



UAV Use in Engineering and Bridge Inspection

Best Practices / Lessons Learned

April 7, 2022

Why Use a UAV/UAS?

- Access to Areas That Cannot be Reached
 - Heights or Reach
 - Areas Over Water
- Different Views and Perspectives
- Efficiency
- Ability to Create Videos
- Enhance Hands On or Other Techniques



Types of Projects

- Bridge Inspection
 - Routine / NBIS
 - Emergency / Flood
- Environmental
 - Wetland Delineation
- H&H / Hydraulics
- General Design & Project Development
 - Public Involvement
- LIDAR & Mapping




Training & Certification

- FAA Section 107 for Pilots
 - Certification for Commercial Use of UAV
 - Training Courses Available
 - Certification Process
- Small UAS Certificate of Registration
 - Registration of Actual Drone
- Policies and Procedures from Authority Having Jurisdiction
 - DCNR
 - PennDOT
 - PA Turnpike

PennDOT AV-14 Form

IV-14 (7-19)



pennsylvania
DEPARTMENT OF TRANSPORTATION
www.penndot.gov

UAS FLIGHT REQUEST FORM

FLIGHT PERSONNEL & EQUIPMENT

Remote PIC:	UAS Make:	
PennDOT Cert. #:	Model:	
Mission Observer:	Add Aircraft:	
IF THIRD PARTY		
Organization Name:		

FLIGHT INFORMATION

Date(s):	Project Name:
Location:	Purpose of Flt:
Municipality:	Projected # Flts:

RISK ASSESSMENT

Complexity of Mission Simple: <input type="checkbox"/> L <input type="checkbox"/> M <input type="checkbox"/> H Moderate: <input type="checkbox"/> L <input type="checkbox"/> M <input type="checkbox"/> H Complex: <input type="checkbox"/> L <input type="checkbox"/> M <input type="checkbox"/> H	Controlled Airspace Class G: <input type="checkbox"/> L <input type="checkbox"/> M <input type="checkbox"/> H Class E: <input type="checkbox"/> L <input type="checkbox"/> M <input type="checkbox"/> H Class B-D: <input type="checkbox"/> L <input type="checkbox"/> M <input type="checkbox"/> H	Nearby Airport/Heliport None nearby > 3 mile: <input type="checkbox"/> L <input type="checkbox"/> M <input type="checkbox"/> H Nearby 1-3 miles: <input type="checkbox"/> L <input type="checkbox"/> M <input type="checkbox"/> H Close Proximity < 1 mile: <input type="checkbox"/> L <input type="checkbox"/> M <input type="checkbox"/> H
Wires/Trees/Structures Not present: <input type="checkbox"/> L <input type="checkbox"/> M <input type="checkbox"/> H Nearby > 100': <input type="checkbox"/> L <input type="checkbox"/> M <input type="checkbox"/> H Present: <input type="checkbox"/> L <input type="checkbox"/> M <input type="checkbox"/> H	Proximity to Roads Not over open roads: <input type="checkbox"/> L <input type="checkbox"/> M <input type="checkbox"/> H Open roadways < 40': <input type="checkbox"/> L <input type="checkbox"/> M <input type="checkbox"/> H Over open roads: <input type="checkbox"/> L <input type="checkbox"/> M <input type="checkbox"/> H	Pedestrians/distracted Not present: <input type="checkbox"/> L <input type="checkbox"/> M <input type="checkbox"/> H Nearby uncontrolled: <input type="checkbox"/> L <input type="checkbox"/> M <input type="checkbox"/> H Close Proximity: <input type="checkbox"/> L <input type="checkbox"/> M <input type="checkbox"/> H
Drone Distance from Operator Vertical Dist < 300': <input type="checkbox"/> L <input type="checkbox"/> M <input type="checkbox"/> H Vertical Dist > 300': <input type="checkbox"/> L <input type="checkbox"/> M <input type="checkbox"/> H Hor Dist: > 400 yards: <input type="checkbox"/> L <input type="checkbox"/> M <input type="checkbox"/> H	Private Property N/A or Permission: <input type="checkbox"/> L <input type="checkbox"/> M <input type="checkbox"/> H Nearby > 50': <input type="checkbox"/> L <input type="checkbox"/> M <input type="checkbox"/> H Over or < 10 feet: <input type="checkbox"/> L <input type="checkbox"/> M <input type="checkbox"/> H	Over Water Not over water: <input type="checkbox"/> L <input type="checkbox"/> M <input type="checkbox"/> H Near water: <input type="checkbox"/> L <input type="checkbox"/> M <input type="checkbox"/> H Over water: <input type="checkbox"/> L <input type="checkbox"/> M <input type="checkbox"/> H
Winds Winds < 15 knots: <input type="checkbox"/> L <input type="checkbox"/> M <input type="checkbox"/> H Winds 15-25 knots: <input type="checkbox"/> L <input type="checkbox"/> M <input type="checkbox"/> H Winds > 25 knots: <input type="checkbox"/> L <input type="checkbox"/> M <input type="checkbox"/> H	Daylight Daytime only: <input type="checkbox"/> L <input type="checkbox"/> M <input type="checkbox"/> H During Dawn / Dusk: <input type="checkbox"/> L <input type="checkbox"/> M <input type="checkbox"/> H Nighttime: <input type="checkbox"/> L <input type="checkbox"/> M <input type="checkbox"/> H	Rf Dead Spots Unlikely: <input type="checkbox"/> L <input type="checkbox"/> M <input type="checkbox"/> H Possible: <input type="checkbox"/> L <input type="checkbox"/> M <input type="checkbox"/> H Likely: <input type="checkbox"/> L <input type="checkbox"/> M <input type="checkbox"/> H
Chance of Precipitation None: <input type="checkbox"/> L <input type="checkbox"/> M <input type="checkbox"/> H < 50%: <input type="checkbox"/> L <input type="checkbox"/> M <input type="checkbox"/> H >50%: <input type="checkbox"/> L <input type="checkbox"/> M <input type="checkbox"/> H	Visibility Greater than 3 mile: <input type="checkbox"/> L <input type="checkbox"/> M <input type="checkbox"/> H Chance of low vis: <input type="checkbox"/> L <input type="checkbox"/> M <input type="checkbox"/> H Reduced < 3 mile: <input type="checkbox"/> L <input type="checkbox"/> M <input type="checkbox"/> H	Cloud Base >1,000' AGL: <input type="checkbox"/> L <input type="checkbox"/> M <input type="checkbox"/> H Chance of < 1,000': <input type="checkbox"/> L <input type="checkbox"/> M <input type="checkbox"/> H < 700' AGL: <input type="checkbox"/> L <input type="checkbox"/> M <input type="checkbox"/> H
Private Property Coordination Rqd? <input type="checkbox"/> YES <input type="checkbox"/> NO Notice of Intent to Enter Rqd? <input type="checkbox"/> YES <input type="checkbox"/> NO Airport/Heliport Coordination Rqd? <input type="checkbox"/> YES <input type="checkbox"/> NO		Fill in highest rating from above Overall Risk

CERTIFICATION

UAS Remote PIC Signature:	Title:
PennDOT Signature:	Title:

[illegible]

Considerations for UAV Use

- What Information Are You Trying to Capture?
- Permissions & Authorizations for Flight
- Adequate Personnel
- Site Conditions
 - Obstructions
 - Utilities
 - Access for Pilot & VO
- Weather



Other Considerations

- Proximity of Local Airports
 - What Are Their Operations
- Time Restrictions
- Data Storage Requirements
- For Structure Projects – Configuration of the Structure



Limitations of UAV/UAS Use

- Bridge Inspections:
 - Not a Substitute for Hands On Inspection
 - Access Challenges
 - Line of Sight / Communications
- Batteries
- Data Size / Storage



Kinzua Viaduct Inspection

- Conducted July and August 2021
- Support for NBIS Inspection
- Data Capture for Future Rehab Projects
- Photos and Videos



Kinzua Viaduct Inspection



Kinzua Viaduct Inspection



Port Authority Tower Inspections

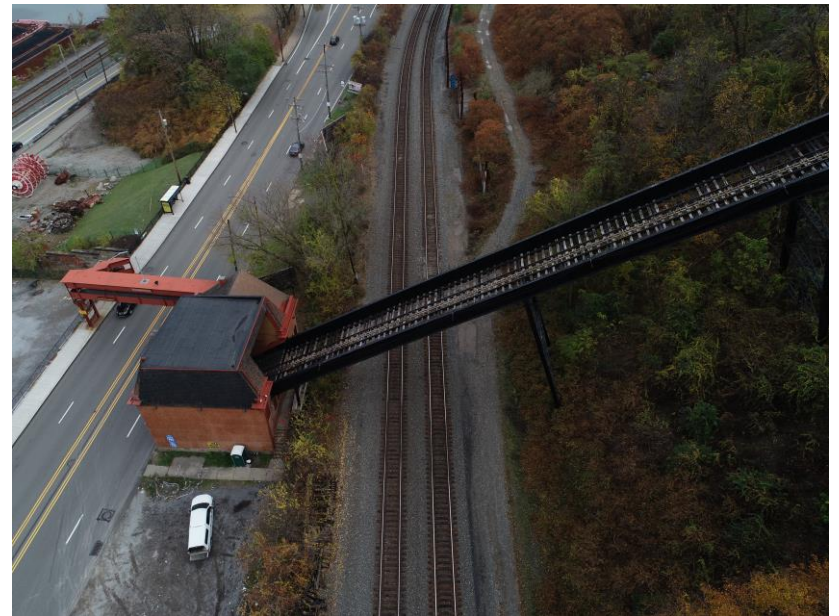
- Port Authority of Allegheny County
- Radio Tower Inspections
- Augment Hands On and Climbing Inspections
- Cursory Inspection of Radio Equipment



Port Authority Tower Inspections



Port Authority Duquesne Incline



Park Bridge Inspections

- Ohiopyle State Park
- High Bridge over Yough River
- Bike Trail over SR 381 and Yough River
- Augment Inspection and Capture Overall Photos



Park Bridge Inspections



Flyover of Trail Bridge - Ohiopyle



Contact Info



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