Northbrook hits a HOME RUN with rainwater harvesting and flood mitigation
See page 24

Also Inside:
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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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With the Broadway smash hit *Hamilton* beginning its national tour, some of us in the public works field might feel a bit of regret that there is no attention in the script to involvement of Alexander Hamilton and Aaron Burr in providing a water supply to the growing city of New York. Not high drama or very musical, maybe, but the thought comes to mind (okay…maybe I’m stretching) because back then water supply lines were made from sections of tree trunk and transportation meant mostly horses on unpaved roads.

Times change and technology advances. New materials for pipes and pavements have dramatically improved durability and service levels. Electronics and telecommunications continue to transform how we produce, operate, and maintain public works. And there is every reason to expect this kind of technology to continue to evolve rapidly.

The current U.S. political climate could favor more and faster change. In last fall’s acrimonious campaigns, fixing the nation’s infrastructure seemed to be one area where democrats and republicans might find common ground. President Trump’s talk of using tax credits to get the private sector to invest billions could offer significant opportunities to introduce new technology into public works. Even the high-tech sector is taking notice: *Wired*, a magazine more typically attuned to electronics, software, and biotech, has lately been talking about infrastructure.

There is certainly cause for “buzz.” Applications of computers and communication technology into transportation have people excited about the prospects for improved road safety and travel-times with automated vehicles and on-demand public transportation. More affordable and efficient solar collectors are beginning to show up on roofs, walls, and even roadways as pollution-free power sources. Increasingly strong and durable polymer pipes and liners are a considerable improvement over the wood segments of Hamilton’s time. And there is much more to be excited about.

APWA’s Engineering and Technology Committee (E&T) works to increase our awareness and facilitate sharing of information about new technology and advances in public works. This work is part of APWA’s efforts to...

**Ronald J. Calkins, P.E., PWLF**
APWA President

"Serving our diverse communities remains our ultimate goal as public works practitioners."
support our members and other organizations that plan, build, maintain, and improve our communities.

In this issue of the Reporter, E&T members have provided articles offering different perspectives on both the use and experience of engineering and technology in public works. Several of the articles are about interesting applications in design and construction, the sort of subject most readers probably think about as “engineering and technology.” Other articles look at emerging technologies that have the potential to bring big changes to public works. A rather different look at public works and APWA’s technology is offered by the experience of an E&T Committee member who found herself relying on a wheelchair at last year’s PWX.

This cross section of perspectives highlights the continuing importance of both refining tried-and-true practices and continuing to explore new frontiers, while keeping in mind that serving our diverse communities remains our ultimate goal as public works practitioners.

One of Alexander Hamilton’s lines from the musical has become quite popular: “There’s a million things I haven’t done…just you wait!” I think it’s an apt thought for the role of engineering imagination and technology in public works, today and in the future.

“We cannot interfere in one area of the ecosystem without paying due attention both to the consequences of such interference in other areas and to the well-being of future generations.”

There’s a million things I haven’t done...just you wait!

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

The Engineering and Technology (E&T) Committee is one of APWA’s most wide-ranging Technical Committees. The E&T Committee works to encourage the increase, sharing, and application of knowledge about technology and advancing practices in public works, pursuing APWA’s mission to develop and support the people, agencies, and organizations that plan, build, maintain, and improve our communities. The committee sponsors technical sessions at PWX each year, provides informative articles in the June issue of the APWA Reporter and sponsors Click, Listen & Learn programs.

At PWX in August, the E&T Committee will sponsor three sessions:

• Successful implementation of new technology and green infrastructure – Vacuum Sewers and Porous Asphalt in the Midwest
• Change Order Management – Turning Risk Into Opportunity
• Achieving Sewer Separation through a Botanical Garden and a Landfill

The E&T Committee sponsored a Click, Listen & Learn titled Geotechnical Site Characterization for Trenchless Construction. It is available on the APWA Members’ Library.

In addition, the committee has been developing articles for this edition of the Reporter. Articles submitted or sponsored by the committee include:

• “Navigating PWX in a wheelchair” by Ravyn Whitewolf
• “Northbrook hits a home run with rainwater harvesting and flood mitigation” by Paul Siegfried
• “Qualification-Based Selection: A recipe for a successful partnership” by Ravyn Whitewolf
• “What do you know? Public Works Organizations and Knowledge Management” by Andrew C. Lemer
• “Yes, it is happening: close tolerance HDD is changing the open cut industry” by Ted Dimitroff
• “The benefits of restoration in an urban environment: Amazon Creek in Eugene, Oregon” by Doug Singer

Also, you can read the “President’s Message” in this issue about new public works technology...just you wait!

To make new technology more accessible to members, E&T members actively scan emerging new technology that could improve public works practice and to encourage thinking about future best practices, 5 to 10 years hence. Brief items appear in the Reporter in the “Imagination to Innovation” column written by Andrew Lemer, Ph.D.

The E&T Committee has formed a subcommittee on Underground Infrastructure Asset Technology. Chris Koenig is the Chair of this subcommittee. The committee has also formed a Construction Inspection Subcommittee. Ravyn Whitewolf is Chair of the subcommittee. If you are interested in joining a subcommittee, please contact Rita Cassida at rcassida@apwa.net.

As the committee looks to the future, it is their hope to serve as a resource to chapters and members. With a diverse committee makeup which includes representation from the public, private and education sectors, it is the mission of the committee to serve the needs of members.

The current members of the Engineering and Technology Technical Committee are:

• Dr. Andrew Lemer, Ph.D. (Committee Chair), Senior Program Officer, Transportation Research
Board of The National Academies of Sciences, Engineering, and Medicine, Washington, DC

- Mr. John Bechard, Sr. Principal & Managing Director, Vanasse Hangen Brustlin Inc., Watertown, MA
- Mr. Chris Koenig, Senior Project Manager, HDR Inc., Omaha, NE
- Ms. Joline McFarlane, Asset Management Specialist, City of Airdrie, Alberta

- Ms. Katherine Sheehan, P.E., Associate Engineer, CSG Consultants, Inc., Foster City, CA
- Ms. Ravyn Whitewolf, P.E., PMP, AVS, PWE, Public Works Director, City of Blaine, WA
- Mr. David L. Lawry, P.E. (Board Liaison), Director of Engineering and Public Works, Village of Schaumburg, IL
- Ms. Rita Cassida, P.E. (Staff Liaison), Education Program Manager, American Public Works Association, Kansas City, MO

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

“What sets worlds in motion is the interplay of differences, their attractions and repulsions; life is plurality, death is uniformity.”

– Octavio Paz (1914-1998), Mexican poet and critic

Your Vote in APWA Does Count

As an APWA member, you will have the opportunity to vote for members of the APWA Board of Directors between June 28, 2017 and July 28, 2017:

- APWA President-Elect
- At-Large Director in the functional area of Fleet and Facilities
- Regions I, II, V, VI and VIII Regional Directors (by APWA members in those respective regions)

The ballot will be available for online voting between June 28 and July 28, 2017 via a link on the APWA website. If you are unable to vote online, you may request a paper ballot from Teresa Hon at (816) 595-5224. Additional reminders of the voting process will be through the APWA website; via e-mail to every member for whom we have an e-mail address; and in future issues of the APWA Reporter.

If you have questions, please contact Teresa Hon at (816) 595-5224 or thon@apwa.net.
This past March, I was in Washington, D.C. and had the opportunity to present with APWA President-Elect Bo Mills to Congressional Staff during a brief sponsored by the U.S. House Public Works and Infrastructure Caucus. As of the writing of this article, the Caucus has 17 members. The topic of the brief was the important role public works agencies serve in protecting critical infrastructure. For public works professionals, protecting critical infrastructure takes on the Merriam Webster definition to protect which is, “to maintain the status or integrity.” It is what we do every day in the communities that we serve—we make normal happen.

While I was in D.C. for the day, APWA Government Affairs Manager Marty Williams and I met with a number of legislative assistants working for Congressional members who serve my community. Arranging the meetings took a few phone calls and e-mails, so if you want to meet with the staff for elected officials (which you should) make sure to plan well in advance.

The Congressional staffs with whom I met are the legislative assistants responsible for covering particular policy areas and handle drafting, tracking, and researching legislation. They are the point people for the elected representatives on the issues, and most of them cover multiple legislative areas at one time and are very busy. During my short time in D.C., the legislative assistants who work for U.S. House members representing the Crystal, MN area graciously accepted my request to meet with them. Though they work in Washington, D.C. full time, those I met with all have Minnesota roots. So while it may seem somewhat intimidating to meet with Congressional staff, it does not take long to realize that you most likely have something (or someone) in common.

Representing APWA in Washington, D.C. was truly an honor and a very educational experience for me. One of the things I quickly learned is that while one may think that the Congressional offices are full of meeting rooms, they are not. Meetings seem to happen wherever space and time intersect. I met with Senator Franken’s Legislative Assistant Adam Schiff while standing in line to get a photo with the Senator. Legislative Assistant Maria Laverdiere with Representative Keith Ellison and I talked in a hallway near her office. It was not until the last meeting of the day with Legislative Assistants Flynn Rico-Johnson and Tommy Walker that we were in a conference room, which

One day in Washington, D.C.

Mark Ray, P.E.
Director of Public Works
City of Crystal, Minnesota
Member, APWA Emergency Management Committee

Left to right: Tommy Walker, Mark Ray, Bo Mills, Scott Grayson, and Flynn Rico-Johnson meeting in a conference room
was good because at that point in the day my feet were starting to hurt from all the walking back and forth on Capitol Hill.

The key thing to note is to be prepared to tell your public works story anywhere (hallway, while waiting in line, etc.). Do not wait for the perfect moment, just look for the opportunity and act on it. My conversations were focused on talking about my community, the exciting things we are doing, and how APWA is there to support the Congressional members and staff so that we can all work together for the greater good. The Congressional staff I met with clearly care about their jobs and were present in the conversations.

My goal in meeting with the Congressional staff was to reinforce that one of the core functions of APWA is to be a resource to them in matters related to public works. APWA’s priority is to be the trusted, “go-to” source for input on proposed legislation and other federal activities such as rule-makings and regulatory matters. I was not there to sell anything or to directly get more money for infrastructure. I was there to tell them about the great things that public works professionals do every day to protect critical infrastructure in their communities and make normal happen for our residents.

If you are ever in Washington, D.C. or your local state house, take an opportunity to meet with your representatives or their staff. You do not need to have a polished elevator speech ready to go, but you should have a desired outcome for the conversation. My recommendation for a meet-and-greet is to simply introduce yourself, talk about what you do, and that APWA is a resource for them. Remember, they are people too and when it comes to the function that public works serves, at the end of the day we are all in this together.

For further guidance on engaging with your elected representatives, or for more information about APWA’s public policy priorities, please reach out to APWA Director of Government Affairs Andrea Eales at aeales@apwa.net.

Mark Ray can be reached at (763) 531-1160 or mark.ray@crystalmn.gov.
n 2015, my diversity Reporter article focused on Building Stronger Communities in the Ferguson/Florissant School District through the STEM initiative of Project Lead the Way. Almost two years have passed since that article was printed and already we are seeing the fruits of our labor: Building stronger relationships within that community has come to fruition through a project called West Florissant Avenue Great Streets.

Crawford, Murphy & Tilly (CMT), a well-known local engineering consultant, formed a diverse team of partners to pursue a project in a high-profile community of protests during the Michael Brown tragedy.

To ensure diversity throughout the project, the CMT team collaborated with the Cities of Ferguson and Dellwood, Mo., and partnered with the local Harris-Stowe University to mentor student interns. The team worked closely to engage the interns in all aspects of civil engineering, surveying and team building. To date their diverse team includes eight interns, 26% MBE, and 16% FBE participation.

The CMT team also collaborated with the client St. Louis County, Metropolitan Planning Organization, local public works, Metro, Great Rivers Greenway, and the Metropolitan Sewer District. The team engaged the Dellwood Rec Center whose students would be using the Great Streets project to and from school, and walked door to door engaging 50 business owners, 500 stakeholders, and 27 groups who have come together to ensure the success of the West Florissant Avenue Great Streets Project.

“I want to be part of a team who is designing and developing plans to create a space that will be shared by residents, visitors and employees in the area.”
– Curtis Collins, Engineering Science intern

“I want to gain skills needed for proper planning and design and be able to improve my communication and technical skills.”
– Diamond Cottman – Engineering/Planning intern

Lori Daiber can be reached at (618) 343-1170 or ldaiber@civildesigninc.com.

Diversity: Changing a community

Lori Daiber
Business Development Group Leader
Civil Design, Inc., Granite City, Illinois
Member, APWA Diversity Committee
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Nominator’s Name:
Lee R. Feldman, ICMA-CM

Candidate’s Name:
Chuck Scott

Candidate’s Title:
Maintenance Chief

Candidate’s Agency/Organization:
City of Fort Lauderdale Public Works Department

Candidate’s City/State:
Fort Lauderdale, FL

A simple definition of leadership is that leadership is the art of motivating a group of people to act towards achieving a common goal. Many times we find ourselves thinking of leaders being only at the top of an organization. Not so. Leaders are found at all levels within our public works organizations. Most often, they are anonymous; they are simply doing their jobs and yet, their actions impact many.

Look around your organization and find someone to recognize for a specific project they have done. It could be your manager, first-line supervisor, assistant, or janitor. Submit the name of the individual and a brief summary of the project you would like to recognize them for to Becky Stein at bstein@apwa.net.

All submissions will be reviewed by members of the Leadership & Management Committee. Those individuals selected will be recognized in a future issue of the APWA Reporter.

How long has the candidate been involved in the public works industry?
12 years

How long has the candidate worked in their current position?
Four months

Please describe the reason that the candidate is being considered for recognition.
The City of Fort Lauderdale measures our success, in part, by the customer service satisfaction levels of our neighbors. On Saturday, December 17, 2016, at the peak of the holiday season, Maintenance Chief Chuck Scott rapidly and expertly responded to a serious break in a large, 30-inch diameter sewer main.

While approximately 2.5 million gallons of raw sewage was spilling over 22 acres of high-density residential property, Mr. Scott quickly deployed a response team consisting of ten staff members and numerous private contractors, many of whom were off duty, to engage in an escalating emergency response.

How was the candidate’s leadership ideas/actions brought to the forefront?
In order to isolate the break and contain the spill, Mr. Scott and his team needed to isolate the pipe and stop the sanitary sewer flow from forty lift stations in about 20 percent of the city. Mr. Scott worked to ease anxiety and assist every resident who had questions, complaints and other issues as quickly as possible. He supervised his team as well as contractors on the cleanup efforts, including pressure-cleaning roads, sidewalks and driveways, vacuuming raw sewage and disinfecting properties.

Who did the candidate work with to help bring this idea/action forward?
Mr. Scott worked closely with City management and his Public Works Department management team Rick Johnson, Steve Roberts and Vincent Brown who were onsite to implement
an immediate action plan following cleanup protocols. In a letter to City management, Mr. Scott graciously acknowledged the emergency response performance of his team, including Leroy Cummings, Fredrick Clarke, Mike Chartier, Shawn Carey, John Paradgone Jr., Moises Saez, Llewellyn Ayton, Charles Casimir, Herman Williams and Edgar Lattimore.

Did the candidate experience any challenges when trying to implement this?
The challenge of dealing with 2.5 million gallons of flooding sewage was exacerbated by four stubborn isolation valves which required about four hours to secure. Once sewage flow was stopped, the cleanup and repair work began. The top priority was to remove the standing wastewater from the streets and swales using vacuum trucks and tankers. Stormwater crews assisted in cleaning clogged storm drains. Crews worked to reopen roads to detour neighbors around the break site. Due to the size of the pipe, an emergency was declared and the service of emergency contractors was engaged to complete the repair. City crews excavated to expose the pipe to assess the damage and determine the cause of the failure. Inspections revealed a longitudinal split on the bottom of twenty feet of pipe. Crews worked to redirect flow to other force mains and place many of the lift stations back in service. Repairs were completed and streets were reopened.

The cleanup response was immense and required coordination of multiple City crews, emergency contractors and contract vendors. Mr. Scott, his team and the City’s 24-Hour Neighbor Call Center assisted our neighbors with questions and provided guidance on cleanup and damage mitigation.

Are there steps/processes that, when looking back, the candidate could have done differently to make this idea/action even more successful (lessons learned)?
Mr. Scott’s one-on-one interaction with neighbors earned him many accolades and much respect. The questions he and his team received spurred the idea to create a City webpage to answer “Frequently Asked Questions” that could be referenced in the event of a future emergency. The City has already posted the public outreach page, which is available for replication by other cities: http://www.fortlauderdales.gov/departments/public-works/utilities-division/sewage-overflow-clean-up-procedures.
The APWA Government Affairs Committee (GAC) recently held a joint meeting with three APWA Technical Committees: Water Resources Management, Engineering and Technology, and Transportation. The meeting was held April 11-13, 2017 in Washington, D.C. and provided meeting participants with the opportunity to directly engage with numerous high-level Congressional committee staff and representatives from federal agencies.

One of the highlights of the session was a meeting between APWA representatives and U.S. Department of Transportation Secretary Elaine Chao. Secretary Chao was extremely gracious with her time and addressed questions posed by meeting attendees on topics ranging from the benefits of public/private partnerships (P3s), the possibility of an increase in the gas tax, and the importance of continuing the funding of public works and emergency management professionals. The importance of the meeting was echoed by APWA Executive Director Scott Grayson: “I am so pleased that 37 APWA members had the opportunity to see the U.S. Government in action. They had the time to interact with numerous government agency officials, Congressional staff, and some even had a personal meeting with U.S. Secretary of Transportation Elaine Chao to discuss the importance of infrastructure funding.” APWA Government Affairs Director Andrea Eales went on to add, “The time taken by members of these four committees to travel to D.C. and engage with national leaders clearly demonstrates APWA’s strong commitment to advocating on behalf of the thousands of public works professionals across North America.”

The meeting kicked off with opening remarks from Mr. Clarence Anthony, Executive Director for the National League of Cities (NLC). Mr. Anthony emphasized the importance of building partnerships between like-minded organizations such as NLC and APWA. “By working together on common issues,” he said, “we help amplify our message to the nation’s elected leaders.”

Following individual committee meetings, attendees heard from a full slate of thought-leaders and speakers who provided updates on strategy and networking opportunities.

The speakers included:

- Mr. King Gee, Director of Engineering & Technical Services, American Association of State Highway and Transportation Officials (AASHTO), who focused on the dangers of distracted driving and the goal of getting to zero fatalities on our roads through smarter and safer driving.

- Mr. Walter Waidelich, Deputy Acting Administrator with the Federal Highway Administration, discussed the importance of considering P3 partnerships, where viable, and struck a tone of optimism regarding the potential streamlining of federal regulations.

- Mr. Michael Patella, Sr. Policy Advisor, Water Policy Office of the Environmental Protection Agency, addressed the ongoing issue of finding a balance between over-regulation and smart regulations.

- Mr. Steven Farole, Program Manager of the Cybersecurity & Communications Office of the Department of Homeland Security (DHS), stressed the importance of staying vigilant with respect to cyber security and ensuring proper safety protocols are in place to safeguard our infrastructure.

- Mr. Colt Hagmaier, Senior Advisor with the Office of Policy & Program Analysis, Federal Emergency Management Agency (FEMA), provided an update on the FEMA Public Assistance Disaster Deductible, and shared that FEMA is seeking to put in place the most fiscally responsible program possible.

- Mr. Andrew Delany, Government Affairs with FirstNet, authorized
by Congress in 2012, closed out the day with a session on FirstNet’s goal to develop, build and operate a nationwide broadband network that equips first responders with a communication tool to save lives and protect U.S. communities.

On the morning of April 12, attendees were back at work with a briefing from Ms. Claire Thomas, Executive Officer for the Federal Insurance Directorate at FEMA, who spoke about the National Flood Insurance Program (NFIP). Following Ms. Thomas, Ms. Katherine Loughead, Legislative Assistant to Representative Ryan Costello (R-PA), Co-Chair of the House Public Works & Infrastructure Caucus, provided an update on the Caucus and Congressional activities.

Subsequently, APWA committee members were divided into groups to attend specific targeted meetings with key Congressional staff. Each group was led by a member of the Government Affairs team to maximize advocacy efforts. These meetings included time with staff from the Senate Finance Committee, the Senate Appropriations Subcommittee on Homeland Security, and nine senior staff of the House Transportation and Infrastructure Committee. Additionally, APWA members met with counsel from the Senate Environment and Public Works Committee, policy staff to Speaker of the House Paul Ryan (R-WI), and staff with the House Appropriations Transportation Subcommittee.

On the final day, GAC members closed out their time in D.C. by meeting with Mr. Paul Balmer, senior legislative staff member to Congressman Earl Blumenauer (D-OR), who serves on the House Ways and Means Committee and is a member of the House Public Works & Infrastructure Caucus.

The time spent in Washington was a great opportunity for meeting participants to speak directly with policymakers who are working on legislation and regulations impacting public works. APWA President-Elect Bo Mills shared his synopsis of the meetings: “What a tremendous opportunity the Government Affairs, Water Resources Management, Transportation, and Engineering and Technology Committees of APWA had to meet with officials from numerous agencies, and Congressional offices to advocate for public works. The recognition of APWA and its importance as a resource to policymakers and agencies was evident during each of our meetings.”

Advocacy is a strategic priority for APWA, and having dedicated members willing to take time away from their busy daily lives to speak up for public works is a tremendous help in continuing to raise APWA’s public policy profile.

Marty Williams may be reached at (202) 218-6732 or mwilliams@apwa.net.
Investing in transportation: California approves $52 billion to “Fix it First”

Lisa Rapp, PWLF, Director of Public Works, City of Lakewood, CA
and Chair, APWA Government Affairs Committee; Debbie Hale, Executive
Director, Transportation Agency for Monterey County, CA and member,
APWA Government Affairs Committee

As the APWA Government Affairs Committee (GAC) traveled to Washington, D.C. in April, most of us were focused on educating the new administration about our nation’s public works infrastructure needs. However, as the two Californians in the group, we were especially giddy—not just because we were going to meet the new Transportation Secretary, Elaine Chao—but because a few days earlier, the California State Legislature had just voted to approve a transportation funding package estimated to raise $52.4 billion over the next 10 years, known as Senate Bill 1 (SB 1).

After lengthy negotiations and some might say pork-barrel politics ($1 billion in earmarks), the Governor promised to sign the bill into law. The package is estimated to cost most drivers less than $10 a month—significantly less than the estimated $700 per year drivers spend on vehicle repairs caused by rough roads. Another important feature is that electric vehicles will now pay for their wear and tear on the roads with a new $100/year fee, beginning in 2020. (To see what you might pay under this measure, there is a calculator at: http://www.sacbee.com/news/politics-government/capitol-alert/article141595099.html)

The vast majority of the new funding is focused on a “fix it first” approach—emphasizing road maintenance and safety improvements—with modest investments in bus and rail transit and a small share for active transportation. Cities and counties will get nearly 38% of the funding, split 50-50, with the cities’ share being allocated by population, and the counties’ share being allocated based on road miles and vehicle registration. State highway safety and maintenance projects will receive an equivalent share of the money. The remaining share, about one-fourth of the total, will be devoted to highway capacity programs, transit capital and operations, and a range of other programs. The State Transportation Improvement Program, a flexible funding program for regional agencies usually devoted to major capacity, rail or safety projects, will benefit from stabilizing the existing gas tax and permanent indexing for inflation.

The success of California’s “fix it first” funding program was the result of a united effort of a variety of stakeholders over time. The metropolitan areas of the state—including the greater Los Angeles and the San Francisco Bay areas—started making the case early on that highway and road repair needed the most attention, because they practically reached the limit of their ability to widen highways. In fact, Senator Jim Beall, the author of SB 1, represents the Silicon Valley metropolitan area.

The California Transportation Commission, a transportation oversight body appointed by the Governor and the State Legislature, issued a statewide infrastructure needs report in 2011 that identified...
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Local governments, who own 81% of California’s road miles, also made the case over several years that road maintenance funding was in short supply. Since 2008, cities and counties have been collaborating to produce a “Local Streets and Roads Needs Assessment.” Updated every two years, the assessment created a huge database of information that documents how statewide the unmet local road repair needs have grown to $296 billion, as of 2016. Real data covering 99% of local streets and roads played a major role in making the case for updated transportation funding. The results of the report, which is available at www.saveourstreets.org, were regularly quoted by both the media and elected officials.

We asked Dan Carrigg, Deputy Executive Director and Legislative Director for the League of California Cities, what was the formula that got SB 1 over the finish line when previous attempts had been unsuccessful? Dan stated that, “The work done by the League of California Cities and the California Association of Counties 10 years ago on the Local Streets and Roads Assessment was critical. Prior to this effort, we had a very difficult time talking about local infrastructure challenges due to a lack of data. The report established credibility with the Legislature, the California Transportation Commission, and the Governor. The effort of public works professionals to establish and maintain this resource was vital.”

He added, “No one was arguing that there was not a problem with California’s transportation infrastructure, but rather how best to solve it and fund it. The League remained flexible in the choice of revenue sources, while trying to address the impacts of reduced fuel consumption and zero emission vehicles. And local government worked in a strong coalition of partners that included transit, labor, and heavy construction.”
“In terms of the politics, the Legislature had to find its own sweet spot to get the required two-thirds majority vote and the Governor’s signature. Against the backdrop of the damage done by the winter’s severe storms, outstanding leadership in the Senate and Assembly was key to addressing the needs of local infrastructure. City Council members and County Supervisors pointed out specific projects in their legislators’ districts that would be accomplished with the enhanced funding. And finally, the Governor, in addition to his commitment to address the state’s fiscal deficit, also committed to addressing the state’s infrastructure deficit.”

APWA’s California Chapters Advocacy Committee, representing all nine California APWA chapters, was also very active in the effort to get SB 1 passed. The CA Advocacy Committee agreed to send letters of support to the various committees that heard testimony on the bill, and through the chapters urged their members, agencies, and firms to send letters of support too.

California is joining 21 other states in raising the fuel tax within the last five years. Four of those states are awaiting their Governors’ signatures on the legislation, while 17 other states approved gas tax increases in prior years. By contrast, the federal fuel tax has not changed from 18.4 cents/gallon since 1994, despite the recommendation of two independent commissions.

Due to the lack of new resources, the Highway Trust Fund (HTF) faces insolvency—we are spending more each year on transportation than the federal gas tax revenues can pay for. This shortfall has occurred because our cars are getting better gas mileage, and there has been no adjustment for inflation over the past 23 years. APWA’s transportation policy has for many years recommended not only increasing the gas tax, but also indexing it for inflation. Regular one-time bailouts of the Federal HTF law have occurred over the last few years, but a long-term solution is needed. While the GAC heard from many individuals during our visit to the nation’s capital that an infrastructure finance package is forthcoming (after health care and tax reform), lawmakers still need to find a way to pay for it. Agreeing upon a federal transportation funding source could take several months, if not years, and the Trump administration’s proposed “skinny budget” cuts are not a promising start.

Let’s hope that California’s SB 1 is a model for other states, as well as the Federal Government.

Lisa Rapp is the APWA Government Affairs Committee Chair and the Public Works Director for the City of Lakewood, which happens to be represented by the California State Assembly Speaker, Anthony Rendon; she may be reached at (562) 866-9771 or lrapp@lakewoodcity.org. Debbie Hale is a member of the APWA Government Affairs Committee and the Executive Director for the Transportation Agency for Monterey County, which happens to be home to the California State Senate Majority Leader, Bill Monning. She may be reached at (831) 596-4542 or debbie@tamcmonterey.org.

The graph above shows how the California Road Repair and Accountability Act of 2017 will raise approximately $52.4 billion over ten years.
Readers of a certain age will appreciate my confusion on a recent shopping trip to purchase light bulbs. The incandescent bulbs of my youth have almost totally disappeared from the store shelves, replaced by a dizzying array of compact fluorescents, halogens, and light-emitting diodes (LEDs). These newer alternatives cost more, but claim to last much longer than the older style bulbs...although users' experience may vary.

The motivation for is energy consumption, of course. Only about 2% of the electric energy fed into an incandescent bulb comes out as visible light. The bulb's design has changed little since Edison perfected the technology more than a century ago: Electricity runs through a filament (a tungsten spiral in most cases); resistance causes the filament to heat up (to about 5,000 degrees Fahrenheit); the filament glows brightly. The light is produced by what physicists term “black body radiation.” Much of the radiation is in the infrared part of the spectrum—which we feel as heat—and is wasted.

In comparison, the newer alternative lights are much more efficient. Halogen bulbs, which are simply a variation on the older incandescent, are only about 10 to 20 percent more energy efficient and run at even hotter temperatures. But the others are better by a factor of 3 to 6 times. Compact fluorescent bulbs typically emit between 7% and 13% of the energy input as visible light. LEDs achieve between 5% and 15%. Of course, as many of us have experienced, the color of these alternatives may not measure up to the expectations of those raised on incandescent lights.

Researchers recently have developed technology that could give new life to the incandescent bulb by dramatically increasing its energy efficiency. The technology uses photonic crystals, materials structured in such a way that they block particular wavelengths of light or permit them to pass. (Mother of pearl and opal owe their colorful iridescence to their photonic crystal character.)

The researchers reshaped the filament and surrounded it with specially designed photonic crystals that reflect the heat (infrared radiation) back onto the filament while allowing the visible light to pass through. The reflected heat helps warm the filament, reducing the amount of electricity needed to raise the temperature to its working level. This recycling of the emitted energy that otherwise would be wasted boosts the bulb's output efficiency to nearly 7%, about 3 times that of a conventional incandescent. Some experts believe the efficiency could be increased to perhaps 40 percent! If that can be achieved, Edison's achievement could come back brighter than ever.

Andrew Lemer, Ph.D., is currently a Senior Program Officer with the National Academy of Sciences, Engineering, and Medicine, Washington, D.C.; Chair, APWA Engineering & Technology Committee.

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.

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.”

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.andrewlem.com.
Chance of drizzle today...no worries

Meteorologists are an interesting “breed” of people. Being one for the past twenty-plus years, and having many meteorology friends and colleagues, has given me perspective on how we view the world. The weather has fascinated us since we first became interested in the subject, and decided to make it our profession. What attracts most of us to weather is the power and mystery that it holds. From the unknowns of a forecast to the power of standing in your house one minute, and next, the house being gone. When a meteorologist thinks of severity, we of course think with this passion at our core, and thus think in terms of extremes. What is the hottest it could ever get here? The windiest? The snowiest? Why? Because as a meteorologist forecasting the weather you are constantly seeing things you never thought possible. We think, can Mother Nature surprise us one more time? Almost like an addiction, we wonder what it would feel like to be at the center of the hurricane.

This is why when we think of impact we relate to extreme weather conditions. Extremes cause droughts, blizzards, floods, heat waves, and if we understand those things we can protect the world and the people that receive our forecasts. If we take winter weather as an example, if 6 inches (15cm) of snow is bad, 12 inches (30cm) must be worse. It has to be! Right? When a meteorologist issues a forecast, or a warning, we think “strong” weather causes the most impact. The fact is, this is not necessarily true. This is compounded recently by the weather community in the United States making an all-out push to relate and talk about impact. You will hear the media make statements like “30 million people are under the threat of this weather tonight.” While it is true that those 30 million people have a forecast for _____, we have to be careful what exactly is the impact. I am going to use winter weather again to highlight how impact is not that simple.

On the 16th of December 2016, my hometown, St. Louis, Mo., saw a weather event that created quite an impact. It began in morning with a “Winter Weather Advisory” issued by the National Weather Service for much of the St. Louis area until 6:00 p.m. that evening, due to the possibility of freezing drizzle. The night before in the local media, and even still that morning, there was little to no mention of this approaching condition. Most weather apps and weather sites had no mention of the threat. Drizzle. Sound scary to you? I didn’t think so. Would you change your plans at all that evening or during the day, especially if I add that December 16 was a Friday (a Friday during the holiday season). Of course not. Very light freezing drizzle occurred occasionally throughout the day, but the impact was very minor, just some ice forming on parked vehicles. At 4:00 p.m. the intensity began to increase and a freezing fog had developed. All surfaces quickly became icy, and the impact really began to be felt. Nearly all major roads and interstates became parking lots with vehicles scattered over the roads.

Why was this ice storm particularly challenging to vehicles? Because the intensity never increased more than a drizzle, so the road surface became a smooth sheet of ice. One important thing to remember is that every ice storm is different. Factors such as surface temperature, air temperature, temperature of the falling water, amount of falling precipitation and thickness of the cold air all play a factor in how quickly water turns to ice. For example, if the surface temperatures are not significantly below freezing, it can take such a long time for ice to form that traffic and a little road chemical can keep things from freezing. Or if the precipitation falling is in large quantities, the ice forms on the road and is crushed by traffic it can actually form crushed ice, which can provide a little traction.

An event where St. Louis Lambert International Airport weather station recorded a “Trace” of precipitation throughout the entire event caused 1,500 vehicle crashes, as reported by the Missouri Highway Patrol, and school children to spend the night at school with staff because buses and maintenance vehicles could not travel the route between the school and homes. Many individuals reported evening commutes of seven and eight hours to travel the short distances home. All from drizzle. In the days that followed the blame game started as to who was responsible for this. Many wanted to blame the DOT, the counties, and municipalities for not treating the roads. The problem is that freezing rain or drizzle is one of biggest challenges to winter road maintenance for two reasons. One, pretreatment is rarely possible because the precipitation falls in a liquid form, washing off any pretreatment. Second, and more importantly, when snow falls on a road surface it is not entirely water; in other words, when we melt down the snow it is much less than as it falls as snow. This directly relates to how effective road chemicals are, plus snow is removed by mechanical means (a plow) and ice cannot be removed in this way. So who was to blame for this event? No one! It is called the impact of Mother Nature and something we still must live with on this planet. The media could
have “scared” the population a little more, but would people really heed the warning for freezing drizzle on a Friday night when there are important holiday events to attend? A month later, a freezing rain event was forecast to affect the region again. This time the newly appointed Governor of Missouri activated the National Guard, and the National Weather Service placed the entire state in an ice warning for three days. Schools and business closed preemptively ahead of the approaching storm, all with fresh thoughts of the month before. What happened? Nothing. The roads were too warm, the rain was too warm, ice formed on vegetation, but that was it.

Another winter scenario that causes issues with respect to impact is snow accumulation. Again, if we think about meteorologists, when they think of impact of snow they think more is worse, but with the roads and the traveling public that is not entirely true. A small amount of snow (1” or a few cm) is much worse to vehicles for several reasons. One, when any snow falls it typically does not fall uniformly across an area. So as you drive from one place to another you will drive in areas where more snow or less snow has fallen. This causes the driver to see quickly-changing road conditions, meaning you could be on a wet road, go around a corner and suddenly be on a snow-covered road. This means that crashes are far more common. The same variability happens in larger storms, but everything is still pretty much the same. Second, lighter snow does not form piles or tracks; therefore, it provides less traction than deeper snow, causing the roads to be slippery.

A final reason that larger storms typically cause fewer crashes is because of the hype surrounding large storms. Before and during large storms travelers are prepared to either not travel or travel at a very cautious speed. So while the media and meteorologists relate large storms with the highest impact level, when it comes to crashes, injuries and fatalities this is not necessarily the case.

My advice: For the winter maintenance community do not base your reaction and response levels to what are necessarily “high impact” events. You must always think of how the predicted event will impact the roads. You already take into consideration a Monday evening rush hour storm vs. a storm on a Saturday night; the same should be true for storm intensity. For the weather community, we must think of what the impact will be and not always think more is worse.

Jon Tarleton can be reached at (303) 436-2943 or jon.tarleton@vaisala.com.
Recently I had the opportunity to engage a community outreach technique that was fun, informative, concise, cost effective, profoundly effective and a bunch of other adjectives that I will spare you from for now. So, everyone in the community was asking, “How’d you do that?”

Telephone Town Hall Meeting (TTHM) is a company that uses similar technology as reverse 911 calls but it is so much more.

The first time I did this was when I worked for Palm Bay, Florida (as the Public Works Director). Then-city manager Lee Feldman and I were trying to educate folks on a road funding referendum. When we hit the “go” button it was awesome to actually be talking to thousands of folks all at the same time. How crazy is this I thought? While our referendum ultimately failed (miserably), we had found a cost-effective technology where we could engage lots of folks and get feedback in a single hour. Can you imagine getting a town hall meeting done in an hour? I can’t!

Well, while our referendum ultimately failed (miserably), we had found a cost-effective technology where we could engage lots of folks and get feedback in a single hour. Can you imagine getting a town hall meeting done in an hour? I can’t!

Typically in our normal outreach process we execute dozens of face-to-face meetings all over town and never get more than two dozen participants at any one meeting. We seldom get away from folks in less than two or more hours and sometimes these meetings roll on into the wee hours of the night draining every last ounce of energy out of staff.

So after many beat-down meetings with never-ending questions about varying topics and sometimes not even the topics you are there to present, we tried the TTHM here in Rowlett. Hey, it worked before, why not here in my new playground?

And yes, much to my expectations and everyone else’s surprise, it worked, and pretty easily too. So how does it work, you ask?

Well, we sent the TTHM folks a shape file of our city; your GIS folks can do this fairly easily. The TTHM folks take this file and with their magic powers (software) they build the call database which you ultimately now own for use on the call and even for future calls. On the designated time and date when the call launches, it hits all of the phones associated with the addresses in this shape file. Pretty cool, huh?

Before the actual event you record a couple of phone messages (one for people who are joining the call and one for the folks who don’t answer going to their voicemail). Then the moderator, a cool guy named Colorado Curt, who is very experienced at this, guides you through the process. By the way, everyone there at TTHM is pretty cool so don’t worry, they got this!

While the calls goes on, you manage the calls through an Internet-based portal where the TTHM folks and your designated “driver” communicate, managing the questions.

Think about the old classic TV show “Fraser.” When someone calls in, they talked to Roz, who queued up the calls for Fraser. In this case you can see all the callers through the portal with their questions, and you can choose those questions in a logical order to make your points to the listeners and ensure that the message you want to deliver gets delivered. And unlike Fraser, who sought out the crazies, you can manage them painlessly and efficiently.

And if that isn’t cool enough… you can poll the listeners too.

Think about that: a cheap, simple way to gather data fast about your topic, your project, your referendum, and your community issues. And if you craft your questions right, you have great data to support your initiatives. Such powerful stuff at your fingertips!
And did I say this whole process is done in an hour? BAM!
And yet it gets better!
A short while after your event is over you get all of the data from the polling questions, all of the call data, all of the participant contact info, the questions asked from the respective callers, call stats, an MP3 of the whole event that you can post online, and more.

For the folks who didn’t get to participate, yet had a burning question about the meaning of life in their respective world, we just follow up with the next day. In fact on my last TTHM I called everyone back who expressed any interest, had a question, or actually called in and left messages. The response to our outreach effort was amazing. This step is optional but nevertheless is my personal preference, and the powerful impact of such an action is very effective in serving your community.

So I have now used this tool for a road referendum, general outreach Town Hall-type meetings, bond elections, playground community build project and more. In my current playground in Rowlett, Tex., where I started my adventure as the Public Works Director, and now as Assistant City Manager, I continue using TTHM as an outreach method and the results are in.

It works well and reaches those unreachable but not less deserving folks who need to hear from you—those folks who work out of town, or have to commute, and who simply don’t have the time to come to a physical meeting but are certainly just as interested in the community as those who are perpetually standing at the podium at your council meetings.

So why not engage them at their convenience, because they pay taxes too, and they may actually support your programs if you meet them where they are at!

So check it out at http://telephone-townhallmeeting.com and when you do, tell Curt and Ian that Jim sent you. They are awesome folks to work with.

Jim Proce is the Assistant City Manager for the City of Rowlett, Tex., where he is responsible for Public Works, Utilities, Fleet Services, Parks & Recreation, Information Technology, Development Services, Building Permitting, and Capital Improvements. He is a Public Works Leadership Fellow, has been a speaker at APWA PWX on multiple occasions, is an APWA Top Ten Leader of the Year and Community Involvement Award winner, and currently serves on the Leadership and Management Committee. He can be reached at jproce@rowlett.com.
A new urban culture through planning and civic participation

Parmenides Canseco
Mobility and Urban Design Coordinator
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Saltillo, Coahuila, Mexico

Over the past 30 years, Saltillo, a northern Mexican city with an important automotive manufacturing cluster, has been part of an urban evolution due to its economic competitiveness and working culture. The urbanization model that has taken place is based on single-family houses, land use zoning and car-oriented infrastructure, creating a low-density, low-rise city and a strong culture centering around private cars. The side effects of this model are related to the loss of urban public space, inefficient alternative modes of transportation, and vulnerable cyclists and pedestrians.

In Mexico, as in many other cities in the world, social movements and academia are working for humanizing cities through civic activism with positive results; the federal, state and local governments are including these ideas in their agendas and creating important changes, improving the legal framework or creating new sustainable infrastructure.

However, changing the paradigm of a new urban culture is a huge challenge that will need great skills and a large amount of resources to make it possible. Not only that, but public participation is needed to endorse concepts and projects, not only in the traditional way of polls or surveys, but in the design, planning and evaluation areas of the whole project. Thus, governments must be prepared for a new way of building cities.

Thankfully, the changes mentioned are becoming real, maybe not as fast as we would prefer, but with institutions that are leading the change. In Mexico, the municipality is the legal manager of
cities that are promoting the creation of long-term planning agencies, commonly known as Municipal Planning Institutes (Implanes).

With only 60 Implanes across the country, they are becoming renowned for being close to the new urban agenda that promotes urban sustainability, compactness, higher densities or non-motorized mobility. It is common to find that the Implanes public officials are former activists, better qualified for their jobs of researching and testing projects based on the best practices around the world.

Although the Implanes’ main objectives are medium- and long-term planning, they have worked as urban labs, participating with NGOs, academic institutions and interested citizens, creating a new space where ideas and projects can be tested and evaluated before a more permanent implementation.

Having limited budgets and many necessities, Implanes have to be creative and efficient to achieve their goals and persuade politicians to invest in sustainable planning tools and infrastructure projects; having support from society and various institutions, these new ideas have less chance of failure.

Inspired by social movements and tactical urbanism, Implanes have invested large amounts of economic and human resources to implement high-impact and low-cost solutions.

In Saltillo, the Implan has painted several pedestrian intersections with outstanding and creative designs as a strategy to be close with society while promoting the pedestrian culture. Throughout these actions, with participation from neighbors, students and local artists, along with public officials, the voice of society is being heard and used as an important input for the planning process.

As an example, in 2015 a participatory diagnosis was performed in the G. Espinoza Community Center, where a very creative and original crosswalk was painted as a strategy to invite neighbors to participate in the workshops. Children and teenagers provided valuable information different from what the adults provided, demonstrating how the use of the public space differed amongst the different ages. Having information from all age ranges made it possible to create an accurate neighborhood profile.

Promoting a new urban culture has been one of the principal tasks of the Implan Saltillo. At the Oceania Community Center, people asked us to paint a crosswalk in a dangerous intersection to facilitate access to the facilities. The people's advice and knowledge of where to paint the crosswalk ensured that the Implan Saltillo was successful.

Additionally, local artists approached Implan to create a different crosswalk, not the typical one. They wanted to improve the pedestrian crossing and paint a unique art piece to promote creativity among students from a nearby middle school. The result was stunning and everyone embraced the new design.

With involving citizens, giving them time and creative spaces where the community can express their concerns or feelings, we have gotten closer to the people by investing small amounts of money. By systematizing the information, ideas and comments are maintained in formal documents, and planning tools and resources are seen as valuable as the mobility culture continues to actively grow.

Parmenides Canseco can be reached at pcanseco@implansaltillo.mx.

Local artists designed and painted an original crosswalk to promote art in front of a public middle school. (Photo by Juan de la Peña)
he typical sounds of summer fill the air at Wescott Park in Northbrook, Ill. Cheers erupt from the baseball diamonds, and laughter spills out from the playgrounds. But it is what is filling the structure beneath the park that has residents in the area resting a bit easier this year.

Underground and out of sight, a large labyrinth of precast concrete modules forms a detention chamber capable of holding more than 7.7 million gallons of stormwater. More than 1,720 precast concrete pieces manufactured by StormTrap® were used to construct the storage facility, making it the largest of its kind by volume currently in existence. The project also included installation of almost one quarter mile of new 42-inch diameter storm sewer to convey stormwater to the storage

Northbrook hits a home run with rainwater harvesting and flood mitigation

Paul Siegfried, P.E., CFM, CPESC
Assistant Manager, Water Resources Department
Baxter & Woodman, Inc.
Crystal Lake, Illinois
The ability to divert and store this volume of stormwater will help reduce local flooding, and as an additional benefit, a portion of the stored runoff can be used for irrigation and other purposes.

Balancing the community’s needs
For many decades, the village’s Sunset Fields subdivision experienced severe flooding of homes, yards, and roadways. Platted in the 1950s, the subdivision lacked detention facilities, adequately sized storm sewer, and overland flow routes that could safely convey stormwater. As the first step to address these problematic flooding issues, the Northbrook Master Stormwater Management Plan introduced a conceptual stormwater detention project at Wescott Park.

“Stormwater requirements for subdivisions built 60 years ago were not what they are today,” said Northbrook Director of Public Works Kelly Hamill. “This project was so important to our Master Stormwater Management Plan not only because of the benefits that the properties in this subdivision would see, but also other areas downstream that experience flooding as well. Having flooding become an afterthought rather than a primary concern would be a great success.”

The village embarked on making the Wescott Park Stormwater Storage Facility project a reality in May of 2013. Northbrook consulted with civil engineering firm Baxter & Woodman, Inc. to conduct a detailed study of several improvement options, including above ground, below ground, and hybrid detention configurations. The decision to go underground stemmed from the village’s desire to maintain the highly valued open space and recreational amenities at the park. Two ballfields, an outfield grass area, walking trail, and two playgrounds are enjoyed by residents and used frequently by both the Northbrook Park District and Wescott Elementary School.

Going green with rainwater harvesting
A way to creatively combine large-scale flood mitigation with green infrastructure was identified during the study phase of the project. The addition of a rainwater harvesting system would allow the village to use a portion of the stored stormwater to meet typical seasonal water needs of the park’s new irrigation system without requiring a domestic water source. With the estimated price tag nearing $9.7 million for the base project, the village knew they would need a little help if they wanted to incorporate this innovative feature.

The Metropolitan Water Reclamation District of Greater Chicago (MWRD) had been looking for a project on which to collaborate with the village and showcase the benefits of sustainability. The Wescott Park project presented an opportunity for the village to secure $475,000 in green infrastructure funding from MWRD for the addition of the rainwater harvesting system.

“There is a movement to combine grey infrastructure, such as sewers and pumping stations, with green infrastructure, such as rain gardens and permeable pavement, in order to conserve water and reduce flooding. The MWRD is committed to being a leader in this movement,” said MWRD Principal Civil Engineer Jim Yurik. “This project was an innovative use of excess stormwater that would have otherwise caused flooding.”

Managing stormwater as a resource
Baxter & Woodman worked with Wahaso Water Harvesting Solutions, Inc. to design a system that filters, stores, and sanitizes the stored stormwater before pumping it to the park’s new irrigation system. The village’s typical irrigation usage is 60 water cycles per year, requiring more than 1.3 million gallons of water. The sump area located below the gravity outlet of the storage facility is capable of holding more than 177,400 gallons of stormwater for reuse, which will provide eight complete irrigation cycles without replenishment. An analysis of past rainfall data confirmed that the need for domestic water for irrigation is extremely unlikely with the use of the rain harvesting system. “In dry weather, the system will utilize the captured rainwater instead of taking fresh Lake Michigan water for irrigation,” Yurik said.

A spigot was also added to the system so the harvested water could be used for trees and plants at locations outside the park, and for use with non-sanitary equipment, such as vacuum trucks and street sweepers.

“The primary reuse of the water will be for irrigation of the ballfield on top of the detention facility. Previously, the park district had to use a portable sprinkler system,” Hamill said. “Another usage of the rainwater harvesting system will be the filling station. This will allow both the village and park district to fill water tanks onsite for use in other areas.”

Water used for spray irrigation must meet NSF 350 standards for water quality, as required by the Illinois Department of Public Health. Two main components of the rainwater harvesting system reduce contaminant concentrations: Suntree Technologies’ Nutrient Separating Baffle Box® filter and an ultraviolet (UV) sanitization system.

Pretreatment filtration is provided by a precast concrete chamber located in line with the stormwater storage facility’s inflow pipe. Water flows through a metal screen that captures leaves, trash, and other floatable debris. After a storm event, the vegetation and litter are held above the static water to prevent the system from going septic. Sediment collects in a series of three chambers where deflectors prevent resuspension, and a boom and skimmer remove hydrocarbons.
Up to 90 percent of suspended solids are removed at this stage, resulting in cleaner discharge to the downstream storm sewer and, ultimately, to the West Fork of the North Branch of the Chicago River. The baffle box filter requires quarterly maintenance inspections and periodic cleaning of the filter screen and sediment chambers with a vacuum truck.

Before water is pumped from the sump area of the stormwater storage facility to the park’s irrigation system, it passes through a UV sanitization system. The sanitization system includes additional filtration to remove suspended solids that can reduce the effectiveness of the UV treatment. UV bulbs then kill bacteria and pathogens with radiation. This treatment method requires minimal contact time, and has the advantage of being chemical and odor free.

An automated controls system developed by B&W Control Systems Integration uses online weather forecast data to pump stored water to the downstream sewer in advance of large storms. By draining down the water stored in the sump area, the maximum stormwater storage volume is available when it is needed most. A touchpad control screen is located onsite in a locked enclosure. This touchpad screen can be used to perform system checks, adjust system settings, view alarms, and shut down or start up the system. A web interface is also available to monitor the system remotely.

**Scoring a win for flood mitigation**

The village celebrated completion of the Wescott Park Stormwater Storage Facility project and renovated park amenities with an official ribbon cutting ceremony on Nov. 15, 2016.

“The number one goal of the project was to provide property protection from flooding conditions,” Hamill said. “We were able to supplement this goal by including a rainwater harvesting system, which is a great example of stewardship for the environment.”

This approach to stormwater management and reuse earned the village and Baxter & Woodman a 2017 Special Achievement Award for Engineering Excellence from the American Council of Engineering Companies of Illinois.

“**This project demonstrates innovative thinking on solving several problems,**” Yurik said. “**If communities are willing to partner with local agencies to fund and construct similar projects, future water shortages and flooding could be greatly reduced.”**

Paul Siegfried has focused on designing effective flood mitigation projects and implementing creative stormwater management solutions for more than 10 years. He can be reached at (815) 444-3360 or psiegfried@baxterwoodman.com.
walking the path along Amazon Creek, it was apparent that the habitat was compromised. Creek banks were failing and undermining the path. Blackberries had taken over, choking out nearly all other plants. Something had to be done. In the summer of 2013, Eugene Public Works engineers started the Amazon Creek Stabilization and Enhancement project, with a focus on clean water, restored habitat and flood control.

The creek starts as two headwater streams in the foothills of southeast Eugene. Before the area was settled, the creek naturally spread through the valley as a braided network of small streams, floodplains and wetlands. As Eugene grew in the late 1800s, flooding around Amazon Creek became problematic to the settlers. Flood control became a high priority for the expanding city. The first recorded flood channelization project occurred in 1902, followed by efforts starting in 1913 to use horse-drawn pan scrapers to improve flow by removing silt and vegetation.

In the 1950s, the U.S. Army Corps of Engineers channelized Amazon Creek as a flood risk reduction project. The floodplains were drained and the creek was straightened and deepened into a single man-made trapezoidal channel. Amazon Creek runs the whole length of Eugene and drains more than 11,000 acres of urban and agricultural lands before flowing to the Fern Ridge Reservoir and the Willamette River.
The rainwater that used to slowly move across meadows and fill wetlands and floodplains now rapidly flows off buildings, parking lots and roads. This has resulted in increased pollution, higher flows and velocities, eroded banks, and a degraded creek bottom. This man-made channel was an unnatural environment for plants, invertebrates, fish, birds and mammals that live in and around the creek.

Changing community values and the enactment of the 1987 federal Clean Water Act, which mandated communities like Eugene to reduce the discharge of stormwater pollutants into receiving waters, have prompted significant action regarding the way Amazon Creek is managed today. In 1993, the City of Eugene adopted its first Comprehensive Stormwater Management Plan that set ambitious policies aimed at improving water quality, habitat, and natural resource functions of area waterways. Research shows that restoration efforts on rivers, floodplains, and wetlands improve water quality and habitat, and increase the populations of many aquatic species including migratory fish like salmon. Though restoration efforts on small creeks and streams in the urban environment are not as well studied they do have a positive impact on stream health.

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Amazon Creek and the Fern Ridge Path run through Garfield Park in the middle of a residential neighborhood. Over the years this 1,900-foot reach experienced repeated bank failures which were difficult to access and repair due to steep banks. The failures endangered a nearby medical office building and undermined the Fern Ridge Path in several locations. The creek also had bottom degradation and erosion at a downstream street bridge abutment.

The U.S. Army Corps of Engineers and the City of Eugene identified the creek as needing restoration in a master planning process in 2009. The goals of the multi-objective project included bank stabilization, improved water quality and habitat, and additional flood capacity. Ultimately this reach of Amazon Creek was an ideal location for restoration in an urban environment.

Relocation of the Fern Ridge Path was a key component that needed to be addressed before the City could begin the creek restoration. Due to the advanced master planning of the project, Eugene Public Works was able to secure American Recovery and Reinvestment Act (ARRA) “shovel ready” Federal Highway Administration funds to realign the path in 2012.

Construction of the restoration project began in August 2013 and was originally planned to be completed by October 2013. The Eugene area experienced five times the average rainfall in September 2013. The project required dewatering the creek in phases. The heavy rains caused creek flows that far exceeded the ability of the contractor to dewater the work areas. It soon became apparent that progress to complete the project in 2013 was going to be impossible. The engineer and contractor agreed to stop work on the project in late September and resume work the following summer. The contractor was able to successfully complete the work by fall 2014.

Despite unforeseen challenges, many factors contributed to the success of the project. Eugene Public Works staff proactively managed the construction with an inspector onsite full-time to monitor and assist the contractor. A construction manager and engineer visited the site almost daily to support the
inspector, and a Certified Sediment and Erosion Control Lead (CSECL) helped to assure compliance with environmental permits.

Eugene Public Works used Auto-CAD Civil 3-D modeling software for design and survey-grade Global Positioning System (GPS) equipment for construction staking and grade checking which aided in efficiency on many levels. Using GPS with the 3-D model for instant grade checking allowed the contractor to perform excavation and finish grading in a single operation. Eugene Public Works was able to confirm grade control quickly and easily. The use of 3-D design software and GPS control technologies reduced staff time in design and construction monitoring, and saved time and money as it sped up the excavation work.

The engineer designed several modifications to the creek geometry with the intent of improving water flow

Reshaped creek bend, boulder wall and low-flow channel after construction
characteristics, adding capacity, and protecting against down-cutting and erosion.

The original wide and flat-bottomed channel which perpetuated slow, warm summer flows and ideal conditions for algae and bacteria growth was reshaped into a narrow, low-flow channel. This change increased low-flow water velocity, reducing summer time thermal impacts and ultimately improving water quality through reduced bacteria and algae growth.

Construction of the low-flow channel moved the creek bottom more than 14 feet and increased the radius of the creek’s bend through the park. A boulder wall was built along the outside of the bend. The boulder wall and longer radius will reduce energy and prevent erosion of the banks. Boulder walls were built at bridge abutments and bioengineered soil wraps stabilized the banks throughout the reach. Inverted vortex weirs were built with boulders in three locations to direct water energy into the middle of the channel, further reducing erosive forces along banks. These measures have stabilized the creek to protect the buildings and critical infrastructure along this reach.

A floodplain bend was excavated on the north side and the bank slopes were “laid back” along the entire reach through excavation and contouring. These changes significantly increase flood capacity and reduce velocities during high flow events.

Grass and invasive species like blackberry vines were removed and replaced with more than 13,000 native plants including willows, shrubs, trees, grasses and wildflowers. The plants have stabilized the banks, added shade, and improved habitat, all creating a natural environment that has attracted birds to the park.

Engineers also focused on natural materials for the project. The boulders used for walls and weirs, and river rock used as natural stream bed material were locally sourced. Willows were harvested locally from other reaches of Amazon Creek. The contractor integrated soil excavated from the floodplain area into the soil wraps used for bioengineered bank stabilization. Natural coconut husk coir fabric, an abundant natural by-product of the coconut industry, was used for soil wraps and permanent erosion matting. The boulders and river rock blend into the natural environment and native plants improve wildlife habitat.

Although the original reason for this project was bank stabilization, the City of Eugene took the goals of clean water, habitat restoration and flood control to a new level. Eugene Public Works transformed this reach of Amazon Creek and Garfield Park into a refuge for the community and for nature. The restoration project received an Environmental Project of the Year award from the APWA Oregon Chapter in 2016. Through clean water, enhanced habitat, added flood capacity, improved recreation and transportation, this project demonstrates the benefits of restoration in an urban environment.

Doug Singer can be reached at (541) 682-8460 or Doug.k.singer@ci.eugene.or.us.

Spring wildflowers and native grasses draw birds to Garfield Park.
Navigating PWX in a wheelchair

Ravyn Whitewolf, P.E., PMP, AVS, PWE
Public Works Director
City of Blaine, Washington
Member, APWA Engineering and Technology Committee

As a civil engineer who has designed and constructed countless projects that include the ADA (Americans with Disabilities Act) requirements, I have always been sensitive to the purpose for which they are intended, but also critical of how frequently the standards change, and the inconsistency in which they are applied across different jurisdictions. For example, many designers and local agency staff have experienced frustration with the many changes in curb ramp requirements, such as the changes to “truncated domes” (the yellow dotted squares required in some states at the bottom of ramps where the concrete meets the asphalt). Some of these changes include color, application and location of the domes as well as various other changes related to curb ramp (width, slope, and “landing” requirements behind the ramp).

Imagine my surprise when my personal circumstances landed me in Minneapolis last summer in a wheelchair. First, I should mention that I deliberately reserved a hotel room several blocks from the convention center with the intention of enjoying a walk at the beginning and end of each day. I had already paid for my plane ticket and hotel reservations, and because of my responsibilities on two APWA committees, cancelling my plans to attend PWX was not an option. So, when I broke my foot on vacation three weeks before the conference, I realized that a wheelchair would be the only way to keep those commitments. I was not aware that APWA offered ADA assistance on their registration form since I was already registered; however, I was lucky to make arrangements to borrow a wheelchair from my hotel for the duration of my stay. Minneapolis here I come!

Airports, I was happy to learn, are very accommodating with “gate to gate” assistance for disabled passengers. What I didn’t realize until I experienced it making flight connections, is that some airports (possibly so they aren’t stolen?) only provide wheelchairs with tiny rear wheels that need to be pushed by another person in order to move. What this means in reality is that once you are delivered to the gate by an airport attendant, you are stuck there until your flight boards unless you ask them to take you to the restroom or to get something to eat. With a layover of more than an hour, this becomes pretty awkward. Other wheelchairs, in order to accommodate the most diverse number of travelers, are so wide that self-propelling is very difficult without bruising the inside of your arms. My hotel room was at the far end of a corridor, and the ramp to the dining area was blocked by chairs that were being used to delineate a closed section of the facility. Despite these challenges, the people I encountered were very patient and helpful, and my overall travel experience was reasonably pleasant.

Propelling myself to the conference each morning was an invigorating experience. Once at the conference center, I was able to easily find the check-in area, but initially needed help finding the elevator because the directional sign was so far down the hall. The opening session was very accessible, with ample flat areas in the back of the auditorium to accommodate my wheelchair. Maneuvering in the bathroom was a bit more difficult, as most of the handicapped stalls were so close to the entryway doors that wheelchair
acrobatics were required in order to gain entry. The exhibition hall was a bit overwhelming, although the vast space might be so for healthy-legged people as well. Once I figured out the layout and discovered how to use the directional signs to locate specific events and display areas, I thoroughly enjoyed the variety of the exhibits (even though I didn’t win any of the offered raffles). Getting into some of the sessions was a challenge as, despite my best efforts, I was often late and they were frequently crowded. I was greatly appreciative of finding healthy food options within the conference center so outside transportation wasn’t needed until the evening. This afforded me more time to explore opportunities within the conference center, network with colleagues, and visit the APWA bookstore and sponsored events that were occurring simultaneously all day.

When not participating in arranged nighttime activities, I chose to use the skyway instead of the city streets for transportation since it was so warm outside. These overhead glass transportation corridors, unique to downtown Minneapolis, provide above-ground pathway with connections to stores, restaurants and hotels for pedestrians who want to avoid the severe temperatures or traffic in the area. Since the skyway doesn’t follow the traditional street grid, it can be confusing when on two legs, but moving around in a wheelchair was even more bewildering. One kind stranger, when he saw my matching APWA name tag, offered to wheel me as far as his destination. A security officer was equally courteous, when helping me to an elevator back to the street level after notifying me that the skyway was closed. (Whoops, it closes early on weekends.) Because of the layout of this aerial maze, I would often end up traveling farther to my hotel than if I had taken surface streets, providing a great workout. Overall I found good transportation links although getting around construction sites was challenging. One night, I went to dinner with a friend who offered to push me in the wheelchair back to the hotel. I discovered, the
hard way, that handicapped ramps that are too steep can be hazardous if your seated center of gravity is not all the way on the back wheels of the wheelchair. I picked myself off the pavement and we had a good laugh about it after determining that I was not further injured (except my ego perhaps). Safely back at my hotel with a short stop at the bar to settle my nerves, I realized how different the outcome might have been if a car had turned the corner at the wrong time.

The experience of traveling to PWX in a wheelchair, while not something I care to repeat, overall was positive and very eye-opening. Despite my training in intersection design, the numbers of videos I have watched of the disabled traveling on city streets and the sensitivity I thought I had for the plight of the handicapped, nothing prepared me for my experience in a wheelchair for that length of time. Further reflection revealed to me how important it is to have functional ramps at all intersections as well as compliant alternatives when construction or other barriers are in place. Handicapped stalls in restrooms are great, but they need to be located away from the entryway so that the stall door can be pulled open without having to do acrobatics on wheels to get in (especially in light of the urgency that usually accompanies one going there). Finally, and most importantly, take care of yourself and don’t step in a pothole when you are on vacation or otherwise break a limb if you can help it.

It is so easy to take for granted the abilities we have when we are healthy. I feel very fortunate for this experience and the people who “stepped up” to help me. Now that I am back on two legs, I plan to continue to “pay forward” that kindness, both in my professional work and my daily life.

Ravyn Whitewolf is Public Works Director for the City of Blaine, located in northwest Washington State, and has been in the public side of the public works profession for 25 years. She serves on the APWA Engineering and Technology Committee and has been an APWA member for 15 years. Ravyn also serves on the WA State Design Standards Committee and previously served on the Project Review Committee for the WA State Capital Project Review Board for design-build projects. She can be reached at (360) 332-8820 or RWhitewolf@ci.blaine.wa.us.

APWA’s meetings and events are held in venues that meet the necessary requirements under the American with Disabilities Act. APWA has a full complement of meetings staff available to assist with making any special arrangements necessary for attendees and exhibitors. If you are in need of assistance please contact the APWA Meetings Department at pwx@apwa.net or (816) 472-6100.
Qualification-Based Selection: A recipe for a successful partnership

Ravyn Whitewolf, P.E., PMP, AVS, PWE
Public Works Director
City of Blaine, Washington
Member, APWA Engineering and Technology Committee

Qualification-Based Selection, often referred to as QBS, was originally established by the U.S. Congress in 1972 by the Brooks Act. Currently it is used as the standard for selecting engineers and architects for projects utilizing federal funds, and 44 states have adopted it as standard practice for all projects. In fact, many states are now incorporating qualifications into the mix when selecting construction contractors, where low-bid selection is usually the law.

The appeal of choosing a consultant based on qualifications is that it encourages creativity and innovation in the design of our public infrastructure. Since design costs are such a small percentage of the project lifecycle, the most qualified designer doesn’t always represent more project cost. It also helps put small firms on a level playing field with the larger firms as it provides the smaller firm with an opportunity to present their unique skillsets compared to the diversity of services offered by larger firms.

The process starts with a “request for qualifications” (RFQ) solicited by a public agency. The components of an RFQ often comprise the following:

I. Clear description of project, with adequate detail to determine tasks and products
II. Project constraints, including time and budget
III. Concerns/challenges to be addressed in proposal
IV. Proposed project schedule
V. Selection and scoring criteria matched to scope of services if possible. These often include:
   a. proposed scope/approach
   b. proposed schedule
   c. team structure
   d. example projects
   e. qualifications of team
   f. references
VI. Clear directions for submittal, including page limitations and due date, allowing adequate response time
VII. Professional services contract template
VIII. Reference documents

For the consultant, it is critical that the responding proposal should follow the directions precisely. It is very important to show your firm’s understanding of the project, including pointing out challenges and how you will address them. It is absolutely okay to respectfully point out errors to the extent that it demonstrates your abilities, not tout them. It is great to exhibit your prowess with visual presentation, but make sure your formatting is legible, understanding that the agency staff often reviews dozens of these at a time. If the public agency is kind enough to provide you the selection criteria in advance, it is critical that you identify the criteria in your response, to simplify scoring as much as possible. Many consultants try to meet with agency personnel prior to the release of the request for qualifications and some companies don’t submit a response if they are

DIFFERENT PERSPECTIVES ON QBS

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<th>PROS</th>
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<td>Focuses on qualifications</td>
<td>Budgets aren’t always realistic</td>
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<td>You get what you pay for</td>
<td>Hard to predict, plan for costs</td>
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<td>Negotiation = Ownership</td>
<td>Time consuming</td>
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<td>Experience is indicator</td>
<td>Negotiating skills needed</td>
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<td>Promotes ingenuity and innovation</td>
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An example could be, “Describe your understanding of the project and how the team you have formed is the best to address the challenges identified in the proposal.”

Unless the agency already has an established working relationship with the teams it is considering, holding interviews, while time consuming, is really essential. It is very important that a synergy develops between the agency’s and the consultant’s project managers. As far as interview formats are concerned, many interviews are like a live version of the proposal. This approach is not the best use of time (consider the hourly rate of all those in the room and you may agree) of those involved. Why go through the process of the interview if you can’t learn things about the consulting team that weren’t in the proposal? How about time management, team interaction and dynamics, creativity, and how teams respond to stress?

One method to make the interview more interactive is for the agency to provide the consultant with questions in advance (typically 4-5). These questions can be derived from the project challenges identified in the proposal or other topics that might distinguish your finalist teams from one another. An example could be, “Describe your approach to handling the wetland impacts caused by the project while keeping the project on schedule.” The teams should be advised to answer the questions in whatever way they wish but a time limit (typically 20-30 minutes, depending on number of questions) is recommended and should be enforced. It is helpful to provide the consultant with the names of the interview panel members, and request that they limit the number of members of their team at the interview to a maximum of 4-5. Finally, the consultant should be informed that there will be additional questions from the interview panel after the presentation and that they will have opportunity for questions of the panel at the end of the interview. This approach not only expands upon the project proposal, it provides additional information about the project from various perspectives. In addition, this interview format drills into these other valuable team qualifications and characteristics that are very helpful in the final firm selection. By communicating information about the interview structure and timing in advance, panel members and interviewees have a much better idea of what to expect, making the experience a lot more valuable for all those involved.

Once a consultant is selected, the next step is for the consultant and agency to negotiate the scope and fee. This process can take some back and forth, but is usually successful. The scope and fee are then wrapped into a professional services contract. Contract elements are different for every agency, but some of the common elements include:

- Clear scope and expectations of deliverables
- Define deliverables and what is and isn’t expected
- Roles and responsibilities
- Schedule: work breakdown structure, milestones
- Types of contracts and payment methods
- Address issues of changes in personnel, change management
- Invoice terms
- General and professional liability insurance
- Standard of care and indemnification
- Dispute resolution

It is recommended that you get the input from your attorney for contract elements such as liability, indemnification and dispute resolution as these are very specific to you and your industry.

The teamwork experienced when working with a consultant can be one of the most rewarding experiences on a project, and the relationships created can exist throughout your career. Team is the important word here, as very few projects are handed off to a consultant completely, and while an agency may be looking to a consultant for expertise, it doesn’t mean that agency staff doesn’t have a lot to contribute to the final picture. That all being said, it is important to allow the consultant the freedom to be creative, as long as it doesn’t lead to that dreaded word: scope-creep. Communication styles are different with every project team, so have the conversation early about frequency of project updates and stick to them! Dialog works both ways, so being candid with each other about your needs is critical for your project to succeed.

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Resources:
- http://www.acec.org/advocacy/qbs/

www.apwa.net  /  June 2017  /  APWA Reporter 37
What do you know? Public Works Organizations and Knowledge Management

Andrew C. Lemer, Ph.D., Senior Program Officer, the National Academies of Sciences, Engineering, and Medicine, Washington, D.C.; Chair, APWA Engineering & Technology Committee

...t happens all the time. Someone in the department who really knows her job gets a promotion or retires and her coworkers who remain behind discover that they don’t have a clue about many of the things their former colleague did so well. Who were the key contacts on that road project? Why is the computer network set up this way? Where are those old drawings and specs stored? Knowledge important to the smooth running of the organization has been lost.

We all have knowledge and we use it to make decisions and guide our actions, working alone or collaborating with others to get things done. We can build or expand our knowledge by drawing on information stored in books or file drawers; by being trained, taught, or mentored by others who know more about a topic or task then we do; and by experience, practice, and learning on the job. However we get it, the knowledge is uniquely ours and how we use it can make a real difference to whatever organization we are part of.

The collective knowledge of a public works organization’s employees and partners is a valuable asset—human capital. Knowledge Management (KM) is a set of practices intended to help the organization retain, enhance, acquire, and effectively apply its knowledge. The exact causal relationship between knowledge and productivity is difficult to measure, but a survey of senior European corporate executives found that two-thirds put business intelligence and KM solutions at the top of their lists of technologies important to achieving an organization’s strategic goals.

KM began to emerge as a discipline in the 1950s. Today its practitioners draw on theory and practices from diverse sources including personnel management, information sciences, education, economics, and psychology. KM tools include personnel training and succession planning, information archiving and retrieval technologies, communities of practice and social media, and more.

Any leader of a group of people can apply KM but doing it well takes some forethought. To be effective, KM activities must be suited to the way an organization is structured and goes about its business and they must have the support and participation of people throughout the organization. Such diverse organizations as the World Bank, Kraft Foods, and the Michigan Department of Transportation are using KM.

The World Bank—more formally, the International Bank for Reconstruction and Development—lends money and provides supporting technical services and strategic advice to help developing countries expand their infrastructure and their economic and social capabilities to raise the incomes and living standards of their people. The Bank offers extensive learning opportunities to its borrowers to enhance their knowledge of best international practices in engineering and financial management. Kraft Foods, now a division of Kraft Heinz Company, makes and sells a variety of popular grocery store items. Company experts nearing retirement undergo an extensive series of interviews to document details of product development, manufacturing, packaging, and marketing for which she or he was responsible; the information gathered is archived in computerized “knowledge books” and made available as a reference to others in the enterprise. The Michigan Department of Transportation is responsible for nearly 10,000 miles of state highways; and programs for aviation, intercity passenger services, rail freight, and local public transit services. The agency has adopted a paperless process for administration of design and construction, relying extensively on mobile devices and supporting quick access to project information in the office or in the field, to support and extend staff and consultants applying their knowledge throughout the facility development process and after project completion.

The growth of KM is in large part a result of rapid expansion of technologies for communication and information storage, processing, and retrieval; and the successful experience of corporations like Amazon, Southwest Airlines, and Zappos that have prospered by being particularly effective at teambuilding and knowledge sharing. There are many articles...
and books that offer advice on setting up and using KM and present examples of how such organizations have done it. The advice typically falls into four principal areas: KM leadership and direction; learning and communities of practice; knowledge capture and sharing; and skill-set management and succession planning.

- **KM Leadership and Direction** – KM engages the whole organization but commitment and leadership from the top are essential to making it work. There needs to be an identification of the areas of knowledge that are critical to the organization’s goals and functioning. For a public works department, essential knowledge certainly includes the community’s facilities and systems, but also operating relationships between the department and other organizations such as police, fire, and City Hall. There needs to be also an explicit definition of the activities designed to maintain and expand the department’s knowledge and performance measures to track these activities.

- **Learning and Communities of Practice** – Bringing together people who face similar challenges gives them an opportunity to share their knowledge and learn from one another. It also helps develop a culture of improvement and pride in achievement. Communities of practice can extend beyond the public works department to other government units and other jurisdictions. A number of web-based and mobile apps have been developed—some of them free for small groups—that facilitate formation and operation of these interest groups and knowledge exchange among the members. APWA’s Technical Committees and infoNOW service are tools that can help form and support communities of practice.

- **Knowledge Capture and Sharing** – Knowledge capture can be accomplished through formal procedures like those used at Kraft Foods or less formally through mentoring and shadowing practices. Turning in an individual’s or group’s knowledge into recorded information allows for storage and retrieval, for example through Internet portals and wikis. Assigning a departmental staff member to work with a consultant team or having a new employee accompany and assist a seasoned staffer for a period of time are examples as well. Such activities facilitate not only the sharing of knowledge among the department’s employees and partners, but also help to establish a common vocabulary and understanding of the organization’s business processes and history; they can improve employees’ effectiveness in applying their knowledge to doing their jobs better.

- **Skill-Set Management and Succession Planning** – Sports-team managers and coaches know well that the team is strongest when its members fit together well, without too much overlap and no significant voids in the skills required to play the game. While many people may think about succession planning only for top leadership, practicing Knowledge Management draws attention to the possibilities that any member of the team may be taken out of action at any time. Skills and capabilities are matched to the areas of knowledge critical to achieving the organization’s goals and effective operation.

Knowledge Management is not yet practiced among many public works agencies, but asking around and Internet search yield some diverse examples: Arlington, Texas; Anne Arundel County, Maryland; Sacramento, California. Each of these agencies has implemented KM in a way that they feel is worth presenting to the public. The City of Arlington, a part of the Dallas-Ft. Worth area, has established an Office of Knowledge Management, “focused on the intellectual capital within the organization...that assists employees in accessing relevant data in a fast and efficient way, and re-using it as part of normal work processes. The division’s primary focus is on identifying, creating, representing, and distributing knowledge for re-use, awareness and learning across the organization.”

That kind of vision seems more typical of high-tech startup companies than local government agencies. But we are all learning that we need to make the most of our assets. Looking to Knowledge Management as a way to gain big payoffs in public works seems like a no-brainer.

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.

**CORRECTION**

The heading/caption included with the photo on p. 13 in the May issue of the Reporter was inadvertently misleading. APWA did not meet with Senator Amy Klobuchar directly, but met with her staff. We regret the error.
Close tolerance HDD is changing the open cut industry

Ted Dimitroff
President
Trenchless Consulting, LLC
Columbia, Missouri

Close tolerance HDD/CTHDD uses a standard directional drilling machine combined with specially designed tools and process that allows the new pipe to be installed within a close tolerance back-reamed hole, typically ¼ to ½ inch larger than the pipe being installed. The process has 100% control of drilling slurry pressure. The tight fit, back-reamed hole prevents pipe movement and soil settlement. Vertical holes known as “sight relief holes” ensures that the pilot stem is online and on grade while controlling fluid pressure and lubricating the pipe during installation. The largest pipe installed so far is 30-inch RCP, the deepest project was 42 feet deep, and .15% is the flattest percent of grade to date.

It has taken many years for CTHDD to be accepted by engineering firms. Open cut projects have been completed using CTHDD in Edmond, Okla.; St. Louis, Mo.; Jefferson City, Mo.; Germantown, Tenn.; Lexington, Ky.; Greenville, S.C.; Baton Rouge, La.; Shreveport, La.; Orange County, Fla.; Broward County, Fla.; and most recently in Melbourne, Fla. CTHDD projects are now in design, and currently out for bids in many areas beyond the listed locations.

CTHDD has installed over 70,000 feet of flat-grade gravity sewer systems, shallow-depth large diameter mainlines, deep-lift station mainlines, portable and force mainlines, concrete storm pipe and steel casings all done using CTHDD. Pipe materials have included PVC, Hobas pipe, RCP, clay tile, steel, HDPE, and ductile iron. Recent field testing of new tool designs now allow CTHDD to remove and replace clay tile sewers and asbestos mainlines.

Florida has accepted the CTHDD method to greatly reduce the social, economic and environmental impacts that the open cut method creates. Dewatering is not needed unless there are service connections. CTHDD allows engineering firms the ability to design projects in narrow areas between the curb and sidewalk and not in the street.

Testing was recently completed on new tool designs that can make lateral connections without large open cut excavations. The complete package to change open cut mainlines and laterals to trenchless is now market-ready, but is the market ready for trenchless? That is the question.

Fully-trained service providers are now in the Midwest and Southeast with more contractors considering the training.

Ted Dimitroff can be reached at (573) 268-2294 or ted@trenchlessflowline.com.
Laser and sight hole

Complete on-grade setup

Pipe laser setup

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Laser and sight hole
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Construction Inspection 201: Project Management

This 24-course program includes sessions on communication, contractor relations, plans and specifications, meetings, scheduling, documentation and more. Courses can be purchased à la carte or in a program bundle in the APWA Store.

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APWA's new eLearning educational programs allow you to access curriculum outside a traditional classroom setting using online technology. These easy-to-use courses feature slide-based content, simple navigation buttons, and quizzes with true/false or multiple choice questions to educate and train participants on public works topics.

All APWA eLearning programs will be accessible through APWA’s new, comprehensive eLearning Portal. With the eLearning Portal, users can access their program purchases, view content, complete evaluations and track and report their progress from any digital device.

Start your APWA eLearning journey today!

For more information send an email to lms@apwa.net or go to www.apwa.net/elearning.

CEUs:
Participants qualifying for .6 CEUs/6 PDHs upon completion of the program.

CPIIs:
Upon program completion, Certified Public Infrastructure Inspectors (CPII) are eligible for 6 continuing education hours toward recertification.
Products in the News

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.

No-Dig Snap-Tite® relines damaged culverts in a “snap”

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).

STRIPE-OFF™ makes cleanup of striping paint overspray a breeze

STRIPE-OFF™ makes cleanup of striping paint overspray a breeze. Just apply STRIPE-OFF™ before you begin striping and it will prevent quick-drying, water or solvent-borne thermoplastic and epoxy-based paints from bonding to your striping machines, gun packs, tires, and stencils. Now all you have to do is simply flush or wipe off any striping paint overspray accumulations. It’s that easy! For more information, call RHOMAR Industries, Inc. at 1-800-688-6221.

Hardliner: the disposable sanitary hard hat liner

The Hardliner™ is a disposable hard hat liner that will assist in preventing diseases of the hair and scalp. It will also save time and money cleaning and sanitizing the hat. Millions have been sold in work places where more sanitary conditions are a priority, especially to those sharing or borrowing hats. Saves time and money cleaning and sanitizing hard hats. Easy to use, just place over hard hat suspension. When soiled, remove and dispose of. Hardliners has been sold outside the U.S. as well. Hardliner was actually invented by a former Plant Manager who saw the need for a more sanitary way to have clean hard hats. For a free sample and/or information, please contact GKR Industries at 800-526-7879 or kris@gkrindustries.com and refer to code “Liners APWA.”
ClearSpan Fabric Structures is the industry-leading manufacturer of tension fabric buildings, offering American-made structures with in-house engineering, manufacturing, financing and installation. These structures provide energy-efficient, economical solutions for snow management, construction, and sand and salt storage. ClearSpan Hercules Truss Arch Buildings feature abundant natural light and spacious interiors without support posts, allowing easy clearance for forklifts, dump trucks, skid loaders, conveyers and other heavy machinery. Every Hercules Truss Arch Building is custom engineered to fit the building requirements of the specific location. With minimal foundation requirements, the structures can be permanent or temporary, and are easy to relocate. For more information, please visit www.clearspan.com or call 1.866.643.1010.

Bark for Your Park™ Program

PetSafe® Brand will award 25 communities over $250,000 in grants during the 2017 Bark for Your Park™ Program. The grants include five New Park Awards valuing $25,000 each, 10 Makeover Awards valuing $10,000 each, and 10 Enhancement Awards valuing $5,000 each. May 1–June 30, 2017, communities can submit a grant application on www.petsafe.net/barkforyourpark. Grant recipients will receive a combination of funds as well as commercial grade dog park equipment from UltraSite™, a PlayCore Company. The chosen communities will be announced in August. Since 2011, PetSafe Brand has invested over $1 million to help fund S2 off-leash dog parks. For more information, contact Justin Young, PetSafe® Brand, at jyoung@petsafe.net or (865) 824-5176, or visit www.petsafe.net/barkforyourpark.

Stronghold Coatings introduces MM1018, a polymeric metal material that provides 100% force fit gap compensation for the repair of concrete and steel bridges, power plants and utility construction projects, offshore drilling rigs, wind turbines, and other demanding high-load, critical environments. This high-performance repair product provides 100% volume restoration inside the gap between bearing and construction without machining of back plate and face plate. It combines high compressive and shear strength, excellent vibration damping, and long-term corrosion protection in extreme service conditions (vibration, temperature extremes, etc.), and is resistant to weathering and aging, as well as gasoline, oils, coolants, acids, lye and more. For more information visit www.StrongholdOne.com.

Walter Surface Technologies launches E-Weld Plasma™, long-lasting protection for laser and plasma cutting tables

Walter Surface Technologies, the global industry leader in surface treatment technologies, announces the launch of E-Weld Plasma™, a revolutionary ceramic, water-based, anti-spatter solution that is applied to laser and plasma cutting tables to reduce slag buildup. A true innovation in plasma and laser cutting, E-Weld Plasma™ offers a simple yet efficient means of providing long-lasting protection—even under extreme heat—by inhibiting the adherence of slag. E-Weld Plasma is applied to plasma and laser cutting tables with an ergonomic arm-mounted applicator. Users can quickly and easily coat areas as large as 500 square feet. A first-to-market product, E-Weld Plasma™ is applied by painting or spraying. More information is available at: www.walter.com.
DON'T MISS THIS CHANCE TO GET IN THE APWA REPORTER'S TRANSPORTATION AND PROJECTS OF THE YEAR ISSUE

The deadline to reserve your space is June 10

Don't miss this opportunity to advertise in the July “Transportation” and “Projects of the Year” issue. Our transportation articles will feature topics such as road maintenance, construction, traffic controls and paving materials. And the Projects of the Year award is a great honor and our members will be looking eagerly to the issue to see which public works projects have been chosen.

Call Fox Associates at (312) 644-3888
EDUCATION AT YOUR DESKTOP

For more information about these programs or to register online, visit www2.apwa.net/Events. Program information will be updated as it becomes available. Questions? Call the Professional Development Department at 1-800-848-APWA.

2017

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<tr>
<th>Date</th>
<th>Program</th>
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<td>June 15</td>
<td>Bicycle Infrastructure: Where the Rubber Meets the Road</td>
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<td>July 17-20</td>
<td>CSM, CPII and CPFP Certification Exams (computer-based testing)</td>
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<td>August 27-30</td>
<td>2017 PWX, Orange County Convention Center, Orlando, FL</td>
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<td>September 25-28</td>
<td>CSM, CPII and CPFP Certification Exams (computer-based testing)</td>
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<tr>
<td>November 6-10</td>
<td>CSM, CPII and CPFP Certification Exams (computer-based testing)</td>
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2018

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<tr>
<th>Date</th>
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<tr>
<td>May 6-9</td>
<td>2018 North American Snow Conference, Indianapolis, IN</td>
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<td>August 26-29</td>
<td>2018 PWX, Kansas City, MO</td>
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2019

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<tr>
<td>May 19-22</td>
<td>2019 North American Snow Conference, Salt Lake City, UT</td>
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<tr>
<td>September 8-11</td>
<td>2019 PWX, Seattle, WA</td>
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</table>

= 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/

Bicycle Infrastructure — Where the Rubber Meets the Road
Thursday, June 15, 2017
11 ET / 10 CT / 9 MT / 8 PT
UPCOMING APWA EVENTS

PWX
2017  Aug. 27–30  Orlando, FL
2018  Aug. 26–29  Kansas City, MO
2019  Sept. 8–11  Seattle, WA
For more information, contact David Dancy at (800) 848-APWA or send e-mail to ddancy@apwa.net.

National Public Works Week: May 20–26, 2018
Always the third full week in May. For more information, contact David Dancy at (800) 848-APWA or send e-mail to ddancy@apwa.net.

North American Snow Conference
2018  May 6–9  Indianapolis, IN
For more information, contact Brenda Shaver at (800) 848-APWA or send e-mail to bshaver@apwa.net.

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When you contact an advertiser regarding a product, please tell them you saw their ad in the APWA Reporter. Thanks! – The Editor

Legend: IFC = Inside Front Cover; IBC = Inside Back Cover; BC = Back Cover

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7/30–8/2  Institute of Transportation Engineers, Annual Meeting and Exhibit, Toronto, ON, www.ite.org

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4–6  2017 Next Generation Water Summit, Santa Fe, NM, www.nextgenerationwatersummit.com
4–7 National Association of Regional Councils, NARC’s 51st Annual Conference & Exhibition, Monterey, CA, www.narc.org

AUGUST 2017

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