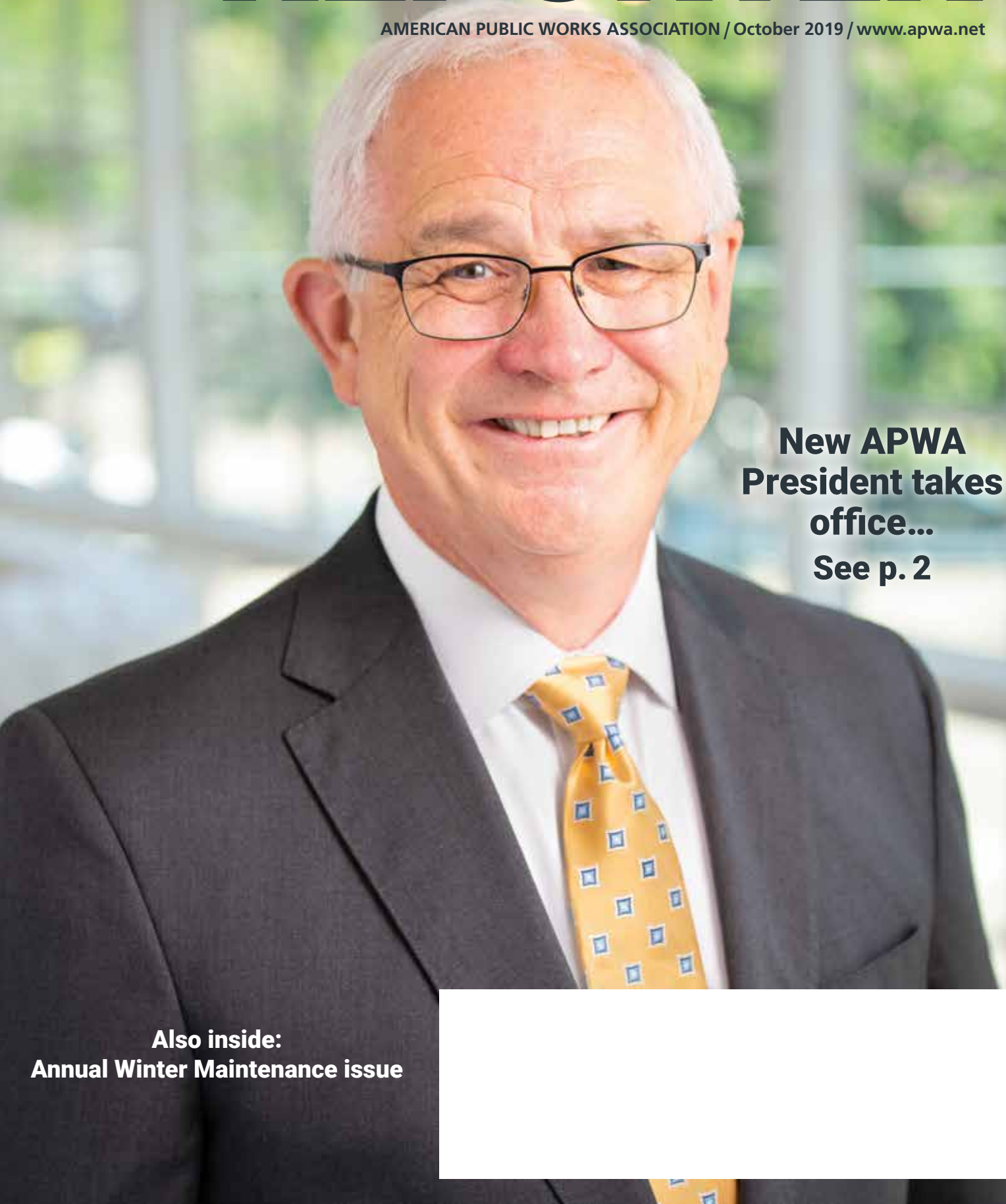




REPORTER

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**New APWA
President takes
office...
See p. 2**

**Also inside:
Annual Winter Maintenance issue**

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REPORTER

October 2019 / Vol. 86, No. 10

WINTER MAINTENANCE ISSUE



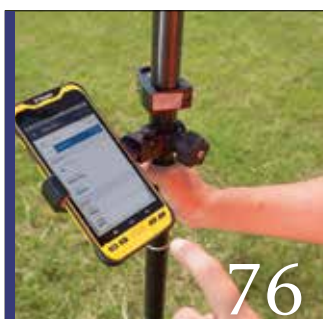
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APWA becomes another extended family

William E. (Bill) Spearman, III, P.E.
APWA President

Editor's Note: As has become tradition, each new APWA President is interviewed by the APWA Reporter at the beginning of each presidential term.

In this manner, presidential plans are laid out, hopes revealed and observations noted.

Bill Spearman's professional career has spanned 43 years, all of which have been in the public works industry. He has spent 16 years in the public sector (eight years with the Federal Highway Administration and eight years with the South Carolina Land Resources Conservation Commission); and 27 years in the private sector (one year with Wilbur Smith Associates, 21 years with Woolpert, Inc. and five years as owner and principal of WE3 Consultants LLC).

President Spearman has been an active member of APWA at both the chapter and national levels. In service to the South Carolina Chapter he has served as a Director, Vice President, and President and has chaired and co-chaired the chapter's Awards Committee. At the national level he served six years on the Board of Directors as the Director-at-Large, Environmental Management, and one year as President-Elect. He has also served on several national committees, including the Water Resources Management, Government Affairs, Finance, and Strategic Planning Committees. He led the efforts to develop the APWA Certified Stormwater Manager certification

program and the Stormwater Summit at APWA's annual PWX; served on the task force that developed the Center for Sustainability; taught numerous environmental short courses; led several Click, Listen & Learns; and supported APWA's advocacy staff with coalition partners on funding and regulatory issues.

How did you get into public works?

Well, my story is probably a little different than most people. Many folks kind of fall into the public works profession or get there through a circuitous route. From as early as I can remember, I wanted to be a civil engineer for a couple of reasons. First, my grandfather worked for what was then Southern Railway for fifty-seven years. So, I grew up around railroads and trains and saw the importance of a good transportation system in delivering the things that make our lives better. Second, my father worked for Duke Power Company for forty-four years at the same electric power generating station and I got to grow up inside steam and hydro power plants, walked over earthen dams and crawled inside the concrete dam, and saw rain and streamflow gauges that helped me understand hydrology and how rivers flowed and their impacts. I got to see first-hand the things that public works projects and services could do to make life better for everybody else. I can remember even in fourth or

REPORTER

**Official Magazine of the
American Public Works Association**

PUBLISHER

American Public Works Association

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Kansas City, MO 64105
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Disclaimer: The American Public Works Association assumes no responsibility for statements and/or opinions advanced by either editorial or advertising contributors to this issue. APWA reserves the right to refuse to publish and to edit manuscripts to conform to the APWA Reporter standards.

Publisher's Notice: The APWA Reporter, October 2019, Vol. 86, No. 10 (ISSN 0092-4873; Publications Agreement No. 41450540). The APWA Reporter is published monthly by the American Public Works Association, One Kansas City Place, 1200 Main Street, Suite 1400, Kansas City, MO 64105. Subscription rate is \$233 for nonmembers and \$25 for chapter-sponsored students. Periodicals postage paid at Kansas City, MO and additional mailing offices. POSTMASTER: Send address changes to the APWA Reporter, One Kansas City Place, 1200 Main Street, Suite 1400, Kansas City, MO 64105. Canada returns to: P.O. Box 2600, Mississauga, ON L4T 0A8.

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The APWA Reporter is printed by Royle Printing, Sun Prairie, Wisconsin.

fifth grade, when people would ask you what you're going to be, everybody else in my class said "I want to be a doctor" or "I want to be a lawyer" or "I want to be a truck driver" (that kid's father owned a large trucking company). For me, it was "I want to be a civil engineer." So, I was really focused on a career in the public works industry.

What are some of the changes that you have seen in public works? One of the major changes is technology. When I was in high school and even starting college, I used a slide rule. I can remember my first calculator was a TI-10 and it even did square roots. I got it during my junior year in college which really helped me with my surveying class. Then in my senior year in college I bought an HP45 that cost me almost four hundred dollars, and boy did I think that I was something. Everybody wanted to play with it because it was state-of-the-art. When I

Now we're growing toward a very diverse industry and I think it definitely helps us out tremendously.

did the research for my master's thesis, I actually had eight PCs in the computer lab assigned to me and I was able to run eight simulations simultaneously, running from one to another every time one of the PCs beeped. Now everybody has a PC or tablet, and everybody has a smart phone that does more than the early PCs could do. That technology change has just been amazing to see in my lifetime—just how it's helped us do so many things.

I think the other change is seeing the diversity in the industry and APWA now. When I first joined the industry, you hardly ever saw a young person or

people of color. Most of the folks were like me—professional engineers or at least with engineering degrees. Now, we have come to recognize and value the members of our industry regardless of their educational levels or what jobs they perform. To me that's one of the great things that I see when I go to our conferences and meet with the chapters—the people. They were always great people, but now we're growing toward a very diverse industry and I think it definitely helps us out tremendously.

What are some of your major accomplishments? If I think back, probably the biggest accomplishment I had was being the principal author of the South Carolina Stormwater Management and Sediment Reduction Act of 1991 when I was with the State of South Carolina. It was one of the first statewide stormwater and sediment control regulations in the Southeast. In South Carolina there was a need for it because the state was

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developing quickly and urban flooding was affecting the quality of life for our citizens. Everyone was surprised when it actually passed. We even had media coverage from California and they really were surprised that a state like South Carolina would adopt such a comprehensive bill. It's had a profound impact on development and water quality as

we've moved through the NPDES water quality regulations and created storm-water utilities to fund our stormwater programs. Even now when I ride around and I see a sediment basin or detention pond that's being well maintained and erosion control fabric installed properly, I say "You know, self, you may have had something to do with that." To me

that's a major accomplishment that I think is very important.

I've been very blessed to be able to mentor and coach young employees and other colleagues to get involved in APWA.

An accomplishment that I am equally proud of was my service on the Saluda County Water & Sewer Authority. Saluda County was like a lot of rural counties in the early 1990s. Our economy was driven by small textile plants and agriculture. There were small water and sewer systems but no county-wide system with the capacity to promote economic development in the county. I along with four other county residents was asked to serve on the initial board of the County Water & Sewer Authority. With less than \$10,000 in seed money from the County Council, we were tasked with developing a water and sewer system to permit our largest employer to continue to grow and serve the needs of a growing second-home recreation market on a large lake in the county. We all pitched in and used our collective talents of two engineers, a manager of a local electric utility and two local businessmen to secure almost \$10M in loans and grants to plan, construct and operate the first phase of our water and sewer system. We did what everyone in the public works profession does every day—we recognized a problem and did what was necessary to address it. An important side note is that we did these without having our first, paying customer.

Another thing that I am proud of is being able to encourage others to get involved in APWA. APWA is an association where you don't necessarily join on your own. Somebody either invites you, takes you, tells you to go to meet-

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ings, and gives you that opportunity to get involved. I've been very blessed to be able to mentor and coach young employees and other colleagues to get involved in APWA. The benefits to you personally and professionally just cannot be overstated.

What will be your priorities as APWA President? You are president for a year, and you really can't effect major changes in a year. But you can set a target or a goal for a path forward. One thing that I'm very excited about is the foundation that we're working on. I think it will be a great addition to APWA and will give us the flexibility and opportunity to do things that we can't do right now. I would love to have an intern working in Congress for three to six months in one of the House or Senate committees. I think that would be a great thing. I would love to see us be able to expand our Emerging Leaders Academy down to the chapter level with a chapter Emerging Leaders Academy, and really grow some leaders on the chapter level and then grow those folks on the national level. We're an educational organization, so making sure we have educational products and services that truly meet the needs of our members, that's of utmost importance. And being able to push those down to the chapter level to benefit our members and their agencies and companies.

You've been very active in APWA over the years at both the national and chapter levels. What are some of the highlights of your involvement with APWA? I have been very blessed that people have given me opportunities in APWA. Starting with Dwayne Kalynchuk [APWA National President, 2003-04] who asked me to be on the National Nominating Committee back in 2003. Then I was able to be on the Governance Task Force in 2008 where we made some changes to terms of office for directors. I was fortunate enough to be on the task force that developed the Center for Sustainability. That was

something that we saw the need for, and we were out in front with that, which helped us be involved with the Institute for Sustainable Infrastructure, Envision, etc.

When I got on the Water Resources Management Committee, we looked at two different things. George Crombie

[APWA National President, 2010-11] challenged us to do things, because he was our technical director. We actually started to work on the Certified Stormwater Manager program, which has taken off. The other thing was the Stormwater Summit at PWX. We really wanted to go back to the old two- and three-day workshops, but instead we

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thought this was a good venue to hold it at PWX for two half days, and it has been very successful over the years and very well attended.

On the chapter level, I wondered why the South Carolina Chapter never got the PACE [Presidential Award for Chapter Excellence] award. Then I learned that we didn't have an awards program at the chapter level. During my time on the SC Board, I helped restart our awards program. Our first manager of the year winner, Larry Morris of Aiken, SC, went on to be selected as a Top 10 winner the next year. And the SC Chapter has won the PACE award almost every year since then. Showing the value that our members bring to the Association and to their communities is really an important part of what we do.

Those are the kinds of things that I'm very proud of. I didn't do it by myself, I did it with a dedicated group of volunteers in the chapter and on the committee and a very dedicated group of staff from APWA.

Who have been your mentors and who inspires you? Well, I have to look first at my parents and grandparents as my mentors. They were role models who really showed me the importance of hard work, dedication, and respecting all people. To me that's something that's very important, regardless of education or background, just being able to respect people for who they are and what they do.

A good example is my grandfather who would do taxes for a lot of the poor and lesser educated folks in our little town. Of course, he didn't charge them for doing that. We grew up close to the depot there in Chappells, SC (actually right next to the Section House for those familiar with the railroad). There were people who rode the passenger trains in those days, and many nights people would knock on our door, and Dad and Mom would give them a blanket, a thermos of coffee, a flashlight, and a couple of dollars to get a train ticket

I didn't do it by myself, I did it with a dedicated group of volunteers in the chapter and on the committee and a very dedicated group of staff from APWA.

the next morning. So being able to serve is something that's very important that I saw from my mother, my father, my grandfather, my grandmother. That definitely inspired me.

Also, I was very fortunate to have had teachers and professors that saw something in me and pushed me to excel. I think that the real key today is pushing people to where they're almost uncomfortable, because they will definitely surprise you by what they can accomplish. I've been very blessed to have had those opportunities to do those kinds of things. At APWA, I can look over the past presidents and so many of the members of the Board of Directors who really took an interest in me, got to know me, and gave me the opportunities to join the task forces or do other things. That gives you the confidence. I hope that I will be able to give other folks those same types of opportunities, so that they can succeed both personally and professionally, and help APWA become even a stronger association.

Tell us about your work with WE3 Consultants LLC. When I took an early retirement at the end of 2014, I really expected to take a couple of months and just kind of relax and play golf and do everything that I had put off over the preceding thirty-eight years. But clients called my former firm and wanted me to help them with NPDES permits, stormwater utilities, and TMDL compliance issues so I created a one-person consulting firm to be able to meet those needs of clients. I've been able to help some old clients and solve some issues that they had. That's really what WE3 Consultants is all about.

We are in a people business. Regardless of what our roles, responsibilities or job titles are, we deal with the public.

Whether we're consultants dealing with our clients, whether we're public works folks dealing with the public, whether we're vendors dealing with everyone, we are in a people business. Those relationships are what's to me the most important thing about our industry and that's why I am happy to share my experience and expertise with folks that ask.

What is the greatest benefit you see in being a member of APWA? Well, even though we are an educational association and I think our educational opportunities are the best out there, the relationships that you establish with the other members, sponsors, vendors, etc., is the most important thing and the greatest benefit of being a member of APWA. It becomes another extended family. When we have a hurricane on the east coast or major flooding, people from all over the country call me to make sure I'm okay. When the shootings and fires happened at Thousand Oaks last year, I called Jay Spurgin [Public Works Director] and told him, "I want you to know I'm thinking about you." So, that extended family that we have in APWA is like nothing I have seen before. I have been very active in the American Council of Engineering Companies, and I've been section president of the American Society of Civil Engineers in South Carolina. But neither of those organizations rises to the level of the relationships, and the family feeling in APWA, and just the caring that we have for each other. I always say, to me public works is the highest form of public service, because people in this industry do things unselfishly. It's that type of relationship and truly caring for each other that to me is the greatest benefit. That just helps all these other things that we do even be better. 

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One of the highlights of this year's North American Snow Conference in Salt Lake City was the annual General Session Talk Show.



Winter Maintenance Subcommittee: Leading a path forward through education and innovation

Daniel Schacher, Fairbanks District Superintendent, Alaska DOT and Public Facilities, Fairbanks, Alaska, and Chair, APWA Winter Maintenance Subcommittee

Your APWA Winter Maintenance Subcommittee has been busy with many varied activities throughout the past year. This group is composed of winter specialists from wide-ranging locations throughout the United States and Canada. Members have diverse roles within their various organizations, both public and private, including academia, operations, and leadership responsibilities. The main role of the Winter Maintenance Subcommittee is to advocate for innovations and efficiencies in the public works sector of the winter maintenance profession

in conjunction with private industry. To support that goal, the group assists in the development and delivery of winter-related education and training to APWA members, as well as those outside of the association, and provides strong leadership in industry improvement and outreach. The variety and depth of knowledge this subcommittee brings to APWA, along with decades of distinct real-world and academic experience, make it one of the most respected sources of information and know-how in the winter maintenance field.

Acknowledging Our Leaders

One of the highlights of the year for APWA members is the announcement of the Top 10 Public Works Leaders of the Year. This year was an especially exciting announcement for the Winter Maintenance Subcommittee, as two of our members were chosen for this noted award. We are proud to recognize Diana Clonch and John Klostermann as Top 10 Public Works Leaders of 2019.

Diana had a long career in public works before venturing into the consulting field, founding and operating her own

business, DW Clonch, LLC. John has held a variety of roles in his 43 years at the City of Dubuque, Iowa, most recently the Director of Public Works.

Please join us in a well-deserved congratulations to both Diana and John.

Training, Education, and Knowledge-Sharing

For many years the Winter Maintenance Subcommittee has been asked to search out opportunities to educate front-line, boots-on-the-ground, in-the-plow truck operators. We heard this request and in response have created a new four-hour training program tailored specifically to operators. This program can be a stand-alone course or presented in conjunction with the highly successful Winter Maintenance Supervisor Certificate Program. The Operator Training Program has to-date been presented as a pilot program but was recently adopted by APWA as an educational tool. The first APWA-certified operator training was held at the Western Snow & Ice Conference in Loveland, Colorado in September. The first APWA-certified operator training was hosted by the Central Pennsylvania Chapter in August and will be hosted by at least three other chapters throughout this fall.

The Winter Maintenance Supervisor Certificate Program continues to succeed as a very effective educational tool and method for advancing our profession. More than 4,300 individuals have now received certificates through this program! Many opportunities to attend this training are available through local APWA chapters throughout the year. If you would like information on how you can host the Winter Maintenance Supervisor Certificate Program and/or the Operator Training Program, please contact APWA staff.

In addition to developing the new training opportunity, the subcommittee is proud to have been deeply involved in planning and delivering its flagship event, the APWA North American Snow Conference (NASC),

which was held in Salt Lake City, Utah this year. One of the highlights of the 2019 NASC was delivery of the revised four-part “Liquid Use in Winter Maintenance” series of presentations sponsored by the Winter Maintenance Subcommittee. Courses in Liquids 101, 201, 301 and Advanced Liquids led attendees on a journey, from discovery through mastery, to incorporating the use of liquids into their winter event toolkit. Each session was standing room only with questions at the end of each session often lasting well beyond the time allotted. Based on the demand and continued support for the educational sessions, we plan on submitting the four-part series for consideration again in Cleveland for 2020.

Knowledge-sharing opportunities don’t stop there. The “Open Your Winter Toolbox” series in the *APWA Reporter* continues to appear each month, all year long. Subcommittee member Dr. Wilfrid Nixon authors most of these articles, with guest writers contributing as they are available. Each timely and informative article tackles a different subject and involves tools, technology or innovations that agencies can consider implementing to improve their operations. Wilfrid and the guest writers discuss nearly all topics of interest in winter maintenance today in this series. As programs and innovations arise, they are sure to be discussed in greater detail when you “Open Your Winter Toolbox” each month.

2019’s “Click, Listen & Learn” (CLL) topic is “Succession Planning and Servant Leadership: a Multi-Generational Perspective.” Please tune in October 10 as subcommittee member Mike Coffey from Juneau, Alaska, JD Bunnell from Lehi City, Utah, and I discuss this topic that affects all our agencies.

Other News

Many changes are still in the works at APWA regarding staff assignments and procedures. Deanne Cross has been the liaison to the Winter Maintenance Subcommittee for the past year. After PWX

in Seattle, Deanne will be handing off her liaison duties to Rita Cassida. Rita has worked with our group on many projects, so the transition should be seamless. We look forward to continued success working closely with Rita.

Two of our members are new additions onto other committees. Dr. Wilfrid Nixon is representing winter maintenance interests on the Autonomous/Connected Vehicle Subcommittee and Bret Hodne was nominated by the team to serve on the Professional Manager/Snow and Ice Control Award Committee.

Our subcommittee regularly fields media requests through APWA and drafts articles for the *APWA Reporter* and other industry publications. These articles can be seen on a monthly basis in the *Reporter* in the “Open Your Winter Toolbox” series mentioned earlier. We also contribute to the annual Transportation and Winter Maintenance editions of the *Reporter*. Our members are frequently sought-after speakers at winter-related conferences and trainings in North America and abroad, demonstrating the extent to which our APWA members are viewed as leaders in our profession.

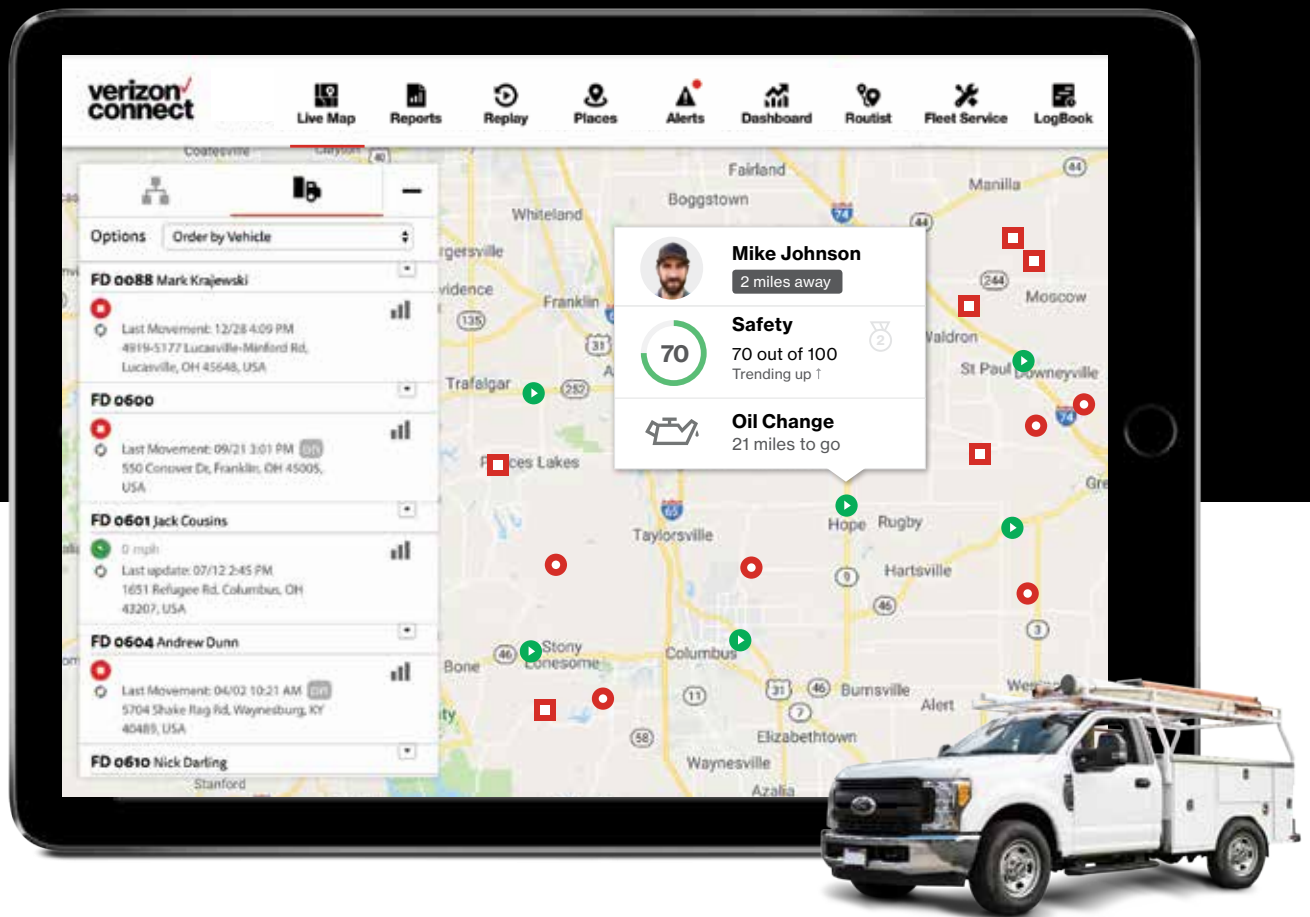
Of special note, due to changing life circumstances, we had six longstanding members of the subcommittee step back from their commitments to the group over the past year. We want to express our sincere thanks to Mark Cornwell, Ron Ditmars, Ben Dow, Warren Nicholishen, John Scharfbillig, and Harvey Williams for the years of tireless service each of them has contributed to the winter maintenance profession.

As chair of this outstanding group, I encourage you to visit the APWA Winter Maintenance Subcommittee website and become more familiar with our members and the excellent opportunities for education and innovation this group delivers.

Daniel Schacher can be reached at (907) 451-5276 or daniel.schacher@alaska.gov. 

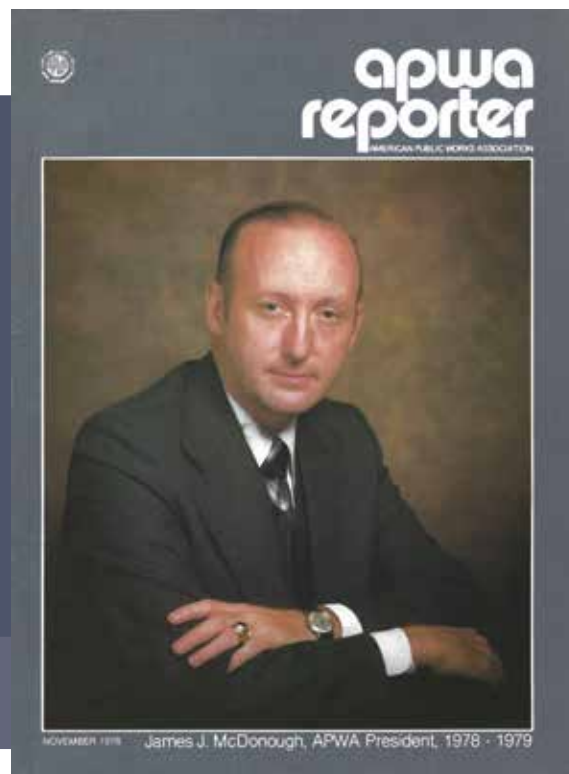
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James J. McDonough, as shown on the cover of the APWA Reporter, November 1978 issue

James J. McDonough, APWA Past President, dies at 85

James J. (“Jim”) McDonough, who served as APWA National President in 1978-79, died on August 11. He was 85.

A lifelong Chicagoan and graduate of the city’s St. Ignatius High School, McDonough earned his degree in business from John Carroll University, where he was a member of the school’s ROTC. After college, McDonough served in the United States Army as a First Lieutenant and an Area Transportation Officer in Korea.

Upon his return from military service in 1957, McDonough took the first of many positions with the City of Chicago, joining the Department of Streets and Sanitation in a supervisory role and eventually advancing to the positions of Deputy Commissioner and Commissioner. He was also the Chief Administrator of the Chicago Skyway Toll Bridge and later served as Chairman of both the Chicago Transit Authority and the American Public Transit Association.

In 1974, McDonough became President and CEO of Murphy Engineering, which later became McDonough Associates, Inc., a full-service engineering and architectural consulting firm which he led for almost four decades. Though the company had clients around the globe, its work on a myriad of significant projects closer to home cemented the firm’s—and McDonough’s—legacy as incomparable public works partners.

Throughout his entire career, McDonough was a prominent member of APWA, serving as the Chicago Metro Chapter’s president and taking a role on its national Board of Directors before his election as president in 1978. Beyond the countless building projects that impacted millions of workers, commuters, citizens, and visitors, McDonough also contributed to his community as a prolific philanthropist, donating substantial sums to a wide range of charitable and educational institutions through the James J. & Jacqueline A. McDonough Foundation.

McDonough is survived by his wife, Jacque; his son, Jim (Jennifer) McDonough; his daughter, Maureen (Dan) Curley; and his four grandchildren, MaryKate, Jack, Tim, and Quinn.

“In the summer of 1966, the First Deputy Commissioner of Streets & Sanitation officially signed on a young, timid college boy to his first real job,” said Samuel Polonetzky, P.E., Chicago Metro Branch Officer. “That summer job as an Engineer-in-Training for the Bureau of Streets repeated three more times, and then the now-Commissioner of Streets & Sanitation hired him as a full-time, civil service, rookie Civil Engineer I. He, Commissioner McDonough, always took pride and pleasure in both discovering and then advancing young professionals. Over the years, our careers continued to intersect as he became Chairman of the Chicago Transit Authority, and then his own, world-renowned engineering firm.” 



From left to right in front of the NET Cancer Awareness snowplow: David Whittier, Debbie Allen Grover, Brandon Thibeau, Lindsay Nunley

Plowing a Path for a Cure: Maine community raises awareness for NET Cancer

NET CANCER DAY

The NET Cancer Awareness logo

Thea Voutiritsas, Production Editor, American Public Works Association, Kansas City, Missouri

The town of North Yarmouth, Maine had just broken out of a blistering heat wave when I hopped on the phone with Debbie Allen Grover, Town Clerk of North Yarmouth since 2008, who'd just returned to her office. When the heat reaches extreme highs, she, her team, and members of the fire department make rounds to check on the ill and elderly—ensuring that they're staying cool and safe in the heat. "We have a good connection with the residents here in town. We're a population of roughly 4,000, so we know each other," says Grover.

"In a small town, department doesn't matter," she says. "People pitch in wherever they're needed." With a population of just under 4,000 in North Yarmouth, and just over 7,000 in the neighboring town of Cumberland, the com-

munities are tightly knit. But since 2003, three residents of North Yarmouth and Cumberland have fallen victim to the rare disease of Neuroendocrine (NET) Cancer.

First, Susan Grover, 41-year-old EMT and mother of four, died less than a year after her diagnosis. Eleven years later, the former town manager of North Yarmouth, Marnie Diffin, succumbed within months of her NET diagnosis. Then in 2017, 22-year-old fire-science student and friend of Grover, Brandon Thibeau, died two years after the biopsy of a swollen lymph node confirmed NET. "Who would have thought a young 22-year-old man who's going to fire science school would have been stricken with neuroendocrine tumors at such a young age," says Grover, "but it happened to him."

NET, or NETs, is an umbrella term for a group of rare, slow-growing tumors which arise from neuroendocrine cells found throughout the body. Most often, NETs appear in the digestive system, lung, and pancreas—though it may spread to other areas such as the lymph nodes, liver, or bones. NET Cancer has been dubbed a “silent killer” as many of those affected do not develop symptoms until later stages of the disease. Less than 200,000 people are diagnosed with NET cancer in the United States each year. Due to its rarity, it is often misdiagnosed. “For a cancer so rare, how could it have affected three people that I know and care about?” Grover says.

In the face of such tragedy, the town of North Yarmouth has found creative ways to band together and bring awareness to the disease. Under the leadership of Debbie Allen Grover, a woman with over 30 years of town operations experience under her belt, North Yarmouth has raised a good chunk of change and national attention for NET Cancer Awareness. Their most successful projects include a benefit breakfast and an eye-catching zebra-striped snowplow, which went on to win APWA’s 2019 Snow Conference Photo Contest [see August *APWA Reporter*, pp. 10-11 – Ed.].

Shortly after young Thibeu’s diagnosis, he and Grover joined forces to get the word out about NET Cancer; “[Bran-

don] just wanted to do the best he could to make people more aware of it,” said Grover. “One of the last things he said to me was ‘don’t give up the fight,’” Grover recalls. “You’re fighting on my behalf, and everybody who’s in my shoes, and everybody who’s going to be in my shoes,” said Thibeu.

Thibeu’s words stuck with Grover, and she began racking her brain for ideas to bring awareness to NET Cancer. She knew that the awareness campaigns for early breast cancer and prostate cancer have increased the rates of early detection, ultimately increasing the survival rate for the diseases. “Let’s try to do this with Neuroendocrine cancer,” she thought.

Soon after, Grover came across a photo from a nearby town that had painted one of their plows pink to raise awareness for breast cancer. Grover wondered if they could do the same with Zebra stripes, the ribbon pattern for NET Cancer Awareness.

Debbie went straight to the Town Manager, Rosemary Roy, with the idea. Roy was all ears. “If you can get the public works department to agree to it, go for it,” she said. “I’m not going to stop you.” With Roy’s blessing, Grover took the idea to the Public Works Garage. Luckily enough, one of the crew members painted cars as a hobby and was able to use his skills for the cause.

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Soon, a striking snowplow, complete with zebra stripes and the words “NET Cancer Awareness: Plowing a Path for a Cure” stamped across the front, emerged to clear the streets of North Yarmouth. The plow received immediate attention. “I remember the first winter we had the plow out there,” says Grover. “I actually had a couple of residents come in [to the office], and they had their little kids with them, and the only reason they came into town hall was to ask ‘Why is there a plow truck plowing the roads of North Yarmouth painted with zebra stripes?!’”

Grover was happy to explain. Over time, she saw others in the department jumping in as well. “When I first started this, people would always point to me to explain, and now I don’t have to do that anymore,” says Grover. “I’ve witnessed some of even the younger coworkers in the town office... jump right up answer the question. They’ve taken ownership of it too.”

Grover entered the zebra-striped plow in the APWA’s Snow Conference Photo Contest on a whim, promoting it among her colleagues and on social media. “Everybody jumped on board and voted for our photo,” says Grover. Out of nearly 100 entries, their photo was selected.

The painted snowplow eventually became a tool to raise awareness for another outstanding effort: the annual pancake breakfast. Now on its third year, the pancake breakfast is held in the North Yarmouth Fire Rescue Station, put on by Grover, the North Yarmouth Fire Company, and other volunteers like the Fire Rescue live-in students, Thibeau’s family, and others affected by NET Cancer.

To promote the event, Debbie spearheads a mailing campaign, reaching out to local businesses for cash donations to buy supplies for the breakfast. This year, they also entered the zebra-striped snowplow in the Yarmouth Clam Festival, which brings tens of thousands of visitors to Yarmouth each year. Equipped with a fresh coat of paint and the newly released public works first responder decal, the snowplow joined the parade to promote the pancake breakfast.

Grover also makes use of platforms like Facebook and Instagram to spread the word. She has been amazed by the online response. Grover even once heard from a woman diagnosed with NET Cancer who wanted to volunteer her time—though she lived 50 miles away. “I’d love to have you,” Grover told her. “If you feel up to helping, you’re welcome to take in the donations as people pay for their meal or you can help serve, or whatever you want to do, but I’d love to have you.”



The North Yarmouth NET Cancer Awareness snowplow

The day of the breakfast, all hands are on deck in North Yarmouth. “We don’t have the facilities [in the fire station], so we do a lot of prep the day before,” explains Grover. All supplies for the breakfast are trucked to a nearby school, where volunteers cook eggs, bacon, and home fries. “It’s a lot of work,” says Grover. “Peeling 70 pounds of potatoes for home fries can be a daunting task.” Then, all the food is trucked back to the fire station in food warmers. Only the pancakes (blueberry, chocolate chip, plain) are made onsite.

The volunteers’ hard work is paying off. In its first year, the benefit breakfast raised about \$1,600. The following year, that figure grew to roughly \$2,700—all in donations. “We don’t charge a fee, [the breakfast is] by donation only. Whatever you can give,” says Grover. All proceeds go to the NET Research Foundation in Boston.

“Every year gets a little bit better, and every year we get better at running it too,” says Grover. The town has further plans to raise awareness for NET Cancer, including giving out rubber bracelets provided by the NET Cancer Research Foundation. Grover is also in talks with her colleagues about painting a new plow with zebra stripes. “Can we paint the body, too this time?” she’s asked. The North Yarmouth Fire Rescue has also talked about giving stuffed zebras with NET Cancer ribbons, in lieu of teddy bears, to children involved in incidents that require fire rescue.

“We’re a small town enough that...if somebody needs help or wants to do something, everybody pitches in,” says Grover. “And I’ve been lucky that my coworkers, friends, and neighbors have all jumped on board to help me.”

The impressive efforts in North Yarmouth and Cumberland serve as an example of how public works and city officials can band together and go beyond the call to serve in their community, touching the hearts and lives of their residents. Folks who want to donate to the cause can visit NETRF.org to learn more.

Thea Voutiritsas can be reached at (816) 595-5258 or tvoutiritsas@apwa.net. 



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The APWA accreditation review team and personnel from the Town of Woodstock, VA at the conclusion of the successful review process.

Town of Woodstock, VA joins the ranks of accredited agencies



James E. Didawick, Superintendent of Public Works, Town of Woodstock, Virginia

The Town of Woodstock, Virginia recently completed the final review requirements and has been awarded the coveted full accreditation status from the American Public Works Association.

Located in the heart of Virginia's historic Shenandoah Valley, Woodstock (population 5,100) began discussing the accreditation process in late 2015. Representatives from our organization spoke with personnel from other accredited agencies to gain some background on the program, learn about the process, and assess the benefits of becoming an accredited agency.

One of the main reasons that we decided to pursue accreditation was to ensure the best use of our personnel, financial, and equipment resources. This has allowed us to provide the highest level of service to the citizens and residents and to conduct operations in the most efficient and economic manner possible.

Another reason we chose to move forward with the program is the approaching retirements of several key individuals in the department—which would result in a loss of vast institutional knowledge and experience. It became imperative to collect

and preserve this information for future reference before those individuals embarked on the next chapter of their lives.

APWA received and signed the town's initial application and agreement for the accreditation process on June 3, 2016. Before the review team arrived for final accreditation, the department had to complete a self-assessment and peer review process. In her role as Accreditation Manager, Ms. Lori A. Coffey provided a focused effort and did a fantastic job coordinating, guiding, and keeping the entire staff on track throughout the process.



While on a tour of the community, the accreditation review team stopped by Woodstock's Riley Park to promote the accreditation program on the park's outdoor chalkboard.

Department heads and supervisory personnel held regularly scheduled review meetings to evaluate and update operational data. In order for information to flow smoothly, each supervisor was assigned multiple chapters of the *Public Works Management Practices Manual* according to their job duties and familiarity with the subject matter.

There were six divisions within the Public Works Department that were assigned practices and procedures to be reviewed:

1. Water Treatment
2. Water Transmission and Distribution
3. Sanitary Sewer Collection and Conveyance
4. Streets & Parks
5. Fleet Services
6. Wastewater Treatment

While conducting the initial self-assessment of best management practices, the department discovered that we were already performing the majority of the activities listed, but only documenting a fraction as formal policies or procedures.

The review process encouraged our department supervisors to align their division's goals and objectives with the Town of Woodstock's overall vision. As

such, we have realized that the accreditation process provides our employees with the opportunity to function more consistently and effectively because the services that we provide, and more specifically their end results, are well structured and clearly defined. In addition, the review was an opportunity to strengthen our operating policies and procedures and demonstrate operational excellence to the citizens and residents we serve.

Representatives from our department had the opportunity to sit in with other agencies as they worked through the peer review, re-accreditation, and full accreditation processes at various stages of progression. This was an invaluable experience for us as we moved forward.

After a peer review conducted by members of the Prince William County, Virginia Public Works Department on March 8, 2019, the town was scheduled for the final accreditation review. The review team arrived for the final accreditation review on June 3, 2019—exactly three years after the initial application was signed.

The four-person evaluation team was led by Ms. Tracy Quintana of APWA and included Ms. Laura Brown (Bowling Green, KY), Ms. Heather Bray (Kansas City, MO), and Mr. Muhammed

Rauf (Roswell, GA). After a brief introduction, the team took a tour of the town and its assorted departments. Then they got to work.

The evaluators reviewed a total of 609 practices with the following results:

- Number of practices that were fully compliant: 418
- Number of practices that were substantially compliant: 2
- Number of practices that were deemed Not Applicable: 189

Additionally, there were three Model Practices selected that will be shared with other agencies. These practices are:

- Human Resources Management/ Licensed, Registered or Certified Employees
- Human Resources Management/ Training Goals
- Snow and Ice Control Plan

Certainly, one of the most challenging aspects of day-to-day and long-term management of a public works department is to “do more with less.” Across the nation, departments are often expected to accomplish the same output of services, frequently with minimal increases in personnel, finance, and equipment, while still providing an exemplary level of service to the taxpayers. I think every public works administrator in the country can relate to this challenge.

That said, the accreditation process helped us prioritize and streamline our operations. Some policies and procedures were created new, most were revised and updated, and some that were no longer applicable were done away with entirely. Only a few remained unchanged. Accreditation Manager Ms. Coffey stated that, “The awarding of the APWA Accreditation reflects the dedication from all the staff towards continued improvement and excellence in departmental operations. We are extremely proud to receive this honor.

The stars of this prestigious award are the public works staff whose mission is to provide services and programs that contribute to making Woodstock a great place to live and work.”

Throughout the untold hours of hard work dedicated to this project, the department was fortunate to have a high level of support and commitment from the town’s administration and elected officials. For that, we are most grateful.

To the dedicated employees of the public works department, your professionalism and dedication are evident in all aspects of our operations. Our personnel are steadfast and committed to operating the six divisions of the department at the highest standards in order to meet the needs of our population. Each member of our team has worked hard in preparation for this accomplishment. I thank them wholeheartedly for their efforts. They were able to achieve this goal on top of completing their regularly assigned duties.

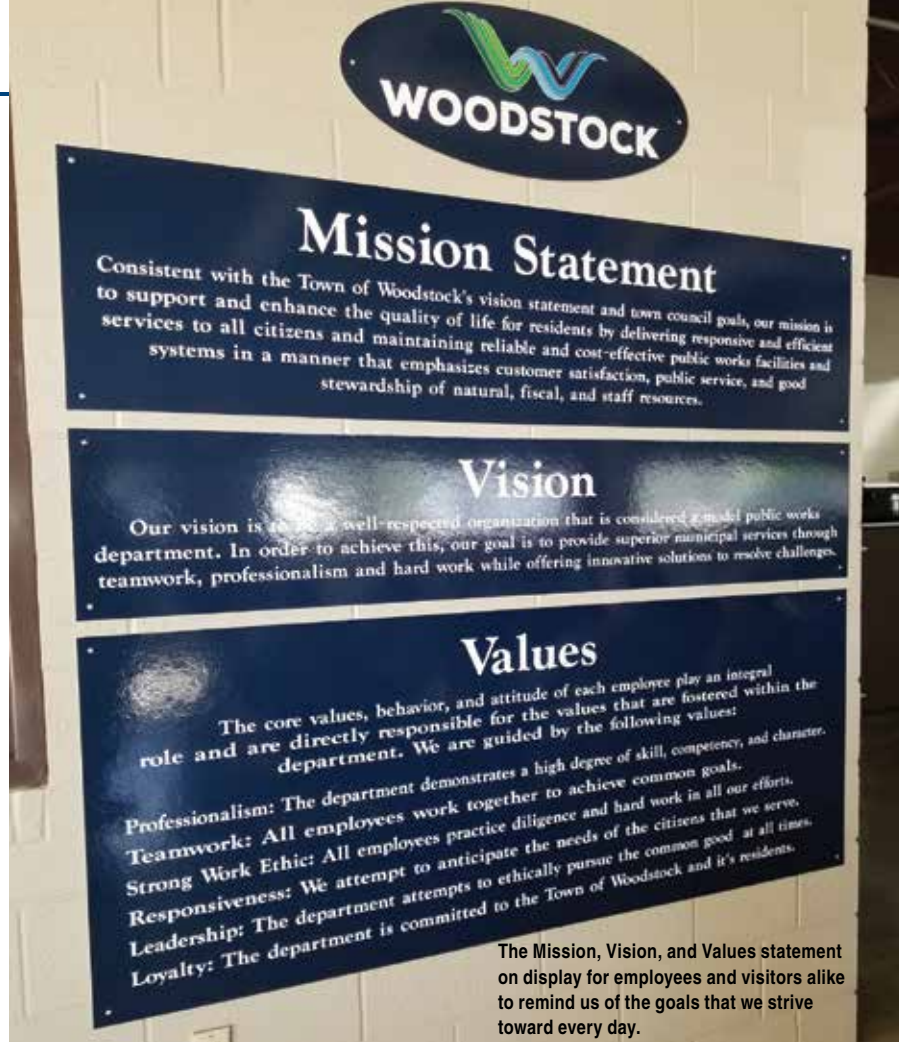
Accreditation is for every public works agency that wants confirmation that they are utilizing the best practices in the most efficient way. There is always room for improvement and, as we move forward, the staff is committed to contin-

ually refining and shaping our objectives to achieve the best possible results.

The completion of the accreditation process makes Woodstock the ninth accredited agency in the Commonwealth of Virginia and the 154th

nationwide. We are pleased and honored to become members of this distinguished community.

James Didawick can be reached at (540) 459-3045 or james.didawick@townof-woodstockva.gov. 



The Mission, Vision, and Values statement on display for employees and visitors alike to remind us of the goals that we strive toward every day.

A Canadian Perspective on Accreditation

“If you wanted to create that new policy or procedure, you would have done it by now!”

Currently, our municipality is in a growth phase and the APWA self-assessment and accreditation program was just what we needed during this period of renewal and new infrastructure construction. The APWA program has helped us identify what we do well and more importantly what we can improve upon.

When accreditation was achieved, the self-assessment team felt a great sense of satisfaction as their input directly affects municipal operations. It demonstrates to the public the Township is serious about creating a culture of continuous improvement and to challenge existing operating parameters and potentially discover new efficiencies.

In Canada a municipal accreditation program doesn’t exist, but as a member of APWA in Canada, we can take advantage of programs APWA offers. I suggest wherever you are located globally, contact APWA and find out more information about the self-assessment process and get going on your accreditation journey!

– Submitted by Jeff Parks, Project Manager – APWA/Asset Management, Township of King, Ontario, Canada, 149th Accredited Agency

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Certified Stormwater Manager: A firsthand account of career enhancement



John Schexnayder, P.E., CFM, CSM, Senior Water Resources Engineer, Wood Environment & Infrastructure Solutions, Baton Rouge, Louisiana

In 2014, I had nearly 12 years of experience on a wide array of civil engineering and infrastructure projects—but I had developed a strong focus on water resources projects. A colleague suggested that the APWA Certified Stormwater Manager (CSM) program might be a good fit for me. After researching, and even speaking with a couple CSMs to get firsthand feedback, I discovered that this program would be a wonderful opportunity to enhance my career and build upon my water resources project experience.

APWA's CSM program promotes excellence and commitment to public service by advancing the knowledge and practice of stormwater management to benefit the community, public agencies, and the profession. Through this certification program, water professionals in both the public

and private sectors demonstrate their competence to coordinate and implement stormwater management programs for city, county, state, provincial, and federal agencies. They also assist in administering drainage, flood control, and water quality programs.

In both preparing for the CSM exam in 2014 (and in my continuing education since), I have developed an environmental awareness approach to stormwater management. Preparation for the certification exam enhanced my knowledge base and taught me that stormwater management is more than simply getting rid of rainwater as quickly as possible. It reinforced the idea that stormwater must be managed in a comprehensive manner, while taking into account the effects on the surrounding environment. Rivers, lakes,

and streams must all be protected from pollutants of runoff and erosion. Thus, stormwater management facilities must be designed and constructed in a manner that maintains natural environments and ecosystems, while addressing the increased risk of flooding to neighboring areas and properties. Since my CSM certification award, these concepts have remained at the forefront of all design and planning projects in which I am involved.

I recently came across an inspiring quote about the CSM program from a former Executive Director of APWA, stating, "The APWA Stormwater Manager certification is a hallmark of excellence for U.S. and Canadian water professionals." He then went on to describe that, "This program highlights the CSMs' professional expertise and dedication to advancing water quality programs, and services in their community, which include state and federal requirements related to stormwater runoff. These also include management of public education, illicit discharges, erosion control, post-development runoff BMPs, system maintenance, water quality monitoring, data analysis, and reporting, as well as drainage, and flood control programs." I can attest to each of these statements, now, in my sixth year as a CSM. The CSM certification program not only advances the profession, but also builds credibility amongst stormwater professionals while ensuring continual education and advancement of the field.

The CSM certification is valid for five years, meaning this past spring (2019), I renewed my certification without a second thought. Recertification requires an extensive 100 hours of continuing education, but in my opinion, it's worth it. This requirement ensures that only professionals who are serious about developing their skills and knowledge of stormwater can renew and be recognized by APWA and the industry as a professional in stormwater management. In fact, the continuing education requirement of this program is one of the things I enjoy the most, as it ensures that my education and skills will continually evolve and expand. At first glance, the recertification process may seem difficult and gruesome, but I've found that is simply not the case. Once a candidate has the required documentation for continuing education, the process is simple and smooth. I intend to maintain my certification for as long as I can, because I believe the CSM program is important to the water resources and stormwater management industry. It

builds credibility amongst professionals and advances the profession by ensuring that CSMs are constantly developing their skills and education.

In my current role as a Senior Water Resources Engineer with Wood Environment & Infrastructure Solutions, certification has proven to be invaluable to my projects, and project teams. I am part of an industry-leading water resources team that provides sustainable, reliable, innovative, and cost-effective solutions to meet the needs of dynamic clients. My work consists of an array of water resources projects including riverine hydrology and hydraulics, floodplain modeling and mapping, watershed management, surface water modeling, and stormwater management, among others. Being a CSM ensures that I will continually grow, and enhance, my skillset, while bringing value to both project teams and clients.

I urge anyone considering the CSM program to commit to certification. It has proven to be a valuable enhancement to my career, and I have no doubts that it can do the same for any water resources professional.

John Schexnayder is a licensed professional engineer in Louisiana and Mississippi, and a Certified Floodplain Manager. He can be reached at john.schexnayder@woodplc.com. 



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SC/RC client-consultant relationships for a successful project

Lori Daiber, Business Development Group Leader, Civil Design Inc., St. Louis, Missouri, and member, APWA Small Cities/Rural Communities Committee; **Alysen Abel**, Public Works Director, City of Parkville, Missouri, and Chair, APWA Small Cities/Rural Communities Committee

Cold Calls...Every client dreads the idea of receiving phone calls or e-mails urging them to take time out of their already busy schedules to meet with the consultants. As a business developer, who makes those calls/e-mails, as well as sometimes being on the receiving end of marketing phone calls, I can appreciate the effort made to develop the client-consultant relationship.



As a business developer for a small Women-Owned Civil Engineering firm, I have an easier time than most

getting my foot in the door, as most Request for Qualifications/Proposals or RFQ/RFPs will require participation by WBE/DBE (Women/Disadvantaged Business Enterprises).

It all boils down to development and fostering relationships. Getting that first foot in the door can be challenging, unless you are involved in professional and technical organizations like APWA, to provide opportunities to make network connections. Involvement in local, regional and national committees allows you the facetime and lays the foundation for a trusting relationship that could lead to future business opportunities.

Small Cities/Rural Communities (SC/RC) share this common issue...developing network relationships that will provide future benefits. Communities struggle with limited funding, resources, equipment, and staff expertise to effectively execute and complete projects, making relationships with consultants even more important. Most elected officials serve their communities in a part-time role and have no experience in running a city or managing its infrastructure. Hence lies the need to develop and nurture those relationships to assist them with selecting the best-qualified consultant, someone they can trust to have their communities' best interest in mind and to deliver a quality product.

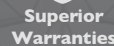
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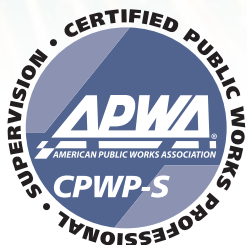
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A stylized illustration of a contract document. The document is white with a folded top-left corner. It features the word "CONTRACT" in bold, uppercase letters, followed by several horizontal lines representing text. A black pen is shown writing a signature on the bottom right of the document.

www.apwa.net / October 2019 / APWA Reporter 23

APWA announces new credentialed professionals



CPWP-S: Certified Public Works Professional – Supervision Earned September 2018 through July 2019

Michael Allocco, Jr., CPWP-S
Town of Kernersville, NC

Nick Bowers, CPWP-S
City of Kingman, AZ

Christina D. Cook, CPWP-S
City of Belvedere, CA

Christopher Decoskey, CPWP-S
Town of Kernersville, NC

Bradley P. Fortin, CPWP-S
City of Crystal, MN

Timothy G. Goins, CPWP-S
Town of Kernersville, NC

Kacey Grosskreuz, CPWP-S
Summit County Road & Bridge
Frisco, CO

Forrest G. Heiderick, CPWP-S
City of Alameda, CA

Walter (Matt) Hogan, CPWP-S
Anderson County
Anderson, SC

Mike Ireland, CPWP-S
Thurston County
Olympia, WA

Brian A. Knight, CPWP-S
Jefferson County Road & Bridge
Golden, CO

William Richard McBride, CPWP-S
Town of Kernersville, NC

Tobey Eugene Plaunty, CPWP-S
City of Kingman, AZ

Mark W. Ray, P.E., CPWP-S
City of Crystal, MN

Martin W. Schmidt, MPA, CPWP-S
Gunnison County
Pagosa Springs, CO

Sarah G. Terry, CPWP-S
Southern New Hampshire University
Corvallis, OR

Kandace Thomas, CPWP-S
Pierce County Human Resources
Tacoma, WA

William James Truesdale, CPWP-S
Jefferson County Road & Bridge
Golden, CO

Marc F. Valenti, CPWP-S
Town of Lexington, MA

Samantha H. Yager, CPWP-S
City of Columbia, SC

Adam T. Yates, CPWP-S
City of Defuniak Springs, FL

**Molly A. Young Trujillo, P.E., CFM,
CPWP-S**
Southeast Metro Stormwater Authority
Centennial, CO



Certified Public Infrastructure Inspectors Earned September 2018 through July 2019

Timothy R. Adams, CPII
City of Norman, OK

John L. Akridge, CPII
Louisville Metro Government
Louisville, KY

Dennis D. Alsup, CCM, CET, CPII
Lamb-Star Engineering LP
Plano, TX

Claudius U. Anyalebechi, CPII
City of Houston, TX

Vicente Bazan, CPII
Parkhill Smith & Cooper Inc.
Socorro, TX

Arthur Becker, CPII
City of Houston, TX

Alan C. Bechok, CPII
Stantec
Sarasota, FL

Shane Bennett, CPII
City of Saratoga Springs, UT

Angie D. Booher, CPII
Cecil County Public Works
Elkton, MD

Michael A. Brett, CPII
City of Sonoma, CA

David J. Bruce, CPII
City of Visalia, CA

Bjorn Bucur, CPII
Broward County Water & Wastewater
Services
Pompano Beach, FL

David A. Campbell, CPII
Broward County Water
Pompano Beach, FL

Jeffrey Thomas Caruso, CPII
City of Buckeye, AZ

Danny Casals, CPII
Village of Palmetto Bay, FL

Paul J. Constable, CPII
City of Ocala, FL

Christopher A. Cooper, CPII
MNS Engineers
Santa Barbara, CA

Paul J. Constable, CPII
City of Ocala, FL

Peter G. Cruz, CPII
County of Santa Clara
San Jose, CA

James Davis, Jr., CPII
City of Houston, TX

Jonathan W. Darden, CPII
Houston Public Works
Deer Park, TX

Martin D. Dopke, CPII
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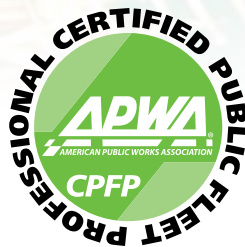
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NHSC: Public Works Embracing the Role of First Responders

Marty Williams, Government Affairs Manager, American Public Works Association, Washington, D.C.

One of the benefits that I am afforded through my work in Government Affairs with APWA is the ability to interact with our many dedicated members. Oftentimes, this may be a short call or a brief e-mail exchange. In other instances, I am privileged enough to work in tandem with members during day-long or multi-day meetings or conferences. This past July, I was able to join Public Works Director Mark Ray from Crystal, Minnesota, at the 2019 National Homeland Security Consortium (NHSC) summer meeting in Louisville, Kentucky. Mark serves as the APWA member representative to the NHSC and as the APWA Emergency Management Technical Committee Chair. For some additional perspective, the NHSC, which is an invitation-only coalition administrated by the National Emergency Management Association (NEMA), is comprised of 21 national organizations representing state, local and private professionals with a focus on providing an opportunity for the sharing and discussion of best practices in the wide-ranging scope of first responder challenges.



Mark Ray, Director of Public Works, Crystal, Minnesota, shares some of the issues he encounters as first responder with Mr. Bob Kolasky, Director of the Department of Homeland Security's National Risk Management Center during the 2019 Summer National Homeland Security Consortium Meeting in Louisville, Kentucky.

I may be accused of sounding like a broken record when it comes to expressing—and hopefully enlightening

others—that the role of a public works professional also includes the designation of “first responder.” However, I

was pleasantly surprised when I did not have to bring this issue up during the NHSC meeting. It was gratifying to have public works regularly inserted into the discussions and presentations without prompting from either Mark or me. I can think of no greater sign of respect and appreciation than when fellow professionals acknowledge the importance of the role that public works plays not only during disasters, but during the preparation, response and recovery following such events.

During this day-long meeting, Mark and I were joined by several other first responders from organizations such as the Department of Homeland Security (DHS), the Federal Emergency Management Agency (FEMA), the White House's National Security Council, the American Association of State Highway and Transportation Officials (AASHTO), as well as representatives responsible for emergency management from state and local organizations from around the country. We discussed a variety of topics, including the protection of national infrastructure and the preparation that goes into planning, executing, and recovering from a major public event such as the Kentucky Derby.

I wanted to touch briefly on one session in particular: the update provided by Mr. Bob Kolasky, Director of the National Risk Management Center (NRMC), a unit of the Department of Homeland Security's Cybersecurity and Infrastructure Security Agency (CISA). The NRMC is tasked with identifying and addressing the most significant risks to our critical national infrastructure as part of a collaborative effort with the public and private sectors as well as other key stakeholders. Mr. Kolasky shared with the attendees that the goal of the NRMC is to build a culture that will ultimately include a back-and-forth sharing of information between his agency, at the federal level, and first responders at the local level—emphasizing that those on the ground, operating directly within a community, have the best grasp of what is required within their respective jurisdictions to



Mr. Mark Harvey, Senior Director for Resilience Policy, White House National Security Council, discusses the importance of coordinating efforts between the White House, federal government, and state and local first responders during disasters and emergencies.

I strongly encourage anyone with the opportunity to participate in a team/coalition effort to do so—not only will you build professional and personal relationships, but you will create an opportunity to learn and share best practices.

address the specific emergency management needs. Certainly, the way a large urban area prepares or responds to a disaster situation and the way a rural or small community responds to a disaster situation will vary. Therefore, the NRMC emphasizes the benefit of incorporating the rules and guidelines installed at the local level to lead or at least lay the groundwork on to best deal with a specific disaster.

Following the briefing from Director Kolasky, NHSC members received an in-depth briefing about the security steps needed to prepare for, execute, and wrap-up all the events that take place during the Kentucky Derby. For security reasons much of what was discussed was classified, but during this interactive session, the recognition of—and reliance upon—public works did not go unnoticed. Public works plays a critical role in the planning process for the festival that surrounds the Derby, including everything from security set-up, to the use of equipment, to—of course—cleanup.

Participating in conferences such as the summer NHSC meeting allows other first responders to directly interact with

APWA. Most importantly, it provides us an opportunity to expand our reach and help us define the part played by public works when it comes to serving as first responders.

I wholeheartedly believe that there is no substitute for getting directly involved in coalition efforts, and through APWA such opportunities do exist. Furthermore, I strongly encourage anyone with the opportunity to participate in a team/coalition effort to do so—not only will you build professional and personal relationships, but you will create an opportunity to learn and share best practices. The ability to exchange ideas is one of the most valuable aspects of participating as a member of the NHSC. If you wish to learn more about APWA's involvement with the NHSC or to become more involved yourself, please feel free to reach out to me. I would be happy to share with you the benefits of being part of the team and I'll happily share with you my thoughts on public works embracing the role of first responders.

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Advocacy: It's not that difficult

Michael D. Millette, P.E., Director of Public Works/Village Engineer, Village of South Elgin, Illinois; member, APWA Government Affairs Committee

Compromise: (*noun*) **a:** settlement of differences by arbitration or by consent reached by mutual concessions; **b:** something intermediate between or blending qualities of two different things. (Source: Merriam-Webster).

Somehow, in the past several years, the political connotations associated with the word have trended decidedly toward the negative. Whether one's beliefs support this concept, or not, the reality of the situation for those of us in public works has been notable.

As good and faithful public servants, our duty is to implement the policies adopted by our employers/clients to the best of our ability. Therefore, in large part, we are separate from the issues in which political folks are entrenching themselves, especially social issues. Where we find ourselves involved, or cynically used, is with fiscal issues—staffing levels and road maintenance.

For the better part of my 32 years in this business, politicians were wont to fund road programs: from big-picture expansions and intersection improvements to the yearly resurfacing program. The most pressure I recall getting was “the streets in my district (ward) need to be done this year, so District 10 can wait until next year.” Only of late have the questions turned to, “why do we spend so much on streets? Our neighbors spend half of what we do and theirs are in better shape.” Aside from the difficulty in explaining the “apple-apple-orange-groundhog” comparison of roads built at different times using different methods within a single community let alone neighboring towns, it has been shockingly difficult to explain the loss of purchasing power in the construction sector as opposed to the consumer sector.

Growing the frustration amongst my peers has been the mantra that the elimination of, “waste, fraud and abuse” would counteract the need to raise fees and taxes. We have been doing this for at least the past twenty-five years and have become leaner, smarter, and are working harder. As an example, the Illinois Department of Transportation had a headcount of approximately 13,000 people in 2000, which now is reduced to 6,000. Also consider that field survey “crews” are now one person whereas until the mid-nineties a three-person crew was the standard. So, while we aren't looking for pats on the back, not acknowledging these, and so many other efficiencies, allows politicians to further demonize taxes and fees.

I, like most people, don't want my taxes to be wasted on \$435 hammers or the investigations into valuing them at that price. I want people who defraud the government to be prosecuted and pay restitution. So, while not happy about my taxes, if I see them being used wisely, I can more easily go about my life.

How can we go from the demagoguery of all things taxes to a real conversation about how to pay the appropriate amount for the infrastructure we maintain?

One word... advocacy.

It's what we on the Government Affairs Committee do, and it's not that difficult. It's simply communicating with elected officials and their staffs, with industry leaders and innovators, and with our neighbors and friends. It's also finding strength in numbers. And, it works. I point to the recent success here in Illinois in raising our Motor Fuel Tax (MFT).

Our MFT of 19 cents hadn't been raised since 1990. As early as 2000, discussions began about raising it. There was always the fear of outpacing our neighbors, or of competing against another worthy program such as child healthcare, so these discussions were just talking. Still, the awareness was being raised. We thought we were gaining traction in 2007, only to run into the Great Recession. As the recovery began, awareness of the deferred maintenance through 2008-2012 was highlighted. Still, we could not get anyone in the General Assembly to bring a bill forward.

Things began to change when we began to understand part of what I described above—the skepticism. To begin to address part of it, the first thing we advocated for was a lockbox amendment which would prohibit the use of transportation funds for any other purpose. The amendment was approved by 79% of the voters in November 2016.

With that assurance, the public education process became truly that. Less skepticism was received at town hall meetings and the public was able to focus on the real monetary needs of our transportation infrastructure system.

This spring, compromise was achieved and the General Assembly approved the raising of the MFT to 38 cents, and

indexed it to inflation going forward. A \$33 billion state capital bill was also approved in the same session.

Thus far in this article I have used the pronoun “we” in almost the royal sense. While I did my share of advocating as did the Government Affairs Committees of the Chicago Metro and the Illinois Chapters, the bulk of the work must be credited to the Transportation for Illinois Coalition (<http://www.tficillinois.org/>), itself a sort of compromise. When organized in 2002, it was a loose coalition of business and labor, primarily the Illinois Chamber of Commerce, the Operating Engineers, the Associated General Contractors, the Consulting Engineers Council, and several others, and now has morphed into a coalition of over 75 groups all sharing the same goal of improving Illinois' transportation network.

The tie to this column appearing in the *APWA Reporter's* winter maintenance issue is: while the focus of the effort to raise and index the MFT was improving our roads and transit, the added benefit is that EVERY (no exaggeration) municipality, township highway district, and county highway department that I know, uses MFT for deicing materials, equipment and, in a few instances, personnel cost.

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The Negative Social Media Comment: What do you do?

Emily Dowsett, Government Affairs Media Manager, American Public Works Association, Washington, D.C.

It's no secret that in the world of public works you can find yourself up against some tough critics, when perhaps a project isn't completed on time, or even for something as small as a new pothole. The tricky part comes when these grievances are taken to social media. For anyone who has managed an organization or brand social media account, at one time or another it is likely that you have encountered a comment or two that you really wish they had just kept to themselves. Do you delete it? Do you ignore it? Do you respond? And then, what do you say?

To answer my first question, deleting a comment should only ever be done in EXTREME situations. Otherwise, when you delete a comment, you run the risk of further angering the poster. They clearly want their comment to be heard and could feel like you are trying to silence them. If that happens, I'll bet you that they're inclined to ramp up their commentary with a new ferocity rather than just go quietly. That being said, there are extreme circumstances where you may want to consider removing a comment or blocking the poster completely (i.e., threats, strong profanity, spam).

So, now that the "delete, or not to delete" question is out of the way—what about the ignoring option? Once again, that is a hard no. If you let a comment just sit on your page sans response, it only reflects poorly on your brand. It shows

a lack of concern for your customer, and ultimately looks unprofessional. Remember why you started your social media account in the first place—as a tool to better communicate with the public. You have to take the good with the bad on that!

Now that we have decided we need to respond to these unfortunate comments, how do you go about doing so? Well, first and foremost, you handle it quickly. The longer that comment sits on your page without a response, the more people will see the one-sided take. Next, you'll want to decide whether you want to respond (fully) online, or "take it offline." That decision will depend completely on the subject/tone of the grievance. If it is easily fixable, or a misunderstanding on their part, you could use the opportunity to post a kind, helpful, and well-thought-out response. On the other hand, if this is a matter you'd rather not discuss in front of the masses, opt to try and handle it privately.

Keep in mind that to handle the matter privately, you will still have to first respond publicly. I know that sounds ridiculous, but to my earlier point, letting a comment sit without a response isn't a good look. In this case, you should respond to the post saying something along the lines of, "Hi Julia, would you mind Direct Messaging us with some further details, please? We would like to look into this right

away. Thanks, Emily.” Hopefully, “Julia” will direct message you, and you can continue the conversation and subsequent solution out of the public eye.

If you decide that in this instance it is appropriate to respond publicly, then there are a few things you will want to keep in mind:

1. Make sure your response is personalized, and not a generic or canned statement. Always start with a greeting and their name, and end with a closing and your actual name. Giving the personal touch can go a long way, and they’ll know they’re talking to a real person!
2. Be kind, and never patronizing! Even if the commenter is just plain wrong about what they are saying, try to correct them in a “soft” manner. You don’t want to embarrass them after all.
3. Offer both an apology and a solution if you can (whether it was your fault or not). This act will be seen favorably by the poster and others who come across the interaction.
4. Some brands try to respond with humor, but unless you know that the joke is going to land well, I would avoid it. A bad (or misunderstood) joke could put you in a worse position than you were in before.

Remember: Don’t delete, do respond, evaluate whether to do so publicly or privately, and above all, keep your cool and handle it professionally.

5. Once you have resolved the issue (i.e., the pothole has been fixed), it is a good idea to once more comment on the post, letting everyone know it was taken care of, and being thankful that it was brought to your attention.

My fingers are crossed that you don’t encounter these troublesome comments, but in case you do, I hope you now feel a bit better prepared to handle them. As prepared as you are, it will likely still be a “pit in your stomach” sort of feeling when you first see that negative comment blasted out. Don’t let that feeling hang around for too long though—you’ve got to act quickly! Remember: Don’t delete, do respond, evaluate whether to do so publicly or privately, and above all, keep your cool and handle it professionally.

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New ideas

Wilfrid Nixon, Ph.D., P.E., PWLF, President, Professional Snowfighters Association, Iowa City, Iowa; member, APWA Winter Maintenance Subcommittee

There is an interesting development in winter maintenance, and it has the potential to bring significant benefits to the field. The change is the idea of “liquid-only routes” which are specific routes selected so that during most winter storms only liquid chemicals (e.g., salt brine, or salt brine with additives, or some other sort of brine) are applied to the road. It sounds a little outlandish, but the work that has been done on this has been very successful and is indicating that the technique holds real promise.

Now let’s be clear right at the start—liquid-only routes are exactly that—SOME routes on which only liquids are used, not all routes. So, this is not a sweeping change but is definitely a new tool for your toolbox if you have the routes that might benefit from it.

The basic idea of these routes is very straightforward. First, prior to the storm, the route is pre-treated with liquids. If the liquid is salt brine, then the application rate is in the range of 35 to 50 gallons per lane mile, which is a typical application rate when



Liquid-only trucks can come in a variety of shapes and sizes. They do not need to be custom made and ingenuity can be applied in their manufacture.

Liquid-only routes are exactly that—SOME routes on which only liquids are used, not all routes.

applying liquids prior to a storm. So far, nothing new. What is different is during the storm. Where in a normal operation we would apply rock salt, pre-wet at a certain rate on the truck (typically about 10 gallons of liquid per ton of material), on a liquid-only route we only apply liquids (brines, as above) and again we are applying the liquids at rates that are fairly typical (perhaps a

bit higher but not hugely so) of regular liquid application rates—about 50 gallons a lane mile.

Why would we do this? Well, the real benefit of using liquids, as we have discussed before, is that they act very quickly. Unlike rock salt, liquids are already in solution so they do not have to dissolve before they can start to give us ice melting capability. I often refer

The benefits of liquid-only routes include using a great deal less salt, which in some areas of the country is becoming more and more important.

to them as rock stars, because they live fast and die young—their major drawback is that they will dilute out more quickly than solid rock salt. And that has operational implications that must be considered if you are interested in using liquid-only routes.

Who is using liquid-only routes? Well, it turns out that folks all around North America are using them, although their use is not widespread. A Clear Roads report in 2018 identified about 13 state DOTs that used liquid-only routes, along with nine city or county agencies doing so. The full report is available at: http://clearroads.org/wp-content/uploads/dlm_uploads/FinalReport_CR16-06_FINAL.pdf.

While liquid-only routes have been used on all sorts of roads and highways, for the most part they seem to be used on high-volume roads. This means they are inevitably used on a high level of service roads too. Their continued use and the expansion of their use suggests that they provide key ways of allowing agencies to meet those high level of service requirements effectively and efficiently.

The benefits of liquid-only routes include using a great deal less salt, which in some areas of the country is becoming more and more important. In Wisconsin, for example, a number of their county highway departments (in Wisconsin the county departments also maintain the state roads) have been using liquid-only routes over the past few winters, and on the basis of their (very complete and well-organized) data, they appear to be reducing

salt usage by as much as 50% which is significant in anyone's book. Some of the counties that are doing this in Wisconsin are Jefferson County, Dane County, and Eau Claire County.

What are the drawbacks of using liquid-only routes? You knew there had to be some, right? After all, every solution has its problems! The primary one is that because the liquid will dilute out more quickly, the cycle times for treatments during the storm have to be lower than when using solids. In most cases agencies like to use cycle times of two hours or less. These low cycle times are aided, however, by the fact that reloading the liquid-only trucks is fairly quick—again typically about 15 minutes to fill the tanks.

Of course, in order to use liquid-only routes you will need to have trucks that carry only liquid and typically sev-

eral thousand gallons of it. While that sounds a bit daunting, and certainly you need to have drivers with the appropriate tanker endorsements, many agencies seem to be having fun adapting and repurposing other vehicles to become their tanker trucks. Ingenuity is in good supply in winter maintenance!

There are of course certain conditions under which liquids are not very effective. Freezing rain is the most obvious, and in those circumstances most agencies revert to a solid chemical treatment. But depending where you are there may be many storms where freezing rain is not a concern, and in those cases liquid-only routes may well be worth considering. It is always good to be able to add some new tools to our toolbox!

Wilfrid Nixon can be reached at (319) 594-4447 or at wilf@psassoc.org. 



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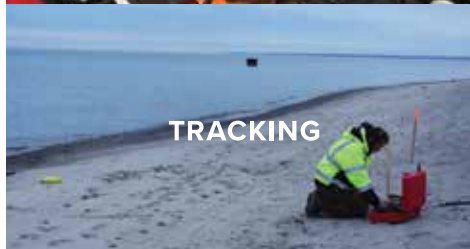
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Cybersecurity: A public works leadership perspective



Stan Brown, P.E., PWLF, City Manager, City of Oakwood, Georgia, and APWA National Director-at-Large, Leadership & Management

Florida City Agrees to Pay Ransomware”; “Small City in Maine Suffers Malware Attack – Shuts Down City Hall and City Operations”; “Georgia County Paid Cybercriminals \$400K After Cyber Attack”; “Major East Coast City Victim of Ransomware – Disrupts Utility Billing System”; and “State DOT Employee Computers Shut Down by Ransomware Virus Attack.” We would all agree that these real-world headlines are ones we do not want to read about our city, county, or department. However, these incidents do serve as warnings to public works leaders to be aware of cybersecurity and to be vigilant to make sure we don’t become the next headline.

Scope of the Problem

According to the U.S. Conference of Mayors, ransomware attacks have hit at least 170 county, city or state government systems since 2013, with 22 of those attacks occurring in the first half of 2019. The Department of Homeland Security reports that financial-driven actors are the most common cyber threat and that the preferred targets include business systems and systems that interface with the public. Unfortunately for many of us, cybercriminals are now targeting smaller governments and agencies that likely are not as prepared, have not upgraded hardware and systems due to limited funding, and, as a result, are considered “low-hanging fruit.” Our current vulnerabilities and the growing threat highlight the importance of making cyber preparedness a priority and taking the necessary steps to protect our IT assets and systems from bad actors.

An APWA Top 5 Trending Technology

Due to current and future impacts of cyber attacks on our

public works infrastructure and operations, cybersecurity was identified as one of the Top 5 Trending Technologies for 2019. As a part of the Top Trending Technologies program, a collaborative working group, comprised of representatives from all major public works services, was formed earlier this year. The charge of the working group is to: (1) identify key areas related to technology that public works professionals need to know about both now and in the future, and (2) identify work products/deliverables, such as a road map, toolbox, or self-assessment guidance, to assist APWA members. The goal is to help public works leaders better understand cyber vulnerabilities, threats, the resulting risks, and how to prepare their agencies and communities to prevent cyber-attacks and to recover if an attack occurs.

To date, the APWA Top Trending Technologies Cybersecurity Collaborative Working Group has hosted a Talking Top Tech webinar in June and held a work session at PWX in September. The working group plans to continue to gather information and feedback on this issue and complete its deliverables for APWA chapters and members by the end of 2019.

Enhancing Cybersecurity Preparedness

Through the efforts of the Cybersecurity Working Group, we found that it is not necessary to recreate the wheel when it comes to developing cybersecurity guidance. Figure 1 is a listing of websites with excellent guidance for standards, best risk management practices, and cybersecurity resources. The National Institute of Standards and Technology’s (NIST) five functions of a comprehensive and successful cybersecurity program (identify, protect, detect, respond, and recover) provide a great foundation for developing an agency frame-

work. This concept is very similar to the public works emergency response roles of prevention, protection, mitigation, response and recovery. The working group recommends that public works leaders become aware of these readily available cybersecurity resources; consider their agency's vulnerabilities, threats, and resulting risks; and commit the resources and efforts necessary to protect and sustain their public works services. Failure to do so will result in operational and service impacts, loss of information systems, reduced efficiencies, remediation costs, and loss of credibility and public confidence.

Address the Low-Hanging Fruit Risks

While cybersecurity may seem like an overwhelming problem, Dave Mims, with Sophicity (and a presenter on our Talking Top Tech webinar), encourages cities to take the first step of addressing the most important "low-hanging fruit risks" which he refers to as the 3P's: passwords, patching, and people. Improvements in these three areas can eliminate some of the biggest risks leading to viruses, ransomware, hacking, and cybersecurity incidents. Being proactive and intentional about these problems will lead to strengthening overall cybersecurity and decreasing liability. Here are more details on the 3P's.

1. Passwords. Half of all security breaches involve stolen or easily determined passwords. The weaker or looser the security around a password, the easier it is for hackers to break into systems and steal information. Here are a few tips to protect information and deny access: (1) do not write passwords down and leave them visible; (2) do not use the same password on all devices; (3) do not use simple or obvious passwords; (4) do not save passwords to websites and applications; and (5) change passwords regularly. One of the best ways to reduce the risk of hackers using passwords is two-factor authentication (2FA). With 2FA, employees enter their e-mail login information and then receive a notification through an app on their phone that they then use to

complete the sign-in process. Even if a hacker somehow obtains an employee's username and password, the information is worthless because they are required to validate the authorization through an app on the employee's phone—which they cannot do.

2. Patching. Since software vendors often stop supporting older systems, those software programs are not getting patched and, as a result, become more of a vulnerability for the agency. To address this concern, IT professionals must rigorously follow patch management procedures to test patches and ensure they will work before full-scale deployment. Patches need to be applied to all machines regardless of their location, including the devices of remote employees using agency-owned hardware and software.

3. People. A recent survey shows that 64 percent of working adults either did not know the definition of ransomware or defined it incorrectly. In addition, 32 percent of working adults could not define malware or misunderstood it. Even with the best information security program, people are still prone to receive an e-mail with ransomware, click on a malicious website link, or open a malicious file attachment. The answer to combat this vulnerability is regular cybersecurity training for everyone who has access to the system. Hackers use techniques that trick employees into handing over access to your systems—and criminals know that people can be the weakest link in your security.

As public works leaders, we must be proactive and take the necessary actions to protect our agencies and communities from cyber threats. Remember, it takes just one unprotected computer for a cybercriminal to exploit the agency and one unsuspecting employee for the cybercriminal to trick. Don't be the next cyber-attack headline!

For additional information on this story, contact Stan Brown at sbrown@cityofoakwood.net.

Figure 1: Cybersecurity Preparedness Resources

Benchmarks/Standards/Frameworks	Notes
https://www.nist.gov/cyberframework	Standards, guidelines, and best practices to manage cybersecurity-related risk
https://www.cisecurity.org/controls/	Prioritized set of best practices created to stop the most pervasive and dangerous threats of today
https://www.us-cert.gov/ccubedvp	Cybersecurity resources provided by DHS to owners and operators of critical infrastructure; small and midsize businesses; and State, Local, Tribal, and Territorial (SLTT) Governments.
https://workbench.cisecurity.org/	SaaS system providing the environment in which all CIS best practice documents (CIS Benchmarks and CIS Controls) are developed
https://www.owasp.org/index.php/Main_Page	Improve security of web applications
https://docs.microsoft.com/en-us/windows/security/threat-protection/windows-security-baselines	Windows security baselines

Helsinki's “This is Snow Problem” competition

Ville Alatyppö, M.Sc., eMBA, D.Sc. Cand., Lean Six Sigma, Director, Street & Park Maintenance Unit, Helsinki City Construction Services Stara, City of Helsinki, Finland; Chair, Finnish Association of Municipal Engineering



The Finnish capital of Helsinki saw large amounts of snowfall in 2009-2013 compared to the average snowfall. The inner city of Helsinki is located on the sea-shore on a narrow cape far away from sites where snow could be dumped, and the issue has been resolved by dumping snow into the sea. The emissions caused by this solution have been considerably lower than they would be from transporting snow to the nearest snow dump.

Helsinki's plan is to be the most functional city in the world. Even the development of snow logistics is aimed at this very goal, because if snow logistics do not run smoothly in wintertime then the city of Helsinki would be forced to close streets, which has never happened thus far.

A public innovation challenge was started for the development of snow management in Helsinki. The “This is Snow Problem” competition looked



Typical snow removal machine used and developed in Finland

for new partners and ideas on how to improve the efficiency and environmental impact of the different phases of snow management. The jury weighed in on the ideas on a few occasions during the competition. Twelve ideas were submitted to the competition, four of which were selected for the pilot phase.

The best solutions focused on reducing the need to transport snow, streamlining storage, and reducing the environmental impact of dumping snow into the sea, among others. “The solutions we received involved taking ideas we already knew about and combining them with new technology. The competition showed that even solutions

that seemed impossible might just be possible,” said Production Manager Tero Koppinen from Operative Maintenance of the City of Helsinki.

The first solution was from the measurement technology company Sensmet Oy with a solution that measures the water generated by melting snow in real time. This creates large data, which is then analyzed to provide information on how, where and when snow should be processed and thawed.

The second shared solution by A&T Subsea Oy and Ullanlinnan Treselex Oy streamlines the dumping of snow into the sea and reduces its environmental impact. The versatile proposal reduces the number of snow transportation trips and the amount of litter winding up in the sea while also reducing CO₂ emissions. This solution is very easy to adopt, and it can be used to reduce the adverse effects of dumping snow into the sea as soon as the coming winter.

The third solution to be selected was designed by W-Rix Oy to prevent the sea from freezing, which happens when large quantities of snow are dumped into it. The solution is an affordable and low-emission way of keeping the waterways clear and reducing the need for dredging.

The fourth solution came from LumiPower Oy, a company developing snow-thawing technology. In this solution, snow is thawed using thermal energy contained in backwater from district heating or other sources of waste heat already at the location where the snow falls. This would allow only water thawed from snow and cleaned of any debris to enter the sea. The proposal aims at minimizing the environmental impact of the entire snow management chain. The goal is to reduce snow transportation significantly along with the number of machines and amount of noise and emissions.

The ideas and innovations received through the “This is Snow Problem” competition are so promising that they will be developed and tested further with all four companies. The competition was organized by Industryhack



Dumping of snow is essential, but obligatory. Sometimes snowpiles are more than 30 metres high.



Even after a massive snowfall, streets are never closed. Helsinki is one of the most functioning cities in the world on snow logistics.

Oy, which developed a model that brings innovative entrepreneurs and potential customers together while also fulfilling the requirements set out in the Act on Public Procurement and Concession Contracts. We now know that snow logistics can be further developed into a more functional

system that puts a lesser strain on the environment while keeping development costs reasonable.

Ville Alatyppö can be reached at Ville.Alatyppo@hel.fi. Helsinki winter maintenance professionals in action can be seen at <https://www.youtube.com/watch?v=qLr-jIvtDzo>. 



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Member \$55/Non \$65

XX-Large

Member \$57/Non \$67

XXX-Large

Member \$58/Non \$68



First Responder Flag (3' x 5')

Member \$80/Non \$90



APWA Women's Adidas Red Sport Shirt

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AND RESOURCES



Municipal Snow & Ice Control

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This book focuses on successful operations and techniques in urban snowfighting so that your citizens reach their destinations with less risk and inconvenience.

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Snow and Ice Control: Field Handbook for Snowplow Operators

This field handbook is to help promote the understanding of the tools, best practices and limitations of snow and ice control. In addition, it encourages progressive changes in snow and ice control practices to help you reduce sand/salt use and lessen environmental impacts while meeting the safety and mobility needs of roadway users.

Member \$10/Non \$15 (Download) Member \$6/Non \$11

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Respect the Plow T-shirt



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Snowfighter Long Sleeve T-shirt



Where the Blade Meets the Road T-shirt



I Know Snow Jitsu T-shirt



NO FEAR T-shirt



Small – X-Large
Member \$15/Non \$20

XX-Large
Member \$17/Non \$22

XXX-Large
Member \$18/ Non \$23



Friction in winter maintenance

A new way to quantify deicer performance and ensure highway safety

Derek Bailey, Formulations Associate,
Mile High Labs, Boulder, Colorado

Ensuring the safety and mobility of motorists on roadways in the winter months is critical in many regions of the country. Some of the most useful parts of the toolkit many municipalities use to ensure roadway safety are deicing chemicals such as granular rock salt, salt brine, magnesium chloride, or calcium chloride. These chemicals function by effectively lowering the freezing point of water. Deicers can be used before a storm to prevent snow and ice from bonding as solidly to pavement and improve the effectiveness of plowing. Typically, this is called “anti-icing” and brines are predominantly used in this capacity. When chemicals are applied after a storm, the snowfighter is typically said to be “deicing” or trying to actively melt snow and ice already present to allow for better removal. A truly effective program will utilize brines and granular products both before and after the storm when necessary in order to allow for rapid removal of snow and ice from a byway. There are a myriad of different products currently on the market and being released every year that claim greater and greater ability to melt snow and ice. But this begs the question: how would a consumer know which deicer is the highest performer? Currently there is no objective and scientifically sound way to answer that question.

When it comes to deicing a roadway, or removing snow and ice that has already accumulated, it is instructive to think about what a snowfighter is trying to accomplish. It is true that, in essence, they are trying to remove snow and ice. But what is the ultimate goal of removing snow and ice? The answer to this most fundamental of questions, is that the snowfighter is attempting to improve the *friction* of the road surface. Without good friction, or “grip,” an automobile will find it very difficult to transverse the roadway. Poor friction is the cause of a vast majority of crashes and fatalities on winter roadways.

A higher level of grip, or friction, is achieved based on the amount of contact between the rough road surface and the textured surface of the tire. Tire manufacturers have long understood that accident avoidance would in very large part need to

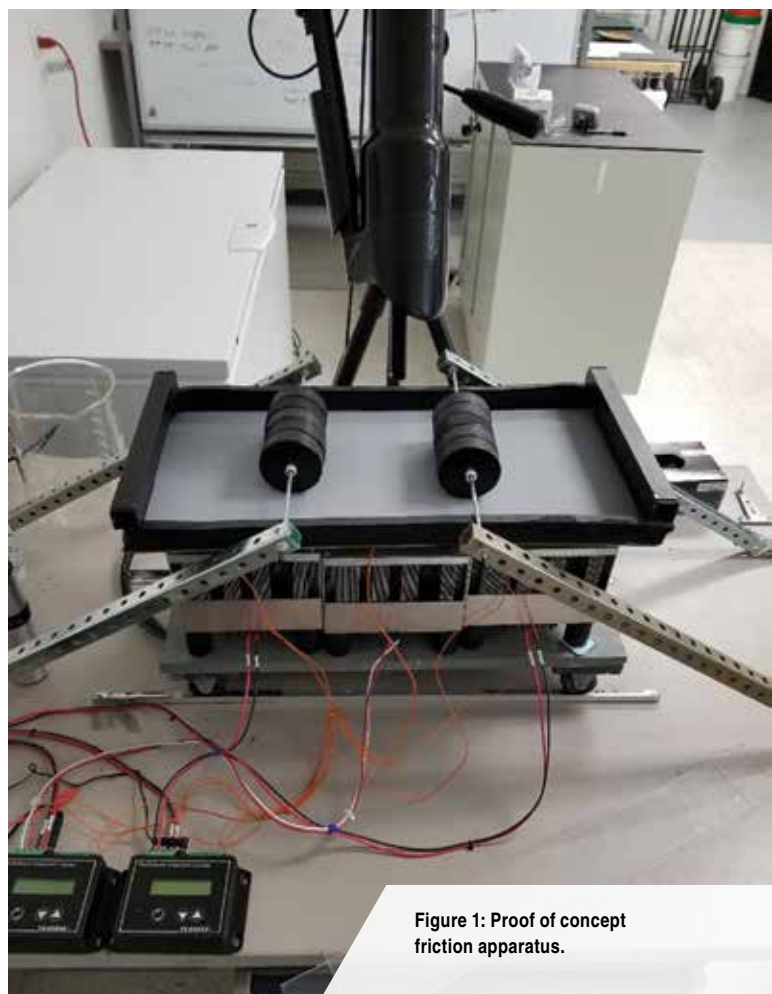


Figure 1: Proof of concept friction apparatus.

start with friction. This is why tire engineering and science has developed so much in the last 90 years. Rubber chemistry has also been a large area of investment for these companies as they try to improve performance, grip, and tire safety.

Friction is a concern when designing roadways as well. There are a myriad of different concrete and asphalt designs on the market to improve friction in different scenarios. Highway engineers understand the importance of optimum friction on a roadway and test during construction often to ensure proper levels of friction. The ASTM Method E-274 (AASHTO T-242) is practiced by 39 states and the territory of Puerto Rico as a U.S. standard method for skid resistance of paved surfaces and uses a full-scale tire. Skid resistance is the force developed when a tire that is prevented from rotating slides along the pavement surface.

Since the ultimate goal as mentioned above for a winter maintenance operation is to return good friction to a road in the most expedient manner possible, it follows that the most important characteristic of a deicer would be how well it can achieve that goal in the quickest manner possible. EnviroTech Services in conjunction with the Western Transportation Institute (WTI) at Montana State University has pioneered a laboratory method of determining how well a deicer performs at rapidly recovering friction on a roadway.

Proof of concept was created at EnviroTech Services, Inc., in Greeley, Colorado, with a small-scale machine consisting of a simulated road surface cooled by three electric heat engines. This surface was capable of oscillating back and forth with simulated traffic applied to the surface and a friction sensor was aimed at the center of the surface (see Figure 1). Water was applied to the road surface, it was then frozen, deicer was applied, and friction could be observed to improve as the salt melted the ice. This proof of concept instrument provided some relatively repeatable data for granular deicers. The issues with this design arose with the fact that it would not be a representative test since the air temperature in the room was not controlled to coincide with the cooled road surface. The trafficking action was also supplied by simple hockey pucks which did not very accurately simulate the downforce that would be applied by a true car tire. To truly control all variables and simulate a winter roadway in a precise manner required the scope and quality of facilities found at WTI.

Initial work performed at WTI involved a cold room able to maintain very precise air temperatures. WTI was in possession of a machine built for a previous study which was an ideal starting point for collaboration. The machine was equipped with an oscillating table, a tire capable of producing realistic down forces on the table, and a slot for placing road surface samples under the tire. Placing the machine in the cold room overnight allowed it to reach the same temperature as the air. EnviroTech Services supplied a friction sensor to begin to try to replicate proof of concept data in this improved environ-

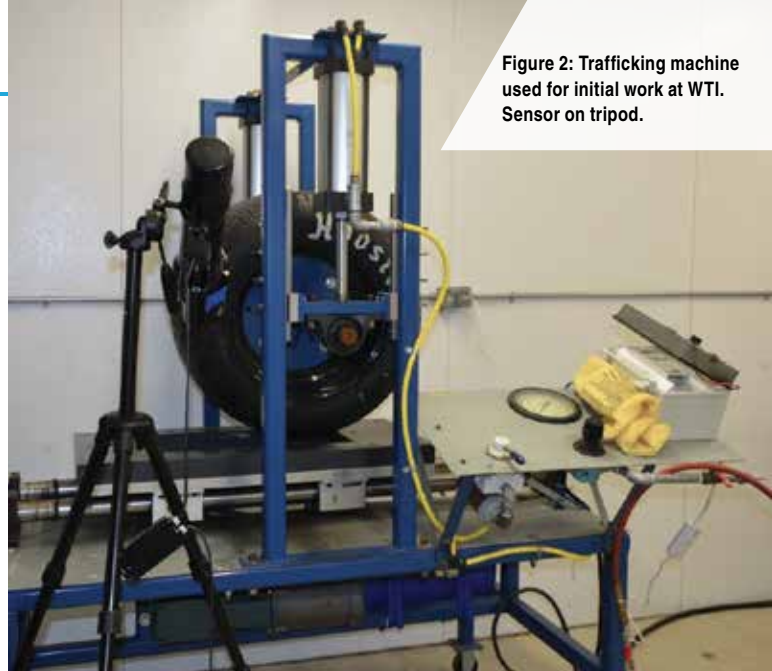


Figure 2: Trafficking machine used for initial work at WTI. Sensor on tripod.



Figure 3: Close-up view of table and road surface on trafficking machine. Sensor is being manually aimed at table for friction measurements.

ment. Unfortunately, the design of the machine did not allow for constant measurement of the pavement surface as the sensor was not able to maintain a constant view. However, the work done allowed for an ideal design to be conceptualized and a path forward to be determined.

EnviroTech Services is currently in the process of building a newly designed and purpose-built machine specifically for measuring friction on roadways featuring an oscillating sensor mount, oscillating table/road surface, and two full-size passenger tires capable of applying realistic downforces to the road surface. Once construction has been completed, this machine will be donated to WTI and Montana State to be used to develop an objective third-party method to quantify how well and how quickly different highway deicers recover friction in realistic conditions. This will allow snowfighters the best information when choosing a chemical to use on their roadways and demand a higher standard from deicing companies, all resulting in safer roadways in cold winter months.

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Deicers, corrosion, and corrosion tests

Scott Koefod, Ph.D., Principal Scientist, Cargill Road Safety, Plymouth, Minnesota

While deicing salt saves lives and reduces economic losses, its corrosiveness is an undeniable downside.

The industry has come a long way in learning how to mitigate salt's corrosive effects, and in this article I will focus specifically on the role of deicer selection. In order to understand the common deicer corrosion specifications, how products meet these specifications and what this means for actual performance under field conditions, it will be helpful to review a few basics about corrosion testing and corrosion inhibitors.

The figure, right, shows mild steel corrosion rates measured on a number of deicers by the commonly used test method developed by the Pacific Northwest Snowfighters (PNS), where 100% is the corrosion rate of sodium chloride and 0% is the corrosion rate of pure water. The deicers are all at the same molar concentration, equivalent to that of a 3% sodium chloride brine.

The most obvious differences are between the chloride and the non-chloride deicers. Note that the two non-chloride deicers, urea and calcium magnesium acetate (CMA), are much less corrosive than any of the chlorides.



Note also that we can measure differences in the corrosiveness of the chloride deicers, with potassium chloride (KCl) being most corrosive, followed by salt (NaCl), calcium chloride (CaCl₂) and magnesium chloride (MgCl₂).

This leads us to a couple important points. Some agencies report increased corrosion of their trucks when deicing with liquid magnesium or calcium chloride compared to salt brine. Does this mean the standard test method is wrong? No. Does this mean the obser-

uations of winter maintenance workers are wrong? No. So what does it mean? It means that corrosion is *complicated*.

The first thing we need to realize is that corrosion rates will vary widely in the field depending on a number of factors, including the specific metal or alloy, the condition of the metal surface, whether different metals are in contact with each other, temperature, humidity, concentration of ice melt brine, concentration of any corrosion inhibitor, pH, and the relative time spent wet versus drying.

Because of this, there is no one single test that perfectly characterizes the corrosiveness of a deicer. The predictive value of any test is only as good as the extent to which that test duplicates the particular conditions in the field at a particular moment, and the farther field conditions stray from the lab test conditions, the less reliable the predictions. This means that we must take the results of any corrosion test with—you knew this was coming—a grain of salt.

Lab corrosion tests can provide valuable information, but they must be interpreted with appropriate care. Since no “perfect” lab test exists, the best we can do is to select a set of test conditions that simulates a common type of field exposure and use that to gauge the *relative* corrosiveness of different deicers, understanding the picture may change if the conditions significantly change. Because of this, I don’t think it means much to draw sharp distinctions between the corrosiveness of the chloride salts. The chloride salts are all generally corrosive to mild steel (the chloride ion being the particular troublemaker), although depending on conditions, they may shuffle positions on which are most corrosive. Non-chloride deicers will generally be much less corrosive to mild steel, although they can be more corrosive to other metals such as galvanized steel—as noted above, it’s complicated!

As a result, when it comes to corrosion, road deicers can be lumped into three general categories: non-chloride deic-

ers, which are relatively expensive but are the least corrosive option; standard chloride deicers, which are the least expensive but will be the most corrosive; and corrosion-inhibited chloride deicers, which offer a middle ground in price and corrosion protection.

The commonly used corrosion inhibitors for road deicers fall into two general categories—organic and inorganic—and they operate by similar mechanisms. In both cases, they form a protective barrier on the metal surface that helps insulate it from the corrosive environment. Organic inhibitors adsorb on the metal surface to form a film—sort of like a very thin layer of oil. Most of the standard agriculturally-based deicer enhancers, such as beet juice and molasses, contain organic components that function in this way.

The most common inorganic inhibitor is phosphate. It works by precipitating a very thin, but strongly adherent, protective iron phosphate “crust” on the metal surface. Phosphates are generally much more effective than the standard organic inhibitors, but they are not compatible with magnesium or calcium chloride liquids. Phosphates are typically used to inhibit the corrosion of solid salt deicers, rather than liquid deicers, and in such products the presence of magnesium chloride actually makes the phosphate much more effective (as mentioned above, it’s complicated)!

Two important points should be kept in mind about corrosion-inhibited chloride deicers. First, no corrosion-inhibited chloride will ever be as low corrosion as a non-chloride deicer, regardless of the corrosion test value. If you add enough corrosion inhibitor to salt, you can get a lab corrosion value lower than that of pure water. But as the corrosion inhibitor progressively dilutes while being spread out in the environment, it will lose effectiveness. In a nutshell, the longer they are on the road and the farther they are from the point of application, the less effective they will be.

We can’t simply assume that a corrosion-inhibited deicer that is 70% less corrosive than salt in the PNS corrosion test will actually be 70% less corrosive than salt in the field—even on average. It should be less corrosive than salt within the vicinity of application, but putting a precise number on that is very difficult. Also, note that corrosion-inhibited deicers will only protect exposed steel. I am unaware of any deicers with corrosion inhibitors that will penetrate concrete well enough to protect rebar.

Second, while it is common for enhanced liquid deicers to be formulated to be 70% less corrosive than salt (based on the PNS test), note that this does not mean you can expect 70% less corrosion from salt pre-wetted with that liquid. The liquid has enough inhibitor to reduce the corrosiveness of its chloride content, but if you blend eight gallons of that liquid with a ton of salt, you will massively dilute the inhibitor.

A liquid deicer that tests as 80% less corrosive can test as 30% less corrosive when blended at eight gallons per ton in salt. If you are applying solid rock salt and you want to substantially inhibit its corrosion once it is all dispersed in the field, higher levels of corrosion inhibitor will be needed than you will get by pre-wetting with typical enhanced deicer liquids. The value of a corrosion-inhibited liquid as a pre-wetting agent is probably limited primarily to protecting equipment (truck beds, front-end loaders, etc.) coming into direct contact with the deicer, where it can act as a reduced corrosion barrier between the salt and the metal.

In conclusion, to minimize deicer corrosion to steel, your best bet is always to use a non-chloride deicer. Where that is not economically feasible, a corrosion-inhibited chloride deicer can buy you some reduction in corrosion at a lower price, but be aware of its limitations.

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Surface Temperatures: The game changer

Diana Clonch, Owner, D.W. Clonch, LLC, Thornville, Ohio; member, APWA Winter Maintenance Subcommittee

Of the many decision-making factors to consider when deciding treatment type and timing for providing snow and ice control, there are none more critical to consider than surface temperature. Surface temperatures, not air temperatures, actually define treatment type and duration. Are there other factors to consider as well? Absolutely there are! However, surface temperatures are major game changers.

Even though surface temperatures are critical to good decision making in snow and ice treatments, all too often we base our decisions on air temperatures. After all, air temperature information is readily available and frequently reported by local and national weather services. We even have access to this information through our smart phones and in many of our vehicle dashboards. Surface temperature information, on the other hand, is not so

readily available or frequently made known. However, it is surface temperatures that define what is needed and when.

It is common practice among those practicing snow and ice control to give consideration to the air temperature and use this information to decide to treat or not treat and how to treat. While air temperatures do influence surface temperatures, the two can be dramatically different. Unfortunately, many municipalities and private companies are still basing their decisions upon air temperatures.

In the past, air temperature data was the primary information available to use in decision making, and that

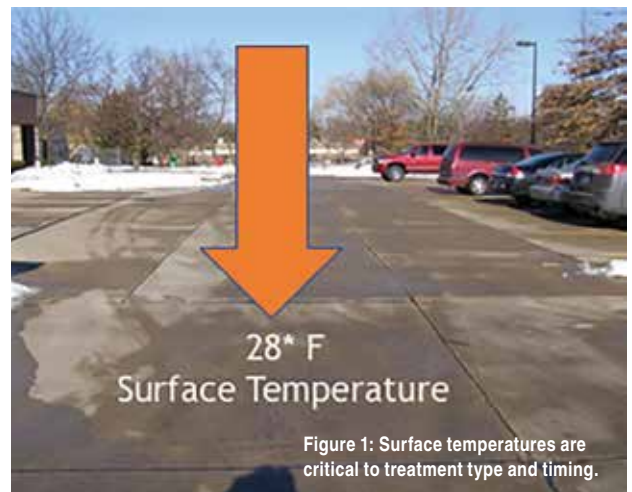


Figure 1: Surface temperatures are critical to treatment type and timing.

limited information leads us astray and generates less than desirable outcomes. Basing treatment timing and type on air temperatures promotes:

- Unnecessary chemical applications as the surface temperatures can vary significantly from air temperatures—while air tempera-

tures may be at or below freezing the surface temperatures can still be above freezing

- Missed treatment timing when surface temperatures are below freezing and air temperatures are not
- Failure in the recognition of how to best adjust treatments to match actual conditions

We now have available to us devices, tools and resources that take the guesswork out of gauging when surfaces are prone to freezing, and thus offer the opportunity for better decision making and the potential for achieving more desirable outcomes.

Factors Impacting Surface Temperatures

Because of the many variables that impact surface temperatures, there can be great disparity between air and surface temperatures at any given location. Surface temperatures, just as all things in the environment, are

impacted by air temperature and air temperatures trends. In addition to air temperatures, surface temperatures are also impacted by numerous other factors. Other areas impacting surface temperatures include:

Subsurface temperatures – Warm subsurface temperatures that typically exist early in the season as found beneath the roadway, parking lot, sidewalk, or footpath, will play a major role in helping the surface maintain heat and can prevent the surface temperature from falling below freezing. While a frozen subsurface as found once the winter season has commenced will promote cooling, drawing heat out of the surface and quickly causing the surface temperature to fall below freezing.

Solar radiation and the absence of such – The presence of sunshine on a surface, or the lack thereof, will make a major difference in surface temperature. Shaded areas will be cooler than the nonshaded counterpart. Once the

sun has set, a surface that has a frozen subsurface can experience a dramatic drop in temperature (as the frozen base beneath the surface quickly draws the heat out of the pavement).

Cloud cover – While being detrimental during daylight hours and preventing the sun from heating the surface, cloud cover can be advantageous during the nighttime as it prevents heat loss from the earth's surface.

Traffic – a heavily traveled surface will experience positive impacts from friction where one less traveled will require additional attention to achieve desired levels of service...or those less traveled may require a different level of service than its busier counterpart.

Structural composition and type – different materials heat and cool differently as do structural types. A bridge, garage or elevated surface is impacted by temperatures on all sides and can have temperatures that are very different from the adjacent surface that has a



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subbase. On roadways and parking lots, the temperatures of asphalt surfaces will vary from that of concrete.

Moisture in the air – precipitation falling on a surface will create cooling as can evaporation of moisture all of which can be critical when surface temperatures are hovering around freezing.

Outcomes

In addition to understanding the many factors impacting surface temperature it is also equally important to understand why this information is of such importance. A few degrees difference in the surface temperature can be the difference between: a surface that is frozen and one that is not; between

needing to apply chemicals and not needing to apply chemicals; between a freezing rain event and rain-only event; between frost and black ice forming or not forming; and in the type of service required, the cost of providing the service, and the success recognized or lost.

We can all reflect on times when we achieved less than desirable outcomes, overapplied chemicals, or seemed to need to apply more chemical. It is highly likely that such times are closely tied to not having accurate surface temperature by which to base our decisions of action:

- Many a time we receive an accumulation of snow that we plow and treat all night only to discover an adjacent surface equally clean that has not been serviced...the surface was warm enough to prevent freezing and promote melting. *We would know this if we are measuring the surface temperatures.*
- The rain was forecasted to change over to freezing rain and, in an effort to prevent the surface from freezing, we apply chemicals; however, the freezing rain did not occur as quickly as was thought and the chemicals washed away creating a situation to reapply. *We would know when the surface is likely to freeze through surface temperature measurements.*
- Chemicals were applied at the ending of the shift to prevent any potential refreeze which never occurred. *We would know the surface temperatures are not below freezing through surface temperature measurements.*
- Frost and black ice formed on the surfaces creating hazardous conditions. *We would know there is a strong potential when monitoring the dew point temperatures and the surface temperatures (i.e., when the surface temperature falls below the dew point temperature of the air, condensation begins to occur; if the surface temperature is below freezing frost will form.).*

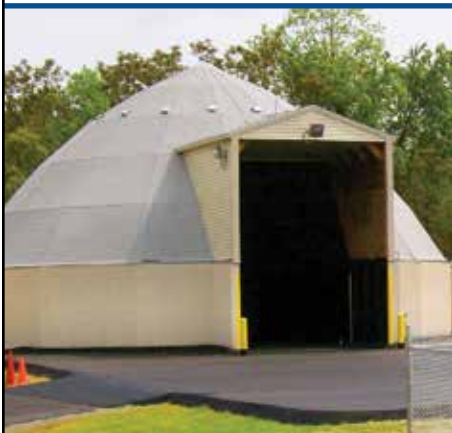
As surface temperatures vary based upon numerous factors and because treatment type and timing are strongly influenced

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by the surface temperatures, putting into practice methods for measuring and monitoring such offers access to the needed information critical in good decision making. Consideration should be given to surface temperatures as occurring across the network of the physical areas being maintained as the temperatures do vary from location to location. Consideration must also be given to changes occurring in the surface temperatures as individual winter events progress from start to end and as conditions in the physical environment unfold, such as from daytime to nighttime and from low traffic volumes to high traffic volumes. In addition to considerations for changes occurring throughout the duration of any given storm event, details are likewise critical for anticipating conditions that are occurring throughout the season in the identification of trouble spots and unforecasted occurrences known to create issues without warning. Monitoring surface temperatures across the network provides the information needed to make timely and accurate treatment decisions.

Finding Surface Temperatures

Through the various tools and resources available to us today, we have several options for obtaining timely and accurate surface temperature information:

Contract services – Numerous contract weather service providers offer not only weather forecasting and alert notifications but also pavement/surface forecasting services. Government agencies frequently utilize such services and it may be worthwhile to find out who provides service to your area and if there is an option for contracting with them as well. While such services may come at a cost, they can also bring great benefit. Weighing options on contracted services for calculated return on investment can provide valuable insight when considering the use of such services. In the long run, one must remember that this information is a “forecast” and thus may vary from the actual occurring conditions; however, there is confidence in knowing the forecasted information is factual-based and can very often offer a very close representation of conditions likely to occur.

Road Weather Information Systems, RWIS – as detailed by the Federal Highway Administration, an RWIS includes an environmental sensing station (ESS), collecting and relaying data associated to the specific site location, including pavement information which can be used in decision making. Research has found that such systems can offer a high benefit-cost to agencies especially as related to forecasting and establishing performance measurements.

Many state Departments of Transportation (DOT) offices and other city agencies manage RWIS sites and provide road condition data through their websites. Often there is the opportunity to partner with these agencies and actively participate in the existing RWIS programs. The State of Ohio, for example, provides information through OHGO at <https://www.ohgo.com/> for over 170 sensor locations across the state and can be accessed for viewing by the public (see Figure 2).

When viewing the RWIS data, it is important to remember that all tools have limitations and if the displayed data appears inaccurate, know that the sensors may be in need of maintenance. Additionally, the temperatures reported at the sensor locations are for the specific site where the sensor is located and will not be an exact match to the surface temperatures at your specific locations, but are an excellent indicator of conditions occurring in “real time” in the area, including “ground truth”—that information critical to good decision making when treating roads, parking lots, walkways and other surfaces.

RWIS – site-specific instrumentation is also available through various providers for installation at specific sites providing a remote option for measuring surface temperatures. Proven to be accurate and reliable, such instrumentation is capable of providing site-specific details such as surface temperature, presence of water, ice and snow, and grip (friction) measurements. Sensors vary by type and manufacturer



Figure 2: OHGO sensor locations

but may be embedded in the surface or mounted above ground. Locations may be selected to best fit an agency’s needs for collecting data at critical sites to support the availability of accurate and timely ground truth.

RWIS – data management, integration and maintenance – Various options exist for acquiring RWIS systems and for managing data associated with such systems. In the past, end users primarily purchased, installed and maintained systems, and managed data independently or through a host, requiring resources not typically available to the smaller end user or agency. It was most common for such data to be only shared internally and used for operational decision making. In today’s world, with the advent of technology, systems are found that are fully operable for even the smallest of installations offering vendor supported management, maintenance and even leasing options for those who are not yet ready to commit to a full purchase. Likewise, data is more commonly found to be shared with the traveling public through various internet sites as a measure to promote safe and efficient travels. See Figure 3.



Figure 3: Vaisala remote temperature sensor for stand-alone operation

RWIS mobile applications are available for direct vehicle mounting offering the ability to view data at designated locations on an as-needed basis. Mobile applications create options for data collection not previously available enhancing the potential for decision making based upon ongoing, real-time, accurate information of surface conditions and temperatures as conditions actually occur.

Vehicle-mounted temperature sensors are readily available, affordable and offer ease of installation and reliable data. It is important to note the manufacturer-suggested installation, calibration and suggested temperature range use. When choosing a sensor, consideration might be given to product reliability for short- and long-term accuracy and functionality in harsh winter environments as well as available service and/or replacement. See Figure 4.



Figure 4: RoadWatch vehicle mounted sensor

While there exist a number of available vehicle-mounted sensors to choose from, considering functionality and accuracy are critical elements to achieving desired outcomes. During winter operations there are times when a few degrees difference can have a major impact on treatment timing and success. Assuring reliable calibration techniques and procedures of selected sensors can offer confidence in the information as related to the temperatures being recorded. Figure 5 illustrates the potential for inaccuracy when calibrating with an ice bath mixture opposed to a known solid object.

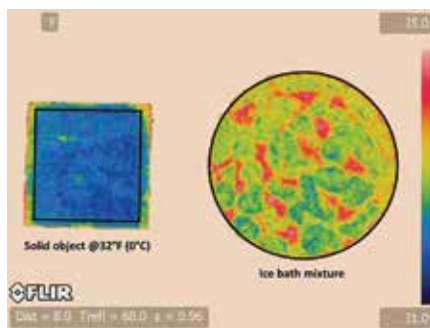


Figure 5: This figure illustrates the potential for inaccuracy when calibrating with an ice bath mixture opposed to a known solid object.

Handheld infrared temperature sensor units, while available, affordable and frequently used in many manufacturing and construction operations, may not be the best choice for winter operations due to limitations in recommended operating temperature ranges, degree of accuracy and a need for acclimation to the environment. Attention must be given to the manufacturer-recommended operating temperature ranges and degree of accuracy. It is not uncommon to find statements of units designed for indoor use only or warmer operating temperatures, accuracy of +/- 4 to 6 degrees, and suggested acclimation times of 20 minutes. It is important to ensure the chosen tool is designed to perform in the given operating environment. See Figure 6.



Figure 6: Handheld units

Summary

Surface temperature information is a critical factor in the decision-making process for winter treatment selection and timing. Knowing this information and the influencing factors provides needed insight for how to best service any given event. Understanding how

to apply this knowledge can promote resource optimization and increase efficiency and effectiveness, enhance safety, and be the difference in achieving desired outcomes or not.

In review of any established application guidance for treatment types, surface temperature is one of the predominant decisive factors. This information is critical to deciding what to do and when to do it. The Federal Highway Administration and numerous DOTs offer application guidance that is based on surface temperature ranges, precipitation types and desired outcomes—clearly indicating the importance of the role that surface temperature data plays in the overall decision-making process.

Getting started with acquiring access to pavement temperature information can be as simple as locating your state DOT's available RWIS on the internet or reaching out to your state DOT for assistance with access to such. Additionally, installing vehicle-mounted sensors and exploring options for mobile RWIS units or taking advantage of being able to co-op on existing state programs are all viable options to getting started with access to real-time information so critical to good decision making in snow and ice operations.

As relying on air temperatures only provides part of the overall story, investing in surface temperature measurement resources and tools becomes an elevated priority. Familiarity with available options and education on details, pros and cons, and end user inputs help to define what may and may not work best for individual operations. At the end of the day, the important thing is to know, understand, and apply to create your own game changer.

Diana Clonch was named a 2019 APWA Top Ten Public Works Leader of the Year. She can be reached at (614) 989-0316 or dwclonch@gmail.com. 



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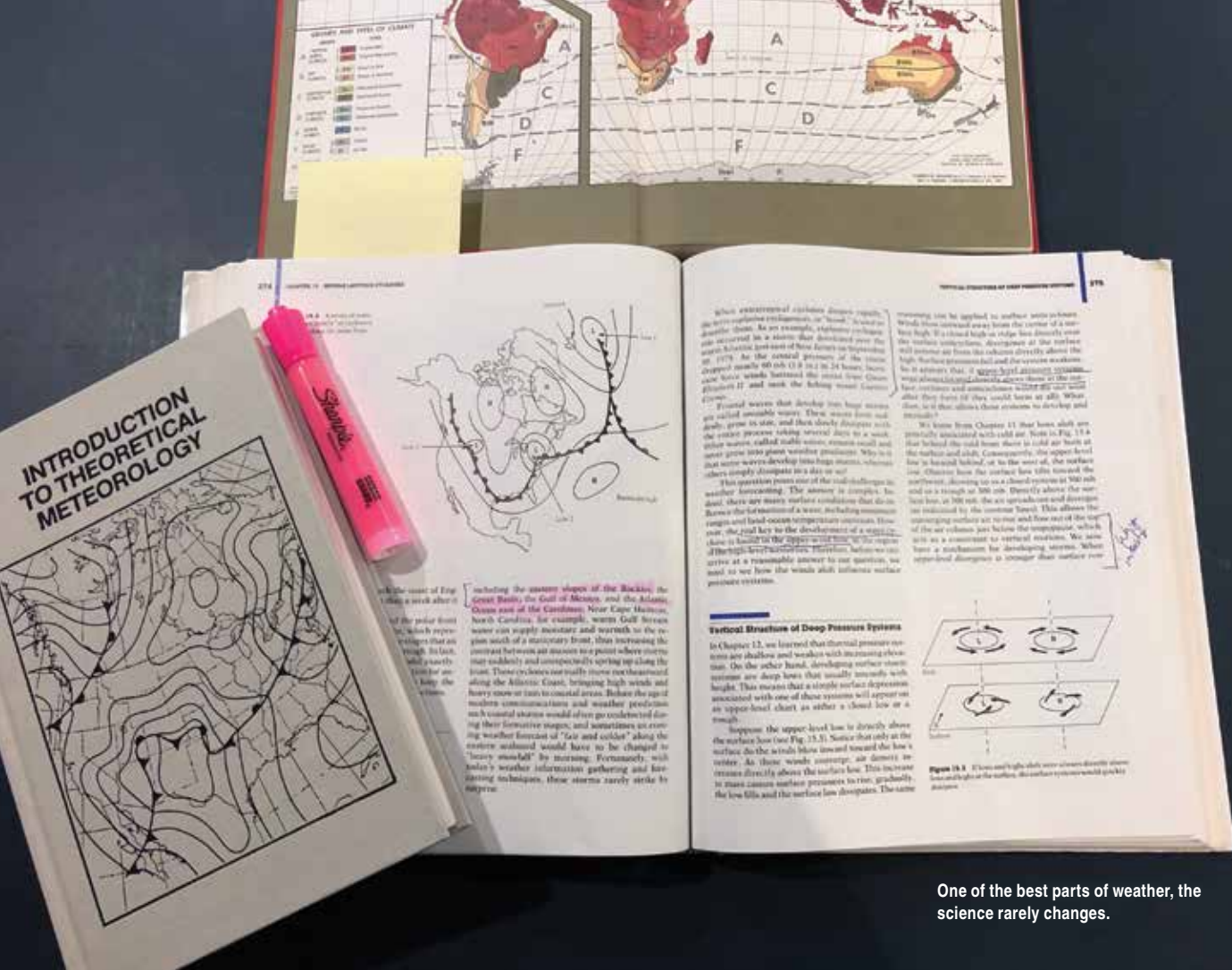
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One of the best parts of weather, the science rarely changes.

Bomb Cyclone: Should you be afraid of it?

Jon Tarleton, Transportation Weather Consultant, and member, APWA Winter Maintenance Subcommittee

In meteorology, just like every other profession, we have a slew of terms we have created specifically for our science. Many of these terms can sound harmless like “Drizzle,” *small droplets between 0.2 and 0.5 mm in diameter that fall slowly and reduce visibility more than light rain.* I bet you didn’t know that meteorologists actually define the size, did you? Of course, there are also the obvious terms, such as tornado, hurricane, and blizzard, which naturally makes us think of horrible, life-threatening weather. Even the term “cyclone” sounds a little dangerous because all you might know is that it is something spinning. During the winter of 2018-19

you probably heard the term “bomb cyclone.” Well, this has to be scary and dangerous! A weather bomb is spinning out of control, coming towards us in the middle of winter. It turns out that a bomb cyclone is nothing new. It is a weather term pulled out of the meteorological textbooks. So, if we peel away all this scary terminology, what does a bomb cyclone really mean and how does it impact winter maintenance?

First, let’s discuss what a cyclone is to a meteorologist. A cyclone is defined as an area of low pressure around which the wind blows counterclockwise in the Northern Hemisphere and clockwise in the Southern Hemisphere. A

cyclone can be used to describe several weather phenomena; however, for the scenario of winter weather we are specifically talking about Middle Latitude Cyclones. In the winter, the polar jet stream marks the boundary between cold arctic air from the north, and more mild southern air. This polar jet snakes all around the top of the globe making a complete circle around the North Pole. In winter, as the cold arctic air slides south, so does the polar jet. Along this jet the stark difference between warm and cold air causes small cyclones to spin along this boundary. Many times, these cyclones live and die quickly, with little to no impact on the surface. However, sometimes they strengthen, or go through what meteorologists call cyclogenesis with a matching low-pressure center at the surface and low-pressure center high in the atmosphere. These storms cause a vast majority of our winter precipitation from the Rockies eastward (and some in the western mountains).

What causes their development into major storms? First, the degree of difference between the cold and warm air at the surface. Larger differences will aid in creating more powerful spin of the cyclone. Second, the conditions above the surface low are important to its growth and continued life. At the surface, the low pressure is acting like a vacuum and sucking in air all around it, and thus, the air is being forced up. If the conditions high in the atmosphere are not right to move this air from the surface away from the area, the air will just sink back down and suppress the low pressure. Finally, the exact location of the polar jet is important in relation to the low pressure at the surface. The polar jet stream's wind speed is not the same all along this river of air, so that changing speed and direction impacts conditions below it, and thus, a developing low needs to be in the "sweet" spot of the jet for the cycle to fully develop.

I was not around many years ago when the meteorologists met and defined a

bomb cyclone; however, I have a pretty good idea how the conversation or decision process went. Meteorologists have to be some of the most addicted scientists at measuring things. After all, that is how we make our forecasts. We begin every day, hour, and minute measuring changes in the atmosphere. We love measuring! Once you measure something, then you need to compare it to other measurements, and that translates into scales of intensity. For example, we have a scale for tornado intensity and categories for hurricanes. We do this so we can compare one storm to another and relate this to the public in our messages. One of the ways meteorologists measure pressure of the atmosphere is known as millibars, written as "mb." When a cyclone is going through cyclogenesis the amount of decrease in mb tells meteorologists how much the storm is intensifying. A bomb cyclone is a cyclone that has a decrease of 24 mb in a 24-hour period. So, a bomb cyclone is a line in the sand that meteorologists made to represent a significant rapid decrease in surface pressure.

What does that mean to winter maintenance? It means that conditions will deteriorate rapidly and given the likelihood of a very low pressure at the center, very strong surface winds. Beyond that, all other conditions should be similar to a typical winter Middle Latitude Cyclone. It will have an area of heavy snow, possibly a band of ice or mixed precipitation, heavy rain, and strong to severe thunderstorms at its most southern point.

For the week of March 10, 2019, the eastern Rockies and the Great Plains experienced a bomb cyclogenesis storm. All the conditions we discussed, the right ingredients, were present to create this bomb cyclone, and the region felt the impact. Most notably were some of the wind reports of 70 and 80 mph around the storm. By all accounts and measurement this was a significant winter event for the region.

What is becoming the bigger story here is the continued interest in the weather by our media, specifically the perceived idea that weather is getting more dangerous.

However, what is becoming the bigger story here is the continued interest in the weather by our media, specifically the perceived idea that weather is getting more dangerous. In recent years, the attention to weather disasters has skyrocketed to the top of the national headlines with each event. It is important for you to know about the media hype because you have been using weather information for years to make critical decisions about your city, state, county, etc. And over the past decade, the amount of noise that is now being broadcast at you is making the decision process harder, not easier.

One example of this is how everything in weather now must be blamed on something or given a reason. Take the polar vortex as one example, which is nothing more than a climatological low pressure that resides each winter between us and the arctic. Its location in winter is a key element on the weather that a large portion of the eastern U.S. and Canada receives during the winter months. However, the polar vortex is not always to blame; more importantly it is not new to the meteorological community.

One of the headlines from the March 2019 bomb cyclone event said:

"The hurricane-force system has combined the worst weather of all four seasons into one—from a string of violent, tornadic thunderstorms to damaging winds, severe blizzard conditions and even flooding."

This is pretty much every middle latitude cyclone that we experience in the



United States. The strong winds were the only really notable item of concern, which I am sure for those plowing snow in that storm made it next to impossible. A second comment said:

"It's a storm for the record books, strengthening from a run-of-the-mill weather disturbance into a historic cyclone in 24 hours. Its central pressure dropped 33 millibars from Tuesday to Wednesday, meeting the criteria of a meteorological "bomb." The storm made this transformation over land, rather than water, which is rare."

Rare? Well, I checked my meteorological textbook, and let's just say it is old enough to predate this age of weather excitement, and it says in the U.S. there are regions which have a propensity for cyclogenesis, including the eastern slopes of the Rockies, the Great Basin, the Gulf of Mexico, and the Atlantic Ocean east of the Carolinas. (Why those areas? There are geographical

The key for you is to make sure you continue to remain diligent in getting your information from the most reputable sources, such as a private weather forecasting company or the National Weather Service.

features in each area which further intensify the conditions we discussed earlier.) So, a bomb cyclone over land, not as common maybe, but I would argue not rare.

These two narratives "be afraid" and "it is historical" are what is making it challenging to prepare a proper winter maintenance response. Don't react enough and you might be blamed for not listening to everything from television to Twitter; react too much and no one is upset, however the amount of money that was lost overreacting. It is more than everyone cares to think about. The key for you is to make sure you continue to remain diligent in getting your information from the most

reputable sources, such as a private weather forecasting company or the National Weather Service. A private weather service is a company, which means they are in tune to your risks, and best at helping you manage that risk. Telling everyone to stay home in a southern city that has virtually no snow removal equipment is the correct response. Doing the same in a city that receives winter weather normally for an "average" event is costing your city more than you are saving. We need to make sure our world is smart about weather, not afraid of it.

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Challenges of a “normal” winter

Greg Bolon, P.E., Director of Operations, Public Works Department, City of Kansas City, Missouri

Kansas City, Missouri (KCMO) is a large, sparsely populated metropolitan city with over 300 square miles within its city limits and a population of 455,000 citizens. The metro area, however, consists of greater than 1.7 million people, multiple cities, and the border of two states. KCMO maintains over 6,500 lane miles of roadway within its street system—roughly 70% of which are residential roadways and 30% are arterials.

The 10-year average for snowfall for Kansas City is just over 20 inches, so the total snowfall for winter 2018-2019 was not substantially greater than the average. So, why did the winter create so many challenges for KCMO when the total snowfall for the year was only 29.1 inches (slightly above average)?

This perfect storm was created by a combination of factors:

- Previous winters experienced lower than average snowfall

- Early cold temperatures that created additional freeze/thaw events and damaged oxidized pavement surfaces
- Increase in snowfall amounts
- Increased winter rains
- Potholes!

To understand how the slightly above average amount of snowfall could be daunting, we need to look at the last several years' total snow accumulations. Only one of the last five years experienced snowfall amounts over 15 inches and the last three years were significantly below average at 5.9, 4.9 and 7.7 inches, respectively. **Citizens had become used to these light winters and forgot what an average winter was like with multiple snow events.**

Furthermore, winter precipitation and extreme cold weather came earlier than usual with the first snow event occurring on October 15. November ended up being the coldest aver-

age temperature ever recorded and Thanksgiving weekend registered the largest snowfall recorded in the last several years, at 5.8 inches—making three total snow events in November alone.

Winter started strong with early snows and cold temperatures and December followed with several significant rain events rather than snow. This early moisture in October, November and December coupled with the early cold temperatures opened surface cracks allowing water to permeate into the pavement openings and be subject to multiple freeze/thaw cycles throughout the winter season.

January through March brought an additional 20 inches of snow which continued to seep into open cracks in aging pavement, creating numerous potholes throughout the metro area. Not only were crews faced with removing the snow, but they would have to transition immediately into pothole repair to attempt to hold pavement surfaces together.

Neither KCMO citizens nor city employees were ready for this constant battle between snow removal and potholes that would continue for six months. Snowfall events for city crews amounted to 12 actual events with six occurring over weekends and three occurring on holiday weekends. Employees were not used to working 15 to 20 consecutive days and consistent overtime between snow removal and pothole patching.

Employees had not been asked to put in these long hours since the last few winters were so light. Additionally, due to retirements and staff changes, over 40% of the staff had not experienced an average winter since they had less than five years of service. New staff had to adjust to the non-stop grind of a long winter which began in mid-October and extended into March.

Not only were employees worn out, but citizens became frustrated because snow issues like slick calls and potholes were not getting addressed as quickly as they would expect due to the volume of calls and lack of staffing resources. Cases entered into the 3-1-1 Action Center jumped considerably compared to previous years. And the same crews responsible for snow removal were also trying to keep up with pothole repairs.

Initially, pothole repairs were made with cold mix patching material as hot mix plants were closed for maintenance and weather conditions. The cold mix-patching materials were subject to extreme conditions and many patches were temporary creating further angst to the citizens of Kansas City. KCMO enlisted the help of resurfacing contractors to help patch several of the worst arterial roadways, hot mix asphalt



KCMO Public Works crews kept the equipment cleaned and maintained between snowplowing and pothole patching in winter 2018-2019.

was made available mid-spring, and crews finally caught up with the pothole backlog over the summer.

As we prepare for another winter season, practice snow routes, train crews and ready equipment, KCMO recognizes a few important lessons learned from winter 2018-2019:

1. Mother nature may give you a break with a light winter or two, but never lose sight of the longer-term average or typical snowfall
2. Pavement surface maintenance needs to be a priority to keep pavements sealed to reduce freeze/thaw effects
3. Staff need to be prepared for the hardships winter can create
4. Management needs to be proactive in funding street preservation projects and recruiting and retaining staff
5. Equipment needs to be rotated on a regular schedule

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Although other chemical combinations and alternatives have been explored, rock salt remains the most common solution for clearing roads of snow and ice.

Using less salt can create safer roads

Newer, smarter salt spreading technologies lower salt consumption while quickly creating safer driving conditions

Marcus Scherer, Ph.D.
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and Development
Aebi Schmidt – North America
Lindenwood, Illinois

At first glance, it seems counter-intuitive. Using more salt on winter roads should automatically create safer roads, right?

Actually, scientific research tells us that's not necessarily the case. And, in fact, often just the opposite is true.

As confirmed by studies from a wide array of universities and municipalities across the country—from Maine to Ohio to Michigan to Wisconsin to Minnesota and more—what matters when it comes to winter road safety is not so much the quantity of the salt put down but, rather, the ratio of the salt mixture and the method by which it is spread.

Salt as an Effective Deicer

Although other chemical combinations and alternatives have been explored, rock salt remains the most common solution for clearing roads of snow and ice. Why? Because it offers the greatest combination of benefits. It performs well, especially when compared with non-chemical options such as beet or pickle juice. According to the American Highway Users Alliance in Washington, D.C., road salt reduces

crashes by up to 88% and injuries by up to 85%.

It's also cost effective, especially when compared with more sophisticated chemical alternatives like liquid calcium chloride, magnesium chloride or potassium acetate which are often as much as three times the cost of sodium chloride (a/k/a road salt).

Making Salt More Effective: Pre-Wetting Strategies

Pre-wetting is a strategy of applying a liquid deicing chemical to a dry solid before or during its application to the pavement. When a liquid is applied to a rock salt particle, the particle absorbs a minor amount of the liquid which increases its density. These heavier salt grains cushion the salt particles so they are less susceptible to movement.

According to the Michigan DOT's 2012 Bounce and Scatter study, about 30% of dry salt is wasted after being applied as a result of wind or traffic or bouncing off the side of the road. Pre-wetting reduces the amount of waste to 5% or less. This means you can spread 30%

The U.S. still lags Europe in the use of pre-wet salt, often using the less efficient dry salt or only a 5% pre-wet solution.



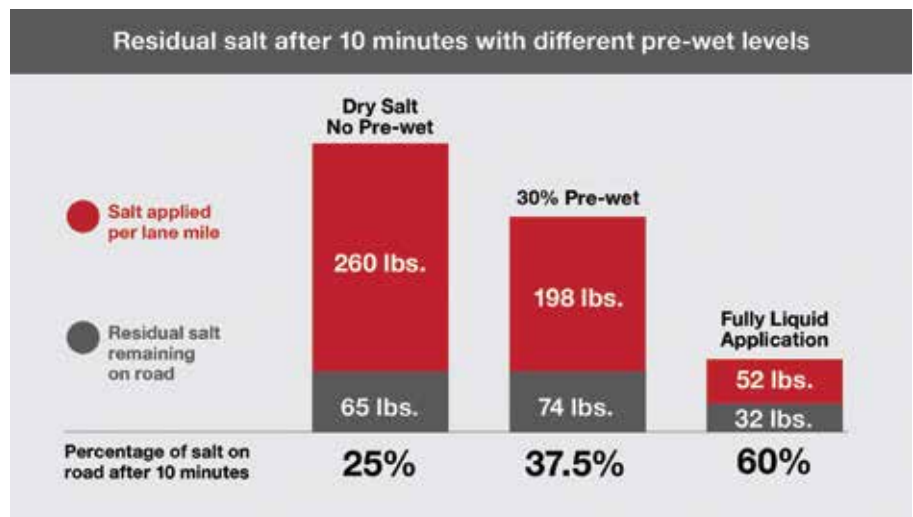
less salt to maintain the same amount of salt on the road.

This reduction in salt usage is confirmed by a wide array of sources, including the Salt Institute which reports that pre-wetting reduces salt application rates 26-30%. ClearRoads.org also promotes research that documents how pre-wetting rock salt provides 20-33% material savings.

Not All Pre-Wet Mixtures Perform the Same

Although some areas in the U.S. still use dry salt, the conversion to pre-wetting has accelerated in recent years thanks to more education in the market.

But simply wetting the salt isn't the full answer. Rather, what matters is how the salt is wetted and in what ratio of salt to liquid. In European countries with significant snowfall, where pre-wetting has been the standard for winter maintenance since 1975, the pre-wet ratios are generally higher than in the U.S. The typical ratio in the U.S. today is 5-6% liquid, which translates into roughly 10-12 gallons of brine per ton. This is significantly lower than the



70:30 pre-wetting ratio typically used in Europe which is equivalent to using 60 gallons of brine per ton used.

A study conducted by the University of Waterloo in Canada compared traction results of various pre-wet ratios. It found that salt with a pre-wet ratio of 10% resulted in 9.5% higher friction values while consuming 13% less salt compared with salt used with a 5% pre-wet ratio. When it tested salt with a pre-wet ratio of 20%, it found 10.09%

higher friction values while consuming 23% less salt compared with salt used with a 5% pre-wet ratio.

Performance is also affected by how the salt is wetted. Many spreaders in the U.S. today lightly spray the salt as it comes through the chute, hitting only one or two sides of the salt grains. The more advanced spreaders, like those often used in Europe, are designed so that the salt falls through the liquid solution, saturating every granule. The



Using a pre-wet ratio of 70:30 reduces salt consumption and keeps roads safer by accelerating the melting action and keeping salt on the road.

addition of a concaved disk (versus the traditional flat disc on many American spreaders) additionally provides a more thorough mixing action.

More Is Not Necessarily Better

Not only is over-salting expensive, but it also has devastating effects on the environment, polluting rivers, streams and soil, and killing plants, trees and aquatic life. It also wreaks havoc on roads and bridges, creating a need for more costly repairs.

What matters is how much salt stays on the road. A study was presented at the 2018 International Winter Road Congress in Poland that compared how much salt remained on the road 10 minutes, as well as up to four hours, after application of various pre-wet ratios ranging from 0% to 100%. The figure on p. 59 demonstrates the superior results of a 30% liquid pre-wet ratio.

In the case of dry salt (0% ratio), nearly 260 pounds of salt were applied per

lane mile. After only 10 minutes, only 25%, or 65 pounds of salt, remained. This is because the lightweight salt bounced, was blown or pushed off to the side of the road by traffic.

In the extreme of a 100% liquid ratio, just under 52 pounds of salt were applied per lane mile and, of those, 60%, or less than 32 pounds of salt, remained on the road after the first 10 minutes.

With the 70:30 ratio, which includes 30% liquid, less than 198 pounds of salt per lane mile was used. Of those, 37.5% (or 74 pounds of salt) remained on the road, proving that less salt can be used to keep more on the road to improve safety.

Smarter Salt Spreading Technologies Reach Higher Pre-Wet Ratios

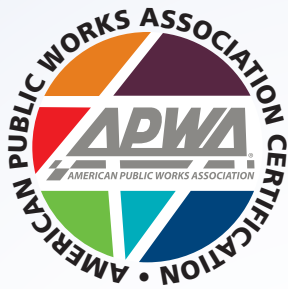
Unfortunately, most traditional spreaders aren't designed to create the highly efficient, super-saturated salt mixtures. They either lack the necessary tank size to carry the larger liquid

quantities or their pumps can't meet the capacity requirements. Typically, the 70:30 ratio requires a 26-gallon-per-minute pump capacity.

Dispersing optimal salt quantities also requires ground speed controls which adjust the spreading rate according to vehicle speed so that salt is not wasted when the vehicle is stopped. Today's smarter technologies also adjust salt spreading rates according to changing road temperatures and weather conditions. Sophisticated controls available on some newer models make these adjustments automatically so operators can focus on driving without distractions to further improve road safety.

Technology is changing the way government entities evaluate their winter road maintenance programs. Smarter salt spreading makes sense economically and environmentally and, more importantly, it's safer.

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Light snow renders lane striping useless.

A two-wheeled tale of two cities

Pat Kennedy, P.E., Senior Engineer, Street Maintenance, City and County of Denver, Colorado; **Larry Schneider**, Street Superintendent, City of Fort Collins, Colorado, and member, APWA Winter Maintenance Subcommittee

Introduction

The urban travel network is home to an ever-increasing number of two-wheeled vehicles. The cities of Fort Collins and Denver in Colorado foster a bicycle-friendly culture with a combined total of over 350 miles of dedicated bike lanes on city streets. Goals have been adopted to increase safety and ridership throughout the year. During winter months the accumulation of snow and ice in bike lanes is a significant hazard and can deter riders from using this mode of transportation during inclement weather. The goal of the two agencies maintaining streets in both cities is to provide timely winter response and a well-defined and communicated level of service.

Design

Street designs are evolving to include dedicated lanes for more than just bicycles. In late August 2019, Denver City Council passed an ordinance mandating electric scooters to use bike lanes rather than being driven on sidewalks. Shared-use lanes with automotive traffic are being supplemented by dedicated bike lanes, some with buffers from traffic, and protected bike lanes (PBLs). Some PBLs are part of the street with lane and parking reductions providing the necessary real estate, and others are being constructed behind the

curb in the sidewalk and amenity zones of major streets. Neighborhood bikeways, where residential streets are being repurposed as safer bikeways with limited vehicular traffic, are also becoming common. In totality, dedicated bike lanes are being installed in municipalities around the country at an accelerated rate.

Staff work closely with the bike community to determine where and when the network will grow. When PBLs are contemplated, additional outreach is necessary because these lanes often entail removal of existing on-street parking or lane diets to remove automobile lanes. As these lanes expand beyond the central business district, scheduling becomes a key component for a successful winter bike program. Keeping all bike lanes clear of snow and ice during or immediately after a heavy snow event is challenging.

Standard snow operation procedures are to plow snow to the curb and apply deicing materials behind the plow to provide the bond-breaker for additional snow that falls. Traffic assists in mixing the deicer with residual and newly accumulating snow prior to the next pass of the plow. The addition of bike lanes adds unique complexities to this process. The deicer mixing action does not take place in bike lanes due to limited traffic and decreased vehicular footprint. This results

in an increased volume of residual snow that can freeze to the pavement.

On new roadways or re-engineered projects that include protected bike lanes, roadway planning and design considerations are now included to avoid unsafe situations. Planning adequate right-of-way for a six- to eight-foot bike lane and a four- to six-foot storage space on the side of the road, or buffer space between the road and sidewalk, allows a typical truck-mounted snowplow to plow snow into the designated storage space rather than the bike lane. The six- to eight-foot width also allows for some narrowing of the bike lane due to snow while still maintaining functionality. Drainage issues may cause ice buildup over the winter in the protected bike lane. Included in the design process is room to cut ice and remove with graders and loaders.

Considerations

In general, the bicycle community seeks a level of service that is difficult to achieve. With all plowing, bare pavement is the ultimate goal; however, as stated above, automobile traffic assists in mixing deicers to accelerate melt minimize bond. The lack of mixing action in bike lanes results in increased residual frozen material in the lane. Automobile traffic can easily travel through two to three inches of snow, which can accumulate between cycles of a plow; however, bicycle commuters desire a lower accumulated amount. This can only be accomplished by more frequent plowing, requiring increased staff and equipment.

In the first few years of accelerated bike lane infrastructure installations, we have learned the following lessons:

- Lane width – A standardized lane width for bike lanes is desirable. Too narrow and the equipment won't fit, too wide and multiple passes or different equipment is needed. The capital cost for this specialized equipment is in the \$85,000 range each so it is important to select equipment that fits the needs and gets the most out of that individual piece.
- Fort Collins has found the average cost for standard bike lanes is \$200 per mile per snowstorm and with protected bike lanes \$1,000 per mile per snowstorm. This expense can change depending on the number of obstacles or weather conditions and should be a strong consideration when designing and installing new protected bike lanes.
- Lane location – Where possible, place lanes on the side of a street with the most winter sun exposure. This can aide in melt and drying, decreasing refreeze after a storm has passed.
- Network expansion – The specialized equipment for protected bike lanes is not easily moved across the city. If the PBL network can be designed to optimize both
- the needs of the public and the ability to move plowing resources efficiently, the cost/benefit of those lanes is increased. The original construction of PBLs in Denver was in the central business district. Many lanes could be plowed in a short period from one single transport. As the network expands into other parts of the city, more of the equipment and staff time will be spent moving the limited pieces of specialized equipment instead of plowing.
- Expanded public outreach to inform all road users what they should expect regarding winter maintenance and possible shared use on what normally would be a separated area. We also encourage cyclists to explore the option of winterizing their bikes with snow tires to increase their safety while traveling the streets.
- On PBLs, choose lane delineation that is visible in heavy snow events and can either be easily removed and replaced or can survive the possible impacts from traffic and maintenance activities.
- Along the front range of Colorado, temperatures and weather are constantly fluctuating in short periods of time and space. It is not uncommon to have a 25-degree temperature differential between sun-exposed areas and ambient locations. Due to these cycles of snow, followed by sun and warm temperatures, melting snow occurs during the day and freezes at night, causing ice to build up quickly. Melted snow trickles down road gutters and when the sun sets, temperatures drop causing the melted snow to freeze. This constant freeze-thaw cycle builds up thick layers of ice and within a few days these ice patches can become nearly a foot thick. These patches



Concrete curb with flexible delineators

of ice become a significant problem which must be addressed due to the hazards for bikes, vehicles and pedestrians.

Conclusion

As the popularity of cycling increases, snow managers need to be cognizant of the fact that multi-modal transportation networks which include an increasing number of dedicated bicycle lanes are part of our future. Bikes are at the same priority as other vehicular travel. With proper planning and consideration of the differing needs, modifying expanding snow programs to include growing transportation alternatives can be accomplished to the benefit of all.

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Winter is no reason to put the bike away.

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APWA Reporter

Statement of Circulation

13. Publication Title APWA Reporter		14. Issue Date for Circulation Data Below September 2019, Vol. 86, No. 9	
15. Extent and Nature of Circulation		Average No. Copies Each Issue During Preceding 12 Months	No. Copies of Single Issue Published Nearest to Filing Date
a. Total Number of Copies (Net press run)		29,250	29,250
b. Paid Circulation (By Mail and Outside the Mail)	(1) Mailed Outside-County Paid Subscriptions Stated on PS Form 3541 (Include paid distribution above nominal rate, advertiser's proof copies, and exchange copies)	26,700	26,700
	(2) Mailed In-County Paid Subscriptions Stated on PS Form 3541 (Include paid distribution above nominal rate, advertiser's proof copies, and exchange copies)	---	---
	(3) Paid Distribution Outside the Mails including Sales Through Dealers and Carriers, Street Vendors, Counter Sales, and Other Paid Distribution Outside USPS®	---	---
	(4) Paid Distribution by Other Classes of Mail Through the USPS (e.g., First-Class Mail®)	2,310	2,310
c. Total Paid Distribution (Sum of 15b (1), (2), (3), and (4))		29,010	29,010
d. Free or Nominal Rate Distribution (By Mail and Outside the Mail)	(1) Free or Nominal Rate Outside-County Copies Included on PS Form 3541	255	255
	(2) Free or Nominal Rate In-County Copies Included on PS Form 3541	---	---
	(3) Free or Nominal Rate Copies Mailed at Other Classes Through the USPS (e.g., First-Class Mail)	---	---
	(4) Free or Nominal Rate Distribution Outside the Mail (Carriers or other means)	---	---
e. Total Free or Nominal Rate Distribution (Sum of 15d (1), (2), (3) and (4))		255	255
f. Total Distribution (Sum of 15c and 15e)		29,265	29,265
g. Copies not Distributed (See Instructions to Publishers #4 (page #3))		520	520
h. Total (Sum of 15f and g)		29,785	29,785
i. Percent Paid (15c divided by 15f times 100)		99.12%	91 to 12%

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☐ Publication not required.																
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<i>Robert Kevin Clark, Editor</i>	September 3, 2019															
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Training: Don't start the season with

New training videos from Clear Roads give guidance on clearing intersections and using liquid deicers

Andrea J. Thomas

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Editing Associate
CTC & Associates LLC
Madison, Wisconsin

Beyond the basics of how to operate a plow, annual training helps keep winter maintenance operators and supervisors up-to-date on best practices as techniques and technologies evolve. For agencies dealing with high turnover rates, a strong training program is especially important.

"We bring in new employees constantly," says Jeff Pifer, assistant director of

the equipment division at the West Virginia Division of Highways. "When you lose an operator who's been there for 20 years, it's hard to put 20 years of experience into a new hire in short order. It's critical that we do training—every bit helps."

For agencies that conduct their own training in-house, the Clear Roads winter maintenance research consortium (clearroads.org) provides a valu-

Clear Roads training videos demonstrate efficient approaches for plowing 10 different intersection and interchange layouts (photo courtesy of Missouri DOT).



hout it



Liquid roadway treatments
(photo courtesy of Oregon DOT)

able resource: free training materials that agencies can incorporate into their programs.

“As a consortium of 36 state DOTs, one of our key goals in developing training materials is to provide a common resource that we can all benefit from,” says Clear Roads representative Scott Lucas, assistant administrator for the Ohio DOT Office of Maintenance Operations. “In developing these materials, we’re able to pull from resources from a wide range of states and cherry-pick the best materials to put in our training.”

Clear Roads used that approach in developing its well-received Snowplow Operator and Supervisor Training, which was released in 2017 and covered a wide range of topics. Following the success of that project, Clear Roads turned its focus to two areas where members saw a need for more instruction and guidance: plowing complex intersections and applying liquid deicers.

Efficiently plowing intersections and interchanges

As traffic volumes have increased, engineers have designed new types

of intersections and interchanges that allow traffic to flow efficiently using multiple merging and turning points. Intersecting roadways can be challenging for snow removal crews, however, and Clear Roads agencies needed a way to help plow operators visualize complex intersections and clear them effectively.

Clear Roads researchers surveyed practitioners in 21 states on the best tools and techniques for plowing 10 different types of intersections and interchanges, then created video animations depicting an aerial view of a snowplow’s path.



Plow operator on the job (photo by Cathy Morrison, Missouri DOT)

The videos show how to plow four intersection types (four-leg, roundabout, median U-turn and displaced left-turn), and six interchange types (single-point, cloverleaf, diamond, diverging diamond, double roundabout and directional T).

“The training is done in a graphical format so you can see how the truck is moving through and what each pass looks like,” says Kevin Hensley, APWA’s liaison to Clear Roads and superintendent of public services for the City of West Des Moines, Iowa. “The great thing about video-based training is that you can fast-forward and rewind as many times as needed to really get it set in your mind.”

Of course, there’s no one right way to clear an intersection. For each layout, the project committee and researchers evaluated multiple approaches and agreed on one to highlight as a best practice. “By showcasing one approach to clearing an intersection, it may



Image from Clear Roads training on Plowing Intersections and Interchanges (from Practice Manual)

“The great thing about video-based training is that you can fast-forward and rewind as many times as needed to really get it set in your mind.”

~ Kevin Hensley, Superintendent of Public Services, West Des Moines, Iowa

provide additional food for thought for an agency that doesn’t normally do it that way,” says project champion Justin Droste, asset maintenance engineer at Michigan DOT.

In some cases, seeing the potential for increased efficiency can help justify a new hire or an equipment purchase. “Sometimes the best way to clear a new type of intersection is with equipment

that you may not own yet,” Lucas says. “You may need a left-wing plow when you only have a right-wing plow, or you may not own a wing plow at all.”

In addition to the videos, the training materials include printable reference cards that can be distributed to operators or posted in breakrooms.

“It’s not an easy sell, because putting liquids down on the road is kind of counterintuitive. People think you’re going to freeze the road up.”

~ Jeff Pifer, Assistant Director, Equipment, West Virginia Division of Highways

Getting the word out: Liquid roadway treatments

Many agencies use salt brine and other liquids as anti-icing treatments to prevent ice from forming on roadways. But the application of salt brine as a deicing treatment—during or after a winter storm—has been slower to catch on.

“It’s not an easy sell, because putting liquids down on the road is kind of counterintuitive,” Pifer says. “People think you’re going to freeze the road up.”

Clear Roads members are taking a second look at liquids. When used in the right conditions, liquid *deicing* treatments can be as effective as granular treatments while using less salt. Liquids are especially effective during light snowfalls and at milder temperatures. Agencies also use liquids as anti-icing treatments before a storm and to loosen packed snow for plowing.

“Here in Ohio, a big thing we’re tasked with is finding ways to save money and resources,” Lucas says. “Using more liquids is one way to do that.”

Clear Roads created two training videos to help agencies expand their use of liquids:



Screen shot from Clear Roads training video on liquid roadway treatments

- A shorter video (12 minutes) for agency decision-makers and the general public that discusses the benefits of liquid anti-icing and deicing treatments while addressing common misconceptions.
- A full-length video (24 minutes) for practitioners that includes information from the short video as well as tips for starting a liquid program, discussion of equipment types, and recommended usage parameters and application rates.

The videos are a good complement to the discussion of liquids in APWA’s Winter Maintenance Supervisor Certificate training program, Hensley says. “For agencies that are interested in exploring this approach, the Clear Roads training goes into more depth about how to implement it,” he says.

To accompany the videos, researchers created two printable reference guides—a Start-Up Reference Guide to help agencies gain buy-in and a Technical Reference Guide with more detailed usage parameters, application rates and general tips.

Snowplow operator and supervisor training

The video-based training on clearing intersections and applying liquids can be used in conjunction with Clear Roads’ flagship training program: Snowplow Operator and Supervisor Training.

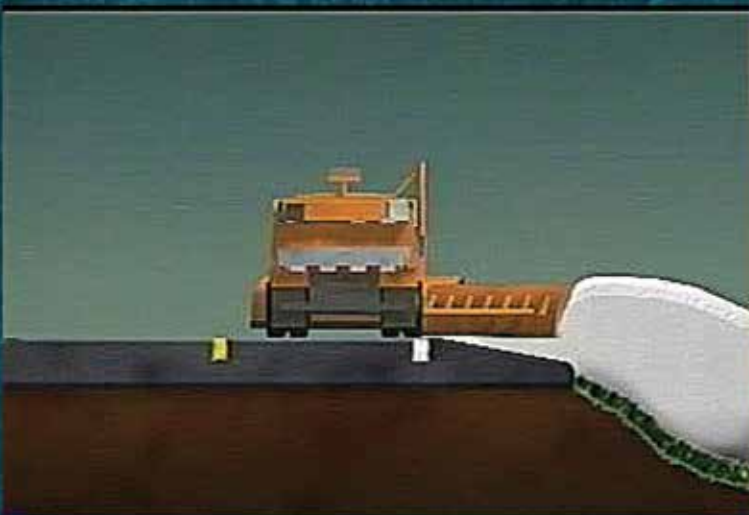
Available as a free download for any agency, the training consists of 22 modules on topics such as plowing procedures, spreaders, pre-wetting, deicing, anti-icing and safety. Designed to be presented by an instructor, each module includes a PowerPoint™ file with teaching notes, an instructor’s guide, and a set of pre-tests and post-tests.

The modules provide over 42 hours of training materials (most modules take 90 to 120 minutes to teach). The modules can be used as a complete package or individually, and agencies can edit and customize them as needed. Each module contains two tracks: operator training and supervisor training.

Since the modules’ release in 2017, they have been accessed by more than 100 agencies and organizations, including many county and municipal highway departments.

Tips from experienced drivers:

Avoid 'down winging' (lowering the back of the wing lower than the road), which may damage equipment.



Push arms level with moldboard.



Could also cause damage to roadside.



Presentation slide from Clear Roads Snowplow Operator and Supervisor Training

Hensley says he hopes that public works agencies will continue to make use of the research and training materials that Clear Roads has to offer.

"Clear Roads produces real, practical research that people can use in their jobs every day," Hensley says. "It's a free resource that all APWA members should take advantage of."

Looking ahead, Clear Roads is continuing to identify topics that could benefit from training materials. Currently in the works: Defensive driving training for snowplow operators, and a report examining equipment repair training needs for mechanics and operators.

To download the training materials discussed in this article, visit the Clear Roads website:

"Clear Roads produces real, practical research that people can use in their jobs every day. It's a free resource that all APWA members should take advantage of."

~ Kevin Hensley, Superintendent of Public Services, West Des Moines, Iowa

- Plowing Intersections and Interchanges: <https://clearroads.org/project/14-03/>
- Liquid Roadway Treatments: <https://clearroads.org/project/16-06/>
- Snowplow Operator and Supervisor Training: <https://clearroads.org/project/12-04/>

For more information on APWA's Winter Maintenance Supervisor Certificate program, visit <http://apwa.net>.

Andrea Thomas is a senior research, writing and editing associate at CTC & Associates, which provides management services for the Clear Roads Pooled Fund. She can be reached at andrea.thomas@ctcandasociates.com. 

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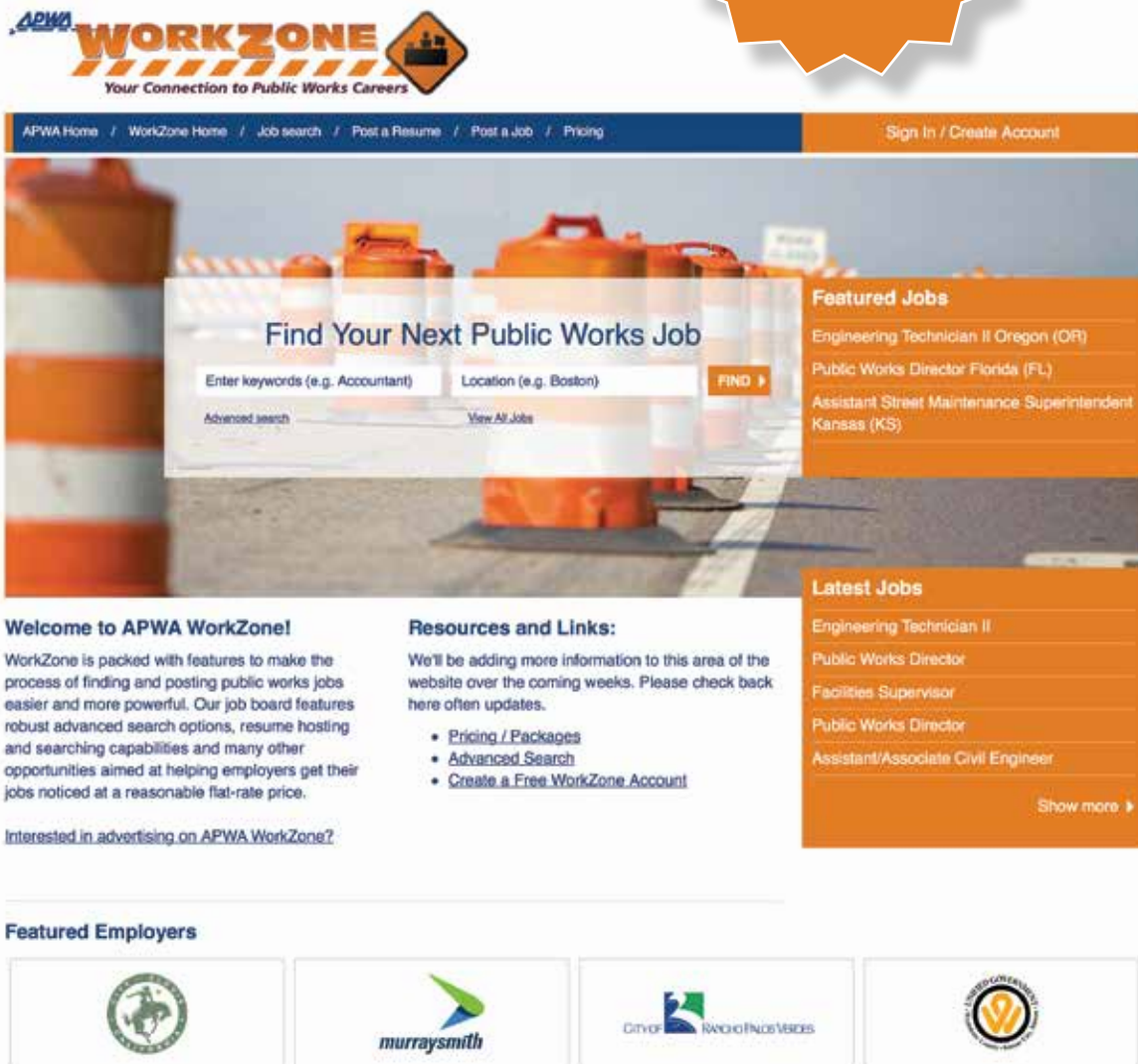
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Innovative solution to seawall failures at storm pipe outfalls provides long-term protection and saves costs

Quality Enterprises teamed with Foster Consulting on a design-build project in Florida to address seawall failures at storm pipe outfalls that ran within City easements between homes. The **Truline® Seawall System**, an 8" steel-reinforced concrete wall sealed inside a vinyl form, was used for four reasons: (1) increased pile depth and greater rigidity, (2) hand-carry parts and install with smaller equipment, (3) cost-effective, and (4) ability to modify/cut openings easier and faster than 6" concrete panels. Ultimately, the versatility and flexibility of the Truline system contributed to the successful completion of the repairs. For more information, visit www.truline.us.

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Infiltrator Quick4 Plus™ Chamber systems offer advanced contouring capability and an interior load-bearing column for maximum strength. The Quick4 Plus series is available in different sizes, styles, and

storage volumes to meet regulatory and site requirements and accommodate peak flows. Its Contour Swivel Connection™ permits turns up to 15°, right or left and the available Quick4 Plus All-in-One 12 Endcap and the Quick4 Periscope provide flexibility in system configurations. The Quick4 Plus Chamber system supports wheel loads of 16,000 lbs. per axle with 12" of cover. No stone or geotextile is required for installation. For more information, call (800) 221-4436 or visit www.infiltratorwater.com.



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Vehicle Reman is a complete vehicle remanufacturer that helps companies and municipalities get twice the life from their truck fleets while saving up to half the cost of purchasing new. The company uses remanufactured parts and components to return vehicles to same-as-new condition. Remanufactured vehicles cost 30-50 percent less than purchasing new and are backed by a three-year powertrain warranty. Vehicle Reman recently saved the City of Diboll, Texas 48 percent by remanufacturing a Ford F-350 water department truck. Vehicle Reman specializes in Class 1-5 trucks: pickups, vans, SUVs, box trucks, flatbed trucks and specialty vehicles up to 19,500 pounds. Learn more at www.vehiclereman.com. (Before/after photos show the truck reman process with a water department truck from the City of Diboll, Texas.)

InstaCEI: Built to save time in the field

InstaCEI is a new mobile and web platform which allows users in the Transportation Engineering & Construction Inspection (CEI) field to view horizontal alignment and roadway stationing inside any project limits. The mobile app offers transportation engineers and contractors stationing viewer and photo stamper tools that can be used in the field to save time and improve safety. Roadway stationing viewer detects the user's live location in the field and displays it in a station format (i.e., 15+75). The photos stamper feature labels construction progress photos taken using the app's camera with project name, date, time, and station of the photo (0+00 format). Learn more at www.InstaCEI.com.



Clean Water Services Tualatin Interceptor Project

As part of an upgrade to 42-year-old infrastructure, **Mortenson** collaborated with **Clean Water Services** in a progressive design-build process to complete the Tualatin Interceptor in Oregon, tunneling underground to move 22 million gallons of water through a pipeline while tackling major geographical challenges. The project ensured water quality and met population capacity demands. Notably, with the head differential across the river of only a few feet and a short completion timeframe, the team utilized an innovative method, that had not yet been completed in North America before for the given diameter and radius required, to construct a "u-shaped" or vertically curved micro-tunnel under the Tualatin River. For more information, contact Tom Paul, Mortenson General Manager, at (425) 497-6661 or tom.paul@mortenson.com.

Mead & Hunt acquires "boutique" transportation consulting firm Sabra & Associates, Inc.

Mead & Hunt, a large, well-known national architecture-engineering firm, has acquired **Sabra & Associates, Inc. (SAI)**, a multi-disciplinary consulting firm with a strong emphasis on the transportation sector. This move gives both firms the opportunity to provide clients expanded consulting resources and service areas. SAI brings sophisticated multi-modal transportation planning, travel demand modeling, GIS, traffic engineering, and highway design and construction inspection to Mead & Hunt's Transportation team, which excels at roadway and bridge design and construction inspection. For more information, call (608) 443-0600, (681) 313-4615 or (608) 443-0378.

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Trimble announces new offline data transfer and post-processing workflow for Trimble TerraFlex Software

Trimble has announced that its Trimble® TerraFlex™ field software now supports the transfer of data between the field and office without the use of Trimble cloud services. The new software workflow—called offline data transfer—is possible through the integration of Trimble TerraFlex and the Trimble Positions™ Desktop add-in for Esri® ArcGIS® Desktop. TerraFlex is a field solution that enables mobile workers to easily collect, manage and edit their geospatial feature data. The new workflow provides an alternative to using Trimble cloud services for storing and transferring GIS feature data collected with the TerraFlex platform. For more information, visit www.trimble.com.

The “First Line of Defense” in protecting membrane filters

A growing number of municipalities are ensuring superior water quality, membrane longevity and reliable production, utilizing low maintenance, multi-element, self-cleaning, pre-treatment filters from R. P. Adams, which first introduced and patented the technology in the 1960s and has over **10,000 installations worldwide today**. This design provides continuous removal of suspended solids. When utilized as the “first line of defense” for pre-membrane water filtration, it typically filters out sand, silt, and other suspended solids from 500 to 75 microns. For more information, call (716) 877-2608 or visit www.rpadams.com.



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Keeper anchored tool tether series has been designed with a unique and proprietary low-force woven polyurethane elastic core that has a 2.5:1 stretch factor (42" relaxed – 18' extended). Because they have the shortest relaxed length and longest extension length, Gear Keeper's new anchor tethers minimize entanglement issues when climbing or working in small quarters to increase safety for technicians at heights. For more information, call (888) 588-9981 or visit gearkeeper.com.

Sourcewell awards pre-engineered buildings contract to BlueScope Construction

BlueScope Construction announces

a **second consecutive Sourcewell contract** in the pre-engineered building category. As the top-scoring respondent, BlueScope Construction earned the new four-year contract during a recent competitive solicitation process. BlueScope Construction's response included considerations such as pricing, customer service and warranties. BlueScope Construction is the only design-build contractor and manufacturer to be awarded a Sourcewell contract, which encompasses turnkey, design-build services, material-erect solutions, site preparation and installation services, for both new facility construction and renovation. To learn more about BlueScope Construction design-build solutions, visit Sourcewell.BlueScopeConstruction.com. 



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For more information about these programs or to register online, visit www.apwa.net/Events.
Program information will be updated as it becomes available.

Questions? Call the Professional Development Department at 1-800-848-APWA.

2019



October 3

Talking Top Tech: Preparing for Implementation of Automated/Connected Vehicles



October 8-10

Certification Exam Dates (CSM, CPII, CPFP, CPWP-S, CPWP-M)



October 10

Succession Planning and Servant Leadership

October 14

Call for Presentations deadline for PWX 2020



October 15-16

Certification Exam Dates (CSM, CPII, CPFP, CPWP-S, CPWP-M)



October 24

Addressing Drainage Concerns with 2D Hydraulic Modeling



November 12-14

Certification Exam Dates (CSM, CPII, CPFP, CPWP-S, CPWP-M)



November 21

Facility Maintenance Efficiency Strategies



December 5

Talking Top Tech: Augmented Reality Edition



December 10-12

Certification Exam Dates (CSM, CPII, CPFP, CPWP-S, CPWP-M)

2020



April 19-22

North American Snow Conference, Cleveland, OH



= Talking Top Tech



= Click, Listen & Learn program (Free to Members)



= Live Conference (Paid Registration)



= Web-based training



= Certification Exam

APWA members may access past Click, Listen & Learn programs from the Members' Library at no cost. Programs can be streamed to your computer via the link found in the library.

If you have expertise that you would like to share, please use the online Call for Presentations form to describe your expertise and perspective on the topic. www.apwa.net/callforpresentations/

Addressing Drainage Concerns with 2D Hydraulic Modeling

Thursday, October 24, 2019
11 ET / 10 CT / 9 MT / 8 PT



UPCOMING APWA EVENTS

PWX

2020 Aug. 30-Sept. 2 New Orleans, LA
2021 Aug. 29-Sept. 1 St. Louis, MO

For more information, contact David Dancy at (800) 848-APWA or send e-mail to ddancy@apwa.net.

National Public Works Week: May 17 – 23, 2020

Always the third full week in May. For more information, contact David Dancy at (800) 848-APWA or send e-mail to ddancy@apwa.net.

North American Snow Conference

2020 April 19-22 Cleveland, OH

For more information, contact Brenda Shaver at (800) 848-APWA or send e-mail to bshaver@apwa.net.

OCTOBER 2019

- 3** **APWA Talking Top Tech: Preparing for Implementation of Automated/Connected Vehicles, (800) 848-APWA, www.apwa.net**
- 3-5** National Precast Concrete Association, Annual Convention, Seattle, WA, www.precast.org
- 6-8** Sealant, Waterproofing & Restoration Institute, 2019 Fall Technical Meeting, Charleston, SC, www.swrionline.org
- 9-11** National Trailer Dealers Association, 29th Annual Convention, West Palm Beach, FL, www.ntda.org
- 10** **APWA Click, Listen & Learn, Succession Planning and Servant Leadership, (800) 848-APWA, www.apwa.net**
- 10-13** American Society of Civil Engineers, ASCE Convention, Miami, FL, www.asce.org
- 13-16** American Public Transportation Association, 2019 TRANSform Conference, New York, NY, www.apta.com
- 15-18** Deep Foundations Institute, 44th Annual Conference on Deep Foundations, Chicago, IL, www.dfi.org
- 20-30** International Code Council, Annual Conference, Las Vegas, NV, www.media.iccsafe.org

- 24** **APWA Click, Listen & Learn, Addressing Drainage Concerns with 2D Hydraulic Modeling, (800) 848-APWA, www.apwa.net**

NOVEMBER 2019

- 3-6** American Water Resources Association, Annual Water Resources Conference, Salt Lake City, UT, www.awra.org
- 4-6** American Segmental Bridge Institute, 31st Annual Convention, Orlando, FL, www.asbi-assoc.org
- 7-9** Tree Care Industry Association, TCI EXPO 2019, Pittsburgh, PA, www.tcia.org
- 12-14** **APWA Certification Exam Dates (CSM, CPII, CPFP, CPWP-S, CPWP-M)**
- 18-19** Canadian Council for Public Private Partnerships, 27th Annual Conference, Toronto, ON, www.p3-2019.ca
- 20-23** National League of Cities, City Summit, San Antonio, TX, www.nlc.org
- 21** **APWA Click, Listen & Learn, Facility Maintenance Efficiency Strategies, (800) 848-APWA, www.apwa.net**

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