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See our special PWX section beginning on page 33 and Program on pages 63-110
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The APWA Reporter, the official magazine of the American Public Works Association, covers all facets of public works for APWA members including industry news, legislative actions, management issues and emerging technologies.

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Many years ago my grandmother used to tell me to enjoy my time in high school, as time passed much too quickly. I find myself reflecting on her words as I begin this column, and as I prepare to end my presidential year. Yes, this year time has passed quickly.

The journey this past year has been so memorable, with many fond memories, and a few not so fond ones I will discuss in a moment. There are a number of great moments that APWA Presidents experience during their tenure: meeting so many great professionals from across North America both in their home chapters and at national events was both educational and invigorating; meeting so many dedicated leaders at the chapter and branch levels, the hardworking people who make our Association strong and a valuable resource to our members; and being able to call the winners of the Top Ten award and enjoying with them this moment of recognition and success is so rewarding. Representing you, the members of APWA, is both humbling and honoring.

As many of you know, my winter was memorable in its own right, but not in a truly positive sense. A necessary surgery at the beginning of January was difficult to accept during this year of APWA service. That however turned out to be minimal when in early February I fell and broke my hip, laying me up for the next 12 weeks. For
my employer, the succession plan we had in place worked as designed, and our operations went on with very little impact. January is generally slow for APWA travel, but I was forced to miss the February Board meeting, and a few chapter events in February and March while I recovered. Where possible President-Elect Ron Calkins and Past President Larry Stevens readily jumped in and covered those obligations.

Again, succession planning at APWA helped the organization to not miss a beat. And I must give a big thank you to so many of you who reached out to me during this time to offer your support and share your thoughts. It meant so much to hear from you all.

As I have traveled over the past two years, I have been so impressed by the dedication and commitment of all our members and volunteer leaders. I have seen strong, vibrant and growing chapters everywhere I went. I have been so excited by the number of younger, emerging leaders I have seen in so many chapters. The participation of these younger generational members reminds me so much of the period in the early ’80s when I and so many of our current leaders became active and began our journey through APWA.

As I mentioned in my comments in Phoenix, I encourage all our members to reach out, share with each other, and learn from each other no matter where you are in age or career. We can all learn from each other.

I am so excited about the newly formed Public Works and Infrastructure Congressional Caucus formed in early June, in which APWA had a guiding hand in its formation. This group of our congressional members will provide a broad, bipartisan group to which APWA and our sister

“We do not inherit the Earth from our ancestors, we borrow it from our children.”

– Native American Proverb
associations can weigh in on our needs and concerns, while we serve as providing the technical expertise to the Caucus and its staff members. This, combined with our National Public Works Week Transportation Roundtable, held in the U.S. Capital Visitors Center, has helped bring far more attention to APWA on the Congressional and Executive Departmental behalf.

I have enjoyed meeting so many of our members, learning their successes and challenges, and offering encouragement where possible. I have enjoyed the hospitality from so many chapters during my travels, from New England to Hawaii, and so many places in between. I thank you for your wonderful welcomes and support. The chapter leaders, the APWA committee members, and so many other volunteers without whom APWA would be unable to do what we do continue to amaze me with the hours of work they put in for all of us to benefit from. You have my enduring appreciation for all you provide, as well as all you’ve given up, to help this organization be the amazing organization it is.

This is not a one-person show, and I must send my thanks and appreciation to the APWA staff who work so hard every day to make sure that your needs are met, and that I get to where I need to be when I need to be there. All of our fifty-plus employees work so hard for you, our members. Scott Grayson, our Executive Director, has hit the ground running and is not only working to know our staff, but also has been traveling across North America to meet our members, and to listen to them. I am confident that he is the right man for the right time in the right place. I know he is excited to be with APWA, and your Board of Directors is excited to have him with us. And to my fellow Board members, thank you so very much for everything this past year. You have made it so very wonderful and stress free, well mostly. Your love and dedication to APWA is so very noticeable in every meeting you attend. It has been my honor to work beside you.

My employer, the City of Largo, Florida, has been so understanding and supportive during this year. Former City Manager Norton Craig, current City Manager Henry Schubert, Assistant City Manager Mike Staffopoulos, and the City Commission have been so gracious as I carried out these duties. Thank you is hardly enough, but I hope it suffices for now.

To my lovely wife Teri I owe a debt of gratitude for allowing me to take this journey. She knows too well the late nights and weekends spent juggling my role as APWA President and my job as Public Works Director. She found herself not only supporting me in this role, but having to nurse me back to health for four months on top of that. I cannot repay that debt.

Lastly, it has been my distinct honor and privilege to represent you, the members of APWA. This organization has been so responsible for my success as a public works administrator and manager, as a knowledgeable professional, and as a volunteer leader. I hope, that when all is balanced out, this year of service to you has been in some measure a repayment for all it has provided me.

Thank you for an amazing year.
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APWA Connect contains familiar tools such as the infoNOW communities, as well as expanded and enhanced technical and networking resources. In addition to infoNOW, APWA Connect now features Committee, Chapter, Networking and User Groups.

Get connected at infonow.apwa.net/welcome.htm!
Tax reform likely to impact public infrastructure financing

Josh Reiner
Government Affairs Manager
American Public Works Association
Washington, D.C.

The rhetoric surrounding the economy often gets in the way of meaningful discussion on the serious economic issues at play. Candidates for the President and Congress in both parties have long made the issue of taxes part of their platform, but “tax reform” has increasingly been mentioned as a goal both parties want. So what are candidates talking about when they talk about “tax reform”? It would involve changing tax rates, deductions, and procedures for businesses and people. These proposals could drastically affect public works by altering or eliminating the provisions that fund our nation’s infrastructure.

There is frequent mention of eliminating “unfair” parts of the tax code to pay for lower income taxes for all. The tax code is littered with these provisions, each inserted over the years as Congress has tinkered with it for its own policy goals. For example, major tax provisions for individuals include the home mortgage interest deduction ($71 billion), and not taxing on employer contributions for healthcare ($145 billion). Minor ones include not taxing military disability benefits ($1.4 billion) and employer transit benefits ($27.1 billion). Deductions important to public works include the exclusion of interest on municipal bonds ($187.7 billion), and private activity bonds for water, and highway projects ($2.9 billion). At a time when local governments face tight budgets, these deductions encourage the free market to invest in infrastructure without raising taxes for all.

While these deductions make sense to public works professionals, they could be eliminated in the coming years as part of tax reform. The need for major changes to the tax code is universally accepted by our nation’s leaders, including President Obama, who capped municipal bonds in his 2016 budget; all major presidential candidates; the chairmen of the tax writing committees in Congress; and the leadership of both chambers. In June, the Chairman of the Ways and Means Committee, Kevin Brady of Texas, released his blueprint for tax reform. His broad proposal includes his plan for lowering of rates, and simplifying the process for paying federal income taxes. It does not mention tax-exempt interest on municipal bonds, either to affirm that it will continue or that it has been eliminated. The lack of clarity shows that Congress is seriously considering eliminating or adjusting it.

The harm to public works and its ability to care for our nation’s infrastructure would be severe. In the last ten years, tax-exempt municipal bonds have funded $3 trillion in critical infrastructure, from roads and schools to water and sewer facilities. Even if the tax-free interest on municipal bonds was capped, the results would be drastic. According to the National Association of Counties, capping municipal bonds at 28% between 2002 and 2012 would have cost state and local governments an additional $173 billion in interest costs. A total repeal of the exemption over that period would have been ever more harmful, with $495 billion in additional borrowing costs for state and local governments.

Public works and those that depend on this funding source must be prepared to defend this part of the tax code to Congress, or the ability to build infrastructure will be at great threat. The APWA Government Affairs team will continue to monitor tax reform proposals impacting public works, engage lawmakers when appropriate, and enlist APWA membership to exercise their grassroots muscle when needed.

Josh Reiner has ten years of experience in government, having worked for the U.S. House of Representatives. He formerly advised Members of Congress in environmental, natural resources, and tax policy. He can be reached at (202) 218-6734 or jreiner@apwa.net.
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UPROW Committee: One of APWA’s busiest Technical Committees

Rita J. Cassida, P.E.
Professional Development Program Manager
American Public Works Association
Kansas City, Missouri

The Utilities and Public Right-of-Way (UPROW) Committee is one of APWA’s busiest Technical Committees. The committee provides education and information to help raise awareness about and promote the best use of the public rights-of-way. It provides a forum where diverse stakeholders can come together to discuss common issues, best management practices, and peaceful integration of all users of the right-of-way. The committee was established as the result of a task force report identifying the need for clarification of common issues arising from the use of the public rights-of-way.

The committee sponsors technical sessions at PWX each year, provides informative articles in the August issue of the APWA Reporter, and sponsors informative Click, Listen & Learn programs.

At PWX this month, the UPROW Committee will sponsor three sessions:

- Trenchless Trends in the Midwest
- Abandoned Utilities: Out of Sight, Out of Mind?
- There’s a New Sheriff in Town: Enforcement Issues in Right-of-Way Use

In addition to the educational sessions at PWX, the committee has been writing articles for this edition of the Reporter. Articles submitted or sponsored by the committee include:

- “Damage Prevention Partnering Process (D3P)” by Hoyt G. Lowder
- “Bringing Cost Effective APWA Training to the Next Generation of Public Works Professionals” by Vic Bianes, P.E. and Rita Cassida, P.E.
- “Right-of-Way Acquisition Process Management Utilizing GIS” by Perry Clark, GISP and Pat Lambert, RWA
- “Developing and implementing a streetlight fee for Salem, Oregon” by Peter Fernandez, P.E.
- “Guidance Statement for Abandoned Underground Facilities” by Al Field
- “Embracing Technology for Damage Prevention” by Mike Sullivan and Derrick Saedal

If you are interested in matters related to utilities or right-of-way, you may want to consider joining an UPROW subcommittee.

If you are interested in matters related to utilities or right-of-way, you may want to consider joining an UPROW subcommittee. There are currently five subcommittees with open membership. You may apply directly to the subcommittee and do not need to fill out an application or go through the appointment process. The time commitment is generally limited to six, one-hour conference calls a year. For more information, contact staff liaison Rita Cassida at rcassida@apwa.net.
The five current UPROW subcommittees are:

- Right-of-Way Management
- Construction Practices/Gas Industry Right-of-Way
- Damage Prevention
- Locating
- Abandoned Utilities

A number of topics being discussed within the subcommittees include: developing best practices associated with abandoned utilities, directional boring, trenchless technology, micro-trenching standards, and rapid broadband deployment; locator certification; utility mark-out standardization; optimization and protection practices within the rights-of-way; identifying technology solutions to enhance operations; and the training and development of future professionals specializing in rights-of-way management.

The current members of the UPROW Technical Committee are:

- Vic Bianes, P.E. (Chair), Assistant Director, Transportation and Stormwater Department, City of San Diego, California
- William Roger Buell, P.E., PWLF, Assistant City Engineer, City of Miami Beach, Florida
- Al Field, President, Al Field and Associates LLC, Phoenix, Arizona
- Rouen Q. Liu, Project Administrator, Hawaiian Electric Company, Honolulu, Hawaii
- Gerald Lundquist, P.E., Director, National Grid, Brooklyn, New York
- Derrick Saedal, Supervisor of UGS, City of Winnipeg, Manitoba
- David L. Lawry, P.E. (Board Liaison), Director of Engineering and Public Works, Village of Schaumburg, IL
- Rita Cassida, P.E. (Staff Liaison), Professional Development Program Manager, American Public Works Association, Kansas City, Missouri

Rita Cassida serves as the liaison to three of APWA’s Technical Committees: Engineering and Technology, Transportation, and Utilities and Public Right-of-Way. She can be reached at (816) 595-5222 or rcassida@apwa.net.
Snow Conference returns to New England

“Probably the best show we attend each year.”

Phyllis Muder
Professional Development Program Manager
American Public Works Association
Kansas City, Missouri

It was 1989 when Hartford, Conn., last hosted the North American Snow Conference. A lot has changed since then. Massive protests brought about the collapse of the Berlin wall and the terror of Tiananmen Square, the Exxon Valdez Oil Spill spoiled Alaska’s wilderness, and the country watched in horror as the “World Series Earthquake” shook Candlestick Park and devastated the San Francisco Bay area.

An English scientist had just invented the World Wide Web and Microsoft forever changed office work with the release of its Office suite. Smartphones did not exist. GIS was for land surveying and AVL was not widely used. The use of computerized controls and RWIS was almost unheard of. Liquids were rarely used and anti-icing and deicing were not common. Concern for winter maintenance’s environmental impacts was just starting.

In 1989, APWA was headquartered in Chicago and had just fewer than 26,000 members. Six hundred thirty delegate attendees came to the Snow Conference and toured an exhibit floor with tabletop displays of 58 equipment manufacturers and material suppliers.

Fast forward to 2016…
The Connecticut Convention Center saw 2,337 people at this year’s Hartford Snow Conference counting all the attendees, exhibitor reps, expo passes and volunteers. The exhibit floor broke records with 48,900 square feet of exhibitor space packed with trucks, equipment and materials in 411 booths representing 211 companies.

In almost everyone’s hand was his or her smartphone containing the APWA conference mobile app. The app provided information on all the education sessions, had the ability to schedule appointments with exhibitors, and linked attendees to social media. The first-ever APWA photo contest was a huge hit with over 100 entries from across North America.

Education remains an integral aspect of the NASC with over 40 educational sessions and eight Exhibitor Solutions Theaters, focusing on current trends in winter maintenance. Topics included subjects not imagined in 1989 such as utilizing alternative fuels, automating paperwork utilizing Web-based tools, and Web-based GIS for winter maintenance.

A key component of the current Snow Conference is the Winter Maintenance Supervisor Certificate workshop held all day on Sunday. This year, 201 attendees earned the certificate after learning about winter maintenance planning, winter weather patterns, proper material and equipment selection and handling, as well as the latest in snow and ice control techniques. They all then savored the delicious refreshments at the Welcome Reception on the exhibit floor.

Monday started bright and early with the Opening General Session. After welcoming remarks from Jennifer Royce Perry, the President of the APWA New England Chapter and Director of Public Works for the City of Exeter, N.H., and Marilyn Cruz Aponte, Acting Public Works Director, City of Hartford, Conn., APWA President Brian Usher took the stage. He acknowledged the plethora of APWA dignitaries in attendance, and then turned his attention to the winners of the Excellence in Snow and Ice Control Award.

Differences between 1989 and 2016

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<thead>
<tr>
<th></th>
<th>1989</th>
<th>Year End 2015</th>
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<tr>
<td>Yearly Inflation Rate U.S.A.</td>
<td>4.83%</td>
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<td>Year End Close Dow Jones</td>
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<td>Industrial Average</td>
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<td>Interest Rates Year End</td>
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<td>Average Cost of new house</td>
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<td>Average Income per year</td>
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<td>1 gallon of gas</td>
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</table>
The Excellence in Snow and Ice Control Award was established in 2008 to promote excellence in the management and administration of public works snow and ice operations, and to promote best practices in snow and ice removal while minimizing environmental impacts. Nominees are evaluated in six categories—materials and handling, equipment, training, community outreach, technology, and environmental practices. This year, three agencies warranted the award with one agency, Orangetown, winning the award for the second time.

The winners of the 2016 Excellence in Snow and Ice Control Award are:

- The City of Longmont, Colorado
- The Town of Orangetown, New York
- The Village of Buffalo Grove, Illinois

For more information on each award recipient, see the May Reporter on pp. 12-13.

Next up was the General Session Talk show moderated by Rick Stinson, APWA Region I Director and Director of Public Works for the Town of Wakefield, Mass. This year highlighted what public works departments across the continent can do to improve their relationships with the public and boost their agency’s image. The panelists included:

- Earle “Chip” Chesley, Public Works Director, City of Concord, N.H.
- Thomas C. Collins, PWLF, Deputy Director, Town of Natick, Mass.
- Kathleen B. Davis, APWA Director of Transportation and Director of Local Programs, Washington State DOT, Olympia, Wash.
- Lee Perkins, PWM, Transportation Operations Manager, City of Lethbridge, Alberta
- Jon D. Tarleton, Head of Transportation Marketing/Meteorologist, Vaisala, Inc., St. Louis, Mo.

Two full days of educational sessions followed with ample time in between to tour and meet with vendors in the exhibit hall. Once again, the Winter Maintenance Supervisor Certificate course rose to the top of the “what was the best session you attended at the conference” responses. Other notable sessions were Direct Liquid Application During and After The Storm; Let’s Talk Road Weather; Gravel Road Maintenance; How Two Towns Survived; New England Storm Stories; Liquids in Snow and Ice Control; and We are Small, But We Are Mighty.
When asked, “What was the most valuable piece of information you learned at this year’s conference?” one responder summed it up well: “No matter who you are or where you are from we all have funding issues, meteorology issues, unrealistic expectations of elected officials and citizens. From Alaska to Connecticut we are all faced with the very same challenges.”

The North American Snow Conference continues to evolve and work to meet the needs of public works professionals charged with winter maintenance responsibilities. We consistently look for new and innovative initiatives, but we need you! The Call for Presentations is now open for the 2017 North American Snow Conference, April 23-26 in Des Moines, Iowa. Go to the Call for Presentations tab on the APWA website to submit your proposal.

When attendees were asked what sessions they would like to see at the next show, most responses resembled this one: “Much the same as this year—weather, liquids, alternative fuels, equipment, budget.”

However, the following are some specific topics requested.

**Management/Leadership:**
- Contract administration/spec writing for plowing residential streets
- Drug use in public works – how to combat it
- Managing a team where much tension exists
- How to manage subcontractors
- Changing staff, running shifts effectively
- How to implement change/leadership training
- More in-depth public relations experiences

**Daily Operations:**
- More on salt management
- More topics on liquid applications
- Route planning and optimization
- Liquids and studies on cutting edges
- More on anti-icing

**Equipment & Fleet**
- Possibly setting up different trucks with plows, wing plows, sanders, light bodies, liquid tanks; the differences in truck manufacturers and how they differ or are the same
- Truck building and specifications
- Soft and/or flexible plow blades less destructive to pavements
- Some equipment spec’ing
- More vehicle maintenance specific topics
- More fleet-related concerns

**Weather & Environmental Impacts**
- Environmental implications and expanded info on BMPs for stormwater
- More weather classes
- Salt alternatives
- Road weather forecasting

**Special/Peripheral Operations:**
- More on snow storage site and facilities
- More plowing in open areas on highways
- More about dirt roads and maintenance
- Care of bridge surfaces and expansion joints
- Bike lane snow maintenance
- Sidewalk anti-icing and snow removal
- Techniques on loading snow out of urban areas

**Innovation:**
- Innovative products and techniques
- LED lighting and safety lights – what is best on the market for improving safety
- New technology
- Don’t know yet. Technology is moving fast. Best way to say it is...I don’t know, what I don’t know.

Still wondering if the next year’s North American Snow Conference is for you and your agency? This is what other agencies said about their experience:

“Probably the best show we attend each year. Very pertinent information from people who actually do this work.”

“Loved the whole show...got about 40% new knowledge in the classrooms and the other 60% from other attendees and vendors... just awesome show.”

“Education sessions were topnotch. Exhibit floor was great. Facility was excellent.”

See you next April in Des Moines!

Phyllis Muder can be reached at (816) 595-5211 or pmuder@apwa.net.
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Karen Mondora, P.E.
Assistant to the Director of Public Services
City of Farmington Hills, Michigan
Member, APWA Diversity Committee and Projects of the Year Awards Committee

Believe you can and you’re halfway there.” – Theodore Roosevelt

It’s often said that the key to success is self-confidence. How many times have you been able to secure a positive outcome in a situation simply by giving off an air of self-assurance, poise or composure?

We can have all the brains in the world, but if we lack self-confidence it can be hard to speak up in difficult situations. How can we think outside the box, bring up a new idea, break with convention, ask for a raise or go for that promotion if we’re hesitant and uncertain?

Building strength and confidence in yourself and your coworkers requires dedication, but the rewards are worth the effort. Confident people are self-motivated and willing to take risks.

Here are ten ways to cultivate confidence in the workplace:

1. **Provide experiences with diversity.** Expanding diversity in the workplace is a good way to inject fresh ideas into homogenous groups and promote thinking outside the norm.

2. **Catch people doing good work.** It doesn’t take much to make someone feel valued. A simple, “Hey, I heard you did a great job.” Or “I like how you kept your composure and resolved that issue.” Or even just saying “Thank you” can provide a much-needed boost.

3. **Don’t assume people know how good they are.** Use those dreaded performance reviews to your advantage. Encourage people to keep a running list of their accomplishments. It’s easy to just do the job and move on to the next assignment, but at the end of the year, it can be very fulfilling to see a laundry list of achievements.

4. **Embrace differences.** That young whippersnapper may have a great new approach or that veteran old-timer may actually teach you a thing or two!

5. **Maintain professionalism and respect.** You may think that using a pet name for someone shows affection, but referring to someone as “Honey” or “Sweetie” can come across as condescending and highly offensive.

6. **Pay attention.** When you pay attention to what others are saying, it shows respect and motivates others to come to you with their thoughts and ideas.

7. **Delegate step by step.** Competence and confidence are intertwined. Throwing employees into the deep end works sometimes, but only if they don’t drown in the process. Provide opportunities for progressive responsibility.

8. **Encourage networking.** Help employees make connections with colleagues from other organizations. Encourage them to get involved in APWA branch and chapter activities.

9. **Offer mentoring opportunities.** Provide a chance for employees to teach others. Take note of their best skills and encourage them to share those with other team members. Confident employees take ownership of projects and shepherd them to success.

10. **Ask questions.** It’s tempting to provide the answers, but try to lead conversations with a question. If a successful idea or workflow comes from staff, it can be empowering and confidence boosting.

Employees are the heart and soul of any organization. When employees are confident, everyone succeeds. Engaged employees are better spokespersons for themselves and for the agency. When you boost employees’ self-confidence, you boost productivity and positivity—a win–win situation for everyone!

Karen Mondora can be reached at (248) 871-2534 or kmondora@fhgov.com.
Superiority is a beautiful thing.

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CPII certification draws attention to your fine-tuned skills in infrastructure inspection

Caleb Edwards, CPII
Inspector
ms consultants, inc
Indianapolis, Indiana

As an inspector and project manager working for civil engineering consulting firms, I have participated in the public works industry for eight-plus years. I have participated in roles from a sub-consultant inspector position for an airport apron replacement in northern Indiana, to a consulting project manager onsite for the City of Indianapolis Department of Public Works–Engineering (DPW), and finally, as a consulting Resident Project Representative (RPR)/inspector for many utility, roadway/interstate, and sidewalk projects for clients across Indiana.

An APWA certification was pursued because, although my Bachelor of Science degree in Construction Engineering Management Technology (CEMT) from Indiana University–Purdue University, Indianapolis (IUPUI) provided excellent opportunities to work in the construction industry, my career in the civil engineering consultant industry required additional complements to the bachelor’s degree. Once my career had a good start in civil engineering specifically, clients in Central Indiana made their desires clear, through their Request for Qualification (RFQ) process, that they prefer specialized certifications and/or graduate degrees/licenses in addition to work type-related undergraduate degrees. After careful consideration of available options and client input, APWA’s Certified Public Infrastructure Inspector (CPII) certification complimented my current Bachelor of Science degree and provides a good fit to help build the qualifications submittals of the firm I work for, ms consultants.

My past experience, especially working as a service provider project manager for the City of Indianapolis DPW, contributed greatly to my eligibility and maintenance of the CPII certification. The experience as a City of Indianapolis DPW project manager included assistance in RFQ reviews and selection, design management, construction contract bidding and selection, contractor and inspection firm contract management, construction oversight and management, and project closeout. Additionally, my position as an RPR/inspector at ms consultants, inc., has provided experience in sub-inspector team management, billing to the client, and of course, inspector duties such as daily and weekly reports, contractor schedule evaluations, quantity and quality management of construction project materials, coordination of and leading progress meetings, change order processes, review and recommendation for approval of contractors invoices, and submitting of final construction records.

In preparing for the CPII exam, my B.S. degree in CEMT from IUPUI provided an excellent foundation for construction management activities, especially mathematical-related inspection routines. Additionally, reviewing the CPII exam content

Projects with a CPII on the technical team are likely to receive the best inspection quality and efficiency of current industry and business practices, such as the Cruse Street upgrades project in Indianapolis, Indiana.
As a CPII, the certification has provided quality assurance of current inspection practices to my peers, clients, and the contractors that I work with. In return of the increase in acknowledged quality, more opportunities with greater responsibilities to lead project inspection and management have become available from clients and peers. The CPII also testifies to my skill set and thus providing potentially unique, one-off assignments which have allowed me to build new and extend existing customer relationships benefiting both my career and my employer.

Having the CPII has benefited ms consultants in winning contracts through the RFQ process. Having a CPII on the proposed project team shows potential clients that a technical team member has the required experience and skills to assist in making the project a success according to the client’s metrics. For example, a CPII certification tells the potential client that although a technical team member may or may not have an undergraduate degree in the related field, that they do have a significant amount of field experience that utilizes specified construction inspection skills. Additional confidence and trust from the client has been granted to me during inspection projects thus allowing the client’s project manager to efficiently manage their other priorities as well.

Additionally, my community has benefited from the CPII certification through improved inspection quality and cost control. Projects with a CPII on the technical team are likely to receive the best inspection quality and efficiency of current industry and business practices. Quality inspection from the project’s CPII lowers the community’s risk of having excessive future maintenance and repair efforts, while also potentially reducing actual inspection fees from increased efficiency of inspection tasks.

Unlike becoming a licensed Professional Engineer, Certified Construction Manager, or Project Management Professional, the CPII certification specifies your skills and responsibilities to infrastructure inspection only. Although the other credentials mentioned above are great accreditations, they allow a multitude of career potentials across the entire construction industry and potentially others. The CPII is solely focused on infrastructure inspection quality and thus assures to your employer and clients that your professional focus is only infrastructure inspection.

The CPII certification draws attention to your fine-tuned skills in infrastructure inspection. Pursuing and receiving the certification will help you and your employer stand out during project team selections. And finally, the CPII certification will help anyone wanting to fulfill an advanced level career with the most current knowledge and practices through continued education requirements.

Caleb Edwards can be reached at (317) 566-0050 or CEdwards@msconsultants.com.
As industry leaders, we need to continue to raise awareness of public works! Most people don’t even think about who fixes that traffic signal, or who fills that pothole, or who brings drinking water to our homes, or where the water goes when we flush the toilets, or who fixes the police cars so they can respond to emergencies...and the list goes on.

From cities, counties, or state agencies, to engineers, consultants, contractors, inspectors, and vendors that work for these agencies, we are the men and women that make the quality of life better and improve our communities every day by providing core services (streets, drainage, transportation, environmental protection, fleet maintenance, drinking water, wastewater treatment, solid waste collection, signs, streetlighting, traffic signals, pavement markings, facility maintenance, engineering, emergency response, surveying, and so much more!!!).

This awareness starts with YOU as a public works professional. Just sharing what you do with your family and friends can make a HUGE impact. When I was the Public Works Director for the City of Palm Bay, I experienced the difficulties in convincing city leaders that public works was an essential service, just like police and fire, and that we needed more funding and more staff to provide the essential services to the city. We worked behind the scenes in making sure our emergency service departments safely got to their emergency without their vehicles breaking down, or without a huge pothole in the way; yet, I felt that they had a stronger voice. I decided that we needed to share with our community what their local Public Works Department did for them, as I was confident that most people did not know we existed. With this awareness, I hoped the community would see how we were part of their everyday lives, and hoped they would be our advocate to increase our resources, which in turn would improve their quality of life. With those challenges in mind, we created a video that highlighted our services in Palm Bay and debuted it at our annual update presentation for our City Council, then posted it on our website and shared it with everyone. I also shared the video with my friends and family, and was surprised to see how many of them knew I worked for a city, but had no idea what I did. Again, just sharing what you do with those close to you can make a HUGE impact!

Public Works is EVERYWHERE, yet most people don’t even know we exist. Let’s change that and show people what we look like and what we do! Nowadays, everyone has a phone with a camera and easy access to their social media sites—let’s start a new movement and create #iampublicworks on all the social media outlets. When you are doing your normal, everyday public works thing that you do, take a picture and post it to your social media site with a caption of what you are doing, and with #iampublicworks to share with your network. Also, you can show your support on social media by supporting our Twibbon campaign at: http://twibbon.com/Support/i-am-public-works.

Show the world the AWESOME work you do for them!

Elia Twigg can be reached at (407) 829-7818 or etwigg@targetengineering.com.
SAFETY AND CONTROL ARE ESSENTIAL

DRIVABILITY MATTERS

“It doesn’t matter if I’m on the job scouting locations for my next big stunt or planning a weekend getaway with my family: Safety is my top priority. That’s why asphalt pavements are always my first choice. They are smooth, skid-resistant and have excellent gripping power, making them the safest choice. Asphalt pavements give me the control I need to perform on the job, and the safety I want when traveling with my family. That matters.”

-Jeremy Fry | Stuntman | Family Man

A SAFE RIDE
It’s just one of the ways asphalt delivers drivability.

The Asphalt Pavement Alliance is a partnership of the Asphalt Institute, National Asphalt Pavement Association, and the State Asphalt Pavement Associations.
Awards 2016

APWA’s Awards Program recognizes outstanding individuals, groups and chapters representing the best in public works. In the May issue of the APWA Reporter we announced the recipients of the Top Ten Public Works Leaders of the Year Award and the Excellence in Snow and Ice Control Award; and in the July issue we announced the recipients of the Public Works Projects of the Year Award. In this issue we announce the rest of this year’s award winners, recognizing their achievements in excellence demonstrated by their vision, passion and delivery of service to their communities.

Presidential Leadership Award

The Presidential Leadership Award is presented by the APWA President to members who have distinguished themselves and the public works profession with their leadership. APWA President Brian Usher selected James F. Owens, Sales Manager, Falls Snow Plows, Little Falls, Minnesota, and Christine Walsh, Director of Operations (retired), City of Beloit, Wisconsin.

James F. Owens
Sales Manager
Falls Snow Plows
Little Falls, Minnesota

“Jim has been a tireless supporter of the APWA conferences for more than 30 years, and he has been a fixture at both the annual Congress (now PWX) and the North American Snow Conference,” said President Usher. “Beginning in 1993 Jim began his formal participation as a member of the Product Users and Suppliers Council with APWA. Beginning in 2002 he was appointed a member of the Exposition Advisory Committee, serving as this group’s chair for two years. He served for nine years on the Congress Site Selection Committee, providing a vendor’s perspective on the needs and concerns as locations were reviewed for hosting Congress. Jim was more often found inspecting the loading docks and ramps at the convention centers than he was inspecting hotel or meeting rooms.

“APWA could not provide the support and assistance we do for our members and chapters without the ongoing help and participation of our vendors at our trade shows, as well as those shows undertaken by our chapters across North America. Jim is well known across the continent for his participation in not just our national shows, but for support of numerous chapter events as well. His unwavering, dedicated and tireless support, and leadership in the vendor community of APWA, deserves to be recognized.”

Christine Walsh
Director of Operations (retired)
City of Beloit, Wisconsin

“Chris has been tireless in her pursuit of recognition by others regarding the role of public works in emergency management and disaster response,” said President Usher. “Beyond her six-year term on the Emergency Management Committee, two years chairing the committee, she also has traveled to Washington, D.C. on short notice numerous times to represent APWA and public works at meetings with federal departments, congressional staffs, and has testified before a congressional briefing group. She has authored numerous articles and white papers which APWA used to educate our federal partners on the involvement of public works in diverse emergency management issues including the impacts on public works from agricultural emergencies, such as the Avian Flu, and the impact of pandemic illness on the operations of public works.

“Chris is a member of the APWA Professional Development Committee serving for the past three years. In Wisconsin she was appointed to the Governor’s Recycling Market Development Board for six years, and chaired this group for three years. She has served on the Wisconsin Chapter’s Solid Waste Committee, and chaired this committee, as well as served on the chapter’s Emergency Management Committee. She has fostered an ongoing pilot program now in its seventh year with the University of Wisconsin, developing

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simple Hydrogen Generating Cells which power various city vehicles. In these and so many other ways Chris has distinguished herself, brought credit to our profession, and provided leadership at all levels of our organization.”

Young Leader Award

The Young Leader Award recognizes APWA members who have demonstrated an initial commitment to the profession and the Association and display potential for future growth within the Association. The award promotes the concept that length of career does not necessarily indicate leadership abilities or potential for service. (Three recipients)

Lauren J. Behm
Management Analyst
Pierce County Public Works
Tacoma, Washington

Lauren Behm is a Management Analyst with the Airport & Ferry Division of Pierce County Public Works in Tacoma, Washington. She is an active member of the APWA Washington Chapter and has worked in the public works field for 10 years. As Management Analyst, Behm develops and monitors operational budgets for the airport fund and the ferry fund. She is also responsible for performance measures, process improvement, property management, policies and procedures, contract management and many other aspects of Division operations.

In 2014, Behm participated in a Process Improvement Project for airport accounts receivable related to tenant leases. She acted as the representative from the Airport & Ferry Division and worked with staff from Contracts, Fiscal, and Budget & Finance. The project evaluated the current process, identified problems, ideas, opportunities, and gaps. The team then developed an implementation plan including procedures, tool kits, communication plans, and performance measures. They trained staff, communicated changes to customers, and worked for six months to clean up existing issues with airport leases. Behm continues to lead lease management for the Airport & Ferry Division. The work done on this Process Improvement Project will continue to positively impact the airports for years to come.

Frank Lopez, P.E., QSD, CFM
Director
Harris & Associates
Salinas, California

Frank Lopez currently works as a Director at Harris & Associates, within the firm’s Community Services market sector, which serves public agencies. He is a client manager for numerous clients in the Monterey Bay region, including the cities of Salinas, Soledad, Gonzales, Seaside and the County of Monterey. Lopez is recognized as a stormwater expert; he has presented at several organizations on the topic of low impact development, including outreach to city councils. He has begun to grow Harris’ stormwater consulting practice, sharing his knowledge with agencies and fellow employees in webinars and recaps of conferences.

Lopez has been invited to join various advisory committees as a technical expert and as a representative for various agencies. He has served as a member of the San Luis Obispo County Technical Advisory Committee on Low Impact Development and Hydromodification, and is also an active member of California’s Central Coast Regional Water Quality Control Board Joint Effort Review Team. Recently, he was asked to take part in a committee tasked with developing a cost-effective stormwater BMP assessment tool to be used by agencies on the Central Coast in order to comply with the NPDES Permit. Lopez’s contributions to the stormwater arena have led to collaborative efforts between agencies.

Paul “Andrew” Parker
Assistant Public Works Director
City of Dalton, Georgia

After graduating magna cum laude with a major in civil engineering from Southern Polytechnic State University in 2010, Paul “Andrew” Parker began his career with the City of Dalton Public Works Department as Project Manager and was promoted to Assistant Director in 2013. Parker has been instrumental in the development and implementation of new programs and initiatives, including the implementation of a new stormwater management plan that has led to significant improvements in water quality in the city. Parker is a valuable asset to the city, and his contributions have been instrumental in the development and implementation of new programs and initiatives.
Manager. In 2014 he was promoted to his current position as Assistant Public Works Director where he assists the director in managing and planning the daily operations of 70 employees, in seven divisions, who provide essential public works services to the city’s 33,000 residents.

As a member of APWA, Parker has served as an officer of the Northwest Georgia Branch; served as District 7 director on the chapter’s Executive Committee; developed and maintained the chapter’s website; and is the Georgia Chapter representative on the National Young Professionals Steering Committee. In 2014, he was appointed to the APWA National Projects of the Year Awards Committee and also served as co-chair on the committee in 2016. Parker is serving as Vice President of the Georgia Chapter in 2016.

Emerging Leaders Academy

APWA’s Emerging Leaders Academy provides ongoing leadership and management training within the context of public works, encourages professional growth through a strong network of peers, and offers an in-depth introduction to APWA at the national, chapter and branch levels. Sixteen candidates were accepted into the ninth class of the Academy based upon their short tenure in the field of public works, their interest in advancing their careers within the profession, and a firm commitment of their time and effort to the program.

Members of the Class of 2016 Emerging Leaders Academy:

- Ryan K. Betz, City of San Luis Obispo, California
- Ben Carroll, City of Greenville, South Carolina
- Frances D. Ellerbe, EIT, Woolpert, Inc, Columbia, South Carolina
- Britt Elmore, City of Chattanooga, Tennessee
- Chad Findlay, City of Ottawa, Ontario
- Matthew Goolsby, CFM, P.E., CDM Smith, Jacksonville, Florida
- Leslie Green, City of Mississauga, Ontario
- Samantha A. Hayden, P.E., City of Ankeny, Iowa
- Jose M. Leon, Jr., City of Roeland Park, Kansas
- Heather Maloney, City of Napa, California
- Jordan Ottow, City of Monroe, Washington
- Christopher Peal, City of Temple, Texas
- Michael J. Pepin, City of Meridian, Idaho
- Eric J. Seaburg, City of Golden Valley, Minnesota
- Michael Wodalski, P.E., Village of Weston, Wisconsin

Sustainability Practices Award – Individual

To recognize individuals, teams or organizations that have made outstanding contributions to promote sustainability in public works. Sustainability is accomplished by the efficient delivery of infrastructure in an environmentally and socially responsible way that ensures the best choice in the long term.

Mike Faha, PLA, ASLA, LEED AP
Principal/Landscape Architect
GreenWorks, PC
Portland, Oregon

Sustainability Practices Award – Program/Organization

To recognize individuals, teams or organizations that have made outstanding contributions to promote sustainability in public works. Sustainability is accomplished by the efficient delivery of infrastructure in an environmentally and socially responsible way that ensures the best choice in the long term.

Faha and GreenWorks provided the design work for the new Dundee Wastewater Treatment Plant. GreenWorks incorporated natural landscaping, sustainability and stormwater management in their conceptual alternatives. In Dundee, there was an opportunity to make a community asset from some of the acreage. About 40 acres in size, the plans call for protecting and restoring recognized priority habitats such as wetlands, riparian forest and shrublands, and Western Oregon oak woodland and oak savannah, and establishing a small area in the northwest corner of the site that provides access for passive recreation, a nature-based play area/playground, and the interpretation of environmental, cultural, and historical values associated with the site.
City of Coon Rapids, Minnesota

The City of Coon Rapids has been a leader in sustainable and innovative practices for decades and continues to strive to meet the changing needs of our residents. Coon Rapids is a largely developed city with a large amount of residential property, commercial property and redevelopment areas. With specific goals of redevelopment and innovation, the City has looked for ways to integrate sustainable practices in every new building, project and development. These goals and policies are supported by City Council, City staff, citizen advisory commissions and residents, which is illustrated by their success. Sustainability in Coon Rapids encompasses three key areas: environmental, social and economic sustainability.

In March 2014, Coon Rapids became part of the MN GreenStep Cities program as a Step 1 City. This voluntary challenge, assistance, and recognition program has helped the City of Coon Rapids recognize and acknowledge its sustainability goals. The program consists of 29 Best Practices in various areas of sustainability with specific criteria to gain credit for each. By participating in this program, Coon Rapids has identified past and current practices related to various aspects of city and community sustainability. Currently, the City has completed 13 of the 29 Best Practices in the GreenStep framework, qualifying Coon Rapids as a Step 2 City. This program has also allowed the City to compare themselves to neighboring cities, and utilize valuable resources such as City ordinances, best practices and more.

Professional Manager of the Year Award – Administrative Management

The Professional Manager of the Year Award in Administrative Management seeks to recognize outstanding achievement in the area of administration within the public works department and to inspire excellence and dedication in the public sector by recognizing the outstanding career service achievements of administrative professionals.
As the Administrative Manager for the City of Brookline’s Department of Public Works, Julie Piacentini is responsible for coordinating and organizing all clerical and administrative activities of the central administrative office and the Commissioner’s office. She provides assistance to all of the DPW’s professional staff as needed. Her job functions require the exercise of considerable judgment and a broad knowledge of department operations. She is responsible for carrying through entire functions that are essential to the office.

One of several innovations that Piacentini has spearheaded is DPW Day in Brookline. As a true champion of public works awareness she led this event in 2006 and has been doing so each year ever since. Brookline’s DPW Day is an incredible outreach tool that educates the public on the role public works has in enhancing the quality of life for everyone. Students and families of Brookline who have participated have seen some of the functions of Engineering, Highway, Parks and Water Divisions. The divisions set up stations and demonstrate their role in the community. Piacentini contributed an excellent article about DPW Day in the March 2007 issue of the APWA Reporter.

Professional Manager of the Year Award – Engineering and Technology

The Professional Manager of the Year Award in the Engineering and Technology category recognizes the outstanding career service achievements of engineering and technology professionals.

Edward “Ed” Roberge, P.E.
City Engineer
City of Concord, New Hampshire

Edward “Ed” Roberge’s extensive experience in the engineering field has enabled the City of Concord to flourish, especially with his direct involvement in the US Route 3 Corridor Improvement Program (2007). He was responsible for the planning, design, and construction of this 6.6-mile, multi-phased “Complete Street” corridor project, improving transportation for the city. Additionally, the project included extensive public participation, particularly during the Penacook Village (Concord’s 2nd Downtown) reconstruction phase, where village safety and streetscape improvements followed the undergrounding of aerial utilities.

Roberge also works to create viable engineering options for sustainability in the City of Concord. Struggling with the impacts of continued street cuts in newer pavements, Roberge and the Engineering Services Division conducted considerable research and led an advisory committee to explore options to protect against long-term street cut damage. He introduced an amended Street Excavation Ordinance, adopted by City Council, authorizing the assessment of street damage fees to utilities and contractors to open-cut city streets. This ordinance was the first in New Hampshire to create a mechanism where street maintenance is sustainable. Not only does this initiative aid in the transportation welfare of Concord, but also in the sustainability of the engineering industry as a whole.

Professional Manager of the Year Award – Facilities and Grounds

The Facilities and Grounds Professional Manager of the Year Award seeks to inspire excellence and dedication in the public sector by recognizing the outstanding career service achievements of facilities and/or grounds management professionals. The focus of this award is the recognition of exceptional leadership and management in the field of facilities and/or grounds.

Nick Caggiano
Superintendent of Parks & Recreation
City of Nashua, New Hampshire

Nick Caggiano has continuously worked in the Green Industry since 1979, while completing and after
finishing his Associate’s Degree in Applied Science Recreational Land Management from the State University of New York in Cobleskill, New York in 1980. After graduation, he worked in the private sector as an Operations Manager for 20 years before shifting to the public sector in the City of Nashua. For the last 16 years, Caggiano has served as the Associate Manager of Park Maintenance and subsequently the Superintendent and Tree Warden for the Parks and Recreation Department.

To support the efforts of his team, Caggiano’s involvement with the New England Park Association and New England Sports Turf Association has allowed Nashua to host regional workshops. These workshops have drawn over 100 peer professionals to various Nashua facilities to learn about the concerted efforts of the team. With the added support from industry professionals, members of the Parks & Recreation Department have learned new techniques through the educational programs offered at these various training events.

Professional Manager of the Year Award – Public Fleet

The Professional Manager of the Year Award in the Public Fleet category recognizes the outstanding career service achievements of public fleet management professionals with the award’s primary focus on exceptional leadership and management of public sector fleets.

Melvin L. Garrett
Assistant Fleet Director
Charleston County Government
North Charleston, South Carolina

Melvin Garrett has served as the Assistant Fleet Manager for Charleston County Government since 1990. His approach in achieving a successful fleet operation has been to properly equip the maintenance facilities with state-of-the-art equipment and adopt industry standards for technician credentialing and certification. Both strategies have paid off in the retention and recruitment of qualified technicians. In just the past three years, more than 85% of the Fleet technician staff have achieved the Institute for Automotive Service Excellence (ASE) certification for critical repair disciplines and resulted in negligible staff turnovers.

As a charter member of the County’s Vehicle Review Board (VRB), Garrett provides expert insight on vehicle performance and manufacturer’s technical specifications in the safe operation of County-owned and-operated equipment. As a primary member of this board, he conducts reviews of each referred accident taking into consideration all available documents, reports, testimony or other relevant evidence. Board members regularly confide in his reviews and analysis of events and equipment capabilities to do whatever is necessary to prevent accidents and the unsafe operation of County equipment.
Professional Manager of the Year Award – Public Works Emergency Management

Kürt Blomquist, P.E.
Public Works Director/Emergency Management Director
City of Keene, New Hampshire

Kürt Blomquist understands the crucial role that public works professionals play in emergency management. His leadership is evident in his history as an Air Force officer and his management during emergency situations in Keene, including floods and extreme winter weather. Throughout his career, he has continuously demonstrated his passion for emergency management and public works, from serving on various local, state and national committees, to educating public works agencies and communities at conferences. Whether he is sharing the importance of public works personnel with others or working with the Keene Police and Fire Departments, Blomquist nurtures his interest and knowledge in emergency management and encourages others to appreciate the vital role this industry plays in ensuring a safe community.

As the City’s Public Works Director, Blomquist works directly with the other emergency response departments. Since his appointment, he has been involved with responding to and recovering from eight Federal Disaster Declarations events impacting the City of Keene. These events ranged from severe winter weather to major floods. During these difficult circumstances, he served as the lead for the public works response, advising senior management, leading the City’s recovery actions, as well as interfacing with state and federal agencies.

Blomquist provided the public works lead for the city’s largest community event, Keene Annual Pumpkin Festival, which brought in over 50,000 people to the city’s downtown area.

Professional Manager of the Year Award – Solid Waste

Mike Mundell
Solid Waste Manager
City of New Braunfels, Texas

Mike Mundell is the manager of the Solid Waste and Recycling Division of the Public Works Department for the City of New Braunfels. He has served as a municipal solid waste manager in Texas for 11 years, holds a Texas Municipal Solid Waste “A” license, and is a voting member of the Alamo Area Council of Governments (AACOG) Resource Recovery Committee (RRC). Mundell also manages the quarterly bulky goods drop-offs program, three annual household hazardous waste collections events, and one electronics recycling drop off event, that are all free of charge to residents.

Recognizing the significant growth rate in the community, Mundell’s strategic planning initiative includes expanding operations to ensure that the Solid Waste and Recycling Division can continue to provide an adequate level of service to the community. He has added additional staff and specialized equipment, such as a grapple truck, to expand on the services of bulky trash and brush collection. He has expanded his management team to improve the span of control in the residential and recycling collection subdivision. Mundell has also added a Recycle Center staff to expand the opportunities for participation at the Recycle Center and outreach and education for the residents of the community.

Professional Manager of the Year Award – Transportation

Debbie Hale
Executive Director
Transportation Agency for Monterey County
Salinas, California

Mike Mundell is the manager of the Solid Waste and Recycling Division of the Public Works Department for the City of New Braunfels. He has served as a municipal solid waste manager in Texas for 11 years, holds a Texas Municipal Solid Waste “A” license, and is a voting member of the Alamo Area Council of Governments (AACOG) Resource Recovery Committee (RRC). Mundell also manages the quarterly bulky goods drop-offs program, three annual household hazardous waste collections events, and one electronics recycling drop off event, that are all free of charge to residents.

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Debbie Hale became the first woman, and more notably the first non-engineer, to serve as the Executive Director of the Transportation Agency for Monterey County (TAMC), in 2006. She joined the agency in 2001, and has worked there for almost 15 years. Under her stewardship, TAMC has facilitated the delivery of more than $400 million in regional transportation projects to make travel safer and more convenient for visitors, residents and businesses. Under her guidance, the agency has secured funding and helped deliver large and small transportation projects that have dramatically changed the landscape of Monterey County. As a result, the region’s transportation improvements have saved lives, improved commerce, created healthier transportation choices and enhanced the quality of life in Monterey County.

Hale and her agency have taken on several projects and programs to create a more sustainable transportation future. This year, the agency is completing its second federally-funded use of the INVEST sustainability evaluation tool, a project that includes training other agencies in its use. Last year, TAMC adopted the Marina-Salinas Multimodal Corridor Plan, which developed conceptual designs for future high-quality transit services and regional bicycle connections, and new bike lanes in the corridor were just striped as a direct result of that plan. In 2014, TAMC adopted Complete Streets guidelines to assist local jurisdictions in planning, designing and implementing projects that are more sustainable, and serve all modes of travel.

**Professional Manager of the Year Award – Water Resources**

*The Professional Manager of the Year Award in the Water Resources category recognizes outstanding career service achievements of water resources professionals.*

**Andrew M. Pappastergion**

Commissioner of Public Works  
**Town of Brookline, Massachusetts**

Throughout his public works career of more than 45 years, Andrew M. Pappastergion has been a leader in protecting and enhancing water resources in his community and in Greater Boston. As Commissioner for Brookline’s nearly 60,000 residents, Pappastergion directed the $38 million rehabilitation of the Town’s entire water system and helped implement a $92 million project to improve flood control, improve ecosystems, and restore the historic Muddy River. Under his direction, the Town of Brookline also implemented the AquaHawk utility customer portal, a fixed network system that provides users with water leakage and usage threshold alerts with the ultimate goal of reducing water consumption and property damage. Pappastergion has demonstrated the use of new, innovative ideas and technologies that have advanced the effectiveness of water resources management and water treatment. In particular, as the waterworks leader on the Massachusetts Water Resources Authority’s Board, he played a key role in the design and construction of the Authority’s John J. Carroll Water Treatment Plant, which was completed in 2005. As the senior member of the Water Policy and Oversight Committee, Pappastergion made key decisions regarding the appropriate treatment technology for the new plant that ultimately provided for both ozone and ultraviolet light treatment for disinfection in compliance with the EPA’s Long-Term Enhanced Surface Water Treatment Rule.

**Citation for Exemplary Service to Public Works**

*The Citation for Exemplary Service to Public Works recognizes a nonmember of APWA who is an eminent government or other public service leader for their far-reaching, positive impact on local, state or national public works programs, services, or policies.*

**Kevin Western**  
State Bridge Engineer  
**Minnesota Department of Transportation**  
**Oakdale, Minnesota**
Kevin Western has made a profound impact on the bridge program in the State of Minnesota through his technical abilities, leadership, and community outreach. He began his career at the Minnesota Department of Transportation (MnDOT) in 1987 as a designer in the Bridge Office. During his 29-year tenure in the Bridge Office, he has held many roles, including a Design Unit Leader, Structural Standards Engineer, State Aid Bridge Engineer, State Bridge Design Engineer, Metro Area Engineer, and currently the Major Projects Bridge Engineer.

The Trunk Highway (TH) 53 relocation project in Virginia, Minnesota, included the design of a major bridge on a very aggressive schedule with challenging site conditions. The potential cost to the State of Minnesota of not completing the project in a timely fashion was significant. Not pursuing the project would have been tremendously detrimental to the communities served by the roadway. Western was able to lead the design of a bridge that was both economical to construct and could be completed in the very limited time available.

**Charles Walter Nichols Award for Environmental Excellence**

The Charles Walter Nichols Award for Environmental Excellence was established to recognize outstanding and meritorious achievement in the environmental fields in its broadest sense. This may include, but is not limited to, street sanitation; refuse collection, disposal and recycling; sewers and sewage treatment; and water supply and water treatment.

**Daniel Nix**

Utilities Operations Manager
City of Wichita Falls, Texas

Daniel Nix has worked on numerous environmental sustainability projects during his career with the City of Wichita Falls, Texas. He is responsible for the creation of a Texas specialty license plate that promotes water conservation throughout the state and funds a scholarship program within the Texas Section AWWA (American Water Works Association). He has revised and implemented the City of Wichita Falls’ Water Conservation/Drought Contingency Plan, saving 6.9 billion gallons of water thus far through this extended drought. He has implemented changes to the Distribution Flushing Program to reuse all of the water that is flushed from fire hydrants.

Nix’s most recent, and most pioneering, contribution in the field of environmental sustainability (not only locally but throughout the world) is his development of the Direct Potable Reuse (DPR) project for Wichita Falls. This project is supplying five million gallons of drinking water each day from treated wastewater effluent. Coupled with the reduction in water demand from conservation, the DPR project has lowered the demand on the lakes from 12 MGD to 7 MGD in the summer months of July/August for a population of 140,000 people served. All of this has helped to extend the City’s water supply an additional four years through this ongoing drought.

**Harry S. Swearingen Award for Outstanding Chapter Achievement and Excellence in Chapter Service – Individual**

The Harry S. Swearingen Award was established to recognize outstanding service to APWA as an individual member or corporate company member at the chapter level.

**Angela Popenhagen, P.E., LEED AP**

President
Stevens Engineers
Hudson, Wisconsin

Angela Popenhagen has been a dedicated and truly active member of the Minnesota Chapter, a fairly large chapter of APWA. From 1994, when she first joined APWA, to now, the chapter has ranged from 800 members to over 1,000 members currently. With this many members, one would expect an overwhelming number of volunteers. However, Popenhagen’s leadership and willingness to become involved in numerous initiatives has demonstrated her ongoing commitment to the Minnesota Chapter and APWA that is above and beyond the typical volunteer.

For more than 20 years Popenhagen has continued a trend of personal and professional growth in active Minnesota Chapter committee volunteerism and chapter leadership on the Executive Committee as
a Director, Secretary/Treasurer, Vice President, President and Past President, and most recently served two consecutive terms as the Chapter Delegate. In her spare time, Popenhagen also volunteered to serve on the Hospitality Committee for the 2005 APWA Congress hosted by the chapter, and currently serves as the chapter’s 2016 PWX Conference Planning Committee Co-Chair and is an active member of the chapter’s History Committee.

**Harry S. Swearingen Award for Outstanding Chapter Achievement and Excellence in Chapter Service – Corporate**

The Harry S. Swearingen Award was established to recognize outstanding service to APWA as an individual member or corporate company member at the chapter level.

**Bolton & Menk, Inc.**

Mankato, Minnesota

Bolton & Menk, Inc. has been an effective and longstanding partner of the Minnesota Chapter of APWA. The firm has demonstrated an exceptional commitment to the organization by providing financial support as a Platinum Plus sponsor, the chapter’s highest level of sponsorship. Bolton & Menk is also a sponsor to numerous chapter events throughout the year. Employees of Bolton & Menk are currently serving as committee chairs and committee members and other employees have been members of the Executive Committee, APWA award recipients and session moderators at chapter conferences.

Past President of Bolton & Menk Jon Rippke took to the Minnesota Chapter to reignite the chapter’s Diversity Committee. In 2013, the relatively new Minnesota Chapter Diversity Committee identified “outreach” as its primary goal and basis for its initial activities. In general, the outreach goal focuses on increasing the diversity of the Minnesota public works industry as well as the diversity of the chapter membership through increased contact with minority populations. The committee’s outreach goal was further divided into short-term, mid-range, and long-term initiatives.

**Donald C. Stone Award for Excellence in Education – Chapter**

The Donald C. Stone Award for Excellence in Education was established in honor of Donald C. Stone, founder of APWA. The award recognizes outstanding and meritorious achievement of individuals assisting in the areas of continuing and graduate professional education for public works professionals, as well as chapters in their work in delivering educational opportunities for all levels of persons engaged in the delivery of public works services.

**New England Chapter**

The APWA New England Chapter has established an educational program consisting of more than 10 programs each year, in various locations throughout New England for the convenience of all chapter members. The professional meetings provide an opportunity for information exchange regarding the response of public works to emerging trends related to the economy, society, energy, technological advances, population demographics, politics, etc., including lessons learned and “how we did it” case studies.

The yearly meetings include the Spring Conference (two concurrent sessions, three topics each, with CEUs), two Mechanics Workshops, Supervisor Training, the Summer Conference (two-day program, concurrent sessions, total of 12 presentations, with CEUs), Fall Conference (two concurrent sessions, three topics each, with CEUs) and Snow and Ice Workshop (four topics, with CEUs). More than 2,000 public works officials and other government officials attend these educational forums, which generally begin in April and end in November each year.

**Exceptional Performance Award–Adversity**

The Exceptional Performance Award–Adversity recognizes exceptional performance in the face of adversity in service to the public.

**Record Snowfall Response**

Town of Lexington, Massachusetts Department of Public Works

During the winter of 2014-2015 the Lexington, Massachusetts Department of Public Works experienced unprecedented challenges. The Lexington DPW was used to managing
snow and ice operations; however, the winter season would be like no other. In addition to receiving 103 inches of snow and subzero temperatures, DPW crews were attending to 23 water main breaks, numerous frozen water services, a few special events and dozens of downed trees. After each event the town was safe and clear, water kept flowing, power was restored in a timely manner and schools opened consistently within 24 hours of the last snowflake for an organization that is repeatedly named as one of the top three public school systems in Massachusetts.

Lexington DPW took everything that was thrown at them and responded in a professional and positive manner. Adjustments were made as events were unfolding and the pre-planning was crucial to their efforts. The DPW pulled through to live a real-life tabletop exercise not for an eight-hour day, but for an entire winter season.

**Exceptional Performance Award–Journalism**

The Exceptional Performance Award–Journalism recognizes exceptional performance in presenting the story of a public works issue or event that projects a positive image of individuals or agencies in the course of their performance in both broadcast and print mediums.

**Sweet Streets Website**

City of Richfield, Minnesota

The City of Richfield, Minn., created a multi-faceted public awareness campaign to inform the public of a major six-year commitment being made to street improvements throughout the city. The campaign included the use of a distinct website for the program, social media, print media (newspaper and bus bench advertisements), and promotional items.

As a part of the Sweet Streets program, nearly every street in town will have some level of improvement over the six-year span of time (construction began in 2015). Given the level of work being proposed, the City knew it was important to inform and educate the public, its residents and neighbors, and continues to actively engage with everyone throughout the campaign.

**“Public Works Makes It Happen” Video**

New England Chapter
Public Works Awareness Committee

All too often the public works community is overlooked as a vital and necessary function. The New England Chapter, through its Public Works Awareness Committee, has engaged in a robust campaign to bring an important message to government officials and the general public about the value and importance of public works in our communities and in our lives.

This past fall the chapter aired its public works awareness video, “Public Works Makes It Happen.” The setting takes place around a Thanksgiving high school football game. And while the fans are cheering on their favorite teams the video brings to light all of the services that public works professionals are accomplishing behind the scenes. The video was aired by local cable stations throughout New England and can be seen at https://www.youtube.com/watch?v=TQ4eyYJ Eoww&feature=youtu.be.

**Exceptional Performance Award–Safety**

The Exceptional Performance Award–Safety recognizes exceptional performance in the area of safety.

**Missouri’s Blueprint to Save More Lives**

Missouri Coalition for Roadway Safety
Jefferson City, Missouri

In 2004, a partnership of Missouri safety advocates, including law enforcement agencies, health care providers, courts, local, state and federal government agencies, advocacy groups, planning organizations, concerned citizens and others, banded together to form the Missouri Coalition for Roadway Safety (MCRS). This group worked with regional safety coalitions to implement the first strategic highway safety plan titled Missouri’s Blueprint for Safer Roadways. The four-year plan was updated in 2008, named Missouri’s Blueprint to ARRIVE ALIVE; and 2012 as Missouri’s Blueprint to Save More Lives. All plans have established a fatality reduction goal and provided a
comprehensive framework to reduce roadway fatalities and serious injuries.

Strategies which include median guard cable, rumble strips, brighter stripes and bigger signs, more delineation, improved intersections, and key enforcement and education efforts implemented since 2005 contributed to six consecutive annual decreases in traffic crash fatalities and 10 consecutive annual decreases in serious injuries. Between 2005 and 2014, Missouri experienced a 39 percent fatality reduction, resulting in a total of 3,270 lives saved. The fatality rate fell from 1.8 fatalities per 100 million vehicle miles of travel in 2005 to 1.08 in 2014.

Management Innovation Award

The Management Innovation Award recognizes an individual, team or organization for the development and implementation of a creative idea, device, process or system that enhances the goals of public works in serving the public and protecting the environment.

Right-of-Way Management System
Laclede Gas Company
St. Louis, Missouri

Laclede Gas Company has developed a proprietary Right-of-Way Management System to better manage their pipeline replacement work within the nearly 100 municipalities in which they provide natural gas service on a daily basis. This tool links their mapping system of underground gas pipelines to the City of St. Louis Street Department, giving both organizations more visibility to upcoming projects and avoiding duplicate efforts with street restoration, for example.

The Laclede Right-of-Way Management System has shown great benefits to the municipalities served and to the public that utilizes the right-of-way, whether it be by bus, car, bicycle or on foot. The system allows Laclede to better recognize potential conflicts to work schedules and proactively identify solutions to problems before they arise. The public works departments in and around St. Louis are able to coordinate their street maintenance work in an efficient and cost-effective manner. This system takes communication and sharing information to the next level.

Technical Innovation Award

The Technical Innovation Award recognizes an individual, team or organization for the development and implementation of a creative idea, device, process or system that enhances the goals of public works in serving the public and protecting the environment.

Bridge Inspections Using Unmanned Aircraft Systems
Minnesota Department of Transportation
St. Paul, Minnesota

Utilizing Unmanned Aircraft Systems (UAS) technology, the Minnesota Department of Transportation (MnDOT) initiated a research project to study the effectiveness of UAS technology as it applies to bridge safety inspections for both state and local bridges. The project team inspected four bridges at various locations throughout Minnesota and evaluated the UAS’s effectiveness in improving inspection quality and inspector safety based on field results. Various UAS capabilities were utilized to evaluate current technologies, such as still images, video, infrared thermal imaging, and 3D models, as they relate to use in bridge inspections. The study detailed the advantages and challenges of using UASs for bridge inspection, an analysis of current and future UAS technologies as they relate to bridge inspection, and an analysis describing how current and future technologies adhere to the National Bridge Inspection Standards.

A second research effort is currently underway at MnDOT to also investigate UAS use in regards to confined space inspections, project and inspection planning, and emergency response to bridge hits when it is deemed unsafe for inspectors and traditional access methods to be deployed. Additionally, a best practices document will be created to identify bridges that are best suited for UAS inspection based on bridge type, location, condition, and other variables. It is the goal, based on this research, to implement a statewide UAS bridge inspection contract which will identify overall cost effectiveness, improvements in quality and safety, and future funding sources for both state and local bridges.

For more information about APWA’s Awards Program contact the Chapter Relations Department at (800) 848-APWA or rwilhite@apwa.net.
## EDUCATION CALENDAR

For more information about these programs or to register online, visit [www2.apwa.net/Events](http://www2.apwa.net/Events). Program information will be updated as it becomes available.

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

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- ✨ = Click, Listen & Learn program (Free to Members)
- 📆 = Live Conference (Paid Registration)
- ☑️ = Certification Exam
- 🎥 = Web-based training

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/](http://www.apwa.net/callforpresentations/)
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WE’LL SEE YOU THROUGH
Four options to attend PWX

A PWA is excited to bring the first-ever Public Works Expo (PWX) to Minneapolis, Minnesota, August 28-31, at the Minneapolis Convention Center. With more than 125 educational sessions and nearly 90,000 square feet of exhibit space, you will have the opportunity to learn, network and see the largest display of public works equipment in North America.

By the time this issue of the APWA Reporter hits your mailbox, there will only be a short time left before PWX begins. Needless to say, time is running out; however, there’s still time to register! Just go to www.apwa.net/PWX for more information.

To ensure you are able to arrange your schedule to be here and have the options you need, APWA gives you four options to attend PWX:

1. Full PWX Registration – $899.00. Includes access to the exhibit hall, entry to all educational sessions including General Sessions, Wednesday Workshops, Get Acquainted Party, Awards Ceremony and much more.

2. One-Day PWX Registration – $440.00. Choose the day(s) you can attend and get access to the exhibit hall and entry to all educational sessions including General Session.

3. One-Day Expo Only Pass – $45.00. Access to more than 400 exhibitors with all the latest in public works equipment, services and technology.

4. Pre-PWX Seminar Registration – $350.00. This year’s Pre-PWX Seminar is “Self-Assessment Using the Public Works Management Practices Manual—A Tool for Improving Operations and Management.” This workshop has a separate fee and you do not have to be registered for PWX to take advantage of this great opportunity for additional education.

Don’t miss this opportunity to take advantage of this full library of resources and to experience the excitement of Minneapolis. Remember the magic URL: www.apwa.net/PWX.

Minneapolis here we come!
Don’t miss these at PWX!

• If you’re looking for a place to meet with your colleagues, gather with old and new acquaintances or just relax awhile, visit the Minnesota Host Chapter Hospitality area in the Hall B Lobby of the Minneapolis Convention Center.

• Join us in honoring the best in the business! Come see your peers recognized during APWA’s Annual Awards and Recognition Ceremony on Monday from 5:00-6:00 p.m. in the Convention Center Auditorium. Be sure to attend the reception that follows in The Hub @ PWX/Hall B Lobby.

• All-new this year: APWA is revamping our presence on the PWX exhibit floor! Our booth will be changing from the “Expo Experience” to “APWA Connect LIVE!” Similar to our online APWA Connect community, APWA Connect LIVE!’s goal is to provide attendees with an environment where each of you can meet public works experts, network with your peers and stay up-to-date with the latest happenings in public works. We’ve added so much, you might have a hard time leaving! Don’t worry, we’ll also have knowledgeable APWA staff available to answer your show questions and provide you with information on APWA products and programs.

• One of the most popular features at PWX, the New Product Showcase is a must-see attraction. Get the chance to see, touch and feel the latest products and developments recently introduced to the public works industry over the last year—and vote for your favorites! The winner will be announced as the Best New Product of 2016 at the General Session on Tuesday, August 30. Check out the participating companies in this year’s New Product Showcase (at www.apwa.net/PWX) and remember to stop by in Minneapolis!

• The 2016 Public Works Stormwater Summit has so much to offer, we are holding it over two afternoons—a total of six hours of up-to-the-minute and must-know information! APWA’s Water Resources Management Committee has planned a program that features the latest approaches for stormwater planning and management in North America. Day One: Monday, August 29, 2:00-4:50 p.m.; Day Two: Tuesday, August 30, 2:00-4:50 p.m.
One-day passes available for PWX

Can’t take off a whole week for APWA’s first-ever PWX? Don’t worry. We have the ticket that is just your ticket—our one-day registration! Geared for those who cannot take the entire time for PWX, the one-day pass entitles the registrant to all educational sessions on that day and, also, entry to the exhibit floor where the latest in public works equipment and services will be on display.

The one-day registrations may be purchased onsite at $440.00. A special pass to tour the exhibit hall only is also available for just $45.00.

Speaking of the $45.00 special exhibit hall pass, the APWA PWX in Minneapolis is the perfect opportunity for supervisors to let staff attend the exposition for one day. PWX is great for those attendees who are able to go for four days, but it is also a wonderful experience for non-supervisors who can tour the exhibit floor for only $45.00 per day. It’s a chance to have your entire staff take advantage of this once-a-year gathering of the biggest and best in public works.

We’re looking forward to seeing you in Minneapolis!

APWA Booth #1814

Sign Post Pulling Made Easy!

JJ050X Series recommended for “tough” soils
- Ideal for soils such as clay, rock or frozen soil
- Handle extension for added leverage
- 28 to 1 mechanical advantage
- 100lbs push down on handle = 2800lbs upward force
- Unit weighs 33 lbs.

Increase Efficiency and Reduce Costs with JackJaw Post Extractors!
- Fast, easy, safe sign post pulling
- Grips tightly on any sign post, no slipping, no back strain
- All-steel construction

To find a dealer or to place an order, call 937.429.9089 or visit our website at www.jackjaw.com. For more information, email Bob@JackJaw.com.

JJ030X Series recommended for “normal” soils
- 16 to 1 mechanical advantage
- 100lbs push down on handle = 1600lbs upward force
- Unit weighs 21 lbs.
Experience Minneapolis bicycling facilities

Each year, the APWA PWX celebrates the public works profession and provides opportunities to attend engaging educational sessions, observe innovative technologies/products, and create new friendships with public works professionals from around the world. The APWA Minnesota Chapter is excited to serve as your host for the 2016 APWA PWX!

The 2016 APWA PWX includes a Wednesday Workshop/Tour event that highlights several of Minnesota’s public works achievements. The Minneapolis Bicycle Facilities Tour is one of the opportunities.

APWA Bike Tour Route
The City of Minneapolis has over 125 miles of on-street bikeways and nearly 100 miles of off-street bikeways. The city is nationally recognized for its strong commitment in promoting bicycling as a safe and efficient method of transportation, and providing and preserving bicycle-friendly infrastructure. Minneapolis, in partnership with Hennepin County and private development, continues to plan, program and build protected bikeways as part of its long-term goal to provide multi-modal transportation for all people.

The Minneapolis Bicycle Facilities Tour is an eight-mile circular route through downtown and surrounding neighborhoods along the Mississippi River which features recent public improvements and safety enhancements including: designated bikeways with protective bollards; signal detection and accessibility

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Connecting you to better snow fighting solutions, Cargill Deicing Technology is your supplier of answers for safer roads. Our effective deicing products and environmentally conscious anti-icing solutions fight dangerous winter conditions and help reduce the amount of chlorides in the environment, helping you provide safer roadways.

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The Minneapolis Bicycle Facilities Tour include:

- New bollard-protected bikeway on 3rd Ave S
- Washington Ave S improvements, including a major reconstruction including a curb-raised protected bikeway as well as a connecting 4-to-3 conversion (by Hennepin County)
- Plymouth Ave N bollard protected bikeway, including a bridge over the Mississippi River
- Bicycle boulevards on 5th St SE and 6th Ave SE, including contraflow lane and bicycle push buttons
- Stone Arch Bridge (historic bicycle/pedestrian bridge)
- West River Parkway (an existing trail that is part of the Minneapolis Park and Recreation Board trail system, which serves as the backbone of the bicycle network)
- 11th Ave S bikeway (bollard-protected bikeway to be installed in 2016)
- Park Ave S curb-raised protected bikeway (in partnership with private development)

Save the date
Join your fellow public works professionals on Wednesday, August 31. The Minnesota Chapter is excited to provide you with a rewarding and informative first-hand experience of the sights and sounds of Minneapolis up close. Registration is on a first-come, first-served basis. Participation is limited and there is a $50 fee to cover rentals.
Attention Public Works Directors: Over the last two years we have lovingly crafted a program for you called the International Public Works Director Roundtable, “Where Directors Go to Grow.” This two-hour session is designed to be a free-flowing, dynamic exchange of ideas with your fellow PWDs aimed at making you better and more effective directors. The response has been fantastic. Last year the Roundtable was the highest-rated session at Congress! If you’ve joined us before, thank you and we hope you’ll come again as we introduce new discussion topics selected by your fellow directors through participation in the International Public Works Director Survey (link below). If not allow me to introduce myself and the concept. I am the Moderator and MC for the IPWD Roundtable, my name is Chris Evers, Past President of the Florida Chapter and the Founder of the original PWD Roundtable held at the Florida Chapter Public Works EXPO every year and Congress in 2014 and 2015. I am joined by some fantastic fellow moderators and public works leaders including Elizabeth Treadway, PWLF, APWA Past President, and Chas Jordan, 2013 Young Leader of the Year and President of the Florida Chapter.

If your job title is Public Works Director or some iteration thereof, or you serve your agency as the equivalent of the traditional Public Works Director, we’d like you to join us for a groundbreaking and exciting session on Monday, August 29, 2:00-3:50. Expect a high-energy, solutions-based public works bonanza focused on energizing and connecting Public Works Directors and communities across North America! We will be employing a mixed bag of motivation, technology, networking and multi-media to help take you and your agency to the next level of Public Works Awesomeness! Introducing:

The 2016 International Public Works Director Roundtable

Technology plays a part in everything we do in public works so it wouldn’t be a successful Roundtable unless we unleashed some to support the effort. Each year we use the survey below to pick three topics that PWDs from
around the world want to discuss in the Roundtable format. Previous topics have included transportation funding, greying of the workforce, escaping the bunker mentality, working with millennials, and the importance of advocacy and succession planning. This session is the only one of its kind at PWX that allows you the participant to help steer the ship. Survey results will help us make the session more valuable, informative and participatory. Some interesting data always comes out of the survey results! Your time is valuable so please go to the site to answer a few short questions: https://www.surveymonkey.com/r/IPWDRoundtable2016.

Networking has been a key component to our efforts at Congress in Toronto and Phoenix during the previous IPWD Roundtables. The past two years we’ve encouraged directors from across the world to network with each other and use the knowledge they each possess to help solve some of the most challenging issues facing us all. It has worked beautifully and the Roundtable format will enable you to congregate and network with PWDs who share some of the same challenges you currently face. Bring plenty of business cards and be ready to shake some hands!

We’ll be employing sprinkles of multimedia throughout the Roundtable and providing you with tools you can use when you get home too. Not only does APWA have outstanding resources you may not be aware of, but many of your fellow PWDs have created videos, training materials, innovative solutions, new processes and more that could make your public works life easier. We call it the Public Works Director Toolbox and we’ll be supplying PWDs attending the Roundtable with a virtual PWD Toolbox at PWX!

Are you a PWD planning to go to PWX? If so we hope you’ll join us on August 29 from 2:00 to 3:50! Elizabeth, Chas and I look forward to a journey of epic public works proportion!

Chris Evers can be reached at (727) 638-1699 or chrise@apwaflorida.org.
Let's begin by asking the question, what is your objective? What do you want to be known for as a fleet manager? Are you a trusted and valued supplier of high-quality services that enable the users of fleet vehicles and equipment to do their jobs at peak performance? Or is fleet management really just another internal department that provides a mediocre service that gets in the way for no noticeable benefit?

This may be your situation because management believes they need a watchdog. After all, they are rightly concerned about the huge sum of money tied up in expensive mobile machinery that can quickly be destroyed by careless employees. They want a policy firmly enforced to catch and punish the wrongdoers. However, telling the fleet manager to do this is a big mistake. Nothing good will be accomplished by making the fleet manager a watchdog.

In this article, we talk about what is strategy, and how this is different from tactics. We look at strategy options in the context of fleet management, and how to carry out the strategy and reach your objective by developing tactics and organizing them in each of the five main management functions. These are Finance, Information Technology, Operations, Human Resources, and Marketing and Communications. This makes it easier to group the tactics in a way that is understood by your corporate management team.

Strategy is a word that is misused in many organizations. “Strategy” is part of everyday business language and is often used in the wrong context (“Operational Excellence” is not strategy, it’s a goal).

A strategy is about making choices of “which way” to reach the “why” (the objective), supplemented with the “how” (doing it).

A strategic plan with multiple strategies is misusing the word “strategy” when it really means “tactics,” defined as how to do it. It is important not to confuse the terms “strategy” and “tactics.”

Usually the objective is to manage fleet assets to enable peak performance in delivery of the organization’s product.

In the simple chart below, there are three different strategies shown in the left-side blocks. One is called focus and manage, which means keep the fleet management function in place and make it work better. The second strategy is to outsource fleet management to another organization, and not have a position internally for fleet management. The third strategy is to abolish a centralized fleet management function and let those parts of the organization that use vehicles and equipment take care of those things themselves. In the right-side blocks, a short list of what this means is that the recommended strategy, focus and manage is the lowest cost, least disruptive and fastest way to get to the objective. Outsourcing is an option, but it would be more costly and split among many suppliers. A third option, return to users would be disruptive for the users and distract them from their main purpose.
Here are some tactics in each of the five management functions that make a focus and manage strategy successful. We will start with Finance, because this includes the most fundamental decision for fleet managers, which is deciding who truly controls fleet expenses. We will then proceed through Information Technology, Operations, Human Resources, and Marketing and Communications.

Can the fleet manager really do anything about cost pressures like diesel fuel, or can the fleet manager really produce a 20% reduction in fleet cost? Where is control and accountability for fleet expenses placed in the organization? Is the budget in the right place? Is each transaction, such as a brake repair or a fuel refill, billed to the department that uses the vehicle? Tactics: look at creating user budget line items for fleet expenses and see how that changes behavior.

The principal driver of fleet cost is the number of units in service. If public works does residential waste collection, the number of trucks needed to get the job done is not decided by the fleet manager. The fleet manager is an expert on fleet management, not waste collection. Any attempt by the fleet manager to reduce costs by taking trucks out of service will be met with fierce resistance by the waste collection operations manager. So the fleet manager’s ability to control the main driver of fleet costs, the number of units in service, is zero.

Then why do so many organizations insist on making the fleet manager accountable for fleet expenses, when the control is effectively with the users? Put the budget where the control is—with the users.

The next management function is Information Technology. This is important because of the role it plays in managing the budget. Tactics: the system can be simple, using Excel spreadsheets to record data and create invoices, or expensive and state-of-the-art like those used by new car dealers to manage the service department. And there are many software programs marketed specifically for fleet management which are basically asset and work order management systems.

The third management function is Operations. If you have an in-house garage, you will know that shop hours can be a contentious issue. Conflict over when to service a vehicle that seems to be running normally is very likely if both the users and the garage are only open on a single daytime shift, simultaneously. Users don’t want to give up a unit unless it has broken down. This forces the fleet manager to adopt a form of “hostage maintenance” to do preventive maintenance whenever a vehicle is towed to the shop. Tactics: if the user has need for vehicles only on a day shift, the fleet manager should consider providing after-hours service in the afternoons and evenings.

The fourth management function is Human Resources. If the goal is to build a high-performance service organization, then the fleet manager has to create a high quality of life at work for employees. Tactics include having good labour relations with all employees whether they are part of a union or not, handling grievances fairly and honouring collective agreements, keeping mechanics at the top of their game by arranging technical training, managing the career expectations of non-union staff and creating a succession plan.

We have now come to the fifth and final management function, which is Marketing and Communications. Some may find it unusual that fleet managers must think about marketing, but it’s true. Fleet management is vulnerable to outsource attacks, unreasonable user expectations and management neglect, to mention a few reasons to be concerned with marketing.

Tactics include creating and implementing a Fleet Strategic Plan and sharing it widely within the organization. This improves fleet management’s credibility and understanding of its role in organizational success. It’s not enough to come to work and make up a plan as each day develops. The steps described in this article—Objective, Strategy and Tactics—will guide in creating a Fleet Strategic Plan that is worthwhile.

Chris Hill will give a presentation on this topic at the APWA PWX in Minneapolis, Minnesota. His presentation is entitled “Effective Fleet Management Strategy for Municipal Fleets” and takes place on Tuesday, August 30, at 9:45 a.m. He can be reached at (905) 301-5950 or chill@fleetchallenge.ca.
In April 2013, Ramsey County purchased a 427-acre parcel of the former Twin Cities Army Ammunition Plant in Arden Hills, Minnesota, with the goal of revitalizing a long-dormant industrial area into a vibrant residential, commercial and retail area. Because it was the largest Superfund site in Minnesota, the cost, scale and risks associated with cleaning up the land precluded it from previous redevelopment efforts.

The Twin Cities Army Ammunition Plant (TCAAP) was constructed in 1941-1942 to manufacture small-arms ammunition for American and Allied forces during World War II. At its peak, the plant employed 26,000 people—more than half of whom were women. The plant closed after the U.S. declared victory over Japan in 1945, but was intermittently reactivated during the Korean and Vietnam wars. It became inactive in 1976.

Working closely with the City of Arden Hills, a community of less than 10,000 residents, Ramsey County invested $30 million in the demolition and remediation of the site to residential standards. Over a 32-month period, crews removed more than 49 miles of linear utility infrastructure from the site, more than 400,000 tons of concrete and asphalt, nearly 10,000 tons of PCB hazardous waste, more than 7,000 tons of asbestos-containing soil waste, and nearly 100,000 tons of non-hazardous impacted soil. In total, 93% of the materials removed from the site were recycled or reused in new roadways on the site and in other parts of the Twin Cities.

Work to remediate the soil to residential standards was completed in November 2015, and the county is now working with the Minnesota Pollution Control Agency (MPCA) through its Voluntary Investigation and Cleanup (VIC) program and the Environmental Protection Agency (EPA) to secure a Certificate of Completion, remove existing land use controls, and delist the site from the federal Superfund list for soil contamination.
Last large-scale redevelopment opportunity in the Twin Cities
This work paves the way for the Rice Creek Commons redevelopment, the last large-scale redevelopment opportunity in the Twin Cities. The site, which is located less than 10 miles from downtown Saint Paul and downtown Minneapolis, is planned to be a cohesive residential and commercial development that will be home and workplace for thousands of people. In May 2016, Ramsey County and Arden Hills selected prominent commercial and residential developer Alatus LLC as the master developer for the site. Alatus will help guide the overall residential and commercial development of Rice Creek Commons.

The entire site will be interwoven with an internal network of green space and trails that will not only provide open space for all types of recreation, but also perform important environmental functions such as stormwater management and natural habitat restoration. A 50-acre natural resources corridor will weave through the site, and 24 acres of active park space is planned. Ramsey County is building a bike and pedestrian trail on the eastern edge of the development that will connect to the larger regional system, providing future residents with easy access to linked trails and other active living opportunities.

Rice Creek, which runs through the site, serves as another natural amenity. Originally flowing along a winding path that included many twists and turns, the creek was straightened in the early 1900s for agricultural purposes. The straightened route resulted in loss of floodplain and faster flowing water, which increased erosion along the stream bank and bed. A section of the creek that flows through Rice Creek Commons is being transformed back to its natural, meandering path and stabilized along its banks with native plants and trees. Nearly 2,000 new feet of stream will be created by the project. As a result, recreation, aesthetics, water quality and wildlife habitat are all expected to improve.

To safely handle the influx of 3,000 new residents and 4,000 new workers at Rice Creek Commons, Ramsey County has led efforts to improve several access points to the site. In 2015, Ramsey
County completed construction of a new interchange at Interstate 35W and Highway 96. The diverging diamond interchange improves traffic safety and mobility. Work is underway this year on a new interchange at Interstate 35W and County Road H. Construction of a roundabout at County Road I and a new county road designed to carry 40,000 cars per day through the site will begin in 2017.

**Leveraging green technologies**

Through this project, Ramsey County and the City of Arden Hills are converting vacant, polluted land into a transformative development that leverages the latest advances in sustainability and energy technology. The two entities developed an Energy Integration Resiliency Framework, which sets forth a vision to create the largest net-zero energy redevelopment in the state.

In 2016 Ramsey County purchased a 62-acre parcel of land adjacent to Rice Creek Commons and is in negotiations with Xcel Energy to build a solar installation that would generate 8-12 megawatts of electricity, enough energy to power all onsite commercial and residential developments. Estimates show the installation has the potential to reduce greenhouse gas emissions by more than 7,500 tons annually, roughly the amount produced by 1,400 cars each year.

Additionally, Ramsey County and Arden Hills envision net-zero residential neighborhoods at Rice Creek Commons, made possible by utilizing the energy generated from ongoing water treatment at the site. Instead of a traditional HVAC system, homes would be heated and cooled by thermal energy captured from groundwater that is continually pumped onsite.

Ramsey County is confident that these energy features will make Rice Creek Commons more attractive to prospective developers, residents, and commercial users; positively impact the environment; and serve as a model for energy resilient developments across the country.

Ultimately, the Rice Creek Commons project will transform a contaminated parcel of land into a regional asset. The opportunities for this transformative development are endless, and the community is eager to see the site return to the economic engine it once was—this time with homes, businesses and retailers.

Beth Engum will give a presentation on this topic at the 2016 APWA PWX in Minneapolis, Minnesota. Her session is entitled “Rice Creek Commons: Revitalizing a Vacant Brownfield” and takes place on Wednesday, August 31, at 8:30 a.m. She can be reached at (651) 266-7115 or beth.engum@co.ramsey.mn.us.

Ramsey County is in the process of transforming Rice Creek back to its natural meandering path through the development.
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The remarkable impact of being an effective client

David J. Skuodas, P.E., CFM, LEED AP
Project Manager
Urban Drainage and Flood Control District, Denver, Colorado
Presenter, 2016 APWA PWX

As the U.S. economy has rebounded from the recession of 2008, the workload for the consulting and construction industries has skyrocketed. In 2013, Colorado experienced massive flooding, resulting in over $4 billion in damages. The timing of this disaster, coupled with the (then) booming oil and gas industry and the resurgent land development market, meant that anyone with an excavator was in high demand.

Construction is still booming three years later; as a result, consultants and contractors can be very selective about which clients they choose to work for, as opportunities abound. When advertising a bid for construction there is a very real chance that a client may receive no...bids...at...all.

With market conditions like these, how can we set ourselves apart as a client of choice? Conversely, what things might we be doing that are making us a difficult client to work with? Could we be costing ourselves in time, money, or quality either because of arduous internal processes or simply by how we treat consultants and contractors on a personal level? Could lengthy or confusing procurement practices be turning away the most talented consultants and contractors before our projects can even get off the ground?

I interviewed over 50 consultants, contractors, and client project managers about this topic. I asked them questions like:

• What do you think makes a client effective or ineffective?
• What was your best or worst client experience and how did that impact you?
• How much does your pricing change depending on the client?

I peeked behind the curtain and learned how consultants and contractors really differentiate between good and bad clients, how client behavior affects the price and quality of work—and even how consultants and contractors (vendors) choose whom to work for.

We’re in an environment where many vendors are short staffed and there’s plenty of work. Being a desirable client matters if we want the best and brightest professionals working on our projects. With budgets getting tighter and costs going up, as the stewards of taxpayer dollars there is a lot at stake.

I was able to distill the stories I heard down to three major themes:

1. Build Professional Trust
2. Don’t Un-Motivate Your Project Teams
3. Manage Risk Equitably

Road flooding in the 2013 Colorado flood
Build Professional Trust

A common theme throughout the interviews was the issue of trust. A lack of trust can most certainly result in a bad client experience. What might a lack of trust look like?

I heard of several situations where vendors were afraid to give their client bad news because they knew they would blow a gasket. Many vendors complained of owners who treat every request for additional money as suspicious. I heard of clients modifying consultants’ designs in ways they weren’t comfortable with, or asking for substandard designs to cut costs. One consultant even had a client completely change his design, enough so that it no longer functioned, and then had the audacity to sue him for a faulty design after the client built it and problems arose.

As the late Steve Jobs said: “It doesn’t make sense to hire smart people and then tell them what to do; we hire smart people so they can tell us what to do.”

And here’s the key thing—they’re not always going to tell us what we want to hear, so create an environment where they feel comfortable being honest.

Don’t Un-Motivate Your Project Teams

Our vendors are for-profit businesses, but their personal satisfaction—what gets them out of bed in the morning—comes more from the work itself rather than the monetary reward associated with it.

One consultant I spoke with was working on a large river project with a recreational element to it—they were building a wave feature on the river for people to actually surf. To get the desired results they felt strongly that a physical model was needed to calibrate the wave. Problem was, there wasn’t enough budget to pay for building a physical model—models are very labor intensive to construct. This consultant was so invested in making this project successful that he and his coworker, on their own time, built the physical model themselves in his garage. The work itself was rewarding enough that they did it even though they weren’t getting paid. (See photo on page 50.)

Understand that the best and brightest vendors aren’t just motivated by...
money—the work itself is rewarding. We just need to avoid un-motivating them. The easiest way to un-motivate your team is to pay them poorly or late, so value paying your vendors fairly and punctually.

**Manage Risk Equitably**
EVERY consultant and contractor I spoke with said that costs can go up by 10%, 20% or even 30% solely based on the client they’re dealing with. Consultants price projects differently based on the community or the project manager; for contractors it could be different based on the designer or even the inspector if they know who it is. It’s all about their perception of cost risk in working with us. Their risk is losing money on the project. If we have a reputation of being notoriously difficult to negotiate with for fair increases to scope and fee, vendors will price our work higher. While we may perceive that we’re receiving a “low bid,” in reality we could be paying 20% more from the start. If we’re fair with our vendors, they’ll be fair with us—it pays to be reasonable to work with.

**Conclusion**
About a year after the 2013 flood we held an appreciation party at a nearby park for our consultant and contractor community. We served breakfast burritos and said a few words just to thank them for their service in helping rebuild our state after the flood.

This simple gesture strengthened our vendor relationships—but being an effective client is not a destination we arrive at and our work is done. How we treat our vendors is important regardless of the state of the economy, something we should work at on every project. It’s important to frequently ask ourselves: what else can we do to help our vendors do their work, to help them help us? How can we make ourselves more desirable clients to work for?

So why does being an effective client matter? Because effective clients attract more talented project teams, get more for their money, and build better projects. Being a bad client, quite frankly, is bad business.

David Skuodas will give a presentation on this topic at the 2016 APWA PWX in Minneapolis, Minnesota. His session is entitled “The Remarkable Impact of Being an Effective Client” and takes place on Monday, August 29, at 4:00 p.m. He can be reached at (303) 455-6277 or dskuodas@udfcd.org.
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Goats for Vegetation Management Program

Gary Mekjian, P.E., Assistant City Manager, City of Farmington Hills, Michigan, and Past President, APWA Michigan Chapter; Karen Mondora, P.E., Assistant to the Public Services Director, City of Farmington Hills, Michigan, and member, APWA Diversity Committee; presenters, 2016 APWA PWX

Project Background
The City of Farmington Hills, Michigan, is a developed suburb of Detroit. With a population of approximately 80,000, it is covered by an NPDES MS4 Stormwater Permit with provisions for Post Construction Runoff Control and Good Housekeeping at municipally-owned property.

As part of the City’s permit, it is challenged with the control of invasive and nuisance plants such as phragmites, buckthorn, grapevine and poison ivy. Standard invasive treatments include multi-year herbicides and/or controlled burns. Not all areas, however, are suited to these practices, which are expensive and can have a negative effect on surrounding desirable vegetation. So the City began researching other options, one of which was the use of goats.

One of our engineers read about goats being used to manage vegetation. In jest, the Department of Public Services (DPS) pitched the idea of a program using goats. To our amazement, City management loved the idea and authorized us to proceed (see photos on pages 53-55).

DPS staff evaluated options for implementing the idea, which included contracting with a vendor or developing an in-house program. While using a vendor may have been easier, it had higher “hard costs” than an in-house program. Ultimately the decision was made for us when a goat unexpectedly became available. A pygmy goat, coincidentally rescued by the City’s Police Department, was adopted by DPS staff and put to work!

Since the goat was an experiment, DPS wanted to start small with a pilot project (hence the name “Pilot”) to see if this was a viable option. To minimize staff time, a location was selected where the goat could easily receive care. An existing stormwater detention basin and “no-mow” zone on the City Hall campus provided an excellent first habitat for the goat during business hours.

The City partnered with a local farmer who provided weekend care and lodging during the winter. A team of volunteers, with oversight from DPS staff, monitored food, water, and bedding, and secured the goat in the farmer’s overnight kennel.

Project Schedule
- April 2015: Authorization received to implement a Pilot Vegetation Management Program using Goats.
- May 2015: Began search for available goats.
- June 2015: Farmington Hills Police Department rescues a pygmy goat and turns him over to Oakland County Animal Control.
- July 2015: The 21-day stray period expires and DPS adopts “Pilot the Goat.” Pilot begins work at the City Hall detention pond.
- July 2015: Search resumes for a second goat. Contact is made with the Michigan State University Tollgate Farm in Novi; a young goat becomes available at the end of summer.
- September 2015: “Co-Pilot,” a young Toggenberg goat, joins the DPS goat herd.
- November 2015: Growing season ends and the project concludes. Pilot and Co-Pilot are boarded for the winter at a local farm.

Public Health and Safety
Fortunately, during the project there were no significant safety issues. To ensure that both the public and the goats were as safe as possible, the following precautions and requirements were implemented:

- The goats received veterinary care and were registered with the USDA Scrapies Program, which requires registration and certifies that a goat is free of scrapie, a central nervous system disease.
- Signage was used to advise the public not to feed the goats.
- Volunteer handlers walked the goats from their kennel to their grazing areas in the mornings and evenings and walked in pairs to watch for traffic and keep the animals calm.
• A dog crate was used to transport the goats from the city to the farm on weekends.

**Community Relations**

Pilot generated a frenzy of overwhelmingly positive media attention. DPS staff and Pilot were featured in multiple media outlets both locally and nationally including television news programs, major print publications, YouTube, newspapers, websites, and even CNN! Regular updates were provided at staff meetings and City Council meetings. Pilot and Co-Pilot received a tremendous amount of interest from the public throughout their time at City Hall. Staff volunteers kept watch from office windows, stopped by during breaks, and even brought family members for visits. Pilot was a guest at a local elementary school where the Principal had to “Kiss the Goat” as a reward for students meeting goals. Pilot was a popular exhibit at the DPW Open House and even starred in a DPW training video on winter maintenance. The goats became unofficial mascots for the Department of Public Services and helped the City develop new relationships with MSU, Oakland County Animal Control, USDA, and others.

**Lessons Learned**

**Engage community resources.** Fortunately, we had a nearby resident who owned goats and was willing to assist with their care. The MSU Tollgate Farm, located three miles from the DPW, was another valuable resource. Residents were overwhelmingly supportive, once concerns about proper animal treatment were allayed.

**Recognize the social and physical needs of goats.** Goats are herd animals and need socialization; we quickly learned that they are happier and more productive in groups. Goats come in a wide variety of breeds, with Pygmies fully grown at 50 pounds, while Alpines can reach 175 pounds. Smaller breeds are easier to handle, but eat less. Regular veterinary care and immunizations were needed, as was registration with the USDA. Finding a qualified, local veterinarian who worked with farm animals in an urban area wasn’t easy, so advance planning is recommended.

**Have realistic expectations.** One or two goats aren’t going to solve any invasive problem overnight. Our small detention basin at City Hall received effective treatment in a three-month period. Many plants will require multiple treatments over several years until the existing seed bank is exhausted. Some plants are toxic (yew, nightshade, rhododendron, and many more) to goats and they just don’t seem to eat certain plants, such as thistle and catnip.

**Provide variety and safe conditions.** Goats are like young children—playful and rambunctious! Many farms use electric fencing to contain goats, but they will often test the system and break free. They also love to climb, so providing wooden shipping crates, donated playground equipment, etc. will add to their productivity and help the animals reach taller woody vegetation. Goats also enjoy the company of people. This is great for public relations, but can be potentially harmful for the animals if someone is intent on pranking or causing harm to the livestock.

**Leverage your local animal lovers to your advantage.** People are passionate about animals. We used this to our advantage to gain support for the program and solicit volunteers to assist with the care of the animals.

The authors will give a presentation on this topic at the 2016 APWA PWX in Minneapolis, Minnesota. Their session is entitled “Herbicide on Legs – Goats for Vegetation Management” and takes place on Tuesday, August 30, at 2:00 p.m. Gary Mekjian can be reached at (248) 871-2535 or GMekjian@fhgov.com; Karen Mondora can be reached at (248) 871-2534 or kmondora@fhgov.com.
Pilot the goat eating invasive plants at the City of Farmington Hills Municipal Complex

Co-Pilot joins the FH herd

Staff walking Pilot to his kennel

Transporting the goats to their weekend accommodations
Pilot meets the “neighbors” – goats he stays with on weekends and during winter

Karen Mondora, Assistant to the Director, shows Pilot around the neighborhood.

Pilot and Co-Pilot working at the City Hall detention basin
Sustainability is often thought of as simply being environmentally friendly, but the two other components of sustainability, social and economic concerns, are just as important to the equation. Across the country, social, political, and economic landscapes are changing and many municipalities find themselves having to adapt to shrinking budgets while demands and expectations on infrastructure management increase.

Faced with these same challenges and deteriorating roadway infrastructure, the Town of Dedham, Mass., took the opportunity to create a new long-term pavement management program that would dramatically improve the Pavement Condition Index (PCI) of the town while creating a sustainable maintenance and improvement schedule.

Dedham’s pavement condition. The study showed that the average PCI was 70 out of a possible 100. What this meant was that the Town’s pavements were on the verge of failing. A pavement management program was then developed that would utilize preventive maintenance and new pavement technologies on strategically selected streets to improve the pavement condition on a network-wide basis with a focus on roadway longevity and lengthening of maintenance cycles. By creating a plan that not only addressed the failing roads, but would also maintain the “good” roads, keeping them from falling into disrepair, the Public Works Department was able to convince Dedham leaders to provide additional funding over a 10-year period with the goal of improving the average PCI to 80 or above. In order to accomplish this, every effort had to be made to make each pavement segment last as long as possible for the least expense, and of course, with the least disruption to the driving public. In other words, the pavement had to be sustainable.

Early in the program, the Town suffered a significant setback. East Street, one of the Town’s major collectors, which was paved in 2001, was showing signs of longitudinal joint failure. Early failure means early maintenance and additional expense, setting the sustainable pavement plan in the wrong direction. The Town enlisted the help of VHB to determine the cause of the premature failure. While it was determined that poor compaction at the longitudinal joints during construction was the culprit, Dedham’s Department of Public Works (DPW) had no recourse due to the Town’s outdated specifications. The decades-old version of the state’s specification did not have any requirement for density at the joint and the road had exceeded the one-year bonding period.

As with most failures, this was treated as a learning experience. Several positives evolved from the setback. Dedham not only reevaluated their asphalt specifications, they completely rewrote them with the help of their consulting engineers, this time to include a volumetric mix design method, the use of recycled asphalt pavement (RAP), mat and joint density requirements, and quality assurance testing at the production facility and at time of placement.

The new specification would have lot sizes suitable for municipal paving, not large mainline state projects and would include incentive/disincentive pay adjustments based on designated quality indicators such as gradation, asphalt content, laboratory compacted air voids, mat and joint density. The lesson learned was that better specifications and stringent project oversight results in better quality and therefore longer lasting roads.

As part of the East Street failure investigation came the recommendation for repair. Rather than just continuously fill the joints as they deteriorated, the consultants suggested the use of an ultrathin bonded wearing course as a protective...
layer. This preservation maintenance technique is applied after cutting and patching severely deteriorated areas: adjust and reset all manholes and utility valve boxes; adjust all catch basins; then crack seal all joints. It provides a good riding surface and a uniform appearance, while preventing further raveling at the joint without losing curb height at a relatively low cost per square yard. Many years following the application of the bonded wearing surface, East Street is still in excellent condition, and the Town has another tool in their sustainable pavements toolbox. We actually pushed out the next treatment on East Street during last year’s review.

In 2008, the Commonwealth of Massachusetts passed the “Global Warming Solutions Act” into law. The new law committed the Commonwealth and its newly formed MassDOT to reduce its greenhouse gas emissions by 25% of the 1990 levels by 2020, with a total reduction of 80% by the year 2050. As a part of the statewide effort to comply with the new standards, MassDOT began to specify the use of warm mix asphalt (WMA) on select projects. Reducing mixing temperatures at the asphalt production facility by 50 degrees Fahrenheit (F) can reduce emissions by up to 35% and fuel consumption by as much as 30%, making the conversion from hot mix asphalt (HMA) to warm mix an easy decision. By 2013, 68% of the asphalt placed on MassDOT projects was WMA. With a successful track record of innovative applications, Dedham, also a Green Community, chose to follow MassDOT’s lead by replacing HMA with warm mix asphalt in their annual paving program, amending their specification once again. Like the DOT, Dedham called for the use of an additive, capable of reducing mixing and compaction temperatures by at least 50 degrees F. Mechanical methods of producing WMA, such as foaming, would not be permitted, as it does not produce the reduction in temperatures required by the specification. Not only would Dedham be furthering its sustainable practice with this new specification, but research indicates that asphalt produced at lower temperatures reduces oxidization of the binder, making asphalt pavements last longer.

These long-term and environmental gains were not the only benefits to be seen. Dedham decided to go with WMA on a trial basis in 2014, during their annual paving program. Working with the bid-winning contractor, TL Edwards, the DPW was able to negotiate an amendment to the contract to allow use of WMA. TL
Edwards chose to utilize a chemical additive called Evotherm® to meet the Town’s specification because of its ease of use, requiring no modification to the plant because it is blended at the asphalt terminal. The additive surfactant properties not only make mixing and compaction at lower temperatures possible, but also promote the bond between the asphalt and aggregate, making the mix less susceptible to moisture and stripping, further increasing its durability. Steve Edwards, TL Edwards asphalt plant manager said, “I’ve seen a lot of change in this industry and not a lot of it good. I think Evotherm is one of the best things to come along in a long time. It makes the workability and compaction of our mix better and the crew really likes it.” TL Edwards is now using the WMA additive in 100% of its production at all three of its asphalt plants.

Both the contractor and the DPW witnessed the immediate benefits of WMA, such as better workability, increased compaction, extended paving season, and longer paving days, especially in New England’s chilly fall weather. This was most notable while paving the roundabout at the intersection of Cedar Street, East Street and Sprague Street. Given the high traffic volume of the intersection and the need to completely close down the intersection, the decision was made to pave on a Saturday in order to minimize disruption. This intersection is a major collector and a shortcut to Boston utilized by many trucks, residents and commuters. The original plan was to shut down for up to eight hours with detours through residential neighborhoods. Two paving crews were brought in to further expedite the process. September in New England can be unpredictable, and this Saturday was no exception. Overnight a cold front had moved through, bringing 30 degree F weather for the seven o’clock a.m. start time. Normal HMA specifications would not allow pavement to be placed until the surface reaches 40 degrees F, but given that an additive-based WMA was being used, the contractor was allowed to proceed. Saving this potential delay allowed the contractor to complete paving the roundabout within the allotted time, therefore reducing the impact to the public. Public Works Director Joe Flanagan commented: “That alone made the switch to WMA worth it. The paving crew liked to work with the warm mix and we saw immediate results on the compaction.”

The Town of Dedham is now in its third year of their WMA program. Now with a second contractor, Lorusso Corp., Dedham continues to see successful pavement projects. Lorusso has also experienced better compaction, reduced fuel consumption, and reduced emissions using the chemical additive. Lorusso’s Project Manager, Wes Sterns, reports: “Lorusso Corp. prides itself on being able to provide our customers a superior quality product while reducing our carbon footprint. The use of Evotherm on this and other projects has enabled us to achieve higher levels of compaction, avoiding penalties and maximizing incentives.” Although time will tell, Joe Flanagan feels that he is receiving a great deal of benefit from WMA. Between the longer binder life and the increased compaction, Dedham’s roads should last longer. Flanagan continues: “That gives me more time to pave other roads before we have to come back to these roads.”

Dedham set out to create a more sustainable paving program without reducing scope or increasing overall budget. By developing a partnership with their paving contractor, engineering consultants, and utilizing the latest WMA additive technologies, they have been able to implement a quality-focused WMA specification that allowed placement and compaction of asphalt at temperatures 50 degrees F below that of HMA. In 2015, they became the first municipality in the Commonwealth to require the use of WMA. Director of Engineering Jason Mammon and Joe Flanagan have seen the overwhelming success of the warm mix and outstanding compaction reports. “We present a yearly report to The Board of Selectmen on our pavement management program from the previous year and we also ask the Board to endorse the next three-year program. To date we have not only met but exceeded our 10-year goal of a PCI of 80.” The Town of Dedham continues to maximize the almost $700,000 annual state-funded budget, and the $1,500,000 Town-funded budget continually improves the PCI of their infrastructure (currently at an 84) while reducing the overall pavement rehabilitation backlog from nearly $24 million to the current $10 million. We have exceeded our 10-year goal with a PCI at an 84 while saving hundreds of thousands of dollars, and having roads that are exceeding in compaction, density and rideability. We are also reducing our Town-funded capital paving investment. We will maintain a PCI at or above an 84 while reducing the capital required because of our pavement management program and the addition of Evotherm Warm Mix Asphalt. We take great pride in embarking upon this improvement program in a more responsible and sustainable manner.

Matthew J. LaChance can be reached at (843) 697-3673 or matthew.lachance@ingevery.com; Joseph Flanagan can be reached at (781) 751-9350 or jflanagan@dedham-ma.gov. Joseph Flanagan will give a presentation on this topic at the 2016 APWA PWX in Minneapolis, Minnesota. His session is entitled “Warming Up to Sustainable Paving” and takes place on Sunday, August 28, at 8:30 a.m.
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Asset management through a life-cycle lens

Jim Engfer  
GIS Manager  
Stantec Consulting Services Inc., St. Paul, Minnesota  
Presenter, 2016 APWA PWX

My route to work involves navigating city streets until I reach the freeway—pretty typical of most commuters. Recently a stretch of road along my route was seal coated. This got me thinking, as I have ample time to do on my daily commute, why did this happen when the same stretch of road was just repaved only two years ago?

I just so happen to have a buddy who works at the City, so I asked him about the project. He explained to me that the City was trying something new to extend the life of the streets as part of its asset life-cycle management strategy to ultimately save costs.

Municipalities and other organizations have different takes on what asset management means, but it comes down to planning to maximize the value of an asset. These are the common elements of any asset management program:

- **Asset inventories** – How many manholes are in the sanitary sewer system? Where are they located?
- **Data storage and analysis** – Geographic information systems (GIS) and asset management software are powerful tools. Software can be used to store asset inventories and asset conditions as well as document asset maintenance. The data can be used for modeling purposes to recommend maintenance cycles, enabling city

Documenting the condition of an asset, like the storm sewers depicted in the above inspection form, is very important to a city’s financial health and resilience. The more we understand how an asset deteriorates over time, the more cost-effectively we can approach its life-cycle maintenance.
Know your window of opportunity. Through the use of deterioration models, communities can better determine the best time to replace an asset.

- Planning and budgeting – It is critical for an organization’s financial health to allocate proper funds for asset maintenance and replacement. Surprises are not only inconvenient; they can be financially devastating, and create an unsafe environment for residents and visitors alike. Understanding the life cycle of an asset and how to best maintain the asset is a key aspect of adequate planning and budgeting.

Nothing lasts forever. The more we understand about how an asset deteriorates over time, the more cost-effectively we can approach its life-cycle maintenance. Deterioration models can be used to predict when an asset will reach the end of its useful life. In other words, we can determine the best time to replace an asset by looking at replacement costs throughout the asset’s life cycle. This analysis can also provide insight on when to maintain, rehabilitate, or replace an asset.

Historically, municipal budgeting is based on previous years and a contingency percentage is added to accommodate unplanned expenses. What if municipalities approached this in a smarter and more cost-effective way?
Asset management enables us to determine capital costs and a defined contingency based on typical asset life cycles. Operations and maintenance (O&M) costs are added for efficient and planned maintenance to occur over time at key points, ultimately extending the life of any particular asset. Combining the capital with the O&M costs defines the annual sustainable funding level needed to cost-effectively maintain, rehabilitate, and replace such assets.

What is the next step? Creating a realistic budget. Now it is time for the agency or municipality to figure out how to budget for that annual sustainable funding level and create a realistic budget. It’s imperative to include the finance director in this planning. Approaching the Council, Board, or other decision makers who have approval authority with a concerted, well-defined program is important. With an effective asset management plan based on life-cycle planning, it is easier to justify a budget that reflects the sustainable funding level for any particular asset.

There will always be times when something unforeseen happens, but thoughtful and deliberate life-cycle planning is our best approach to maintaining reliable and safe infrastructure for our communities. As I travel my route to work, I can appreciate this concept within my own city as a taxpayer and as a driver.

Interested in learning more about this important municipal topic? Come to the upcoming PWX conference being held at the Minneapolis Convention Center on August 28-31, 2016. Jim Engfer, Stantec’s GIS Manager in St. Paul, and Andrew Faley, Stantec’s GIS Manager in Columbus, will be presenting “Effective Asset Management Planning through a Life Cycle Lens” on August 29 from 9:45-11:00 a.m. Jim and Andrew would be happy to meet attendees and answer questions after the session.

Achieving a sustainable funding level is attainable with smarter planning. Combining the capital with the O&M costs defines the annual sustainable funding needed to cost-effectively maintain, rehabilitate, and replace infrastructure assets.
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- Asset Management Solutions
- What is a “Smart City”
- Bicycle Infrastructure
- Emergency Management
- Are You Ready to Get Engaged with APWA
- Solid Waste Technologies — Pros & Cons
- Dealing with ANNOYING CRAP
- What is Public Works Going to Look Like in 2030, 2050?

Toast & Jam Session:
In case you didn’t get enough Jam on Monday and Tuesday, grab a bite to eat on Wednesday morning for a Toast & Jam on the topic:

- Dealing With Vehicle Technician Shortages
- Into the Future Beyond the PWX Experience

LIGHTNING ROUNDS

You’ll enjoy these fast-paced, concise presentations on today’s hottest topics. Each lightning round will consist of three short presentations from different speakers followed by the opportunity to ask questions, share, and network with your colleagues.

- MnDOT Approach to Winter Maintenance
- Caring for the Urban Forest
- Minnesota, It’s Not Just About Projects Anymore

INNOVATION STATION

Share your best innovations, and learn something new to take back with you when you head home!

The Innovation Station is an all-new, multi-purpose common area at PWX. Located in The Hub near Registration, this area will host Public Works Exchange discussions and APWA Tech Time presentations part of the day, and serve as a community area, during the rest of the day.

Public Works Exchange
Among the Urban Dictionary definitions of a “MacGyver” is the classic: “someone who can jump-start a truck with a cactus.”

That’s public works in a nutshell — a cadre of talented, committed professionals who are able to use ingenuity, creativity and common sense to solve issues ranging from:

- Developing innovative funding strategies
- Using new technologies to increase efficiency
- MacGyvering a piece of equipment to improve a process or save dollars.

Don’t keep these ideas to yourself! Drop by the Innovation Station between 2:00 – 4:00 p.m. on Monday and Tuesday, make friends with professionals from around the world, and share your best innovations during these interactive discussions.

Tech Time
Let’s face it, new technology is popping up everywhere you look these days, and lots of it can be intimidating. Tech Time is here to help! These informal sessions are meant to help catch you up on new tools and resources you may be missing out on and answer questions you might have on how they can help you be more productive in the workplace. These casual training and Q&A sessions will cover social media in public works; apps, tools and resources for professionals; and APWA-specific technology like the APWA Events App, APWA Connect and the new APWA website. Drop by for how-to’s, tips, tricks and more!

Tech Time Schedule
Sunday, August 28
Social Media: 8:00 – 8:30 a.m.
Professional Tools & Resources: 8:45 – 9:15 a.m.
APWA Technology: 9:30 – 10:00 a.m.

Tuesday, August 30
Open Discussion: 9:30 – 10:00 a.m.

FLEET WORKSHOP: Challenges and Solutions for Public Fleet Managers
An all-new, jam-packed day of fleet solutions that includes the Monday general session featuring Jeff Havens, two hours on the exhibit floor, and presentations and discussions on:

- Top Ten Performance Measures for 21st Century Fleet Management
- What to Look for in a Fleet Management System
- Attracting Fleet Managers and Technicians to Replace Retiring Staff
- Insourcing, partnership opportunities, and service agreements
- Replacement Funding

APWA CONNECT LIVE!

Booth 537
APWA is revamping our presence on the PWX Exhibit Floor! Our booth will be changing from the “Expo Experience” to "APWA Connect LIVE!” Similar to our online APWA Connect community, the goal of APWA Connect LIVE! is to provide attendees with an environment where each of you can meet public works experts, network with your peers and stay up-to-date with the latest happenings in public works! Don’t worry, we’ll also have knowledgeable APWA staff available to answer your questions and provide you with information on APWA products and programs.

EXPANDED TECHNOLOGY

WiFi
Attendees desire to stay connected to work, to the world and to each other. In consideration of that complimentary WiFi will be provided throughout the Convention Center.

Event App
We’ve expanded the APWA app to include new features to connect with colleagues and enhance your overall experience. We’ll have WiFi available throughout the entire Convention Center, making the app available on tablets, phones, and laptops. A directory will be available to help you message and find your colleagues at the show. In addition, speaker handouts, session evaluations, social media, maps, exhibitors and more will all be available through this year’s app.

Live Streaming — NEW!
For the first time ever, APWA is broadcasting concurrent education sessions across the internet to allow opportunities for those who cannot travel to experience the education provided at PWX. Live Streaming will include one education session during each concurrent session time slot. Be sure to contact your colleagues at home and let them know that they can download the select live stream sessions from their desk for only $249.

These are just some of the many new experiences at PWX. For all the latest information, download the mobile app.
NATIONAL SPONSORS

Cityworks (Booth 1837)
Thank you to Cityworks for sponsoring Sunday’s General Session! Be sure to stop by their booth to say thank you for their generous support!

GPS Insight (Booth 2028)
Thank you to GPS Insight for sponsoring the official Welcome Signage and the lanyard you are wearing. Be sure to stop by their booth and say thanks!

GPS Insight

BigFoot Construction Equipment, Inc (Booth 1552)
Thank you to Bigfoot Construction Equipment for sponsoring Sunday and Monday’s Happy Hour Beer! Be sure to stop by the booth to say thank you for their generous support!

HNTB
Thank you to HNTB for sponsoring the Awards & Recognition Reception on Monday, August 29. Be sure to say thanks!

SealMaster (Booth 711)
Thank you to SealMaster for sponsoring Monday’s Happy Hour on the Exhibit Floor, and the PW Paws Costume. Be sure to stop by to say thank you for the generous support!

STANTEC (Booth 1605)
Thank you to Stantec for sponsoring the Young Professionals Reception on Monday, August 29. Be sure to say thanks for their generous support!

Volvo Construction Equipment NA, LLC (Booth 525)
Thank you to Volvo Construction Equipment NA, LLC for sponsoring the First-Timers Meeting on Sunday, August 28! Be sure to stop by their booth and say thank you!

Dude Solutions (Booth 1828)
Thank you to Dude Solutions for sponsoring the attendee badge. Be sure to stop by and say thanks for their support!

BSM Technologies (Webtech Wireless, Division of BSM Technologies (Booth 1823)
Thank you to BSM Technologies for sponsoring our Sunday Happy Hour! Stop by their booth for a cold one and say thank you!

Bentley Systems (Booth 2029)
Thank you to Bentley Systems for sponsoring our Monday Happy Hour! Stop by their booth for a cold one and say thank you!

MINNESOTA CHAPTER SPONSORS

PLATINUM PLUS
3M, Booth 1213
Bolton & Menk, Inc., Booth 218
MacQueen Equipment, Inc., Booth 714
WSB & Associates, Inc., Booth 823

PLATINUM
Stantec, Booth 1605
SEH, Inc., Booth 204

DIAMOND
City Engineers Association of Minnesota
GoodPointe Technology
HDR
Kimley-Horn & Associates, Inc.
WSP Parsons Brinckerhoff
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Thank You to the...

PWX PROGRAM REVIEW COMMITTEE

The PWX Education Program topics were selected through a criteria-based judging process by members of APWA’s Technical Committees and the Center for Sustainability. The final program was developed by the PWX Program Review Committee – a representative group of public works professionals appointed by the APWA President. Congratulations and thank you to the members of 2016 committee for their professional expertise and personal dedication to the outstanding quality of your PWX experience.

Front Row Left to Right: Joseph Cory, Kim Lundgren
Back Row Left to Right: Mary Monahan, Mike Eastling, Paul Smeltzer, Martha Graham, Randall Bowman

MINNESOTA HOST CHAPTER

A special thank you goes to the Minnesota Host Chapter for their dedication and hard work to make this PWX a success. Thank you to all the APWA members who so generously volunteered time to support the 2016 PWX! When you see a volunteer be sure to say “Thank you” for all their hard work and support! The APWA Family is without equal in their generosity and willingness to support so many worthy efforts. Thanks to each of you for being an “Everyday Hero!”

Front Row Left: Mike Marti, Mike Eastling, Mark Ray, Dave Hutton, Shelly Pederson, Chris Petree, Dale Reed; Second Row Left: Mitch Hoeft, Brian Lokkesmoe, Nick Egger; Third Row Left: Bert Tracy, Matt Saam; Fourth Row Left: Dave Sonnenberg, Sue Mason, Richard McCoy; Top Row Left: Jeannine Clancy, Jim Grube, Angela Poppenhagen

Additional Committee Members who were not present when photo taken: Mark Kasma, Steve Albrecht, Justin Messner, Jupe Hale, April Crockett, Kristin Asher, Charlie Wild, Justin Gese, Judd Genereaux, Jim Owens, Heidi Hamilton, Beth Engum, Eric Seaburg, Don Theisen, Bridget Rief, Lee Gustafson, and Will Manchester
President
Ronald J. Calkins, P.E., PWLF
Director of Public Works (retired)
City of Ventura, CA

President-Elect
Bo Mills, PWLF
Director of Public Works
City of Germantown, TN

Past President
Brian R. Usher, PWLF
Director of Public Works
City of Largo, FL

President-Elect
Bo Mills, PWLF
Director of Public Works
City of Germantown, TN

Past President
Brian R. Usher, PWLF
Director of Public Works
City of Largo, FL

President-Elect
Bo Mills, PWLF
Director of Public Works
City of Germantown, TN

Past President
Brian R. Usher, PWLF
Director of Public Works
City of Largo, FL
All events and meetings are at the Minneapolis Convention Center unless otherwise noted.

### FRIDAY, AUGUST 26

<table>
<thead>
<tr>
<th>TIME</th>
<th>EVENT/MEETING</th>
<th>LOCATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00 a.m. – 2:00 p.m.</td>
<td>National Roadeo Task Force Meeting</td>
<td>Hilton – Board Room 3</td>
</tr>
<tr>
<td>10:00 a.m. – 5:00 p.m.</td>
<td>Board of Directors Meeting</td>
<td>Hilton – Duluth Room</td>
</tr>
</tbody>
</table>

### SATURDAY, AUGUST 27

<table>
<thead>
<tr>
<th>TIME</th>
<th>EVENT/MEETING</th>
<th>LOCATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:00 a.m. – 5:00 p.m.</td>
<td>Registration Open</td>
<td>The Hub / Hall B Lobby</td>
</tr>
<tr>
<td>7:00 a.m. – 4:00 p.m.</td>
<td>Council of Chapters</td>
<td>205 ABCD</td>
</tr>
<tr>
<td>8:00 – 11:30 a.m.</td>
<td>Government Affairs Committee</td>
<td>201 A</td>
</tr>
<tr>
<td></td>
<td>Engineering and Technology Committee</td>
<td>201 B</td>
</tr>
<tr>
<td></td>
<td>Solid Waste Management Committee</td>
<td>203 A</td>
</tr>
<tr>
<td></td>
<td>Fleet Services Committee</td>
<td>203 B</td>
</tr>
<tr>
<td></td>
<td>Leadership and Management Committee</td>
<td>204 A</td>
</tr>
<tr>
<td>8:00 a.m. – 4:30 p.m.</td>
<td>Self Assessment Workshop (ticketed event)</td>
<td>102 F</td>
</tr>
<tr>
<td>8:00 a.m. – 5:00 p.m.</td>
<td>Professional Development Committee &amp; Subcommittees</td>
<td>various</td>
</tr>
<tr>
<td>8:00 a.m. – 10:00 p.m.</td>
<td>Fishing (pre-registration required)</td>
<td>Lake Mille Lacs</td>
</tr>
<tr>
<td>9:00 a.m. – 5:30 p.m.</td>
<td>Golf Tournament (pre-registration required)</td>
<td>The Meadows at Mystic Lake</td>
</tr>
<tr>
<td>11:30 a.m. – 1:30 p.m.</td>
<td>Joint APWA Committees &amp; Council of Chapters Meeting</td>
<td>205 ABCD</td>
</tr>
<tr>
<td>1:00 – 2:00 p.m.</td>
<td>International Partnerships Meeting</td>
<td>201 B</td>
</tr>
<tr>
<td>1:30 – 2:30 p.m.</td>
<td>Small Cities/Rural Communities (SCRC)</td>
<td>103 B</td>
</tr>
<tr>
<td>1:30 – 3:30 p.m.</td>
<td>Certification Council</td>
<td>103 A</td>
</tr>
<tr>
<td>1:30 – 5:00 p.m.</td>
<td>UPROW Committee</td>
<td>208 A</td>
</tr>
<tr>
<td></td>
<td>Water Resources Management Committee</td>
<td>203 A</td>
</tr>
<tr>
<td></td>
<td>Facilities and Grounds Committee</td>
<td>203 B</td>
</tr>
<tr>
<td></td>
<td>Emergency Management Committee</td>
<td>204 A</td>
</tr>
<tr>
<td></td>
<td>Transportation Committee</td>
<td>208 B</td>
</tr>
<tr>
<td></td>
<td>Professional Development Committee</td>
<td>208 C</td>
</tr>
<tr>
<td>2:00 – 3:00 p.m.</td>
<td>Jennings Randolph Fellows Meeting</td>
<td>201 B</td>
</tr>
<tr>
<td>2:00 – 6:30 p.m.</td>
<td>Microbrew Experience (pre-registration required)</td>
<td>Twin Cities’ Brew Pubs</td>
</tr>
<tr>
<td>3:00 – 4:00 p.m.</td>
<td>Diversity Committee</td>
<td>201 A</td>
</tr>
<tr>
<td>3:00 – 5:00 p.m.</td>
<td>International Affairs Committee</td>
<td>201 B</td>
</tr>
<tr>
<td>4:30 – 5:30 p.m.</td>
<td>Road Safety Subcommittee</td>
<td>208 B</td>
</tr>
<tr>
<td>6:00 – 7:00 p.m.</td>
<td>PWI/South Carolina Chapter Meeting</td>
<td>103 B</td>
</tr>
</tbody>
</table>

### SUNDAY, AUGUST 28

<table>
<thead>
<tr>
<th>TIME</th>
<th>EVENT/MEETING</th>
<th>LOCATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:00 a.m. – 5:00 p.m.</td>
<td>Registration Open</td>
<td>The Hub / Hall B Lobby</td>
</tr>
<tr>
<td>7:00 – 8:20 a.m.</td>
<td>First-Timers Meeting</td>
<td>205 ABCD</td>
</tr>
<tr>
<td>7:00 – 9:45 a.m.</td>
<td>Center for Sustainability Leadership Group</td>
<td>201 A</td>
</tr>
<tr>
<td>8:00 – 9:45 a.m.</td>
<td>Accreditation Council</td>
<td>203 A</td>
</tr>
<tr>
<td></td>
<td>Transportation Reauthorization Task Force</td>
<td>201 B</td>
</tr>
<tr>
<td></td>
<td>Winter Maintenance Subcommittee</td>
<td>208 B</td>
</tr>
<tr>
<td></td>
<td>DCS Council Chairs</td>
<td>203 B</td>
</tr>
<tr>
<td>Time</td>
<td>Event/Meeting</td>
<td>Location</td>
</tr>
<tr>
<td>-------------------</td>
<td>---------------------------------------------------</td>
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</tr>
<tr>
<td>8:00 – 10:00 a.m.</td>
<td>Innovation Station</td>
<td></td>
</tr>
<tr>
<td>8:30 – 9:45 a.m.</td>
<td>APWA Tech Time</td>
<td>Innovation Station</td>
</tr>
<tr>
<td>10:00 a.m. – Noon</td>
<td>Opening General Session: Captain Scott Kelly</td>
<td>Auditorium</td>
</tr>
<tr>
<td>12:00 – 4:00 p.m.</td>
<td>Exposition Open (non-compete time: Noon – 3 p.m.)</td>
<td>Halls BCD</td>
</tr>
<tr>
<td>12:00 – 2:00 p.m.</td>
<td>Regional Directors and COC Steering Committee</td>
<td>208 B</td>
</tr>
<tr>
<td>1:00 – 1:50 p.m.</td>
<td>Exhibitor Solutions Theater #1</td>
<td>APWA Connect LIVE! – Booth 537</td>
</tr>
<tr>
<td>1:00 – 3:00 p.m.</td>
<td>Asset Management Task Force</td>
<td>208 A</td>
</tr>
<tr>
<td>2:00 – 2:50 p.m.</td>
<td>Exhibitor Solutions Theater #2</td>
<td>APWA Connect LIVE! – Booth 537</td>
</tr>
<tr>
<td>2:00 – 4:00 p.m.</td>
<td>Chapter Leaders Forum</td>
<td>208 CD</td>
</tr>
<tr>
<td>3:00 – 3:50 p.m.</td>
<td>There's An App For That Theater</td>
<td>Booth 191</td>
</tr>
<tr>
<td>3:00 – 4:00 p.m.</td>
<td>Exhibition Open (non-compete time: 11 a.m. – 2 p.m.)</td>
<td>Halls BCD</td>
</tr>
<tr>
<td>4:00 – 4:50 p.m.</td>
<td>Fleet Workshop</td>
<td>102BC</td>
</tr>
<tr>
<td>5:00 – 7:00 p.m.</td>
<td>Get Acquainted Party</td>
<td>Target Field</td>
</tr>
</tbody>
</table>

**MONDAY, AUGUST 29**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event/Meeting</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:00 a.m. – 5:00 p.m.</td>
<td>Registration Open</td>
<td>The Hub / Hall B Lobby</td>
</tr>
<tr>
<td>7:00 a.m. – 4:00 p.m.</td>
<td>APWA Futures (invitation only)</td>
<td>208 CD</td>
</tr>
<tr>
<td>8:00 – 9:30 a.m.</td>
<td>General Session: Jeff Havens</td>
<td>Auditorium</td>
</tr>
<tr>
<td>8:00 a.m. – 3:30 p.m.</td>
<td>DCS PWE Accelerated Planning Group</td>
<td>203A</td>
</tr>
<tr>
<td>9:00 a.m. – 3:00 p.m.</td>
<td>Exposition Open (non-compete time: 11 a.m. – 2 p.m.)</td>
<td>2300 Aisle</td>
</tr>
<tr>
<td>9:45 – 11:00 a.m.</td>
<td>Education Sessions</td>
<td>See Education Sessions At-A-Glance on page 84</td>
</tr>
<tr>
<td>9:45 a.m. – 5:00 p.m.</td>
<td>Fleet Workshop</td>
<td>102BC</td>
</tr>
<tr>
<td>10:00 – 10:50 a.m.</td>
<td>Exhibitor Solutions Theater #1</td>
<td>APWA Connect LIVE! – Booth 537</td>
</tr>
<tr>
<td>11:00 – 11:50 a.m.</td>
<td>Exhibitor Solutions Theater #2</td>
<td>Booth 201</td>
</tr>
<tr>
<td>12:00 – 12:50 p.m.</td>
<td>Exhibitor Solutions Theater #1</td>
<td>APWA Connect LIVE! – Booth 537</td>
</tr>
</tbody>
</table>
### MONDAY, AUGUST 29

<table>
<thead>
<tr>
<th>TIME</th>
<th>EVENT/MEETING</th>
<th>LOCATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>12:00 – 1:30 p.m.</td>
<td>CPWA Luncheon (ticketed event)</td>
<td>205 ABCD</td>
</tr>
<tr>
<td>1:00 – 1:50 p.m.</td>
<td>Connecting Your Way Through APWA Online</td>
<td>102 F</td>
</tr>
<tr>
<td></td>
<td>Exhibitor Solutions Theater #1</td>
<td>APWA Connect LIVE! – Booth 537</td>
</tr>
<tr>
<td></td>
<td>Exhibitor Solutions Theater #2</td>
<td>Booth 201</td>
</tr>
<tr>
<td></td>
<td>There’s An App For That Theater</td>
<td>Booth 1919</td>
</tr>
<tr>
<td>1:50 p.m.</td>
<td>Daily Prize Drawings</td>
<td>APWA Connect LIVE! – Booth 537</td>
</tr>
<tr>
<td>2:00 – 2:50 p.m.</td>
<td>Education Sessions</td>
<td>102 F</td>
</tr>
<tr>
<td></td>
<td>Exhibitor Solutions Theater #1</td>
<td>APWA Connect LIVE! – Booth 537</td>
</tr>
<tr>
<td></td>
<td>Exhibitor Solutions Theater #2</td>
<td>Booth 201</td>
</tr>
<tr>
<td></td>
<td>There’s An App For That Theater</td>
<td>Booth 1919</td>
</tr>
<tr>
<td></td>
<td>Education Sessions</td>
<td>See Education Sessions At-A-Glance on page 85</td>
</tr>
<tr>
<td>2:00 – 3:50 p.m.</td>
<td>Public Works Director Roundtable</td>
<td>101 ABC</td>
</tr>
<tr>
<td>2:00 – 4:00 p.m.</td>
<td>Public Works Exchange</td>
<td>Innovation Station</td>
</tr>
<tr>
<td>2:00 – 5:00 p.m.</td>
<td>Public Works Stormwater Summit — Day One</td>
<td>Auditorium 3</td>
</tr>
<tr>
<td>2:00 – 3:50 p.m.</td>
<td>CPWA Board of Directors Meeting</td>
<td>201 A</td>
</tr>
<tr>
<td>3:00 – 3:50 p.m.</td>
<td>Education Sessions</td>
<td>See Education Sessions At-A-Glance on page 85</td>
</tr>
<tr>
<td>3:00 – 4:30 p.m.</td>
<td>Self Assessment &amp; Accreditation Open Forum</td>
<td>208 A</td>
</tr>
<tr>
<td>3:30 – 4:30 p.m.</td>
<td>DCS Meet &amp; Greet</td>
<td>Lounge A</td>
</tr>
<tr>
<td>3:30 – 8:00 p.m.</td>
<td>Tennis (pre-registration required)</td>
<td>University of Minnesota</td>
</tr>
<tr>
<td>4:00 – 5:00 p.m.</td>
<td>Education Sessions</td>
<td>See Education Sessions At-A-Glance on page 85</td>
</tr>
<tr>
<td>4:00 – 5:00 p.m.</td>
<td>Happy Hour Jams</td>
<td>Auditorium</td>
</tr>
<tr>
<td>5:00 – 7:00 p.m.</td>
<td>Awards &amp; Recognition Ceremony and Reception</td>
<td>Brit’s Pub – Clubhouse &amp; Veranda</td>
</tr>
<tr>
<td>8:00 – 9:30 p.m.</td>
<td>Young Professionals Networking Reception</td>
<td></td>
</tr>
</tbody>
</table>

### TUESDAY, AUGUST 30

<table>
<thead>
<tr>
<th>TIME</th>
<th>EVENT/MEETING</th>
<th>LOCATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:00 – 8:30 a.m.</td>
<td>Fun Run (pre-registration required)</td>
<td>5K Course along Mississippi River</td>
</tr>
<tr>
<td>7:00 a.m. – 4:00 p.m.</td>
<td>Registration Open</td>
<td>The Hub / Hall B Lobby</td>
</tr>
<tr>
<td>8:00 – 9:30 a.m.</td>
<td>General Session: Mel Robbins</td>
<td>Auditorium</td>
</tr>
<tr>
<td>9:30 – 10:00 a.m.</td>
<td>APWA Tech Time</td>
<td>Innovation Station</td>
</tr>
<tr>
<td>9:45 – 11:00 a.m.</td>
<td>Education Sessions</td>
<td>See Education Sessions At-A-Glance on page 86</td>
</tr>
<tr>
<td>10:00 – 10:50 a.m.</td>
<td>Exhibitor Solutions Theater #1</td>
<td>APWA Connect LIVE! – Booth 537</td>
</tr>
<tr>
<td></td>
<td>Exhibitor Solutions Theater #2</td>
<td>Booth 201</td>
</tr>
<tr>
<td></td>
<td>There’s An App For That Theater</td>
<td>Booth 1919</td>
</tr>
<tr>
<td>10:00 – 11:30 a.m.</td>
<td>SCRC Town Hall Brunch (ticketed event)</td>
<td>208 ABCD</td>
</tr>
<tr>
<td></td>
<td>Diversity Brunch (ticketed event)</td>
<td>205 ABCD</td>
</tr>
<tr>
<td>10:00 a.m. – 2:00 p.m.</td>
<td>Exposition Open (non-compete time 11 a.m. – 2 p.m.)</td>
<td>Halls BCD</td>
</tr>
<tr>
<td></td>
<td>Blood Drive — Memorial Blood Centers</td>
<td>2300 Aisle</td>
</tr>
<tr>
<td>10:30 a.m. – 12:30 p.m.</td>
<td>APWA Past Presidents Advisory Council</td>
<td>201 A</td>
</tr>
<tr>
<td>TIME</td>
<td>EVENT/MEETING</td>
<td>LOCATION</td>
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<tr>
<td>11:00 – 11:50 a.m.</td>
<td>Exhibitor Solutions Theater #1</td>
<td>APWA Connect LIVE! – Booth 537</td>
</tr>
<tr>
<td></td>
<td>Exhibitor Solutions Theater #2</td>
<td>Booth 201</td>
</tr>
<tr>
<td></td>
<td>There’s An App For That Theater</td>
<td>Booth 1919</td>
</tr>
<tr>
<td>11:00 a.m. – Noon</td>
<td>Chapter Website Template Training: More Than Just the Basics</td>
<td>102 F</td>
</tr>
<tr>
<td>12:00 – 12:50 p.m.</td>
<td>Exhibitor Solutions Theater #1</td>
<td>APWA Connect LIVE! – Booth 537</td>
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<td></td>
<td>Exhibitor Solutions Theater #2</td>
<td>Booth 201</td>
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<tr>
<td></td>
<td>There’s An App For That Theater</td>
<td>Booth 1919</td>
</tr>
<tr>
<td>12:50 p.m.</td>
<td>Daily Prize Drawings</td>
<td>APWA Connect LIVE! – Booth 537</td>
</tr>
<tr>
<td>1:00 – 1:50 p.m.</td>
<td>Exhibitor Solutions Theater #1</td>
<td>APWA Connect LIVE! – Booth 537</td>
</tr>
<tr>
<td></td>
<td>There’s An App For That Theater</td>
<td>Booth 201</td>
</tr>
<tr>
<td>1:00 – 2:00 p.m.</td>
<td>Online Tools &amp; Resources for Chapter Leaders</td>
<td>102 F</td>
</tr>
<tr>
<td>1:30 – 3:30 p.m.</td>
<td>Western Canadian Exchange Meeting</td>
<td>203 AB</td>
</tr>
<tr>
<td>1:30 – 4:00 p.m.</td>
<td>Safeguarding Your “Get Out of Jail Free Card” and Other APWA Chapter Assets</td>
<td>201 B</td>
</tr>
<tr>
<td>2:00 – 2:50 p.m.</td>
<td>Education Sessions</td>
<td>See Education Sessions At-A-Glance on page 87</td>
</tr>
<tr>
<td>2:00 – 4:00 p.m.</td>
<td>Public Works Exchange</td>
<td>Innovation Station</td>
</tr>
<tr>
<td>2:00 – 5:00 p.m.</td>
<td>Public Works Stormwater Summit — Day Two</td>
<td>Auditorium 3</td>
</tr>
<tr>
<td>3:00 – 3:50 p.m.</td>
<td>Education Sessions</td>
<td>See Education Sessions At-A-Glance on page 87</td>
</tr>
<tr>
<td>3:30 – 5:00 p.m.</td>
<td>APWA/OPWA Meeting</td>
<td>203 AB</td>
</tr>
<tr>
<td>4:00 – 4:50 p.m.</td>
<td>Education Sessions</td>
<td>See Education Sessions At-A-Glance on page 87</td>
</tr>
<tr>
<td>4:00 – 5:00 p.m.</td>
<td>Happy Hour Jams</td>
<td>See Education Sessions At-A-Glance on page 87</td>
</tr>
<tr>
<td>Evening</td>
<td>Chapter Dinners</td>
<td></td>
</tr>
</tbody>
</table>

**WEDNESDAY, AUGUST 31**

<table>
<thead>
<tr>
<th>TIME</th>
<th>EVENT/MEETING</th>
<th>LOCATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:00 – 10:45 a.m.</td>
<td>Workshop/Tours (ticketed event)</td>
<td>The Hub / Hall B Lobby</td>
</tr>
<tr>
<td></td>
<td>See Education Sessions At-A-Glance on page 88</td>
<td></td>
</tr>
<tr>
<td>7:00 a.m. – 12:30 p.m.</td>
<td>Registration Open</td>
<td>The Hub / Hall B Lobby</td>
</tr>
<tr>
<td>8:00 – 10:30 a.m.</td>
<td>APWA Board of Directors Meeting</td>
<td>Hilton — Rochester Room</td>
</tr>
<tr>
<td>8:30 – 9:20 a.m.</td>
<td>Education Sessions</td>
<td>See Education Sessions At-A-Glance on page 88</td>
</tr>
<tr>
<td>8:30 – 9:30 a.m.</td>
<td>Toast and Jams</td>
<td>See Education Sessions At-A-Glance on page 88</td>
</tr>
<tr>
<td>8:30 – 10:45 a.m.</td>
<td>Workshop Wednesday</td>
<td>See Education Sessions At-A-Glance on page 88</td>
</tr>
<tr>
<td></td>
<td>2016 &amp; 2017 PWX Host Committees</td>
<td>201 A</td>
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<tr>
<td>9:30 – 10:45 a.m.</td>
<td>Education Sessions</td>
<td>See Education Sessions At-A-Glance on page 88</td>
</tr>
<tr>
<td>11:00 a.m. – 12:15 p.m.</td>
<td>Closing General Session: Charles Marohn</td>
<td>Auditorium</td>
</tr>
</tbody>
</table>
BADGES
PWX badges have color-coded stripes for quick and easy identification.
Red  Attendee
Blue  Exhibitor
Green  Guest
Yellow  Expo Only
Purple  Daily

CHAPTER DINNERS
Most chapter dinners will be Tuesday evening, August 30. Chapter Dinner information, that APWA has received, can be found by accessing the Chapter Dinner icon in the event mobile application.

EMERGENCIES
For emergencies at the Convention Center please call extension x6040 from a house phone or 612-335-6040 from your cell.
For emergencies outside of the Convention Center please call 911.

HOSPITALITY
Be sure to stop by the Minnesota Chapter’s Hospitality Area in The Hub at PWX, located in the lobby space area near Registration. You can visit with members of the local host chapter, meet with your colleagues, gather with old and new acquaintances, or just rest a while! And while you’re there, be sure to say “Thanks” for all their work in making your PWX experience a great one! The Hospitality Area will be open Sunday through Wednesday. See you there!
Sponsored by the Minnesota Chapter.

PHOTOGRAPHIC AND VIDEO EQUIPMENT
No photography or video recording is permitted in the exhibit halls by anyone other than official or APWA staff photographers and approved press. Also, the use of cameras, video equipment and audio recorders is never permitted during program sessions.

RIBBONS & STICKERS
New this year! Check out the Badge Zone near Registration. APWA is providing free stickers and ribbons for you to “outfit” your badge and help you network with attendees who have the same professional interest/responsibilities that you do.

HOTELS
Do you have a question or concern about your hotel? Call 888-947-2233 or email housing@minneapolis.org with your questions.
APWA’s Official Hotels are:
• Hilton Minneapolis – Headquarters
• Hyatt Regency
• Millennium Hotel Minneapolis
• Holiday Inn Express
• Hilton Garden Inn Minneapolis Downtown
• Double Tree & Suites Minneapolis
• Minneapolis Marriott City Center*
• Radisson Blu Minneapolis, Downtown*
Hotel shuttle service is limited as most hotels are within walking distance. Those with shuttle service are indicated by *

PHONE NUMBERS & OFFICE LOCATIONS
APWA PWX Management Office
Room M100E, Phone: 612-330-3002
First Aid Room
Located near Dunn Brothers and Room 101E.
Housing/Hotels
888-947-2233
Speaker Check-In
Room M100F, Phone: 612-330-3001

MINNEAPOLIS CONVENTION CENTER
Unless otherwise noted, all PWX activities will take place in the Minneapolis Convention Center. A map of the Exhibit Hall and lobby area can be found under the maps icon in the mobile app or on pages 90-91 of the Reporter Program.

SPEAKER CHECK-IN ROOM
Upon arriving at the Convention Center, speakers must first pick up their badges and registration materials at the PWX Registration counters, located in The Hub — Hall B Lobby on the first level. Then speakers must check in at the Speaker Check-In Room, located in Room M100F. The Speaker Check-In Room provides resources to accommodate speakers as they make final preparations for their sessions. To contact staff in the Speaker Check-in room dial 612-330-3001.

PWX CD-ROMS/ONLINE LIBRARY
Full PWX Registrants are receiving a fantastic deal! You will be receiving free access to the downloadable recordings and slides of those PWX speakers who have given us permission to have their presentations recorded. Once the recordings are edited and archived, each full registrant will receive an e-mail notice that includes your individual code to access the APWA/ProLibraries Online Library. You will receive this code and the Online Library link about six weeks after the PWX.

For daily registrants or those who cannot attend the 2016 PWX—you may still purchase the online recordings of individual sessions or the full PWX by using the Online Order Form at www.ProLibraries.com.

REGISTRATION HOURS
Registration is located in The Hub — Hall B Lobby on the first level.
Saturday
7:00 a.m.—5:00 p.m.
Sunday
7:00 a.m.—5:00 p.m.
Monday
7:00 a.m.—5:00 p.m.
Tuesday
7:00 a.m.—4:00 p.m.
Wednesday
7:00 a.m.—12:30 p.m.
SHUTTLE BUS SERVICE
Limited complimentary shuttle bus service will operate between the Convention Center and the Radisson Blu and Marriott City Center hotels. All other hotels are within walking distance of the Convention Center. The shuttle will operate during the following days and times:

Saturday
6:30 a.m. - 5:30 p.m.

Sunday
6:30 a.m. – 7:30 p.m.*

Monday
6:30 a.m. - 7:30 p.m.

Tuesday
6:30 a.m. – 5:30 p.m.

Wednesday
6:30 a.m. – 1:00 p.m.

Please refer to the lobby signs for frequency of pickups, or visit the on-site Shuttle Bus Information Desk located at the Convention Center by the shuttle pick-up and drop-off point near the main entrance.

* Extended hours for transportation to the Get Acquainted Party. Following the party buses will return to all Official PWX hotels.

SPECIAL TRANSPORTATION NEEDS
If transportation is needed for the physically challenged or if you require further assistance with the shuttle, please call the STS dispatcher at 206-852-7695 or the PWX Management office at 612-330-3002, or contact any member of the STS and shuttle staff at the Convention Center.

WEDNESDAY WORKSHOP/TOUR BUSES
All buses for the Wednesday Workshop/Tours will depart from the front entrance of the Minneapolis Convention Center. Please check the program for departure times.

WiFi
Complimentary WiFi is available throughout the Convention Center.
To access:
Network Name: PWX2016
Password: APWA2016

USE OF ELECTRONIC DEVICES
As a courtesy to other PWX attendees, APWA requests that all cellular devices be set to vibrate during educational sessions. If you must use your cell phone, please use the vibrate ring mode and step outside the meeting room to take the call.

PWX MOBILE APP
All attendees are strongly encouraged to download the APWA Events app as it will provide you with everything you need to get the best out of your PWX experience in Minneapolis. The free app is available for iPhone and iPads in the App Store and for Android devices in the Google Play store. Don’t have any of these devices? Visit the PWX website to learn how to access the app through your device’s internet browser.

Don’t forget to download the APWA EVENTS CONFERENCE APP!
Be sure to download the free “APWA Events” mobile app in the App Store or Google Play for the ultimate PWX experience! In an effort to make PWX a more sustainable conference, we’re offering fewer printed materials than ever before. This means the “APWA Events” app is your number one resource for show information and resources. We’ve completely redesigned the app with brand new features to make sure you have everything you need right at your fingertips:

• Full conference schedule
• Attendee, exhibitor and speaker directories
• Appointment setting
• Exhibit floor, city and convention center maps
• Activity Feed with social sharing
• Speaker Evaluations
• Downloadable speaker handouts
• Customizable calendar
• Appointment setting
• In-app messaging
• Onsite mobile polling
• And more!

Don’t have any of these devices? Visit the PWX website to learn how to access the app through your device’s internet browser.
**EXPO TIMES**
The exhibits are located in Exhibit Hall B and will be open the following days and times:

- **Sunday** Noon – 4:00 p.m.
- **Monday** 9:00 a.m. – 3:00 p.m.
- **Tuesday** 10:00 a.m. – 2:00 p.m.

**NON-COMPETE TIMES**
We’ve made it easy for you to spend time with the exhibitors and not miss a single educational session. Each day, non-compete exhibit times have been set aside for you to visit the exhibits and have lunch.

- **Sunday** Noon – 3:00 p.m.
- **Monday** 11:00 a.m. – 2:00 p.m.
- **Tuesday** 11:00 a.m. – 2:00 p.m.

**APWA CONNECT LIVE!**
**Booth 537**
APWA is revamping our presence on the PWX Exhibit Floor! Our booth will be changing from the “Expo Experience” to “APWA Connect LIVE!” Similar to our online APWA Connect community, the goal of APWA Connect LIVE! is to provide attendees with an environment to meet public works experts, network with peers and stay up-to-date with the latest happenings in public works!

New this year, APWA staff will also be hosting informal technology training and Q&As in the APWA Connect LIVE! booth. Topics will include social media in the workplace (Twitter, Facebook, LinkedIn, Instagram), professional tools and resources (Evernote, Dropbox, Skype, Google Hangouts, etc.) and APWA-specific technology like the APWA Events app, APWA Connect, the new APWA website and more! Don’t worry, we’ll also have knowledgeable staff available to answer your general show questions and provide you with information on APWA products and programs.

**APWA Connect LIVE!**
**Training and Q&A Schedule**
- **Sunday, August 28**
  - Social Media: 1:00 – 1:30 p.m.
  - Professional Tools & Resources: 2:00 – 2:30 p.m.
  - APWA Technology: 3:00 – 3:30 p.m.
- **Monday, August 29**
  - Social Media: 10:00 – 10:30 a.m.
  - Professional Tools & Resources: 11:00 – 11:30 a.m.
  - APWA Technology: Noon – 12:30 p.m.
- **Tuesday, August 30**
  - Social Media: 11:00 – 11:30 a.m.
  - Professional Tools & Resources: Noon – 12:30 p.m.
  - APWA Technology: 1:00 – 1:30 p.m.
FOOD AVAILABLE IN THE EXHIBIT HALL
Attention all attendees and exhibitors! Lunch will be available for purchase in the Exhibit Hall. Be sure to stop by and buy your lunch here so you don’t miss any time away from the PWX Exhibits and Education Sessions! Refer to the FOOD icon on the mobile app for more information.

CHILDREN ON THE EXHIBIT FLOOR
APWA allows children to visit the exhibit floor during regular exhibition hours. For safety, anyone under 18 must be registered and be accompanied by an adult. The parent/guardian assumes all risk and is responsible for the safety of the child. Child registration forms are available at Registration.

GREEN PRODUCTS, SERVICES, AND PRACTICES
Exhibitors with green products, services, and practices are identified as green in the Exposition section, starting on page 92.

PRIZE DRAWINGS
APWA Connect LIVE!, Booth 537
Great prizes, donated by the Minnesota Host Chapter, will be given away each day in the Exhibit Hall at APWA Connect LIVE!, Booth 537.

Your prize tickets are conveniently printed with your badge. To be eligible to win, you’ll have to locate one of the prize ticket bins on the show floor.

Sunday  2:50 p.m.
Monday  1:50 p.m.
Tuesday  12:50 p.m.

You must be present to win. Good Luck!

NEW PRODUCTS OFFERED BY EXHIBITORS
Booth 2327
New & Improved this year at APWA PWX—The New Product Showcase. The showcase will feature actual products newly introduced to the public works industry since last year’s PWX. Attendees will have the opportunity to vote for the Best New Product of 2016. To place your vote, access the New Products icon on the event mobile application.

Winners will be announced on Tuesday, August 30 in the General Session at 8:00 a.m. The New Product Showcase will be the place to choose the latest products to make your job-site or office more efficient and effective.

EXHIBITOR SOLUTIONS THEATER
The APWA Connect LIVE! – Booth 537 and Booth 201
Don’t miss this opportunity to hear insightful and detailed presentations by our exhibitors on topics you won’t want to miss. Plus you can earn CEU’s as you learn from each presenter! Exhibiting companies will be presenting sessions on topics uniquely designed to give you cutting-edge information on a product or service addressing the needs of the public works industry. These 50-minute presentations will take place in the exhibit hall in The APWA Connect LIVE! Booth 537, and Booth 201, making it easy for you to take advantage of this unique learning opportunity.

Plan your days now to attend as many as possible! Be sure to check the daily schedule for dates and times.

THERE’S AN APP FOR THAT!
Booth 1919
Come see the hottest technology and find out about great public works apps during “There’s an App for That” interactive demos. Exhibitors presenting these 50-minute sessions will present you with information on smartphone technology applicable to public works. These sessions will be located in the Technology Pavilion on the exhibit floor in Booth 1919.

HAPPY HOUR ON THE EXHIBIT FLOOR
Join us on the exhibit floor for an ice cold beer while visiting with all of your favorite exhibitors.

Sunday  Noon – 4:00 p.m.
Monday  11:00 a.m. – 3:00 p.m.
Tuesday  11:00 a.m. – 2:00 p.m.

Beer will be served at the booths of our Happy Hour Sponsors. Check the mobile app for additional sponsors.

Sunday
BSM Technologies (Webtech Wireless, a Division of BSM Technologies)
Booth 1823

Sunday and Monday
Bigfoot Construction Equipment, Inc
Booth 1552

Monday
SealMaster
Booth 711

BENTLEY SYSTEMS
Booth 2029

APWA BOOKSTORE
Be sure to visit the newly updated APWA Bookstore, located in the The Hub — in Lobby B, where you’ll find a wide selection of publications, resources and APWA-branded merchandise available for purchase!

At the American Public Works Association, we take pride in bringing you the latest products and services that cover the field of public works. In the APWA Bookstore you will find publications, training resources and self-assessment tools on nearly every public works topic, from fleet services to winter maintenance, from the history of public works to management policies and practices, and from emergency management to water resources. Whether you’re looking to educate your workforce on a new technology, to inform the community at-large about public works in general, or to increase your own knowledge of a specific topic, APWA has an extensive selection of public works resources at your fingertips!

APWA BOOKSTORE HOURS
Saturday  8:00 a.m. – 4:30 p.m.
Sunday  8:00 a.m. – 4:30 p.m.
Monday  8:00 a.m. – 4:30 p.m.
Tuesday  8:00 a.m. – 4:30 p.m.
Wednesday  8:00 a.m. – Noon
SATURDAY, AUGUST 27

8:00 a.m. – 10:00 p.m.  Lake Mille Lacs

FISHING
Pre-registration required. Visit the Minnesota Hospitality for space availability and more information.

A box lunch with beverages is included.

Enjoy a true North Country experience, in the Land of 10,000 lakes, by spending the day fishing on beautiful Lake Mille Lacs. Located 1.5 hours from the Convention Center and the second largest fresh water lake within Minnesota’s borders, it is one of the top fishing lakes in Minnesota. We’ll stick around through dinner (on your own) at Twin Pines Resort after a day on the water. Fishing poles, tackle and bait will be provided on the resort’s launch, or if you would like you can bring your own.

9:00 a.m. – 5:30 p.m.

GOLF
The Meadows at Mystic Lake
Pre-registration required. Visit the Minnesota Hospitality for space availability and more information.

This fall the Minneapolis area is host to golf’s most prestigious Ryder Cup, just a few days after the PWX golf mixer. The Meadows at Mystic Lake is a nationally acclaimed public golf course offering a unique, challenging, and scenic golf experience with many picturesque features like waterfalls, wildlife statues, streams, lakes, and some very nice architecture.

Schedule:
7:00 a.m. Load busses at Convention Center
7:30 a.m. Busses leave for golf course
8:30 a.m. Check-in
9:30 a.m. Shot-gun golf
2:30 p.m. Reception/Awards ceremony
4:30 p.m. Busses leave for Convention Center

2:00 – 6:30 p.m.

MICROBREW EXPERIENCE
Pre-registration required. Visit the Minnesota Hospitality for space availability and more information.

The microbrewery scene in the Twin Cities is vibrant and expanding, and this tour will teach your inner craft beer aficionado to speak Minnesotan. If you can arrive in downtown Minneapolis by lunchtime on the Saturday before PWX starts (August 27) and you enjoy the taste of craft beer, join in this opportunity to experience some of the best beers the area has to offer!

Schedule:
2:00 p.m.
Depart from the Minneapolis the Convention Center
2:15 p.m. to 6:15 p.m.
Experience three (3) of the area’s finest microbreweries
6:30 p.m.
Completion of tour. Shuttles will drop you back at Convention Center.

-OR-

**You can choose to be dropped off at the Surly Beer Hall and Restaurant – a recently-opened “Destination Brewery” with a full dinner menu and 20 rotating beers on tap. Cab or light rail transport on your own for remainder of evening.

SUNDAY, AUGUST 28

7:00 – 8:20 a.m. Room 205 ABCD

First-Timers Meeting
If you’re attending PWX for the first time, please join us at the First-Timers Meeting. You’ll hear greetings from the APWA President and learn how to get the most out of your experience; learn all about the educational sessions and tracks that APWA offers; learn how to use the exhibits to your advantage; and in the process, make some lifelong acquaintances of public works people from around the world.

First-Timers Meeting is coordinated by the APWA Diversity Committee.

5:00 – 7:00 p.m. Target Field

Get Acquainted Party
The Minnesota Chapter welcomes you to Minneapolis and PWX with a fantastic opening party! Enjoy good company, food, drink, entertainment and a few surprises at Target Field in downtown Minneapolis — Home of the Minnesota Twins! Target Field is historically rated one of the best baseball parks in America, and in 2010 ESPN named it the best baseball experience in the country. Show your colors and wear your favorite sports jersey. Play Ball!

MONDAY, AUGUST 29

12 Noon – 1:30 p.m. Room 205 ABCD

Canadian Public Works Association (CPWA) Luncheon
CentrePort Canada — Building North America’s Largest Inland Port
Ticketed event — separate fee and preregistration required.

Featured Speaker: Diane Gray, Chief Executive Officer, CentrePort Canada Inc., Winnipeg, Manitoba, Canada

The largest inland port in North America, CentrePort Canada, is located in Winnipeg, Manitoba. Connected to interstate highways, three class 1 railways, and a 24/7 international cargo airport, CentrePort offers business prime industrial land for any size of development including manufacturing and assembly, warehousing and distribution, agribusiness, food processing and packaging and transportation related logistics. With 50 new companies on more than 270 acres of greenfield development, CentrePort Canada is poised for significant new growth. Diane Gray, President & CEO, gives you an inside look at the latest developments on the 20,000 acre footprint.
TUESDAY, AUGUST 30

7:00 – 8:30 a.m.  
FUN RUN
Pre-registration required. Visit the Minnesota Hospitality for space availability and more information.
Join us for a 5K Fun Run on the banks of the Mississippi River just a short walk from the Convention Center and hotels. The paved trail loop route winds along and over the Mighty Mississippi on a portion of the Mississippi River Trail. Breathtaking views of both the built and natural environments include the Minneapolis skyline, historic Stone Arch Bridge, the Lock & Dam, St. Anthony Falls, and the former historic grain mill sites which was the catalyst for the intertwined histories of the flour industry, the river, and the City of Minneapolis.

10 – 11:30 a.m.  Room 208 ABCD
Small Cities Rural Communities Town Hall Brunch
Ticketed event — separate fee and preregistration is required.
Hosted by APWA’s Small Cities Rural Communities Committee
Work for a community with a population under 65,000? Ever feel like you’re out there alone and no one understands? Come join with others from small cities and rural communities for a Town Hall Meeting to share your concerns, ideas, and frustrations.

PROUD TO CARE
Monday, August 29 — 9:00 a.m. – 3:00 p.m.
Tuesday, August 30 — 10:00 a.m. – 2:00 p.m.
Located in the exhibit hall, in the 2300 Aisle

Ninth Annual Blood Drive
Do you have 45 minutes to spare to save the life of another person? Did you know that every three seconds someone needs blood? One single donation can save as many as three lives – and there is NO substitute for human blood.

We need you! We need your time and your total commitment for 45 minutes to save a life. You can make a difference today! Do you know someone who is a frequent blood donor? Tell them about the simple process of donating blood and explain the importance of their role in saving lives.

Anyone age 17 years or older, who weighs at least 110 pounds and is in good general health may donate. Photo identification is required before beginning the donation process. (Some health conditions or medications may temporarily or permanently prevent persons from donating blood.) Prospective donors must first complete a health history questionnaire and go through a screening process. During the screening process, a technician will take important vital signs such as blood pressure, temperature and an iron check. If all requirements are met, a unit of blood is drawn from the donor. The actual blood collection takes approximately 15-20 minutes. The entire process, from when you sign in to the time you leave, takes between 45-60 minutes. Please roll up your sleeve and save a life! THANK YOU!

DONATED FOOD
Again, this year we will be donating all unserved food from our PWX events at the Convention Center.

SPECIAL EVENTS
An astronaut since 1996, Kelly’s achievements over his illustrious 20-year career with NASA earned him the coveted position as America’s first year-round astronaut. On his historic mission that spanned from March 2015 to March 2016, Kelly and Russian cosmonaut Mikhail Kornienko conducted experiments, reconfigured station modules, and captivated the world with live interviews and never-before-seen photos from the International Space Station.

Back from his historic record-breaking “Year In Space,” NASA astronaut Captain Scott Kelly has laid the groundwork for the future of space travel and exploration, garnering exposure like no other pioneer of our time. From the cover of TIME magazine, features in Forbes, and appearances on TODAY and CNN, and a Twitter following well over 1 million, the world remains in awe as we celebrate a hero’s return to the planet we call home.

As a PWX attendee, you’ll have the privilege to hear Captain Kelly’s extraordinary adventure first-hand as he keeps you on the edge of your seat during this truly one-of-a-kind experience. Filled with life lessons and personal stories that reveal unique and valuable advice on pushing one’s own limits, insight on the leadership and teamwork required in such demanding conditions, and the challenges—such as long-term deprivation from loved ones and Planet Earth—Kelly reflects on the choices and life events that paved his journey’s path.

Jeff Havens is one of the most in-demand speakers in North America. Jeff insists that education is the only way that we improve at anything and that we’ll all improve better and faster if we enjoy the learning process. His mission is to demonstrate how small changes in our communication strategies can be the most important (and least expensive) way to strengthen relationships, increase loyalty, and create an unbreakable culture of teamwork and mutual respect.

By highlighting and then poking fun at practices that we are all occasionally guilty of, Jeff’s presentation of Uncrapify Your Life! is at once hilarious and meaningful; and guaranteed to leave you refreshed, surprised, and inspired.
MEL ROBBINS
@melrobbins
The 5 Second Rule — Achieve Breakthrough Performance in Your Career and Life
Three million people have learned the secret to reaching their true potential — now it’s your turn. You are meant to do extraordinary things in your career and your life and the 5 Second Rule will help you achieve it.

Mel Robbins’ TEDx Talk on “How to Stop Screwing Yourself Over” has over three million views. In it, she demystifies neuroscience research to explain how and why you do what you do. Mel will teach you how to identify the mistakes you are making and how to create lasting behavior change within yourself.

Mel began her career as a criminal defense attorney and went on to launch and sell a retail and internet technology company. From these experiences, she has gone on to be one of CNN’s most popular on-air commentators and opinion writers on human behavior.

The lessons and tools you’ll learn from Mel can be applied immediately and you will leave feeling inspired and equipped to tackle your professional and personal dreams.

CHARLES MAROHN
@clmarohn
Strong Towns
Charles (Chuck) Marohn is founder and president of Strong Towns which is a national media nonprofit that publishes award-winning daily articles by dozens of contributors, hosts events across the continent and shares insight and ideas through weekly podcasts.

The Strong Towns approach is a fundamental rethinking of how we work together to build lasting wealth and prosperity within our communities. Its mission is “to support a model of development that allows America’s cities, towns, and neighborhoods to become financially strong and resilient.”

The Strong Towns Principles are:

- Strong cities, towns, and neighborhoods cannot happen without strong citizens (people who care).
- Local government is a platform for strong citizens to collaboratively build a prosperous place.
- Financial solvency is a prerequisite for long-term prosperity.
- Land is the base resource from which community prosperity is built and sustained. It must not be squandered.
- A transportation system is a means of creating prosperity in a community, not an end to itself.
- Job creation and economic growth are the results of a healthy local economy, not substitutes for one.

Chuck is a Professional Engineer (PE) and lives with his family in Baxter, Minnesota. Besides being passionate about building a stronger America, he loves playing music, is an obsessive reader, and religiously follows his favorite team, the Minnesota Twins.
CEUs & PDHs

.1 CEU (Continuing Education Unit) = 1 PDH (Professional Development Hour)

APWA’s education sessions are eligible for CEU credit. Full and daily registrants may receive CEU credit as part of your registration fee. But please note—you must still have your badge scanned at the end of each session you attend. You must attend the entire session to be eligible to receive CEUs. Within four weeks of the conclusion of PWX, APWA will enter into the system your data and a list of the sessions for which you had your badge scanned. You will receive an e-mail notice with instructions for downloading your CEU transcript from the APWA website.

APWA is an International Association for Continuing Education and Training (IACET) Accredited Provider of CEUs, and we comply with all IACET requirements for planning and evaluating continuing education activities and for recordkeeping.

EDUCATION SESSION SPEAKER HANDOUTS

APWA is making great strides in our efforts to reduce the carbon footprint of our meetings and events. Speaker handouts are available via the PWX web site (www.apwa.net/pwx) and the PWX Mobile App. See page 77 to learn how to access the PWX mobile app. On both the website and the mobile app, simply look for the handout PDF available next to each session description.

SATURDAY, AUGUST 27
8:00 a.m. – 4:30 p.m.

SUNDAY, AUGUST 28
7:00 – 8:20 a.m.
205 ABCD First-Timers Meeting
8:30 – 9:45 a.m.
EDUCATION SESSIONS (.1 CEU)
102 DE A Complete Roundabout with All the Latest Features
200 DE Everyone Should Get to Go Home — An Active Shooter Preparedness and Response Program
101 FG Facilities & Grounds Open Forum
102 BC Fleet Services Open Forum
200 ABC How-to Guide for Funding Stormwater Programs and Projects for Small Cities Rural Communities
200 FG If It’s Not Broken, Why Change? Changing Workplace Culture With a Deep History
200 HIJ Millennials Are Taking Over, One Bike Lane at a Time
101 DE Surviving a Community-Wide Fiber-to-the-Home (FTTH) Build-out
101 HIJ The 3 Pillars of Sustainable Infrastructure: Go Beyond Plain Vanilla Asset Management
101 ABC Warming Up to Sustainable Paving

8:00 – 10:00 a.m.
Innovation Station APWA Tech Time
10:00 a.m. – Noon
OPENING GENERAL SESSION
Auditorium History-Making U.S. Astronaut & Retired U.S. Navy Captain
Captain Scott Kelly
102 DE  The Mississippi River and Wastewater Treatment: A History of Water Quality Improvements and Its Impact on the Vitality of St. Paul’s Riverfront Development

101 HIJ  The New Zealand National 30-Year Infrastructure Plan

3:00 – 3:50 p.m.
EXHIBITOR SOLUTIONS THEATER #1 (.1 CEU)
APWA Connect
LIVE! Booth 537  More on Building Accessible Work Zones: Sidewalk Diversions and Closures

EXHIBITOR SOLUTIONS THEATER #2 (.1 CEU)
Booth 201  Increase Vehicle Uptime And Reduce Operational Costs With Maintenance Automation

3:00 – 4:00 p.m.
102 F  Tee Up! For a Successful Golf Tournament

4:00 – 4:50 p.m.
EDUCATION SESSIONS (.1 CEU)
101 DE  Abandoned Utilities: Out of Sight, Out of Mind?
200 DE  Didn’t See That Coming — The Waste Management Response to Ebola in New York City
101 HIJ  Do the Right Work at the Right Time — An Infrastructure Asset Management Approach Utilizing GIS and Mobile Technology
200 HIJ  Environmental Justice and Public Works — Protecting Our Customers
101 FG  Here Are the Keys to the Facilities, Now What?
Auditorium 1  How to Avoid Losing Your Federal-Aid Funding on Local Public Agency (LPA) Projects
200 FG  Learning Organizations, the Platform for Resilient Communities
102 BC  More Cyclists Through Better Winter Maintenance
200 ABC  Mouse River: Enhanced Flood Protection and Hazard Mitigation
101 ABC  Permeable Paver Streets Are Not Parking Lots — Successes and Challenges with Permeable Paver Streets in the Midwest
102 DE  Reducing Basement Backups through Intergovernmental Cooperation and Design-Build
Auditorium 3  What — My Employees are Human? I Need Them to Produce More!

5:00 – 7:00 p.m.
Target Field  Get Acquainted Party

SEE MOBILE APP FOR THE UPDATES AND FULL EDUCATION DESCRIPTION INFORMATION.
MONDAY, AUGUST 29

8:00 – 9:30 a.m.
MONDAY GENERAL SESSION
Auditorium Uncrapify Your Life
Jeff Havens

9:00 a.m. – 3:00 p.m.
Halls BCD Exposition Open
(non-compete time: 11:00 a.m. – 2:00 p.m.)

9:45 – 11:00 a.m.
EDUCATION SESSIONS (.1 CEU)
Auditorium 1 Active, Safe and Green
101 HIJ Advocacy Palooza!
102 DE Artists and Engineers — Are We Really THAT Different and Why Can’t We All Just Get Along
200 ABC Cutting the Gordian Knot — Funding Approaches and Resources for Wastewater Collection and Treatment Systems
101 FG Effective Asset Management Planning through a Life Cycle Lens
200 FG LIGHTNING ROUND: MnDOT’s Approach to Winter Maintenance
200 DE Moving Beyond Adaptive Traffic Signal Control to Semi-Autonomous/Autonomous Systems
200 HIJ Preparing the Next Generation of Public Works — Equipping Leaders with Tools to Engage Your Staff and Harness the Power of Community
101 ABC The Benefits of Implementing A Pavement Management System
Auditorium 3 The Evolving Role of Public Works in Emergency Management
101 DE Trenchless Trends in the Midwest

9:45 – 5:00 p.m.
102 BC Workshop: Challenges and Solutions for Public Fleet Managers

10:00 – 10:50 a.m.
EXHIBITOR SOLUTIONS THEATER #1 (.1 CEU)
APWA Connect
LIVE! Booth 537 Protective Coatings Solutions

10:00 – 10:50 a.m.
EXHIBITOR SOLUTIONS THEATER #2 (.1 CEU)
Booth 201 Using RFID Tags to Mark and Manage Infrastructure.

11:00 – 11:50 a.m.
EXHIBITOR SOLUTIONS THEATER #1 (.1 CEU)
APWA Connect
LIVE! Booth 537 Telematics: A Tool To Increase Municipal Performance and Efficiency

11:00 – 11:50 a.m.
EXHIBITOR SOLUTIONS THEATER #2 (.1 CEU)
Booth 201 Positive Protection vs. Positive Perception

12:00 – 12:50 p.m.
CANADIAN PUBLIC WORKS ASSOCIATION (CPWA) LUNCHEON:
205 ABCD CentrePort Canada — Building North America’s Largest Inland Port.
Featured Speaker: Diane Gray, CEO, CentrePort Canada

12:00 – 1:30 p.m.
THERES AN APP FOR THAT! THEATER (.1 CEU)
Booth 1919 Modern Mobile

1:00 – 1:50 p.m.
102F Connecting Your Way Through APWA Online

1:00 – 1:50 p.m.
EXHIBITOR SOLUTIONS THEATER #1 (.1 CEU)
APWA Connect
LIVE! Booth 537 Understanding Your City Through the Lens of Geospatial Data Analytics

1:00 – 1:50 p.m.
EXHIBITOR SOLUTIONS THEATER #2 (.1 CEU)
Booth 201 Digital Print Systems: Future of Traffic Sign Fabrication

1:50 p.m.
APWA Connect
LIVE! Booth 537 Daily Prize Drawings

SEE MOBILE APP FOR THE UPDATES AND FULL EDUCATION DESCRIPTION INFORMATION.
2:00 – 2:50 p.m.  
**EDUCATION SESSIONS (.1 CEU)**

**101 FG**  
Asset Management: The Key to Weathering the Facility and Energy Management Storm? Perspectives of 3 Minnesota Local Governments

Auditorium 1  
Can a City Effectively and Successfully Incorporate a Work Order Management System and GIS into an Asset Management Program? Yes!

**101 DE**  
City of Minneapolis ROWAY: You Can’t Just Close Streets Without Telling Us

**200 ABC**  
Disasters Only Happen to Other People

**200 FG**  
How to Achieve Excellence in Snow and Ice Control

**101 HIJ**  
Municipal Engineers and Bicycle Advocates Make Really Great Friends!

**102 DE**  
Project Risk Assessment and Management

**200 DE**  
The Godzilla, “El Nino” and Debris Management — Cleaning Up the Aftermath!

**200 HIJ**  
When You Talk is Anyone Listening? Strategies for Getting Your Message Heard

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**3:00 – 3:50 p.m.  
EDUCATION SESSIONS (.1 CEU)**

**101 HIJ**  
A Year in the Life of a Protected Bike Lane

**200 FG**  
Perspectives on J100 Vulnerability Assessment — Outcomes and Lessons Learned by Minneapolis Water Treatment

**200 DE**  
Solar Collaboration Among Local Governments

**101 DE**  
There’s a New Sheriff in Town: Enforcement Issues in Right-of-Way Use

**200 ABC**  
Turning the Corner on Municipal Transportation Policy!

**200 HIJ**  
Unmanned Aircraft Systems (UAS) for Bridge Inspection

**101 FG**  
JR Fellow Presentation — Waterfront Redevelopment and Transportation Planning in Auckland, New Zealand: The Down Under Education of an American Transportation Planner

**102 DE**  
What Funding? Where? How to Build Support for It?

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**3:00 – 4:30 p.m.**

**EXHIBITOR SOLUTIONS THEATER #1 (.1 CEU)**

**APWA Connect LIVE! Booth 537**  
Advancements in Road Data Collection Technology

**EXHIBITOR SOLUTIONS THEATER #2 (.1 CEU)**

**Booth 201**  
Route Optimization: The Cost of Doing Nothing in Today’s Budget Conscious Environment

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**4:00 – 4:50 p.m.  
EDUCATION SESSIONS (.1 CEU)**

**101 ABC**  
Addressing Homelessness in Eugene and Public Works

**200 HIJ**  
Advocacy Success for Public Works at the State and Local Level

**200 DE**  
Do’s and Don’ts of Implementing Fully Automated Garbage & Recycling Collection

**200 FG**  
New Technologies for Airport Snow Removal

**Auditorium 1**  
Overcoming the Challenges to Bring More Women Into the Trades

**200 ABC**  
Refreshing the Effective Utility Management (EUM) Framework

**102 DE**  
The Remarkable Impact of Being an Effective Client

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**5:00 – 7:00 p.m.**

**Auditorium**  
Awards & Recognition Ceremony and Reception

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**SEE MOBILE APP FOR THE UPDATES AND FULL EDUCATION DESCRIPTION INFORMATION.**
TUESDAY, AUGUST 30

8:00 – 9:30 a.m.
TUESDAY GENERAL SESSION
Auditorium  The 5 Second Rule — Achieve Breakthrough Performance in Your Career and Life
Mel Robbins

9:30 – 10:00 p.m.
Innovation Station  APWA Tech Time

9:45 – 11:00 a.m.
EDUCATION SESSIONS (.1 CEU)
Auditorium 1 Complete Streets Design—State-of-the-Practice
101 ABC Disaster Preparedness — What Are You Missing?
102 BC Effective Fleet Management Strategy for Municipal Fleets
101 FG Highway 53 Relocation Project — “You Can’t Make This Stuff Up”
Auditorium 3 Innovative Procurement and Financing for Smart Water Technologies
200 FG Introduction to “Safety 365: A Safety Workshop for Local Governments”
102 DE LIGHTNING ROUND: Caring for the Urban Forest
101 HIJ LIGHTNING ROUND: In Minnesota, It’s Not Just About Projects Anymore!
200 HIJ MN2050 Initiative — Making Infrastructure Great Again
200 DE Mutual Aid Agreement for Utah Public Works Emergency Management Alliance
200 ABC Park the Coupe, Ride the Loop!
101 DE Public Works Career Café

10:00 – 11:30 p.m.
205 ABCD Diversity Brunch: Basement to Building Stronger Communities
Featured Speaker: Vicki LaRose, CDI-Civil Design, Inc., St. Louis, MO
208 ABCD Small Cities Rural Communities Town Hall Brunch

10:00 – 10:50 a.m.
THERE’S AN APP FOR THAT! THEATER (.1 CEU)
Booth 1919 Bringing Mobility to Electronic Plan Review

10:00 a.m. – 2:00 p.m.
Halls BCD Exposition Open
(non-competitive time: 11:00 a.m. – 2 p.m.)

11:00 – 11:50 a.m.
EXHIBITOR SOLUTIONS THEATER #1 (.1 CEU)
APWA Connect LIVE! Booth 537 I & I: Identifying, Abatement and Prevention Measures in Manholes

EXHIBITOR SOLUTIONS THEATER #2 (.1 CEU)
Booth 201 How to Work with Unions to Get GPS Tracking

THERE’S AN APP FOR THAT! THEATER (.1 CEU)
Booth 1919 Leveraging Mobile Technology for Field Inspection

11:00 a.m. – Noon
102 F Chapter Website Template Training: More Than Just the Basics

12:00 – 12:50 p.m.
EXHIBITOR SOLUTIONS THEATER #1 (.1 CEU)
APWA Connect LIVE! Booth 537 Press-In Pile Driving — A Low Noise & Low Vibration Solution For Foundation Work In Congested Urban Areas

EXHIBITOR SOLUTIONS THEATER #2 (.1 CEU)
Booth 201 Why High Dump?

THERE’S AN APP FOR THAT! THEATER (.1 CEU)
Booth 1919 Fleet Mobile Apps

12:50 p.m.
APWA Connect
LIVE! Booth 537 Daily Prize Drawings

1:00 – 1:50 p.m.
EXHIBITOR SOLUTIONS THEATER #1 (.1 CEU)
APWA Connect LIVE! Booth 537 Best Practices for Successful Pothole Patching and Road Repairs

EXHIBITOR SOLUTIONS THEATER #2 (.1 CEU)
Booth 201 Is BMP Management Making You Feel SWAMPed?

THERE’S AN APP FOR THAT! THEATER (.1 CEU)
Booth 1919 Get Real Time Interaction Direct from Site with Mobile Asset Management

1:00 – 2:00 p.m.
102 F Online Tools & Resources for Chapter Leaders

1:30 – 4:00 p.m.
201 B Safeguarding Your “Get Out of Jail Free Card” and Other APWA Chapter Assets

SEE MOBILE APP FOR THE UPDATES AND FULL EDUCATION DESCRIPTION INFORMATION.
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<th>Time</th>
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<td>2:00 – 2:50 p.m.</td>
<td>EDUCATION SESSIONS (.1 CEU)</td>
<td>101 ABC Adaptation and Resilience at the City of Fort Lauderdale</td>
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<td>101 FG Big Bang for the Buck — Laser Scanning Values in Public Works Infrastructure</td>
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<td>101 DE Built It and They ALL Came! Redondo Beach Harbor Gateway and Bike Path</td>
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<td>200 DE Celebrating Success! Accreditation: What Has It Done For Us?</td>
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<td>200 ABC Herbicide on Legs — Goats for Vegetation</td>
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<td>200 HIJ Motivation Techniques to Improve Organizational Performance</td>
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<td>101 HIJ Paying by the Mile — An Inside Look at California’s Road Charge Pilot Program</td>
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<td>200 FG Take the Pain Out of Your Snow Plan</td>
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<td>102 DE Thanks Academy Street for a Great Walk</td>
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<td>2:00 – 4:00 p.m.</td>
<td>Innovation Station Public Works Exchange</td>
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<td>Auditorium 3 Public Works Stormwater Summit Day Two: Trends and Solutions for Stormwater Management</td>
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<td>101 FG APWA Public Works Institutes Roundtable</td>
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<td>200 DE Doing it Right — A Systems Approach to Park Maintenance and Asset Management</td>
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<td>101 ABC Get ‘Em While They’re Young: Recruiting &amp; Retaining Young Professionals</td>
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<td>102 DE How Digitization is Changing Public Works</td>
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<td>101 DE JR Fellow Presentation — Kiwi Perspectives on Sustainability and Stewardship</td>
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<td>101 HIJ Longmont, Colorado’s Sustainability Evaluation System - A Custom Approach</td>
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<td>200 ABC Overcoming Political Pressure and Community Stigma when Evaluating Tree Removal for Public Works Projects</td>
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<td>102 BC We Have Always Done It This Way — Moving Away From Emotions in Developing a Fleet Capital Equipment Program</td>
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<td>200 HIJ What the Public Works Community Needs to Know about Connected Vehicles</td>
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<td>200 FG Winter Maintenance Assessment Tool: An Innovative Tool To Manage Salt</td>
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<td>4:00 – 4:50 p.m.</td>
<td>EDUCATION SESSIONS (.1 CEU)</td>
<td>200 HIJ Extreme Signal Makeover</td>
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<td>102 DE From Nowhere to Somewhere: Constructing the East-Side Roadway in Northern Manitoba</td>
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<td>200 ABC Habitat Restoration and Public Works</td>
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<td>200 FG Utilizing Technology to Achieve Results in Winter Maintenance</td>
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<td>4:00 – 5:00 p.m.</td>
<td>EDUCATION SESSIONS (.1 CEU)</td>
<td>101 DE HAPPY HOUR JAM! Bicycle Infrastructure — Share Your Experiences and Ideas for Innovative Bike Accommodations</td>
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<td>101 ABC HAPPY HOUR JAM! Dealing with ANNOYING CRAP!</td>
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<td>101 FG HAPPY HOUR JAM! It’s the BIG Question — Are youReady to get Engaged with APWA?</td>
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<td>102 BC HAPPY HOUR JAM! Pros and Cons of Incorporating Technology into Solid Waste Operations</td>
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<td>101 HIJ HAPPY HOUR JAM! What is a “Smart City”?</td>
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SEE MOBILE APP FOR THE UPDATES AND FULL EDUCATION DESCRIPTION INFORMATION.
WEDNESDAY, AUGUST 31

7:00 – 10:45 a.m.
WORKSHOP/TOUR (.25 CEUs):
Advanced Registration Required
Full Circle Organic Facility Compost Tour
Multimodal Transportation Systems Serving the Mall of America

7:30 – 10:45 a.m.
WORKSHOP/TOUR (.25 CEUs):
Advanced Registration Required
St Croix Crossing Project
3M Innovation Center
Union Depot and Metro Green Line LRT Tour

8:00 – 10:45 a.m.
WORKSHOP/TOUR (.25 CEUs):
Advanced Registration Required
Metropolitan Wastewater Treatment Plant, St. Paul, MN
Minneapolis Bicycle Facilities
U.S. Bank Stadium

COMBINATION CLASSROOM & WALKING TOUR
Advanced Registration Required
Auditorium 1 Innovations in Pedestrian Safety

8:30 – 9:20 a.m.
EDUCATION SESSIONS (.1 CEU)
102 DE Kenosha County Park and Ride Project — Innovative Partnerships, Design and Construction Techniques Resolve Multiple Challenges
200 ABC Next Practices in Project Delivery Drives Roadway Success
200 DE Rice Creek Commons: Revitalizing a Vacant Brownfield
200 FG The Complete Solution to Water Resources Management — Moorpark Desalter Project
200 HIJ Using Asset Management Tools to Design, Implement and Monitor Energy Efficiency Improvements
102 BC TOAST AND JAM! Dealing with Vehicle Technician Shortages
101 HIJ TOAST AND JAM: Into the Future and Beyond — The PWX Experience

8:30 – 10:45 a.m.
WORKSHOP WEDNESDAY:
101 ABC Aspiring to Public Works Leadership?
101 DE Capital Improvement Planning Processes — Executing Processes for Successful Community Investments
Auditorium 3 Greenroads
101 FG Waste as a Resource? Designing a Circular Economy in Your Region

9:30 – 10:45 a.m.
EDUCATION SESSIONS (.1 CEU)
200 ABC A View from the Top — Women in All Stages of Public Works Talk About Their Lives and Careers
102 DE Culvert Inspection and Repair — We Could Have Fixed it Cheaper, Sooner!
102 BC Measuring Mobility — Beyond Level of Service
200 HIJ Transportation for the Future
200 DE Triple Bottom Line Analysis Drives St. Paul Redevelopment Planning Project
200 FG Where Is My Snow Plow? Real World Uses of Fleet Telematics

11:00 a.m. – 12:15 p.m.
CLOSING GENERAL SESSION
Auditorium 3 Strong Towns
Charles Marohn

SEE MOBILE APP FOR THE UPDATES AND FULL EDUCATION DESCRIPTION INFORMATION.
MARK YOUR CALENDAR!

PWX
PUBLIC WORKS EXPO
ORLANDO
AUGUST 27-30, 2017
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| EXHIBITORS WITH GREEN PRODUCTS, SERVICES AND PRACTICES ARE IDENTIFIED IN GREEN | SEE MOBILE APP FOR DETAILED EXHIBITOR LISTING INFORMATION |

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<td>Right Pointe Company</td>
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<td>Ron Turley Associates Inc.</td>
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EXHIBITORS WITH GREEN PRODUCTS, SERVICES AND PRACTICES ARE IDENTIFIED IN GREEN

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<td>Avery Dennison</td>
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<td>ROADS — Subgrade Improvement</td>
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*EXHIBITORS WITH GREEN PRODUCTS, SERVICES AND PRACTICES ARE IDENTIFIED IN GREEN*
### SNOW & ICE CONTROL — Plows

- **Aebi-Schmidt** 1809
- **Buyers Products Company** 2137
- **Flink Co.** 610
- **Henderson Products, Inc.** 1437
- **Highway Equipment Company** 217
- **J-Craft Inc** 918
- **Little Falls Machine, Inc.** 1201
- **Monroe Truck Equipment, Inc.** 801
- **Ventrac by Venture Products Inc.** 1529
- **Western Products and SnowEx Products** 249
- **Wille North America Inc.** 1325

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- **Aebi-Schmidt** 1809
- **Buyers Products Company** 2137
- **Flink Co.** 610
- **Henderson Products, Inc.** 1437
- **Highway Equipment Company** 217
- **Little Falls Machine, Inc.** 1201
- **Monroe Truck Equipment, Inc.** 801
- **Ventrac by Venture Products Inc.** 1529
- **Western Products and SnowEx Products** 249
- **Wille North America Inc.** 1325

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- **Little Falls Machine, Inc.** 1201
- **Wausau Equipment Company** 1537
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- **Wille North America Inc.** 1325

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- **PB Loader Corporation** 515
| EXHIBITORS WITH GREEN PRODUCTS, SERVICES AND PRACTICES ARE IDENTIFIED IN GREEN | PRODUCTS & SERVICES EXHIBITOR LISTING | @ APWATWEETS | #PWX2016 | AUGUST 28-31, 2016 | WWW.APWA.NET/PWX

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- Stertil-Koni .................................. 1425

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- SoundOff Signal ................................ 1349
- Superior Signals, Inc. ......................... 1803

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- Eureka Chemical Co. ............................ 411
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New & Improved this year at APWA PWX — The New Product Showcase. The showcase will feature actual products newly introduced to the public works industry since last year’s PWX. And for the first time ever, PWX attendees will have the opportunity to vote for the Best New Product of 2016. To place your vote, access the New Products icon on the event mobile application.

Winners will be announced on Tuesday, August 30 in the General Session at 8:00 a.m. The New Product Showcase will be the place to choose the latest products to make your job-site or office more efficient and effective.

<table>
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<th>EXHIBITORS’ NEW PRODUCTS</th>
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<td><strong>3M</strong></td>
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<tr>
<td><a href="http://www.3m.com/advancedEGP">www.3m.com/advancedEGP</a></td>
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<tr>
<td><strong>3M Advanced Engineer Grade Prismatic Sheeting</strong></td>
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<tr>
<td>A new micro-seal technology which creates an engineer grade prismatic material that provides a bright white and vivid traffic colors with visual uniformity in a flexible, easy to handle, product. 3M Advanced Engineered Grade Prismatic sheeting can be used to fulfill all of your non-critical signage needs.</td>
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<tr>
<td><strong>Airstar America, Inc.</strong></td>
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<td><a href="http://www.airstar-light.us">www.airstar-light.us</a></td>
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<tr>
<td><strong>Sirocco S 240W LED</strong></td>
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<tr>
<td>Self-inflating, portable LED lighting balloon. 240 Watts with 110 and 220 volt options. Small and compact which is great for emergency, logistical, security and industrial lighting. Instant re-strike allows flexibility for each application.</td>
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<tr>
<td><strong>Allstates Coatings Company</strong></td>
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<td><a href="http://www.allstatescoatings.com">www.allstatescoatings.com</a></td>
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<tr>
<td><strong>Flex Crete</strong></td>
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<tr>
<td>The first NON-Silicone gray single-component, ready-to-use, ultra-low modulus, pourable, neutral cure elastomeric waterbased joint AND crack sealant which offers the performance and durability characteristics of conventional silicone and meets ASTM standards. It provides a lasting and flexible seal with the ease of installation of self-leveling pourable materials, is less expensive, has NO vapors and easy inexpensive application methods.</td>
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<td><strong>AssetWorks</strong></td>
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<td><a href="http://www.assetworks.com/fleet">www.assetworks.com/fleet</a></td>
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<tr>
<td><strong>SmartApps</strong></td>
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</table>
| The SmartApps suite of products is designed to harness the power of FleetFocus into simple, easy-to-use iphone and tablet apps. Each app has specific functionality geared towards the user of the app and integrates with the full FleetFocus enterprise software solution. The SmartApps suite is comprised of:  
  - WorkCenter - WorkCenter captures real-time labor for technicians as they work on various jobs throughout a day, as well as any indirect time spent on non-maintenance activities. Technicians can easily manage their workload for the day by viewing all their assigned work from a phone or tablet.  
  - Reservation Center - Reservation Center is an app that can allow your customers to book and manage motor pool reservations directly from their phone or tablet. Reservation Center integrates directly with FleetFocus and KeyValet automated motor pool.  
  - MyVehicle - MyVehicle is an app that has the vehicle operator in mind. It provides drivers with information about any vehicle that is associated to them in FleetFocus. The app also allows users to report problems with the vehicle, change parking locations, review work history, enter meter readings, and view any upcoming PM work. This app can be offered to vehicle operators who may not have access to FleetFocus.  
  - Inspection Checklist - Minimize paper forms for any type of inspection or checklist, such as pre- and post-trip, annual condition assessments, PM checklists and more. The Inspection Checklist app is compliant with DOT regulations and will allow users to report defects that can automatically create service requests in FleetFocus. It will also give drivers the ability to provide a signature confirming inspection, as well as access to inspection history. |
| **ACO Polymer Products** |
| www.acodrain.us |
| **New ACO DrainLok & 4-Bolt Grates for 2”, 4”, 8” & 12” Trench Drains** |
| New trench drain grates are now available by ACO Polymer Products and include a new DrainLok locking feature for ACO KlassikDrain trench drains or 4-bolt iron grates for ACO PowerDrain trench drains for added grate security. New grate styles include grates in plastic, iron, galvanized steel and stainless steel materials. Designs include a new microgrip texture, an improved Brickslot top with 3 slot options and a 4-bolt slotted style. |
| **Municipal Dump Spreader (MDS)** |
| The new SaltDogg Municipal Dump Spreader (MDS) provides the practicality of a dump body combined with convenience of a conveyor spreader allowing for four-season operation. Featuring 304 stainless steel construction and unique, roll-formed sides and cross memberless floor, the MDS provides for excellent material flow and strength-to-weight ratio. |
| **Custom Linings, Inc.** |
| http://www.customlinings.com |
| **ECOQUI2 Vapor Evapor Blaster** |
| Safer alternative to dry blasting. |
| **Evolution Edges** |
| www.EvolutionEdges.com |
| **Evolution Edges - UNIQCS** |
| Evolution Edges - UNIQCS (Universal Quick Change Scraper); Polyurethane Cutting Edge System offering improved hard surface sustainability for snow and ice maintenance. Features: NO TOOLS required, Two-Foot sections to minimize work related injuries during single person blade change-out, Universal moldboard attachment. Click on https://www.youtube.com/watch?v=RoPzgpZNb4 for a demonstration. |
Exhibitors with Green Products, Services and Practices are identified in Green.

**Portable Rumble Strip.**
Safe-keeping of RoadQuake 2F Temporary deployment, removal, storage and designed specifically for the transport, and timescales.

**Power Pusher, a Division of Nu Star, Inc.**
E-750 Electric Wheelbarrow
**Slurry Tub Attachment**
Since the inception of the versatile E-750, Power Pusher continues to evolve its attachments, fitting the unique needs for each customer’s distinct applications, both indoor and outdoor. With its unique change system, customers can simplify complex jobs by relying on a single machine to complete various applications required for projects.

**ChipSafe Winch Strap**
Attach the ChipSafe® winch strap to your chipper’s winch rope near the hook and never have to worry about your winch hook being dragged into your chipper’s feed system again! When the winch strap enters the ChipSafe sensing zone, the feeding mechanism stops, protecting your chipper from potential catastrophic damage.

**Muncie Power Products**
V080 Hybrid System
Muncie Power Products optimizes snow and ice operations with its new V080 Hybrid system. The V080 Hybrid features a unique circuit design, ensuring cylinders and spreader operations can work independently and simultaneously. As an electronic spreader system operating with ground speed control, the V080 Hybrid saves salt and money.

**Pitney Bowes**
Confirm
Our product — Confirm — is an enterprise asset management EAM software solution from Pitney Bowes specifically designed to empower public entities with the insight to make informed decisions on repair, maintenance, and investment for critical public infrastructure assets against tightly constrained budgets and timescales.

**Plastic Safety Systems**
RoadQuake 2F CRIB Cargo Carrier
CRIB is a fully integrated cargo carrier designed specifically for the transport, deployment, removal, storage and safekeeping of RoadQuake 2F Temporary Portable Rumble Strip.

**TreeDiaper and GardenMat**
“TreeDiaper™” and “GardenMat™” are patent-pending products of Zynnovation LLC (DBA "TreeDiaper"), with the novel combination of self-charging/slow-release irrigation, weed control and extreme weather root protection functionalities. They are designed to promote tree and/or plant establishment and survival, and to reduce maintenance costs.

**Trimble**
eGovernment Field-to-Finish Solution
Trimble eGovernment Field-to-Finish solution integrates Trimble Feedback, Trimble TerraFlex, Trimble GNSS and Esri GIS technologies to enable cities to better identify, collect, process, inspect, address and report location-based maintenance and operations functions. The cloud-based system allows service request automation and centralization of crowd sourced and GNSS data collection.

**Visiontron Corp.**
Retracta-Cade
Crowd control where and when you need it. A retired NYPD Lieutenant developed the Retracta-Cade crowd control barrier so first responders can have a heavy duty 10’ safety barricade immediately available, that’s light enough to carry, easy to transport in patrol cars and inexpensive to store.
HOTELS

A Hilton Minneapolis – HQ
B Hyatt Regency Minneapolis
C Millennium Hotel Minneapolis
D Holiday Inn Express Hotel & Suites
E Hilton Garden Inn — Downtown
F DoubleTree Suites by Hilton Minneapolis
G Marriott Minneapolis City Center Hotel
H Radisson Plaza Hotel Minneapolis
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How long has the candidate been involved in the public works industry?

Since July 29, 2004

How long has the candidate worked in their current position?

Six years, since 2010 as a Maintenance Specialist 3, but since 2012 as a member of the Rowlett Wellness Committee.

Please describe the reason that the candidate is being considered for recognition.

Will Plexico is a Maintenance Specialist 3 in the City of Rowlett, Texas, Public Works Department. His primary job involves the pavement management program in Rowlett. Each and every day Will is out on the streets of Rowlett analyzing the street segments and entering data into the MicroPAVER database. But that is not the reason Will is being considered for recognition. Will consistently goes above and beyond expectations in everything that he does, at work, at home, and in life and his attitude and behavior. Most of all his leadership has had a profound effect upon the Rowlett Public Works Department as well as other departments of the City, several of which are beyond the areas of his responsibility.

How was the candidate's leadership ideas/actions brought to the forefront?

Rowlett has a very active and incentivized wellness program. Employees are given the opportunity to participate in physical challenges, compete in activities, get educated on health and wellness topics, and manage and maintain their health and well-being, being coached by professional wellness professionals, medical providers and certified physical trainers.

When faced with an issue where the Public Works teams had scheduling difficulties with accessing the available facilities located at the Rowlett Recreation Center, Will thought, “Why couldn’t we (Public Works) have what public safety department facilities have?” It wasn’t such a farfetched idea to have a Public Works Fitness Center, was it?

Will set out on a mission to develop a proposal to be presented to the City Manager. Not having been familiar with making a formal proposal, Will
went on YouTube to first learn how to make a PowerPoint™ presentation. He researched presentation and proposal formats and when he was ready he made his pitch, inclusive of a floor plan, construction plan, equipment selection, funding plan, safety protocol, performance measures and incentive program for employee use and care of the facility. He even designed a T-shirt that participants would get as a reward for using the facility.

The proposal was so well received that not only was the funding plan approved, but it was given three times the amount requested and was built with a sense of urgency to get things up and running as quickly as possible.

Who did the candidate work with to help bring this idea/action forward?
Will approached then-Public Works Director Jim Proce and inquired on how he could get his initiatives heard and ultimately implemented. Jim provided a general overview on how the typical project creation process in Rowlett worked and suggested that Will approach his initiatives in a similar fashion to make his pitch to the City Manager, since the City Manager was the Chairperson of the City Wellness Committee and held the purse strings. If any progress was to occur, that was the biggest hurdle to the success of any proposal regarding wellness programs.

Did the candidate experience any challenges when trying to implement this?
The challenges encountered included:

- Funding – initially no funds were allocated for this, but this was overcome by the successful presentation.
- Space – finding convenient and adequate spacing was difficult in what was thought to be a burdened storage area, but this was overcome by the reallocation of valve and hydrant storage to the water station storage areas.
- Safety – concern for safe and proper use of the facility was a concern, but was overcome by the development of a tracking, safety protocol and several staff who were certified as trainers in several areas to ensure injury prevention.
- Accountability – there is always a concern for return on investment. This was overcome by Will’s development of usage tracking and performance measures, augmented by rewards for use.

Are there steps/processes that, when looking back, the candidate could have done differently to make this idea/action even more successful (lessons learned)?
In looking back, Will’s plan was well crafted and executed, but knowing what we know now there would have been more space allocated. Nevertheless, this facility is a great addition to the Public Works facility and folks who come to work for us or who tour the facility are impressed by the existence of such a nice facility.

Since this occurred Will has personally walked the walk and talked the talk in the wellness world. Since his initial involvement on the City’s Wellness Committee, Will has been the poster child for wellness in Rowlett and in Public Works and this story is only one of many where Will has been impactful in our organization.

Will quit smoking, lost 70 pounds, and today is the epitome of a healthy and fit success story of Rowlett wellness at its best.

Will routinely participates in 5K’s as a habit and has completed a half dozen or more half marathons. He is certified as a CrossFit instructor, teaches the City’s CORE-FIT program (a CrossFit like program for employees), is a realFIT certified official, and teaches fitness classes to all departments, not just Public Works.

Will’s approach to work and leadership is one of service and can be summed up in his own words: “Never pass up the opportunity to help make a difference not only for your coworkers while at work, but leave an impact that they carry home each and every day.” Not only is Will Plexico empowered, he now empowers others.

Special thanks goes to Will’s Implementation Team: Jake Gilliland (APWA ELA graduate) for the artwork; Clayton Hubbard for the construction; and Fred Burns, our first trainer.

As footnote to wellness, Will is a superstar in what he actually does in his real job of pavement management. In an effort to educate the public and the City Council, Will stars in his own YouTube video where he talks about pavement management principles in laymen’s terms. This video was recognized as far away as Australia and noted on the IPWEA website, mentioned here: http://www.ipwea.org/communities/all-discussions/discussions-moderation/message?MID=3125

Keeping the Good Streets Good – Will Plexico, Rowlett Texas
https://youtu.be/7o8qi-3J0jI

Look for Will at PWX in Minneapolis this year, as he will be spending some time with the MicroPAVER folks sharing his experiences. If you find him on the exhibit floor tell him thanks for making a difference. He is an inspiration to us all!

E-mail submissions to bstein@apwa.net
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Andrew C. Lemer, Ph.D., Senior Program Officer, the National Academies of Sciences, Engineering, and Medicine, Washington, D.C.; Chair, APWA Engineering & Technology Committee

Dennis Gabor, awarded the 1971 Nobel Prize in Physics for his discoveries underpinning the development of holography, once wrote, “The future cannot be predicted, but futures can be invented.” Imagination to Innovation is a periodic look at new technology and scientific discovery that we could be using to invent the future of public works.

dealing with the public in public works has always been a challenge: It is not hard to imagine residents of ancient Rome, for example, complaining about water-supply leaks and roadway irregularities. Historians tell us the “landfills” outside of the walls of 16th-Century Paris were higher than the walls themselves, a problem when attackers could use the waste dumps to fire projectiles down into the city.

The creation of 3-1-1 services in the 1990s gave the public a more direct channel for reporting problems and making complaints, but the effective distance between the customer and public works service provider was not much reduced. In addition, the service providers still relied on their own inspections to assess problem severity.

Increasing use of computers, data-management tools, and new communications technology are bringing changes. Several public works agencies are already using cell-phone apps that let people report potholes or graffiti on city streets. Some are using social media (think Facebook or Twitter) to enable anyone with access to a computer to have the same kind of easy connectivity that a cell-phone app provides. Fans say these tools give customers a stronger sense of ownership of the city but there is not a lot of evidence for evaluating what that may be worth.

Where the future may get really interesting is the opportunities to bring the public—the customers—in as partners with the works agency, using yet-to-be-defined combinations of data acquisition, analysis, and crowdsourcing. The Smart City App Hack (SCAH), for example, was initiated in 2015 to encourage residents of several participating cities worldwide to create apps and businesses to improve city life. One winner was CITIVIVA, a platform designed to enable individuals, private companies, and public agencies to rate and compare services they receive and thereby participate in a discussion of the distribution of costs and performance. A trial implementation was scheduled for Montevideo, Uruguay.

Another example is the emerging class of communication tools that support the development and functioning of online communities. Yammer, HipChat, and Slack are examples of tools designed to create forums for discussion supported by information storage that brings facts, content, and work in progress to the attention of anyone with an interest in the topic at hand. When the topic is a project that participants are working on, the tools purport to provide a kind of “war room” environment that gives access to work files as well as conversations and synchronize everything across smartphones, tablets, laptops, and desktop computers. Slack, with a somewhat limited free version available for small groups to use, is experiencing rapid growth of its user base (reportedly including hundreds of companies, even NASA) and attracting big investments of venture capital.

Using such tools, the public works department of the future could be part of the neighborhood, able not only to field complaints but also to schedule repairs and other field work with neighbors’ participation.

Andrew Lemer, Ph.D., is currently a Senior Program Officer with the National Academy of Sciences of the United States of America. In addition to technical papers and occasional articles for the Reporter, he writes on civil infrastructure and human settlement at www.andrewlemer.com.
Training

Wilfrid Nixon, Ph.D., P.E., PWLF
Vice President, Science and the Environment
Salt Institute, Alexandria, Virginia
Member, APWA Winter Maintenance Subcommittee

For the moment at any rate, snowplows require drivers. And that means those drivers need to be trained. And that is where it starts to get a little bit tricky because training can mean all sorts of different things. Is it how to use a plow—what we might typically call motor skills training? Or is it knowing how much salt to apply to the road—which we might call cognitive training, or imparting knowledge? What sort of training does an employee need, and how will we make sure that he or she gets the training that they need?

We can think of winter maintenance training in terms of three broad categories. First is acquiring knowledge and skills that are generally needed for the task of winter maintenance. Second is acquiring knowledge and skills that are specific to a given agency. And third is acquiring knowledge and skills that address specific problems or issues being encountered by an agency. Of course, there are many more ways of looking at training than these three broad categories, but these provide us with a place to begin our examination of the training tools in our winter toolbox.

But before we dig further into these three areas, we also have to look at one overarching question—how do you know if your training worked? Let’s put this in pretty blunt terms. You have put all your plow operators through a one-day training in the classroom. Even if there is no direct charge for that training, you have in essence paid for one day of time for all your operators. Have you got your money’s worth? How would you know?

There are three traditional ways of measuring the value of training. First, you conduct some sort of test at the end of the training (or, perhaps, throughout the training). Many people do not like this, since the testing can create stress among employees, many of whom are not particularly pleased to be in the classroom in the first place. Nonetheless, for both knowledge and motor skills training, some form of testing can be helpful. You will see the most value in your testing if you do “before and after” testing. This sort of testing, where you might test what employees know about your snow plan before and after they receive training on the snow plan (as an example) allows you to demonstrate a gain in knowledge (or skills, as appropriate) as a result of the testing. The challenge with this sort of testing is that it does not determine how well the new knowledge or skill is either retained by your employees, or used in the field by your employees. By the time they need the knowledge or skills you gave them in the training, they may have forgotten all about it!

The second traditional way of measurement is most applicable in the area of issues or problem-oriented training. Let’s suppose that last winter you had some problems with wing plows, in that you felt you had more than the usual number of accidents involving wing plows on your trucks. You might then, over the summer, provide your operators with special training on how to use their wing plows appropriately and to greatest effect, in the hope that this would result in fewer wing plow-related accidents the following winter. Then, the next winter, you would measure (again) how many wing plow problems you had, and you would hope to see a significant reduction as a direct result of the training that you conducted. In essence what you are doing here is using a key performance indicator (sometimes called a KPI) which in this case might be wing plow accidents occurring per mile of wing plow use over the winter season to determine whether your training is effective.

The third way of measuring the effectiveness of your training is simply to assume that it worked, and not do anything specific to measure whether it did or not. Unfortunately, this is the most common way of (not) measuring the effectiveness of training!

Acquiring broad knowledge and skills
The first type of training for your winter maintenance team is the broadest. It is providing them with background knowledge and skills about how we deal with winter storms. These might include things like how chemicals work and should be used in winter operations, or how to properly handle the plow and the spreading equipment on a truck. It is not going to
be overly specific about departmental policies or specific plow routes but will cover things in more general terms.

One example of this would be the APWA Winter Maintenance Supervisor Certificate Training program. This has been taught every year for the past five years at the North American Snow Conference, and has also been taught at a number of APWA chapter meetings. The Winter Maintenance Subcommittee winter toolbox links page has details of offerings coming up this fall. This one-day training provides a lot of information in very little time, and so is a bit like trying to take a drink from a fire hose. It includes a testing component but there are two drawbacks to the one-day certificate training. First, not everyone can get to it, even though it is being offered more times this year than ever before; and second, not everyone learns well in a classroom-type setting.

This issue of learning styles is very important. To paraphrase the protagonist in *The Life of Brian*, we are all individuals, and that means, among other things, that while some of us learn very well in a classroom-type setting, others among us do not! Fortunately there is at least one alternative general training option in winter maintenance, and that is the series of computer-based training (CBT) programs that were developed by AASHTO some years ago (and have been expanded upon and updated since then, with funding from the Clear Roads pooled fund study and the Aurora pooled fund study). Details on how to obtain these CBT modules are also on the Winter Maintenance Subcommittee web page.

**Acquiring agency-specific knowledge and skills**

So there are definitely options when it comes to the more general sort of winter maintenance training (and there are more options in addition to the two I have mentioned here). What about when you are seeking training on more agency-specific areas? These might include a refresher training each fall on your agency’s winter maintenance policy document and snow plan, for example. This sort of training is almost always done in-house, and that can present a challenge. Put simply, training like this involves public speaking, and not all of us enjoy that or are any good at it at all. What can you do if you have responsibility for the training, but hate to do public speaking (and perhaps even fear that your efforts at public speaking would cure insomniacs the world over)?

All is not lost! You cannot dodge all of this training, and at the very least you will need to develop the training materials, so that you can highlight what the important parts of the snow plan are, for example, and really stress key aspects of your policy document. But YOU do not need to be the one presenting all the material. Suppose your agency is using brine—why not have the training on the brine parts of your snow plan and policy document done by the “brine champion” in your agency, rather than by you? This serves at least three purposes. First, by having different folk give different parts of the training, you substantially reduce the whole snooze factor of training. Second, the champion of any given topic (be it brine, or whatever) or if you prefer, the in-house expert, is likely to be enthusiastic about their topic and keen to share all the good things about it with their colleagues. Enthusiasm helps when it comes to training! And third, you are giving that individual a chance to develop their own skill set, by learning to present training effectively and efficiently. Indeed, in some agencies they use this approach so well that some of their champions now go regularly to other agencies and to present at regional and national APWA shows on their area of expertise. That is real value added for your training (and you got the value without having to do all the training yourself—a double win!).

**Acquiring problem-specific knowledge and skills**

This type of training is the most focused sort, and when done correctly can help move an agency to a higher level of proficiency and effectiveness. However, it is important when considering doing this sort of training to ensure that it is not punitive in any way. In the ideal, the goals of the training should be expressed somewhat impersonally. So, instead of saying “I want you to have fewer accidents with your wing plows this winter,” it might be better to say “we want to improve our safety levels on wing plow usage.” In this way, we can perhaps avoid the negative mindset that typically accompanies a scolding!

This sort of training requires a strong focus on a metric. To continue with our wing plow example, that might be how many miles of wing plow use between wing plow accidents. With that as a metric the goal is to increase the miles (or if you prefer, to reduce the accidents!). We express it in this way, normalized by the total usage of wing plows (in this case, by the miles over which wing plows were used) to allow us to compare one winter with another.

We do need to be a bit careful with this approach, because there can be reasons for an accident that cannot be addressed by any training. Also, sometimes circumstances can conspire to increase the likelihood of accidents. For example, a couple of winters ago in the Midwest we had a run of winter weather that meant for many
agencies that plow operators worked more than 50 days in a row. In such circumstances, people are going to get tired and when people get tired, mistakes get made. The approach in such a situation would not be to say “don’t have accidents” but rather to remind people that because they are tired they need to think through things even more carefully and be even more deliberate in their actions.

The content of training that is intended to address key performance indicators (KPI) will of course be determined by what KPI is being addressed. If it relates to the use of a piece of equipment or technology, then it could be appropriate to get input and materials from your vendors or suppliers. It may be that the issue causing problems is one that can be simply addressed (of course, it may not be, also!) so it is worth checking this first!

**How much training is enough?**
A really contentious issue when it comes to training is how much training you should do. Unsurprisingly, trainers, especially those who make their living training, believe that more is not just better, but a whole lot better! They may be a little biased, but the question of how much training remains pertinent.

I do not want to suggest a minimum percentage of your annual budget should be set aside for training (although some agencies do set aside a percentage of their budget and find that approach to be helpful). However, you might want to think in terms of the value of the assets that you are protecting through your winter maintenance activities. As agencies have started to evaluate the infrastructure of a city or town in terms of a dollar replacement value, they have been rather surprised by what they have found. A friend who is the Director of Public Works for a Midwestern city of about 65,000 told me that the value of their infrastructure was about $800 million. That is a lot of value that is being protected by winter maintenance training to ensure that the protection is as good as it can be is almost certainly worthwhile!

Wilfrid Nixon can be reached at (703) 549-4648 or wilf@saltinstitute.org.
Managing the Rights-of-Way

Murv Morehead, Senior Engineering Technician, BHC Rhodes, Overland Park, Kansas, and member, APWA Abandoned Utilities Subcommittee and Construction Practices Subcommittee; Al Field, President, Al Field & Associates, Phoenix, Arizona, and Chair, APWA Abandoned Utilities Subcommittee, and member, APWA Utilities & Public Right-of-Way Committee

In this edition of the Leadership by Discipline series, Murv Morehead, Senior Engineering Technician, BHC Rhodes, Overland Park, Kans., formerly Right-of-Way Coordinator for the City of Overland Park, Kans., member of CGA Best Practices Committee and Past Chairman of APWA’s Utilities and Public Right-of-Way Committee, and APWA Leadership and Management Committee representative; and Al Field, President, Al Field & Associates, Phoenix, Ariz., and member, APWA Utilities and Public Right-of-Way Committee, consider the role of leadership and management in the use and management of public rights-of-way.

A PWA’s Utilities and Public Right-of-Way Committee works to provide education and information that will raise awareness and promote the best use of the public rights-of-way for the public good and encourage best management practices that will promote the peaceful integration of all users and stakeholders within the public rights-of-way.

As a former Right-of-Way Manager for a city of 185,000 residents, the first scene that comes to Murv’s mind when asked about right-of-way management was “herding cats.” Herding cats generally refers to an attempt to keep numerous entities headed in one direction; this is initially very difficult to accomplish when each one has their own plan.

Rights-of-way are public property that needs to be managed on behalf of the owner—the residents. It is quite possible that a municipality’s rights-of-way are its highest value asset. Rights-of-way serve not only as the primary transportation corridor throughout the area; it is also set aside for the transport and delivery of both public and private utilities—all of which are fundamental requirements of any community. The concept of using street rights-of-way for providing streets for travel and delivery of utility services was recognized well over a hundred years ago as an action in the public interest. Right-of-way management does not consist of only the surface; it also includes what lies below ground, out of sight.

Who uses the rights-of-way? Government, public/private utilities and private contractors and/or individuals. Each of these users has a specific need for the public rights-of-way. In many cases these needs can interfere with one another and with the public’s normal use of rights-of-way. Therein lies the primary reason that the rights-of-way need to be proactively managed—to ensure that each user’s needs are met without causing a detrimental effect to another user.

The primary method to achieve right-of-way management is through right-of-way regulation. The absolute first objective of right-of-way management must be public safety.

On the surface, the public expects and deserves safe streets for mobility and convenience. This could involve anything from proper street repair to proper temporary traffic control to posted detour routes when necessary to permitting parades or sidewalk seating for cafes and restaurants.

Below the surface, management of public safety takes the form of requiring safe excavation practices by contractors, endless efforts to locate and protect existing buried utility lines, coordination among and between all potential rights-of-way users to avoid damage to buried utilities, and review of proposed construction that may inhibit another utility from accessing or repairing their facility in the future.

All of these outcomes can be best accomplished through regulation of the rights-of-way. This generally means requiring that a permit be issued before any disturbance of the rights-of-way can take place. Permits are usually issued by the regulating authority to control activities and actions in the rights-of-way. Permits generally have provisions for bonding, emergency work, pavement repair specifications, earth compaction specifications, traffic management, special restrictions and inspection among others. The permit will set forth the guidelines the contractor/right-of-way user must adhere to and will allow the Right-of-Way Manager and his staff to effectively control (manage) what, when and where activities occur in the rights-of-way.

Another objective of active rights-of-way management is protecting the public interest in the rights-of-way. As previously mentioned, public
rights-of-way are public property and everyone can and should benefit from its use when all uses and users are part of the management equation. In order for this use to continue indefinitely, sustainability must be introduced into management practices. Rights-of-way are finite resources and must be kept viable for generations to come. This could be in the form of assigned utility corridors, using new technologies and products that minimize disruption to the rights-of-way, and most of all, planning for the future, not just for the present.

While some utility delivery systems will not change drastically due to the nature of the product (i.e., water, gas, electric power), communication systems are changing at a breakneck pace. The days of the copper-wire phone lines, and phones being used only for communication, are long gone. They have been replaced by antenna towers and fiber optic cables that are being introduced into nearly every home. This process is necessary to keep up with the current data demands of our society. Smart phones, IPTV (Internet Protocol television), working from home, and home entertainment, are just a few of the driving forces behind the explosion in communication technologies.

In addition to the miles of new buried fiber cables being deployed in rights-of-way all across the United States in an effort to meet the communications demand, large and small cell towers, distributed antenna systems and other similar wireless technologies are being constructed. Right-of-Way Managers must understand that although at times these deployments can be overwhelming, the end product is in the best interest of the residents and must be managed to the best interest of all involved. This may require significant changes in the permitting and inspection processes, but must be done.

The “herding cats” scenario was what we first encountered when beginning my Right-of-Way Coordinator career. Although “informal” right-of-way work permits were issued, at the time there was no way to track the work being done or by whom; much of the work was never permitted and therefore never inspected. Unless a utility had a conflict with a municipal capital improvement project, they were virtually unregulated. The importance and finite nature of rights-of-way was just beginning to be understood.

I was the first person to hold this newly created position, which also meant I had to build a management system that, after much trial and error, encompassed the points we have touched on and believe to be the foundation for management of the rights-of-way. The building blocks of right-of-way management should not change, but the successful Right-of-Way Manager must be willing and able to adapt to whatever is needed when the “herd of cats” changes direction. Management of the public rights-of-way must be proactive and detailed. Many agencies have little or no process for managing these assets, or tend to trivialize their importance. Hopefully this article will assist those in management, or inspire those who are in search of or are responsible for the public rights-of-way. Perhaps this may assist them to develop their rights-of-way management process and to seek out assistance from professional sources.

Murv Morehead can be reached at (913) 663-1900 or murv.morehead@ibhc.com; Al Field can be reached at (602) 616-3618 or al.field@alfiel field-assoc.com.
The APWA International Affairs Committee (IAC) strives to promote APWA and the public works profession at the global level. We have formed alliances with like-minded organizations in other regions of the world with the goal of learning from each other. We have found that many of our public works issues are truly global. Sustainable funding for infrastructure, the need for professional training, credentialing and certifications, and frustrations due to local politics are just a few of our common issues. The IAC believes we can truly learn much from each other. To that end we are dedicated to supporting global exchange for the mutual benefit of APWA members and our global partners in public works.

In 2015-16 the IAC took a major step to establish its future vision. Earlier this year IAC members met with APWA staff and President-Elect Ron Calkins for two days of strategic planning. We originally intended to establish strategic priorities for the committee. We quickly realized that our primary objectives are the same as those of APWA: advocacy, professional development, and support of chapters. The only difference is that our focus is at the global level. With that in mind, we established six action items to guide our future efforts (see sidebar). IAC also identified the advancement of sustainability as a global priority. We will be partnering with the APWA Center for Sustainability to present a PWX session on resiliency.

Our International Partners
The strength of the IAC stems from the strong partnerships we have forged with other countries and regions of the world. We have subcommittees dedicated to each of our formal international partner regions (Latin America, Australia/New Zealand, Nordic Countries, and the Czech/Slovak Republics). APWA is also a member of the International Federation of Municipal Engineers (IFME). This year for the first time, membership on a subcommittee was opened up to all APWA members rather than by presidential appointment. The increased dialogue between APWA members and their international counterparts helped to raise awareness and provided connections that may not otherwise occur.

International Federation of Municipal Engineers
As mentioned previously, APWA is a member of the International Federation of Municipal Engineers, whose purpose is to connect public works professionals around the world. APWA and other IFME members benefit from the “global pool” of knowledge established through the exchange of ideas by its members from nineteen countries. Doug Drever, a former APWA board member, is the IFME President and an IAC member. During the last year IFME added China, Slovakia, and the South Pacific to its list of members. IFME also established a new website, www.ifmeworld.org, that includes links to all its member countries. Their “best practices in winter maintenance” paper is almost...
ready for publication. A joint meeting of the CPWA and IFME boards was held in Ottawa in April. Representatives of 14 countries discussed asset management, sustainability, and other global public works issues. Their initiatives for 2016 include competency standards for municipal/public works engineers, promotion of asset management, and possible establishment of a global mentoring program.

**APWA/SPWA/CZPWA Subcommittee (Czech and Slovak Republics)**
The APWA/SPWA/CZPWA Subcommittee was chaired by Martin Pastucha. Their task during this year was to craft a new partnership agreement for adoption at a future PWX. Traditionally their members have attended past Congresses every other year. Several APWA members and Jennings Randolph Fellows have attended conferences and conducted study tours in both republics.

**APWA/CPWA/IPWEA/IPWEA NZ Subcommittee (Australia/New Zealand)**
The Institute of Public Works Engineering Australasia (IPWEA) includes Australia and New Zealand. They have been a formal partner of APWA for many years. Each year they send two contingents of public works professionals on study tours to the United States and Canada in conjunction with the Congress/PWX. They also regularly contribute speakers, APWA Reporter articles, and provide subject matter experts in areas of expertise. Noel Thompson, former APWA President, chaired the subcommittee. Peter Higgs, President of IPWEA New Zealand, will be one of the presenters at the PWX session on resiliency.

**APWA/Mexico/Latin America Subcommittee**
Under the leadership of Tyler Palmer, the Latin America Subcommittee
had a busy year in 2015-16. APWA signed a new partnership agreement with ICLEI Mexico, Central America and the Caribbean at the Congress (PWX) in Phoenix. Tyler contacted and had initial conversations with FEMCIC (Mexican Association of Civil Engineers) and accepted an invitation to attend and participate in ICLEI’s Public Works Congresses in Chihuahua and Saltillo, Mexico. The subcommittee also contributed multiple articles to the APWA Reporter, including an article contributed by ICLEI.

“We hope to continue to provide value to APWA through our efforts, and look forward to better communicating said value to the membership,” said Tyler. “We are confident that our outreach efforts in Latin America will pay long-term dividends for our association.” Tyler will be chairing the IAC in 2016-17.

Nordic Subcommittee
With the partnership agreement now almost two years old, the Nordic Subcommittee has evolved into an active dialogue between APWA and its Nordic partners (Denmark, Sweden, Finland, Norway and Iceland). Joy Schaad, subcommittee chair, held conference calls on a monthly basis. The group facilitated two Finnish articles for the APWA Reporter, contributed to IFME’s “Best Practices in Winter Maintenance” report, facilitated travel and study arrangement for Jennings Randolph Fellow Matt Rodrigues, and secured a presentation for PWX in Minneapolis. At least 12 attendees from our Nordic partners will be attending PWX. They will also be hosted for a study tour by the Chicago Metro Chapter.

Jennings Randolph International Fellowship Program
The Jennings Randolph International Fellowship Program provides financial assistance for APWA members to attend and present at a Public Works Conference of one of APWA’s international partners and to conduct a public works study tour in that country. The IAC is charged with the program’s application process. This year we had 18 highly qualified applicants who proposed public works study tours in New Zealand and Sweden.

Bruce Kaplan from Boston, Mass., and Matt Rodrigues from Eugene, Ore., were the 2016 Jennings Randolph International Fellowship Award recipients. Bruce travelled to Auckland to study the waterfront redevelopment and central rail terminal. Matt will be traveling to the Swedish Association of Municipal Engineers’ annual conference in Malmo, Sweden. Please watch the APWA Reporter for future articles describing their experiences.

To learn more about the program, contact APWA International and Outreach Manager Lillie Plowman at lplowman@apwa.net.

Ambassador Program
At the APWA Congress (PWX) in Phoenix the IAC completed a successful second year of the International Congress (PWX) Ambassador Program. All registered international attendees were paired with APWA volunteers. The volunteer ambassadors were asked to contact their international guests before PWX and attend the Opening General Session and International Reception together. Many ambassadors went much further by inviting their international guests to attend chapter dinners and other events. The networking and social opportunities have proven to be mutually beneficial. The hospitality we show to our international guests serves as a statement of the values of APWA and its members. What better way to improve the perception of our organization?

A call for volunteers for the third year of the ambassador program for the PWX in Minneapolis is expected in July. If interested, contact APWA’s Lillie Plowman at lplowman@apwa.net or any member of the IAC.

Vydas Juskelis can be reached at (630) 834-8505 or Juskelis@invillapark.com.
International Affairs Committee
Strategic Priorities

Advocacy of Public Works
1. Continue to improve the perception of the public works professionals around the world.
2. Enhance efforts to increase participation in international educational exchange programs and public works study tours with APWA’s international partners and their communities.

Professional Development – Integrated and Comprehensive
1. Develop a Communication Plan that effectively demonstrates the value and opportunities in APWA’s international activities to the members, chapter, committees, Board and partnerships.
2. Support technology transfer of the public works profession through education, professional development, partnering and advocacy.

Support and Strengthen Chapters
1. Cultivate an international exchange pilot program at the chapter level.
2. Broaden the International Ambassador program so that public works professionals in North America and abroad can share their insight and expertise with fellow public works professionals.

Advancing Support Sustainability
The 2016-17 IAC Committee members are:
- Tyler Palmer, Division Manager, City of Moscow, Idaho (Rocky Mountain)
- Vydas Juskelis, P.E., Director of Public Works, Village of Village Park, Illinois (Chicago Metro)
- Tracy Warner, P.E., Municipal Engineer, City of Ames, Iowa (Iowa)
- Martin Pastucha, Director of Public Works, City of Santa Monica, California (Southern California)
- Joy M. Schaad, P.E., Retired, Chicago, Illinois (Chicago Metro)
- W. Gary Losier, P.Eng., Town of Quispamsis, New Brunswick (Atlantic Provinces)
- Doug Drever, FEC, P.Eng., President, IFME, Saskatoon, Saskatchewan (Saskatchewan) (ex officio)
- Chris Champion, CPEng, Chief Executive Officer, IPWEA, Sydney, Australia (No Chapter Affiliation) (ex officio)
- Ross Vincent, Consultant, IPWEA NZ, Thames, New Zealand (No Chapter Affiliation) (ex officio)
- Inger Sundstrom, City Planning Director, Orebro, Sweden, SKT (No Chapter Affiliation) (ex officio)
- Lissette Hernandez Salazar, Subdirectora de Eventos, Col. Centro, C.P., Mexico, DF, ICLEI (No Chapter Affiliation) (ex officio)
- Ville Alatyppo, MSc, D SC, FAME, Secretary General, Helsinki, Finland, FAME (No Chapter Affiliation) (ex officio)

Resources:
- APWA’s website: http://www.apwa.net/discover_apwa/APWA-International
- Lillle Plowman, APWA’s International and Outreach Manager: lplowman@apwa.net, (816) 595-5253
- Dave Dancy, APWA’s Director of International Programs: ddancy@apwa.net or (816) 595-5250
- Tyler Palmer, IAC Chair 2016-17: tpalmer@ci.moscow.id.us

APWA President Brian Usher addresses the attendees at the IPWEA conference in New Zealand.
Embracing technology for damage prevention

Mike Sullivan, President, Alberta One-Call Corp, Calgary, Alberta; Derrick Saedal, Underground Structures Branch, City of Winnipeg, Manitoba, and member, APWA Utilities & Public Right-of-Way Committee

The damage prevention industry has done an exemplary job promoting “Call Before You Dig.” In fact, over the past four decades, the term has become synonymous with the damage prevention industry. In today’s technological world, though, the public has choices. They can call or click before digging, and in some cases, they can also tap the app to request a locate. These efficiencies result in faster response times, better data, and operational cost savings for the One-Call Center as well as the member.

“Technology, being what it is, means nothing stays the same for very long,” explains Louis Panzer, Executive Director of North Carolina 811. “Updates and enhancements are routine and we need to keep moving with them.”

Denis Courchesne, President and CEO of Info-Excavation, agrees. “There is an operational advantage for the contact center to migrate locate requests from the phone to the web,” he says. “Web and mobile applications allow features that are simply unavailable with phone locate requests, such as electronically pre-marking your dig site (virtual whitelining) or adding a drawing or sketch directly online. These tools help the analysis process of the locate request, accelerate contact center processing and reduce the number of locates required by the member.”

To achieve the goal of migrating locate requests from the phone to the web, education and outreach need to change, too.

“That’s where you’d think there would be a challenge with 811,” explains Ruby Crosier, Call Center Manager for Sunshine 811. “811 suggests a phone call because it’s a phone number, but 811 promotion in the United States hasn’t deterred awareness of the online locate request process. Many U.S. states have embraced the 811 campaign by simply adopting ‘811’ and ‘.com’ into their corporate brand.”

“811 is a remarkable awareness campaign,” says Matt Ruddo, Director of Client Relations for One Call Concepts. “We’ve been able to leverage its success and use it to our advantage. It’s made the online locate request option more intuitive.”

So, how about teaching an old dog new tricks?

Alberta One-Call, the oldest contact center in Canada, with the most members (740), made the calculated shift just over a year ago. We couldn’t use 811 so we started the “Click Before You Dig” brand and promotion in Canada. In eight weeks, we went from 33% web-based locates to over 65%. We saw the success our friends in Quebec were experiencing (roughly 85% of Info-Excavation locate requests originate on the web) and knew we needed to make a change. Our high member numbers and the rural nature of buried utilities across Alberta’s vast expanse, however, left us wondering whether we could achieve our goal. Clearly, though, that wasn’t an issue.

At the 2014 CGA 811 Excavation Safety Conference & Expo in Phoenix, the presentation “Making it Click – Embracing Technology and Increasing Online Tickets” reinforced the importance of offering people a choice. Perhaps more importantly, though, the well-attended session also affirmed that remaining current and meeting the reasonable expectations of the public can’t be an option.
The Click Before You Dig App is a convenient way for excavators to submit their request at their convenience. Ticket history will be included in the App, including a list of Subscriber companies who will be responding to the locate request. The App is linked to Google Maps so it’s easy to navigate to find and submit a google image with virtual white lining of your work site. The Google image at right is included in the notification to subscriber companies and their locators. This feature eliminates errors in data entry, decreases processing time and reduces costs to subscriber companies.

“Public demand isn’t going to slow down,” explains Gary Hansen, President of Bluestakes Utah. “It goes hand-in-hand with knowledge. Today, the ability to create ‘the next best thing’ is literally in the public’s hands. Mobile technology isn’t the future—it is right here, right now. If we’re not meeting public demand, we risk being irrelevant. Public safety and damage prevention simply can’t afford that.”

Mike Sullivan is the President of Alberta One-Call, Executive Director of the Canadian Common Ground Alliance, and one of the presenters of the “Making it Click” presentation at the 2014 CGA 811 Excavation Safety Conference & Expo. He can be reached at msullivan@albertaonecall.com.

Derrick Saedal is a member of APWA’s Utilities & Public Right-of-Way Technical Committee and Executive Director of the Manitoba Common Ground Alliance. He can be reached at dsaedal@winnipeg.ca.
As public works supervisors and managers, we face the reality that many of our long-term experienced staff are moving into their next phase in life and into retirement. With the departure of these senior and experienced staff, public agencies must work with an employee base of often younger and less experienced staff. This places a huge burden on the organization to quickly train new staff to ensure that essential services are delivered. Many public agencies may not have adequately budgeted for the needed technical training or allocated the time necessary for staff to attend technical conferences.

APWA embarked on developing an Internet-based educational program that allows APWA members to obtain cost-effective training within their organization. APWA’s Click, Listen & Learn (CLL) program was initiated in 2001. The first Click, Listen & Learn was held on October 25, 2001 and was entitled “Are You Prepared to Respond to a Disaster?” There have been 227 Click, Listen & Learns presented since the program began.

The CLL training is led by top experts in their fields who convey new ideas, innovative methods and explore new technology to maximize organizational efficiencies. Each training session is fast-paced and completed in two hours. The true benefit of the program is that it allows an organization to gather office and field staff together in one location so that all training curriculum is heard and understood uniformly. This format allows post-discussions to take place between the supervisor and staff to discuss lessons learned and its application to their respective city or agency.

The cost for this training is free for APWA members. The cost for nonmembers is minimal at $175, which covers the audio and web broadcast. The supervisor determines the appropriate number of participants to view each CLL training session.

APWA’s national Utilities and Public Right-of-Way (UPROW) Committee is actively involved each year in identifying Click, Listen & Learn topics to provide needed training to right-of-way professionals. The mission of the UPROW Committee is twofold. One mission is to provide education and information that will raise awareness and promote the best use of the public rights-of-way for the public good. Another mission is to provide a forum where stakeholders can come together to discuss common issues and best management practices that will promote the peaceful integration of all users and stakeholders within the public rights-of-way.

The UPROW Committee sets goals to identify new resources, state-of-the-art technology, and innovative approaches to assist managers, users, contractors, and elected officials in the ongoing formulation of public policy, local and state ordinances, and identifying best practices for the management of public rights-of-way.

The Members’ Library is a benefit of APWA membership and is free to use. To date there are 18 topics in the Members’ Library for training in the field of right-of-way management. The training includes Click, Listen & Learn programs as well as educational sessions from PWX. The following are utilities and public right-of-way topics:

**Click, Listen & Learn Programs**
- Build Your Trenchless Toolbox
- Do you know DIRT (Damage Information Reporting Tool)?
- How the Effective Utility Management Tool Will Significantly Improve Your Public Works Department or Utility
- Utility Coordination for Municipal Capital Improvement Projects
- Keyhole Technology
- How to Initiate and Implement a Right-of-Way Program
Congress/PWX Educational Sessions

- Using Programmatic Permits to Improve Efficiencies with Utilities in the Right-of-Way
- Using Abandoned Utility Lines for Fiber Optic Network Use
- The Evolution of Cast Iron Water Main Rehabilitation
- Securing What’s Needed for a New Water Source: The Carlsbad Desalination Project
- Abandoned Utilities – What to Do?
- Making an IMMPACT
- Trenchless in Toronto
- Designing and Constructing ADA-Compliant Curb Ramps
- Trees in the Pipeline Right-of-Way
- Pavement Sustainability on Steroids: How Keyhole Technology Extends Pavement Life
- Using DIRT to Improve Safety
- Making ADA Requirements Work for Small Cities/Rural Communities

Learn programs that date back to 2008. Some CLL programs of interest include:

- Emergency Management – Public Works Senior Leaders Talk About Traffic Incident Management
- Engineering and Technology – Infrastructure Asset Management, More than just Managing Assets
- Facilities and Grounds – The Urban Forestry Role in Community Resilience

If you are interested in other topics that may be also applicable, the Members’ Library contains 139 Click, Listen &

For more information on APWA’s Click, Listen & Learn programs or to see how you can get involved on the UPROW Committee, please contact APWA staff at 1-800-848-APWA.

Vic Bianes can be reached at (619) 236-6066 or vbianes@sandiego.gov; Rita Cassida can be reached at (816) 595-5222 or rcassida@apwa.net.
Guidance Statement for Abandoned Underground Facilities

Al Field, President, Al Field & Associates, LLC, Phoenix, Arizona; Chair, APWA Abandoned Utilities Subcommittee; member, APWA Utilities and Public Right-of-Way Committee

Regulations and Laws
Regulations and legislation at the local, state, and federal levels should uphold the authority of public agencies to require utility owners to maintain ownership records, maintain accurate mapping, and locate and mark for excavation purposes per One-Call Center laws and regulations, all buried utilities, appurtenances and other facilities they or their predecessors have installed that are considered “abandoned” or “no longer in service” adjacent to, or within the public rights-of-way. Since some facility owners purchase assets from “predecessors” without knowing whether or not all of those assets are appropriately mapped and, therefore, may not have records showing where the facilities exist and are not able to mark those unmapped facilities or indicate that there are abandoned facilities in the area without significant effort, their best effort must be made to locate and mark the facilities.

Existing codes, laws, franchises and other regulations shall be regularly enforced or the creator/enforcer of the codes, laws, franchises and other regulations shall forfeit the right to claim damages.

Legislation must be suggested to allow abandonment for taxation purposes while still requiring facility mapping and records maintenance.

Treatment of Existing Lines
All facilities, whether abandoned or not, must be treated as active/live.

Standard of Care
Utilization of ASCE Standard 38-02, Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data, should be expected prior to all excavation reducing the uncertainty of addressing unknown abandoned lines during construction activities.

Maintenance of Records of Abandoned Buried Facilities
Owners of buried facilities in public rights-of-way must maintain records of, and locate for excavation purposes per One-Call requirements, a buried facility’s location until it is removed from the public rights-of-way or ownership is transferred to another entity. Owners of leased or rented utilities must retain responsibility for locating the facility.

A standardized symbology should be established by locators for identifying/markning abandoned facilities. An example of one used in Arizona is a circle with an “A” in it using the appropriate color code for the type of facility that is abandoned, placed within the dig site boundaries described in a One-Call ticket in the appropriate color code for the type of utility that has been abandoned.

Since abandoned facilities are typically physically separated from active facilities, it is not always possible to locate them for marking. For this reason, a circle with an “A” in it is used for marking purposes to indicate an abandoned facility exists in the area. If an excavator has received responses from all underground facility owners impacted on a one call center ticket and some of them have indicated they have abandoned lines in the area by marking the circle with an “A” in it in their corresponding color code, it is possible that the excavator could uncover an unmarked line. If this is the case, the excavator would contact all facility owners (they could use the One Call center to do this) who have used the circle with “A” mark so they can come to the job site and visually inspect the exposed facility and tell the excavator whether or not it is their abandoned facility. If they determine it is not one of their abandoned facilities, then the excavator would need to contact the One Call center to start the Unknown Line process.

A repository for the collection of utility records of companies that are no longer in business shall be established.
Ownership of Abandoned Facilities

Owners of buried facilities in public rights-of-way may not relinquish ownership by claiming to place them “out of service” or by abandoning them. If, by claiming to place them “out of service” or by abandoning a line or facility, the owner receives a tax or other benefit and claiming this status allows that benefit, it is the owner’s responsibility to find a legislative remedy such as reclassifying the facility. In any case the owner does not relinquish responsibility for locating and marking the facility.

Owners of utilities to be “abandoned” must properly and safely evacuate/empty the underground facility. These abandoned lines may be repurposed for use by another utility. If the abandoned line is repurposed, the owner may need to work with the public utilities commission to determine if the facility can be sold or leased to another utility (this is based on local and state laws). The new utility must apply for and receive a permit from the appropriate agency. The new utility/owner will be responsible for the One Call designation. In the case of a leased facility, the owner retains the ultimate responsibility for mapping and marking with the appropriate designation. If a utility owner decides to abandon the facility, he must work with the appropriate agency to determine proper and safe evacuation/emptying requirements. Owners of buried facilities in public rights-of-way shall be responsible for all costs, including environmental costs, associated with the removal of that facility by others.

Abandonment of Facilities

Where abandonment is the only reasonable option, the owner of the facility must take steps to ensure that the facility is properly and safely evacuated/emptied. This may include notifying all parties with a legal interest in the facility, working with the appropriate agency to determine proper and safe evacuation/emptying requirements, and following any applicable laws and regulations. If the facility is repurposed, the new owner/owner will be responsible for the One Call designation. In the case of a leased facility, the owner retains the ultimate responsibility for mapping and marking with the appropriate designation. If a utility owner decides to abandon the facility, he must work with the appropriate agency to determine proper and safe evacuation/emptying requirements.
facility shall work with the agency to
determine final requirements. Final
requirements may require filling
metallic pipelines with nitrogen or
another inert gas to reduce the rate of
deterioration from the inside. Metallic
and non-metallic pipelines may require
the line to be filled with material
or plugged in specific locations. All
pipelines may require the installation
of locating devices to allow the
One Call center to accurately locate
the facility. Manholes, pull-boxes,
J-boxes and similar structures as well
as all above-ground features must be
properly and safely removed.

Contractors encountering unmapped
abandoned facilities must be able to
notify the owner of the facility of its
location with the expectation that the
information provided will be recorded,
mapped and marked for future use.
A locating device such as a marker
ball shall be placed at the location for
ability to locate in the future unless the
facility is to be completely removed.

Owners of facilities already abandoned
in place in a public right-of-way and
not currently mapped should be
required to employ a registered land
surveyor to officially survey the line
and stamp the record document so
that the owner will be able to map the
facility and there will be a public record
of its location.

Recording the Location of
Abandoned Facilities
Capital Improvement Project
owners for all contracts requiring
excavation should include a bid item
in project specifications requiring
the contractor/excavator to remove
encountered abandoned facilities
to the extent of conflict within the
project limits. (Removal pricing will
vary depending on the abandoned
utility encountered.) If this is done, it
is considered a reasonable alternative
to the facility owner that would
be responsible for removing their
facility for the project. Billing for the
costs shall be to the facility owner
as a separate contract line item. The
estimated cost must be established
during project design so that the
project owner can recover it from the
facility owner prior to project start.

Abandoned Facilities Best Practices
This Guidance Statement has been
developed by the American Public
Works Association Utilities & Public
Right-of-Way Committee with
assistance from other interested
parties. The Guidance Statement
is suggested practices which are not
intended to be all-encompassing or
to conflict with any legal or other
responsibilities of the user.

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or al.field@alfield-assoc.com.

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Quality - Performance - Public Safety - Value - Customer Support
Although Carver County is the smallest of the seven Minneapolis-St. Paul metropolitan counties by population, when it comes to technology and its use in innovation, it is considered to be a leader. With a rapidly expanding population, affordable housing and growth in commerce, Carver County recognizes the importance of being as efficient as possible while keeping the costs to taxpayers as low as possible. To this end, the use of Geographic Information Systems (GIS) has been important to the Public Works Division, in both the need for new and efficient roadways, as well as keeping the existing network well maintained and safe.

After the sudden and untimely passing of the county Right-of-Way Agent, Patrick Lambert was hired to fill the vacancy. Pat walked into his office on the first day to discover boxes of files and little or no consistent electronic filing system to track right-of-way acquisition projects. Many hours were spent trying to organize current right-of-way acquisition efforts and match them to their appropriate project file. Pat recognized the opportunity for improvement and reached out to other county staff for assistance.

A Kaizen event (Japanese for small change), led by Business Analyst Lorraine Brady, was conducted where the entire right-of-way acquisition procedure was broken down into small steps that could be analyzed and improved for greater efficiency. At the end of the three-day Kaizen event, the Right-of-Way Agent was asked what, in his opinion, would be the perfect solution to improve the management of the acquisition process. He replied that a map, whereby he could click on each parcel for a particular project, and all information would be at his fingertips, including access to an organized ROW folder within the project file, that would contain appraisals, legal documents, parcel exhibits, correspondence and anything else necessary for the purchase of that parcel. In addition, it would track the process of acquisition through each stage, from initial property owner contact to final settlement or condemnation proceeding, as well as keep supervisory personnel informed of right-of-way expenditures.

After the Kaizen event, a number of commercial off the shelf (COTS) right-of-way applications were considered but none had a mapping component that was readily available and easy to use. Public Works already had a project management software implementation planned, and it was recognized that Right-of-Way staff would have to interact with that system by entering tasks and deadlines. Additionally the county has numerous resources for document management, so duplicating tasks, deadlines and documents in a standalone COTS right-of-way application did not make sense.

Perry Clark, the Public Works Asset Manager, and the division’s lead in GIS, recognized that the county’s existing investment in Esri GIS could be leveraged to fill the unmet right-of-way management needs left by the division’s existing COTS software. Perry used maps and apps that are part of the ArcGIS Online system in this project to provide an intuitive interface and showcase right-of-way acquisition status and staff performance. ArcGIS Online is Esri’s web-based GIS. A simple editing app was created for data entry, and the Operations Dashboard was implemented as the primary viewing application. The Operations Dashboard offers numerous configurable widgets that work great for presenting status, cost and performance.

The Right-of-Way Acquisitions dashboard has the ability to track the acquisition process from beginning to end and report real-time project status throughout. The application helps keep the Right-of-Way Department on track to deliver within statutory timelines and allow for supervisors and project managers to track costs. This implementation provides easy instant access to acquisition status, funds expended and outstanding offers. Data can be filtered many different ways which allows quick analysis of individual staff and project performance. In addition to higher level charts and graphs, users are able to drill down to acquire specific...
acquisition parcel data. The application has proven useful in collaborating with other county departments, contract Right-of-Way Agents and other agencies. As an added bonus, a feature has been added to predict acquisition costs by estimating low, median and maximum estimated settlements and then seeing where the final settlement falls within the range. This function helps in predicting right-of-way costs on future projects. A favorite feature is the ability to jump from the map directly to related documents and other COTS applications. Of course, because it is GIS, it’s all neatly tied to the interactive map.

In anticipation of a State Aid review of the right-of-way files for a project, the reviewer was asked if he preferred paper files or electronic files via a GIS mapping application. After being shown how to navigate the application, he was amazed at its ease of use and how quickly the review could be completed. Instead of taking a day or more of reviewing the files for 47 parcels and 100-plus individual easement documents and agreements, the full review took less than four hours. The State Aid reviewer commented that Carver County was “light years ahead of every other agency in Minnesota, including the Dept. of Transportation” when it came to utilizing GIS technology in the right-of-way acquisition process.

Some of the future enhancements planned include integrating with BrightWork project management software, integrating with SharePoint document management, and developing a printable parcel level report card that shows the parcel status and a map. Everyone involved in the project at Carver County really likes the outcome, and this implementation has inspired similar implementations in other metro counties. Using the ArcGIS Online Operations Dashboard, instead of purchasing a COTS system to fill the software gap, has saved the county money.

In summary, we offer the following summary and suggestions based on our Kaizen experience utilizing GIS for right-of-way acquisition:

• The good outcome in this project started with a complete analysis of the entire acquisition process
• Adding an additional commercial off the shelf application is not always the answer to data management, presentation and reporting


- GIS is a tool that most right-of-way departments have at their disposal; it is a great linking technology capable of connecting external systems and it can be used to fill the gaps in existing business processes.

- ArcGIS Online contains a powerful suite of configure and use applications that can be implemented very rapidly.

- The simple interface of the Right-of-Way Acquisitions dashboard allows the Right-of-Way Agent to be confident in his data organization, upper management to stay informed during the acquisition process, and collaboration across a wide array of users.

Patrick Lambert can be reached at (952) 466-5200.

By clicking on a parcel users are able to drill down to parcel level data and click a link that takes them directly to additional documents related to the parcel acquisition.
Developing and implementing a streetlight fee for Salem, Oregon

Peter Fernandez, P.E.
Public Works Director
City of Salem, Oregon

The City of Salem is a full-service municipal government located in Oregon’s mid-Willamette Valley. It is the state capital with a population of 165,000, within a metropolitan area of 350,000. The city’s streetlight system consists of 11,500 streetlights, within a 640 centerline mile street system. The streetlight inventory has expanded over the years with installation of a variety of fixtures, including luminaires mounted on electric utility poles, stand-alone poles, and historic pedestrian-scale streetlights.

Ownership and maintenance responsibilities of the streetlights are split between the city and two private utility companies. Oregon Public Utility Commission regulations require that streetlights be divided into one of three categories: Option A, utility-owned and maintained (31% of the city’s inventory); Option B, city-owned, utility-maintained (62%); and Option C, city-owned and maintained (7%). City code requires all new streetlights to be installed as Option B. Regardless of option, the city bears all of the power and maintenance costs through OPUC-imposed tariffs.

Salem implemented a streetlight fee in 2015. The purpose of the fee was to create a reliable and independent funding source for operating, maintaining, modernizing, and expanding the city’s streetlight system. Adoption of the streetlight fee was the culmination of two years of development work and extensive public outreach. The fee is charged monthly to the city’s utility customers and ranges from $2.80 for single family homes to $13.50 for non-residential uses. A complete fee schedule is shown in the table below.

Why a streetlight fee?
The streetlight fee was proposed in 2013 as a funding strategy to address a projected, and recurring, $1 million revenue shortfall in the annual streets maintenance budget. The shortfall was caused by a combination of reduced revenues and increasing costs. Rather than propose a new tax to address the shortfall, a proposal was developed to transfer the $1.2 million in streetlight costs from the streets maintenance budget to a new dedicated funding source. The idea for the transfer was twofold. It would remove a specialty service from the streets maintenance budget. And city staff understood the community’s preference of adopting a new revenue source for a specific service rather than for general, unspecified services.

Once the decision was made to separate streetlights from the streets maintenance budget, two questions were considered. Should the program be expanded to address more than the costs of operation and maintenance of the existing system? What type of revenue (property tax, fee, etc.) would be sought?

City of Salem, Oregon Streetlight Fee Methodology and Schedule

<table>
<thead>
<tr>
<th>Customer Classification</th>
<th>Street Frontage</th>
<th>Units</th>
<th>Monthly Fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single family</td>
<td>78%</td>
<td>38,140</td>
<td>$2.80</td>
</tr>
<tr>
<td>Multi-family (4 or fewer units)</td>
<td>1,186</td>
<td>$2.80</td>
<td></td>
</tr>
<tr>
<td>Multi-family (5 to 25 units)</td>
<td>417</td>
<td>$10.40</td>
<td></td>
</tr>
<tr>
<td>Multi-family (more than 25 units)</td>
<td>161</td>
<td>$18.00</td>
<td></td>
</tr>
<tr>
<td>Small commercial 9</td>
<td>22%</td>
<td>103</td>
<td>$2.80</td>
</tr>
<tr>
<td>Commercial</td>
<td></td>
<td>2,271</td>
<td>$13.50</td>
</tr>
<tr>
<td>Industrial</td>
<td></td>
<td>12</td>
<td>$13.50</td>
</tr>
<tr>
<td>Institutional</td>
<td></td>
<td>8</td>
<td>$13.50</td>
</tr>
<tr>
<td>Public</td>
<td></td>
<td>79</td>
<td>$13.50</td>
</tr>
<tr>
<td>Irrigation</td>
<td></td>
<td>23</td>
<td>$2.80</td>
</tr>
</tbody>
</table>

Notes:
1Approximate residential (local and collector) street frontage versus non-residential (arterial) street frontage. Data was used for initial division of streetlight revenue responsibility.
2Multi-family fee is charged by site and not by unit or building.
3Small commercial are businesses that occupy a building similar in size to a single family home (~3,000 square feet).
Additional funding was desired to expand the program by converting the existing high pressure sodium lamps to light-emitting diodes, replacing poles that were reaching the end of their useful life, and installing new streetlights in unlit neighborhoods. The annual cost of the expanded services was estimated at $600,000.

Salem looked at streetlight funding strategies used in other Oregon communities including special taxing districts, general property taxes, and gas taxes. Forming a special lighting district funded by a new tax levy was not possible due to Oregon property tax limitations. Allocating a portion of the city’s general property tax revenue was possible, but infeasible due to other community needs and services already lacking full funding. Adding an additional fee to electric utility bills was dismissed due to strong opposition by the power companies. In the end, a monthly fee billed directly to residents was considered the most feasible solution.

**Fee development considerations and methodology**

In the city staff’s opinion, it was important to propose a fee that was fair and easy to understand. The final fee schedule was informed, and influenced, by the input received from the extensive community outreach conducted in support of the streetlight fee. Political and practical implementation considerations also influenced its development.

A financial planning model was developed to test current and long-range cost and revenue assumptions. The model included assumptions related to operating and capital costs. The financial impacts of the LED re-lamping, including planned borrowing costs and projected power cost savings, were analyzed. The modeling confirmed the proposed fee amount could be held at the same rate for at least five years, an important feature to gaining political support for its adoption.

Consideration was given to the impact the fee would have on low-income households. The existing utility discount program for these customers was increased by $2.80, effectively negating the amount of the streetlight fee on their utility bills.

The fee methodology was developed based on the annual required revenue of $1.8 million. The required revenues were first divided by street functional classification to differentiate between residential and non-residential revenue responsibility. This assumed that residential land uses are located on local and collector streets, and non-residential uses are located on arterials. The required revenues were then further divided by customer classification to create the fee schedule illustrated in the table. Non-residential uses (except for small commercial and irrigation) were assigned the same rate for ease of billing.

**Program implementation issues**

Upon adoption of the fee a number of implementation issues important to the long-term success of the program were addressed. The solutions were developed with the assistance of a citizen advisory group, lending additional credibility to them.

A key decision was to use the city’s existing utility billing system to invoice the fee. The city owns and operates its water and sewer system and invoices 42,000 city utility customers every month. Creating a new stand-alone billing system for invoicing the streetlight fee would have cost $250,000 to develop and would have added recurring operating costs to the program.

The city created a separate budgetary fund to track revenues and expenses of the new fee. This new fund is used to publicly demonstrate that the streetlight fee revenues are being spent appropriately and for their intended purpose.

A decision was made for the program to absorb the cost of privately funded streetlights on public rights-of-way. These streetlights had been installed at the request of adjacent property owners who paid a monthly maintenance and power fee directly to the power company.

Criteria were developed for prioritizing locations for the installation of new streetlights. Proposing a fee low enough to be politically palatable, and keeping the promise of not proposing a fee increase for at least five years, meant that only a fraction of the needed 1,800 new streetlights could be installed annually. The criteria provide a means to manage the installation schedule.

**So far so good**

As the program enters its second year things are going quite well. Its dual goals of stabilizing the streets maintenance budget and improving the community’s streetlight service are being realized.

First-year revenues came in as projected, and delinquencies were significantly lower than had been anticipated. The LED re-lamping project is underway. And the first new poles will be installed later this year.

Detailed information about the streetlight fee is available at the City of Salem website, www.cityofsalem.net/streetlightfee.

*Peter Fernandez can be reached at (503) 588-6008 or pfernandez@cityofsalem.net.*
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The American Public Works Association (APWA) is committed to ensuring the fiscal integrity of all users of public rights-of-way. An innovative process which has proven successful on individual construction projects across North America now has been leveraged by APWA to further the success of damage prevention of underground facilities within permitted public rights-of-way.

Utilization of the Damage Prevention Partnering Process (D3P) virtually assures that there will be NO DAMAGE when incorporated on a specific project permitted by APWA. The process begins with a kick-off session attended by the senior executives of all key stakeholders on the specific project. And, the process may be utilized even at project inception. Incorporating D3P during design certainly could ensure that all subsequent stakeholders will be able to utilize the best known information regarding the location of existing facilities. Whether the project is for new installation or for replacement or addition to existing facilities, D3P provides the steps necessary for NO DAMAGES.

With all senior management engaged, aware and committed to NO DAMAGE on this project, all of the stakeholder personnel are entitled and committed to do “whatever is necessary” to assure NO DAMAGE. The kick-off session will address the actual communication and/or training required to achieve the committed outcome of NO DAMAGE. These steps may involve periodic team or taskforce meetings among the stakeholder personnel on the specific project. These meetings are facilitated by an independent consultant who is experienced with D3P processes and applications within the design, construction and installation of the particular underground facilities on this individual project.

Results from the Tampa Bay Excavation Task Force (TBETF) meetings show that where D3P is utilized, communication, attitudes, productivity and safety results are measurably improved. TBETF was created in the Tampa Bay area over six years ago and has worked closely with all stakeholders in the greater bay area to provide the forum for experiencing the results of collaboration among all participants and stakeholder entities on an entire range of underground facility projects.

Participating members include all the major utilities, municipalities and departments, engineers, public entity locators, contract locators, subsurface utility engineering firms, directional boring companies, excavation contractors, equipment rental companies, airport authorities, 811 directors and staff, regional and local OSHA representatives, insurance companies, insurance agencies, foremen, superintendents, owners, senior executives, construction managers, general contractors, and equipment manufacturers. Members of the state and local associations of engineering, construction, law enforcement and individual owner representatives from the cities, counties and civic organizations participate when the projects directly impact their facilities or communities.

APWA, Common Ground Alliance (CGA), Associated General Contractors of America (AGC), National Utility Contractors Association (NUCA) and Suncoast Utility Contractors Association (SUCA) have been engaged to share the learning experiences and discovery of this collaborative forum.

Ongoing D3P projects are implemented with the increased
appreciation discovered from actual collaboration among individuals who have experience the value of doing “whatever is necessary” to prevent damage and improve safety. And, experience shows that a specific project enables the key stakeholders to focus their attention on the specific project interaction, communication and the awareness that my individual actions may be the key to preventing damage or an accident. D3P provides a forum for discovering that preventing damage improves productivity, eliminates conflicts, improves safety and yields measurable improvements when put into action.

And, the benefits are:

- Improved productivity
- Eliminated litigation
- Improved safety
- Accelerated completion in many cases
- Better relationships for key stakeholders on future projects

APWA chapters may begin providing the forums for evaluating the steps to incorporating D3P as part of the existing permitting process. Each individual project has unique characteristics that must be addressed; however, in general, D3P for specific projects will range from $3,000-5,000 for the initial session and will be utilized to determine the next steps for assuring the result of NO Damages. The number of sessions is usually dependent upon the length and the complexity of the individual project.

In addition, the APWA Utilities and Public Right-of-Way (UPROW) Committee can take the lead in educating members and the public entities on this innovative and proven approach to damage prevention of all facilities within public rights-of-way. Preparing a presentation for a Click, Listen & Learn will depend upon the desires and support provided by APWA and the UPROW Committee. A completed presentation and product ready for presentation by CLL should be achievable within six months from agreement to proceed.

Hoyt G. Lowder can be reached at (813) 690-0738 or hoyt@hgbsolutions.com.

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A bridge of firsts and lasts

Los Angeles’s high-profile Sixth Street Viaduct Replacement Project is making history in more ways than one

Gary Lee Moore, P.E., ENV SP
City Engineer
City of Los Angeles, California

Before demolition began in February 2016, Los Angeles’s iconic Sixth Street Viaduct stretched more than 3,500 feet over a river, seventeen sets of railroad tracks, a major downtown freeway and an industrial area lined with dozens of warehouses and businesses. Not only was the viaduct a critical link between our city’s booming Downtown Arts District and the historic Boyle Heights community, it has long been one of the most recognizable bridges in the world and one of the most beloved structures in Los Angeles.
Often used to represent our city’s more gritty side in countless movies, videos and television, the viaduct is best known as the double-arched structure seen looming above cars racing along the concrete channel of the LA River.

Sadly, the 84-year-old structure suffers from a type of concrete “cancer” known as Alkali Silica Reaction. Although numerous attempts were made to strengthen and repair the structure, a 2004 seismic vulnerability study determined the viaduct needed to come down.

Los Angeles, like most cities across the country, is facing the challenge and cost of replacing infrastructure, as America’s highways crumble, sewage systems crack and bridges exceed their design life. Although part of that aging infrastructure, the Sixth Street Viaduct Replacement Project is unique in countless ways and has brought our department, the City of Los Angeles’ Bureau of Engineering, challenges—and opportunities—we’ve never faced before.

Our first hurdle came when historians challenged the need to take down the viaduct. As a historic structure, built in 1932, there was a large contingent of Angelenos who wanted to save the viaduct. After months of pushback from the general public and elected officials, we convened a national panel of structural experts to render an opinion on the viaduct’s viability. Their determination matched ours; the viaduct could not be saved.

Once there was consensus that the viaduct needed to be replaced, we needed to determine what would replace the beloved icon. There were many stakeholders who wanted us to simply replicate the viaduct. If we needed to remove it, their thinking was, we should replace it with the exact same design. The debate throughout the city on what the new viaduct should look like continued for months.

At the end of the day, however, we knew the replacement of the viaduct provided a much more significant opportunity than just duplicating the original bridge design.

We would build a new icon for our city, the largest bridge project in the history of Los Angeles.

In 2012, the Bureau of Engineering held an international design competition seeking a concept that would capture the imagination of the city and the world. After significant deliberation and input from a collaboration of stakeholders, elected officials, community members and a design advisory committee, engineering firm HNTB and architect Michael Maltzan’s design—The Ribbon of Light—were chosen. Skanska Stacey and Witbeck were chosen as our contractor.

The design is unlike anything seen before in Los Angeles. Echoing the original structure’s pair of distinctive steel arches, the new viaduct will have ten pairs of LED-illuminated arches that stretch the entire length of the viaduct. The dramatic, energy-efficient nighttime effect eliminates streetlight poles, accentuates the canted arches and lowers light pollution. The design has sidewalks and bike lanes on both sides and stairs from the ground level up to the viaduct. Below the structure, there will be 11 acres of open and recreational space, including an Art Park, with enhanced connectivity to the soon-to-be revitalized LA River.

With the political and emotional battle receding, our team now had to decide the best way to construct the $445 million viaduct. The Bureau of Engineering secured 13 funding sources, drawing from the Federal Highway Administration’s (FHWA) Highway Bridge Rehabilitation and Replacement Program, California Proposition 1B bonds and a variety of city funds. Federal and state funding represents over 90 percent of total project costs and is managed by the California Department of Transportation (Caltrans).

But how would we build it? As owner of the project, we needed a delivery method that allowed us to replace the viaduct as quickly as possible, while also enabling us to work through the constructability and cost of the many unique and state-of-the-art design features.
Utilizing the more traditional Design-Bid-Build method, we would have completed the design of the viaduct before bringing on a contractor. The designer would have been required to make assumptions about the contractor’s preferred means and methods of constructing this one-of-a-kind structure. In addition, all permits, approvals, and real estate acquisitions would need to be completed prior to beginning any phase of construction. This could have added up to two additional years to the project.

Or we could use the Construction Manager/General Contractor (CMGC) method, where the project owner hires a contractor to provide feedback during the design phase before the start of construction. Although our department had never used CMGC before, and it had only been rarely used for city projects, we felt CMGC was the best option.

The new viaduct design includes many engineering firsts. The arches use a concrete network tied design that will be built monolithically with Y-Bents. This is the first time in the world this has been done in a high seismic area. Using sliding seismic isolation bearings mid-height in columns is also new in the U.S. The nine-degree cant of the concrete arches is also an industry first. CMGC allows us to solve constructability problems on these groundbreaking features as design plans are being developed.

We are also using the Envision™ sustainable infrastructure rating system, another first for bridges in California. Envision encourages sustainability and resource efficiency and our goal is to achieve a Platinum rating, the highest awarded.

With all these groundbreaking features and the urgency to complete a major highway that carries 20,000 cars each day crossing in and out of downtown Los Angeles, we believe CMGC is giving us the ability to complete the project on time and within budget. For example, we will still be demolishing the viaduct on one end, while we begin construction of the new viaduct on the other.

At the same time, designing a structure of this size as you are preparing to build it also presents numerous challenges. So to ensure input and agreement on each step, I lead meetings each month that include the designer and contractor, as well as our funding and City partners, including Caltrans, the Federal Highway Administration (FHWA), elected officials and many others. These meetings allow our partners to provide continuous feedback, not just on constructability,
but on pricing, estimates and schedule, as well.

We are not the only ones new to this way of building a bridge. FHWA has never funded a project in California using this method. This means that, together, we are literally “writing the book” as we go through the process, along with providing lessons learned and valuable feedback that will help FHWA develop policies and procedures for future projects that use the CMGC process.

The Sixth Street Viaduct Replacement Project is breaking ground in many ways here in Los Angeles.

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Second Chances: Workforce reentry through structured employment

Eric B. Pethtel, CPM, PWLF
Director of Public Works
City of Fishers, Indiana
Vice President and Delegate, APWA Indiana Chapter

Is your agency still feeling the effects of the Housing Recession of 2008?

You may recall that in January 2010, at the peak of the recession, the national unemployment rate reached 9.7 percent. In Hamilton County, Indiana, it wasn’t quite as bad and only reached 7.6 percent.

It is quite possible that many of you experienced the same phenomenon our department did—which is, to witness record numbers of applicants for job opportunities. In fact, for the Fishers Department of Public Works, the number of applicants was off the charts. We actually had attorneys, CPAs, engineers and other professions represented in our seasonal snowplowing staff.

Fast forward to January 2016, you will find the national unemployment rate is down to 4.9 percent and in Hamilton County, it is at 3.5 percent. To say we are having a hard time getting candidates in the door looking for employment is an understatement. We went as far as to retune our job postings so they were more attractive. We created informative videos that show the impact public works has in our community and the benefits of being part of our team and we increased our social media presence. Unfortunately, these efforts were met with marginal success.

Let’s take a look back to the summer of 2015, which is the genesis of this story.

Fishers Mayor Scott Fadness was considering ideas on how best to address the growing mental health concerns facing our community. Partnering with our local public safety agencies, our mayor also brought together the local medical profession and the faith-based community to have frank discussions on community challenges. Concerns such as depression, suicide, anxiety, and drug and alcohol addictions were at the forefront of their conversations. As they all started to take a deep dive into these concerns, there was one mental health aspect that wasn’t being talked about. At some point, a unique idea came up. After discussion, it was decided to reach out to an untapped source for potentially motivated employees to create the Fishers RISE Program.

RISE stands for Reentry Initiative through Structured Employment. The City of Fishers tapped into the transitioning workforce of Hamilton County by creating a program with a mission to recruit, assist and equip the members of this transitioning workforce in their effort to reestablish themselves as productive members of society.

If the program is successful, it would aid on two fronts: it would help us get motivated employees in the door who are willing to work, and more importantly, it would help in the rehabilitation process of citizens who made bad choices, had a debt to pay to society and as felons, are now facing the challenges of finding meaningful employment.

There are many reasons why a transitioning workforce program makes sense to society. Chief among the reasons is recidivism. If you are like me, when you see that word, you are asking yourself what it means. Webster’s tell us it is “The tendency to relapse into a previous condition or mode of behavior; especially relapse into criminal behavior.”

There are scientific studies that reveal there are two by-products of employment post-incarceration:

<table>
<thead>
<tr>
<th>Education at Release</th>
<th>Return Rate/Employment</th>
<th>Return rate/ No Employment</th>
</tr>
</thead>
<tbody>
<tr>
<td>College</td>
<td>17.3%</td>
<td>26.3%</td>
</tr>
<tr>
<td>GED/HS Diploma</td>
<td>23.3%</td>
<td>38.4%</td>
</tr>
<tr>
<td>Below GED</td>
<td>28.5%</td>
<td>44.7%</td>
</tr>
</tbody>
</table>

Source: Hamilton County Community Corrections
As the level of education increases, the likelihood of a past offender gaining employment increases.

As employment increases, recidivism decreases.

A transitioning workforce program could improve, but will never completely eliminate recidivism. If one considers what it costs to house an offender, this information alone could be enough motivation to consider a transitioning workforce program for your agency.

In December 2014, Indiana had 25,269 adult offenders in 23 facilities.

Each institution receives $54.28 per diem per day for each person.

Indiana taxpayers fund $1,371,601 per day to house our prison population.

Who understands how a program like this could help the community more than someone who is involved in the criminal justice system every day? Judge Steve Nation, a Superior Court Judge in Hamilton County, sees the possibilities.

“Counties throughout the state of Indiana, including Hamilton County, are all faced with the issue of growing jail populations. The reality is that the majority of the people who are now serving time in our county jails are under 25 years of age, are alleged to or have committed crimes involving substance abuse, alcohol or property crimes, have dropped out of high school and will be released back to our communities after serving only short sentences,” said Judge Nation.

“We have found that incarceration alone does not deter the individuals now serving time in our county jails from committing future crimes,” he added.

Set aside the fact that we are talking about an untapped workforce, one which would help us with our daily responsibilities. This information was also symbolic in that it paved the way for a policy decision for our department that no longer would we ignore a known opportunity to aid in the rehabilitation of a fellow citizen. Once we fully understood what recidivism was and the associated costs to taxpayers, it provided the motivation to move forward.

We were unaware of any other similar program. We reached out to the Hamilton County Department of Community Corrections, which serves as an organization with options for the legal system to use when a judge sees remorse or promise in an offender. Although the offender still needs to pay
a debt to society, through experience, the judge recognizes the offender has enough redeeming qualities to show mercy and have them detained either by electronic monitoring in their personal home or within the Community Corrections facility. In either event, they are required to seek, attain and maintain employment, which is why we identified them as an untapped, motivated workforce.

If program participants do not maintain employment, they can potentially be removed from the program and if any suspended sentences exist, they could be activated and the offender is required to pay their remaining debt to society in jail or prison.

Even though we felt this was a good opportunity, just giving the offenders employment wasn’t good enough. We wanted to go the extra mile and do our best to make sure the individuals we embraced did not end up in future recidivism rates. With that in mind, we implemented monthly training regimens that are soft skills in nature.

Training sessions in the future will include basic financial management as simple as balancing a checkbook, customer service/ servant leadership training and group sessions with counselors. Additionally, participants will have the option to go through our in-house CDL license class. The opportunity to have a valid driver’s license with a CDL endorsement will go a long way to help these individuals maintain employment after they leave our program.

There is also the potential for the participant to be rewarded with full-time employment with our department if there is a position available at the time they complete the program. In the event no position is available and they were a model employee, they can receive a letter of reference from the Mayor of Fishers. This is yet another step in our efforts to help these individuals as they transition back into society.

“I applaud Mayor Scott Fadness and his Public Works staff in Fishers for creating the RISE program and for coordinating with the Hamilton County Courts and Hamilton County Community Corrections to implement this new approach,” said Judge Nation.

“This program provides not only needed services to our communities, but helps individuals acquire life and business skills, and develop career paths so that they may stay out of jail and give back to the community,” he added.

If you feel your local leaders would entertain a transitional workforce program, please consider these important steps:

- Reach out to your local law enforcement community, especially the court system. Meet with the judges to discuss the program as an option during the sentencing phase.
- Your staff will be crucial to the success of your program. Include them in the conversation as early as possible and keep them informed of your progress as you develop the program.
- Identify pro-social role models in your staff that will partner with your chosen participants and provide good instructions, words of encouragement and be an example of what a good work ethic looks like.
- In order to put your own program in a position to be successful, you need to have a firm foundation. Consider a small group of recruits during your first effort and build upon that success.
- Be sure to meet with your local police department as early as possible. Discuss your goals and include them when reviewing the history of the candidates you are considering. They will likely hesitate, but recidivism is a goal for them, too. Make this your selling point.
- Most importantly, your organization must understand that with any transitional workforce program, there is a level of acceptable risk your agency must be comfortable with before crafting a program that fits.

Good luck! Go forth and make a difference!

Eric B. Pethtel is the Director of Public Works for the City of Fishers, Ind., as well as the Vice President for the APWA Indiana Chapter. He also serves as the Chapter Delegate and is a member of the Council of Chapters’ Public Works Leadership for the Future Committee. In addition, he also works with the APWA Emergency Management Education and Training Subcommittee. He can be reached at pethtele@fishers.in.us or via Twitter at @FishersDPW or @APWA_Indiana or at (317) 595-3161.
Developing a quality sidewalk program in Fairfield, Ohio

Ben Mann, P.E.
City Engineer
City of Fairfield, Ohio

Location
The City of Fairfield is located in Butler County, Ohio, just north of Cincinnati and bordered to the south by the I-275 beltway. Fairfield is home to approximately 42,000 residents and has a working population base approaching 35,000. The community is made up of a blend of single-family and multi-family residential housing, significant commercial development, and some large industrial employers. The city’s major employers are in the insurance, pharmaceutical/health, and auto parts manufacturing industries.

Overview of our program
The city requires sidewalks for new development and has also included new sidewalk on many construction projects. The city has over 180 miles of sidewalk in the public right-of-way. By city ordinance, the responsibility for the maintenance and replacement of both driveway aprons and sidewalks is borne by the abutting property owner as part of the program. The city...
does not charge the property owners for installation or repair to handicap ramps. The street curb is also not charged to the property owners and is paid for out of the city’s capital budget.

In 1994, Fairfield began a program to inspect and require the repair of sidewalks and aprons throughout the city. This program was begun as a response to the Americans with Disabilities Act and aims to limit the liability of the city and the property owners. Over time, the emphasis has grown to include more than just safety. It is now seen as a property maintenance initiative that helps protect property values while showing the pride that the city and its residents have for where they work, live and play.

Setting up the program
The program was set up to inspect one-fourth of the city per year by area so that every area is inspected once every four years. The program is divided so that one quarter of each of the four council wards are inspected per year. This is so that no single council person has all the work done in one year, particularly if it is an election year. The program was accepted rather quickly and this has not been a particularly political issue, especially so now that the program has been established for over two decades. Initially, two part-time sidewalk inspectors were hired to handle the additional work required for this program. Clerical work and billing have been incorporated by existing staff and did not require additional employees. The number of sidewalk inspectors was eventually reduced to one part-time worker who has been able to maintain the program effectively. (See diagram on page 151.)

Inspection
Inspections are done by the city’s part-time staff in early autumn, after the previous year’s construction is completed and before the leaves fall. The inspector walks the project area scheduled for inspection and marks, logs, and photographs deficient sidewalks and drive aprons. Upon completion of the inspections for the upcoming year’s work, the data is entered into a spreadsheet and all of the corresponding billing addresses are determined for notification.

Notification
The city council passes a resolution of necessity each January to require the repair of sidewalk by the abutting property owners. In March, the property owners receive a certified letter detailing the work to be done and how much it will cost to have the work done by the city’s low bid contractor. This information is also provided in the form of a brochure and is available on our website at http://www.fairfield-city.org/publicworks/sidewalks.cfm. The letter also states that property owners have the option to repair or replace the sidewalk to city standards themselves or with their own contractor. Historically, about 10 percent of the sidewalk ends up being contracted or performed by the property owner. The property owner is required to have a city inspection for sidewalks and drive aprons. There is no fee for the sidewalk inspection and a nominal fee for the apron inspections.

Providing options
The city has allowed repairs such as patching of holes but does not allow leveling materials to repair trip hazards. In 2013, the city did a test project using concrete cutting as a method of repair within city parks and on other city properties. The project was well received, so in 2014 the city began marking the sidewalks for cutting or replacement based on the...
judgement of city staff. The city makes the determination and marks the sidewalk with an “x” for replacement or a line across the edge to be cut. The cuts can be done for less than half of the cost of replacement. The cuts take twenty to thirty minutes with almost no disturbance to the surrounding area. Reaction to our providing this option has been very positive because it saves the residents money and is much safer and more convenient than the more time-intensive process of tearing out, forming, pouring, and restoring the concrete.

**Paying for the program**

After the quantities have been determined for the upcoming year, the concrete replacement contract for the sidewalk and apron program is bid with a second- and third-year option. The bids include four-inch-thick sidewalk, seven-inch residential aprons, and nine-inch commercial aprons as well as curb ramps and miscellaneous curb. Past bid results can be found at http://www.fairfield-city.org/finance/pastbids.cfm. The project contractor is paid by the city from the general fund and the property owner is not billed until the following January. A second notice is sent later in the spring to those who have not yet paid. If the property owners are unable to pay by the end of July, the amount owed is added to the tax bill for the property. The balance can be spread over five years to make it more affordable for property owners without the means to pay the entire bill at once. There is a four percent interest fee charged by the city and a three percent handling fee added by the county.

**Coordinating construction**

The addition of the cutting method option has added a second contractor and another contract for the city to manage and coordinate. The cutting contractor for the city is currently Precision Concrete’s Cincinnati area office. The nature of these two separate operations has allowed both contractors to be working at the same time in adjacent areas.

**Final thoughts**

The City of Fairfield is committed to maintaining a quality standard of living and takes pride in the community. Implementing and operating a successful sidewalk program is important for keeping those who spend their time in Fairfield connected and safe.

*Ben Mann can be reached at (513) 867-4213 or bmann@fairfield-city.org.*
We all know it takes work to maintain our infrastructure. The things we build in public works require care and upkeep. This includes the skills we need in our organizations to perform infrastructure maintenance. Just like that roadway, bridge or water main, if we don’t maintain these skills they too will decay. Each year, day by day, a little bit at a time.

When it comes to building infrastructure, we value competency and professionalism. We build infrastructure through plans developed by licensed engineers and from work qualities defined by written specifications. The building process is formal. Laws and code regulations often set standards for how infrastructure will be built. We take pride in building something new and want it to be the best that it can be. The process encourages our infrastructure to be competently built and by skilled people.

Once built, however, it is all too easy for our values on skill and competency to change. Maintenance needs on that new capital investment soon become a drain on an already stagnant operating budget. The system pushes us to do more with less and before you know it, we’ve unwittingly transitioned from skilled maintenance to rudimentary patch-it-together routines. The danger is that this happens over time; it’s incremental.

The same values for skill and competency that helped build our infrastructure should be the values we use to maintain it. This does not mean that we need to develop engineered plans and specifications for every pothole repair. It simply suggests that we value professionalism in our maintenance work by making sure we maintain our maintenance skills. We start by instilling respect for the work and the folks who do it. The effort can be subtle, sometimes just a matter of how we refer to it and the standards we expect. Is filling a pothole a skilled task requiring competency and professionalism or is it simply throwing asphalt goo into a hole? Throwing asphalt goo into a hole certainly doesn’t seem like a task needing a training program or skilled staff performing it. On the other hand, filling a pothole does involve traffic control, interaction with citizens, use of specialized equipment, knowledge of asphalt materials and job safety. Who wouldn’t want professionalism and competency to be a part of this type of street maintenance work?

A big step in maintaining your maintenance skills is deciding what is important for your organization. What skills do you want your organization to have and your staff to have? One approach is to break down your operation into its core business lines. Are there core maintenance skills that are critical to keeping the operation running? If so, those are probably the maintenance skills you need and might want to consider for your staff to have. Don’t be afraid to build a skill if you find you don’t have it. Professional sports programs routinely build their team; recruiting and training new players for a future championship win. Public Works organizations are no different. If you’re looking for a topnotch maintenance crew, you may have to similarly build your team or an individual’s skill to achieve the future goal. Outsourcing a needed skill can be cost effective when you’re starting from scratch or find yourself struggling to develop it internally. Just make sure the outsourced firm can reliably maintain their own skills, particularly if your operation depends on it.

And don’t forget redundancy! Succession planning is also a big part of maintaining skill. If you only have one expert and no one working with them, who do they train? You are not maintaining your skill if you don’t have a means of passing the torch. If your organization has established apprenticeship programs or is large enough to have multiple people assigned to own a skill, great. If not, perhaps an informal mentoring program might help. Identify someone interested in learning the skill and allow them to help out on jobs where the skill is practiced. Even if you can only allow them to observe the work, at least they are being exposed to it and learning something along the way.
Value your maintenance programs and your maintenance skill by professionalizing your maintenance procedures; dot the i’s and cross the t’s on all that you do. Maintenance work is ripe for developing into ad-hoc procedures, then bad work habits and eventually poor skills. Be diligent in emphasizing professionalism and competency. The added work to follow a standard or be technically correct in how a task is performed is an investment into building and maintaining a skill. Make sure to give ownership to those you’ve assigned to have a skill. Let them own and be accountable for the work that will help them build and maintain their competency. Support skill development by providing the right tools and challenging work. You can’t build the skill if you don’t provide the opportunity to do the work or use the tools. Even if you already have the skill in your organization, it must be maintained by regular practice. If you want cement finishing skills, for example, be prepared to fund a concrete repair program, one large enough to provide ample practice and sufficient challenges.

Maintaining your maintenance skill also means investing in training. Training can be internal mentoring, on-the-job practice, or external class instruction. Whatever the format, be sure to formalize your programs. Certify the results so they are consistent. You can do this by combining class instruction, a period of on-the-job practice, and quantitative testing. Offering skill certifications not only affirms the skill level you may think you have, but they can also instill a sense of professionalism and competency. I often see certificates and licenses proudly displayed by those who have earned them. Just look at any fleet maintenance shop—if they have earned their ASE (Automotive Service Excellence) certificate then chances are it’s on a wall somewhere.

We all know that our infrastructure won’t last long if we don’t take the time to skillfully maintain it. The same holds true of our maintenance skill. Without a bit of its own maintenance once in a while, it too won’t last long; then where will we be?

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Traveling in new directions: Proactively addressing future transportation needs

Andrew Singelakis, AICP
Director
Washington County Department of Land Use & Transportation
Hillsboro, Oregon

Our story is a familiar one: Large residential developments are coming online, and the additional vehicle traffic they will generate is more than existing roads can handle. What are now winding, rural roads with minimal traffic are about to suddenly turn into heavily-travelled arterials that have neighbors, commuters, pedestrians, freight, bicyclists and elected officials demanding solutions.

Here in Washington County, Ore., we have four large residential planning areas slated for development simultaneously in the next 20 years in three cities and in the urban unincorporated communities. These areas are expected to generate about 18,000 homes and add thousands of vehicles to aging roads that were not built to accommodate high traffic volumes. We wanted to be proactive by improving connecting roads as development occurs—rather than trying to play catch-up. But like most local governments, we didn’t have an estimated $140 million to fund the necessary road improvements.

Washington County is lucky in that we have a capital funding program known as MSTIP—short for Major Streets Transportation Improvement Program. MSTIP is used to improve existing roads and is supported by local property taxes. We also have a Transportation Development Tax (TDT) which is paid by developers to offset the cost of capital improvements to support growth. But if we used MSTIP and TDT revenue to pay the $140 million price tag for these improvements, those funds would be depleted and other high-priority traffic improvements would be sacrificed.

We needed to get creative. We started with the two basic strategies—funding...
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The key to the funding partnerships was a “fair share” formula to equitably divide the $140 million cost of the road improvements. Travel forecasting estimates indicated that one-third of the travelers using the improved roads will result from the new developments, most of which are located in cities. The remaining two-thirds will be “regional travel”—trips that begin and end outside the new developments. As a result, the cities are paying one-third and Washington County is paying the remaining two-thirds.

Our two-thirds portion equals $93 million. We opted to issue bonds by leveraging the annual incremental revenue growth in assessed valuation from the MSTIP fund to pay them off. This will preserve the MSTIP balance for other high-priority road projects. Our funding partners may use other development-based revenue to fund their $47 million portion.

The Bonding Cost-sharing Program has been in place for about a year. We have identified 20 road projects that will be funded/constructed through the program within the next 10 years. The first seven projects are already in design. The funding/construction schedule is mirroring the anticipated schedule for development of the high-growth areas. When vehicles travel to and from these future developments, the roads they travel on will have wide lanes, bicycle and pedestrian facilities and other safety improvements.

Andrew Singelakis, AICP, is the Director of the Department of Land Use & Transportation of Washington County, Oregon, which is located in the Portland metro area. It has a population of about 570,000 and covers about 700 square miles. Andrew can be reached at (503) 846-3823 or andrew_singelakis@co.washington.or.us.

www.apwa.net / August 2016 / APWA Reporter 157
Using data to drive innovation in environmental services

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The Regional Municipality of York, Newmarket, Ontario

Like many organizations, municipalities collect massive amounts of data every day. As processes become automated and the Internet of Things reaches deeper into business process design, municipalities will find themselves buried under what seems to be insurmountable volumes of data.

The Regional Municipality of York continuously investigates new techniques to use data to make sound business decisions. The Environmental Services Department is one of the largest generators of data in the Region, collecting 23,000 pieces of data per minute and more than 12 billion per year. Traditionally, we have used data to tell what has happened, not predict what is going to happen. At York Region, this is beginning to change.

In an effort to shift to a more future-focused and proactive approach, York Region has partnered with York University’s Schulich School of Business to complete two predictive analytics projects. Predictive analytics involves using several techniques from data mining, statistics and modelling to analyze current data and make predictions about the future. Through this approach, trends can be forecasted, scenarios can be simulated and compared for optimized results, and correlations can be identified quickly. The end goal is to develop insights into operations that can be better quantified and measured to effectively deliver services.

Since the completion of the Region’s first pilot project at one wastewater pumping facility in May 2015, minor operational changes have been implemented resulting in an estimated energy savings of approximately 15 percent per year.

The graph at left illustrates the actual energy use compared to the projected energy use had operational optimization changes not been implemented.

Following the success of the pilot, a second project was initiated at another wastewater pumping facility in Aurora, Ontario. Using the same application of predictive analytics, even greater savings are expected once fully implemented.

York Region continues to seek opportunities to leverage our data and data analytics techniques to effectively...
achieve operational excellence, regulatory monitoring and to make the best business decisions possible for delivering services to residents.

York Region is considering other areas where predictive analytics can benefit business decisions. Some potential opportunities include using data from internal staff to further increase employee engagement and influence recruitment strategies and expanding the scope of successful operational optimization projects to additional facilities.

In addition to embarking on new projects, York Region is beginning to build in-house business analytics capabilities in order to achieve sustainability with this approach. This means aligning existing processes to allow for readily available and validated data and investing in analytics infrastructure and in-house analytics expertise. Predictive analytics is not as simple as purchasing off-the-shelf technology or software products. It requires specific skills, knowledge and curiosity.

York Region has already taken a number of steps to prepare for this shift by ensuring operational data is properly stored, validated and available when needed. This is being achieved through an internal data validation team that has been working collaboratively to refine existing processes and ensure there is one version of validated data available for all stakeholders. This approach used a “Community of Interest” model to increase skills and decision-making amongst staff using data in their day-to-day work.

“We are very excited about the infinite possibilities for our organization and the residents of York Region,” said Erin Mahoney, Commissioner of Environmental Services. “The validation team has already been able to make better informed business decisions through this innovative approach and this is really just the beginning.”

Working collaboratively with the Region’s Geographic Information Services Branch, the validation team has helped update the York Online Data Access catalogue with a total of five Environmental Services datasets. The information available to staff and the public through this open data initiative include:

1. Solid Waste Sites
2. Regional Forest Boundaries
3. Broader Public Sector Energy Reporting 397-11
4. Current Environmental Assessment
5. York Region Waste Diversion Statistics
6. Annual Greenhouse Gas Emissions

Visit York Region’s website at york.ca and search “Statistics and Data” for more information and to access data that is already available to the public.

Data analytics is an essential skill that needs to be integrated into frontline analysis and decision making; it has to be as pervasive as word processing and spreadsheets for organizations to truly reap the benefits of evidence-based decision making.

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Wastewater pump at York Region’s Newmarket Sewage Pumping Station. This sewage pumping station transmits wastewater through the York Durham sewage system to be treated at the Duffin Creek Water Pollution Control Plant.
Local Funding: “Where the rubber meets the road” in transportation revenue generation

Ellie Payne
President
Show Your Story Media, LLC
Johns Island, South Carolina

How did a sprawling Southern community in South Carolina keep its citizens working while other communities slipped into recession? They built roads! As of March 2016, $395.5 million worth of infrastructure projects were completed in a state with the third lowest gas tax in the nation. A local option sales tax levied over a decade ago in Charleston County set the stage for progress that was sustained even when state revenues were low and other counties suffered a steep decline in industry growth. The Great Recession had a calamitous effect on the deterioration of American highways and has fueled an ongoing funding battle. Could a locally funded program like the Transportation Sales Tax in Charleston County be the key for other mid-size counties struggling to fund infrastructure? The long-term, “customer”-centered approach might just be where the rubber meets the road in fixing America’s main streets.

Build the roads, jobs will come
Home to big players in both the auto and airplane industries, Charleston County boasts the lowest unemployment rate in the state, according to the SC Department of Employment and Workforce. It comprises three of the state’s four largest cites: Charleston, North Charleston, and Mt. Pleasant, as well as 13 other municipalities. Major projects across the county like Johnnie Dodds Boulevard, the Arthur Ravenel Bridge, and the Palmetto Commerce Parkway attracted significant employers like Boeing and Daimler Vans. Mt. Pleasant is connected to the Charleston peninsula by the Arthur Ravenel Bridge. This fixed-spanned, eight-lane bridge flows directly into beautiful Johnnie Dodds Boulevard in Mt. Pleasant. “Johnnie Dodds is more than just a highway, it’s our corridor,” comments Mt. Pleasant Town Councilman Paul Gawrych, who serves on the Transportation Committee. He explains that not only did the road create a center of town for Mt. Pleasant, but at the time of conception, was the poster project of the referendum and would be on the ballot right before the opening of the new Ravenel Bridge. Timing was everything. Located northwest...
of Johnnie Dodds Boulevard, North Charleston’s Palmetto Commerce Parkway was built to “accommodate intra-regional travel” and “provide better distribution of traffic in the area,” according to Charleston County. The new road was completed in less than seven years, just in time for aerospace giant Boeing to open the doors to its new 1.2-million-square-foot 787 Assembly building. North Charleston Mayor Keith Summey was one of the major proponents of the sales tax program in 2004 and believes the Palmetto Commerce Parkway has encouraged a tremendous job hub in the city. “With vast tracts of land along the roadway for additional economic development and its close proximity to the Port of Charleston and major interstates, Palmetto Commerce is perfectly positioned to be a draw for major companies for years to come,” Mayor Summey said.

The sales tax has done far more than just address commutes for daily drivers. It has kept the community alive. But exactly how did it come to fruition?

Precise presentation key for the ballot
On a drizzly day in 2004, the mayors of Charleston, North Charleston and Mt. Pleasant stood on the side of the road holding signs and handing out pennies in support of the half-cent sales tax. The program was sold as Small Change for Big Change; a path to a better way of life. Eleven years later, the Charleston Metro Chamber of Commerce reported that taxpayers saw a $1.97 return for every dollar raised by the sales tax. From this vantage point, the passing of the original referendum was a no-brainer, but the public had to be won. A key feature, the 25-year tax collection term, made many wary. Jim Armstrong is the Deputy County Administrator for Transportation and Public Works in Charleston County and has been with the program since its inception. “These projects ranged in cost from about $3 million to upwards of $80 million. I think the key element of our successful sales tax referendum in 2004 [was that] we clearly laid out the most important projects that would be constructed,” recalls Armstrong. These were big projects that showed immediate gridlock problems, and had been in the forefront of commuters and leaders’ minds for quite some time. Gawrych says that putting Johnnie Dodds up front was a marketing strategy that worked. “Everyone in the county got to watch it come to fruition and now everyone is talking about how it’s a model road in the county and the state,” he said. Further, by packaging transportation projects with other public issues, the deal was sealed with voters. Three quarters of the money
was to go to roads, but the remaining went to greenspace and mass transit.

Extended collection means more money up front
Considered to be one of the most important features of the Charleston County Transportation Sales Tax Program, the ability for the county to collect the tax over a term longer than the typical seven or eight years made all the difference. The 25-year term allowed more money to be available up front through bonding efforts and matching funds. Plus, by beginning several large-scale projects immediately, the county could take advantage of lower interest rates and hedge inflated construction costs. From there, the projects would follow customized schedules based on public input and development specifications. This efficient project management of numerous ongoing improvements saved tremendous time and cost overall. The locally funded Johnnie Dodds project mentioned earlier was technically on the state system, but not a high priority on the state DOT’s to-do list. In Armstrong’s estimation, a project like this would have taken about eight years just to get through preconstruction if managed completely by the state, but the county completed the project in less than six. Plus, the $84 million bill was completely paid for through the sales tax program. In fact, a majority of the projects funded fully or in part through the Transportation Sales Tax are on the state system which requires approval from state DOT. It took some time to realize that working with the state DOT throughout planning and construction could accelerate project timelines even more. “I think it is important for any local government passing a transportation referendum to be significant partners with the department of transportation,” reflects Armstrong. “That doesn’t mean to just turn everything over, but it is imperative to have a clear understanding of what’s to be accomplished.”

While specificity was essential, an element of flexibility is also required and built in to this program. That’s where the allocation project funds come into play. While 37% of the roads budget goes to the big ticket items, $10.5 million is set aside and earmarked annually for smaller road projects. This is manifested by a constant and open dialogue with communities and councils of government within the county. These are local paving projects, drainage and intersection improvements, bike and pedestrian enhancements—things that can be managed in-house. “Continuing forward with the implementation and build-out of the funded infrastructure, dialogue has remained open to ensure success of the program,” says Mayor Summey. “Overall, this has ensured not only timely completion but full transparency, a vital element to all programs utilizing taxpayer monies.”

Armstrong recalls that even from day one the program was treated as a customer service type of business. “Once the sales tax was approved the very first order of business was to hold five public meetings to elicit input from the public,” he said. Everyone gets a seat at the table and the County

Marshfield Subdivision Connector, completed 2009; example of allocation funded project. Before (left) and after (right)
pides itself on the measures taken to publicize upcoming projects. Signs are posted throughout town, and news outlets are notified. By the beginning of February 2015, 52 heavily advertised public meetings were attended by the public generating nearly 6,000 public comments. “The smaller the government the closer it is to the people,” says Armstrong, who continues to note that many times it’s the citizen who first reports a problem. This intergovernmental cooperation supported by consistent feedback from the public has done a lot to nurture the trust of the taxpayers.

**A model for the country?**
In her May 2015 article “What It Will Take To Fix America’s Crumbling Infrastructure,” Rosabeth Moss Kanter of the Harvard Business Review wrote that “change requires an awareness of common fate—that everyone shares a piece of the suffering but can benefit from contributing to its improvements.” In December, Congress finally passed a $305 billion bill to fund federal and state infrastructure projects, but the legislation has limited long-term vision, according to the Associated Press. Evidence of a pattern seen in state capitals nationwide, South Carolina has let yet another year pass without a plan for transportation improvement funding. It’s imperative that local counties heed the call of constituents and take on even more of the burden of fixing local roads.

A long-term tax collection period supported by award-winning public outreach is the successful strategy that has awarded Charleston County much development in face of little outside help. As road wars continue to rage on across the country, the program underway in Charleston County could serve as a model for revenue generation, inspiring a grassroots solution for America’s infrastructure problem.

*This article was prepared for Charleston County Transportation Development by Ellie Payne through CHH Communications. For more information, please call (843) 202-6140.*
Pueblo levee project requires artful listening to many stakeholders

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When CTL|Thompson joined the team rehabilitating the landmark 2.8-mile-long levee along the Arkansas River in Pueblo, Colorado, the firm understood the engineering challenges inherent in a project of this size. Not anticipated, however, were the skills and techniques far beyond engineering that were required. In reality, successful completion of this project has required artful listening to the many stakeholders—including artists’ groups, city staff and elected officials, historians and the team of contractors—all facing one of the biggest challenges of their careers.

First things first: identifying funding

Constructed from 1923 through 1926, the nearly 45-foot-tall levee performed admirably over nine decades, but damage from erosion at the toe of the structure and buckling of the concrete facing of the levee began to impact the levee’s effectiveness. The Pueblo Conservancy District oversees the levee and could initiate levee repairs, A hydrologic study showed that the Pueblo, Colo., levee could be lowered. The original height and narrow top of the levee can be seen in the background (upstream). The toe of the downstream portion of the levee was found to be below the river level, so sheet piling was used to provide access for construction of the new concrete facing.
but property assessments to fund repair stopped in 1955, when tax levies paid off the bonds that financed that construction. The district had the power to reinitiate maintenance fund assessments, but a lot had changed in nearly 100 years. Many properties had new ownership, had been rezoned or had been demolished and rebuilt.

Fortunately, the district board and the design team were able to demonstrate to taxpayers the benefit to the greater good of enacting a three-tiered assessment approach that extended the boundaries from just the floodplain to all of Pueblo County. The new funding mechanism will pay for the current renovations, which will require nearly 10 years to complete, and provide for ongoing maintenance.

Ready, set, wait: limited access requires creative thinking

Just as the Pueblo Conservancy District had to get creative with funding, so the team had to use its best engineering minds to mitigate the substantial problems caused by the levee’s location and slope.

The levee is between the river and a major railroad switching yard, severely limiting access to the work area. Bridges for four major roadways—including Interstate 25—created additional conflicts, as did a residential neighborhood with homes built up to the toe of the levee. Finally, river flows restricted work activities to November through March.

Moreover, the grade of the levee face is so steep that the team could not walk or drive typical equipment up to the levee’s narrow crest (which varied from only four to eight feet in width).

The steep slope also made soil surveys difficult to administer, a problem exacerbated by the near inexistence of any historical maps or charts from the levee’s initial construction.

Fortunately, the rehabilitation team was able to procure a drilling rig that was capable of drilling to adequate depth, could be driven up the levee face, and had only a four-foot-wide track. Because it could access and move along the narrow crest of the levee without the need for a crane, the cost of operating the narrow-track rig was almost one-third of that estimated for the light-duty, crane-set rig.

Although the narrow drilling rig solved the subsurface investigation issue, the narrow width at the crest still created a major construction issue. Fortunately, NorthStar Engineering and Surveying found, through hydraulic evaluation, that the levee could be reduced in height yet still provide the required level of flood protection. Reducing the levee’s height allowed the width of the crest to be increased to 20 feet, helping to facilitate construction and lower rehabilitation costs.

In a project rife with challenges, switching yard operations were located near the landside embankment toe, so all work had to be coordinated with the railroad, and additional safety measures were required to keep the drilling crew safe. The toe of the levee was also in a restricted access zone, and, to pile on more issues, it was actually below water (the upstream end was eight feet below the active river bottom), making restoration of the toe and its concrete facing even more difficult. To counteract the issues, the team installed a sheet piling cofferdam from the river side during the first phase of the project, allowing dewatering of the toe and creating a dry working environment for full-height restoration of the concrete.

The lowered levee provided a wide access way for concrete delivery. Concrete trucks were routed up a temporary access embankment and delivered concrete to a conveyor that placed the zero-slump concrete mixture ahead of the canal paver.
facing. New concrete was placed around existing sheet piling at the toe where it existed. Where sheet piling did not exist, the toe was re-keyed into the existing substrata.

**Long history created big challenges**

Going in, the team knew that rehabilitation work would have to comply with the requirements of the Federal Emergency Management Agency (FEMA) National Flood Insurance Program, as well as the U.S. Army Corps of Engineers (USACE) Levee Safety Program.

After work had begun, however, the USACE alerted the team that the state historic preservation officer would need to approve the project. Although the levee is not on the historic registry, it has historical significance, as the means and methods used to build the original structure were considered “of the time.” To gain approval, NorthStar agreed to send regular progress updates to the USACE.

In yet another fascinating twist, the levee held the Guinness World Record for the world’s largest outdoor mural, created by contributions from thousands of artists over four decades. When the local artist community learned that some of its work would be destroyed by repairs, its members were understandably upset.

In moving forward on this engineering project, the team has held ongoing meetings with the artist community to understand the community’s concerns and try to find a reasonable solution. Artful listening led to a creative solution. Artists can now safely access the site and are already designing new works of art to beautify the community.

**A coordinated team paves the way to a smooth project**

The renovation will require nearly 10 years to complete. NorthStar Engineering and Surveying was retained in 2012 to assess the scope of the project, which included engineering solutions and establishing a funding mechanism for the repairs. CTL|Thompson joined the project in 2013, during the preliminary design phase, and construction began in November 2014. An estimated three more phases remain, encompassing three to four more years. While the design and construction team still has years of work ahead, it attributes initial success to more than just sound engineering expertise. By communicating early and often and identifying areas of collaboration and cooperation, the team has overcome great obstacles that will inform future projects for years to come.

**Bill Hoffmann** is Vice President and Senior Principal Engineer at CTL|Thompson, a full-service geotechnical, structural, environmental and materials engineering firm. Established in 1971, the firm currently employs 200 technical and non-technical employees and provides expertise in small and large-scale projects in all areas of construction. Bill can be reached at (719) 528-8300 or whoffmann@ctlthompson.com.

The river side of the levee in Pueblo, Colo., included a large mural produced by multiple artists. The levee was evaluated with the aid of borings taken with a narrow-track drilling rig (center).
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Most municipalities look to consultants after a safety inspector has found gaps in its safety programs or trainings. Gaps can lead to citations, fines and unsafe working conditions. What most municipalities fail to realize is that truly effective safety programming and training must be customized to meet the specific needs of the workplace. There is no “one-size-fits-all” solution when it comes to safety, and municipalities should avoid using a boilerplate approach when conducting such activities.

**Hard facts**

**Studies show that for every $1 invested in injury prevention, the return on investment runs between $2 and $6** ([http://www.safetyandhealthmagazine.com/articles/10414-the-roi-of-safety](http://www.safetyandhealthmagazine.com/articles/10414-the-roi-of-safety)). Clearly, there is a financial case for better safety, but the more important reason is to protect employees from injury or possibly death. Having a customized program provides the employees the best possible information to protect their health and safety. The addition of profit savings is icing on the cake, but many times is at the core of the decision-making process. As evidenced with the statistics provided in the URL above, if the focus stays on the implementation of a focused, specific and custom plan, the financial benefits will follow.

### What can be done?

**Avoid solely relying on safety manuals.** Some websites advertise “safety manuals” and refer to them as “safety programs.” Companies claim their manuals meet the minimum Occupational Safety and Health Administration (OSHA) requirements, but they are certainly not safety programs. A safety program includes training, tracking and specific instruction for a facility.

The issue with relying on a basic safety manual is it only answers the question of what to do or not to do. A manual doesn’t create the kind of atmosphere and culture in an organization which reduces accidents. A customized manual starts by providing awareness to the individuals on why safety is important. The steps that will lead to a truly safety-conscious culture are creating consistency, customized instruction, and reinforcement, and incentive to do the right thing when presented with safety decisions. A truly customized program can take an organization to the next level, providing both training and support to improve the overall safety culture.

**Take the proper time and due diligence.** For safety programs, it’s common for consultants to discover simple errors that are typically made when rushing to complete a program. Simple errors can result in violations. For example, when developing a safety program, make sure all portions of the program are complete. Cross-reference to make sure you are correctly identifying all the specifics of the program and don’t leave any spaces blank. Simple errors can indicate to the inspector that the program was not given the proper time and attentiveness, rendering it ineffective.

**Be specific.** Be sure the content in safety programs and trainings is tailored to your specific workplace. Year after year the Control of Hazardous Energy (1910.147 Lockout Tagout – LO/TO) standard makes the top ten most-cited OSHA regulation. Why? In most cases it is because there are no specific...
procedures written for the equipment. Oftentimes, municipalities have programs that state “we will follow all LO/TO procedures as outlined in the regulations,” but when asked to be shown (for example) “the procedure on how to lockout that conveyor belt,” the response given is: “we don’t have that.”

The first step to writing a solid LO/TO procedure is to reach out to the staff member who knows the equipment best. Although not a daily user of the equipment, the most knowledgeable person usually resides in the maintenance department. They have a much better knowledge of the inner workings and dangers associated with the equipment. Using the maintenance department accomplishes two tasks: gathering staff input and ensuring accuracy.

The next step includes listing the type of energy source (i.e., electrical, hydraulic, pneumatic etc.), magnitude (i.e., volts, psi etc.), whether there is a potential for stored energy, the location of these energy sources (i.e., panel 2B on west wall), and method on how to de-energize the equipment.

Once the above information is gathered, the procedure should be written and verified through actual implementation. After testing, if it creates a zero energy state, the procedure is complete and the organization can proceed with documenting the procedure for the next piece of equipment until all procedures are written.

Although pictures of the energy source location are not necessary, they provide a visual element which assists in identification. Additionally, more municipalities are laminating procedures and placing them on the machine, providing this key information in the easiest and most accessible location.

**Do not conduct general trainings, but rather incorporate as many specific details as possible.** Below are tips on how to conduct a well-received and informed educational learning experience:

- Keep it concise and to the point. Let’s face it, safety is not a topic that generates a lot of excitement from employees, so keep the training session on task.
- Make sure all employees are aware of the program coordinator and the exact location of the LO/TO equipment.
- List the actual names of the employees authorized to use the equipment and those affected.
- Review group LO/TO and shift change procedures.
- Practice specific procedures. Break the session up into small groups and have all trainees perform LO/TO on at least one piece of equipment. This requires the employees to use equipment and ensures the procedures are being reviewed. Practicing the procedures also provides an opportunity to ask questions.

- Draw on participants’ own experiences. Nothing keeps a training session more entertaining than talking about near misses.

The above LO/TO example can be followed for every safety issue in any public works facility. Other opportunities included in a comprehensive customized safety plan may include confined spaces, forklift safety and construction site safety. Taking the time to develop site-specific programs and trainings will pay off. The results include cost savings, reduced citations, employee buy-in and, most importantly, a safer workplace.

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Interlocking concrete pavement as an alternative to asphalt concrete for Howard Road, Westley, California

Matt Machado, P.E., LS, MBA, Public Works Director, Stanislaus County, California; Ron Illium, P.E., Regional Engineer, Basalite Concrete Products, LLC, Dixon, California

The implementation of interlocking concrete pavement in heavily loaded applications has gained significant popularity in recent years. From 1993 to 2008, the Port of Oakland completed eight berths with over 6.5 million square feet of concrete pavers for container handling and storage areas. In 2014 Stanislaus County used 170,000 sf of interlocking concrete pavement to replace poorly-performing asphalt on Howard Road in Westley, California. This article provides background to this solution which has broad appeal and decades of applications around the world. This is evidenced by the fact that over three billion square feet are installed annually in Europe for pedestrian, municipal, industrial and port applications.

Background
An early version of interlocking concrete pavement dates back to the Roman Empire when The Appian Way was built from stone paving on an aggregate base in 312 B.C. Used as a main route for military supplies, it connected Rome to Brindisi, Apulia, in southeast Italy. The road is 350 miles long, about 20 feet wide, and has held up for more than 2,000 years. The entire ancient Roman road system servicing their empire was longer than the interstate highway system in the U.S.

Pavement characteristics
The interlocking concrete pavement system offers the advantages of the high compressive strength of concrete and the flexibility of asphalt pavement. The pavers are attractive and provide a traffic calming effect. Research in the United States and overseas has shown that the combined paver and sand layers stiffen or interlock as they are exposed to greater numbers of traffic loads. The resulting resilient modulus is equivalent to the same thickness of asphalt. In other words, the 3.125 inch (80mm) thick pavers and one-inch thick bedding sand have an AASHTO layer coefficient equivalent to the same thickness of asphalt.

Ripon experience
As City Engineer with the City of Ripon, Matt Machado developed interlocking concrete pavement as a roadway standard, adopted by City Council for all new roads and for some pavement rehabilitations. With the standard in place the City constructed more than 1.3 million square feet between 2005 and 2008. This total included the high-profile Main Street in historic downtown Ripon with 50,000 sf of interlocking concrete pavement.

Based on a life-cycle cost analysis for Ripon, Calif. streets, concrete pavers are approximately 75% of the cost of asphalt concrete over a 100-year period. Maintenance costs for concrete pavers for the same period are approximately 20% the cost of asphalt.
Concrete. Heavier loaded interlocking concrete pavement streets can have a lower life-cycle cost and shorter return on investment as maintenance is generally higher for roads paved with asphalt concrete.

**Howard Road in Westley, California**
Located in Westley, Calif. at exit 441 on I-5, Howard Road handles a tremendous amount of heavy truck traffic. The Stanislaus Public Works Department was faced with the challenge of designing a long-term, economical pavement solution for the frontage road. Given that the asphalt pavement had failed, the County looked at interlocking concrete pavers as the innovative solution.

**In-house design**
Given design parameters of an R-value of <5 for the subgrade soils and a Traffic Index of 11, the Public Works staff designed the pavement section that called for the 80 millimeter thick concrete pavers in a herringbone laying pattern. The pavement section required 14 inches of compacted Caltrans Class 2 aggregate and a layer of biaxial geogrid installed over the compacted subgrade for additional structural support.

**Construction**
Stanislaus County received six bids ranging from $4.50 to $6.00/sf to install the concrete pavers manufactured by Basalite Concrete Products, LLC. Earth Shelter Developers was awarded the concrete paver installation. With businesses such as Denny’s, Chevron and Joe’s Travel Plaza open 24 hours per day, an extensive traffic control plan was implemented allowing the contractor to maintain open drive aisles to accommodate the truck traffic during construction. The project went smoothly and was completed in fall 2014.

**Follow-up pavement inspection**
A follow-up visit conducted by Basalite and Stanislaus County in August 2015 showed that the concrete pavers are performing well, even with the extreme conditions in Westley. In the heat of the summer, it is not unusual for temperatures to reach 110° F. which can weaken asphalt concrete pavement. Truck traffic on the reconditioned road was non-stop during the site visit.

After finding success in Ripon in lighter load applications, interlocking concrete pavement presents a durable pavement rehabilitation project for Stanislaus County. The innovative pavement is cost effective, attractive and can hold up to even the toughest loading conditions.

Note: Structural design guidance is available in the following national standard: ASCE/ANSI 58-10 Structural Design of Interlocking Concrete Pavement for Municipal Streets and Roadways as well as Tech Spec 4 Structural Design of Interlocking Concrete Pavements from the Interlocking Concrete Pavement Institute as well as other technical bulletins on construction and maintenance.

Matt Machado can be reached at (209) 525-4153 or machadom@stancounty.com; Ron Illium can be reached at (916) 716-6500 or ron.illium@paccoast.com.

The concrete pavers were machine-set by Earth Shelter Developers.

Typical traffic on Howard Road 24/7
America’s Local Governments: Their annual budget process

Roger L. Kemp, MPA, MBA, Ph.D., ICMA-CM
Practitioner in Residence, MPA Program
Department of Public Management, School of Public Service
University of New Haven, Connecticut

The Annual Budget Process

The best way to understand a local government’s annual budget process in America is by using the systems approach to management. This approach recognizes the interdependence of all major activities within an organization, especially public ones. A public organization is viewed as an open system that includes five basic subsystems, which are highlighted and explained below as they relate to the annual budget process in municipal governments.

The Input. This includes available revenues to finance public services for the coming fiscal year. A local government’s revenues typically include non-restricted funds, restricted funds, and other possible funding sources as allocated and approved by its elected officials. The services provided by a public agency are based on the available revenues from all sources as approved in its annual budget, which is a result of the annual budget development process, that is explained below.

The Process. The budget preparation process includes four typical steps followed by public officials, both elected and appointed. These steps include the administrative preparation of the budget, the legislative approval of the budget, the financial implementation of the budget, and the annual year-end accounting and financial reporting, which is usually performed by an independent outside auditor. This process is in the best interest of everyone—the citizens, their elected officials, as well as the employees of a public organization.

The Output. The output of the budget process is determined based on the available revenues and approved allocation of these revenues to pay for projected departmental services for the coming fiscal year. Available funds are allocated to finance the public services provided by the departments in a local government, as well as its approved capital projects, for the coming fiscal year. The common types of public budgets include line-item budgets, program budgets, performance budgets, zero-based budgets, and other evolving budget formats. Most local government budgets use a line-item format, with possible program performance measurements, where they have been developed.

The Feedback. The financial feedback on the adopted budget is provided to both the elected officials, and their administrators, based on an annual audit that is typically conducted by an outside independent auditor. This is usually required by a city’s charter, which is approved by its voters. This financially objective feedback is provided to the organization’s major stakeholders for both the operating and capital budgets, including its elected officials, management staff, and citizens. It is typically placed online on a city’s public website, as well as copies placed in its public
library to accommodate those citizens that wish to review a hard copy of this annual report.

**The Environment.** The annual budget process is influenced by several factors that comprise a public organization’s operating, or organizational, environment. These factors include its political environment, its economic environment, its social environment, and its legal environment. All of these factors are interrelated and greatly influence all phases of a public organization’s annual budget process. While elected officials and their administrators have an influence on their internal environment, they have little control over their external environment.

**The Future**

Elected officials typically create the political orientation of their organization, its political environment. While some local governments are liberal, others are conservative, many represent both political perspectives, and yet others change their political perspective over time. While the political portion of a local government’s environment may change, the other components of a local government’s budget process generally remain the same, and unfold annually and continually influence the organization’s political, economic, social, and legal subsystems, all of which influence its annual budget process. Most of these other, primarily external, subsystems change slowly over time.

Many aspects of a local government’s environment are influenced by higher levels of government too, primarily their state government and the federal government. Local public officials, both elected and appointed, generally have little influence over these levels of government, and usually only react and adapt to their respective mandates, available grants, and legal requirements.

Roger L. Kemp has been a career City Manager in California, Connecticut, and New Jersey. He has worked in and managed the largest council-manager government cities in these states. He is presently a Practitioner in Residence, Department of Public Management, University of New Haven. Roger can be reached via email at rlkbsr@snet.net.
“What’s an ‘Environmental Management System’? We are confused about what it should be and whether we need one or not. Any help would be appreciated.”

Join the crowd! We are getting lots of questions about an EMS. Actually just recently we conducted a Click, Listen & Learn session (June 23) where we attempted to clarify some of the issues. If we look at the basis for the plan, we know that public works and utility agencies have significant responsibility for ensuring that operations are conducted in compliance with all federal, state and local environmental laws and regulations, and that sustainability principles are incorporated into your operations. Because of the level of control and influence public works and utilities have on the infrastructure and activities having the potential to impact the environment in your communities, as well as the high visibility of your actions, it is imperative that agencies demonstrate leadership in compliance and sustainability.

Compliance and sustainability improvement efforts are best achieved through structured implementation of an environmental management system incorporating elements of planning, execution, and review that lead to continuous improvement. An EMS provides agencies with the platform and opportunity to set and achieve environmental objectives and targets that are appropriate for the size of the community you serve and the scope of your operations. Elements of the EMS include establishing a policy indicating the agency (or city, or county, etc.) is committed to environmental improvements and sustainability. This would most likely be a governing body initiative which public works/utilities may be charged with monitoring. Other elements include conducting a thorough review of the significant elements that are critical to the operation of the agency, which if not controlled, could present a risk to human health or the environment. The plan addresses legal and/or other requirements such as federal, state and local environmental laws, regulations, policies and directives. It might also include local ordinances, non-regulatory guidelines, or voluntary principles or codes of practices such as energy conservation. Of course, it is essential to have legal counsel consulted for purposes of interpretation and application of existing statutes, regulations, etc. that are already in place within the governing body. It involves setting goals and objectives and methods of measuring your performance in each of the goals. An action plan is included which also addresses responsibility for various sustainability functions. A key function is development of documentation to ensure that all areas are covered and maintaining records and reports relative to the critical operations and activities that have been determined to present risk to human health or the environment.

Chapter 40 of the Public Works Management Practices Manual, 8th edition, is the vehicle for information for the program. There is some confusion from agencies working through Accreditation about the need for them to develop an EMS.

“Prejudice is the child of ignorance.”
– William Hazlitt, early Eighteenth Century English essayist and literary critic

“Everyone is kneaded out of the same dough, but not baked in the same oven.”
– Yiddish Proverb
As is true throughout the majority of the chapters in the Manual, since this is a governing body decision, the relevancy to the public works or utility departments is dependent upon the designation of this responsibility to said departments. It may be that there is a separate department that handles all the environmental and sustainability issues. That is well and good as long as the aspects of these issues, which are the mission of the two departments, are included in a citywide EMS Plan or, if there is not such a plan, that the public works/utility departments review the practices to determine that they are incorporating all the necessary review and regulation of federal, state and local mandates.

The Management Practices Manual has always had many sustainability and regulatory practices. Some may see this chapter as being redundant. Once again, if your department is not the responsible group to manage a program of this kind, it would be to your benefit to review the practices in the chapter to see where you may find a vehicle to make your ability to monitor the public health and sustainability services provided by your department(s) more transparent and open to the public.

The Click, Listen & Learn program is now available in the Members’ Library for you to download. You can also visit the Accreditation web pages at www.apwa.net/about/accreditation to find examples of Environmental Management Systems which we hope will help you grasp the essentials. If you have questions, feel free to contact Jackie Crumrine, Norman, Okla., at Jackie.crumrine@normanok.gov or myself and we will help you with clarification.

Ask Ann...

Please address all inquiries to:

Ann Daniels
APWA Director of Accreditation
APWA
1200 Main Street, Suite 1400
Kansas City, MO 64105-2100

Fax questions to: (816) 472-1610
E-mail: adaniels@apwa.net
Trackless Vehicles Ltd. recently introduced their new Series 7 municipal tractor. Over the last 45 years there have been hundreds of changes and improvements which have increased equipment performance, operator comfort and safety features while reducing fuel costs, noise levels and downtime. The MT7 now takes us to a whole new level.

The new MT7 is being well received by all customers who have had the opportunity to test drive, check out all of the design enhancements, and learn how all of the value-added features benefit and reduce cost for their various departments.

A 74 hp John Deere 4.5 LT Tier 4 final diesel engine powers the MT7. Rather than a smaller 2.8 to 3.3 LT engine, we chose the larger displacement engine for higher torque and longevity. Although the horsepower is less than our prior model MT6, it is very close to our MT3, MT4 and early model MT5s which were produced for many years and cleared snow from sidewalks, loaded trucks with our larger snow blowers and powered our largest mowing equipment.

The 74 hp pto-driven snow blower handles the toughest sidewalk snow conditions as did our prior, similarly powered models. The only difference an operator will notice vs. the higher HP MT6 is the time required to load a truck with the snow blower. It may take up to an extra minute now. However, due to the time it takes to place a truck in position to load, pull away when loaded and position another truck in its place to continue loading, we have been told by customers that adding another 60 seconds per load will not have a significant impact on their overall snow loading operation.
Another reason for choosing this engine was to be ahead of the mandated regulations from EPA, CARB and NRC. Since the Tier 4 interim engines are only a short-lived engine, which many if not most manufacturers decided to just skip past and go straight to the Tier 4 final, it did not make sense to produce a small number of tractors with a Tier 4I (interim) engine, for obvious reasons.

Two things we wanted to avoid with the Tier 4 final engine, and all customers that we consulted with agreed, was having to run urea and parked regens. Therefore, we incorporated an engine package that does not require urea and utilizes passive regens, basically meaning the regen takes place automatically while operating the tractor.

A new joystick design for the MT7 automatically programs itself for whatever attachment is being operated by the tractor. It can now move both mower wings or folding plow wings at the same time. Forward, neutral and reverse are achieved by a simple flick of a switch on the joystick. The design and function of the new joystick is both ergonomic and extremely easy to learn and operate.

The new digital dash illustrates all tractor and engine functions, switches to a backup camera screen when in reverse, allows access for maintenance personnel to retrieve information and displays all on-board self-diagnostics. The self-diagnostic feature functions continuously and advises what error codes along with what the ECU has diagnosed to be the cause.

The fuel saving from the work mode/travel mode is similar to our prior series 6 tractor. Customers have reported that they reduce their fuel consumption by approximately 50% when plowing, sanding, sweeping or roading the tractor in travel mode. Only when operating an attachment such as a snow blower or mower that requires full engine rpm for the pto is it necessary to run in work mode. The fuel cost saving over the life of the vehicle is up to $25,000 based on today’s fuel cost. Since most purchasing departments today evaluate life-cycle costing instead of simply who is low bid, Trackless is most often deemed the most cost-effective choice.

Other efficient features include auto/run. When auto mode is engaged, the sander temporarily shuts off automatically every time the tractor stops or is shifted into reverse. This saves considerable time from having to refill less often during a shift. The MT7 also has an adjustable flow rate switch as standard equipment.

To decrease maintenance costs, the MT7 comes equipped with an automatic reversing engine fan to always keep the radiator and oil cooler clean. All hoods including the top hood lift off in two minutes, without the use of any tools, for quick easy access. However, there are still access doors on the left-side panel for daily checks. The cab and hoods are all steel due to the abuse they encounter, hitting poles, scraping walls, fences, etc. However, we did switch to aluminum for the top hood to make it lighter for lifting.

Hydrostatic lock, a type of cruise control, is now standard equipment. An electric locking front differential is still optional. A new feature that customers are very impressed with is our anti-bounce ride control. It eliminates the bouncing after hitting a bump or pothole in the road. To accomplish this, the tractor ECU obtains the hydraulic pressure used to lift the attachment. From that it calculates what the weight of the attachment is. When the tractor hits a bump the computer calculates the speed the tractor is travelling at impact, the force of the impact together with the weight of the attachment and calculates within a logarithm how much the attachment has to move to counteract and deaden the bounce of the tractor. It all happens in milliseconds. The system does not eliminate the initial bump but it eliminates the after-effect which many times can be up to ten bounces.

To learn more about the new Trackless Series MT7 or arrange to have a demonstration, please visit us at www.tracklessvehicles.com.
Tippmann Post Driving Equipment introduces side mount adapter for driving u-channel posts

**Tippmann Side Mount Adapter** fastens quickly to all u-channel posts ranging in size from 2 lb. per foot all the way up to a 4 lb. per foot post. Whether you are driving an 8 ft. post or a 14 ft. post, this adapter will allow you to drive from a height you are comfortable with and your feet on the ground. This adapter is equipped with 11 sturdy attachment pins, which fit all major manufacturer u-channel hole patterns. The side mount adapter is then held in place by a long retaining pin and clevis. Learn more about this adapter as well as view online video demonstrations by visiting propanehammer.com. Or call toll free for a free brochure: (866) 286-8046.

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**Snap-Tite®’s patented joint and installation system** eliminates the need to remove failing culverts. Small segments are “snapped” together, all with watertight seals. With Snap-Tite’s ease of installation and variable lengths, 95 percent of culvert repairs are done off-road. This means increased safety for workers and motorists. Snap-Tite is made from HDPE pipe, has a life expectancy of 100 years and meets AASHTO Standard M326 for relining culverts. For more information, visit www.culvert-rehab.com or call 1-800-CULVERT (285-8378).

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**TAGSTER™ Graffiti Remover** is the safe, biodegradable, non-toxic, non-caustic, and non-flammable way for public works departments to eliminate graffiti and tagging problems. Whether you are trying to remove a declaration of love or gang symbols, TAGSTER unique gelled solution will allow you to wipe it away easily and safely. Removes graffiti from metal, concrete, wood, rock, plastic, restroom privacy panels or virtually any surface! For more information, call RHOMAR Industries, Inc., at (800) 688-6221.

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BoardWalk Ramp, a temporary device, is designed for sidewalk work zones, where pedestrian pathways have been rerouted. BoardWalk Ramp provides accessible, detectable and safe guidance wherever temporary, alternate, pedestrian access routes cross curbs or other obstacles. We offer BoardWalk in two configurations: BoardWalk Ramp: Installed perpendicular to the street, BoardWalk Ramp provides a safe pathway across the curb and to the temporary crosswalk. BoardWalk Ramp and Platform: Installed parallel to the street, BoardWalk Ramp and Platform provides safe guidance and access to the curb lane, when the curb lane is used as the temporary pedestrian access route. Contact us at 800-662-6338 or visit www.pss-innovations.com.

Ingevity’s Evotherm® warm mix asphalt

Ingevity’s Evotherm® warm mix asphalt promotes adhesion and enables temperature reductions up to 60°F lower than traditional hot mix. Lower temperatures mean extended paving seasons, longer hauls, and a better working environment that reduces environmental emissions. Evotherm WMA is provided by local contractors and allows the use of existing mix designs, asphalt plant and paving equipment without modification. Over the past 12 years, Evotherm WMA has been approved and used across all 50 states and seven countries around the world—enough to circle the globe eight times. Talk to your local contractor about using Evotherm WMA today. For more information please visit www.Evotherm.com or www.BehindTheScreed.com.

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The Hot-in-Place Recycling process lets you resurface 13 miles with a budget that only covers 10 miles. Scarification is an in-place road surface rehabilitation process. It restores cracked, brittle, and irregular, worn asphalt pavement in preparation for a final thin wearing course as selected by the awarding authority. Most roadways that possess a stable and structurally adequate base are appropriate candidates for this process—many of your proposed projects may be perfectly suitable. Please contact us, as the depth and nature of the existing materials must be evaluated prior to construction. Visit www.hotinplacerecycling.com or call us at (708) 877-7160.

NASTT’s Bookstore has expanded!

CIPP Good Practices Guidelines and Laterals Good Practices Guidelines books have been added to our bookstore. Cured-in-place pipe or CIPP is a proven and trusted trenchless method used worldwide to rehabilitate municipal sewer mains. This new peer-reviewed publication written by industry experts is the complete guide to this important trenchless technology. Sewer lateral rehabilitation is a rapidly evolving trenchless technology with major benefits and costs savings for both property owners and municipalities. This manual presents trenchless solutions without extensive excavation or property damage for an often overlooked but critical part of municipal infrastructure. Visit nastt.org/bookstore to order your copy today!
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Utilities Field Operations Manager
City & Borough of Juneau, Juneau, Alaska
$86,278.40–$98,342.40 Annually (DOQ)

The Public Works and Engineering – Utilities Division is looking for an experienced candidate interested in serving as the Utilities Field Operations Manager who manages staff, systems, and facilities for the City and Borough of Juneau (CBJ). The CBJ Utilities Division provides water and wastewater services to 32,000 residents and businesses and over a million visitors annually. The Utilities Field Operations Manager position will oversee the water distribution and wastewater collections systems for the entire community, including more than 15 staff in the operation of 175 miles of water and 140 miles of sewer, 45 lift stations, 9 reservoirs, and 43 pump stations or pressure regulating values. **Desirable Qualifications:**

**Education:** A bachelor’s degree from an accredited college in environmental science, engineering, public works administration, or a closely-related field. **Experience:** Four (4) years of experience in utility engineering, the operation and management of water or wastewater treatment systems, or public works administration. Two (2) years must have been in a supervisory capacity. **Licenses:** A Professional Engineering License. **Position Requirements:** Valid Alaska Driver’s License at time of appointment and for continued employment. To find more information and to find the City & Borough of Juneau’s application and process, please visit our website: http://www.juneau.org/personnel/jobs.php.

Utilities Production & Treatment Manager
City & Borough of Juneau, Juneau, Alaska
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Borough of Juneau (CBJ). The CBJ Utilities Division provides water and wastewater services to 32,000 residents and businesses and over a million visitors annually. This Utilities Production & Treatment Manager position will oversee the potable water supplies and wastewater treatment for the entire community, including managing more than 20 staff in the operation of two major potable water sources and treatment plants, three major wastewater treatment plants, and the bio solids handing program. Desirable Qualifications:

Education: A bachelor’s degree from an accredited college in environmental science, engineering, or public works administration or a closely related field. Experience: Four (4) years of experience in utility engineering, the operation and management of water or wastewater treatment systems, or public works administration, of which two (2) years were in a supervisory capacity. Substitution: Any combination of the specified experience and education may substitute on a year-for-year basis for the desirable qualifications. (Experience substitutes for the required education on the basis of one month of experience for 2.5 semester hours or 3.75 quarter hours of education.) Licenses: A Professional Engineering License is strongly preferred but not required. Position Requirements: Licenses: A valid Alaska Driver’s License at time of appointment and for continued employment. To find more information and to find the City & Borough of Juneau’s application and process, please visit our website: http://www.juneau.org/personnel/jobs.php.
### UPCOMING APWA EVENTS

**PWX**

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<td>2017</td>
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<td>Orlando, FL</td>
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For more information, contact David Dancy at (800) 848-APWA or send e-mail to dancy@apwa.net.

### AUGUST 2016

14-17 Institute of Transportation Engineers, Annual Meeting & Exhibit, Anaheim, CA, www.ite.org


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