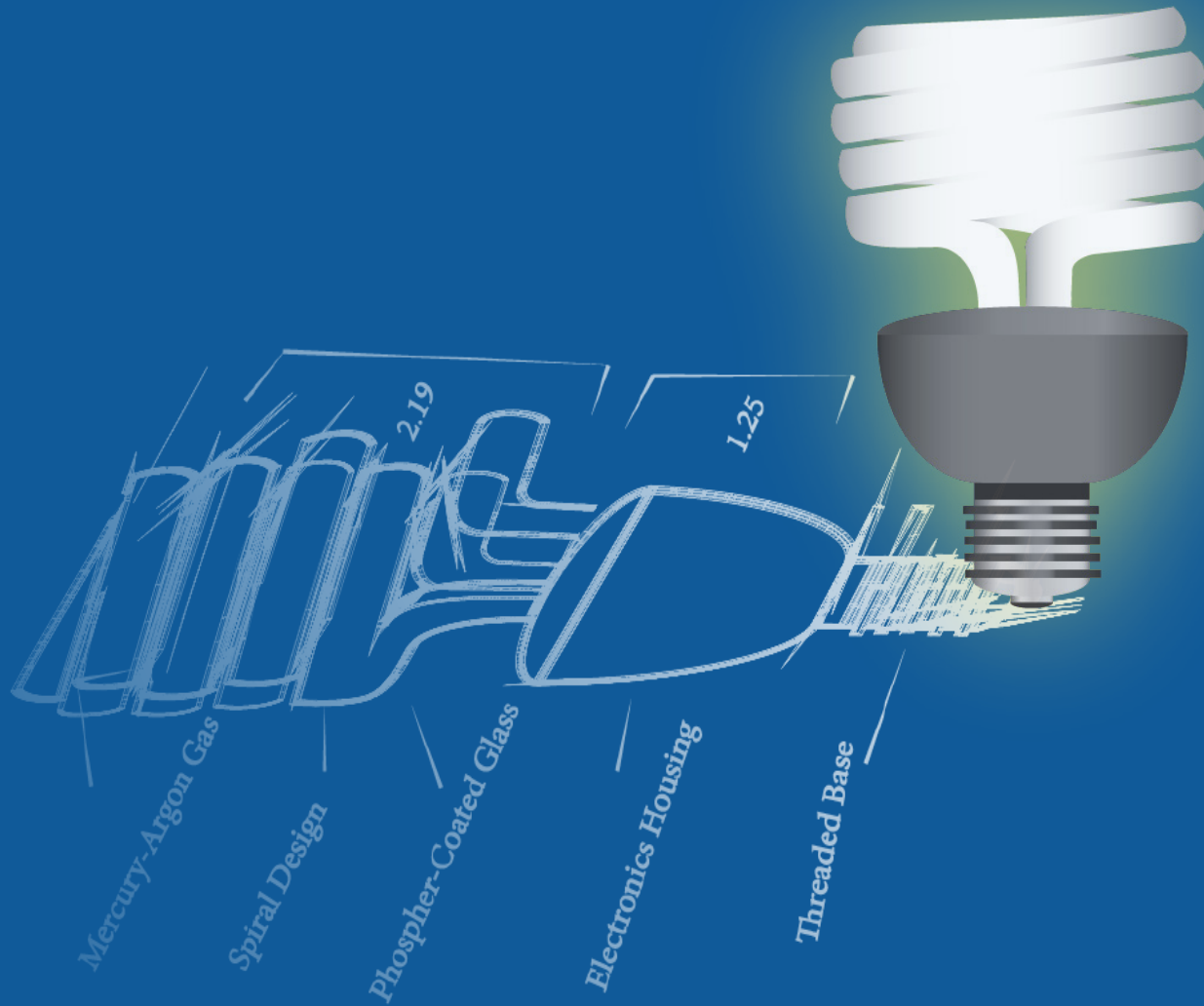


# 2015 Entries



Michigan LTAP  
**Great Ideas**

## CHALLENGE

*Identifying, sharing, and rewarding innovative ideas from local road agencies*

## Important

This document describes equipment and practices developed by employees of local road agencies for use within their agencies. The equipment and practices described herein have not necessarily been tested and/or approved to meet engineering design or safety standards. Agencies considering adopting the practices described in this document should first verify the practice is appropriate and safe for their agency's use. The Center for Technology & Training (CTT) is not responsible for damage to equipment or facilities, or for bodily injury as a result of reproducing and/or using the equipment or practices described herein.

## What is the Great Ideas Challenge?

Working through Michigan's Local Technical Assistance Program (LTAP), members of the Center for Technology & Training staff get to visit dozens of local road agency facilities every year. Every time we stop at a county road commission or a city department of public works, we are impressed with what goes on behind the scenes. The men and women who manage and maintain local agency roads, facilities, and equipment are intelligent, ambitious, passionate, innovative, and productive. No matter the obstacle, they figure out how to get stuff done. And they do it well.

The *Great Ideas Challenge* is meant to help identify, share, and reward the great work that gets done at local road agencies in Michigan. The Challenge is open to all employees of road agencies that serve counties, townships, cities, and villages in Michigan. All entries are considered for the state-wide competition, and the entry that wins first place in Michigan is automatically entered in the Federal Highway Administration's LTAP Build a Better Mousetrap national competition.

The 2016 *Great Ideas Challenge* will open in March 2016.

## Special Thanks to the Judges

Judges for the *Great Ideas Challenge* took time out of their busy schedules to evaluate, discuss, and score each entry based on five criteria: Cost, Ingenuity, Effectiveness, Ease of Adoption, and Return on Investment. Judges include:

Andi Barajas – Challenge Coordinator, Michigan LTAP  
Lance Malburg – Engineer, Dickinson County Road Commission  
Larry Hummel – Engineer-Manager, Van Buren County Road Commission  
Mike TenBrock – Project Engineer, Kent County Road Commission

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# Transportation Asset Collection Using Android Tablet & ArcGIS Collector



## Road Commission for Oakland County

### Contact Information

Ken Hudak  
khudak@rcoc.org  
248.645.2000

### Problem Statement

The Road Commission for Oakland County was seeking a cost effective solution to map road stream crossings and dry-weather flow screening within its right-of-way for storm-water permit compliance. Mapping road infrastructure and assets can often be expensive because of the required equipment and time.

### Summary of Solution

The Road Commission for Oakland County leveraged its existing geographic information system (GIS) to support field mapping using a free collection software suite called ArcGIS Collector.

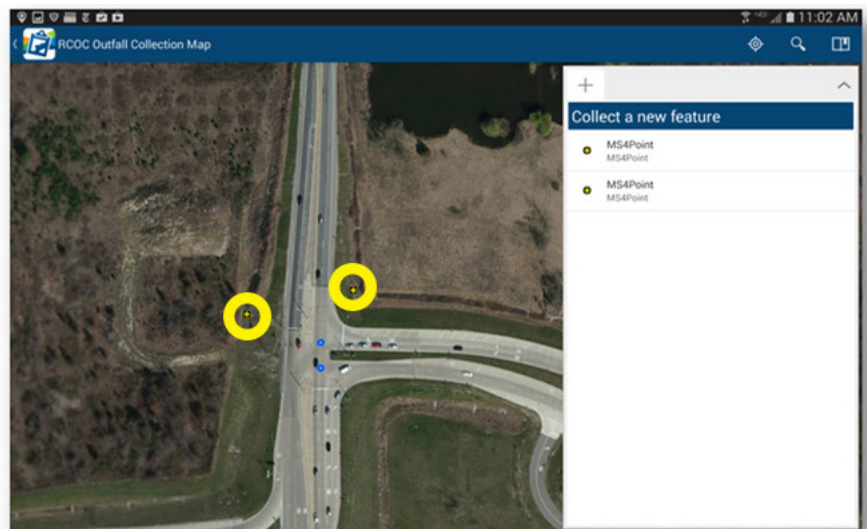
ArcGIS Collector runs on Android and Apple tablets. It uses the tablet's built-in GPS that provides a two-meter accuracy, which was well within the required parameters of the project. This equipment can be acquired at retail wireless providers for just 10% of the cost of survey-grade GPS systems.

The Road Commission for Oakland County then hired two summer interns with a background in Environmental Studies and GIS to conduct the field surveys. Over the course of 10 weeks, the interns visited over 500 locations and mapped road stream crossing points (outfalls) where storm-water drainage from the pavement fed into natural waterways. In total, over 2,500 points were collected at a total cost which was 80% lower than similar proposals from private consultants.

The team was also able to identify problems with infrastructure (such as dry weather flow indicating potential illicit discharge) and collapsed structures. These were inventoried with geotagged photos and submitted to highway maintenance for additional investigation.

### Labor, Equipment, Materials

- Two summer interns.
- ArcGIS Collector program.
- Android or Apple tablet.



*ArcGIS Collector Field Application Showing Mapped Outfall Collection*


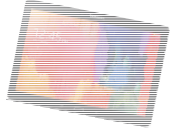
# Transportation Asset Collection Using Android Tablet & ArcGIS Collector *(continued)*

## Summary of Expenses

Total cost of labor, equipment, and software were 80% lower than contractor's proposals of a similar project.

## Benefits

Lower cost and a readily available system for collecting transportation assets in the future.

BETTER THAN TRIMBLE?	
<b>TRIMBLE</b>	<b>TABLET + COLLECTOR</b>
	
<b><u>Pros</u></b>	<b><u>Pros</u></b>
<ul style="list-style-type: none"><li>✓ <b>High accuracy</b></li><li>✓ <b>No need for network connection</b></li></ul>	<ul style="list-style-type: none"><li>✓ <b>Relatively quick &amp; easy</b></li><li>✓ <b>Real-time data collection</b></li><li>✓ <b>Take visual and written field notes</b></li></ul>
<b><u>Cons</u></b>	<b><u>Cons</u></b>
<ul style="list-style-type: none"><li>✓ <b>Must lock on to multiple satellites</b></li><li>✓ <b>Takes a lot of time</b></li><li>✓ <b>Very weather-sensitive</b></li><li>✓ <b>Hardware quickly becomes obsolete</b></li></ul>	<ul style="list-style-type: none"><li>✓ <b>Use multi-layer maps in Collector app</b></li><li>✓ <b>Save and share data out in the field with Collector and OneDrive</b></li><li>✓ <b>Price around \$600</b></li><li>✓ <b>Less accuracy</b></li><li>✓ <b>Spotty 4G/internet in rural areas</b></li></ul>

*“Pro and Con Table” submitted by the Road Commission for Oakland County*

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# Cutting Edge Little Helper

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## Otsego County Road Commission

### Contact Information

Kiel House  
shop@ocrc-mi.org  
989.732.5202

### Problem Statement

Lifting cutting blades for replacement is a difficult task. In the past, a shovel was used to lift the cutting edge into position to be bolted to the moldboard. However, this method is especially straining on drivers' backs.

### Summary of Solution

The Otsego County Road Commission built a tool that replaces the shovel and better aids in lifting cutting edges. The head (angle end piece) has the ability to pivot 180 degrees and the "u" shape flat stock gives it the ability to slide in position with ease and provides its ability to lift. To use the tool, start by putting a bolt on the innermost hole. Then insert the tool under the cutting edge and lift until the holes are all aligned. Finally, insert and tighten the remaining nuts and bolts. Repeat the same process on the other cutting edge.

"We had used many different variations of this type of tool in the past, with wheels and without. This works because you don't need a clean or even a flat surface, which aren't always available in our line of work."

### Labor, Equipment, Materials

Scrap metal.

### Summary of Expenses

Labor to fabricate.

### Benefits

Less down time for drivers.

Prevention of back injuries.



# Bar Seal



## Roscommon County Road Commission

### Contact Information

Scott Eckstorm  
eckstorms@roscommoncrc.com  
989.366.0333

### Problem Statement

Many roads suffer from deteriorating edges and various cracking throughout. Before the road is able to be repaired with a chip seal or ultrathin overlay, it needs to have a relatively uniform surface. If the road has differing levels of distress, any effort to repair the road with a chip seal or ultrathin overlay would fail.

### Summary of Solution

The Roscommon County Road Commission has applied the bar seal to repair distressed roadway edges as well as additional areas of distress in preparation for a future chip seal or ultrathin overlay. The bar seal has proven to be very effective in stabilizing the road edges as well as other areas of distressed pavement and at a fairly reasonable cost per square yard.

### Labor, Equipment, Materials

- One truck driver to operate truck with a Duz-Mor spreader.
- One truck driver for asphalt distributor.
- One truck driver for one-ton with roller.
- One person to operate hopper on the rear of the spreader.
- One or two people for traffic control.
- Terry Seal (AE90)  
Application Rate: .40 gal/yard<sup>2</sup> (3ft wide).
- H-1 Blue Limestone  
Application Rate: 32 lbs/yard<sup>2</sup>.

### Summary of Expenses

Cost = \$2.10/yard<sup>2</sup>.

### Benefits

Prolongs the life of the road surface at a reasonable cost.



# Wing Pivot Links

## Allegan County Road Commission

### Contact Information

Walter Jansen  
rcwalter@alleganroads.org  
269.673.2184

### Problem Statement

Plow wings undergo a lot of stress during the operation season. On occasion, the pivot links break and the varying links available make service calls a hassle for both the operator and mechanic. When plow wing trucks are nonoperational, time and money are lost.

### Summary of Solution

In order to make service calls more convenient and precise, the different links are painted different colors. When a driver has a failure and calls in, the color of the link is indicated. (i.e. "I need a red one.")

### Labor, Equipment, Materials

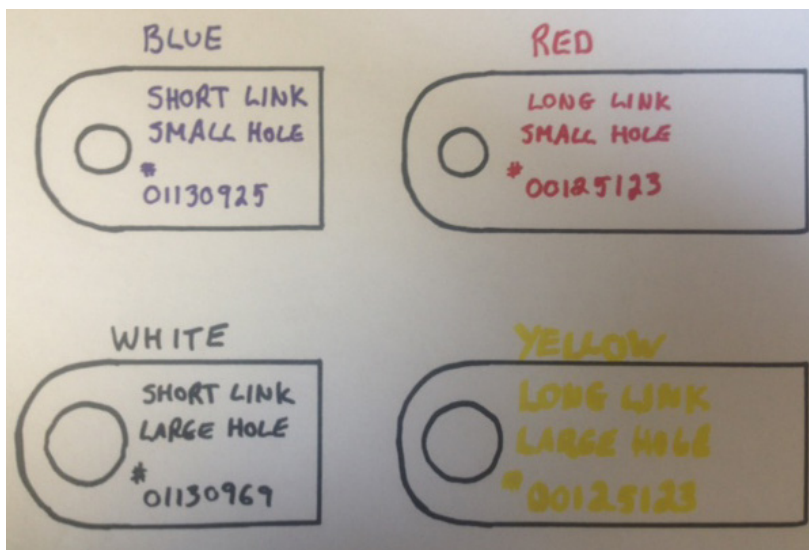
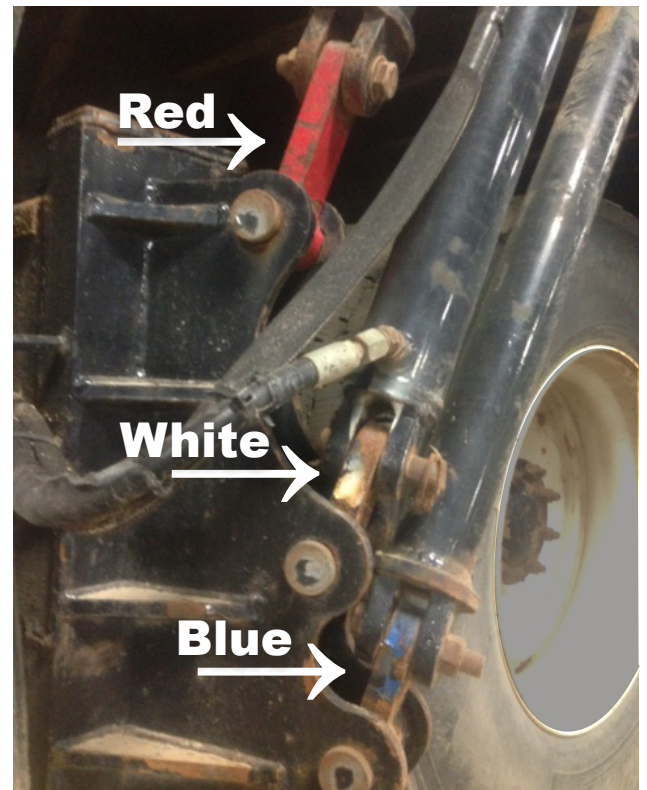
Paint, parts, and time of application.

### Summary of Expenses

Materials and labor costs.

### Benefits

This system makes ordering correct parts easier and more accurate.





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# Moldboard Step

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## Ottawa County Road Commission

### Contact Information

Randy Nagelkirk  
rnagelkirk@ottawacorc.com  
616.842.5400

### Problem Statement

Drivers have slipped and fallen off the moldboard while entering or exiting their trucks. The Ottawa County Road Commission needed to make it safer when drivers use their moldboard for a step.

### Summary of Solution

While most agencies may already use some type of abrasion on the end of their moldboard, the Ottawa County Road Commission found that adding a grate step proved to be safer and allowed material to fall through. The grate step is raised off the moldboard and level to the ground for easy access.

### Labor, Equipment, Materials

- 1-8" x 12" welded steel grating.
- Two pieces of 2" x 8" x 1/4" flat stock, cut to the contour of the top of moldboard.
- Approximately two hours labor to cut and install step.

### Summary of Expenses

Cost of material and installation.

### Benefits

Increased driver safety.



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# Cut-Out Scales

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## Grand Traverse County Road Commission

### Contact Information

Toby Javin  
tjavin@gtrc.org  
231.922.4848

### Problem Statement

During spring weight restrictions, it is difficult to accurately and safely determine the weight on truck axles in the field and to reduce the load to an acceptable weight. Adverse weather conditions and drive-by traffic hamper the timely and accurate determination of a vehicle's weight against the restrictions. Portable scales and blocks must be physically removed and relocated from axle to axle. Overweight items must be removed or relocated. This process causes safety issues from the adjacent traffic, risks personal injury from lifting, potential property damage and is time consuming.

### Summary of Solution

Grand Traverse County Road Commission cut out an area on the concrete floor of the truck storage facility. Then they placed portable weight scales for both sets of tires in the cut out area for when a truck is weighed.

This site allows the vehicle to be moved out of the weather and traffic. The driver of the truck in question simply aligns the first axle onto the cut-out scale allowing the Weighmaster to record the weight. The driver moves the vehicle forward until the next axle is in place.

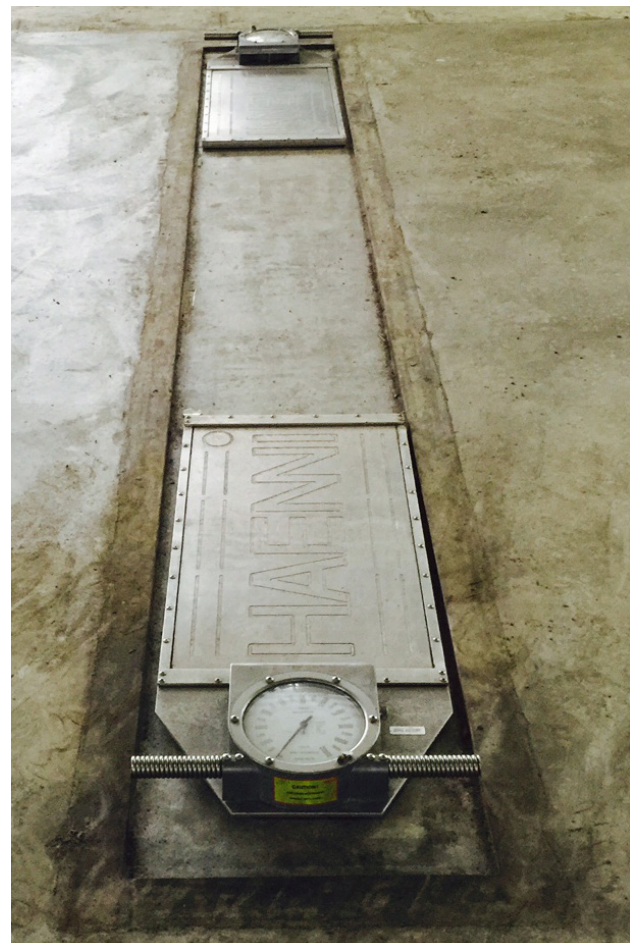
The cutouts are located in the indoor, lighted, drive-through storage building with room to park any vehicles in the yard until they are made legal. The Grand Traverse County Road Commission also provides 24-hour/7-day law enforcement for weighing and indoor truck inspections out of the weather.

### Labor, Equipment, Materials & Expenses

- Labor for cutting out space in concrete floor and installation.
- Weighmaster axle scale.

### Benefits

Safe, easy, and quick weight restriction determination.





The Center for Technology & Training is located on the campus of Michigan Technological University. The CTT's mission is to develop technology and software, coordinate training, and conduct research to support the agencies that manage public infrastructure. For more information, visit [www.ctt.mtu.edu](http://www.ctt.mtu.edu).