

PROJECT OVERVIEW REPORT

1. UTC Identifying Number
DTRT13-G-UTC28
2. Center Identifying Number
CAIT-UTC-NC8
3. Project Title
Unmanned Aerial Vehicle (UAV) based Traffic Monitoring and Management
4. Principal Investigator & Contact Information
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7. Project Description
The proposed study includes two phases: system development phase and field test phase. One key resource available to the investigation team is the FAA approved UAS (Unmanned Aerial System) test site expected to be operational by the summer of 2014. The test site is planned to be located in the East Jersey area, and currently covers stretches of two freeway systems: the Garden State Parkway and U.S. 9 along the New Jersey shoreline and arterial traffic system near Atlantic City. During the project period, the team is expected to conduct 7-8 field tests including UAV system testing (1 test), Waypoint optimization testing (2 tests), simulated incident site evaluation (1 test), traffic congestion video shooting (1 test), and actual field implementation tests (2-3 tests). With the flexibility and streamlined procedure of flight scheduling at the test site, the proposed research can ensure that the proposed system is calibrated and evaluated in real-world scenarios. The team will purchase and assemble a fitting UAV platform with sufficient payload and flying time capabilities to allow the deployment of video sensors and communication units. This is expected to conclude with 2-3 months of the project. The field evaluation of the Air-TIMS system will be conducted in collaboration with Traffic Incident Response crew at NJDOT responsible for the highways near the test sites so that the system can be tested in real-world conditions.
8. Implementation of Research Outcomes (or why not implemented)
Upon the completion of the project, a fully-functioning prototype system along with its system design document and operating manual will be developed. The investigative team will work closely with local transportation agencies and incident response crew

during the development of the Air-TIMS system. During the process, we will communicate with field crew to develop efficient training programs and materials to help them understand the system and experiment with its functionalities.

When transferring to practice, all hardware and software systems will be fully tested and validated. Documentation and training materials will be provided to the customer so that the system can be replicated and improved. The team will seek interested private and public sector partners to commercialize the product. The deployment is expected to start from one or two testing corridors. If successful, we can seek opportunities for larger-scale deployment efforts.

9. Impacts/Benefits of Implementation (actual, not anticipated)

To Be Determined

10. Dates and Budget

Start date: 9/1/2014

End date: 8/31/2015

UTC (CAIT) Dollars: \$73,850

Cost Sharing: \$0

Total Dollars: \$73,850

11. Keywords

Unmanned Aerial Vehicle, Drone, Remote Sensing, Congestion Detection, Incident Reconstruction, Connected Vehicles

12. Web Links (Reports and Project Website)

<https://cait.rutgers.edu/cait/research/unmanned-aerial-vehicle-uav-based-traffic-monitoring-and-management>