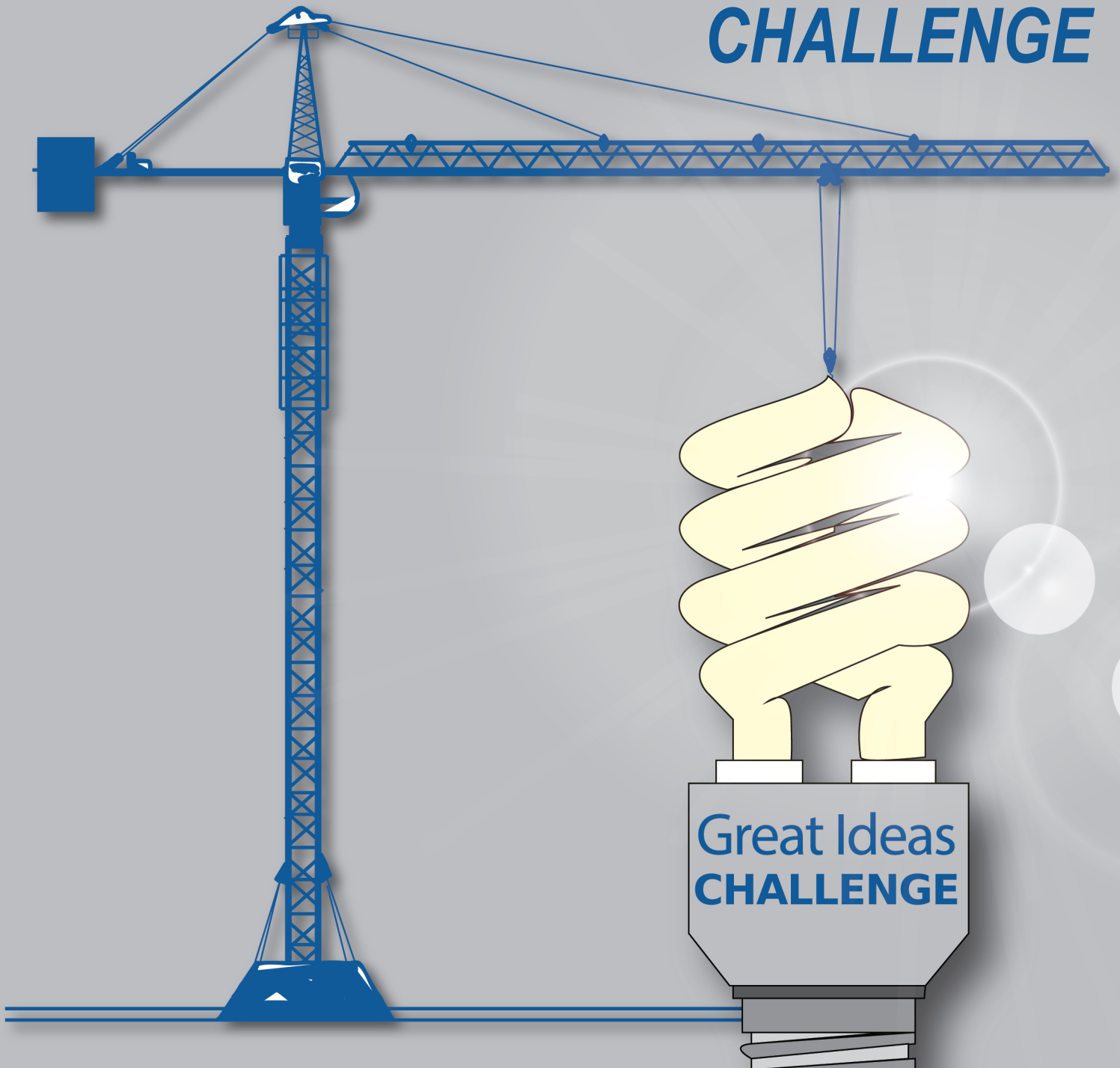




Michigan LTAP

Great Ideas

CHALLENGE



2016 Entries

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

Attention!

Note: 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 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 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 who serve counties, townships, cities, and villages in Michigan. All entries are considered for the statewide 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.


Next year, the 2017 *Great Ideas Challenge* will open on March 6, 2017.

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
Robert Lindbeck — Engineer/Manager, Alger County Road Commission
Peter Meingast — Engineering Assistant, Center for Technology & Training
Drew Roberts — Engineer Intern, Center for Technology & Training
Pete Torola — Research Engineer, Center for Technology & Training

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WING HINGE BRACKET



Ottawa County Road Commission

Contact Information

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616.842.5400

Problem Statement

Nearly almost all road commissions have used wings for part of their snow fighting equipment. We quickly noticed that they take a lot of abuse by hanging out of the side of the truck. Eventually, we noticed that the hinge would start to bow. This would make it impossible to remove the hinge pin and the wing would lose its stability. This would also cause damage to the mounting center hole of the wing.

Summary of Solution

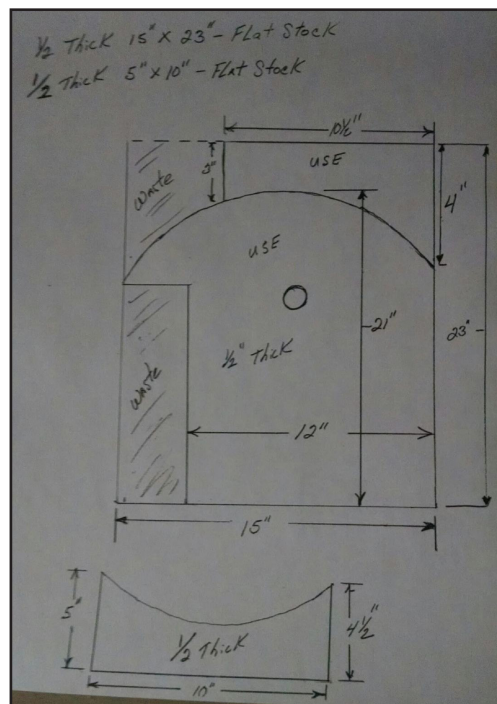
The solution is to give the wing more support at the mounting end. A mechanic technicians of Ottawa CRC's Grand Haven Garage came up with a swivel mounting system that still allows for wing mobility while giving stability to the mounting system. Since they introduced this change, they haven't had any mounting bracket issues.

Labor, Equipment, & Materials

Materials needed include: steel, which most municipalities already have as scrap around the shop: $\frac{1}{2}$ " thick flat stock around 15" X 23" and $\frac{5}{8}$ " flat about 10" X 5". Costs include the time to cut and weld the steel. Tools needed would be a torch or plasma cutter, a welder, and a drill.

Benefits

- The wing is more stable.
- Wing mounting bolt stays tight.
- Less egg shaping occurs in the mounting center hole.
- Less chance of wing breaking off (safer for public and driver)
- This increases wing life with a two-holding mount.



AUTOMATED ROAD MAINTENANCE SPREADSHEET (cont.)

The Automated Road Maintenance Project Spreadsheet (ARMPS) then creates a project list for the current year based solely on these recommended maintenance intervals. Next, the total project cost is estimated based upon average cost per mile for that type of road treatment or project. Road treatment costs are entered into the spreadsheet and are fully customizable. Future treatment costs are then estimated based upon a yearly inflation rate (typically 2% or 3%) that the user may also enter. In the next column, a project cost for townships is calculated. Based upon what the average township pays on the local road system, these numbers are determined by what the user initially enters for the cost per mile of each treatment. Primary roads may be removed from township costs estimates by entering “Yes” or “No” at the bottom of the ARMPS.

The next column in the ARMPS is called “Notes”. This column will give a treatment recommendation based upon the latest PASER and *not* the time interval since the last treatment or activity occurred. The next three columns are also based upon the segment’s PASER. These columns list the recommended treatment, project cost, and township cost for the recommended treatment.

The ARMPS can now project out ten years with a project list for every year. A ten-year cost summary is generated giving the average cost per year if this program is followed.

Once again, the ARMPS is fully customizable for treatment intervals, treatment cost per mile, inflation rate, and PASER trigger; and it can remove primary road projects for estimating township costs.

Labor, Equipment, & Materials

The ARMPS will be easily customized by other road agencies. For example, a person familiar with Microsoft Excel will be able to remove the Berrien County road data, mileages, ADT, and so forth. and then enter their own agency’s road information. The agency can then enter their own cost per mile information for various treatments.

Summary of Expenses

The BCRC has implemented this spreadsheet by using it as a tool to engage local townships. It is very effective in showing a need to increase township expenditures for local road maintenance. The spreadsheet has been used at many township meetings. The spreadsheet has resulted in many townships increasing their local road budget and has helped in the passing of road millages. The BCRC experienced savings immediately by reducing the time needed to generate project lists. Errors of duplication or admission have been greatly reduced. More revenue from local townships has been secured by using the ARMPS. Long-term savings will be created by treating roads only when needed and without forgetting to treat a road at the correct time.

Benefits

Staff and local officials have been very positive. The project list is generated by taking into account industry best practices, current PASER, and average daily traffic which demonstrates a sound, logical method to selecting various roads for treatments or projects.

The ARMPS was developed in 2015 and is now in use. Officials have used previous methods to determine a three-year project list and found that the results were almost identical to the three-year projects list calculated by the ARMPS. The biggest difference noted was the time needed to generate project lists which was greatly reduced (hours versus days) by using the ARMPS.

CYROGENIC TREATMENT OF MOWER BLADES

Grand Traverse County Road Commission

Contact Information

Tim Trudell, Fleet and Facilities Manager
ttrudell@gtcrc.org
231.922.4848

Problem Statement

One of the routine summer maintenance activities is mowing roadsides. In an average year, Grand Traverse County Road Commission (GTCRC) purchases 100 mower blades at an approximate cost of \$32.27 each. A strategic approach to extend the wearing life of the blades was undertaken. Costs would be saved in the labor needed for replacing the blade as well by reducing the number of blades required.

Summary of Solution

With the thousands of mower blades that are used annually by road agencies, most of these blades end up being sold for scrap because of their typical one-day usage life. To maximize the initial dollars being spent purchasing blades, a question was raised as to howd their usage life be extended yet still sold for salvage value.

Based on discussions with Industrial Cryogenics Engineering (ICE), the Fleet & Facilities Manager agreed to test a method where a cryogenic material is used to toughen materials. If this process works, a substantial savings could be achieved. The process used by ICE has been engineered over the last eight years and is an adaptation of Swiss watchmakers.

In early 2015, they shipped 66 blades for the cryogenic treatment. Treated blades were placed on two mowers and used throughout Grand Traverse County. It should be noted that due to political pressures, roadside spraying was discontinued in 2005. Therefore, unchecked vegetative growth and soil conditions also contributed to the early death of the blades.

It was decided in advance that blades would need to last an additional 30 hours of operation. Early, frequent checks on the rate of blade deterioration revealed the cryogenic treatment was effective. By the end of mowing season, it was determined to be a success.

Labor, Equipment, Materials, & Expenses

By the end of the season, it was determined that cryogenically-treated blades had increased their usage life by



CYROGENIC TREATMENT OF MOWER BLADES *(cont.)*

500% — lasting from one day up to five days. The cost to treat blades was \$16.05 per blade. Both labor and material costs were reduced.

Before the treatment, blades only lasted one day. During a typical season, they would use 100 blades. After using the treatment, the blades lasted five days. Now, the seasonal usage is 40 blades — the net result has been a reduction of 60 blades at \$32.27 each.

Before the treatment, labor time required two employees each two hours to do 25 set changes. After the treatment, labor time now requires two employees each two hours to do 10 set changes. The net result has been a reduction of 15 set changes multiplied by four employee hours, or 60 hours of labor.

Since inception, treated broom bristles last 2.5 times longer and loader cutting edges last 3 times longer.

Savings in blades is \$1,294.20 plus 60 hours of labor.

Benefits

This method has an application for every road agency that uses mower blades and broom bristles cutting edges for loaders. The only change required is to have blades available in time to have them treated. Turnaround time from pickup to delivery was approximately one work week.



SOUTHWEST STICK

Michigan Department of Transportation

Contact Information

Ryan Piasecki, Heavy Equipment Mechanic 10
piaseckir@michigan.gov
269.657.4980

Problem Statement

For years, they relied on the operators to return the salt hopper doors to the correct calibrated height using line of sight decals. This resulted in door height discrepancies from the person-to-person interpretation of the decals. The trucks ended up either distributing too much salt or not enough. Since they were losing track of exactly how much salt was being used, it was costing them money in salt usage and man power to constantly recalibrate trucks.

Summary of Solution

The southwest stick is a stainless steel bar that attaches to the door jack and is slotted to allow for full door travel to the open position for unloading purposes. When the door is closed, the slot returns the door to the calibrated height every time. No guess work.

Labor, Equipment, Materials & Expenses

In order to fabricate the Southwest Stick, Mr. Piasecki first measured the door travel from the calibrated opening to its full open position. He then cut a piece of 3/16" stainless steel banding to length to accommodate the full travel. Then, he drilled a 3/8" hole at one end for the bottom mount point. From there, Mr. Piasecki marked the two spots needed to drill the holes for the full open position of the door and the point at which the door is at the calibrated opening. He then, used a cut-off wheel to cut the slot between these two holes to allow the bar to slide up and down as the door jack is raised and lowered. Creating the two different door stops took about an hour. The short door stop (pictured below) works for the Monroe trucks and fits all bodies. The long stick is for the Monroe slide in hoppers. Installation is simple: the stop just slides onto the pins already in place from the Monroe truck's initial manufacturing and it uses two stainless steel hair pins and a 3/8" washer to prevent the top hair pin from getting caught in the slot. For ease of mass production and accuracy, Mr. Piasecki took the prototypes to a local fabrication shop to make them in mass quantity with a computerized numerical control machine or water-jet. It costed \$22 per piece for the fabrication shop to create. There was an additional \$5 in hardware to install the stick on the truck. The southwest stick takes five minutes to install and costs \$22.00 per truck.

Benefits

They installed them on all 80 plow trucks in their region this winter and the operators like them. They have had fewer complaints of the trucks not distributing salt correctly, which means less recalibrating and time saved.



LOADER BUCKET ATTACHMENT

Mackinac County Road Commission

Contact Information

Dirk Heckman, Engineer Manager
heckman@sault.com
906.643.7333

Problem Statement

The Mackinac County Road Commission (MCRC) needed a way to remove debris from floor drains and to eliminate the manual labor associated with live-bottom dump trucks.

Summary of Solution

The MCRC came up with an attachment for loader bucket, which removes debris from floor drains and eliminates a great deal of manual labor. The attachment is a heated cold-patch tray that works for live-bottom dump trucks.

Labor, Equipment, & Materials

The loader bucket attachment was fabricated from existing materials. The only cost to the MCRC was the labor to fabricate and install the loader bucket onto the live-bottom trucks.

Benefits

The loader bucket attachment reduced down time for drivers as the debris is prevented from clogging the floor drains.

The attachment also prevents back injuries, other injuries, and reduces the manual labor that are associated with live-bottom dump trucks.

SPECIAL NEEDS & WHEEL CHAIR LOAN PROGRAM

City of Madison Heights

Contact Information

Jim Schafer, Community Development Director
jimschafer@madison-heights.org
248.583.0831

Problem Statement

Many city road construction projects result in closure of residential roads for a period of time. This is not only inconvenient to residents, but it also results in safety issues for those who have mobility limitations. Madison Heights seeks to reduce the impact of construction projects on residents as well as make sure city staff and contractors are aware of residents who may need additional assistance during construction.

Summary of Solution

Madison Heights has a Special Needs Form that is distributed to all residents in construction areas. The form is filled out by residents and is then used to alert staff, contractors, and public safety personnel of the special needs so they can keep their eyes and ears open to any additional assistance these residents might need during construction. A small placard is provided that they may post in their front window so field personnel can easily but unobtrusively determine residents with special needs. Madison Heights personnel can then focus on access and other issues that reduce the impact of construction on those residents. Residents who have barrier-free tags or plates also inform Madison Heights of this so they can determine how many temporary barrier-free parking spaces to locate adjacent to construction zones. These measures make projects less intrusive on the citizens' daily lives.

In addition, Madison Heights teamed up with Wright and Filippis, a local business that provides wheel chair and prosthetic services in order to provide free heavy-duty wheel chairs to residents in construction areas for their use during construction.

Labor, Equipment, & Materials

The labor associated with this program included distributing the Special Needs Form and answering




SPECIAL NEEDS & WHEEL CHAIR LOAN PROGRAM *(cont.)*

questions related to the form at the City of Madison Heights office. Besides the cost of form distribution, there is no other funds needed for the program, which has been in effect each construction year since 2007.

Benefits

Both the Special Needs Form and the Wright & Filippis wheel chair service programs have been very well received by City residents. It fosters a good line of communication with impacted residents and eases many of their concerns regarding a project's impact on them or a family member.



City of Madison Heights

City Hall Municipal Offices
300 W. Thirteen Mile Road
Madison Heights, MI 48071

Department of Public Services
801 Ajax Drive
Madison Heights, MI 48071

Fire Department
31313 Brush Street
Madison Heights, MI 48071

Police Department
280 W. Thirteen Mile Road
Madison Heights, MI 48071

www.madison-heights.org

ROAD IMPROVEMENT PROGRAM

Special Needs Form

As a part of the City's Road Improvement Program, we want to reduce the impact of the City's Road Projects on people with special needs.

If you or a neighbor has any special needs (wheelchair, limited mobility, etc.) please fill out this form and return it to the City. If you have a barrier free parking tag or plate for your special need, the City will provide a Handicap Parking space during construction for each barrier free parking tag or plate, but they will not be assigned to individuals.

You may either bring the form to City Hall, mail it to the City Hall address above (ATTN: Community Development Department), fax it to (248) 588-4143, or we can make arrangements to pick up the form at your home. Please call (248) 583-0831 to arrange a time.

NAME OF PERSON WITH SPECIAL NEEDS: _____
(Please print)

ADDRESS: _____
Madison Heights, MI 48071

PHONE: _____

BARRIER FREE TAG / PLATE #: _____

NAME OF CONTACT PERSON IF NOT SAME: _____

ADDRESS: _____

PHONE: _____

BRIEF DESCRIPTION OF SPECIAL NEED:

A City representative may contact you to discuss your needs in more detail and to make any necessary arrangements during construction.

Any questions? - Please call (248) 583-0831

This Form and Additional Information available at www.madison-heights.org

City Assessor	583-0820	Fire Department	588-3605	Nature Center	585-0100
City Clerk	583-0826	43rd District Court	583-1800	Police Department	585-2100
City Manager	583-0829	Housing Commission	583-0843	Purchasing	837-2602
Community Development	583-0831	Human Resources	583-0828	Recreation	589-2294
Department of Public Services	589-2294	Library	588-7763	Senior Citizen Activity Center	545-3464
Finance	583-0846	Mayor & City Council	583-0829	Water & Treasurer	583-0845

UNIVERSAL SIGN TRAILER

City of Marshall

Contact Information

Mike Hackworth, Superintendent
mhackworth@cityofmarshall.com
269.781.5183

Problem Statement

The City of Marshall was looking for a way to manage traffic control sign storage and deployment.

Summary of Solution

The City of Marshall has developed a method of organization and storage for managing traffic control sign storage and deployment.

Labor, Equipment, & Materials

Materials and labor.

Benefits

This method gives the workers in the field the benefit of designated sign storage and deployment equipment.

MODIFIED PNEUMATIC ROLLER

Road Commission of Kalamazoo County

Contact Information

Travis Bartholomew, Operations Director
tbartholomew@kalamazoocountyroads.com
269.271.1155

Problem Statement

When applying a chip seal, a narrow roller needs to have multiple passes in order to cover the construction area.

Summary of Solution

By modifying a new 84” pneumatic tired roller to accept an additional roller system. the new combined unit has an overall working width of 144”.

Labor, Equipment, Materials & Expenses

Labor and materials.

Benefits

The new roller cuts the equipment and labor costs in half for chip seal projects. The roller can also be used for gravel road maintenance.

ALERT SYSTEM — RCKC CONNECT

Road Commission of Kalamazoo County

Contact Information

Michelle Podgorski, Administrative Assistant
mpodgorski@kalamazoocountyroads.com
269.381.3171 ext. 226

Problem Statement

The Road Commission of Kalamazoo County was seeking a means to provide prompt information and notifications to the citizens of Kalamazoo County in the event of road closures, detours, and travel-related construction projects.

Summary of Solution

Statistics show that more than 75 percent of adults use social media on a daily basis as a primary means of communicating and accessing information. The Road Commission of Kalamazoo County incorporates social media into its overall communications to provide citizens with different ways to communicate with the Road Commission of Kalamazoo County.

The Road Commission of Kalamazoo County launched “RCKC CONNECT” on April 12, 2016. This service allows citizens to sign up for notifications via phone call, text message, and e-mail based on locations they care about. They can choose how they receive notifications about events that may affect their travel from home, work, school, and more.

RCKC CONNECT is accessible from the Road Commission of Kalamazoo County’s website home page, www.kalamazoocountyroads.com,

or the Everbridge CONTACTBRIDGE Application (available in the Apple Store and Google Play Store). Citizens must sign up and create a profile by entering their contact information and location. They then choose “Alert Subscriptions” in order to receive notifications from RCKC CONNECT.

The RCKC CONNECT mobile app offers two-way communication, which allows RCKC to deliver text message alerts to residents directly on their smartphones using CONTACTBRIDGE and allows residents to submit service requests, pictures, and free-form text to RCKC.

CONNECT TO ROAD COMMISSION OF KALAMAZOO COUNTY ALERTS

Have You Signed Up?

Receive Message Alerts for:

- ◆ Road Construction
- ◆ Road Closures/Detours
- ◆ General Public News

RCKC CONNECT
RCKC ALERTS SIGN UP NOW

Visit : www.kalamazoocountyroads.com

Road Commission of Kalamazoo County

Your Local Road Professionals since 1909

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RCKC Connect

Sign Up

ALERT SYSTEM — RCKC CONNECT *(cont.)*

RCKC CONNECT is also used internally for initiating employees to report to work during an emergency situation.

Labor, Equipment, Materials & Expenses

- Subscription fees for Mass Notification System
- Service is free to the public
- Staff time for set up, installation, and testing
- Promotion and advertising products

Benefits

The use of a mass notification gives the Road Commission of Kalamazoo County the ability to send time-sensitive alert messages to citizens, emergency service providers, schools, and mass transit authorities as events occur. With this system, the public is kept informed of travel delays that may affect their daily travels. Further, emergency service providers are able to plan their routes accordingly in an effort to provide the best possible services to the public. The Road Commission of Kalamazoo County is able to use the mass notification system internally to quickly and efficiently call additional personnel into work in the event of an emergency. The two-way communication tool is an effective and easy method for reporting service requests to the Road Commission of Kalamazoo County.



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.