Bond Case Briefs

Municipal Finance Law Since 1971

Michigan May Use Drones to Study Unpaved Roads.

Researchers at the Michigan Tech Research Institute (MTRI) are working to find out; engineers, computer scientists and transportation researchers are looking for cost-effective unmanned aerial vehicle (UAV) projects that could replace today's processes for mapping roads and roadside features, identifying potholes and understanding traffic.

One project funded through the U.S. Department of Transportation's Research and Innovation Technology Administration (USDOT/RITA), called Unpaved Roads, aims to help departments of transportation across the country assess and predict repairs needed on unpaved roads more quickly and cheaply.

"We're making data-gathering quicker, easier, safer and more detailed for rapidly understanding our transportation infrastructure," MTRI Senior Research Scientist Colin Brooks told Michigan Tech News. "[The UAVs] can show us how many potholes are in a road and how deep they are, the degree of crown in a roadway, identify rutting conditions in a roadway, wash-boarding, drainage, and evaluate density and severity of road and bridge problems."

Researchers are experimenting with UAVs of varying size and cost on the project, which is scheduled for completion this year. One hexacopter being used costs $5,000, weighs about 11 pounds, and can hold a full-sized digital SLR camera. A smaller drone being used cost $700 and can hold a smaller camera, like a GoPro. The collected imagery is used to create 3-D models, which are often accurate to within a centimeter, said Assistant Research Scientist Richard Dobson.

"We would like to see either local DOTs using this to assess their roads or help them with planning out when they need to go out and re-grade unpaved roads rather than relying on complaints from locals who live on the roads," Dobson said. "If they can figure out how quickly their unpaved roads degrade in certain areas or how quickly after major storm events, if they can better understand that, then they can be more on top of taking care of them before they become a problem."

Instead of governments taking control and managing fleets of UAVs themselves, Dobson predicted that companies will begin offering such UAV technology as a service to DOTs, once the Federal Aviation Administration (FAA) relaxes their policies in 2015, following research in six test UAV test sites. Current methods of assessing damage to roads by on-foot personnel can be time-consuming and expensive for agencies, and contracting a UAV service fits with the public-sector trend of purchasing technology as a service rather than managing it in-house.

This research will wrap up in the next few months, Dobson said, concluding a project that was started in late 2011.

Though strides they've made in their research could lead to new products and services, he noted that there is one shortcoming: an inability to create a piece of cohesive software that removes some of the manual processes required by the user. The team lacked both time and funding to make that happen.

“There’s a fair amount of handholding right now,” he said. “It’s not a user-friendly, single piece of software that you can throw imagery at and get your characterization of the unpaved road at the other end.”

All the software components, such as the 3-D model maker and stress detection, work separately, Dobson added, and the user has to really know what he’s doing to work the software. In terms of raw performance, however, the software works great.

By Colin Wood