



TRANSPORTATION INNOVATION SERIES

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Office of the Assistant Secretary for Research and Technology*

Characterization Of Unpaved Road Conditions Through The Use Of Remote Sensing

Colin Brooks, Michigan Tech Research Institute, Michigan Technological University
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USDOT Headquarters West Building Conference Center – Rooms 8-9-10



Local governments and transportation agencies have shown growing interest in a cost effective system that rapidly assesses the changeable condition of unpaved roads in their jurisdictions. With advances in remote sensing technology and platforms such as

Unmanned Aerial Vehicles (UAVs), it has become more feasible to monitor conditions and provide data useful for unpaved road asset management. With the use of a consumer grade Digital Single Lens Reflex camera (DSLR) and a remote controlled hexacopter, the Michigan Tech research team developed and demonstrated a working

version of the Unsurfaced Road Condition Assessment System (URCAS), which is both cost-effective and easily deployable to multiple sites. Using a combination of existing image processing tools for creating three-dimensional data from overlapping aerial images, plus custom distress detection algorithms, URCAS is able to locate and characterize the severity of potholes, rutting, loss of crown, corrugation, and other indicators of the unpaved roads conditions. With the help of the South Dakota DOT and Local Technical Assistance Program, an in-depth technology demonstration was recently completed. Mr. Brooks will discuss the readiness of these remote sensing capabilities to move from the development and demonstration phase into an extended outreach and implementation period.

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