Statement No. 40

Arkansas Department of Transportation

Transportation Research Committee

RESEARCH PROBLEM STATEMENT

DATE: 10/04/2017 | **PROJECT AREA:** Special Projects

TITLE: An Evaluation of UAS Potential Capabilities for Transportation Applications

PROBLEM STATEMENT:

The cost of a high quality unmanned aerial systems (UAS) has become relatively inexpensive (~$2000/UAS). Consequently, the cost of a single manned flight to capture images for airborne surveys can exceed the cost of a UAS. This comparison does not even include the imaging sensor capital costs included in the single manned flight. Ambient conditions (weather, cloud cover, sun angle, and time) limit manned aircraft operations. Introducing UAS to the ArDOT opens the doorway to significant cost and time savings for data collection for ArDOT transportation projects. Numerous case study examples have shown that UAS can provide a less expensive and less time consuming alternative to traditional aircraft and ground based survey techniques. Iowa State University and North Carolina DOT have conducted extensive research as well as establishing guidelines for UAS.

Opportunities for the ArDOT to incorporate UAS include monitoring and managing infrastructure health: road assessments, bridge inspections, infrared thermography, LiDAR, pavement inspections, asset cataloging, disaster management, and accident reconstruction. In addition, ArDOT Planning will benefit by using UAS for interchange/corridor observation. ArDOT surveys can be amended using UAS collected images. Using UAS will enable ArDOT Bridge Maintenance to safely view bridge structures. ArDOT will be able to use UAS for monitoring construction project progress. Therefore, evaluating potential UAS benefits to ArDOT is invaluable to ArDOT. For the ArDOT to fully utilize the capabilities of UAS, operation standards and guidelines need to be established to provide accurate information to the ArDOT while satisfying Federal Aviation Administration (FAA) requirements.

OBJECTIVES:

1. Review other DOT's concluded research on the use of UAS for transportation applications.
2. Determine the most suitable UAS for ArDOT's needs.
3. Document FAA requirements for using UAS.
4. Conduct field case studies to demonstrate UAS applications in various transportation scenarios.

FORM OF RESEARCH IMPLEMENTATION:

1. A Final Report outlining the various applications and scenarios utilizing UAS for transportation applications.
2. A draft manual for UAS Standard Operating Procedures (SOP). The manual will include regulatory and technological requirements.
3. Develop workshops/seminars for training ArDOT users on UAS recommended by the research team.

Estimated Project Duration: 24 **months**

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Standing Subcommittee Ranking	Advisory Council Ranking	Statement Combined with Statement Number(s)
1 / 4	15 / 44	