Making the Incident Command System meaningful to utility workers

see page 46
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On the cover: Pierce County sewer workers used a real project as an Incident Command System exercise and came away with a new appreciation for emergency management. Right to left going around the table, starting with the closest person: Gloria Van Spanckeren, Senior Planner (navy blue jacket); Clint Sumerall, Maintenance Supervisor; Larry Butner, Maintenance Manager (gray shirt); Jeff Roscoe, Construction Engineering & Inspection Supervisor (orange vest); Scott Roth, Maintenance Program Manager; and Kristin Tinsley, Communications Coordinator (now with the City of Seattle).
A t the risk of sounding like a broken record, public works professionals are considered first responders (Homeland Security Presidential Directive 8; December 17, 2003). With that said, the term “first responder” is not just another title, but a responsibility. Before going into more detail on how to improve trust with other first responders such as police and fire, it is essential that all of us in public works understand how important the first responder responsibility is. When responding to a situation the priorities for response are life, property, and environment. So when an event occurs that threatens life, property, or the environment we cannot just simply wait to be asked to assist. We must proactively reach out to our first responder colleagues and ask if we can assist and what we can do. This responsibility for communication is jointly shared. If we have the skills and equipment to respond to an event, it is our responsibility to reach out to the right people to ask if we can be of assistance. Remember, the people involved in the incident are focused on dealing with the situation at hand to the best of their abilities with the tools they have. They have a lot going on and trying to figure out what others may have and how to get in touch with the resources may be not feasible considering the conditions. Now, just because we offer assistance does not mean that we have to be accepted. And if our offers are not used we should not take that personally nor should that stop us from offering assistance in the future. The first responder community is about relationships, relationships which take time to develop and a commitment to maintain.

While we have a responsibility to offer assistance, it is important to recognize that for a long time there has been the feeling within the public works community that we are not seen in that first responder role by others. There is no doubt that everyone within the first responder community has room to improve with regards to communication and coordination with others. I would submit to you that the basis for any real improvement in communication and coordination, especially between public works and other first responders, will fundamentally come down to trust.

To start, the idea of trust needs to be put in the first responder context. As Phil Mann said in an APWA Reporter article (January 2013, page 48), that in the 24/7 world of fire and police, “absence any other support or information, they will resolve the situation and move on to the next.” Understand that they will resolve the situation the best they can with only the tools and skills that are readily available to them. This approach is not a bad thing and that is how they have been trained, but public works professionals need to be aware of this mindset and understand how it impacts working relationships.
As an example of how the police or fire training and approach play out, consider a normal fire situation. While the focus of the fire department’s response is protecting lives and property, it is really a team effort in that public works is responsible for the streets that get the fire department to the scene, maintenance of the fire hydrants, and providing a steady, reliable source of water to put out the fire. The fire department trusts that public works will have those resources in place and this is a great starting point for additional opportunities to build personal connections and respect the role that each group serves. In one community I worked in, our water division staff were notified any time the fire department flowed water from a hydrant to fight a fire. This allowed them to monitor water pressures and tank levels in the system to ensure that firefighting operations could continue uninterrupted.

Improving the working relationships with our partner first responders is a good practice and will benefit everyone. This has to be done with the reality that improving communication and coordination will take dedicated efforts over a long period of time. As with any change, it is important just to start somewhere. Within the first responder community the core of the duty is about protecting life, property, and the environment. Because of the types of situations first responders can be involved in, the first thing to do is focus on trust which includes both building and maintaining it.

Many books have been written on trust but two that have straightforward concepts and actionable ideas are *The Speed of Trust* and *The Trust Edge*. While the key points are listed at the end of this article, here are some important takeaways for public works.

As public works professionals, either we need to be all-in as first responders or not. The first responder community is in it together; they care for each other and share that connection. There is no middle ground for being a first responder because a middle ground creates a gray area. A gray area hurts the development of a reputation for consistency and delivering results.

Now, a given situation may not have a component where public works can or should respond, but the goal is to have police and fire trust us enough to call, knowing that we will do all we can (within our skills and abilities) to help. If they do not trust us, then they will likely not call and we should use that as an indicator for an area to focus on growth.

Trust has to be built at all levels. In most communities it will be the front-line staff or their immediate supervisors making the initial

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decisions after an emergency occurs. Police or fire supervisors need to know and feel comfortable calling the appropriate public works supervisor at any hour of the day or night when the emergency occurs. Sometimes people feel bad about making that call, but when the personal relationship is built beforehand, that police or fire staff will not have any hesitation in making the call.

Be clear on what services your specific public works staff can provide and what the outcomes will be. Transparency with our operations is not a bad thing and can help build the reputation of public works. Other first responders need to know what will happen when public works is brought into the situation; clarity on what we are doing and transparency on operations is key. Once public works arrives on the scene, they need to contribute to the effort and deliver results. Sometimes it can be tempting to just take in the scene, but as professionals public works crews are there to get the job done. Remember, the other first responders will be watching the public works staff and how the response goes. These observations have a high value on the building (or loss) of trust.

Building trust is not a quick or easy process and it should also not be taken lightly. One of the first actions needed may be letting go of some emotional baggage that is being carried within public works. That baggage could be frustration about an event in the past or feeling like one is not being treated as an equal with regards to being a first responder or budget allocations. Individuals and departments need to accept where they are at and make a plan to improve trust. The commitment to moving forward in trust is not easy and will not protect from future problems or letdowns. But a fresh foundation is needed for trust to be built within the first responder community.

As a public works department continues to establish itself in the first responder community, the first priority needs to be building trust with other first responders. Time is a valuable resource, but time spent building trust is well spent and will reap benefits over the long term. APWA’s Emergency Management Committee is committed to supporting all public works agencies in their first responder role. If the committee can be of any assistance to you or your organization, please contact them.

**Action Items**

1. Have public works staff do ride-alongs with police and fire, or sit-alongs in 9-1-1 dispatch centers. When possible, offer ride-alongs with public works operations to others.

2. Use existing city special events to improve communication and coordination between first responders. Even if a certain system or method has worked in the past, there are still likely opportunities to build a connection with the other staff and have informal discussions.

3. Police and fire primarily use radios to communicate. If your agency has radios as well, try to get them programmed so the radios can monitor the non-main police and fire talk groups. Just listening to what is going on with police and fire can help identify areas where public works can provide support. Offer these groups access to your radio frequencies as well, so they can contact you directly, not having to find a phone number and call. Hopefully, staff will become comfortable with using the radios to communicate and offer assistance during routine activities (such as offering to bring barricades to a fire scene so that police cars do not have to just sit and block a road) or during emergencies.

4. At the department-head level, go out to meals with public safety directors/chiefs periodically. Focus on building personal connections and then the work issues.

*The Trust Edge* by David Horsager’s pillars of trust:

1. Consistency
2. Clarity
3. Compassion
4. Character
5. Contribution
6. Competence
7. Connection
8. Commitment

*The Speed of Trust* by Stephen Covey’s behaviors of high trust relationships:

1. Talk Straight
2. Demonstrate Respect
3. Create Transparency
4. Right Wrongs
5. Show Loyalty
6. Deliver Results
7. Get Better
8. Confront Reality
9. Clarify Expectations
10. Practice Accountability
11. Listen First
12. Keep Commitments
13. Extend Trust
Politics moves to the background for many Americans, until the presidential campaigning starts. In recent years, candidates start to campaign earlier and earlier for president. In 2008, the last time we did not have an incumbent, it began only a few months after Congress was elected. Coverage of the presidential elections consumes a significant amount of time by the news media, and they often drive our collective conversations regarding what we demand of our government leaders.

Many perceive that Congress kicks its agenda until after the election, avoids tough votes, and heads back to their districts to campaign. While members do meet less during election years, with many members from both chambers gone during the summer to attend the national party conventions and during October to campaign, their time in Washington is more concentrated than ever before. Since 1947, Congress has passed more bills during election year sessions than in non-election year sessions. The election spurs Congress to move bills, even if they do not become law, because they can be talking points for their reelections.

Congress considers bills during election season that are often influenced by real-world events and media cycles. Two major events in recent memory significantly changed the plans of congressional leadership to avoid tough issues. In 2008, the economic crisis occurred within weeks of a close presidential election. The election that was driven by the Iraq War immediately became about domestic policy. Congress became consumed with how to deal with the banking crisis, and the ongoing battle between Senators Barack Obama and John McCain for the presidency played heavily into the eventual and controversial solution, the Troubled Asset Relief Program. The programs became law, but only after brass knuckle political fights among President Bush, the presidential candidates, and Congress.

The 2016 election has been in full swing for months again, and has been primarily focused on domestic concerns. That has quickly changed in a matter of days with the terrorist attacks in France. The debate over immigration has become a debate over refugees. Within days of the attacks, the House of Representatives passed legislation with a significant number of bipartisan votes related to the refugee situation. With President Obama in a lame duck position, his party is more willing to differ from his legislative agenda.

The French terrorist attacks have also changed the debate on the budget. In recent months, some Republicans were willing to shut down the government over the issue of abortion. Now, some are willing to do so over the issue of refugees as the media has concentrated on that issue since the attacks. The new Speaker of the House, Paul Ryan, had previously said that he intended to use the coming months to hold hearings and move legislation for dealing with the stagnant economy. Instead, we will see Homeland Security and the war in Iraq and Syria dominating legislation and hearings. The tone and scale of this activity will be heavily driven by the presidential candidates in both parties. Congress may want to head one way, but they will ultimately bow to events on the ground to keep up with the issues of the day. Get ready for a flurry of activity in Washington; unfortunately, this time may be spent more on creating talking points instead of solutions.

Josh Reiner can be reached at (202) 218-6734 or jreiner@apwa.net.
Emergency Management Committee: Engaging members and identifying needs

Teresa Hon
Professional Development Program Manager
Emergency Management Committee Staff Liaison
APWA Kansas City office

Just as the APWA Board of Directors has several priorities with an extra emphasis on a few, so does the Emergency Management Committee. This year’s work plan contains several goals, many of which can be overlapping. The work plan is ambitious but the committee feels the restructuring of the subcommittees will provide the needed support to address the following objectives.

- Public works professionals as first responders and relationship-building with other first responders
- Training and education – individually and at the chapter level
- Continue to support the FHWA Traffic Incident Management (TIM) training and encourage public works professionals to be trained
- Continue the exchange of information with our Canadian members
- Funding opportunities – Stafford Act, mitigation funding, other options
- Lessons learned from recent and as yet undetermined emergency events, e.g., Ebola, wildfires, South Carolina flooding

Fortunately, the committee is drawing to a conclusion on one of their top priorities—the previously mentioned restructuring of the subcommittees. In an effort to pinpoint priorities, subcommittees had been merged from the initial six in 2011 to just four in 2014. After reviewing input from subcommittee members it was determined that members wanted more guidance and clear expectations for meaningful deliverables. An evaluation of interests and needs of our membership led the committee to restructure into five standing subcommittees and one short-term subcommittee/task force (as needed).

- Canadian Subcommittee – this committee will continue their efforts to identify and discuss the unique needs of our Canadian members and offer suggestions based on U.S. experiences
- Education & Training Subcommittee – identify or develop training materials, e.g., exercise template, TIM program, FEMA courses
- Resource Subcommittee – identify materials available to public works professionals and assist in disseminating, e.g., hazard mitigation plans, technology and software which assists in preparing for reimbursement requests
- Chapter Advocacy Subcommittee – assist chapters in cultivating emergency management champions, educating members on their role as first responders
- Lessons Learned Subcommittee – identify what happened and the role public works had in the event
- Special interest/Hot Topic Subcommittee or Task Force – e.g., cyber security, pandemic, UAVs, flooding

APWA members interested in serving on one of these subcommittees should send a message to staff liaison, Teresa Hon (thon@apwa.net). Once the membership of the subcommittees has been determined, each subcommittee will establish their own mission and vision statement. With the assistance of a committee liaison, subcommittee members will determine their projects and goals for the coming months.

Public Works Professionals as First Responders

If you haven’t already read President Usher’s message at the front of the magazine, I encourage you to do so. An uphill battle public works is continually facing (other than lack of funding) is the important role we play as first responders. How can we expect police, fire and EMS to accept public works professionals as first responders if we don’t accept that role ourselves? It is time for public works to stop being the humble, everyday heroes and get the word out. The time is now for grassroots efforts within our profession. Not only are public works professionals frequently the first one in, but also the last one out. Recovery lies solely in our hands, I once heard a member say “in their lifetime, most people will not interact with a police officer, fireman or emergency medical services personnel but they interact with public works and our efforts on a daily basis.” In the coming months the Emergency Management Committee will be working with the subcommittees to develop new ways to get a seat at the table in planning and response.
Training and Education

Increasing awareness of our members of training available for members is one of the top priorities. In addition to the archive of articles, Congress and CLL recordings available through the APWA Members’ Library, there are a number of free educational opportunities available from sources outside of APWA. FEMA funds the Emergency Management Institute which offers free online training as well as reimbursed onsite training at their facility in Emmitsburg, Maryland. Onsite courses range from the National Incident Management System to Virtual Table Top Exercises. Independent study courses offer four, in particular, which were developed specifically for public works professionals, IS-552, IS-554, IS-556 and IS-558 (see the sidebar for more information). An extensive list of courses can be found at www.training.fema.gov. The Texas A&M Engineering Extension Services (TEEX) offers a variety of online and onsite courses relating to infrastructure and safety, and homeland security. Many of these courses were developed using federal grant money and with the assistance of public works professionals. More information is available at www.teex.org. The National Highway Institute offers web-based training and the opportunities to host training which could be of interest to public works professionals, programs like #133107: Principles of Evacuation Planning Tutorial and #133101: Using the Incident Command System at Highway Incidents. To do a more thorough search, go to http://ops.fhwa.dot.gov/eto_tim_pse/about/tim.htm. There are also several programs regarding the program located in the Members’ Library under the Watch and Learn archive of articles, Congress and CLL or go to http://ops.fhwa.dot.gov/home.aspx and search for FHWA-NHI-133126. APWA will be providing additional information regarding training as it becomes available.

If you would like to learn more about the TIM program, check back issues of the January Reporter or go to http://ops.fhwa.dot.gov/eto_tim_pse/about/tim.htm. You can also email Teresa Hon to find out more about the training opportunities in your region, or to bring the program to your state or agency, contact TIMTraining@dot.gov at FHWA.

A free, four-hour, online training course supplements the in-person experience by providing immediate training until a course is available in your area as well as refresher training after you attend an in-person event. The course is offered by the National Highway Institute. To locate the course, go to http://www.nhi.fhwa.dot.gov/home.aspx and search for FHWA-NHI-133126. APWA will be providing additional information regarding training as it becomes available.

Your Emergency Management Committee is working hard to identify what our members need, monitoring trends and new initiatives so that they can bring the information to you. Those members are: Chair Michael Sutherland (Town of Parker, CO); Leon Berrett, MS, P.E. (Salt Lake County Public Works, UT); Teresa Smith, P.E. (A&S Engineering, Evans, GA); Jeff May, P.E. (City of Clive, IA); Mary Wilson (Town of Herndon, MD); Phil Mann, P.E. (City of Gainesville, FL); David Bergner (Mesa, AZ) and Mary Ray, P.E. (City of Crystal, MN). Cora Jackson-Fossett, PWLF (Los Angeles, CA), serves as the committee liaison to the Board of Directors. Feel free to contact any of these members or staff liaison Teresa Hon. Contact information, meeting summaries and more can be found at http://www.apwa.net/technical_committees/Emergency-Management.

Teresa Hon is an APWA Professional Development Program Manager in the Kansas City, Missouri, office. She can be reached by e-mail (thon@apwa.net) or phone (816-595-5224).

Public works-specific courses offered online through EMI (www.training.fema.gov/is):

IS-552 The Public Works Role in Emergency Management – This course provides an introduction to the role of public works departments in community emergency management. The training is intended to help communities improve their emergency management efforts regarding the functions of public works agencies prior to, during, and after disasters. (2 hours)

IS-554 Emergency Planning for Public Works – This course explains how public works prepares and plans for emergencies. (3 hours)

IS-556 Damage Assessments for Public Works – The purpose of this course is to build local capacity for damage assessment by enabling the development or refinement of a damage assessment program for the public works agency. (3 hours)

IS-558 Public Works and Disaster Recovery – This course will explain how public works involved in disaster recovery. (3 hours)
Exploring the world of infrastructure financing

Tim Anderson, P.E.
Middletown, Delaware
Delegate, APWA Delaware State Chapter
Member, Council of Chapters Infrastructure Financing Committee

Most, if not all, municipalities in the United States and Canada have had the challenge of limited budgets to run their public works operations. Adding to this challenge are new requirements mandated by increased regulation, community expectations of levels of service, and enhancements in technology and equipment, which have all increased the costs of operations and maintenance. The American Society of Civil Engineers (ASCE) estimates that an investment of $3.6 trillion is needed by 2020 to fund maintenance and improvements of essential infrastructure. The estimated funding gap for that period in time is more than $1.6 trillion. Local governments are cash-strapped and have a reluctance to fund infrastructure projects through higher taxes, fees, or greater debt, as opposition to such traditional approaches is often encountered. It is difficult to make the case for spending money on infrastructure as much of it is out of sight and out of mind until something breaks. Additionally, net investment in infrastructure does not account for the asset that is created on the balance sheet and the economic benefits of infrastructure investment may not be realized for many years. To further compound the issue, public works departments compete for public funds with public safety and social programs. The APWA Council of Chapters (CoC) established several committees including the Infrastructure Finance Committee to look at ways that APWA might provide members with information on how they could solve the funding shortfalls in their communities. The initial areas of focus for the committee were infrastructure financing and asset management which are two issues that resonate with the APWA Board of Directors and a large part of our membership. During the initial meetings of the committee, it was realized that infrastructure financing was a topic that required significant brainstorming, research, and overall effort. Asset management, though directly related, would therefore require a separate undertaking. Thus, the main focus point for the committee became assistance to APWA members in addressing infrastructure funding by identifying typical and also innovative financing mechanisms and revenue sources utilized by the jurisdictions of the broad membership. This resulting body of knowledge would be provided in the form of a “wiki”-type website as a resource to APWA members. Additionally, one of the committee's goals is to work with the CoC Advocacy Committee to help articulate an understanding of the gap in the need for infrastructure funding. Another goal of the committee is to work with the Board’s Awards Committee to establish innovative financing as a criterion for the Project of the Year Awards.

The committee consists of several APWA members from various regions of the United States. With various backgrounds of local policies and regulations within the jurisdictions of the members, it became apparent during the first committee meeting that a variety of approaches to funding and financing infrastructure, both common and innovative, are utilized from one jurisdiction to another. The committee began to articulate and distinguish financing, or borrowing, and also funding, or revenue sources, which are both key but integral parts of paying for infrastructure. The committee realized that successful approaches to infrastructure funding in one jurisdiction could potentially become an innovative and potentially well-received approach in another jurisdiction.

To bring clarity to the complex nature of infrastructure financing, the committee started by developing a glossary of terms to better define the understanding of financing and funding mechanisms. Additionally, the committee began compiling a list of examples of the various approaches to infrastructure financing and funding taken by various jurisdictions represented by the membership. This
body of knowledge documentation will continue to be developed by gathering additional examples from the broad membership of APWA and will be compiled for availability to the membership in the form of the “wiki” living document cited above. This living document can continuously be updated with information about the existing or new ways and means to finance infrastructure. In broad terms, the glossary includes definitions for the various types of enterprise funds, bonds, districts, taxes, user fees, and public-private partnerships. The documentation also includes various examples of each of these types of either financing or funding for various jurisdictions represented by the membership. It is the goal of the committee to compile an extensive list of examples from the broad membership to become a resource for APWA members by 2016.

We encourage you to become acquainted with the CoC Infrastructure Financing Committee members or become active in the committee as we continue work to address the needs and concerns of the membership. Please feel free to contact any of them with ideas, concerns, or suggestions and with new examples of infrastructure financing for inclusion in the body of knowledge document. Members currently serving on the committee are: Afshin Oskoui, Committee Chair (Silicon Valley); Tim Anderson (Delaware State); Robin Bobzien (South Dakota); Rocco Circosta (New York Metro); Peter DeBoldt (Washington State); Kris Dimmick (New York); Jon Honeywell (Arkansas); Joe Johnson, Committee Liaison (Kansas City Metro); Kenzil Lynn (Kansas); Kevin O’Brien (New York); and Thomas Wendorf (Texas). The committee thanks the following APWA staff for their liaison and facilitation services: Gail Ann Clark, APWA Canadian Advocacy & Outreach Manager; Josh Reiner, APWA Government Affairs Manager; and Sharica Ware, APWA Chapter Relations Manager.

Tim Anderson can be reached at (302) 540-2274 or tanderson@tm-anderson.com.

Contact us today to schedule an immediate meeting or webinar.

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Giving back to the community was voiced strongly through the APWA Kansas City staff Activities Committee survey last year. To support this feedback, the Activities Committee has made a goal to provide more community outreach activities.

With that in mind, on Wednesday, November 18, staff gave back to the Ronald McDonald House by visiting the four Kansas City area locations. Our task was to cook a breakfast item that could be frozen and used throughout the month of November. We randomly split up the office into four teams, and there was a team caption for each group.

The Wylie House group had a great time bonding while baking up 91 burritos, 3½ dozen muffins and learning about what all RMHC does for families of children who are in and out of the hospital. Along with making breakfast items, staff also stepped up with other donations that include disinfectant wipes, non-refrigerated coffee creamers, toiletry items, and snack bags.

The Family Room, located inside the hospital, is designed to be a comfortable space for families to get away from the hospital environment. Located on the second floor of the West Tower at Children’s Mercy Hospital, the Family Room offers a home-like
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The experience of Team Longfellow was a bit different from the other houses in that Longfellow House serves as the primary storage facility for the other houses. Following completion of their burrito building, the Ronald McDonald House Charities-Kansas City Volunteer Manager, Tara Adler, was able to take the group for a tour of the facility and also provide a little bit more background. In 2014 RMHC of KC served more than 4,500 families, often with maximum capacity of 87 families each night. The average stay per family was 10 nights; however, treatment regimens may require some families to stay three, six and even 12 months.

A huge thank-you goes out to the KC staff for being so generous and taking time out of our workday to help out other families.
For the first APWA Washington, D.C. office’s Holiday volunteer effort, we chose to work as a group with Ronald McDonald House Charities. Our choice was to cook a comforting meal for the deserving families and the children, who are treated in hospitals around the greater Washington, D.C. area and who are staying at the Ronald McDonald House during their treatments. Especially during the holiday season, our group thought this effort would provide a bit of relief in the way of a hot meal for the families, so they would not have to cook on their own, but be able to sample our “home-cooked” chili, both meat and vegetarian versions this year.

Our D.C. staff were pleased when they realized our visit to the Ronald McDonald House would also serve as a great team-building effort. We designated our volunteer team leader Michelle Brown to coordinate the purchase and recipe information, make the contacts to schedule our
visit and volunteer meal preparation for the Ronald McDonald House visit. Arriving on the scene our team started to work—helping each other and often multi-tasking to cut, chop and measure ingredients of our chosen meals of either meat chili or vegetarian chili so they could be cooked in time for the families’ meals. We knew that this could be the only meal the families had that day, so our team worked together quickly to help each of the large pots of chili come together for the lunch or early dinner for the Ronald McDonald families that day.

As we cooked in the big Ronald McDonald House kitchens on that day as rain poured down over the city of Washington, a couple of curious children entered the kitchen area who were being treated at area hospitals, along with some of the siblings of those who were being treated. All of those we came in contact with thanked us for our help in making their meals, or just gave us a friendly hug, and they all seemed to be in good spirits for the most part. As our first episode in the APWA D.C. office volunteer work, I think we can say that our team provided a needed respite for the families who are staying there, and all of us felt fulfilled in our efforts to help out the families in great need during this holiday season. If you get a chance to help out in any of the Ronald McDonald House Charities, it would be much appreciated by those who live there at such a difficult time for their families, and it just may work out to be a good team-building experience as well!

51" - 80" Twin Auger Snowblowers
The Trackless Snowblower is a highly efficient, two stage, twin auger unit that has incomparable performance in removing snow from sidewalks. Available in four widths: 51", 60", 70" & 80". All will accept either a sidewalk chute or a quick change truck loading chute.

51" - 75" Ribbon Snowblowers
The Ribbon Snowblower is the next generation of snowblower technology from Trackless. Designed for higher output, this snowblower outperforms all others in heavy wet snow and is extremely aggressive when cutting into frozen banks. Available widths: 51", 60" & 75". A telescopic truck loading chute is standard with the 75" Ribbon Snowblower but is also available for the 51" & 60". 
Green Line LRT Minneapolis and St. Paul, Minnesota

Rail returns to Central Corridor

Craig Eldred, Public Services Director, City of Waconia, Minnesota;
Drew Kerr, Public Relations Specialist, Metro Transit, Minneapolis, Minnesota

For 63 years, streetcars rolled down University Avenue connecting Minneapolis and St. Paul. When the Metro Green Line LRT opened in June 2014, 60 years after the last streetcar made its way through the corridor, the Twin Cities’ premier transit corridor once again could enjoy the rail transit it deserves.

The Green Line light-rail shares five stations with the Blue Line in Minneapolis, but splits outside of the downtown area and continues nearly 10 miles to downtown St. Paul. The Central Corridor includes thousands of businesses, unique neighborhoods and several key destinations, including the University of Minnesota, the State Capitol and downtown St. Paul. Eighteen light-rail stations in Minneapolis and St. Paul are exclusively served by Green Line trains, many with connecting bus services. Operation of the LRT systems occurs 24 hours per day, seven days a week, with sequencing of every 10 minutes throughout the day, every 10-15 minutes evenings and 30-60 minutes overnight.

System Ridership
In its first six months of service, the Green Line saw an average of 34,548 weekday boardings. Ridership has grown in 2015, with average weekday ridership above 40,000 for ten successive weeks through early November. More than 10.2 million rides have been taken on the Green Line through the end of October. On September 3, single-day ridership on the Green and Blue Lines topped 100,000 for the first time ever. Many of the travelers were attending sporting events, including home games at St. Paul’s new minor-league ballpark (CHS Field), the University of Minnesota’s TCF Bank Stadium (Gopher Football) and Target Field (Twins Stadium).

Since the Green Lines inception the ridership in the Central Corridor has nearly doubled and bus services have been reduced. Automatic Passenger Counters, or APCs, are used to ensure ridership is tracked accurately and quickly.

Light-Rail Vehicle Fleet Uniquely Suited to Minnesota
To provide all-day, frequent service on the Green Line, Metro Transit
purchased 47 new light-rail vehicles. Produced by Siemens, the vehicles cost $3.3 million and weigh approximately 100,000 pounds—about 6,000 pounds lighter than the Bombardier trains used on the Blue Line. Lighter cars translate into greater efficiency because they use less electricity. Each train car has nearly 70 seats and can hold about 200 people. When possible, trains run in three-car sets.

Metro Transit’s light-rail vehicles are uniquely equipped to deal with Minnesota’s climate. Siemens trains have extra insulation to keep them warmer during winter months and many trains are equipped with pantographs that have textured copper strips that can cut through ice on overhead wires. The ice-cutting pantographs are only used during inclement weather to reduce wear and tear on overhead lines.

Green Line Construction and Funding

The Green Line construction includes several key Green Infrastructure components. Stormwater infiltration is utilized for runoff and treatment, recycled durable products were utilized in construction materials, LED lighting and enhanced building components were incorporated into the operation and maintenance of its facilities.

More than 5,500 construction jobs were created through the Green Line’s construction. Workers came from more than 60 Minnesota counties, from the Canadian border to Iowa. The estimated payroll was approximately $252 million. About 200 people hold operations and maintenance jobs and are based at the Green Line’s Operations and Maintenance Facility in Lowertown St. Paul.

The Green Line was built with funding from the Federal Transit Administration, Counties Transit Improvement Board, the State of Minnesota, Ramsey and Hennepin counties’ regional railroad authorities, the City of St. Paul, the Metropolitan Council and the Central Corridor Funders Collaborative. The project cost was $974 million.

Green Line Expands Access

Employment along the line is projected to grow by more than 90,000 jobs by 2030, bringing total employment in the area to nearly 375,000 workers. A 2015 study from the University of Minnesota’s Accessibility Observatory found that workers in St. Paul could, on average, reach over 2,000 more jobs by transit than they could before the Green Line opened. Job accessibility in some areas more than doubled due to the Green Line and improvements in connecting bus routes.

Around $3 billion in public and private investments has occurred along the Green Line since construction began. To address development pressures, Metro Transit, the Council and many other partners have worked together to encourage a mix of housing affordability and preserve affordable housing. A coordinated housing plan set a goal of building or preserving 4,500 units of affordable housing along the corridor by 2020. Between 2011 and 2014, nearly 2,400 units of affordable housing units were created or preserved. Development has occurred all along the corridor.

More Information

The Green Line is one of many scheduled Technical Tours including St. Paul’s Union Depot, which connects and ends at Minneapolis’s Target Field Station, which both were previously recognized as APWA Public Works Projects of the Year. See how the metro area Local Units of Government worked to revive rail transit when you attend the APWA PWX in Minneapolis in August 2016.

Additional information may be obtained by contacting Drew Kerr, Public Relations Specialist, Metro Transit at (612) 349-7758.

“As we strive to improve opportunities in science, engineering, and technology for all citizens, we face challenges of inclusion and challenges of opportunity that are in many ways more complex and more subtle, and therefore more difficult to address... That is why we need a new strategy, in a new direction, for human resource development in science and engineering.”

– Dr. Rita R. Colwell, Distinguished Professor, University of Maryland
Acceptance of women civil engineers in public works – are we there yet?

Clark Wantoch, P.E., MS, MBA
Director of Project Development
Collins Engineers Inc., Milwaukee, Wisconsin
Member, APWA Diversity Committee

Are women with a degree in civil engineering accepted in public works? This is a question I had to ask after being involved with the encouragement of minorities and women to pursue a career in engineering through APWA, STEM Forward, ASCE, and ITE for the past 36 years. In particular, my interest is also personal because my daughter is a third-generation civil engineering graduate of Marquette University (MU). To help answer this question, I conducted some research, asked for opinions of women civil engineers in public works and drew from my observations and experiences.

Statistical Review
From 1979 to 2015, the percentage of women graduating in civil engineering has increased from 9% to over 20%. The outreach within universities, high schools and professional societies is evidently working. Having women more visible within public works as role models adds to this success story.

An August 9, 2014 article in the Washington Post by Brigid Schulte indicates that the increase in women graduates is not reflected in the overall workforce. Ms. Schulte mentions that fewer than 11% of all engineers are women. To better understand why, Ms. Schulte reported on the results of a survey of 5,000 women who graduated in engineering over the past six decades and found that 40% had either quit the field or never entered the profession after graduation. Within this 40%, 28% said they stayed home with children because their companies did not accommodate work-life conflicts. The other 72% became either managers or executives in other fields. The 72% indicates that the engineering educational system is working to provide graduates with a fundamental background to become successful. It also shows that the engineering industry is losing out on a valuable workforce.

Survey Results
I asked several women civil engineers if they believe they are accepted within public works. The respondents’ experience ranged from five years to over 30 years. Although they were all positive about the changes they have seen over the years, they provided a unanimous consensus that there is still room for improvement. One respondent noted that acceptance is not only within the workplace but also by the general public that we deal with on a daily basis. It was clear that the years of experience played a greater role in the magnitude of change in the level of acceptance. The comments often reflected that the older a man was, in or out of the engineering profession, the less he accepted women as civil engineers. Therefore, time should provide for greater acceptance.

Concerns expressed in the survey, such as an accommodating workplace, a supportive boss, chance for promotion, etc. are often experienced the same way for men. The feeling of being unappreciated, having to prove your capabilities before being taken seriously and/or questioned about decisions being made is universal among men and women. However, adding gender to the situation, even if meant in a positive way, “you do a pretty good job for a woman” is never acceptable.

A number of responses related to the “good old boys network.” I attended the education session “A View from the Top – Women in All Stages of Public Works Talk About Their Lives and Careers” at APWA’s 2015 Congress in Phoenix. The presentation was delivered by a panel of very successful women in public works. I am happy to say the room was packed. As you can imagine, however, I was only one of a few males in the room. One presenter talked about the “girls night out” group she started through work, felt it was fun and encouraged other women to start something similar. A male in the room asked why she would encourage this exclusivity when women are trying to be included. My thought is that there is nothing wrong with exclusivity because it can be related to a comfort accommodations an employer can make to help both male and female engineers in this regard are a positive step toward a better working environment.
zone, and this was supported by the majority in audience.

**Personal Observations**

I went to a trade and technical high school. The name changed from Boys Tech to Milwaukee Tech in my sophomore year and three girls entered a class of 500 boys. At that time I understood the need to take this positive step in our society. Encountering the encouragement of women in civil engineering both in college and the workplace for me was a needed change. I know this article is not about me, but I am thankful for those women who paved the way over the past 30-plus years to create a better environment for women engineers now entering the workforce, including my daughter.

I have been involved with STEM Forward (formerly Engineers and Scientists of Milwaukee) throughout my career. STEM Forward’s main focus is to get grade school and high school students (regardless of race or gender) interested in an engineering career. To do so, they provide guidance and engineer volunteers to work with school science fair projects, career days, the Future City competition in grade schools and both the Rube Goldberg and Robotics competitions in high schools. This is great but falls short if those graduating are not staying in the profession.

A boss can make or break your career. Enjoying what you do every day is vital to your success. If you are in a poor situation or do not enjoy going to work, find the right mix for you. It is much easier to change your situation than change that of your boss or company. Just do not make it your project.

When it comes to engineers being promoted, remember there are 90% more men than women. As companies typically are pyramid shaped, few people make it to the top. Everyone believes they are the most qualified and most cannot understand why they were passed up for a promotion. Statistically, note that for every woman who doesn’t make it to the top, there are eight men that do not either.

There is a need for woman role models. The panel at the APWA Congress mentioned earlier is a great example. You can be that role model as well. Become involved in professional organizations and encourage more women to seek careers in public works at the grade school and high school levels. With time, women will fill more major roles in engineering. One example is that Marquette University recently appointed Dr. Kristina Ropella as the Opus Dean of the College of Engineering. Dr. Ropella is a 1985 MU graduate and former chair of the Bio-Medical Engineering Department at MU.

Use professional organizations to expose male engineers to the world of woman engineers. APWA’s Wisconsin Chapter included a panel discussion with three successful women in public works at their local conference. “The Softer Side of Public Works” was well received by a standing-room-only crowd. It was so well received and talked about that the three presented again at APWA’s Congress the following year.

Recognize that it is only human nature to surround yourself in a comfortable situation. Have you noticed that coworkers will take over a table at an event rather than mix in with the crowd? The importance of a conference is to gain knowledge from the presentations. However, sometimes more can be learned from interaction with others attending the conference. I make it a point to move around to get to know as many attendees at a conference as possible. I encourage you to reach beyond your comfort zone and do so as well. Consider it a chance to network and to meet others in your profession. You never know who you will meet and what solutions you may find to a situation on which you are working.

**Conclusion**

Research shows the industry is losing a significant educated workforce. The survey shows that the actions of executives and managers play a role in this outcome. The survey also shows that younger men are more acceptable of women civil engineers, making overall acceptance better with time. My observations support the need for an internal review of a boss’s role in creating an effective staff and show the importance of being involved in your community and/or professional organizations in order to create more role models and exposure.

Are we there yet? No. However, I am hopeful that one day we will be there. We continually need to welcome all into the profession regardless of age, race and gender, encourage involvement and find ways to better blend the work environment with family because as an industry, we cannot afford to continue to lose such a talented and educated workforce.

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**Special Reminder:** Please make sure you update your personal membership profile, including answering the optional questions 13-16 (see page 10, November 2013 Reporter). Please refer to APWA’s 2013 Diversity Resource Guide 2nd Edition and the Diversity Toolbox for more ideas in celebrating the diversity in your chapter.
2015 APWA Certified

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The exam questions were targeted at an individual having gained knowledge by working in the field. The APWA certification program is truly meaningful because it’s something you can’t obtain without real experience.

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We Got This!

Sue Hann, AICP, P.E., PWLF
Director of Planning and Project Management
Brevard Public Schools, Malabar, Florida
Member, Donald C. Stone Credentialing Council

Chad Oxton, City of Suffolk, Virginia Public Works
Operations Superintendent II, is one of those guys that makes an impression. I first met Chad in October 2014 as one of sixteen members of the APWA Emerging Leaders Academy (ELA), Class of 2014-2015. That day, I learned Chad is not only an upwardly mobile public works professional, but also a competitive roller-skater and adjunct professor at Tidewater Community College. Chad provided an intriguing introduction from which his ELA classmates and I wanted to know more.

As one of the people who guide the ELA class members through the program, I am fortunate to meet diverse public works professionals who are interested in expanding their leadership potential and influence.

Chad is a compassionate and thoughtful leader. He is influential because he truly cares about his team and values their contributions. I reconnected with Chad at the APWA Congress in Phoenix recently and he told me about a recognition program he’s implemented in his department that is fun, unique and inexpensive. I thought the program could be customized and replicated at other
public works agencies, so I asked him to tell me more about it for the *Reporter*.

Earlier this year Chad adopted the phrase “We Got This” as his leadership motto for himself and his team of 75 employees. The phrase gained popularity and became the standing answer to any challenge they faced.

Ball caps are issued as part of the uniform in Chad’s division. When it came time to order new hats, Chad split his order between the usual ball caps with the City/Division logos and a new hat. The new, fitted hat was a unique color, different from any other hat that had been issued from the department and included the phrase “We Got This” embroidered on the back. The cost of the additional embroidery was still well within the budgeted amount for ball caps.

Unlike the standard hats that are given to every employee, these new hats have been distributed to employees who exemplify a “We Got This” character on the job. For each hat awarded, that employee’s supervisor is challenged to clearly articulate the effort and initiative that makes the candidate a good choice for recognition.

Along with the hats, employees are issued a certificate that proclaims the values and dedication associated. The proclamation states:

*Public Works Operations is proud of our burden. We do not turn our backs on responsibility or opportunity to lend a hand or go the extra mile.*

The *We Got This* hat identifies our employees who have made the extra effort, had the extra fortitude and shown exemplary pride in our goal of providing safe and quality transportation options by improving the safety and efficiency of our roadways.

*We Got This* hat owners make themselves available whenever needed regardless of the hour or the weather.

*We Got This* hat owners are resilient and happily accept change.

*We Got This* hat owners are the backbone of our operation. Without them, Public Works Operations would not operate as smoothly as it does.
Thank you for your efforts. They do not go unnoticed. You have made significant contributions to the City of Suffolk and deserve to not only wear this hat, but to be known as a person who proclaims, “WE GOT THIS!”

Chad believes that every one of his coworkers has the traits required to earn a “We Got This” hat. On the day this program was unveiled, approximately two-thirds of the employees were given hats based solely on past performance, reputation and continuous effort. Other hats have been awarded for extra efforts related to accident-related emergencies, ambitious projects undertaken by Public Works, and displays of positive enthusiasm when faced with daily tasks. Chad continues to promote his program through his Superintendents, reminding them to be on the lookout for “We Got This”-level efforts among the crew members who have not yet been recognized.

The effect of this recognition program is noticeable among the Public Works staff. It is easy to spot the “We Got This” hats in a crowd by the unique color. The people who have not yet strived for a hat are subtly reminded that there is a subgroup among the crews of people who have been recognized for their effort. People who do wear “We Got This” hats are reminded of their extra efforts and looked upon favorably for their new, cool hats.

Chad doesn’t intend to make the “We Got This” hat promotion a one-time deal. Summers in Suffolk, VA can be harsh and hats fade quickly. Winter is coming and the ball caps will soon be replaced by knit caps to stay warm. As hats need replacing, Chad and his superintendents will reevaluate the efforts and dedication of the crew members to determine if they still uphold the values associated with and stated in the “We Got This” proclamation. Having a hat doesn’t guarantee lifetime recognition. Each new edition of hats will carry with it the same requirements of the first generation hats. The new hats will feature different color combinations to make them unique from past hats, encouraging continued contribution to the efforts of the organization.

Chad’s “We Got This” program exemplifies what everyone in public works feels when they are serving their community. I can think of so many times in my own career, where my team has responded to any crisis large or small with “we got this.” I never doubted them because they are public works.

I recently changed careers after many years working for the City of Palm Bay, Florida. I now work for Brevard (Florida) Public Schools in Facilities Services as their Director of Planning and Project Management. I’m new to the world of school facilities and was feeling a little uncertain in my first year. But, this summer my team expertly executed several major mechanical system projects during a very short construction window. Kids come back to school whether we are ready or not. We were ready! Of course, what the team told me a few weeks before the kids arrived with several schools under heavy construction was “we got this” and they absolutely delivered!

Recognition programs from the heart are a great way to let your team know that they are appreciated and noticed. Chad’s program is one example of creative and innovative leadership that contributes to a strong culture of teamwork and collaboration. I challenge you to make sure your team knows how much you appreciate them!

Sue Hann can be reached at (321) 508-9774 or hann.susan@brevardschools.org.
2015 Calibration Cruise-In

Diana Clonch
President
DW Clonch, LLC, Columbus, Ohio
Director, APWA Ohio Chapter

ike others in the snow and ice community, those in the SW Ohio Branch of APWA have been struggling with increasing costs, diminishing resources, and product availability issues. It has been the focus of the SW Branch to provide resources to their membership by offering potential solutions to commonly shared problems. Following the winter of 2013/2014 and its rock salt supply and product costs issues throughout the Midwest, the Branch provided outreach and support through educational sessions and a “Salt Crisis Management Roundtable” workshop where potential solutions, strategies, and resources were explored.

One subject of frequent discussion was the need and importance of snowplow controller calibration. As controlling output and managing material application is highly dependent upon controller accuracy, the issue of regular and proper calibration became a hot topic. While the importance of calibration continued to be elevated, the performance continued to fall short of the mark; simply put, many agencies were not calibrating or doing so successfully.

A veteran snow and ice warrior, Tim Nelson, Fleet & Facilities Superintendent for the Montgomery County Engineer Office in Dayton, Ohio, realized that perhaps personnel did not have the actual “hands-on” skills required to physically complete the calibration of their particular pieces of equipment. While it was evident that the importance of calibration was understood, it became apparent the best way to provide a solution was through a training session.

When Tim shared this idea with fellow SW Board member Mike Huxsoll of the City of Springdale, Ohio, the vision of a Calibration Cruise-In took hold and grew far beyond anything Tim and Mike anticipated. Through the support and efforts of other Board members an event was planned, organized and marketed throughout the region to any agency struggling with the issue of calibration. The event announcement read, “Do you know how much salt
your snowplows are distributing? Do you want to save money on your salt budget?” and offered a “Train the Trainer” workshop to help agencies learn how to calibrate their salt spreaders for optimum effectiveness. The event included plow trucks equipped with various controller types so attendees could learn how each is calibrated. Manufacturer representatives would be on hand to answer questions and illustrate proper calibration procedures. Agencies offered to provide trucks for use in the event which ensured accurate representation of the systems typically used across the region.

What an event it was! Hosted at the facility of the Butler County Engineer in Hamilton, Ohio, there were over 70 attendees from two dozen agencies representing five different counties. Sixteen plow trucks with five types of automated controllers were on hand. All controllers were represented by their respective manufacturers. The day offered a full schedule of hands-on training, networking and information exchange. It allowed the participants to interact with each other as well as the equipment representatives. The event was offered free of charge as a collaborative effort of everyone involved.

By all accounts the Calibration Cruise-In was a “win-win” event. Feedback from the attendees indicated that many had tried on their own to calibrate their systems but were lacking the knowledge of the proper procedures. Throughout the day talk among the attendees centered on what they were learning through active participation.

The manufacturer representatives worked diligently to get through all of the systems that were included in the event. They appreciated the opportunity to meet with a number of their customers in one day at one location and were able to provide needed customer service and assistance. In addition to the typical calibration procedures, the representatives were able to identify and fix various issues that may have otherwise required a separate service call. One representative demonstrated the calibration of a manual system. It was not a system included in his specific product line but he wanted to help the attendees understand the procedure regardless of the controller type.

In moving forward the event organizers from the SW Branch are thinking about what the next Calibration Cruise-In will look like. They are discussing ways in which to make a great event “more better.” No one doubts the recurrence of a Cruise-In. For those agencies who had the opportunity to participate in the first event, Tim Nelson’s hope “is that they take this knowledge back and use it to help their neighbors.”

The many benefits of accurate calibration are well documented. The Clear Roads research related to controllers, including the guide for calibration as published in 2009, provides a good reference tool in helping to understand related procedures and methods. The guide includes forms for use when going through the calibration process and is available through the Clear Roads website (http://clearroads.org/). A key finding of the report noted that “Regardless of the type of spreader/controller used, it is extremely important to calibrate the system.”

Calibration provides the ability to measure material output, a critical component for evaluation and process improvement as illustrated in the following diagram.
Understanding the calibration process and when calibration may be necessary are critical elements to achieving efficiency. Over-application and misrepresented product use can be costly and detrimental on many levels. At a minimum, calibration should be considered when:

- New equipment is received
- Annually (at a minimum)
- Following vehicle maintenance and/or modification especially to the hydraulics, controller and/or auger
- Upon a change in the type of material being applied
- At signs of application issues

Calibration relates to the entire system—the controller, the vehicle, and the material being applied. There is no “one size fits all.”

Other resources providing direction with the calibration process include details and standard calibration charts as found in the Salt Institute’s “Snow Fighter’s Handbook” available through the Salt Institute’s website (http://www.saltinstitute.org/road/snowfighting/). Both the Massachusetts DOT and the City of Farmington Hills, Michigan Department of Public Services have created excellent calibration videos that can be found online through YouTube.

In addition to controlling product output to optimize material use as related to costs and budgets, such efforts are also necessary for reducing chloride loading. Optimal application rates become a critical factor to infrastructure and environmental concerns as related to chemicals used in snow and ice control. The same agencies performing the snow and ice control face the problems associated with deteriorating pavements, walkways, structures, and environmental and stormwater quality issues.

In keeping with the tradition of outreach and support to its membership, the SW Ohio Branch through events such as the Calibration Cruise-In truly represents the core values and mission of the American Public Works Association which states, “The American Public Works Association exists to develop and support the people, agencies, and organizations that plan, build, maintain, and improve our communities. Working together, APWA and its membership contribute to a higher and sustainable quality of life.” The collaborative effort surrounding the Calibration Cruise-In is a shining example of this duty.

Diana Clonch can be reached at (614) 989-0316 or dwclonch@gmail.com.
RECOGNIZE YOUR LEADERS
INTERVIEW WORKSHEET

The following questions are intended to be used by someone interviewing or collecting information for an individual that they would like to nominate for APWA’s Recognize Your Leader series printed monthly in the APWA Reporter. Completed articles should not exceed 250 words and include a picture of the nominee.

Nominator’s Name: ________________________________________________________________

Candidate’s Name: ________________________________________________________________

Candidate’s Title: ________________________________________________________________

Candidate’s Agency/Organization: _________________________________________________

Candidate’s City/State: ____________________________________________________________

How long has the candidate been involved in the Public Works industry? ______________

How long has the candidate worked in their current position? _________________________

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

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

Who did the candidate work with to help bring this idea/action forward?

Did the candidate experience any challenges when trying to implement this?

Are there steps/processes that, when looking back, the candidate could have done differently to make this idea/action even more successful (lessons learned)?

Email submissions to bstein@apwa.net
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Brian Usher
APWA President

SAVE THE DATE!
Make plans to be in Minneapolis in 2016!
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Program information will be updated as it becomes available.
Questions? Call the Professional Development Department at 1-800-848-APWA.

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- Click, Listen & Learn program (Free to Members)
- Live Conference (Paid Registration)
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Andrew C. Lemer, Ph.D.
Senior Program Officer
The National Academies of the United States, Washington, D.C.

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

It’s hardly news to say that computer chips and related electronics have penetrated almost every aspect of modern life. While few people would dispute that this technology has many benefits, with it come some nasty environmental problems. By some estimates more than 400,000 cell phones and 100,000 computers—many of them still functional—are discarded every day in the U.S. Added to these are other broken or obsolete chip-containing electronics, generating some three million tons of electronic waste each year. Much of this waste is toxic because of the gallium arsenide and other exotic chemicals used in the electronic circuits, posing threats to air and water supplies.

The idea that electronic chips might be made largely from wood-based materials—and biodegradable with less toxic residue—is quite appealing, and researchers in the U.S., China, and elsewhere are finding that might be possible. The researchers have been working with cellulose nanofibril (CNF), a material containing tiny fibers with lengths of a few micrometers and widths in the range of nanometers (nm), forming a network structure. (One micrometer equals 1,000 nanometers. A human hair is approximately 80,000 to 100,000 nm wide. A strand of human DNA is 2.5 nm in diameter.) The CNF material can be produced inflexible transparent sheets, and is distinct from the crystalline cellulose and cellulose nanowhiskers presented in a previous column.

Much of the mass of the computer chip is the silicon or gallium arsenide substrate supporting the electronic circuitry. This circuitry is printed on the substrate and works with the electrical and thermal properties of the underlying material. What researchers have found is that CNF has similar electrical properties and can be similarly printed to produce a chip. While gallium arsenide has been used for the circuitry, traditional chips contain about 3,000 to 5,000 times out of that material as compared to the CNF chip. A thin epoxy coating lets the CNF chip resist moisture in use, but the final product can be broken down by funguses in much the same way that downed trees return to the forest soil.

Other researchers are exploring another potentially promising use of wood in electronics. There is some thought that sodium-ion batteries might someday be used on a large scale to store energy from such renewable sources as wind and solar. In contrast to the lithium-ion cells now widely used in cell phones and computers, sodium is cheap, plentiful, and environmentally friendly. A substantial problem has been the phenomenon known as sodiation, which causes the battery anode to swell by 400 percent or more and then return to its original size during the charge/discharge cycle. Anodes made of traditional materials can be pulverized after only a few cycles.

Scientists reasoned that wood fibers have evolved to withstand the swelling as they use capillary forces to transfer sodium ions from the soil to the leaves of a tree or weed. The researchers coated a sliver of wood fibers with a thin layer (about 10 nm) of single-walled carbon nanotubes to make it electrically conductive, and then deposited a tin film over that. The soft wood fibers effectively neutralized the strong mechanical stresses of the sodiation process: Even after charging and discharging the battery hundreds of times, the wood showed wear but was remarkably intact.

We are certainly not likely to see chips, batteries, or money growing on trees, but such novel uses of wood products offer much more sustainable bases for applications of technologies we have come to depend on, using wood, a renewable and recyclable material. These are ideas that could—ahe—grow more important.

Andrew Lemer, Ph.D., is currently a Senior Program Officer with the National Academies of Sciences, Engineering, and Medicine. In addition to technical papers and occasional articles for the Reporter, he writes on civil infrastructure and human settlement at www.andrewlemer.com.
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Leadership by Discipline: Emergency Management

Mark Ray, P.E., MAPA, Director of Public Works/City Engineer, City of Crystal, Minnesota, and member, APWA Emergency Management Committee; Gregory S. McCaffery, P.E., PWLF, Director of Public Works, City of Columbus, Nebraska

In this first edition of the Leadership by Discipline series, Mark Ray, Director of Public Works, Crystal, Minn., and Gregory McCaffery, Director of Public Works, Columbus, Neb., discuss leadership and management skills within the realm of emergency management (the authors represent the Emergency Management Committee and the Leadership and Management Committee working jointly together on the article). One of the goals of APWA’s Emergency Management Committee is to benefit member agencies in the development of sound working environments where public works staff work side by side with other first responder counterparts on a regular basis. Development of strong partnerships will support improving the coordinated response to emergencies, as well as day-to-day operations.

Defining leadership and management in your perspective as it relates to emergency management:
Leadership is about the pursuit of a “High Level Perspective,” looking at where your organization is currently, where your organization should be heading, and setting in place objectives in which to arrive there. For emergency management, the leader’s tasks are to work towards identifying the potential risks, plan for the responses to these risks, and build relationships within the first responder community, all while aiding in communication and information distribution. Management is the oversight of objectives and operations towards obtaining your agency’s goals. Within the area of emergency management it is about understanding your agency’s capabilities, what they need to be, and working towards their improvement. Similarly to leadership, a key component of management is building trusting relationships with other first responders. Having the right combination of successful leadership and management abilities, while integrating a solid foundation of trust, is imperative towards any successful emergency management planning, operation and implementation.

Where does an organization start? Find a Champion in your agency that is passionate about emergency management, regardless of their title or role within your organization. Every program/project needs a Champion and improving an agency’s capabilities and preparedness related to emergency management is no different.
Focusing on leadership, what is the vision as it relates to improving emergency management within public works? In every community across the country, public works staff must personally and professionally connect with other first responder counterparts. The connections that are developed will likely result in a coordinated response not only in day-to-day operations, but in addressing emergencies with each responding agency (police, fire, EMS, public works, etc.). The levels of expertise of which various first responder agencies bring to the table are generally broad and diverse. Successful leaders need to have a general understanding of other first responders as to their abilities and limitations when engaging them in emergency management activities.

Transitioning from leadership to management, what are the goals of building an emergency management mindset within public works? The emergency management/first responder must understand that public works staff service is not simply a job description. In order to be truly effective, being a first responder is a mindset. It is an awareness of the 24/7/365 world of other first responders. This mindset is not only focused on how to accomplish a set of objectives, it is also about engaging other first responders in knowing what is transpiring (information sharing) and utilizing them, where appropriate, in support of common goals. In order to meet these goals, public works staff need to understand how other first responders are able to support public works and where public works can support others. This understanding has to start with a solid foundation of building trust through regular communication and personal interactions.

Why does it matter? Public works agencies bring a wealth of experience and capabilities to an emergency situation. But being part of the first responder community is about trust and providing overall service. Everyone involved in a response needs to entrust within one another that they are working towards a common goal. The components of trust and overall mutual agency understanding take time to develop. Since emergencies can happen at any time, it is important to look towards building trust and overall relationships as soon as possible. This trust generally is gained through ongoing training, planning and walkthrough scenarios.

How does it benefit me or my organization? Whether it is some of the organizational concepts associated with emergency management or the professional connections made with other first responders, exploring all that emergency management is and how it can be integrated into your daily operations is a worthwhile exercise. It is important that public works agencies do not shy away from emergency management, as more often than not they find themselves either directly involved with other first responders, ongoing operations, or likely in the end cleanup actions.

What leadership skills are especially important? Being able to identify a vision for where your agency can grow related to emergency management is important. Being a leader in this respect may not be an easy or popular aspect (even within public works), but it is about working towards the good for all. Trying to improve an agency’s emergency management abilities are generally easier if the person who is the Champion is passionate about emergency management.

Improving professional relationships, communication, and coordination will take time and energy and the leader needs to be prepared for this.

What management skills are especially important? As cliché as it sounds, strong communication skills are essential. In order to be successful in building relationships with other first responders, you have to have an excellent communication skills set, as it will open the doors to building much needed trust. Focus on thinking about what information you have that others will benefit from. Give information to first responders generously (but following the appropriate chain of command should be always followed). You will also find that the more information shared, the more information and resources you will likely obtain.

Where can someone start? The use of readily available tools and formats within the Incident Command System (ICS) and the National Incident Management System (NIMS) will provide much needed guidance. Engaging internal partners, as well as external partners, in the assessment, planning, and training is essential. Having the knowledge of what other first responders can do, are trained to do, and typically do is necessary towards leading public works staff in first responder situations. The best way in which to learn how the other first responders operate is to: (1) Regularly engage one another through self-assessments, planning, and training exercises; (2) Participate in each other’s activities (one of the easiest ways towards others’ actions are to arrange for ride-alongs with police, fire, and EMS agencies; should one look to experience what happens on the dispatch side, a simple sit-in at the local public safety answering point...
(PSAP)); (3) For a more in-depth look at how others operate, go to some of their emergency response training programs. One may even be able to actively participate as a role player for a training scenario. This will truly provide one a firsthand outlook as to how others are trained to respond. It could also be that this experience will also allow time to build personal connections with others who are involved within emergency management. However one looks to engage others, look to build positive relationships with other first responders throughout the process.

What happens when it does not work? The desire to enhance one’s abilities within emergency management and handling the responsibilities as a first responder are ever-changing and involves constant refinement and adjustments. Emergency management principles are based on years of trial and error. As with all things, not all actions, processes and outcomes will go as planned and return the desired results. Continuous review, planning and implementation adjustments are necessities for success. Mistakes will be made, along with several successes; however, it is the learning from the mistakes, refinement and moving forward which is the key. At the end of the day, your community and colleagues need you to be prepared to respond to emergencies, so commit to not being complacent and consistently pursuing improvement.

What our agency is doing now currently works, so why change? Equipment, skill sets and types of situations change. The continuous planning, training and refinement to address these is necessary for a successful program. Many levels of government have formally adopted ICS and NIMS as how their agencies will respond to events and various situations. Improving our capabilities and coordination related to the response to emergency situations is what the public has come to expect of public agencies. It has been said that nothing worthwhile is necessarily easy. Improving our capabilities related to emergency management is no exception. Change happens whether we like or not. We can either proactively change to try and improve preparedness, or reactively change to respond after an event has occurred. Good leaders and managers proactively change in the pursuit of excellence.

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Communication Tips with Other First Responders

1. Focus on getting to know them personally first. This is key in establishing trust. The work-related actions will build on that trust.

2. Don’t talk like a know-it-all. Even if you have family or friends that are police, fire, or EMS do not talk about them. Get to know the person in front of you.

3. Listen and ask questions. Try to understand not only what they do, but why they do things certain ways.

4. Understand what information you may have that will help them. For example, if there is a small water main break that will not be repaired immediately, let public safety know. Remember, they are a 24/7 operation and knowing what is going on in their community is just as important for them. Another example would be if you were about to start plowing snow at a certain time, let them know. Believe it or not, people have called 911 to ask when the plows will be out. Assist public safety in dealing with those basic calls by giving them the information. Power and control are not built by holding onto information but giving it away (where appropriate and legal). 

The emergency management/first responder must understand that public works staff service is not simply a job description.
Throughout history the Mississippi River has brought a lot of benefit to the New Orleans area. The city; its wealth; by American standards, a special urban environment; and its culture would not exist without this legendary river. In the case of Hurricane Katrina, however, the river caused the biggest problems with respect to controlling water. In a hurricane the water first recedes and then returns after a period of time. A river, conversely, discharges water in an uninterrupted flow; and after breaking levees around New Orleans, the water level eventually rose disastrously, covering the city almost entirely—after Katrina had already left the area. Failures in flood protection and post-hurricane rescue operations led to devastation, heartbreak and severe criticism of actions taken and not taken, on both the federal and local levels.

Katrina, the sixth strongest storm on record, hit New Orleans on August 29, 2005. Only the city’s business and tourist district avoided the flooding. Eighty percent of the city ended up below the water level, resulting in significant human and financial devastation.

One of the most important measures instituted to prepare for future storm-related rises of water levels is the Hurricane and Storm Damage Risk Reduction System for Southeast Louisiana (HSDRRS). The system was launched and fully financed by the U.S. Congress. The Finnish delegation (Dan Langstrom and Ville Alatyppö of the City of Helsinki, and Jyrki Paavilainen with Sweco Finland) were able to familiarize themselves with the system and more closely with one of its sub-systems by visiting Louisiana in connection with their trip to the 2015 APWA Congress in Phoenix. The technical excursion was facilitated by the APWA Arizona Chapter that also sent members to learn about the HSDRRS.

Building the entire HSDRRS system has cost $14.45 million; it includes five parishes, and consists of 350 miles of levees and flood walls, 73 pumping stations, three canal closure structures with pumps, and four gated closures. The U.S. Army Corps of Engineers has been in charge of sizing and building the system. The ACOE also participated in the 2015 APWA Congress with an exhibit booth on the project. The goal of the system is to take charge of preparation and protection of basic infrastructure on the federal level.

The Finnish and local officials toured the Gulf Intracoastal Waterway – West...
Closure Complex (GIWW), i.e., the lock-pumping station on the west coast of the Mississippi River, about one hour’s drive south of New Orleans. It was built to protect residents and businesses from rising water caused by future storms in three parishes on the Mississippi River (Orleans, Jefferson and Plaquemines), covering 42 kilometers of levee sections. The station in question was designed to protect the area for a 100-year storm and building it has cost about a billion dollars. Construction started in 2009 and the station was completed in 2013.

The implementation of the West Closure complex included the following structures:

- 19,140 cfs Drainage Pumping Station (11 x 1740 cfs vertical “Flower Pot” pumps)
- 225 foot Navigable Flood gate
- 5 Sluice Gates (each 16’ x 16’)
- 4,200 ft. Concrete T-Wall along the edge of Bayou aux Carpes CWA 404(c) wetlands (a 4200’ X 100’ construction corridor)
- Water Control Structure (with two 8’x 8’ gates)
- Levee and East Bayou Road Realignment
- Environmental Mitigation and Augmentations
- Foreshore Protection
- Dredging of the Algiers Canal

Two hundred and fifty gallons of diesel fuel per hour are burned to run the 5,400 horsepower pumps at full power. The station has 300,000 gallons of diesel fuel on hand to meet roughly 100 hours' full power requirements. So far, it has not been necessary to use the system in a real situation, but it is tested on a regular schedule. The complex has continuous staffing, and sleeping accommodations are available at the station, as well as other requisites for a long stay in a crisis situation.

It was interesting to talk with local municipal technicians about the general attitude towards living in an area that experiences one storm after the other. Locals claim to be more intimidated by the abundant snow in Helsinki than by their own hurricanes. For many, Katrina has been the only storm they have experienced that led to evacuation or significant voluntary movement to higher ground locations. Storms are part of the normal life of the people of Louisiana.
However, people should heed the warning Katrina provided to get prepared elsewhere. More than one third of U.S. citizens currently live on coastal areas and the figure is increasing. Several organizations have forecast that the power of hurricanes will grow in the future, mainly as a result of the climate change. During Hurricane Katrina the water level rose to six meters and exceeded nearly all levees in the area causing damage amounting to 100 billion dollars. Superstorm Sandy of 2012 caused damage amounting to $70 billion in the New Jersey area; mainly damage to real estate. The cause was once again rising water levels. It has been estimated that if a Category 4 hurricane as seen in Miami in 1965 were to hit Miami now, this would cause damage amounting to $160 billion—again, based primarily on the value of real estate. In comparison, this $14.5 billion flood protection of New Orleans is inexpensive preparation.

Dan, Ville and Jyrki were very pleased with the friendly and informative hosting by the local New Orleans Branch. We had great opportunities to learn from our U.S. colleagues during the GIWW visit, luncheon, and visit to the Lake Pontchartrain Causeway. This was all arranged by the local chapter and we are very appreciative.

Sources:

U.S. ARMY CORPS OF ENGINEERS – TEAM NEW ORLEANS / West Closure Complex Brochure.
Jesse D. Noel, Resident Engineer, P.E.
Southeast Louisiana Flood Protection Authority – West

Jyrki Paavilainen is a professional engineering consultant and area manager for Sweco Finland, a large engineering/architectural/environmental firm that provides sustainable solutions for public and private clients throughout Finland. Mr. Paavilainen has a BS degree in Civil Engineering and lives in Helsinki with his wife and daughter. He can be reached at jyrki.paavilainen@sweco.fi.
Making the Incident Command System meaningful to utility workers

Pierce County sewer workers used a real project as an ICS exercise and came away with a new appreciation for emergency management

Gloria Van Spanckeren
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University Place, Washington

In mid-2014, the Pierce County (WA) Public Works Sewer Division found a way to exercise their incident command system (ICS) emergency response training without taking time away from their regularly scheduled work. They used ICS to plan and manage an actual project, giving staff the opportunity to apply the ICS skills they had learned.

The division had already made ICS training a priority in order to comply with the department’s emergency operations plan. All sewer staff, from maintenance techs to senior managers—about 170 people in all—took a number of mostly-online ICS classes assigned to them based on the functions they would be expected to perform during an emergency response.

The ICS exercise was designed around a real project that required the permanent relocation of 90 staff and all their gear, tools, equipment, and supplies from three different worksites to a new maintenance complex. The new facility, known as the Sewer and Traffic Operations facility, or STOP, was constructed in 2014 using traditional project delivery system management strategies.

While the STOP construction was underway, a move-in planning team was formed using the ICS organizational structure. The sewer division manager assumed the role of incident commander, and planning, logistics, and operations sections were formed. Although ICS typically includes a finance/administration section, one was not created for this project because relocation costs were already factored into the construction project budget.

The move-in team met twelve times over a period of ten months, working through the ICS incident planning cycle and creating an event action plan (EAP) that used real ICS forms to cover every anticipated aspect of the upcoming move. A primary objective of the EAP was to safely accomplish move-in activities with zero lost-time injuries. Another objective was to have...
the STOP facility ready for active use within three business days following the move date.

The Planning section organized and led the move-in team’s meetings and prepared the final EAP. Planning also established a command center on moving day and assigned people to track the move in real time and to collect project documentation.

The Logistics section developed packing and move mobilization strategies which included packing instructions, moving labels, packing list forms, and shipping manifests to track items from pickup to delivery. They contracted with a moving company to provide trucks and drivers. The STOP construction engineer was part of the Logistics section and kept the team up-to-date about the facility’s construction progress.

Specific individuals were tasked to provide details relevant to the move using ICS-213 General Message forms which were incorporated into the EAP. There were 20 of these ICS-213 detail sections in all, including a communication plan; packing and move mobilization plan; locker room, seating, and parking plans; parts room plan; warehouse move plan; move-day traffic plan; IT plan; emergency/contingency plan; and continuity of operations plan. The safety plan had its own form, ICS-208, which was placed near the front of the EAP.

Moving day was on Tuesday, January 6, 2015. Staff assignments were written out on ICS-204 Assignment Lists and included in the EAP. Copies of the EAP were distributed to each participating staff member. An organization chart was included to show where each person fit in the overall move project and what their main duties were. The Operations section directed the actual loading, transporting, unloading, and unpacking of moved items.

The move took place without any major glitches. The ICS “Incident Command Team” set up a command center in a large conference room at the STOP facility on the day of the move and gathered hourly field reports on the move’s progress. Briefings and command staff meetings were held at designated times. As information came in it was recorded and displayed where everyone could see. Completed shipping manifests from unloaded moving trucks were delivered to the command center throughout the day, and at the end of the day team leads turned in ICS-214 Activity Logs documenting their activities.

The project was a success on many levels; the move to the STOP facility was accomplished in one day instead of the two or three days originally expected, and there was only one minor injury that caused no time loss. As an ICS exercise, the STOP move took staff’s online training from the theoretical (and forgettable) world into the real world. It demonstrated that ICS really works, and how ICS looks when it is used for a public works application. The people that were assigned leadership roles gained confidence and understanding in their ability to use ICS, and an appreciation for how their ICS positions interact with others. All of their hard work during the planning phase was rewarded by a nearly perfect execution of the Event Action Plan they developed. Following this exercise, they came away better prepared to respond to an actual emergency.

There is a postscript to this story: Immediately following the STOP move-in, preparations began ramping up for the 2015 U.S. Open golf tournament, which was held in June at Pierce County’s Chambers Bay Golf Club. The golf course is on the same property where the Sewer Division’s wastewater treatment plant and office building are located. Because they had just increased their understanding of ICS, sewer managers and supervisors were able to communicate with law enforcement and security agency representatives using the same language they use, and were valuable contributing partners in preparing for the U.S. Open.

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Ventura County Public Works Agency disaster simulation ensures county-wide state of storm readiness

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With California in the midst of one of the most extreme droughts in history and water conservation efforts in full force across Ventura County, reports of an impending El Niño may seem like news worth celebrating. Experts are predicting that the upcoming winter could be one of the wettest in history, and while Ventura County could certainly benefit from the moisture, this storm potential has led the Ventura County Public Works Agency (VCPWA) and other agencies to focus not just on water conservation, but also on how to effectively manage the potential consequences of excessive rain.

Prolonged dry periods followed by months of considerable rainfall generally lead to flooding, heavy debris flow, and mudslides. In some circumstances, these incidents have the ability to threaten the viability of roads, drains, culverts, and other vital infrastructures. It’s up to government agencies and officials to prepare, and to protect their communities from the dangers presented by prolonged storms such as El Niño.

Ventura County Public Works Agency is ready.

On September 29 and 30, VCPWA conducted its annual Storm Day disaster response drill simulating the intensity and flooding of a 50-year storm. The exercise was designed to underscore the VCPWA’s role as first responders in floods, fires, earthquakes, or other emergency circumstances. In critical situations, VCPWA works alongside the Ventura County Sheriff’s Department, the Ventura County Fire Department, and emergency medical personnel to sustain critical infrastructure and maintain public safety. Joining the drill for 2015 was the Ventura County Sheriff’s Office of Emergency Services. It is vital that our two agencies plan, train, and prepare together for major storm events, and Storm Day is a great opportunity for us to practice working on our response to winter storm incidents.

The drill began with an 8:00 a.m. “storm forecast broadcast” and activation of the Emergency Operations Center (EOC) on the
morning of September 29. Pre-loaded injects designed by VCPWA Directors and Deputy Directors were initiated shortly after the broadcast and personnel were assigned to their Storm Day duty stations. Throughout the exercise, agency staff worked entirely from the work stations they would occupy in the event of a real storm emergency.

On Wednesday, September 30, PWA personnel reported to their Storm Day duty stations. Many began field exercises and storm patrols as early as 6:30 a.m. As staff encountered scenarios or were diverted to incidents in the field, they reported them to the Department Operations Centers via Sharepoint, VCPWA’s new WebEOC tool. This new emergency tracking system is a communications upgrade and will help us efficiently direct our field teams in the event of El Niño flooding.

Storm Day is an annual event, but this year’s exercise included a major incident simulation site on Center School Road in Somis. PWA deployed a 60 ft. excavator, loader, dump truck, and light pod in response to reports of a blocked culvert. In the event of a real storm, such a blockage could cause severe flooding and potentially threaten nearby homes and schools so a crew of 10, led by VCPWA Superintendent Roger Boross, worked for several hours to remove actual debris from the area. Not only did the incident simulation help prepare staff for an emergency response, but it also prepped the culvert for the real rain that’s on its way.

While field crews reported and addressed incidents throughout the county, administration teams tested the county’s procedure for declaring County and State Emergencies, as well as state and federal data collection methods for disaster-related expense reimbursement. Local public information officers (PIO) also participated in the exercise from the Joint Information Command center located at the Ventura County Government center. PIOs tested processes for collecting, verifying, and distributing information to spokespeople as it came in from VCPWA representatives in the field.

“The public relies on VCPWA to give them clear roads, clean water, and homes that are safe from flooding. Severe storms and earthquakes can instantly damage the public works infrastructure that provides these safeguards. Our staff must quickly respond and repair our infrastructure when it is damaged in an emergency,” explains Jeff Pratt, VCPWA Director. “With experts predicting that 2015 could be one of the biggest El Niño years in history, making County preparation efforts is more vital than ever. The Ventura County Public Works Agency is confident in our team’s ability and procedures in place so that we are prepared to protect the well-being of our County and its citizens.”

Karl Novak spearheaded this year’s Storm Day exercise. He manages 65 field, technical, and engineering staff in the Operations and Maintenance Division. The division maintains 216 miles of flood control channels, 56 dams, and four pump stations. Karl can be reached at (805) 672-2106 or karl.novak@ventura.org.
Protecting our critical infrastructure through information sharing

Kristina Tanasichuk
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Oakton, Virginia
President, InfraGard National Capital Region Members Alliance

When I had the honor of representing the American Public Works Association after the tragic events of September 11, 2001, one of our primary objectives was information sharing. As many may recall, the lack of communication and “piecing together” of vital clues by both the government and the public left us wide open for the attack. Some say if we had pieced these “clues” together earlier we may have even prevented the attacks that changed our nation.

Since working with all of you, I have continued my work in homeland security and now work as president of one of the foremost organizations to improve information sharing: InfraGard. First as a member and now as President of the National Capital Region chapter, I’ve been committed to finding ways to help move actionable information to those who need it.

And, as we come off of National Critical Infrastructure Security & Resilience Month, InfraGard’s simple mission could not be more center stage: to improve information sharing between the public and private sectors to protect our critical infrastructure. Public works is a critical and vital piece of this information sharing and we believe that APWA and InfraGard chapters working together can improve our exchange to protect local critical infrastructure more effectively.

History of InfraGard
InfraGard began in the Cleveland, Ohio field office of the Federal Bureau
of Investigation in 1996, and has since expanded to become a national-level nonprofit organization, with InfraGard coordinators in every FBI field office. Originally, it was a local effort to gain support from the information technology industry and academia for the FBI’s investigative efforts in the cyber arena, but given so much of the nation’s critical infrastructure is owned by the private sector, estimated as high as 90%, this early model became the backbone for efforts to protect the nation’s infrastructure.

The program expanded to other FBI field offices, and in 1998 the FBI assigned national program responsibility for InfraGard to the former National Infrastructure Protection Center (NIPC) and to the FBI’s Cyber Division in 2003. Since 2003, InfraGard Members Alliances have developed a TRUST-based public-private sector partnership to ensure reliability and integrity of information exchanged about various terrorism, intelligence, criminal, and security matters.

InfraGard focuses on 16 critical infrastructure sectors including water and wastewater systems, transportation, government facilities, emergency services, and dams, among others. See all sectors here: http://www.dhs.gov/critical-infrastructure-sectors.

How does InfraGard protect critical infrastructure?
InfraGard focuses on the development, management and protection of the nation’s critical infrastructure—defined by the U.S. Department of Homeland Security and Presidential Policy Directive 21 (PPD-21): Critical Infrastructure Security and Resilience. The PPD advances a national policy to strengthen and maintain secure, functioning, and resilient critical infrastructure and currently identifies 16 critical infrastructure sectors from water and wastewater to transportation to the country’s financial systems.

Through monthly meetings, InfraGard chapters work to establish relationships between those responsible—in both the public and private sectors—for protecting our critical infrastructure at the local level. Chapter meetings focus on new and persistent threats, new and existing vulnerabilities, best practices, and what federal resources are available for training, physical and IT security best practices, and early warning. Membership in InfraGard is free but does require an application and a security risk assessment, conducted by the FBI.

In honor of November’s Critical Infrastructure Security & Resilience Month, we are reaching out to you to improve the information sharing of critical resources and early warning between our organizations. We’d like to work with APWA to strengthen our network and understand how InfraGard can assist you to get any resources, information, or training you may need to protect your local infrastructure. We are proposing a partnership to focus on critical infrastructure protection during the month of November—something akin to National Public Works Week—only focusing on critical infrastructure protection.

We believe public works plays a vital role in mitigating, protecting, and responding to threats and attacks on our critical infrastructure (whether natural or man-made). Together we can improve the state of our intelligence and assure we never sustain an attack like that of 9/11 again.

To find your local InfraGard chapter, go to www.infragard.org or contact your local FBI field office and ask for the Special Agent InfraGard Coordinator.

Kristina Tanasichuk is the CEO and founder of the Government Technology & Services Coalition, a nonprofit organization working with small businesses in the federal homeland and national security space. She is also President of INCRMA, the InfraGard chapter representing the Nation’s Capital. She is also founder and president of Women in Homeland Security. She worked with APWA’s Emergency Management Committee and managed the Urban Forum immediately after the events of 9/11. She can be reached at (703) 201-7198 or ktanasichuk@gtscoalition.com.
The City of St. Charles has a very active Emergency Management Agency (EMA). Functioning as a division of the Fire Department, the EMA is principally charged not only with the development of the City-wide Emergency Operations Plan (EOP) but also the use of functional drills to test it. While all of the departments within the City have a role in both of these operations, the protection of critical infrastructure takes the lead and this is obviously the domain of the Public Works Department.

Drills take place regularly and the Public Works Department has participated in two of these valuable training experiences since October 1, 2014. The first was a simulated tornado that impacted a large swath of the city. Challenges that were presented included a large fire involving an electrical substation resulting in a total loss, debris strewn streets, water leaks, sanitary failures and the need for heavy equipment assistance in rescue operations. Coordinating all of these functions from the Emergency Operations Center (EOC) certainly presented some challenges.

In the drill, the Public Works management staff gathered in the EOC along with other City departments. Vital information needed for decision-making purposes was limited to only what was available and accessible from the EOC. In today’s technological world, it was fairly easy to plug into our computer network to receive all of the information we were used to having at our fingertips every day. That was until the drill organizers threw us a curve ball. In the scenario, the tornado knocked out our computer system, so the drill organizers “unplugged” our computers. Immediately, the Public Works staff had to rely on information that was prepared in advance of the event in the form of saved computer files on a storage disk. It was at that time that the challenges went from manageable to nearly impossible.

We learned very quickly that preparation for a major disaster event is critical. Even though Public Works staff had time to prepare and gather information well in advance of the drill, it was evident that we were underprepared for the event. After the drill, we realized that everything needed to be considered and nothing could be taken for granted. For example, several Public Works managers did not have a simple list of their employees and respective contact information. Why would they need that, they thought? Well, when their computer was turned off and their smart phone deactivated, many managers struggled to even make a complete list of their staff. Remembering contact information for their staff was nearly impossible.

We had similar challenges gathering accurate information about our available equipment, utility locations, vendor resources, GIS data and historical data, to name a few.

Following the tornado simulation, a second exercise was held to test the distribution of the medications contained within the Strategic National Stockpile (SNS). The SNS is a program that functions under the direction of the Centers for Disease Control and Prevention. It contains large quantities of both medications and medical supplies that are intended to protect the American public in the event of a public health emergency. Examples of this could include a terrorist attack, flu outbreak, earthquake or other disaster significant enough to disrupt the normal supply chain. Upon the agreement of federal and local authorities, medications can be distributed quickly enough to be effective. In order to validate this, exercises must be conducted.

The Public Works Complex for the City of St. Charles was chosen as the location of the exercise as it provides a large facility that has enhanced protections due to the type of operations that take place on the grounds. The exercise that we participated in tested our ability to distribute medications to employees so that critical services (electric, water, etc.) could be restored in a timely manner.

Peter Suhr, Director of Public Works, City of St. Charles, Illinois; Joe Schelstreet, Fire Chief, City of St. Charles, Illinois

Public Works and Emergency Management – City of St. Charles, Illinois
sanitation) could be continued and the continuity of government could be ensured.

Compared to the previous drill, this exercise was much more of a success for the Public Works Department, but did pose some challenges as follows:

• **Parking** – Even though the St. Charles Public Works facility is fairly large, our parking lot was inundated with vehicles. Staff from the entire city gathered in short order to collect their distribution of medication (in this case jelly beans). They arrived at the Public Works facility in fire trucks, police vehicles, public works equipment and personal vehicles. If our drill included staff families and other local communities, the situation would have been worse.

  Traffic control and security access into the distribution facility is definitely something to consider and plan for.

• **Who’s taking care of the disaster?** – While the entire city gathered on the Public Works campus to receive their medication, it goes without saying that they were not out in the public areas dealing with the particular event. Consideration of a phased distribution plan is recommended.

• **Indoor space** – It was a beautiful summer day when we had our drill, so wandering outside was not too much of an issue. However, if the weather was inclement, which often happens during a disaster, thought should be given to large amounts of people being inside an active facility. Keep in mind that the facility still needs to operate as usual.

In summary, the importance of the three-legged strategy of planning, preparing and training cannot be overstressed. It is imperative that all participants not only understand, but are also comfortable with their individual roles in disaster response. This familiarity and comfort only comes from the security of a well-thought-out plan that is coupled with adequate training and strategic preparation.

Peter Suhr can be reached at (630) 377-4405 or psuhr@stcharlesil.gov; Joe Schelstreet can be reached at (630) 762-6984.

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A controlled and successful response could lead to successfully recovering disaster costs from each available federal grant program, given that current disaster recovery policies allow for greater flexibility to use disaster funding, and reduce the administrative burdens of managing those grants.

But a local government’s response to emergency events turns on the training and capacities of its public officials because eligibility for assistance such as Stafford grants is increasingly tied to a community’s preparedness. The better prepared a community is and the better its response actions are documented, the more likely it is to maximize the amount of recovery funds that it obtains from the federal government.

Unfortunately, the majority of work associated with recovering costs is an additional workload on top of the normal job functions of public officials. Cost recovery can continue long after the disaster is over, when the rest of the city has returned to normal operations.

In most cases, a municipality already has a majority of the tools required to successfully document, track, organize, prepare and submit claims for reimbursement of disaster costs, but sometimes one crucial component is missing—the perspective that only an experienced outside consultant can bring.

Acknowledging that an expert who was current with the latest reimbursement policies could help it recover a greater percentage of reimbursements for emergency management, the City of Lauderdale Lakes, Fla., hired a consultant to improve its preparedness. “We recognized that if we don’t spend a little bit of money now we risk losing a lot of money later,” Public Works Director Manny Diez said.

Recalling challenges that the South Florida community of 32,000 residents had recovering emergency expenditures following Hurricane Wilma in 2005 because of its lack of knowledge of federal reimbursement policies, Diez urged the city’s finance director to allocate funding for a preparedness assessment. So, after receiving a task order in September 2015 the community’s grant manager, a civil engineering firm that specializes in federal disaster recovery grants, began to assess the preparedness of the community’s emergency response capabilities.

The goals were to position the City to claim and properly manage as much grant funding as possible and to eliminate commonly lost funding opportunities. This required utilizing all available resources, and identifying the most cost-effective improvements available, including those that the City:

- knew it had and could use for emergency management;
- knew it had but did not know it could use for emergency management; and
- didn’t know it had and could use for emergency management.

In order to improve how response and recovery activities are carried out, the grant manager evaluated the City against the most current federal preparedness guidelines and federal grant management requirements. Contractor representatives interviewed essential personnel; reviewed policies, procedures, response and recovery plans, and financial tracking systems; and toured the City’s new Emergency Operations Center.

The amount of federal disaster recovery grant money that a municipality can obtain depends on the quality of the supporting documentation that is generated during a response effort. Part of that documentation includes policies, procedures, and contracts that were in place prior to a disaster. Without this pre-event documentation, post-event grant funding could be jeopardized.

The grant manager recommended preparedness improvements designed to position the City for obtaining recovery grants, the primary source for which is the Federal Emergency Management Agency (FEMA)’s Public Assistance program, which is based on the Stafford Act.
Properly implemented, its grant manager’s recommendations could help Lauderdale Lakes get as much grant money as possible by documenting such diverse procedures as evacuating senior citizens or residents with disabilities, removing debris and properly procuring disaster response and recovery resources. Free training and resource sharing options also were presented.

Lauderdale Lakes may also be able to recover funds more quickly. The Sandy Recovery Improvement Act, passed in 2013, authorizes a local public entity to write its own cost estimates to claim disaster recovery grants so long as they contain sufficient detail for FEMA to review, approve and obligate grants; conform to Public Assistance program regulations, policy, and guidance; and were prepared by a locally licensed professional engineer.

The last provision acknowledges the important role that engineers have traditionally played in disaster recovery and recognizes the expertise that they can bring. Having cost estimates written by their disaster recovery grant manager, who is also a licensed professional engineer, could therefore mitigate the need for Lauderdale Lakes to draw down emergency reserves.

Typically, it can be difficult for municipalities, particularly small communities, to hire and pay for consultants who can help with a response because reimbursement sources like Stafford Act grants are usually only accessible after a presidentially-declared disaster. Properly procuring qualified contractors can also be prohibitively expensive.

Large firms often prefer to vie for contracts with larger municipalities or to compete for statewide projects. Or, they emphasize the breadth of their services in an attempt to beat out smaller contractors in niches like disaster recovery grant management. When large firms do contract with small municipalities, they often neglect their smaller clients until a disaster happens.

Small firms may be just as qualified, but they may be discouraged by the time and cost that it would require them to spend without an assured outcome, particularly if they would need to wait for a disaster to be paid through Stafford grants or similar means.

Investing in preparedness with the goal of maximizing disaster recovery grants can be a palatable—and attainable—goal for small communities and contractors alike. Done properly, preparedness assessments can identify key improvements to help communities recover more quickly and efficiently through cost-effective solutions like resource sharing with other municipalities.

Lauderdale Lakes learned through its assessment that it must prepare to establish an effective Emergency Operations Center and improve the preparedness of non-public works staff and procedures. Federal funding is tied to the preparedness of all of a community’s departments, including finance and human resources.

Perhaps most importantly, aligning its financial and cost tracking systems with FEMA requirements will allow Lauderdale Lakes to calculate with certainty its overall actual vs. recovered (AVR) disaster costs. The City could also set targets to improve the effectiveness of their recovery strategies, such as recovering 90 percent of all funds spent for the next disaster and then 92 percent for the following.

Even if a presidentially-declared disaster that would trigger Stafford grants does not strike, Lauderdale Lakes officials will have peace of mind knowing that their community is better prepared to respond to an emergency like a riot or pandemic because it has invested in preparedness. It can also save costs through resource sharing with other communities and workflow efficiencies that emanated from its preparedness evaluation, like how to make better use of existing software systems.

Together, the additional capacity and enhanced capabilities of Lauderdale Lakes officials should produce more positive outcomes in emergency response and recovery.

Edmund Christian Saldaña is a Civil P.E. with over twenty years of project management experience, ten of which is in disaster recovery grant management. He is president of Auxilio Engineering, LLC, a Florida-based consulting firm, which supports local governments and state agencies in processing disaster grant funds from FEMA. Saldaña can be reached at (888) 247-2984 or edmund@aux-e.com.
Aerial robotics serves public works in emergency management

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The Robots are coming! Yes, the robots are coming and are already here in the form of Unmanned Aerial Vehicles (UAVs) or Unmanned Aerial Systems (UASs), commonly known as drones. Aerial robotics technology offers affordable tools that enhance emergency management for public works. The use of UAVs has already become widespread, but is expected to grow tremendously over the next few years and beyond.

UAV technology has evolved to the point where small UAVs can be purchased anywhere from a mere few hundred dollars to just a few thousand dollars. This is remarkable when one considers the vast quantity and quality of data that can be obtained. The same data could cost 10 to 100 times or more just ten to twenty years ago from alternate sources such as helicopters, airplanes and satellites. In addition to the cost savings, much of the clarity and types of data that are available from UAVs are not possible from other traditional sources. This data includes high-definition video and photos, infrared imagery, audio capabilities, LIDAR (3D) mapping, chemical and biological sampling and more.

The advent of the era of UAVs provides a huge benefit to public works in many areas and especially in the emergency management arena. UAVs will assist us with continuing improvement of emergency management capabilities by contributing to all four areas of emergency management: preparation, response, recovery and mitigation. It has been estimated that reducing the duration of each phase of a disaster response reduces the duration of the next phase by a factor of 10. (Dr. Robin Murphy, Blog, Nov. 19th, 2015 – CRASAR @ Texas A&M University)

One of the key benefits of UAVs is the increased speed of response to a disaster. This includes damage assessments and direction of response resources. UAVs can provide real-time situational awareness to field and office command staff which helps with decision making at all levels. UAVs also provide valuable data (for example, visual inspection and aerial-based surveys) that can be used to assist with everything from search and rescue to debris management to long-term recovery projects. They assist in preparing for a disaster by increasing our readiness to provide a response and enhancing our mitigation efforts to reduce or avoid future impacts of disasters. An example of this would be the use of UAVs for more efficient inspection of flood control structures, such as dikes and dams.

UAVs include mini-helicopters, quadcopters, hexacopters, octocopters and small fixed-wing aircraft. They vary in size from mini-UAVs that can fit in the palm of your hand to larger UAVs that include launchers. The majority of UAVs that are currently being used for public works are extremely mobile and can be used over almost any terrain. Fixed wing platforms typically have five times or greater battery life capacity than their rotary cousins and can generally carry somewhat heavier payloads. Of course they do lack the incredible maneuverability and hovering capabilities of rotary UAVs.

Someday it will be hard to imagine public works including emergency management functioning efficiently and properly without the use of UAVs.
UAVs are beginning to be used in public works in a variety of ways. Their usage will continue to expand as the benefits of UAVs for public works become better known and appreciated. Current uses and benefits (not exclusive to public works) include:

1. **Inspections**
   a) After an earthquake or other disasters, high-resolution video can be observed in real time and recorded to evaluate structural concerns of buildings, dams, bridges and other structures.
   b) Pre-disaster inspections of structures can be performed to provide information for mitigation, maintenance and repair efforts.
   c) With night vision, inspections can also be done in the dark if needed. Currently, the FAA only allows flights during daylight hours.

2. **Wildfires**
   a) Record hotspots.
   b) Can “see” through smoke.
   c) Track progression of fires.
   d) Subsequent watershed management and observation of burn scars.

3. **Search and Rescue**
   a) Mini-UAVs can enter confined spaces and tight quarters that may be inaccessible or may not be safe for rescuers.
   b) Infrared can detect heat from bodies.
   c) Can fly accurate and complete patterns over an area to ensure no spot is missed.
   d) Some UAVs are so quiet that they can monitor audio to help find those that are trapped.

4. **Mapping**
   a) Survey grade aerial photography.
   b) LIDAR/3D provides survey grade 3D imagery.
   c) Survey and monitor land movements due to land, mud and rock slides, or other occurrences.
   d) Fly patterns to assist with accurate mapping to monitor movements of landslides.

5. **Environmental Incidents**
   a) Chemical, biological and radiological sampling.

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**2016 AWARDS PROGRAM**

APWA’s Awards Program recognizes individuals, groups and chapters for their outstanding contributions to the profession of public works. Some of the awards presented include Professional Manager of the Year Awards, Young Leader, Public Works Project of the Year, and Top Ten Public Works Leader of the Year, to name just a few.

Each award is listed on the APWA website. Criteria and nomination forms for the 2016 Awards Program are now available online.

**NOMINATIONS ARE DUE MARCH 1, 2016**

Visit www.apwa.net/awards
b) UAVs can test for hazardous conditions where it is unsafe for people to go.

c) Hazardous materials spills.

d) Waterway contaminations.

e) Erosion and sediment control issues.

f) Watershed management and monitoring for water quality and other concerns.

6. Transportation

a) Inspection of transportation routes including, highways (local and interstate), rails, waterways, etc. to determine current conditions.

b) Monitoring of congestion, traffic jams, intersection problems, accidents.

c) “Live” work zone monitoring.

7. Severe Weather (Hurricanes, Tornadoes, Heavy Snow, Flooding, Droughts)

a) Identify areas of devastation and destruction.

b) Quantify amount of debris that need to be managed.

c) Monitor crop production during low water years.

d) Assist with search and rescue efforts.

8. Post-Disaster Recovery Efforts

a) Maps can show the extent of damage and where the greatest needs are.

b) Information can be used to provide estimated quantities of debris to be removed.

c) Tracking of capital project work and progress.

9. Communication

a) Testing of cell phone towers to assess functionality.

b) Electromagnetic/microwave monitoring and testing.

c) Future possibilities could include providing temporary “aerial cell phone towers.”

10. Deliveries

a) Goods and medical supplies.

b) Specialized equipment or needs.

c) Communications/documents.

11. Provide Early Warnings

a) Floods from waterways or dam failures.

b) Spring snowmelt runoff. Snowmelt amounts can be observed and stream channels inspected for debris that could contribute to flooding.

c) Fires.

d) Structural collapses.

e) Terrorist attacks.

12. Health Concerns

a) Identify areas of standing water – mosquitoes, disease.

b) Tracking of vermin paths.

c) Monitoring of hazardous wastes and incidents.

13. Legal records

a) Insurance claims.

b) Liability issues.

c) Criminal activity.

The future of UAVs is exciting! As with all technologies, we are still learning as we go. While UAVs can serve a multitude of functions, they are not one size fits all. Before purchasing a UAV it is important to fully understand how the UAV will be utilized and make sure the right UAV for the job is selected. Legal issues that include rules and regulations pose some of the biggest current obstacles. UAVs have been used in over 40 natural disasters, but they have been grounded at times due to legal concerns when they may have been very useful. With the dramatic increase in UAVs, the FAA is actively working to identify and implement the appropriate rules and guidelines for their use. Agencies should verify, under current FAA requirements, that any contractor hired to use UAVs has an FAA Section 333 exception or FAA Certificate of Authorization along with appropriate liability insurance.

UAVs are valuable tools that need to be supported. They have a broad range of benefits that include those that apply to public works. Their benefits (and limitations) have been demonstrated throughout the world. These amazing technological advancements are to our day just like cars, airplanes and computers were in their days of infancy. Today it’s hard to imagine a functioning kitchen without a microwave oven or a fully operational public works without cell phones. Tomorrow it will very likely be hard to imagine public works including emergency management functioning efficiently and properly without the use of UAVs. As we transition into the era of the UAV, it is important that all public works and emergency management agencies consider their use.

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Hurricane Dolores comes to town

Dick McKinley, PWLF
Public Works Director
City of Paso Robles, California
Member, APWA Professional Development Committee

It is a hot, dry summer in the fourth year of the California drought. Paso Robles, Calif., is a beautiful community of about 30,000 in the central coast region, and is wine country and horse country. The highest recorded rainfall in Paso Robles for the month of July was 0.59 inches. That was until Hurricane Dolores came to town on July 19 and hung around for more than six hours. Most storms move through an area, but not Dolores. During the window of time that Dolores stayed, Paso Robles received 3.55 inches of rain officially. More important was the 5-6 inches of rain that fell in the hills to the west, outside the city limits, and with canyons of soils that were devoid of vegetation and runoff controls. Suffice it to say that Paso Robles was deluged with a lot of rain, but a lot more mud and dirt and debris. Hurricane Dolores had come to town.

The key question is, “Could we have been prepared?” The answer to the question is arguably “no” because this was a 300-year storm event and very few, if any, communities spend the money on storm drainage infrastructure to handle that big of a storm. Further, with most of the damage coming from dirt and debris coming from outside the city it is very easy to answer “no.” The problem with this is that even if no is a true and fair answer, it is not okay to just accept that as good enough. We are public works professionals and need to hold ourselves to high standards. Should we have been prepared?

As we prepare and drill for emergency events, do we look outside our areas for things that may come our way, even when they are completely outside our control? On August 14, 2003, the Great Northeast Blackout knocked out power to areas that were not having a power problem, because they were part of a domino effect of a problem that happened far away and outside their control. Fifty-five million people were impacted. Communities have experienced major events due to railroad disasters near their town, or tsunamis from earthquakes that happened a thousand miles away. The question remains, “Should we be prepared?”

The answer is yes, and no. We should be prepared to the extent reasonable, but we cannot prepare for every possibility. So what is “reasonable”? You can’t prepare for a meteor strike, or solar flares, or a zombie outbreak (okay, maybe for that one). You can prepare, however, for unknown events by making sure you are at the top of your game. Do your radios work, or will the antenna be one of the first things to go down? Will your employees show up to help in a disaster, or will they stay home with their families? Are your systems working properly (cleaned and lubed) and tested recently? Are your staff members trained to operate equipment across disciplines? Are your lines of authority clearly defined? Do you have purchasing authority in place? Do you have mutual aid agreements with neighboring jurisdictions? (If not, FEMA may not reimburse for those costs.) Do your key managers know their counterparts in other agencies, or even in your own Police and Fire Departments?

Luckily for all of us, APWA has some great information available to help you sort through these and other questions concerning what level of emergency preparedness is “reasonable.” The Emergency Management Committee’s part of the APWA website is loaded with information. APWA and FEMA work closely together, with FEMA looking to APWA for technical expertise. Remember that we are the first responders and people are counting on us. There are plenty of resources in the APWA Bookstore. Public Works Institutes are loaded with highly educated and experienced professionals to help you prepare as part of your professional career path. There are mentor programs through the DCS Center where you can actively draw on the experiences of a professional who will work directly with you as you improve your knowledge and skills in emergency management (and other topics). The resources are at your immediate disposal, so the level of emergency preparedness that is “reasonable” starts with your personal training and the training of your team.

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The emergency manager’s dilemma

Public works professionals everywhere in municipalities of all sizes continually strive to achieve what can seem like a never-ending overload of work which their jobs require. At the same time, stakeholders (e.g., policy makers, administrative executives, and “whole community” constituents) demand faster service, smaller budgets, and lower taxes.

Preparing for pain which constituents may never feel

When there is no crisis (aka “the sunny times”), the investments in emergency management assets and their associated management programs are frequently under-appreciated—until a major storm or other event strikes the community. During these “declared disasters” the safety and quality of life are threatened, homes are damaged, roads are blocked, utilities are down, municipal services are interrupted, and the built and natural environments may be irreversibly impacted. During these times, stakeholders get to see in real-life action the amount of preparation, prevention, and mitigation which either did or did not happen in “the sunny times.” Response and recovery is what stakeholders see, and whether municipal professionals come across with a well-choreographed dance through crisis, or a chaotic panic of a disaster, will be played out in the local and possibly national media for the world to see. Stakeholders are not content with unplanned “reactive” response and recovery, but are becoming more demanding and clamoring for “proactive” and even “adaptive” approaches to the emergency management professional discipline towards “Resilient Cities.” Resilient Cities cannot only withstand the acute shocks and chronic stressors (e.g., earthquakes, social strife, community health issues, built and natural environment tensions) but can adapt and use shocks and stressors as catalysts towards resilience. The Rockefeller Foundation’s “100 Resilient Cities” initiative is a great example of this principle in practice.
How high up are you on budget priority?
Municipal capital and operating budgets by their very nature represent the prioritized policy choices which communicate the importance of any and all city services. Different programs have different relative priorities dictated simply by the “cost/benefit” allocation of finite resources of tax base, bond funding, and other financial sources. Political considerations also play a factor in the calculus. For example, emergency management budgets may fall below law enforcement and fire protection, but may be higher than parks and recreation. With stakeholder demands to accomplish more services with less time and resources, municipal policy makers, administrative executives and public works professionals must create balanced programs which exhibit “prudent stewardship” and proactive “visionary leadership.” The votes of constituents at the next election may hang in the balance.

Getting higher budget priority through professional alliances
In order to address this more demanding policy paradigm, emergency management professionals have an opportunity to provide innovative solutions collaboratively crafted with unlikely allies. It is possible for municipal professionals from very disparate professional disciplines (e.g., emergency management, urban forestry) to leverage their professional disciplines and put forth policy proposals for funding consideration which realize more value for the “whole community” and municipality than either professional discipline applied separately.

Building an alliance with an unlikely ally
In September 2015, an innovative partnership model called the “Urban Forestry Incident Command Engagement Model” (UFICEM) was created for the very purpose of creating collaborative alliances between emergency management professionals and professionals with “Tree-Related Responsibilities,” which can produce compelling net positive value policy propositions to address community priorities while casting policy makers and administrative executives as “prudent stewards” exercising “visionary leadership.” The UFICEM final draft was presented...
at a “Storm Resilient Communities Summit” in Los Angeles on August 3, 2015 where several American Public Works Association members were integral in facilitating input from a spectrum of stakeholders. In a nutshell, emergency management professionals along with their colleagues with “Tree-Related Responsibilities” can make the case to gain higher priority budgetary and other support for their municipal asset investments and associated management programs.

Where did the UFICEM come from?
The UFICEM was initiated as a follow-on project to an “Urban Forestry Emergency Operations Planning Toolkit” project aimed at an arboriculture audience. The UFICEM was developed over a two-year period by Smart Trees Pacific and XLR8 Educational and Research Foundation, under a United States Forest Service Region V grant, with additional financial support from the California Department of Forestry and Fire Protection (CAL FIRE) Urban and Community Forestry Program, the California Urban Forests Council, and The Davey Tree Expert Company. Additional in-kind contributions were provided by the City of New York – NYC Parks, University of Washington College of the Environment, University of Wisconsin at Stevens Point College of Natural Resources, the American Public Works Association, and Order4Orgs, LLC. Over sixty-four professional contributors from various disciplines served to take part in interviews, review sessions, and also at the “Storm Resilient Communities Summit” for final review of the UFICEM. The audience for the UFICEM is broader to include all professionals in municipalities, nonprofits, and private sector partners along with “Tree-Related Responsibilities” and emergency management professionals.

How does the UFICEM work?
The UFICEM first acknowledges that municipal professionals face challenges in accomplishing their duties when there is no budget or other resources. Then, establishes that policy makers and administrative executives can be educated through innovative, proactive approaches to support budget and other support for combined emergency management, urban forestry and urban greening solutions. The UFICEM does not assume that the municipal professional is a skilled or savvy communications professional and walks the municipal professional through an introduction to the research-based, “dollars and sense” value proposition of urban forestry and urban greening, and then a three-step framework which anybody can use. Simple, plain, easy-to-understand language is used with meaningful and eye-catching visuals in a “magazine” style format which is attractive and concise. The reader is walked through how to “Prepare” themselves to have a conversation with an emergency manager by “learning the languages” of the Incident Command System and the National Incident Management System. Further, the reader prepares by performing a simple self-assessment of their urban forestry and urban greening assets and association management programs so that they know what they have to offer, and know where they need help. Next, the reader learns to “package” concise messages which address known needs of emergency management professionals (e.g., “How can we prevent trees from going down on roads?”; “What resources do you have which can be used during an emergency?”; “How can you help improve the safety of first responders and the public?”). Finally, the reader learns how to “present” their messages to get and hold the attention of emergency managers so that mutually beneficial, collaborative relationships can be established through to policy funding.

It’s an investment, not a cost
A growing body of research over the past 20 years has defined urban forestry and urban greening programs as investments in assets, which have functions with benefits with value which can be quantitatively and qualitatively assessed. And, the value of the tree assets over the life span of the tree, less the costs of management programs, can result in a positive net present value. This means that urban trees and urban greening science, when combined with other sciences such as emergency management, urban planning, transportation planning, and utility planning, can not only pay for the initial investments and costs, but can generate a net positive increase in the value of a community. This is a paradigm shift which can fundamentally change the “cost/benefit” aspects of municipal public works management program proposals. There are free tools available to quantify the baseline value of urban forestry and urban greening assets in a community as well as to model the potential increase in value to a community given different tree canopy goal scenarios. In the Introduction to the UFICEM, Kathleen Wolf, Ph.D., Research Scientist at the University of Washington College of the Environment, provides a lay-person’s overview of “Who Should Care for the Urban Forests?”, “What are Urban Forests?”, the value domains of “Environmental Services” (e.g., energy savings’ stormwater management; improvement of air quality), “Human Health and Wellness” (e.g., faster healing in hospitals; reduced mental and physical stress; better attention to tasks at work), “Better Communities”
(e.g., more active and healthier lifestyles; fewer vehicle accidents; reductions in personal and property crime), and “Economic Benefits” (e.g., higher property values with higher tax base; reduced investments in municipal “gray” infrastructure initial amounts and longer periods of longevity before retrofit or replacement). A detailed discussion on the value of urban forestry and urban greening by Dr. Wolf can be found on the APWA Click, Listen & Learn Library as a November 12, 2015 title, “The Urban Forestry Role in Community Resilience.”

But I’m an emergency manager. Trees normally get in my way!
The lack of or poorly managed urban forestry and urban greening assets and associated asset management program assets can certainly cause trees and urban greening to exacerbate the effectiveness and efficiency of response and recovery efforts after a storm, natural disaster, or even a man-made disaster. Any municipal asset without a proactive asset management plan can deteriorate and become a threat risk which can magnify the impact of a disaster. However, when the urban forestry and urban greening professional disciplines are interwoven with other municipal disciplines into the fast emerging concepts of the “resilient city” as defined by the “City Resilience Framework” from the Rockefeller Foundation, emergency management professionals can find allies who can collaborate and help craft innovative, surplus-generating policy proposals which make a compelling case for budget funding and other support.

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Free, advance PDF copies of the Urban Forestry Incident Command Engagement Model, and Urban Forestry Self-Assessment Tool can be requested from www.smarttreespacific.org or UFICEM@XLUR8.org. Free PDF copies of APWA’s Urban Forestry for Public Works Reports are available from https://www2.apwa.net/about/coopagreements/urbanforestry/
“We recently had a huge sinkhole appear in one area of our city. We found the cause was a collapsed sewer line, and now, after almost a year, the repair work is finishing up. Investigators told us there was a much larger problem underground caused, in part, by water conservation. What did he mean by that?”

In researching causes of sinkholes recently, I discovered the one you are talking about was actually caused by 2,500 feet, or about a half mile, of corroded concrete sewer lines in the area. The neighbors had complained for some time about the horrid smell in the area and the constant sound of raw sewage pumping through their front yards. When folks from the Environmental Services department investigated they discovered the problem was caused by a severe change in the sewage to water ratio, which had caused there to be more waste than water running through the lines, creating more sewage gas which corrodes concrete. Seems that people are flushing their toilets fewer times a day and turning their sinks off during chores instead of letting the water run. And all is being done to comply with water conservation, which is a good thing.

Crews sought out a new long-term solution to the corroding pipe problem. They found that by repairing lines with a plastic material, the life of the sewer lines could be elongated to as many as 100 years of use without needing repair or replacement. As the city began replacement and repair of the area sewer lines they found it was eating up about 75 percent of the annual capital improvements budget, or about $100 million a year. They realized it was what they needed to do to keep the system in good working order. But they have also realized if it is happening in one neighborhood, it is likely to be happening soon in many neighborhoods. Might be something to check into before you find other severe problem areas. It’s another one of those “unseen infrastructure” problems that taxpayers and elected officials alike don’t see so they don’t appreciate the dire need for replacement before major collapses occur.

Q

“I read about an innovative warning system designed to reduce crashes in work zone areas by about 50%. Seems almost too good to be true. Do you have any details?”

A

The program you are asking about was used by the Texas Department of Transportation on a project to widen 96 miles of Interstate 35 through central Texas. Frequent temporary nighttime lane closures were inducing queues upstream of the merging taper. Closures were not permitted in daytime hours. The queues were of concern for the following reasons: The corridor was predominantly rural, so drivers did not expect traffic queues, especially at night; lane closure necessity and locations vary nightly so travelers are unable to develop an expectation of queues; contractors were using all available right-of-way for construction activities, so queue warning equipment could not be easily positioned and left until needed; and the corridor was heavily used by large trucks, which increased the severity risk of any end-of-queue crashes.

The end-of-queue warning system consists of two components: first, a portable work zone queue detection and warning system, which is a highly portable work zone intelligent transportation system (ITS) queue detection and warning system which is deployed upstream of the merging taper on each night that queues are expected. It moved the next morning, along with the merging taper. The second component consists of portable rumble strips. The strips are deployed in the travel lanes upstream of the merging taper to provide tactile, audible, and visual alerts as the driver approaches a lane closure. According to the Fact Sheet, experiences with system effectiveness to date include: deployed on more than 200 nighttime lane closures in the corridor; crashes on those nights reduced by 18 to 45 percent (compared to an estimate of what they would have been if the systems had not been deployed; fewer rear-end collisions and severe crashes injury/fatal) at lane closures with the system deployed than at similar lane closures without the system; savings of between $1.4 million and $1.8
The APWA Oregon Chapter Executive Committee recently held a strategic planning retreat to plan for 2016 and beyond to build its chapter capacity development.

A million in societal crash costs; and ongoing savings of societal crash costs of between $6,600 and $10,000 per night of deployment. A pre-designed PCMS message warns motorists of the presence of stopped or slowed traffic and the approximate distance to the stopped or slowed condition. The pre-designed message is selected using operations rules based on the detected speed at each sensor. The program is being well received and additional information can be found on the work zone safety website at: https://www.workzonesafety.org/sw/technology_application/outreach.

“We’re into snow season already with two events under our belts and it’s only the middle of November. Last year we heard news people using a new phrase to us, ‘polar vortex.’ Exactly what is that?”

Last winter we saw this terminology widely used. To many it just registers as meaning “extremely cold” or “dangerously cold.” Regardless of what thoughts rush through your mind when you hear it, it’s best to understand the cause, and most importantly, the effects of such a snowstorm. A polar vortex is capable of causing subzero temperatures. Consequently your operators need to be especially mindful about cold-prepping their utility vehicles. You may need to require a built-in heating system for the machine’s vital components such as the hydraulics, auxiliaries, and the engine. You should remember that just as you may need a hot cup of coffee to jumpstart your system in extremely cold mornings, so does your equipment. The performance of both your engine and transmission are affected by frigid temperatures, so it’s always best to warm up the vehicles per the manufacturer’s recommendation. Regardless of how extreme the winter may be in your region, you need to be prepared for the inevitable—and sometimes the unexpected. Equip your operators with appropriate outerwear and gear to protect themselves in dangerous situations but you also need to prepare your equipment to handle the workload and the environment in which it must perform. I don’t know about you, but any time I hear the word “polar,” I assume the worst!

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Products in the News

Reduce your slip and fall liability this winter with STAND-UP Freeze Resistant Liquid Deicer

New STAND-UP helps facilities mitigate their slip and fall liabilities by completely clearing away slippery ice and snow pack from their steps, walkways and ramps. STAND-UP is a great alternative to salt around facilities since it keeps working even after the sun goes down. STAND-UP will not track into buildings, and it will not damage expensive stamped concrete and brick pavers like salt can. For more information, watch a short video of STAND-UP in action at www.rhomar.com or call (800) 688-6221.

Color-Safe® durable color pavement marking material

Color safety markings are being used around the country to delineate bike lanes, bus lanes, crosswalks and pedestrian safety areas. Transpo is proud to announce Color-Safe is being used in both New York City and Chicago. Markings must remain vibrant to be a safety feature! As more cities are creating complete streets, the material used for color lanes needs to be considered. Color-Safe® MMA is not only one of the most durable markings on the market, but it can be applied in cold weather extending the marking season. For more information, please visit www.transpo.com.

Save money with Cougar® DC Electric Truck Vibrators

Cougar® DC Electric Truck Vibrators improve the speed and control of material flow from dump trucks and other self-powered heavy equipment. Adding a Cougar® Truck Vibrator saves money on costly repairs to your trucks and increases productivity by eliminating carryback. Features and benefits include the following: shielded, oversized, permanently-lubricated ball bearings assure exceptional service life; sealed against dirt, dust, and water for long life in extreme conditions; small size and lightweight with high-speed, low-amp electric motors; easy, low-cost installation; rugged and durable. Cougar patented the world’s first 12-volt truck vibrator in 1964. For more information, contact David Ruggio, Product Specialist, at davidr@martin-eng.com or 800-544-2947, ext. 713.

UniFlow Laboratory Fume Hoods

UniFlow Fume Hoods are the most complete line of fume hoods in the industry. UniFlow hoods are available in special sizes from 30” to 96” wide in bench top and floor mount models; custom sizes can be easily addressed to suit special needs. UniFlow Hoods feature a unitized construction entirely of
chemical-resistant, fire-resistant, self-extinguishing, non-metallic composite resin materials. The fume chamber is molded one-piece seamless with all corners coved for easy cleaning and light reflectivity. UniFlow hoods include low-flow Constant Volume air bypass and Variable Air Volume VAV models, which are U.L. 1805 certified. A wide selection of electrical, plumbing and ventilation accessories is available, in addition to counter tops and base cabinet options. Visit www.HEMCOcorp.com or call (800) 779-4362.

MQ Power 185 CFM Air Compressor

The model DIS185SSI4F compressor, engineered to meet the needs of construction and equipment rental professionals, is powered by a 49 horsepower Isuzu diesel engine that meets EPA Tier 4 Final engine emissions. Designed for durability and easy maintenance, its air tank has been e-coated to prevent common rust problems due to condensation thus extending its life. There are also two-stage air filters for the engine and compressor. The fuel also goes through two-stage filtration with a manual primer. The sound attenuated cabinet reduces engine noise during operation. A state-of-the-art LED digital control panel displays the compressor’s readings. For more information, please visit www.multiquip.com.

Mobile311 by FacilityDude

Mobile311 by FacilityDude allows users to easily document field work and routes on a web-based, ESRI-integrated map. With one touch, the location and type of work are instantly uploaded to the map so supervisors can see where their units are in real time and can prioritize assignments based on location. Crews know where to go while they’re on the move and stay armed with the information they need to perform their work. Benefits include responsiveness (receive citizen requests and quickly assign the nearest crews to urgent requests); transparency (document routes, improve information sharing and track work); and productivity (improve efficiency of routes and easily flag issues for other departments). For more information: Emma Finch, emma.finch@dudesolutions.com, (919) 674-8543.

Fuss & O’Neill earns urbanism award for New Haven, Connecticut street conversion project

Fuss & O’Neill has been awarded a 2015 Urbanism Award by the Congress for the New Urbanism, New England Chapter. The Manchester, Connecticut-based engineering and planning firm won the award for its plan to convert 10 New Haven one-way streets to two-way, while adding bike lanes, improving bus route reliability, and promoting pedestrian safety. The Fuss & O’Neill plan provides a blueprint for creating a more pedestrian- and bicycle-friendly downtown that is less car-centric. In addition to improving the quality of life for residents and visitors, the multimodal plan will support economic development by greatly improving all forms of travel throughout the city. For more information on Fuss & O’Neill, please go to www.fando.com.

Milbank advises lender syndicate in $1.1 billion gas pipeline projects

Milbank, Tweed, Hadley & McCloy LLP has advised an international bank syndicate in the more than $1.1 billion limited recourse project financing for a pair of natural gas pipelines that will run from a hub in southwest Texas to locations on the U.S./Mexico border. The financing comprises two greenfield projects through two separate financings that have closed and funded concurrently: an approximately $508 million pipeline running 195 miles to San Elizario, Texas, near El Paso; and an approximately $647 million pipeline that will run 148 miles to Presidio, Texas, on the Rio Grande River about 180 miles southeast of San Elizario. The 42-inch pipelines will both originate at the Waha energy storage and transit hub west of Odessa, Texas. To learn more about Milbank, please visit www.milbank.com.
Anchoring systems product line expands with two new anchors

Simpson Strong-Tie has expanded its anchoring systems for residential, commercial and industrial uses to include a new Hollow Drop-In Anchor and a Wood Rod Hanger. The Hollow Drop-In Anchor is an internally threaded, flush-mount anchor for use in hollow materials such as CMU and hollow-core plank, as well as in solid base materials such as brick, normal-weight and lightweight concrete. The Wood Rod Hanger is a one-piece fastening system for suspending 1/4” or 3/8” threaded rod. Vertical rod hangers are designed to suspend threaded rod in overhead applications from wood members. Horizontal rod hangers are available for applications requiring installation into the side of joists, columns and overhead members. For more information, visit strongtie.com/anchors.

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lightweight 26 lbs., 4” x 10” section. For more information, call (800) 245-1333, or visit www.deeconcrete.com.

Trackless 24-inch Stump Grinder

The Trackless 24-inch Stump Grinder is the latest addition to their impressive lineup of attachments for their North American-built municipal tractor. The 24-inch diameter rotor has 34 bolt-on carbide teeth and is powered from the tractor’s hydraulic system. The Trackless joystick movements are very precise and easy for the operator when lowering, tilting, or maneuvering the cutting head. Customers like that the grinder is front mounted, easy to maneuver in tight areas and can be driven from one job site to another without having to load it on a truck and trailer to transport it several times per day. For more information, please visit www.tracklessvehicles.com.

REC Solar makes commercial solar simple

REC Solar is a solar energy provider exclusively on businesses and backed by one of the world’s largest utilities. One of the company’s core focuses is federal government agencies, and REC counts more than 32 megawatts across 35 federal projects. On November 30, 2015, REC Solar announced the interconnection of two solar energy carports totaling 280 kilowatts at United States Army Reserve offices in Arizona and California. REC Solar provided engineering, procurement and construction services for the installations. The carports will provide shading for parking and offset carbon emissions equivalent to burning 521 barrels of oil annually. For more information, visit www.RECSolar.com or call (844) 732-7652.
New pressure washer added to PRO SERIES for 2016

Briggs & Stratton® is introducing a max 3600 PSI, max 2.5 GPM commercial-grade pressure washer to its line of PRO SERIES pressure washers. Powered by a Vanguard 6.5 gross HP engine, the new pressure washer is designed to give contractors enough power for any cleaning job, including prepping exterior siding for paint. The pressure washer is protected by the TransportGuard™ System, which is a simultaneous fuel and ignition shut-off designed to protect the engine from oil and fuel dilution during transit to and from the jobsite. The new model gives contractors a 35 ft. steel braided hose to tackle the toughest cleaning jobs, while a five-year limited commercial warranty offers unmatched peace of mind. For additional information, please visit www.briggsandstratton.com.

Get involved in STEM Education – volunteer tutor or pursue a path to teaching with EnCorps!

The EnCorps STEM Teachers Program (www.encorps.org) provides STEM industry professionals with opportunities to tutor 2-4 hours a week in local high-need middle and high schools. We also offer a program to explore a career in teaching, all free to our participants. Inspire the next generation of scientists and innovators! Find out more by joining one of our monthly free EnCorps 101 webinars, RSVP: http://encorps.org/webinar/ or get in touch with Bethany Orozco, Southern California Program Director, at bethany@encorps.org.

Eaton’s new Eatonite® anti-corrosion laser cladding provides best-in-class protection for cylinders in harsh marine environments

Power management company Eaton has announced new Eatonite® anti-corrosion laser cladding, which enhances the service life and reliability of high-functioning cylinders. The coating, certified to meet Joint Industry Protection guidelines by DNV GL, protects cylinders in the demanding saltwater applications and harsh operating environments, reducing costs of unplanned maintenance and equipment downtime. Suitable for offshore deepwater oil and gas exploration and production, marine, civil engineering, wave power and other heavy duty applications, Eatonite anti-corrosion laser cladding can be applied to new cylinders or refurbished applications. For more information, please visit www.eaton.com/Eatonite.

ReneSola America LED Tube Series

The ReneSola America LED Tube Series is an environmentally friendly, mercury-free LED lamp that uses an integrated thermal design. The tube is one-third aluminum, preventing any product damage or impairment. The LED Tube Series provides consistent light output and can achieve energy savings up to 45 percent greater compared to traditional T8 fluorescent products, and has a longer lamp life compared to T8 fluorescent products. Applications for the LED Tube Series include factories, workshops, warehouses and other commercial uses. The LED Tube Series comes with a five-year warranty. For more information, please call (415) 977-1941 or send e-mail to dwestreich@antennagroup.com.
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### UPCOMING APWA EVENTS

#### PWX
- **2016**
  - Aug. 28-31  Minneapolis, MN
- **2017**
  - Aug. 27-30  Orlando, FL
- **2018**
  - Aug. 26-29  Kansas City, MO

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

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<td>18</td>
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<td>University of Minnesota’s St. Paul</td>
<td><a href="mailto:Glenn.engstrom@state.mn.us">Glenn.engstrom@state.mn.us</a></td>
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<td>American Council of Engineering Companies Annual Convention</td>
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