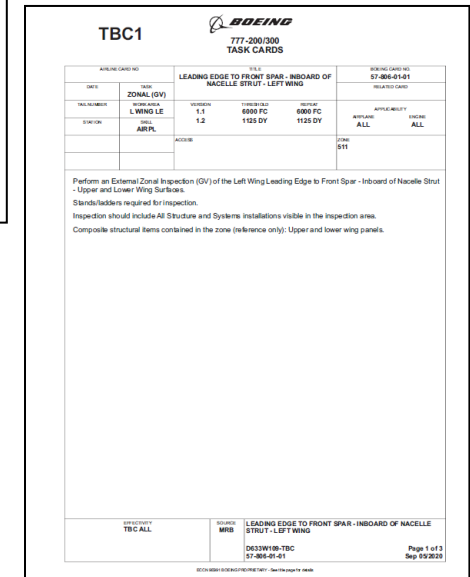
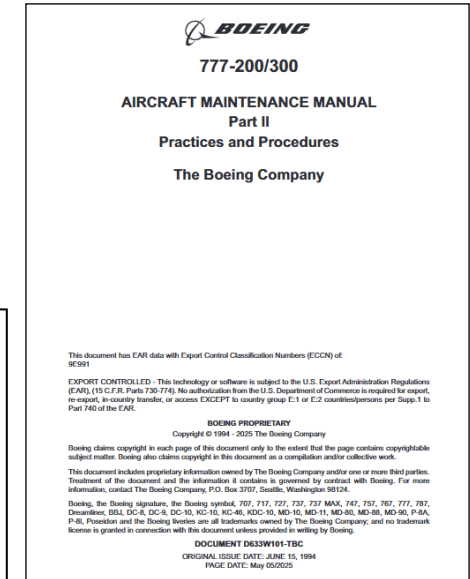


Complete database for historical records, automated analysis, and predictive maintenance

Aircraft	UAV INSP Total Hours	Mechanic INSP Total Hours	Percent Reduction
A/C 1	8.89	21.62	58%
A/C 2	9.68	15.31	36%
A/C 3	9.65	25.18	61%

Incorporation into Maintenance Documents

- Maintenance Planning Document
 - Zonal Program update to list Boeing-approved sUAS alternate method of inspection accepted by FAA.
 - New Appendix listing sUAS Task Cards
- Aircraft Maintenance Manual
 - Two sUAS AMM procedures in Chapter 20
 - Image Collection
 - Image Inspection
 - sUAS External Zonal GV Inspection procedures
- Task Cards
 - New Task Cards for sUAS (same MPD Item #)
 - Alternate method of inspection



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Future

- Possible applications:

sUAS Applications
Lightning Strike
Bird Strike
Hail Strike
Paint quality
Corrosion Inspection
Receiving Inspection Lease transfers
Hard Landing
Antennas

sUAS Applications
Pitot tubes
Static wicks
Door secure
Missing hardware
Ramp checks
Pre-flight checks
Ferry flight check
Incidental damage

Industry Engagement

■ Airline Engagement Opportunities

- Join Boeing's Working Together Team Meeting
- Next Meeting: Tentative November 2025
- Contact: Mike Eckelberry – WTT Chair (michael.j.eckelberry2@boeing.com)



Working Together Team
(WTT #3) Meeting
Seal Beach CA

■ Join Industry Meetings

- SAE G-38 / EUROCAE WG-132 : Automated Aircraft Inspection
- Next Meeting: 4th through 7th November 2025 at Warrendale, PA
- Contact: Greg Sweers – SAE G-38 Chair (gregory.j.sweers@boeing.com)
EUROCAE WG-132 Chair Contact (eurocae@eurocae.net)



Questions?