

# Survey Finds a Growing Number of State DOTs are Using Drones to Improve Safety and Collect Data Faster and Better—*Saving Time and Money*

A March 2016 survey by the American Association of State Highway and Transportation Officials found that seventeen state departments of transportation had researched and/or used drones which are also known as Unmanned Aerial Vehicles (UAV's). The aircraft have assisted state DOTs with bridge inspections, accident clearance, surveying and identifying, monitoring and mitigating risks posed by landslides, rockslides and flooding.

These **DOTs** reported their agency had either researched or used drones.

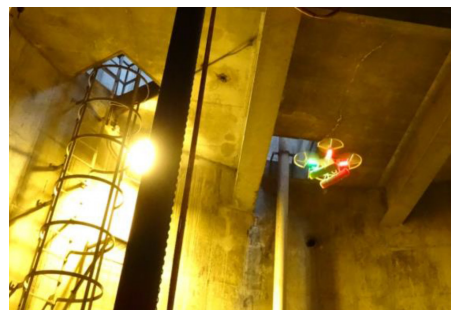
## What are the benefits?

### Improve Safety

A 2014 study conducted by the Michigan Department of Transportation in conjunction with the Michigan Tech Research Institute found drones to be a safe, reliable and cost effective tool.

"Our first study looked at the viability (of UAV's) and what we found out is that the unmanned aerial vehicle provided a mechanism to keep our workers out of harm's way. A traditional bridge inspection for example typically involves setting up work zones, detouring traffic and using heavy equipment. The UAV's can get in and get out quickly, capturing data in near real-time and causing less distraction and inconvenience to drivers."

*Steven J. Cook, P.E. Engineer of Operations and Maintenance, Michigan Department of Transportation*



Micro UAV



Two-person UAV crew



UAV bridge inspection

### Save Time

The Minnesota Department of Transportation in 2015 researched drones for the purpose of conducting bridge inspections.

"In addition to operating the highway system the Minnesota DOT is in charge of aviation as well, so we've been looking at drones from the perspective of commercial operators, businesses, everyone out there using them. The highway side of MnDOT also has been exploring them for potential cost savings for things like bridge inspections, surveying and aerial photography."

*Cassandra Isackson, Director of Aeronautics MNDOT*

### Save Money

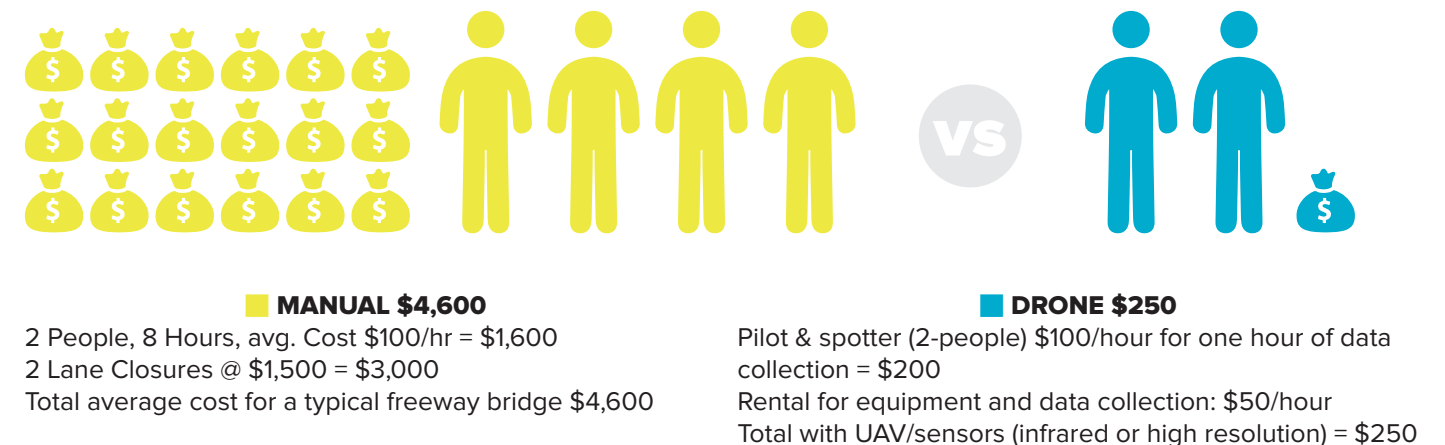
A standard bridge inspection involves setting up a work zone—redirecting traffic around large trucks equipped with buckets. The bucks hoist inspectors under and over the bridge to give them a bird's eye view. Michigan DOT estimates that a traditional inspection of the deck portion of a highway bridge can take eight-hours to complete. The job would require two inspectors, two traffic control personal to close two lanes of traffic at an estimated cost \$46-hundred.

A bridge deck inspection using a drone would require a pilot and a spotter and the operation would take roughly two hours to complete at an estimated cost \$250.



Standard bridge inspection

## Manual vs Drone Cost Comparison of a Bridge Deck Inspection



### Cut Congestion

Michigan DOT estimates that the User Delay Cost of shutting down one lane of a four lane, two way Highway Bridge in a metropolitan area totals to \$14,600 during the 10 hour period it typically takes to complete a bridge inspection.



As drone technology advances a growing number of State Departments of Transportation are getting involved. The March 2016 survey found that 16 state DOTs reported that they are

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"Setting out the policies, what you're going to use the drone for, why you're going to use it. All those kinds of things helps kind of address all those concerns and fears and it's a nice public way of saying this is what we're doing and this is why we're doing it. And most folks are very interested and excited when they hear particularly that we're not just innovative—but that we're able to save money and do things in a safer way by using drones."

*Cassandra Isackson, Director of Aeronautics MNDOT*

### User Delay Cost: \$14,600

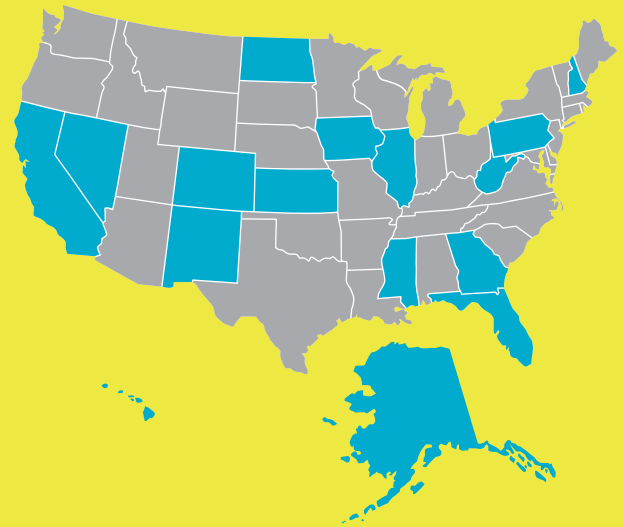
- Bridge Inspection
- Four lane divided highway bridge
- Located near metro area
- Bridge has two-way traffic
- Closure of one lane for 10 hours

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either assisting in the development of drone policies or are working independently or with an academic institution or private entity to conduct drone research: **Alaska, Colorado, California, Florida, Georgia, Hawaii, Iowa, Illinois, Kansas, Mississippi, New Hampshire, New Mexico, Nevada, North Dakota, Pennsylvania, and West Virginia.**

In 2015 the Minnesota DOT (MNDOT) tested a single drone in its Unmanned Aerial Vehicle Bridge Inspection Demonstration Project. MNDOT used a drone to conduct safety inspections at four bridges located across the state.

In 2015 the University of Vermont, working in conjunction with the Vermont Agency of Roads used a USDOT grant to complete an Unmanned Aircraft System (UAS) study to monitor rivers to prevent flooding and damage to roadways.

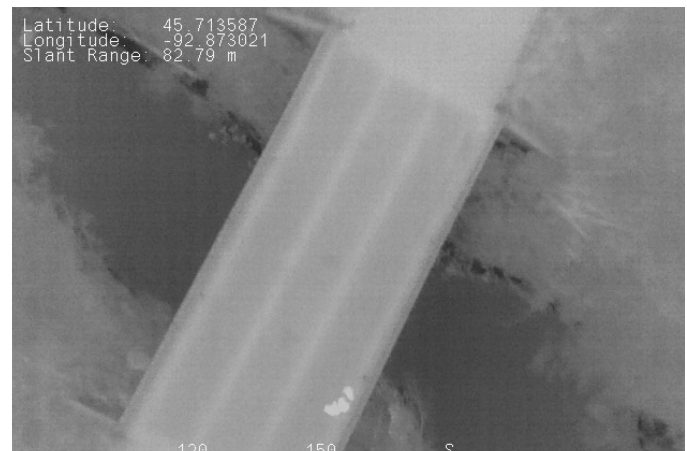


## Safer, Faster, Better Data Collection

- High resolution images can pinpoint problems at the surface.
- LIDAR (Light, Detection and Ranging) can turn photographs into three dimensional images that give researchers the ability to accurately measure space and distance without leaving the office.
- Tiny UAV's are capable of flying into confined spaces like culverts and pump stations to collect data and images.
- Thermal images can detect deterioration and other problems beneath the surface of concrete.



Photo taken from a UAV



Thermal image captured from a UAV



Watch the AASHTO Transportation TV Special Report on the many ways State DOTs are utilizing UAV's at [www.TransportationTV.org](http://www.TransportationTV.org)