

BOONE COUNTY PUBLIC WORKS MAINTENANCE OPERATIONS 2014 YEAR IN REVIEW



Presented to the Boone County Commission On January 29, 2015

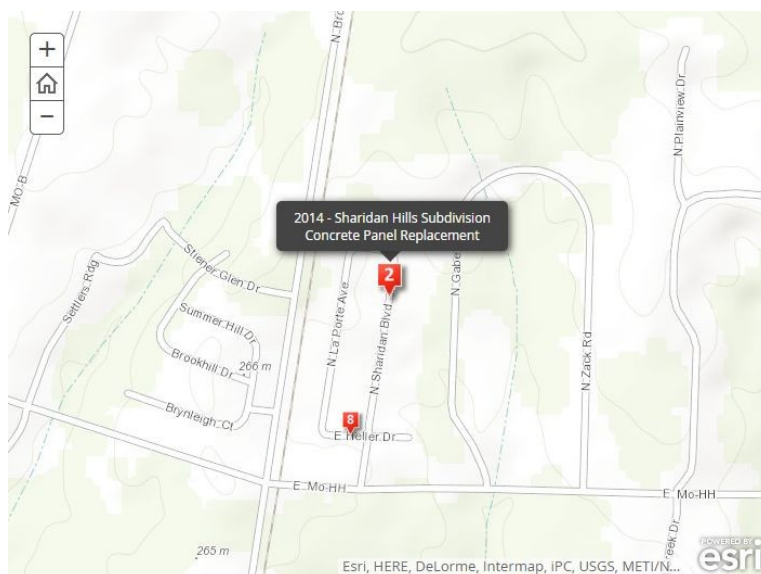
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PAVED ROAD IMPROVEMENT PROJECTS

Concrete Panel Replacements Sharidan Hills Subdivision

Concrete panel replacement is an annual maintenance project that removes and replaces individual, distressed concrete panels - first with filter fabric, then base rock, rebar and finally new concrete. This is a proactive approach that restores the overall integrity of the road and may delay the need for more extensive rehabilitation by many years.



Asphalt Overlay Preparation—Golf View Gardens Subdivision

In preparation for an asphalt overlay, crews complete dig out repairs, replace culverts, accomplish shoulder and right-of-way work, etc.. In 2014, this comprehensive preparation was applied to roads, Pin Oak Blvd, Golf Blvd, and Locust Grove Dr. in the Golf View Gardens subdivision. Implementing this approach before an overlay preserves and improves the paved surfaces by reducing the possibility of future sub-grade failures.



Prep Work: Dig Out Repairs Step by Step

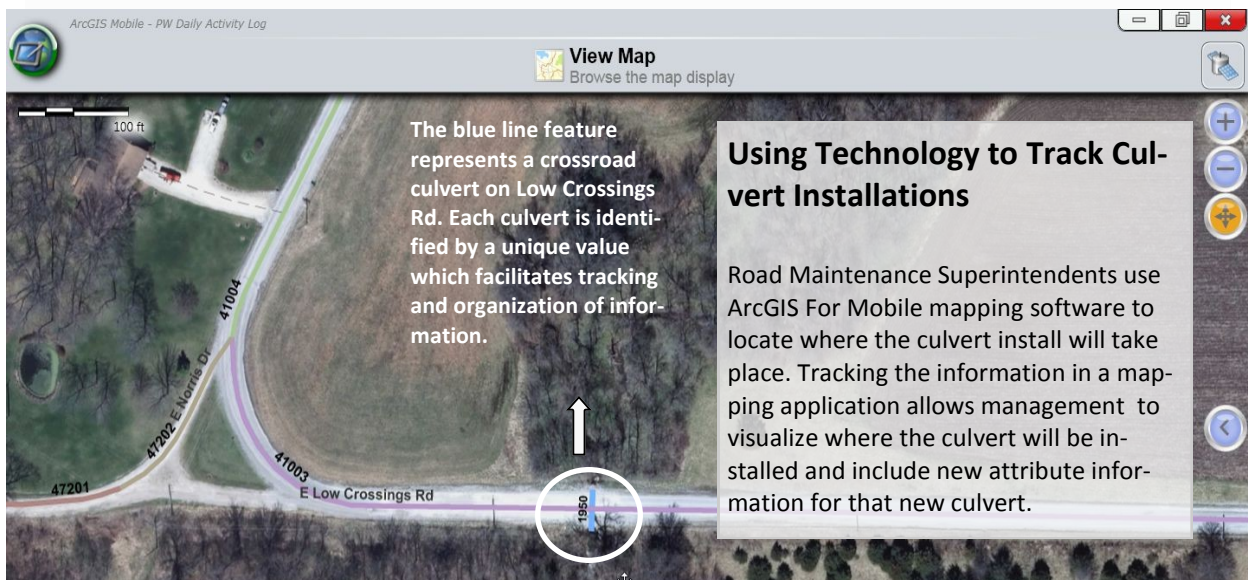
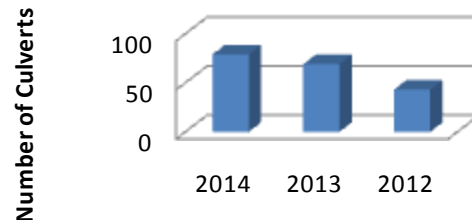
- Saw and excavate 12 inches deep
- Filter fabric is installed in the sub grade to keep pavement breakdowns from occurring
- Six inches of surface rock is distributed on top of the fabric
- Two 3" lifts of asphalt are installed and compacted between lifts

RURAL ROAD IMPROVEMENT PROJECTS — NORTH AND SOUTH BOONE COUNTY

Replacing Culverts—Improving drainage across northern and southern Boone County

BCPWs “proactive instead of reactive” maintenance strategy, has resulted in an increase of crossroad culvert installations over the past three years. The Rural Road Improvement program, already in place, establishes regular maintenance cycles of ditching, profile crowning, grading, etc. In collaboration with the engineering division, specific locations were targeted for culvert replacements and new culvert installations. Replacing crossroad culverts improves drainage and the overall condition of the road. The crossroad culverts installed are poly-coated pipes and have a lifespan of 30-50 years.

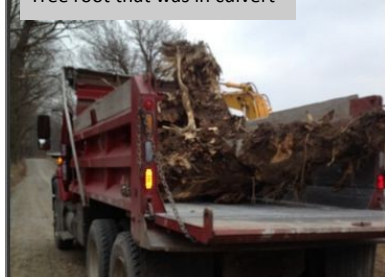
Number of crossroad culvert installs



Replacing crossroad culverts along Old Plank Rd

Two crossroad pipes were replaced on Old Plank Rd just south of Smith Hatchery Rd. this past year. One of the culverts had collapsed due to a tree root growing inside the

Tree root that was in culvert



The new pipe installed in this location, was slightly larger than the original. The larger pipe will help with drainage for this area and keep the road in safer driving condition.

New Culverts:
48" barrel, 44 ft in length
96" barrel, 50 ft in length



BRIDGE DECK SEALING PROGRAM

In 2010, the department initiated a preventative maintenance program to protect Boone County bridges from deterioration caused by weather and salt used for ice control. In 2012, we began a work plan where crews cleaned and sealed 37 bridges. In 2013, a regular 3-year rotation of preventative maintenance was implemented to keep these bridges in top condition. Compared to roads and culverts, bridges are more expensive to fix, therefore preservation provides a significant cost benefit.

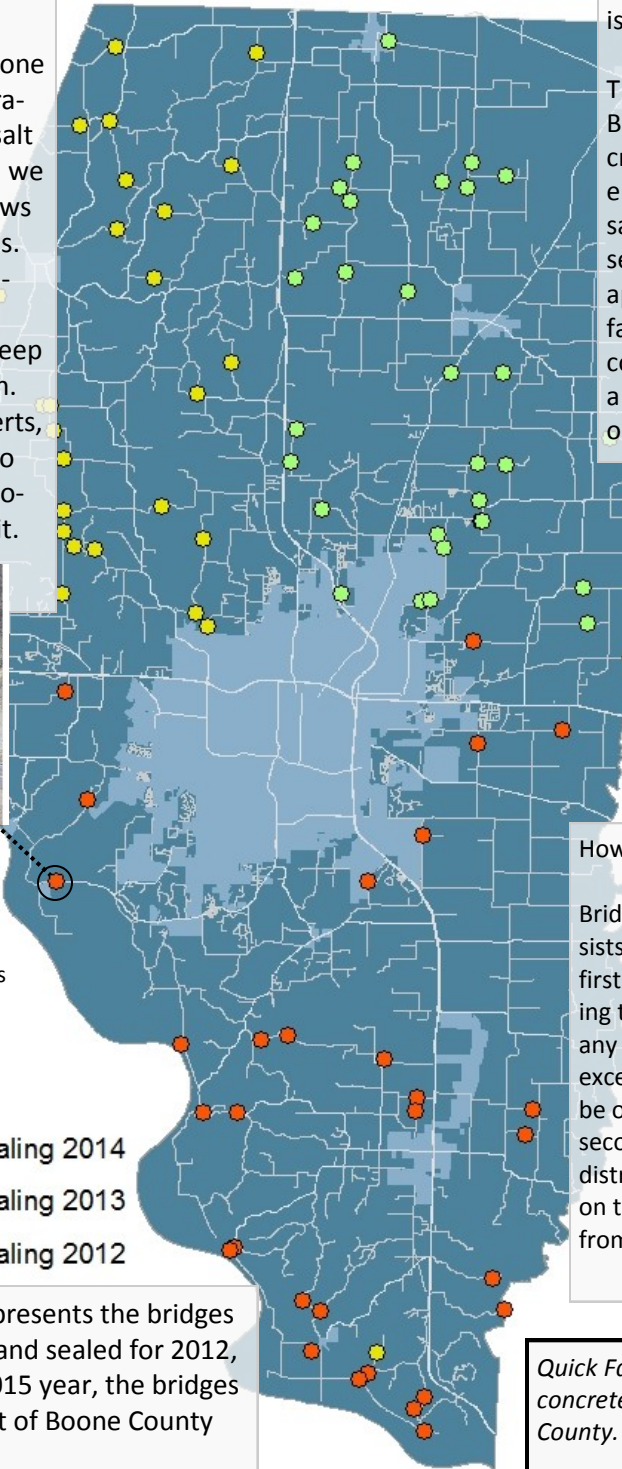


Geospatial technology is used to plan and prioritize bridge maintenance. This is an effective tool to identify the bridges targeted for sealing in the 3-year rotation. This bridge on Burr Oak Rd will be re-sealed in 2015.

Legend

- Bridge Deck Sealing 2014
- Bridge Deck Sealing 2013
- Bridge Deck Sealing 2012

Each point on the map represents the bridges that were power washed and sealed for 2012, 2013 and 2014. For the 2015 year, the bridges in the SE and SW quadrant of Boone County will be completed.



What kind of sealant is used?

The sealant used for Boone County concrete bridges is an environmentally safe, penetrating sealer that is spray applied to the surface to seep into the concrete and provide a protective barrier on the bridge deck.



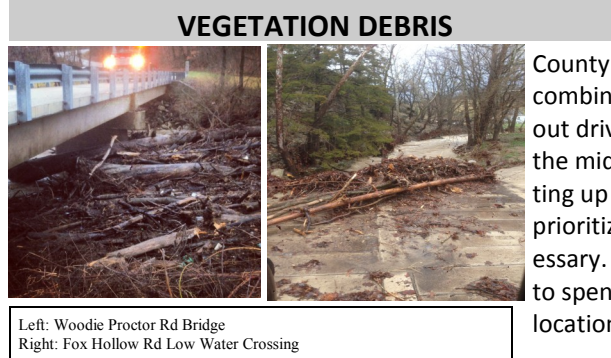
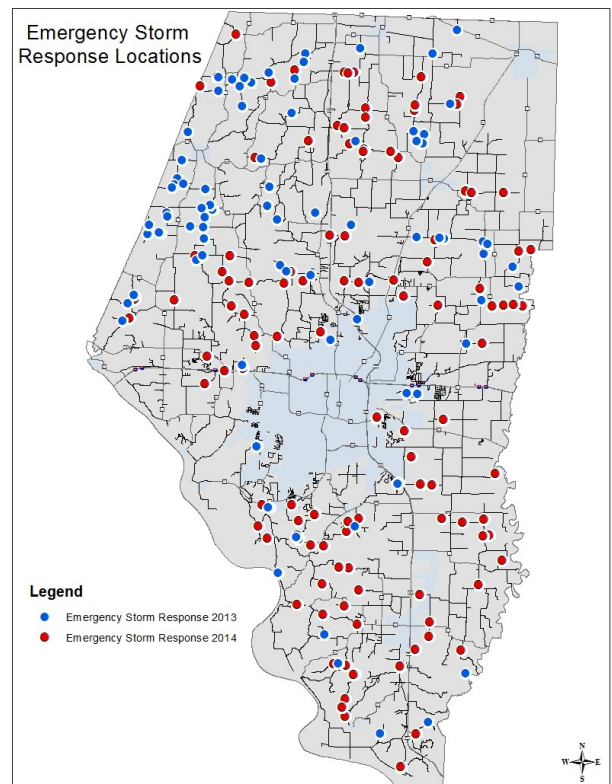
How do we deck seal?

Bridge deck sealing consists of two steps. The first step is power washing the bridge to remove any dirt, aggregate, or excess residue that may be on the bridge. The second step is distributing the sealant on the bridges to keep it from deteriorating.

Quick Fact: There are 128 concrete bridges in Boone County.



During an emergency storm response event, Boone County Public Works road crews and sign technicians put all other projects on hold to respond to severe weather. When a storm hits Boone County, roads and bridges are affected due to flash floods, lightning, and strong winds. Because Public Works employees are officially regarded as first responders, they have an important role in planning, preparing and responding to disasters. Road crews will inspect roads during these events and communicate back to the public works office which intersections are impassable or closed. This information is then reported to Boone County Emergency Management.



Emergency storm response events occur across Boone County every year. Each one of these point locations represent a combination of, clearing vegetation debris from bridges, cleaning out driveway and crossroad culverts, removing fallen trees from the middle of the road, replacing traffic control signage and setting up flood advisory signs. During a storm event, these tasks are prioritized to allow emergency vehicles to access the roads if necessary. Several days after the storm has occurred, crews continue to spend 15-20% of their time completing these tasks due to the location of these affected areas.

RESPONDING TO WINTER WEATHER

PRIORITY ROUTES AND EMERGENCY RESPONSES

During the initial phase of a major snow event, nearly all resources are dedicated to keeping priority roads (paved surface roads that serve critical facilities and provide access between state highways and communities) open.

- Paved roads are treated with a salt mixture that prevents the snow and ice from bonding and sticking to the road surface.

GRAVEL ROADS

Gravel roads are primarily cleared by graders, which operate during daylight hours. Once snow has stopped, it takes approximately 3 complete 12-hour shifts to make a pass over all gravel roads.

- Motor grader operators take windrows of excess rock and distribute it along the roadway creating more traction for motorists.

SUBDIVISIONS

The main streets within the subdivisions are often cleared by our large dump trucks with follow-up on the side streets and cul-de-sacs with our one-ton trucks.

CUL-DE-SACS AND DEAD-END STREETS

Cul-de-sacs are at a disadvantage when it comes to snow removal because snow plow drivers are faced with the problem of maneuverability within the cul-de-sac as well as limited options for depositing the extra snow. These streets are addressed after the higher volume roads.

When a winter storm is forecast for the area, BCPW will have employees and equipment staged and ready to begin clearing the 800+ miles of county roads.

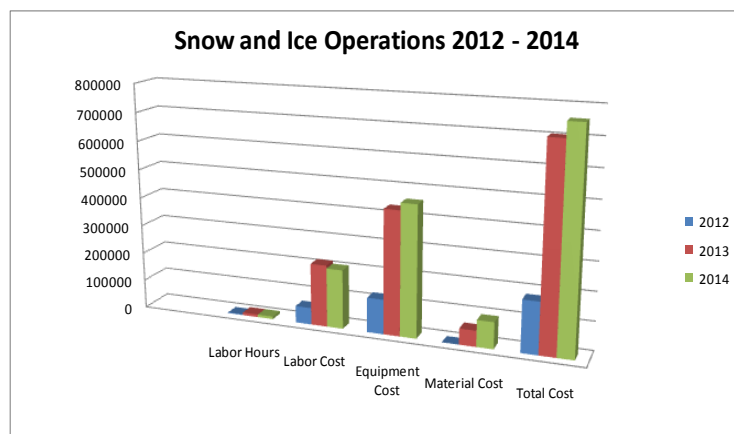
For a major snow/ice event, all 40 drivers are scheduled to work 12-

hour shifts around the clock. Equipment available for snow removal includes: 16 dump trucks, 5 one-ton trucks, and 8 graders. The overall effectiveness of the snow removal effort is enhanced by an organized, consistent approach to the task.



POLAR VORTEX AFFECTS BOONE COUNTY PUBLIC WORKS

Battling any winter weather event is a huge challenge, especially when extreme cold temperatures are present and visibility is low due to blowing snow conditions. This is what BCPW experienced Winter 2014. Due to a polar air mass that blanketed most of the central Midwest, where temperatures were several degrees below zero for multiple days, BCPW experienced frozen fuel lines, difficulty with equipment and ineffective salt mixtures. At subzero temperatures it is too cold to use salt mixtures effectively. Re-freezing, causing more hazardous conditions, is too much of a risk.



The chart above displays hours, labor, equipment and material cost from 2012 to 2014. Because 2014 showcased multiple record breaking winter events, more time and money were dedicated to snow operations. Our snow crews are dedicated and work very hard serving the citizens of Boone County and will continue to do so.

Sources: climate.missouri.edu, SafeWinterRoads.com, <http://www.crh.noaa.gov>

FLEET OPERATIONS

The Public Works Department replaces equipment/vehicles to maximize useful life, minimize downtime, and maximize trade or sale revenue. This is accomplished with the aid of a strategic ten (10) year life cycle plan.



New skid steer purchased 01/14

A review of equipment is conducted each year to evaluate the effectiveness of the equipment. The ratio of repair expenditures to capital investment is a major factor in replacement considerations.



New mini excavator purchased 01/14

If there is new equipment available to perform certain tasks in a more efficient manner, then new equipment is planned for in a future fiscal year.

NEW EQUIPMENT	BENEFIT
Mowers, Motor Graders	For machines that are used daily, overall cost-effectiveness is improved by maintaining a regular replacement cycle
One-Ton Pickup Trucks	Eliminates the need for expensive contractors during snow removal
Mini Excavator	Maneuverable in tight spots, no set-up time required and less expensive than a backhoe, resulting in greater efficiency overall
Skid Steer	Beneficial for shoulder repair and reconstruction. A great tool for improving drainage along rural roads
Till Top Trailer	Safer to load and unload steel drum rollers used for asphalt overlay preparation.

MANAGING PREVENTATIVE MAINTENANCE

New in 2014, Public Works invested in Collective Fleet (Collective Data), a fleet software that is accessible by multiple departments and renders reports on cost analysis, labor and parts inventory.



Helpful reporting improves decision making

The screenshot shows the 'Editing Equipment' screen for a 2012 Freightliner 114SD 6x4. The interface includes a top navigation bar with options like System, Lists, Company Mgmt, Activities, Shop, Task Lists, Inventory, Tool Inventory, Mission Control, Billing, Reports, Windows, and Help. Below this is a search bar and a list of equipment. The main area displays detailed information for the selected vehicle, including its make (Freightliner), model (114SD 6x4), VIN (1FVHJ2N62C8B6544), location (01 Public Works), and department (2040 Maintenance Operations). There are also fields for license plate, fuel type, and fuel tank size.

The asset management screen displays a photo and details of every equipment type we utilize at Public Works



9, 378 SIGNS OF SAFETY



ArcGIS Mobile - PW Signs

 **View Map**
Browse the map display

The Sign Division staff continues to utilize ArcGIS for Windows Mobile and ArcGIS for desktop software suite to precisely track inventory data and sign location. With mapping technology at their fingertips, the Sign Division uses a mobile device with GPS capability to collect and edit sign data in the field. This map-driven workflow efficiently allows office access to data collected in the field. This information is then used to run reports, and/or create maps. Currently, there are 9,378 signs that the Sign Division tracks and maintains.



Displayed here is a screen shot of the signs application. Each sign displayed here is symbolized by different colored boxes that represent different sign types. For example, the “low water” type signs are represented by yellow boxes.

Unlike some other low water type signs, this Flood Area Ahead sign is a permanent sign due to frequent flooding on Easley River Rd., during heavy rainfall events. Easley River Rd—Fall 2014



REFLECTIVITY ON SIGNS AND POLES?

MUTCD standards require some signs to have high intensity prismatic sheeting for safety purposes. It is used to draw attention to specific signs; for example, it is required for “railroad crossing” signs and is common for “chevron” signs. Recently, the



It is typical to see chevron signs on a curvy road



On a railroad crossing sign, the pole will have a white stripe mounted on it for enhancing the importance of safety at these intersections.

Sign Division has included this sheeting on County Maintenance Ends/Begins signs to help night snow plow drivers see where County maintenance begins and ends. The prismatic sheeting is especially helpful in low visibility conditions such as a snow storm.

IN-HOUSE SIGN PRODUCTION

In-house sign production has greatly improved the overall efficiency of the sign division. Fabrication, installment and accurate tracking of sign inventory is accomplished by the sign division staff in a fraction of the time previously

Quick Fact: There are only 249 signs left out of the 9,378 that need to be upgraded to the latest sheeting, high intensity prismatic (HIP). This type of sheeting is highly reflective and commands attention during the day and night.

required for sign orders to be processed by outside vendors. Senior Sign Technician, Raenell Mackey, customizes each sign using a software called Flexi Expert. The software enables her to develop templates for all different types of signs using current MUTCD standards. After the graphics are plotted and mounted on sign plaques,

they're ready to be installed throughout the county. Continuously coordinating with Boone County's Resource Management division, all ID signs have been confirmed with correct coordinates. These coordinates are extremely important for emergency management personnel to quickly and accurately locate addresses.

CONNECTING WITH BOONE COUNTY CITIZENS

CUSTOMER SERVICE

Boone County Public Works makes customer service a top priority. When Boone County citizens call, email, comment on social media or just decide to pop into the office, the administrative staff makes sure their questions and concerns are addressed. Each employee is familiar with the general operations and practices of the Department and is capable of answering most questions/concerns presented by citizens. If more specific information is needed, administrative staff facilitate communication to provide a complete response.

"LET ME MAKE A WORK REQUEST"

If you have ever called BCPW, you have probably heard one of our administrative employees say this to you. A "work request" is a form filled out when a citizen calls with a road, bridge, vegetation or culvert concern. Utilizing this information and the technology we have in place, supervisors can track the work orders and systematically develop their workplans and budget for future projects. Work orders are key to providing a high level of service to our citizens and we take pride in making sure citizen information is communicated effectively.

GOT A ROAD PROBLEM?

The BCPW Road Reporting Application is another way citizens can report road issues—once the user submits the information, it is emailed to Public Works where a work request is created and directed to the appropriate superintendent.

Boone County Public Works Road Problem Reporting Application

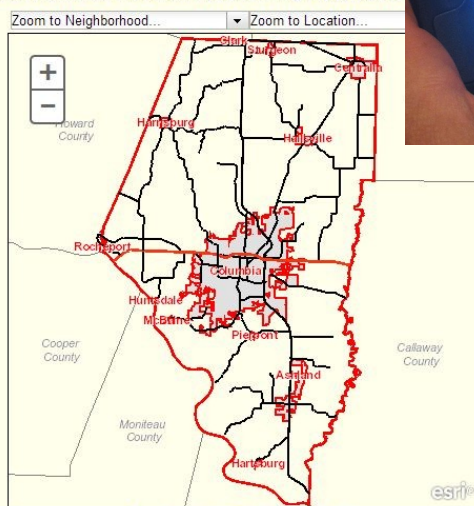
You may report a problem with Boone County roads using this application and either of the methods listed below.

Use the Map and Form

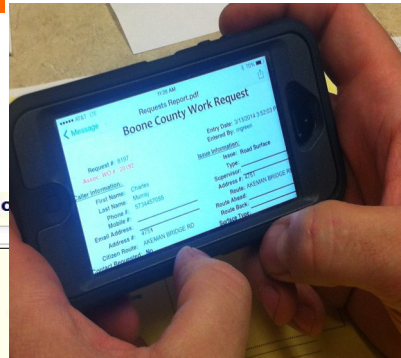
1. Use the + and - map tools to zoom in on the map location of the problem
2. Select the "Report a Problem" map tool
3. Click the map at the location of the problem
4. Fill out the form with the requested information and submit

Use Only the Form

1. Open the Form
2. Fill out the form with the requested information and submit



- Access the Boone County Public Works home page at showmeboone.com/PublicWorks
- Click on "Report Problems" and you will access the **Road Problem Reporting Application**



Northern District Superintendent, Darren Kimbrel viewing a work request on his cell phone. From here he can quickly assign a crew to this address to inspect the issue and provide any feedback to the citizen if necessary.

CITIZENS AND DUST CONTROL

Every Spring, BCPW collaborates with approved vendor, Scotwood Industries to provide an option for citizens to purchase a dust control treatment for particular sections of gravel roads. This optional, private pay service is available for all Boone County citizens, and is easy to setup. All dust control treatment information is available on the Boone County Public Works website.

<http://showmeboone.com/PublicWorks/>

CONTACT BCPW



Hours: 7:00 am—4:30 pm Monday thru Friday



573.449.8515



PublicWorks@boonecountymo.org



Facebook: Boone County, Missouri Public Works

TRAINING, CONFERENCES AND AWARDS

SAFETY DAY

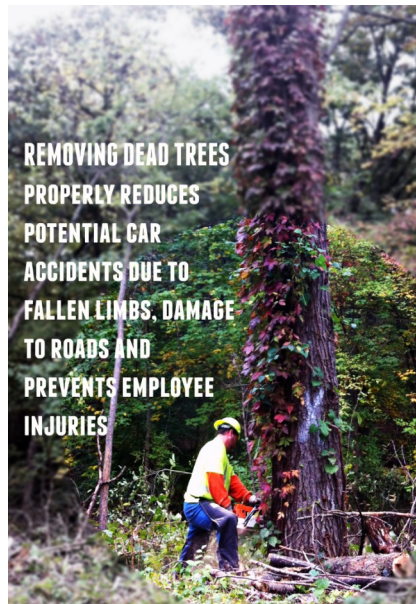


HR Director Jenna Redel-Reed giving a presentation on workplace communication and behavior.

Safety Day at Public Works is an annual event featuring presentations on various topics related to employee well-being. This is an all day event highlighting the importance of safe driving and equipment operation, physical health, effective communication, collaboration and team-work.

ARBORIST TRAINING

Certified arborist training is required for all Boone County Public Works employees that are assigned to the brush crew. The training, taught by City of Columbia's Certified Arborist, Chad Herwald, teaches employees how to properly operate a chainsaw and other tools. They learn how to remove tree limbs safely and correctly so the tree is not harmed or damaged in any way. This training allows our crews to successfully prune trees throughout subdivisions as needed to improve site distance, remove dead trees from the county right of way, and prepare for any planned overlay projects.



MACTO

MISSOURI ASSOCIATION OF COUNTY TRANSPORTATION OFFICIALS

The Missouri Association of County Transportation Officials is a non-profit organization that consists of any county employee, such as county engineers, public works directors, road and bridge administrators, road supervisors and superintendents involved with surveying, design, construction or maintenance of county bridges and highways in the state of Missouri. Boone County has had the opportunity to sit on the board for the organization, attend and plan conferences and host meetings for this collaborative group of road experts.

<http://gomacto.com/index.php>

ROAD SCHOLAR PROGRAM

The road scholar program, sponsored by Missouri Local Technical Assistance Program (MO LTAP) through the Federal Highway

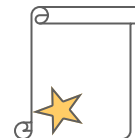
Administration and MODOT aims to enhance the skills of all personnel involved in local transportation in the state of Missouri. To become a road scholar, employees are required to complete 3 core courses and 5 elective courses over a 4-year period.



Employees, Rickey Harvey, Dwayne Kimbrel and Ryan Bennett receiving LTAP Road Scholar certificates.

BCPW has the largest group of "Road Scholar" graduates in the state of Missouri!

AWARDS



Boone County Public Works in collaboration with the Resource Management and the GIS departments was

granted two awards in 2014;

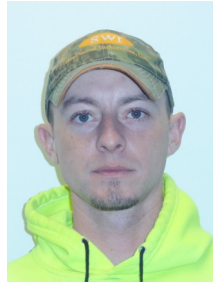
The **Excellence in Operations Management Award** by Asset Management System, Cartegraph, and

The **National Association of Counties (NACo) Award** for effectively maintaining and improving data and information, citizen engagement and demonstrating leadership in the municipal industry.

<http://www.cartegraph.com/learn/blog/2013-excellence-in-operations-management-awards>

<http://www.naco.org/programs/recognition/Pages/2014-Achievement-Award-Winners.aspx>

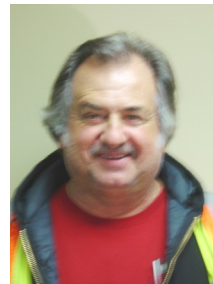
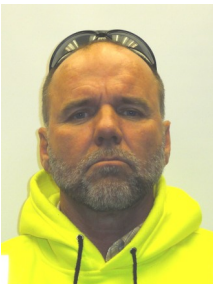
BOONE COUNTY PUBLIC WORKS TEAM



Bart Barner
Brandon Bennett
Ryan Bennett
Corey Bolles



Bryan Boyce
Tod Chandlee
Charly Clendenning
Bobby Craig



David Critchfield
Tony Crocker
Lee Crump
J C Csolak



Mark Donoho
Drake Donoho
Chet Dunn
Allan Eberwein



Greg Edington
Darren Evans
Nick Fairley
Dustin Friedli

BOONE COUNTY PUBLIC WORKS TEAM



Randy Garrett
Mike Glascock
Margaret Green
Raymond Hackmann



Isaiah Harmon
Scott Harmon
Rickey Harvey
Robert Hostetter



Brandon Irwin
Chris Jennings
Darren Kimbrel
Dwayne Kimbrel



Terry Knight
Adam Lewis
Raenell Mackey
Mike Mattingly



Gordon McCune
Billy Montgomery
J.C. Nichols
Price Nichols

BOONE COUNTY PUBLIC WORKS TEAM



Ben Nieman
David Noble
Caleb Okeefe
Justin Quick



Adam Reddick
Joe Reddick
Neal Roberts
Mark Rowland



Teresa Shaw
Robbie Sapp
Bobby Smith
Lincoln Smith



Jane Telander
Marijane Williams
Joey Winn
Jeff Wren

CHECK OUT PAST PUBLIC WORKS ROAD PROJECTS AT
WWW.SHOWMEBOONE.COM/PUBLICWORKS/PROJECTS
AND CLICK ON BOONE COUNTY PUBLIC WORKS PROJECT
STORYMAPS



Roland Wren

"AT'A BOY!"

Boone County Public Works would like to dedicate this page to the citizens who take the time to call, email or drop in and simply say, "thank you" for our efforts. We appreciate your comments and appreciate your patience and cooperation to making Boone County roads better one mile at a time.

"I just wanted to say **thank you** for your hard work in regarding our road. I want you to know that your hard work was noticed and very much appreciated! **The approach from asphalt to gravel is the best** it has been in several years since I have lived here. So thank you for your **due diligence in completing this corrective work expediently!** Hope you have a Happy New Year!"

*Citizen on
Oakland Gravel Rd.*

"**Thank you** so much for quickly fixing the drainage ditch on St. Charles Rd! **I really appreciate it!**"

*Citizen on
St. Charles Rd*

"**Thank you** for putting gravel down on Robinson Rd and Friendship Church Rd last Friday (March 7). **It helped out tremendously!**"

*Citizen on
Friendship Church Rd.*

"They just made a **huge difference** getting this road prepared ahead of time before the rain hit. I mean they just did such a **great job**, thank you so much!"

*Citizen on
Nashville Church Rd*

"**Thank you** and your crew for doing an **excellent job** repairing my driveway and culvert. I really appreciate it. Great work!"

*Citizen on
Williams Rd.*



"You all did a **fantastic** job on this road. The **crews were timely, very professional and the road looks beautiful.** Today someone came out and put rock down where the new asphalt meets my driveway and I was not expecting that. **THANK YOU!!!**"

*Citizen on
River Oaks Rd.*

"**Great job** on getting Rob Cook Rd and Durk Rd. graded this morning! It was **so easy coming into work!**"

Happy Boone County Citizen

Susan who lives off of Robin Ridge Rd wants to say **THANK YOU** for putting gravel down on her road!

*Citizen on
Robin Ridge Rd.*