Roundabouts:
The sustainable intersection choice
(see page 42)

Inside this issue:
The 2015 Top Ten!
BMP, Inc. makes stormwater quality affordable!

- More than 65,000 SNOUTs installed since 1999
- The SNOUT is the most specified brand of Hood or Trap*
- The Stainless TrashScreen is for Full Trash Capture
- The Bio-Skirt is for Hydrocarbons, including PAHs
- Get Verified T.S.S. Reductions with the SAFL Baffle

US Patents 6126817, 7951294, 7857966, 8512556 Canada Patent 2285146, 2688012, 2690156 Others Pending
The SAFL Baffle is a patented and trademarked product of Upstream Technologies, Inc.
* Based on project searches of stormwater quality hoods or traps specified by name brand in 2014 in the USA.
The APWA Reporter, the official magazine of the American Public Works Association, covers all facets of public works for APWA members including industry news, legislative actions, management issues and emerging technologies.

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Expanding our sustainability leadership and resources

Larry Stevens, P.E., PWLF
APWA President

By tradition, this May issue of the APWA Reporter is focused on “Sustainability in Public Works” and I have some exciting updates to share since this time last year.

Since it was created by the APWA Board of Directors in 2008, the APWA Center for Sustainability’s mission has been to build the skills, knowledge and tools for its members to exercise sustainable leadership in their communities.

In January, the Center welcomed the addition of two new members to its Leadership Group.

**Daryl Grigsby, Public Works Director, San Luis Obispo, California**, has over 32 years of experience in the public works profession and has been involved in sustainable projects such as creating a “Master Bike Plan” for the City of Pomona, California. Daryl is a former member of the APWA Board of Directors and will bring his passion for advancing the future of our communities and of the public works profession to the Center.

**Stephane Larocque, SVP, Impact Infrastructure, Toronto, Ontario**, has an extensive background in the field of triple-bottom line economic analysis and was a pioneer in the development of the Sustainable Return on Investment (SROI) Framework. Steph’s wealth of experience and focus on the economics of sustainability will bring valuable perspective to the Center.

The Center also recently welcomed a new **Director of Sustainability, Anne Jackson**, who joined APWA’s Washington office in February and will be the primary staff contact for the Center. Anne will provide leadership, management and direction for the Center and will be responsible for governance, policy and program development, advocacy, education programs, and outreach to members and other organizations.

I look forward to Daryl, Stephane and Anne helping the Center expand the tools, resources, and knowledge that will make our public works professionals more successful in their efforts to create sustainable communities.

The Center has been collaborating since late last year with the Technical Committees on a project to compile “Sustainable Practices in Public Works.” The Center plans to make these best practices available soon to members and to continue adding best practices to their toolkit. See APWA Director of Sustainability Anne Jackson’s article describing how the Center is building resources through collaboration (page 4).

Other noteworthy developments in sustainability come from the Institute for Sustainable Infrastructure (ISI).
ISI announced in February that the Grand Bend Area Wastewater Treatment Facility, located in Ontario on the shoreline of Lake Huron, earned the Envision® Platinum level award. This project is the first ISI Envision verification in Canada, and first wastewater facility to be ISI Envision-verified in North America. The facility features a constructed wetland to support native wildlife species, a flexible design responsive to changing sewage flows, and trails and interpretive signage to encourage community visitors. See APWA Director of Sustainability Anne Jackson’s article describing more sustainability features of the Grand Bend Area Wastewater Treatment Facility (page 18).

Other projects that have earned an Envision award are the Sun Valley Watershed Multi-Benefit Project in Los Angeles County, California (Platinum) and the Tarrant Regional Water District (TRWD) of North Central Texas – Line J, Section 1 Pipeline Project (Silver). See ISI’s website for more information on these projects (http://www.sustainableinfrastructure.org/awards/index.cfm).

In the past 12 months, ISI has gained traction not just in terms of infrastructure projects using the Envision rating system as a tool and achieving awards, but also in the number of public agencies and public works practitioners seeking the ENV SP credential. See JC Alonzo’s article outlining why you should adopt Envision (page 16).

These are exciting developments for the Center for Sustainability as it positions APWA and its members to create vibrant, healthy places that enrich all life.

“[The highest result of education is tolerance.]”

– Helen Keller (1880-1968), American author, activist and lecturer
Building Resources through Collaboration: “Sustainable Practices in Public Works”

Anne Jackson
Director of Sustainability
American Public Works Association
Washington, D.C.

Since it was created by the APWA Board of Directors in 2008, the APWA Center for Sustainability has been committed to serving APWA’s membership by providing tools, resources and case studies that encourage sustainable actions by our members within the communities we serve. The creation and delivery of resources is an ongoing effort and the Center is continuously seeking ways to harness the expertise of APWA members and leaders to highlight how to address sustainability in public works.

To that end, in late 2014 the Center began a collaborative project with APWA’s Technical Committees to identify and document “Sustainable Practices in Public Works.” Each Technical Committee was asked to identify best practices for implementing sustainability within their discipline (transportation, water, fleet, leadership and management, etc.), provide details about the practices and include where and how they are being implemented. The Center is turning these best practices into a regularly updated resource for APWA members illustrating how to achieve improved livability, resilience, and sustainability in their communities. Though this project is by no means complete, the following best practices had been documented by March and will be published in time for Congress:

Emergency Management
- Hazard Mitigation Planning: A Tool for Resilience

Engineering and Technology
- Materials Management for Winter Road Maintenance through the Automation of Application
- Energy Source Diversity and Conservation
- Use of Value Engineering and Life-Cycle Practices for all Construction and Infrastructure Development

Facilities and Grounds
- Utilizing “Greener” Practices in Parks
- Landscaping for Energy Saving and Sustainability
- Improving the Energy Efficiency and Use of Recyclable Materials in Public Facilities

“The Center will continue to gather sustainable practices in public works as part of its broader effort to build a resource library for APWA members.”

“A community is like a ship; everyone ought to be prepared to take the helm.”

– Henrik Ibsen (1828-1906), Norwegian playwright, theatre director, and poet
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The Center will continue to gather sustainable practices in public works as part of its broader effort to build a resource library for APWA members. Many thanks to the Technical and Standing Committees that have contributed to this project:

- Emergency Management
- Engineering and Technology
- Facilities and Grounds
- Fleet Services
- Leadership and Management
- Solid Waste Management
- Transportation
- Water Resources Management
- International Affairs
- Small Cities/Rural Communities

In addition to this recent project, the Center is undertaking a thorough review of case studies, guidelines and other tools it has gathered and created since its inception in order to better organize, add to, and promote these resources. And in order to push concise, timely examples of sustainability in public works out to APWA, the Center began a project in late 2014 to highlight “tips and practices for a more sustainable future” in a monthly campaign called “In the Know” which can be found under “Inside APWA” on the APWA website. Each month, the Center is providing a short description of how citizens and/or public works professionals are working within their communities to bring about a more sustainable future. Tips and practices highlighted in recent months include:

- Washington, D.C.’s “Bag Law” enacted in 2010 to reduce pollution from plastic bags and generate revenue for stream restoration and cleanup. (“In the Know” November 2014)
- Scottsdale, Arizona’s leasing of the city’s streetlights and traffic signals to cell providers to generate revenue for their general fund and minimize new cell towers that might interrupt the scenic landscape. (“In the Know” January 2015)
- Cape May City, New Jersey’s formation of a “Green Team” to guide the City in its goal of achieving improved quality of life, resiliency, and sustainability. (“In the Know” February 2015)
- New Haven, Connecticut’s “Complete Streets” program which engages residents for input on improving streets and focuses on effective, low-cost solutions. (“In the Know” March 2015)

The Center looks forward to furthering these efforts in coming years and will continue to seek out new and continuing opportunities to collaborate with members and Technical Committees. To view the Center’s resources, visit the Center’s website at www.apwa.net/centerforsustainability, and if you have suggestions for sustainability resources, ideas about how to promote sustainable practices in public works, or want to collaborate with the Center, contact Anne Jackson at ajackson@apwa.net.

Fleet Services
- “No Idling/No Top-Off” Policy
- Switching Vehicle Fleets from Petroleum to Synthetic Lubricants
- Multi-Use Hook Lift Hoist Systems

Leadership and Management
- Using Training and Technology to Gain Efficiencies and Increase Sustainability
- “Green Teams” Guiding Cities To Become More Sustainable
- Sustainability Leaders as Story Tellers – Communication Boosts Sustainability Efforts
- The Top 5 Priority Sustainability Actions for Public Works Directors

Small Communities/Rural Communities
- Demonstrating Rainwater Harvesting in Public Works

Solid Waste Management
- “Turning Trash into Resources”
- Public Works and Environmental Education

Transportation
- Promote Bicycling as Part of a Multi-Modal Transportation System

Water Resources Management
- Using Permeable Pavements in Alleys to Improve Stormwater Quality and Reduce Quantity
- Automated Water Metering Systems for Data Management, Secure Customer Access and Leak Identification

The Center will continue to gather sustainable practices in public works as part of its broader effort to build a resource library for APWA members.
Chapter Capacity Building through Mentoring

Robert E. Beamer, P.E., PWLF
Senior Project Manager, Calleguas Municipal Water District
Thousand Oaks, California
Delegate, APWA Ventura County Chapter

The APWA House of Delegates redefined itself last year as the Council of Chapters, whose role is to serve as advisors to APWA’s Board of Directors and Executive Director in support of the Association’s mission statement and Strategic Plan; in addition to continuing to serve as a liaison between the national association and local chapter. The APWA Strategic Plan includes three primary priorities, all of which are of equal importance: Advocacy of Public Works, Integrated and Comprehensive Professional Development, and Support and Strengthen Chapters. The Delegates from each of the 63 chapters sit on one of eight Council of Chapters committees to help develop strategies and further the goals for the Association’s three priorities, as well as the identified secondary priorities included in the plan (the APWA Strategic Plan is located on the website at http://www.apwa.net/download/APWAMentoring).

The Chapter Capacity Building through Mentoring Committee is one of the eight Council of Chapters committees. This committee serves the goals of all three primary priorities, but it is of particular importance in supporting the priority to support and strengthen chapters. Chapters utilize National staff and resources to help them gain members and grow, in addition to getting help on the ever-increasing financial reporting requirements and other needs of doing business as a local chapter. Chapters also rely heavily on each other for sharing of ideas, best practices, problems (and how to solve them), and strategies. At the Council’s winter meeting held earlier this year in Kansas City, Mo., and summer meetings which are held at the APWA National Congress each year, Delegates meet together as a region (and sometimes multiple regions get together) to discuss matters of importance to the Region, but also to share each chapter’s experience over the last half year regarding their best practices, strategies that have worked well (or not worked well) to raise money for scholarships, increasing membership and—more importantly for the current members—providing valuable services for their members, ways to encourage young professionals to become more engaged in the local chapters and in APWA, ways the chapters provide community service to their communities, and so on. In other words, the chapters mentor each other through the sharing of ideas twice a year at these meetings.

The Chapter Capacity Building through Mentoring Committee is beginning to develop resources to assist chapters on an ongoing basis, without having to wait for Congress or a Council of Chapters meeting to share ideas on best practices. To that end, the committee has developed a Chapter Best Practices & Mentoring Catalog. This is a work in progress; members of the Chapter Capacity Building through Mentoring Committee will continue to add to and improve the catalog. A number of chapters have contributed their best practices, including membership development, education and special events, finance management, administration, and marketing to name a few. The Best Practices in the catalog are listed according to which of APWA National’s best practices they support; for example, the Florida Chapter included the following in support of APWA’s Chapter Best Practice No. 49, The Chapter’s written and graphic materials follow APWA branding standards:

“The Chapter has developed a brand that melds the national requirements with the specific attributes that are associated with Florida, namely sunshine and water. We used this branding effort to coordinate similar looking marketing materials, and to provide a more direct connection with our Branches. Now, each of...
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our Branches and associated organizations use our logo as a basis for Branding themselves as well. This has created a strong connection amongst our members and an identity that is not only our own, but one that connects us from our members all the way to the national organization.”

(APWA’s Chapter Best Practices can be found at http://www.apwa.net/download/APWAMentoring)

The other part of the catalog is Chapter Mentoring. The idea is that well-established and successful chapters can volunteer to be a mentor to smaller chapters that are facing challenges in certain capacity areas. A number of mentor chapters have included information in the catalog regarding the size and nature of the chapter (number of members, whether the chapter is made up of several branches, etc.), areas in which the chapter excels or has been particularly successful, and contact information so that other chapters can contact representatives from a mentor chapter to get information, ask questions, or perhaps even establish a mentor/mentee relationship (similar to the APWA Donald C. Stone Center mentoring program). Additional chapters are encouraged to submit to be included in the catalog.

The Chapter Best Practices & Mentoring Catalog is available at here: http://www.apwa.net/download/APWAMentoring.

It is the hope and goal of the Chapter Capacity Building through Mentoring Committee to help all chapters in APWA to become more successful in all areas and particularly to provide resources for chapters to look for and find help on a variety of best practices. All members are encouraged to review the Chapter Best Practices & Mentoring Catalog. The committee welcomes input, suggestions, and feedback on the catalog and the goals of the committee. For more information, please contact Bob Beamer, Ventura Chapter, at rbeamer@calleguas.com or the Committee Chair, Doug Layton, Florida Chapter Delegate, at dlayton@coab.us.
Every person encounters public works every day,” said Doug Bear, Public Communications Manager for Kitsap County. “We use this celebration to help our community understand our programs and activities, and provide young people information about careers in public works.”

This is the 11th year Kitsap County has organized events as part of NPWW. One highlight is Career Day, coordinated in collaboration with a consortium of high school, vocational and college counselors. Local junior and senior high school students are welcomed at two open houses in the central Public Works building and Randy W. Casteel Public Works Annex. Students learn about career opportunities in public works, and get the chance to meet employees, learn about their careers, and ask questions.

After last year’s Career Day, one student commented, “This field trip really confirmed my interest in civil engineering, especially in roadway and infrastructure.”

Prior to the event, each student receives a copy of the American Public Works Association publication, “Shaping the World of Public Works,” which explains the educational requirements, average compensation, working environment, and other areas of interest for public works careers. Students also learn about Kitsap County’s extremely popular summer help program. Through this program, college students work in a variety of paid positions in public works each summer—from assisting with stormwater utilities and survey engineering to sign shop maintenance and road flagging—gaining on-the-job experience in STEM (Science, Technology, Engineering and Math) fields while they continue their education.

Another popular event during the week, and the longest-standing, brings six classes from local elementary schools to the Randy W. Casteel Annex for a matriculated day of presentations about how Public Works serves the community. The sessions are entertaining and educational, and provide a foundation of understanding for the services Kitsap County provides. Students learn how solid waste is managed through a tour of our transfer station; how signs are designed—which includes a sign they help make and take back to their classroom; how traffic signals operate, stormwater is managed and wastewater is treated. Staff enjoys participating as well, eager to share the details of their careers with such an energetic and enthusiastic audience. This field trip also provides a unique opportunity to share information with parent chaperones—approximately 30 per year—who regularly comment on how they learn as much if not more than the students.

Excitement is palpable when students get up-close-and-personal with the big rigs at our equipment show. Students see a demonstration of the skills required to operate the equipment, including how a robotic pipe camera is maneuvered using an Xbox controller! Towards the end of the day, each class gets to play the “Public Works Game Show,” an exciting and fast-paced TV-style game, where students demonstrate their knowledge of public works. Each class receives a specially designed map from the Geographical Information System Division as a prize.

“Teachers consistently say that this is one of the best field trips of the year,” commented Pat Kirshbaum, Education and Outreach Coordinator for the Stormwater Division. “We generally have a waiting list because we can only accommodate 150 students at the facility each year.”
Another unique opportunity for students, also part of NPWW celebration, is the Paint-A-Snowplow contest. Classrooms from throughout Kitsap County are invited to submit an artistic design that can be painted on a county snowplow blade. Once the winning design is selected, Public Works delivers a primed and ready plow blade to the school, along with paint and brushes for them to paint their artwork onto the blade. The students learn about the county’s snow and ice control plan during the delivery of the blade. When complete, their masterpiece is then used to plow roads near their school during inclement weather.

“When they see their plow on the roads it gives them a sense of community pride knowing that they’ve contributed to helping us serve their area,” Bear said.

Kitsap County also uses NPWW as an opportunity for Public Works employees to come together for PRIDE training. PRIDE is an acronym for Professionalism, Respect, Innovation, Diversity and Excellence.

“PRIDE is a core value from our strategic plan,” said Bear. During this training day, the entire department of about 270 employees meets at the county fairgrounds. The day includes an opening keynote from a guest speaker, welcoming remarks from the Kitsap County Board of Commissioners, a “State of the Department” address from the Public Works Director, and displays throughout the venue explaining the roles and duties of various divisions.

“We are a large department with facilities scattered throughout our county. This event gives us a chance to come together, get to know one another, collaborate, and to learn how we can work together in an effort to serve our community more efficiently, and build relationships that make our department more effective,” Bear said.

This year’s event also includes representatives from deferred compensation and other employee benefit providers, local wellness organizations, the county’s Department of Human Resources and the LEAN process improvement division. There is a special workshop provided by Information Services to help employees understand how to use Microsoft Outlook and SharePoint programs more effectively, and to answers questions they may have about electronic communication and software resources.

As part of the PRIDE training, representatives from Snohomish County Public Works will give a special presentation about their response to the Oso, Wash., mudslide in March 2014 and the role Public Works played in the response. The Oso landslide occurred on a Saturday morning when a portion of an unstable hill collapsed, sending mud and debris across the North Fork of the Stillaguamish River. The slide engulfed a rural neighborhood, covering an area of approximately one square mile, resulting in 43 fatalities. Because of its sheer size and path of destruction, it has become a historic event in the state.

“Much was learned from the tragedy in terms of emergency response and we are very fortunate to have this presentation,” said Bear. “We all know that when a major disaster happens, public works is an integral part of the response team. Learning how Snohomish County responded to the tragedy and the challenges they faced will help us refine our disaster response plans and emergency preparedness programs.”

As part of Kitsap’s National Public Works Week program local students paint snowplows that are used on the roads near their school. This plow was painted by students from Brownsville Elementary School.

Kitsap County Public Works serves an unincorporated population of about 170,000 people. It is the county’s largest department, and provides services for over 900 miles of county-maintained roads. The department also operates four wastewater treatment facilities and the associated collection and pumping systems; operates or manages five recycling and garbage facilities; manages the county’s regional waste transfer facility; supports stormwater infrastructure and services; maintains the county’s fleet of vehicles and equipment; and provides support services for the department’s operations. Kitsap County Public Works’ overall excellence was recently recognized when it became an accredited agency through the American Public Works Association in September 2013.

“It takes great effort to coordinate events like these for National Public Works Week,” said Andrew Nelson, Kitsap County Public Works Director. “But we have a solid core of employees who help organize and plan, and are committed to sharing our story with our community. Community does begin here, right here in Public Works, and NPWW provides an excellent way for your agency to connect with the community you serve.”
This year’s national public works week poster is now available!
This year’s theme “Community Begins Here” speaks to the essential nature of Public Works services in support of everyday quality of life. There would be no community to police and protect, no public to lead or represent. Public works allows the world as we know it to be.

About this year’s artist:
Christiane Beauregard is an award winning illustrator and designer. Her creative motivation has been to expand her capacity to bring virtual images to life. From delicate emotion to complex technological data, she is always striving to express her passions through her digital art.

P.W. Paws Sampler
- P.W. Paws Plush
- P.W. Paws Pencil
- P.W. Paws Balloon
- P.W. Paws Comic Book
- P.W. Paws Coloring Book
- P.W. Paws Pencil Pouch
- P.W. Paws Stickers (one sheet)
PB.A347 – Member $12 /Non $17

P.W. Paws Pencil Pouch
Size: 9 1/4” x 6”
PB.A832 – Member $1.25 /Non $2.25

P.W. Paws Pencils
PB.A324 (Package of 12)  
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PB.A402 (Package of 100)  
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PB.A403 (Package of 250)  
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PB.A1206  
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(Logo not actual size)

P.W. Paws Construction Hat
PB.A903  
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P.W. Paws Construction T-shirt
PB.A900 (Child size 6-8)  
PB.A901 (Youth size 10-12)  
PB.A902 (Youth size 14-16)  
Member – $12 /Non $17

P.W. Paws Stickers
PB.STIC1 (30 per sheet)  
Member – $1.25 /Non $2.25

P.W. Paws Bobble Head
PB.A400 – Member $12 /Non $17

P.W. Paws Plush
PB.A313 – Member $10 /Non $15

P.W. Paws Balloons
PB.A312 (Package of 12)  
Member – $3 /Non $5
PB.A405 (Package of 100)  
Member – $20 /Non $25
PB.A406 (Package of 250)  
Member – $45 /Non $50
Not sold separately.

P.W. Paws Coloring Book
PB.PW.TEE14 (Youth size 14-16)  
Member – $12 /Non $17

Playtime with P.W. Paws: A Coloring and Activity Book
PB.A1101 – Member $1.25 /Non $2.25

Public Works

This year’s theme “Community Begins Here” speaks to the essential nature of Public Works services in support of everyday quality of life. There would be no community to police and protect, no public to lead or represent. Public works allows the world as we know it to be.

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P.W. Paws Rain of Terror
A storm is brewing – and evil is rising. Something dark and twisted is growing beneath the streets. With the coming storm, this unseen menace threatens to flood the city. Everything will be washed away. Luckily one – tiger stands in its way—P.W. Paws! Join P.W. Paws as he faces an enemy without fear or mercy—a creature so powerful that a hero can’t vanquish it alone. Fortunately for us all, P.W. Paws never works alone.

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In January, Arizona inaugurated a new governor. In his first State of the State address, Governor Doug Ducey called for Arizona to “Think Big” and focus on improving the state’s economy to create opportunity for all. At the Arizona Department of Transportation (ADOT), we accepted the governor’s challenge as a guiding concept incorporated into ADOT’s vision and strategic plan. Competing to achieve success in a global economy requires a vision and plan of action. Effective leadership aligns and motivates people to action since a vision without implementation is just another idea. For Arizona to compete successfully, it must have an aligned statewide vision and plan coupled with leaders at every level in the public and private spectrums advocating and acting to achieve investment in infrastructure. The alternative—do nothing—throws the state back to a patchwork of competing visions and uncoordinated infrastructure investment, and diminishes our ability to compete with the rest of the world.

Why focus on vision, alignment and action? Arizona, like the United States as a whole, is in a global competition to attract manufacturing to our state to provide high-paying jobs and a robust economy for the realization of the governor’s vision of “opportunity for all.” ADOT believes that transportation infrastructure is a foundational element of establishing and retaining base manufacturing that improves the economy with a “make it here and sell it there” philosophy. Yet like other states across the nation, Arizona’s capital improvement program to expand and modernize its transportation system is hampered not only by an outmoded and underperforming 1950s revenue model that currently provides the bulk of Arizona’s transportation revenue, but also by complacency and the hope that somehow it will all work out.

Let’s be clear: Hope is not a strategy and complacency is not competition. We can do better. We need action.

In fact, as a nation we talk more about how to fund transportation (or to kick the funding can down the road) than about how we will actually use those resources. Why? Because we have no shared national vision and alignment for transportation infrastructure investment, and we are complacent enough to believe that someone else will solve the problem.

Consequently, even though many transportation leaders at all levels have attempted to act and advocate for what they believe is the right solution, the lack of a national vision has fostered a lack of alignment in Congress and consequently resulted in transportation entropy (oxymoron recognized). While many in Congress recognize that “something must be done!” Congress continues to argue with itself about the flaws in funding ideas rather than setting a national vision for a competitive twenty-first-century transportation system and coming to agreement on adequate and sustainable funding mechanisms.

Other countries continue to outpace the United States in percentage of GDP invested in transportation and overall regulatory streamlining. As states and as a nation, complacency and inaction will cost us economic power and jobs in the future.

Infrastructure Planning Built a Nation

It was not always so when it came to recognizing the importance of infrastructure investment. During America’s formative years, our leaders recognized a series of cohesive, shared national visions implemented by
detailed plans that improved our transportation system and built the U.S. into a world leader.

In 1808, President Thomas Jefferson championed the Report on Roads and Canals. This national blueprint for the construction of roads and canals was designed to support independent small farmers by linking those farms to markets and East Coast ports.

By the mid-1800s, a national vision for a coast-to-coast railroad network created the Transcontinental Railroad that opened the West to homesteading and development.

In the early 1900s, President Theodore Roosevelt established an Inland Waterways Commission to develop a national plan to improve America’s waterways for commercial traffic. Visionary leaders, realizing the nation needed infrastructure to grow and compete in the world economy, championed Roosevelt Dam, Hoover Dam, and numerous reclamation and water management public works projects.

By the mid-twentieth century, the needs of national defense and the goal “to get the farmers out of the mud” fostered a national vision to create the Interstate Highway System, further reshaping the American economy, and proving without a doubt that infrastructure investment is key to competition and economic success.

**Transportation Infrastructure: Competition and Complacency**

Today, 230 years of vision and leadership alignment has developed transportation infrastructure that has made the United States an economic superpower and improved our lives through a reliable and accessible transportation system moving us daily from home, to work or school, or literally anywhere on the planet.

What Americans may not understand is that their top priorities—the economy and opportunities for jobs—are directly related to the quality of the nation’s transportation infrastructure. Roads, interstate freeways, ports of entry, airports, rail lines and seaports are conduits driving the economy and creating job opportunities through base manufacturing by making it here and selling it there.

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**www.apwa.net / May 2015 / APWA Reporter**
Need for a National Transportation Vision

As Congress prepares to enact another in a long line of continuing resolutions to kick the transportation funding can down the road, what are those who believe in and are passionate about infrastructure investment as a key to economic success to do? It is apparent that every transportation-related association, professional society and interest group has spent many hours and dollars attempting to convince the legislative and executive branches of the importance of infrastructure investment. At the state level, these efforts have resulted in some states resolving the issue by enacting new or revised investment strategies while others continue to struggle. On the national level, we can continue to hope for something better, but as previously pointed out, hope is not a strategy.

Perhaps as passionate true believers in infrastructure investment, we need to shift our focus and concentrate on two key strategies:

1. **Alignment**. As individual organizations, associations and professional societies, we all have access to policymakers at all levels of government. However, we often approach these policymakers not as a unified front, but as individual organizations touting our particular perspective on the issue. There is strength in numbers. Consequently, a new strategy is to come together and provide policymakers with a national vision and support those willing to step forward and fund infrastructure investment.

2. **Change the audience**. We have been very focused on policymakers and at least awareness has been raised in our executive and legislative branches. However, the current approach is not resonating with the public on a national level. This is curious since jobs and the economy rank near the top of the general public’s list of concerns but the connection between robust infrastructure investment, jobs and the economy has not been made to the extent that citizens are demanding that policymakers fund infrastructure investment.

Consequently, since we have not unified our message and convinced the public, our policymakers are allowed to get away with kicking the infrastructure funding can down the road.

We must all be on a C-L-E-A-R path:

- **Communicate**: Our biggest challenge is to articulate to the public and to decision makers that transportation infrastructure is the key to priming our nation’s economic engine. This makes communication between public- and private-sector partners critically important.

- **Lead**: Leadership resulting in decisions and actions on national transportation issues is imperative. Barring that, coordinated decision making at state and local levels of government, and between the public and private sectors, remains essential to push for a national transportation vision.

- **Economics**: It is imperative to reorient transportation investments to meet a globalized twenty-first-century economy. A national transportation vision, plan and incentives must focus on transportation projects that will keep America economically competitive.

- **Alignment**: We all need to be on the same page, looking beyond borders and regions. As individual entities, we have differing goals and priorities. Together in alignment, we are united for a common cause and can pool resources, research data and brainpower.

- **Roots**: The Transcontinental Railroad. The Interstate Highway System. These are transportation systems created years ago with lasting roots in our society. What roots will our generation plant in this era of renewed emphasis on transportation and the economy?

We cannot afford to rest on our past achievements. It is our turn to lead and act to overcome today’s barriers to infrastructure investment, and challenges with transportation funding and system improvements. Today, more than ever before, we need to protect the value of existing infrastructure, fix the systems in disrepair, and modernize where needed to ensure transportation meets the economic needs of a twenty-first-century society. U.S. infrastructure and economic strength should be second to none.

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MONDAY

PUBLIC WORKS TECHNOLOGIES PANEL
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TUESDAY

DIANA NYAD
Long-distance swimmer, sports journalist and broadcaster
Find a Way

WEDNESDAY

DAN MCNICHOL, PHD
Author, Journalist, Speaker
Low & Slow Across America: A Road Trip through the Nation’s Public Works… in a 1949 Hudson
How adopting the Envision® rating system toolset can result in positive returns

JC Alonzo
Sustainability Consultant
Shockey Consulting Services, Lenexa, Kansas
Member, APWA Center for Sustainability

Every APWA member should be aware of APWA's role as co-founder of the infrastructure rating system, Envision, which helps public agencies in guiding and developing civil infrastructure projects to meet environmental and financial sustainability goals. APWA is a co-founder, along with the American Society of Civil Engineers (ASCE) and the American Council of Engineering Companies (ACEC), of the Institute for Sustainable Infrastructure (ISI), whose purpose is to promote and maintain the rating system. But, how much do you know about the Envision toolset? Did you know there are various tools online, at no charge to download and use?

This article focuses on the benefits of the Envision tools available at no charge. These tools require little to no special training to use, will improve your understanding of the environmental performance of your projects, and can increase the efficiency and resilience of your efforts in resource use and preparation for the future.

With just a small amount of time adopting the ISI’s Envision toolset, your organization can see positive returns in three significant ways. First, the tools will promote environmental sustainability, leading to a better understanding of sustainability by staff, leadership, and the public. Second, the tools are aligned with project management principles, resulting in better planned and implemented projects. And third, the tools provide a consistent and replicable process that benefits internal staff on evaluating goals and objectives and for vendors responding to proposals.

What is the Envision Toolset?
The Envision rating system is a series of tools for evaluating the sustainability of civil infrastructure. The overall purpose is to foster a dramatic and necessary improvement in the performance and resiliency of our physical infrastructure across the full dimensions of sustainability. The set includes:

- Guidance materials for developing sustainable infrastructure
- A self-assessment checklist
- A comprehensive self-assessment tool
- Life-cycle economic analysis spreadsheets
- A third-party verification and recognition program
- A credential program for individuals

The first three tools are available at no charge from the ISI website; however, there is an initial investment of time to familiarize yourself with the tools. No special training or education is required to understand or utilize these excellent guides.

Promotes Environmental Sustainability Application
Envision requires everyone involved in project decisions to deliberate and participate in meeting environmental and financial sustainability goals. The self-assessment checklist helps planners, designers, and developers ask if projects are meeting the Triple Bottom Line approach of including environmental, economic, and equity issues in the decision-making process.

The self-assessment checklist, used for quick project analysis, is a simple Yes/No/NA questionnaire that takes a minimal amount of time for project team members to review and answer. The guidance materials and self-assessment tool go several steps further by expanding on the checklist, providing in-depth questions, considerations, and quantitative goals and analysis on how well the project achieves resource efficiency and resiliency.

Utilizing the tools will ensure that management, project teams, and vendors will review and contemplate important sustainability considerations when using the tools.

Promotes Better Project Management Practices
The tools are aligned with and follow typical project management approaches to planning, scheduling, and controlling projects. Specifically, there are five life-cycle phases to a project:
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**PORTABLE LOAD SCANNER**

JC Alonzo is a Sustainability Consultant with Shockey Consulting Services. He works on management and sustainability planning and has been involved with incorporating Envision into agency planning guides and projects. He currently sits on the Leadership Team of APWA’s Center for Sustainability and the Professional Development Committee for ISI. He is an Envision Sustainability Professional (ENV SP) and an ISI Approved Trainer for ENV SP credentialing. He can be reached at (816) 304-3177 or JC@shockeyconsulting.com.

Envision was developed in joint collaboration between the Zofnass Program for Sustainable Infrastructure at the Harvard University Graduate School of Design and ISI. ISI is a not-for-profit education and research organization founded by APWA, the American Council of Engineering Companies and the American Society of Civil Engineers.
First Envision®-verified wastewater facility in North America

Anne Jackson
Director of Sustainability
American Public Works Association
Washington, D.C.

The Canadian municipalities of Lambton Shores and South Huron can now claim the honor of featuring the first Institute for Sustainable Infrastructure (ISI) Envision®-verified project in Canada, and the first wastewater facility to be ISI Envision-verified in North America. ISI announced in February that the Grand Bend Area Wastewater Treatment Facility, located in Ontario on the shoreline of Lake Huron, earned a Platinum award, the Envision sustainable infrastructure rating system’s highest verification level.

“The Municipality of Lambton Shores is excited to have achieved ISI Envision verification of the Grand Bend Area Wastewater Treatment Facility with our partners—the Municipality of South Huron and Stantec,” said Brent Kittmer, Director of Community Services for the Municipality of Lambton Shores, a mix of rural and urban communities located in north Lambton County, Ontario. “We take great pride in our efforts to achieve sustainability, and hope this project will pave the way for others in Canada to pursue Envision verification in their infrastructure designs.”

Global engineering firm Stantec used the Envision framework, which measures sustainability in infrastructure projects in five categories—Quality of Life (QL), Leadership (LD), Natural World (NW), Resource Allocation (RA), and Climate and Risk (CR)—to integrate sustainable features into the redesign of an existing facility, including:

- the conversion of one of four existing lagoons into an extended aeration mechanical treatment facility,
- a constructed wetland to support native wildlife species and prevent effluent discharges from adversely impacting surface and groundwater quality,
- flexible design that makes the facility responsive to changing sewage flows,
- reduced construction and operational costs through a focus on efficiency,
• constructing the project within the boundaries of the original facility’s footprint to protect prime farmland, and
• trails and interpretive signage to encourage community visitors.

According to ISI President and CEO William Bertera, “both the Stantec project team and municipalities of Lambton and South Huron made significant public commitments to the principles of sustainability. They involved the community on key project issues and concerns, and made sustainable design choices to reduce negative impacts.”

The Grand Bend Area Wastewater Treatment Facility’s sustainable design strategies, outlined below, contributed to rating system credits representing positive social, economic, and environmental impacts for the community. “This project reflects the Municipality’s commitment to protecting the Lake Huron shoreline environment and contributing to the improvement of water quality in the Great Lakes,” said Don Giberson, Environmental Services Director with the Municipality of South Huron, a rural farming community located at the most southern tip of Huron County in southwestern Ontario.

Quality of Life (QL)
Following value engineering sessions and comprehensive reviews, the team achieved significant cost savings for the local municipalities and reduced impacts on nearby residents while maintaining high levels of performance. Numerous features were incorporated into the facility’s design to address resident and stakeholder concerns. Key issues included odor control measures, reduction in negative tourism impacts to beach water quality, noise attenuation to improve community livability, and reduced construction costs.

The site is being restored to native conditions with a constructed wetland. Trails are being installed, and visits to the site are encouraged by the municipalities. In addition, efforts are being taken to actively promote school groups visiting the site for educational purposes.

Leadership (LD)
The nature of this project is meant to extend the useful life of the existing facility to ensure its ability to meet community needs today, and for many years into the future. Key design features enhance its durability, flexibility, and resiliency. The facility can be reconfigured and/or expanded to meet new demands, and respond to changing sewage inflows through the use of flow equalization to prevent sewage bypass events.

The team’s collaboration with stakeholders goes beyond project construction. Input from local volunteers and nonprofit organizations was essential to planning for the restoration, planting, and maintenance of natural features of the site. The project team is negotiating an agreement with a local university to allow graduate students to conduct long-term academic studies on wastewater quality. A public website provides an avenue for stakeholders to communicate with the project owners.

Resource Allocation (RA)
Constructing on the existing lagoon site required considerable fill to elevate the facility. The construction of the wetland provided an opportunity to reuse excavated soils onsite and significantly reduced the need for imported fill and associated costs. Facility performance was improved and project costs were reduced through energy-efficient systems, eliminating potable water consumption for process equipment, and reusing digested sludge material from the lagoons as fertilizer for new vegetation.

Natural World (NW)
Naturalized prime habitat was created through the design of the constructed wetland and restoration of a tallgrass prairie onsite. The project team worked with local conservation groups, volunteers, and municipal staff to develop a plan that supports the elimination of invasive species. It also restores habitat critical to threatened native species, including the Monarch butterfly, snapping turtle, and Bobolink. The site provides a new protected space for these species and assists with their recovery in the local area.

Climate and Risk (CR)
The project design addresses projected changes in population and service area growth and increases in frequency and severity of extreme rainfall events in southern Ontario. The design is consistent with the recommendations incorporated in the “Ontario Adaptation Strategy and Action Plan” based on provincial analysis of expected climate impacts. By developing a more responsive and flexible design, the facility is freed from configuration issues that may reduce its functionality in the future.

Information on this and other Envision-verified projects can be found on the ISI website, www.sustainableinfrastructure.org. Anne Jackson can be reached at (202) 218-6751 or ajackson@apwa.net.
Anne-marie Marshall-Dody: A new degree of confidence

Connie Hartline
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Kansas City, Missouri

’ve had a very rewarding career in the public works industry,” said Anne-marie Marshall-Dody. A planning and programming manager for Pierce County Public Works and Utilities in Washington, Anne-marie received her public works manager (PWM) designation in July of 2014. In an age when few people work for the same employer more than a few years, Anne-marie is genuine about her tenure in public works. Pierce County has been her professional home for 20 years.

When Anne-marie was in college, a Pierce County Public Works and Utilities employee was a guest speaker in one of her classes. She found the subject so interesting that she applied for an internship with the agency, and the speaker became her boss. Anne-marie graduated from Central Washington University with a degree in physical geography and land studies, and a minor in environmental studies.

Her professional emphasis has been in planning, having worked her way through the ranks. She oversees flood hazard management planning, watershed planning, and strategic planning for the surface water management division and provides capital planning support for the Pierce County Flood Control Zone District. She enjoys being a planner and figuring out what provides the greatest efficiencies for each project.

“Each project comes with its own variables and complexities,” Anne-marie noted. “That aspect keeps me interested and wanting to provide the best plan for the other members of my team.”

One of her early large-scale projects for public works was a master plan for the redevelopment of a 650-acre former sand and gravel mine into a multi-use public facility all designed to be compatible with the county’s regional wastewater treatment plant. The multi-year redevelopment includes miles of walking trails, two miles of beach access, play fields and open spaces, and the Chambers Bay Golf Course. Anne-marie started as the project planner in the early years of the project and later

She said the program gives participants the basics of public works and allows them to explore various public works functions and get to know what they like about the profession.”
transitioned into the supervisor of the planning and engineering section of the public development division as implementation of the master plan began.

“What I love is system and process and progress, which magnifies as you go up through an organization,” she said. In keeping with her experience in planning and strategizing, Anne-marie said she likes helping people be successful. She takes a team approach to management to “create success around me and to make someone else look really good.”

With experience managing large projects and other employees, Anne-marie became involved with the APWA Donald C. Stone Center program stating she needed a challenge. It was more than a certificate program for her. She said the program gives participants the basics of public works and allows them to explore various public works functions and get to know what they like about the profession.

Anne-marie’s mentor through the process was Rick Ruiz, PWLF, deputy director of public works in Alameda County. In part, she chose Rick because he is on the West Coast but, primarily, she liked his background in public works operations. Since this is Rick’s area of expertise, discussions on the subject were regular and often lengthy.

In regularly scheduled phone calls, Rick monitored her progression through the DCS program, and discussed such topics as work strategies, use of social media, media relations, technology and the way public agencies in the California Bay Area handle the RFP/RFQ and bidding processes. They also discussed leadership concepts, styles, and principles, as well as techniques for managing work relationships effectively.

Besides the new degree of confidence she has in her own abilities, having the PWM has the additional benefit of affirming the validity of her knowledge to her colleagues. Although she is on the West Coast, Anne-marie participated in the New England Public Works Institute by taking courses online from Norwich University. A wife and mother of three children, she said, “Online could fit into my life.” She also is quick to praise the New England Institute and Norwich University faculty for helping to make working online easy.

To be successful at online learning, Anne-marie said the student must be an independent learner, have some experience with blogging—or get used to it—and be a visual learner. She also noted that, although students can set their own schedules, the workload still can be demanding. Her classes required bi-weekly projects, weekly reading and report assignments, but she got more out of it because of the assignment.

By nature, a capstone project is supposed to be a project that is needed by the candidate’s agency and that the candidate would like to implement. In Anne-marie’s case, her project became a reality within her agency. But it seemed so massive that her colleagues, while supportive, found it daunting when she pitched it.

The intent was to boil down 10,000 pages of information and 428 projects associated with the existing watershed basin plan into a more manageable 50 to 75 projects and 500 pages of information. The strategy was to consolidate all of the existing big plans into a “really doable” plan for the next 20 years.

Incorporating a newly created interactive map and database, the county has started the process of updating information and identifying water characteristics that have been accumulated. Potential projects are evaluated in today’s dollars and may be rerated. They are taking a hard look, inventorying, and deliberating over projects. “It’s a true planning process,” said Anne-marie.

Anne-marie’s plans for the future include the possibility of taking more online courses toward an advanced degree, but she is also interested in obtaining other DCS designations (PWE, Public Works Executive; and PWLF, Public Works Leadership Fellow). “I remain interested in advancing in the public works profession and seeking out new challenges that help me grow my knowledge and leadership abilities,” she said.

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PWA’s Certified Stormwater Manager (CSM) program has been a wonderful and prized experience for me. Having a CSM designation not only keeps me connected with other knowledgeable stormwater managers throughout the United States, but it also provides me with necessary tools and skills to excel on many of my design projects as a civil engineer.

For the past twelve years, I have worked on a wide assortment of civil engineering and public works projects. These include roadway design projects, civil/site design projects, stormwater management analyses and studies, hydraulic and hydrologic modeling, water supply systems, and sewer systems. Throughout this time, I have always had a particular interest in projects that involve hydraulics, hydrology, and stormwater management. I have been involved with a number of these types of projects, such as drainage designs, open channel hydraulics, stormwater masterplanning, floodplain management, and watershed modeling. These types of projects have always been a favorite of mine and I have developed a desire to advance my knowledge, technical capabilities, and experience within these areas.

As a result, I recently began to explore different available certification programs that would both advance my career and expand upon my project experience, particularly in these areas of interest. I was looking to build...
upon my technical capabilities as an engineer, while acquiring useful resources, and connecting myself with other professionals having similar interests. That’s when I discovered APWA’s CSM program. At first glance, this program seemed very interesting, so I decided to research it further. I even spoke with a local CSM in my city, who very willingly offered insight into the program. I quickly realized that this certification program was a very good fit for me and could offer many benefits to my career.

The entire CSM certification process was an extremely pleasant experience. It started with the application process, which was very smooth-sailing and straightforward. Next came scheduling and preparing for the exam, which was the most difficult and time-consuming task, but also proved to be the most beneficial task. While preparing for the exam did require a vast amount of time and research, it proved to be time that was very well spent, as it forced me to explore and read all about stormwater management from a variety of different perspectives. I learned about stormwater management not only as it pertains to an engineering and design perspective, but also from a community enforcement official’s perspective (which isn’t really applicable to the work I do, but is something I found extremely interesting and beneficial). I really enjoyed the process of preparing for the exam as it truly expanded understanding and skills of stormwater management.

One aspect that was of particular interest and worth to me was learning about stormwater design best management practices, which are becoming more and more widely used and required across the country. Learning about these has taught me the importance of making sure that engineering designs not only work well, but are also environmentally-friendly. I now tend to keep this in mind with my engineering design projects.

Another really neat thing about the program is the CSM e-mail group. Many people do not realize this, but all CSMs are connected to each other through an e-mail group. The group is always readily available and willing to offer advice and guidance to fellow-CSMs. I have seen several instances where someone posed a technical question to the group and many replied to offer their insight and experience. It’s a wonderful resource to have at my disposal.

To anyone considering the APWA CSM program, I strongly urge you to pursue it. This program has provided me with a vast array of tools that have advanced my career and helped me to better face design challenges with a more environmentally-friendly mindset and approach. CSMs are widely recognized as professionals who are committed to advancing stormwater management to benefit the communities in which they work.

In my role as Project Engineer/Project Manager at GOTECH, Inc., I am frequently faced with challenging civil engineering tasks that require creative thinking and out-of-the-ordinary ideas and design concepts. The CSM program has given me an edge when I am faced with these issues. Being a CSM has definitely changed the way I approach design issues and challenges. This is truly something that separates the CSM program from most other technical certification programs that I have seen.

Being a CSM has been a been great experience for me, and I look forward to many more years of professional growth and development through this program!

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The Schexnayders: John, Kason, Gabe and Lindsay
Elk Grove Village is a community of nearly 35,000 residents and serves over 3,600 businesses located in the largest consolidated business park in North America. In order to serve this highly diverse community, the Village has built a commitment to infrastructure and developed collaborative processes for dealing with various governmental agencies to maximize the effectiveness of capital expenditures.

The Busse Woods Pedestrian Overpass is an example of the Village's commitment to the community, as well as the necessary infrastructure needed to best serve its constituents. In 2014, the project was named APWA Public Works Project of the Year.

From the beginning, safety was the goal of the project. The heavy traffic that existed onto the roadway, combined with high vehicular speeds, created a hazardous crossing for pedestrians and bicyclists. The Village utilized its expertise in working with multi-jurisdictional agencies and securing federal funds to plan, design, and construct the overpass.

The coordinated effort ensured that the 275-foot-long structure was completed in a timely manner. Bicyclists and pedestrians are now able to cross safely. Vito Sammarco, Elk Grove Village Director of Public Works, says there has been a tremendous amount of positive feedback from the community—as well as regional users of the trail system—for the much-needed project.

The Village of Elk Grove frequently collaborates with federal, state and county agencies to fund and construct infrastructure projects. Working with these agencies benefits not only Village residents and businesses, but also provides important infrastructure improvements for the entire region.

The Village has spent in excess of $55 million on transportation and aesthetic improvements within the business community since the early 1990s. Of that, it has been able to
Leverage federal grants and other funding sources to pay for a significant portion of the project costs. Elk Grove Village's commitment to the community's infrastructure doesn't end there.

The Village is in the beginning stages of a $35 million reinvestment to improve and upgrade the community's drainage and sanitary sewer system within the six-square-mile Elk Grove Village Business Park to ensure reliable and consistent service to its business customers.

This year alone, the Village will spend approximately $8 million on drainage improvements; $3.5 million on sanitary sewer improvements; and close to $3 million on aesthetic improvements, such as landscaping and new gateway signage.

In addition, the Village is utilizing funds through the Federal Surface Transportation Program to reconstruct a vital transportation corridor within the business park. The total project cost is $3.8 million with the local share cost of only $800,000.

Elk Grove Village recognizes the importance of maintaining and improving its public infrastructure. We are proud that our success in collaborating with federal, state and county agencies brings local and regional improvements to our “Exceptional Community,” and complements our elected officials' and staff's dedication to being “Beyond Business Friendly.”

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Notions and ideals can be great vessels for lasting and trendsetting accomplishments for individuals and organizations. These notions and ideals in many cases are the trajectory for success that allows us to become comfortable in our accomplishments. Public works has many successes and accomplishments that have improved safety, provide a standard for quality life and meet vital needs of the communities served. I challenge all public works professionals to evaluate your comfort level when it comes to the notion and ideal of diversity and inclusion. If you are totally comfortable in your organization with your efforts regarding diversity and inclusion then I would suggest that you reference the great vessel Titanic.

Titanic was a trendsetting accomplishment in the early 1900s pertaining to luxury ocean liners. The dream ship was ideal for luxurious travel across the transatlantic passenger route between Great Britain and the United States. This great ship, similar to many of our great public works organizations, was a symbol of strength, authority, and accomplishment that gave unwavering comfort and confidence about its trajectory for success. The ship’s voyage across the Atlantic Ocean can be compared to how comfort and overconfidence can sink even the grandest of organizations by not recognizing the full magnitude of an iceberg. Diversity and inclusion is a notion and ideal that has been on the horizon for decades and is now in the forefront, just as the iceberg was seen off in the distance from Titanic.

Diversity and inclusion are very similar to an iceberg in many ways because almost 90% of an iceberg is underwater and unseen, just like a majority of what makes a person diverse can be considered unseen. It would be in the best interest of any organization to become uncomfortable with their trajectory of success and DIVE IN to the water of diversity and inclusion.

- **Diversity** – The variety of differences and experiences that makes each of us valuable to the team.
- **Inclusion** – Creating an environment that invites participation and encourages mutual respect and sensitivity for everyone.
- **Value** – Find common values that bring people together rather than isolate and exclude.
- **Educate** – Encourage sharing of different cultures and values with the approach of seeking to understand and not forcing to accept.
- **Improve** – Forming and strengthening relationships is a constant improvement process.
- **Now** – Moving towards solutions now is in many situations the best course of action.

In order to become a better public works organization that embraces the notions and ideals of our mission statement we must change the status quo.

**Mission Statement:** 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.

It is our duty as an organization to change the working assumptions in the communities we serve to form ideals that will be catalysts for transcending accomplishment and success related to diversity.

1. Oppression is pervasive and hurts us all, though NOT in the same ways.
2. Racism, sexism, classism and every other form of oppression is both a system of disadvantage and advantage.
3. All prejudice was TAUGHT to us, and we resisted this teaching. If we choose to, we can UN-LEARN it.
4. None of us “invented” oppression; it is a legacy we inherited. Though its creation is not our fault, we must now accept responsibility for our role in its continued existence.
5. All prejudices and oppressions are interwoven and entangled.

6. There is no “hierarchy of oppression.” Trying to rank one group’s pain over another distracts us and prevents us from dismantling any and all oppression.

7. All of us have had the experience as target of oppression, as well as the experience of privilege.

8. There is no such thing as “passive anti-oppression.” We are either actively working against oppression, or we are colluding with it, allowing it to continue in our name.

9. Individuals, organizations and communities can and do grow and change.

10. Our commitment to eliminating all forms of injustice must be a lifelong one.

11. Difference among humans is NOT a deficit or shortcoming to an individual group.

12. Cultural diversity is a gift!

The great thing about APWA is that we have the ability to see diversity and inclusion as a powerful tool that strengthens our organization and empowers our communities in which we serve. Use these steps to allow yourself and organization to become uncomfortable yet empowering!

**How do I participate?**
1. Share information with others
2. Actively participate to stay involved
3. Introduce yourself to others
4. Listen and share
5. Be open-minded about new ideas
6. Face-to-Face conversation
7. Find a common purpose or interest

**How do I get others to participate?**
1. Chip away at barriers
2. Find common ground with coworkers
3. Encourage others to share new ideas
4. Engage employees with conversation
5. Ask for feedback in the problem-solving or decision-making process

**Benefits of Diversity & Inclusion for you?**
1. Build meaningful friendships
2. Increased appreciation and acceptance of individual differences
3. Increased understanding and acceptance of diversity
4. Respect for all people
5. Creates a less stressful environment
6. Increased knowledge and status by involving others
7. Greater resources for everyone

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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.
Sea-level rise is a slow-moving challenge for those with responsibilities for the many public works that protect our coasts. Cities, states, and our national government face huge investments in retrofitting waterfront infrastructure. A critical issue near the center of discussions about adaptations for changing environmental circumstances is whether or not we can fashion sustainable waterfronts. Can we create systems that can serve their intended function in the near term without disrupting current society and continue to perform for future generations—without imposing huge maintenance and upkeep costs?

Louisiana is in the midst of developing a massive coastal restoration program that includes a range of technologies to contend with its disappearing coastal marshes, which will be impacted even more dramatically by sea-level rise. Among the tools it intends to use are levees to protect settled areas, restored barrier islands and marshes, and sediment diversions to help rebuild wetlands. While there are no comparable analogs to shed light on the sustainability of the ambitious sediment diversions, we can look at the historical impacts of the various flood-control outlets constructed after the great flood of 1927 to gauge the long-term impacts of comparable infrastructure.

After the 1927 Mississippi River flood, federal authorities made an abrupt shift in policy. Partly at the behest of Louisiana officials, they abandoned the “levees only” policy and replaced it with a “levees and outlets” policy. In the ensuing years, the Corps of Engineers designed and built two major spillways, or outlets, to complement the existing levee system. One of the outlets, known as the Bonnet Carré, consisted of an insert in the levee about 20 miles upstream from New Orleans. It contained a set of gates that could be opened during high river, a pair of “guide levees,” that would direct the water diverted from the river toward Lake Pontchartrain—effectively a bay of the Gulf of Mexico. The second and larger outlet was the Atchafalaya spillway that also included a gate system near the mouth of the Red River and parallel guide levees that would direct floodwaters to the Gulf of Mexico near Morgan City. Neither was designed to deliver sediment, but they function to direct excess flow toward the ocean.

With the first full-scale use of the Bonnet Carré in 1945, fresh waters flowed through Lake Pontchartrain into the Mississippi Sound off the coast of southern Mississippi. Oyster fishermen complained that river water devastated their catch by dropping salinity levels. Increased flow through the uncompleted Atchafalaya floodway also killed oysters when it reached the coastal bays. Again in 1973, use of both spillways had adverse impacts on oyster populations in coastal waters. In 2011, when both spillways were used once more, oyster mortalities resulted in Mississippi Sound.

These flood diversions are quite different in design, purpose, and use than the diversions planned for coastal restoration. Nonetheless, the impacts accompanying their use illustrate that there are short-term consequential impacts that result from use. Their infrequent use allows traditional resource-based economies to resume after oysters beds are restored. In terms of maintenance, they require considerable efforts and investment to continue providing the intended protection over the long term. Although they have helped protect cities, farms, and factories on the Mississippi River floodplain, it would be inappropriate to call them sustainable.

Craig E. Colten is the author of Southern Waters: The Limits to Abundance (2014). He can be reached at (225) 578-6180 or ccolten@lsu.edu.

The Public Works Historical Society is an affiliate of APWA, with membership open to public works practitioners, authors, academia, and anyone interested in public works history. Membership in APWA is not required. Annual dues are $35, and can be added to APWA members’ regular annual dues statements. Please visit the PWHS website at www.apwa.net/PWHS/ for more details on the Society’s mission and activities.
Recognize Your Leaders

Nominator’s Name: John Harris
Candidate’s Name: David Bries
Candidate’s Title: Utility Division Superintendent
Candidate’s Agency/Organization: City of Montrose, Colorado
Candidate’s City/State: Montrose, Colorado

How long has the candidate been involved in the public works industry? 34 years

How long has the candidate worked in their current position? 1½ years

How was the candidate’s leadership ideas/actions brought to the forefront?
David implemented annual water valve exercising and replacement, waterline and fire hydrant flushing, and sanitary sewer manhole lining programs during his first year of employment with the City of Montrose. Well-planned, systematic maintenance programs such as these did not exist prior to David assuming the Utility Division Superintendent role. The City’s ability to isolate damaged water distribution lines, the quality of distributed potable water, and the control of sanitary sewer collection system infiltration and inflow have markedly improved.

Who did the candidate work with to help bring this idea/action forward?
In early 2014, David met with Utility Division employees and other City staff to understand water distribution system and sanitary sewer collection system needs, available budgets, policies, and procedures. He worked tirelessly, including nights and weekends, to educate himself before preparing written proposals for implementing these programs. He worked closely with the Utility Division Team Leader, Public Works Director, and Finance Director to identify and overcome obstacles for efficient implementation of each program.

Did the candidate experience any challenges when trying to implement this?
Despite budget constraints, David successfully implemented all programs in 2014.

Are there steps/processes that, when looking back, the candidate could have done differently to make this idea/action even more successful (lessons learned)?
David’s experience, leadership style, and decisiveness contributed to the successful implementation of each program.

E-mail submissions for “Recognize Your Leaders” to bstein@apwa.net.
### EDUCATION CALENDAR

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

#### 2015

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<td>May 4-8</td>
<td>CSM, CPII and CPFP Certification Exams (computer-based testing)</td>
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<td>May 28</td>
<td>Public Works Senior Leaders Talk About Traffic Incident Management</td>
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- = Click, Listen & Learn program (Free to Members)
- = Live Conference (Paid Registration)
- = Certification Exam
- = Web-based training

APWA members may access past Click, Listen & Learn programs from the Members’ Library at no cost. Programs can be streamed to your computer via the link found in the library. If you have expertise that you would like to share, please use the online Call for Presentations form to describe your expertise and perspective on the topic: [www.apwa.net/callforpresentations/](http://www.apwa.net/callforpresentations/)
Humans and bacteria have a complicated relationship. Some bacteria cause exotic diseases, others are essential to cheese making and waste recycling. Some are responsible for causing or encouraging the rusting of steel or corrosion of other materials. Biocorrosion, as it is sometimes termed, is a significant annoyance for sewer pipes, bridges, petroleum pipelines, and storage tanks.

Now university researchers have found that one of the bacteria associated with corrosion of steel may become a way to turn electricity into biofuel. What makes *Mariprofundus ferrooxydans* PV-1 newsworthy is that a research team at the University of Minnesota found they could get the bacterium to grow by providing a steady stream of electrons but no iron. The bacteria formed a film on an electrode in a solution with carbon dioxide and some nutrients.

The process was carefully controlled and not easily accomplished, but now that it has been achieved, the implications are substantial. Electricity from such sources as solar or wind power could be used with carbon dioxide (available in ample quantities) to produce biomass, that is, lots of rust-free bacteria. These could then be processed into fuels in forms more easily used and stored. The path to commercialization will undoubtedly be long and complicated, but enthusiasm over the prospects is infectious.

Andrew C. Lemer, Ph.D.
Senior Program Officer
The National Academies of the United States, Washington, D.C.
Member, APWA Engineering & Technology Committee

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

Andrew Lemer, Ph.D., is currently a Senior Program Officer with the National Academy of Sciences of the United States of America. In addition to technical papers and occasional articles for the Reporter, he writes on civil infrastructure and human settlement at www.andrewlemer.com.
I remember a job interview early in my career when I was asked if I believe there is a difference between a manager and a leader and if so, what is the difference? While I don’t remember my specific answer at the time, I did get the job so my answer must have been okay!

If I were asked this same question today, I’d answer that both managers and leaders accomplish things through the work of others. But, people work for managers because managers plan efforts well, prepare their resources properly and establish expectations for the performance of the work. On the other hand, people accomplish things for leaders because they believe in their leaders and are inspired by these leaders. Leaders are not necessarily good managers and managers are not necessarily good leaders. Having someone that has both attributes is a real find and is someone highly valued in an organization.

Facing the attacks on the United Kingdom by the German blitzkrieg during World War II, Prime Minister Winston Churchill was quoted, “Let us therefore brace ourselves to our duties, and so bear ourselves that if the British Empire and its Commonwealth last for a thousand years, men will still say, ‘This was their finest hour.’” History doesn’t judge Sir Winston on his management skills but he will forever be judged as a great leader!

While some may say that leadership skills are a natural born trait and there are aspects of leadership that are achieved that way, most will say that leadership is a learned skill. Unit 4 of the Public Works Institute 11 Core Units focuses on helping our attendees develop, refine and practice their leadership skills. Sub-unit topics that are suggested for presentation during the Public Works Institute (PWI) are:

- Leadership Core Competencies
- Leadership Styles
- Team Development
- Ethics
- Defining Excellence
- Developing a Personal Leadership Strategy
- Embracing and Executing Change
- Creating a Learning Organization

The Kansas City Metro Chapter is blessed with many very strong leaders and we have been able to call on this cadre of people to present many interesting topics related to leadership.

One of the most interesting is the session when we’ve utilized a personality profile testing instrument and helped each attendee know and understand his/her personality and leadership style, how that personality approaches the work effort and workplace relationships and how it interacts with other workplace personality types. This session has helped our attendees learn more about themselves and they really enjoyed the experience.

Attendees discuss their personality profiles and how each personality type will approach a hypothetical problem.

Larry Frevert, P.E., PWLF, Senior Consultant, TREKK Design Group, LLC, Kansas City, Missouri; Chair, APWA Professional Development Committee; Director, Public Works Institute, APWA Kansas City Metro Chapter

Unit 4: Leadership Skills
Because our attendees have expressed their desire that we offer more group exercises rather than strictly lecture presentations, we broke them into small groups and gave them some written, hypothetical problems and asked them to brainstorm how different personality types will solve the problem. A spokesperson for each small group was then chosen to report out the results of their discussions.

Other sessions we present that are focused on leadership include:

• Ethics: We present two sessions on ethics. One is focused on explaining the concepts of ethics and their application in the workplace, including the actual ethics policies of several of our local municipalities. A second session entitled “Ethical Dilemmas” consists of posing several hypothetical (but with some basis of authenticity) situations to small groups for them to discuss and develop an opinion and identify the actions that should be taken.

• Professional Development: Several sessions have been created that focus on helping our attendees understand how to create a plan for their professional development and their leadership strategy. Likewise, we stress the importance of helping their subordinates develop a similar plan.

• Decision making, team development and change management are sessions that correspond directly to sub-unit topics under the Leadership Skills Core Unit.

• Defining Public Works Leadership Excellence is a popular topic as we help our attendees understand why leadership is so important to their organizations. After the session that covers defining public works leadership excellence, another popular topic activity has been a Public Works Leadership Excellence Panel. Participants in this panel were three Public Works Directors who achieved organizational excellence as recognized by their departments obtaining their Public Works Accredited Agency status and personal excellence as recognized by their being selected as a Top Ten Public Works Leader of the Year. Our attendees were spellbound by the stories these leaders related to them and the guidance tips shared with the group. The KC Metro Chapter’s Public Works Institute is presented in four three-day modules, and the Public Works Leadership Excellence Panel is the final session presented in the final module and provides an excellent “wrap up” for our entire Public Works Institute.

We in the Kansas City Metro Chapter believe strongly that we have an obligation to help our public works supervisors and managers do a better job for the public and the cities and agencies they serve. Too often, we have simply promoted the best person to a supervisor or manager position because he or she has done an excellent job in their previous position. While that person may have excellent technical skills, they haven’t been adequately exposed to the supervision, management and leadership skills they need to do an excellent job in their new, more demanding position. Our goal and the goal of other Public Works Institutes is to help to better equip these valuable human resources (public works managers and supervisors) to provide the excellent services their taxpayers deserve and demand.

We are very proud of the materials we have developed to present to the attendees in our chapter’s PWI and are happy to share these resources with other PWI’s. The materials we use in our PWI’s are currently available via the APWA Public Works Institute website:

http://www.apwa.net/learn/PW-Institutes/Institute-Resources/Curriculum/PowerPoint-Presentations.

Or, for copies of these presentations or to learn more about the APWA Kansas City Metro Chapter’s Public Works Institute, you can contact me at the following phone number or e-mail address: (816) 582-9236 or lfrevert@gmail.com.

Excellence in Public Works Leadership Panel, October 2013 Public Works Institute, from left to right: the late Phil Broyles, Springfield, Mo., Public Works Director; Chuck Owsley, Public Works Director (now retired), Lee’s Summit, Mo.; and Doug Brown, Public Works Director (now retired), Overland Park, Kans.
Growing trees as part of wastewater treatment

Michelle Cahill, P.E.
Wastewater Division Director
Public Works Department
City of Eugene, Oregon

In the western Oregon cities of Springfield and Eugene, a successful wastewater treatment program turns wastes into useable commodities. Environmental, social and economic benefits are provided. Biosolids are land-applied as soil amendments and recycled water is used to irrigate a 595-acre poplar Biocycle Farm. The site is owned by the Metropolitan Wastewater Management Commission (MWMC). The benefits resulting from using these wastes as a resource include a large grove of trees on the edge of the metropolitan area and poplar wood.

Who we are
The MWMC is an intergovernmental partnership that provides regional wastewater treatment service for a portion of Lane County as well as Eugene and Springfield, the county’s two main cities. Representatives from the two city councils and the Lane County Board of Commissioners make up the governing body, along with members of the general public appointed by each of the three constituent governments. The City of Eugene Public Works Department is the operational partner; the City of Springfield is the administrative partner.

High environmental standards drive the work of the MWMC. This includes meeting the legal requirements of Oregon’s stringent water, air, groundwater and land quality regulations. For the City of Eugene Wastewater Division it also includes maintaining the ISO14001 Environmental Management System (EMS) certification. The EMS program ensures environmental stewardship, pollution prevention, and continuous improvement such as reducing energy and chemical use. It also includes maximizing reuse of current resources as well as minimizing current and potential environmental impacts.

Water reuse
Water that is cleaned through the treatment process is reused. This reduces the volume of potable drinking water being used for process water and farming. The water is the same quality as that discharged to the Willamette River, except that the irrigation and process water is not dechlorinated.
This saves one step of the process and reduces the amount of chemicals used in the treatment process. The biocycle farm uses about 70 million gallons of effluent per year. An additional two million gallons of recycled water are also used in process equipment at the treatment plant.

**Good biosolids use**

Using the biosolids removed from wastewater reduces the application of commercial inorganic fertilizer by local farmers and for the poplar farm. Using the biosolids as a commodity also reduces landfill or incineration costs and associated impacts to the environment. Dried biosolids are offered to local farmers as a soil amendment and are well received. However, owning and operating a tree farm for application of biosolids as soil amendment gives assurance for a long-term method to use biosolids. This is in essence a green insurance. Liquid application of biosolids on the trees reduces the amount of chemicals, energy and staff time over other methods of application.

The 595-acre MWMC poplar farm has 394 acres with 88,000 hybrid poplar trees in seven varieties. Poplar is grown for its high nitrogen and water uptake, and the multiple varieties were chosen to evaluate the best variety for using the by-products of wastewater treatment. The biosolids removed from the wastewater are further treated and applied as a liquid to the poplars, and in dried form to the buffer areas of the farm. Application to the poplars is limited only by the winter conditions. “As soon as the ground is dry enough, usually around May, we can start applying biosolids clear through to October,” says Dave Breitenstein, Wastewater Operations Manager. The trees are grown on agriculturally zoned land, so they must be periodically harvested.

Poplar trees sequester carbon and, depending on how they are used after harvesting, may have a long-term benefit for the environment. Finding the best use for poplar trees has been an interesting and rewarding process. When the trees were planted several years ago, furniture and chopsticks and other wood products were envisioned. The first harvest in 2013 took nine-year-old trees and created cardboard, paper, charcoal products and fuel. Market conditions and the quantity of trees strongly affect what the wood is used for. With the second-phased harvest the trees were also piloted as a core in plywood. The MWMC is continuing to evaluate the poplar tree farm using a triple-bottom-line analysis.

**Natural treatment**

Including elements of natural treatment available in the wastewater treatment processes, like poplar farms, groundwater recharge or wetlands, is efficient and effective. Natural treatment processes allow agencies like MWMC to meet regulatory requirements while minimizing costs, providing a social benefit and improving the environment. Many agencies have found alternatives to expensive concrete and steel structures and high energy processes to meet regulatory requirements while adding community assets and environmental benefits.

Research in Oregon has shown that our citizens appreciate the natural environment. Through surveying how well the public understands the MWMC and the service we provide, we learned we are best known for the Biocycle Farm and the poplars—the triple bottom line plus a bonus in the community good will.

More information is available at www.mwmcpartners.org.

Michelle Cahill can be reached at (541) 682-8606 or michelle.r.cahill@ci.eugene.or.us.
Monetizing the triple bottom line

Stephane Larocque  
Senior Vice President  
Impact Infrastructure, New York City, New York  
Member, APWA Center for Sustainability

It’s all Greek to you. At least, it’s all Greek until someone translates it into a language you understand. When comparing dollars to the qualitative benefits of high performance buildings, green stormwater infrastructure, or renewable energy, the need for a translator becomes apparent.

A process for converting qualitative benefits into dollars is required to make a sound business case for sustainable investments. Otherwise sustainable projects with higher costs and higher qualitative benefits will never get built. For example, higher capital costs for energy and water-saving designs demand financial comparisons with potential long-term cost savings. Moreover, these investments may lead to greater recreational opportunities, reduced flood risk, or improved health and safety. When these qualitative benefits are present the project would benefit from evidence of the total value including the benefits translated into dollar value. Total value can be determined from impacts on owners, occupants, and the general public, to account for a triple bottom line—financial, environmental, and societal impacts.

The triple bottom line of sustainable design impacts is typically only addressed qualitatively, or perhaps through a multi-criteria assessment with subjective ratings put on various criteria. However, there is a better way forward that has been developing rapidly in recent years: putting an objective monetary equivalent value on each of the positive and negative social and environmental impacts generated by a specific investment. In other words, monetizing the triple bottom line.

Using widely-accepted economic literature to value these impacts in dollars, cost-benefit analysis frameworks such as Social Return on Investment or Sustainable Return on Investment (SROI) have been rapidly gaining traction. These frameworks can be used to prioritize spending and allocate funding to projects that are the most cost effective and create the most public value. With cost-benefit analysis organizations can communicate the benefits of infrastructure spending to different groups. For example, a new Low Impact Development...
stormwater management system may lead to reduced flood risk, increased aesthetic value in the region, increased recreational opportunities, reduced carbon emissions, better air quality, and an increase in property value; detailed cost-benefit analysis can reveal these benefits so that government leaders can communicate these benefits. With a cost-benefit analysis and an assessment of who benefits, nothing gets lost in translation.

Best practices in economic analysis dictate that a transparent, evidence-based process is critical to generating credible measures of the potential value of design options. With many market goods, such as groceries, we have a market price. With intangible goods, such as an afternoon at the park or clean water in its natural state, we do not have a market price. How do we put a price on natural resources that have a market price of zero but that many consider priceless? For these resources economists define three types of value:

- Use value is the benefit people received from a natural resource.
- Existence value is the benefit people receive from knowing that a particular environmental resource exists.
- Bequest or option value is the value arising having ability to use or receive benefit or the benefit from paternalistic altruism.

The value of our natural environment extends beyond that of people who use it directly. Some would like the option to visit a wilderness area sometime in the future. Furthermore, there are people who may express a demand for the natural environment, not because they hope to use it themselves, but because they would like other people and future generations to be able to enjoy it. This is referred to in environmental economics literature as existence value. In environmental economics literature the total economic value is the sum of use value plus option value plus the existence value.

Estimating option and existence values is difficult since individuals are not revealing their preferences explicitly in a market. “Willingness to pay” is the amount of money people are willing to forego to have the item of interest. As shown in auctions, people have different willingness to pay values for the same item. This is where economists use statistical methods to determine the most accurate social value. Value or willingness to pay is estimated by implementing a Stated Preference Survey. In such a survey, a detailed explanation is provided as to what is being proposed is described and the respondent is given a series of choices where tradeoffs have to be made. There are two main types:

- Contingent Valuation: A survey-based economic technique for the valuation of non-market resources, such as environmental preservation or the impact of contamination
- Conjoint Analysis: A statistical technique to determine how people value different attributes (feature, function, benefits) that make up an individual product or service

In a simple world, all prices would be revealed. By simulating a hypothetical (and plausible) market, estimates can be derived by surveying people to collect their evaluation of changes in the level of environmental quality, health and safety. Asking people outright how much they would pay produces highly optimistic and unlikely values as people tend to provide answers they feel are socially expected. The stated preference approach has gained acceptance by academics and policy makers. All externality estimates are subject to uncertainty. Since prices (i.e., value) are not directly observable it is critical to ascertain the nature and degree of risk. The quantification of risk becomes crucial when contingent valuation estimates are used to justify an intervention (i.e., policy). Providing estimate bounds and risk ranges enhances the credibility of the analysis. Therefore risk-based cost-benefit analysis is the best approach to understanding the overall net benefit of projects. It also offers an approach to determine winners, losers, compensation, and risk mitigation and management actions. This approach, along with the valuation of the triple-bottom-line economic, social, and environmental impacts to a project, is the approach of best-practice cost-benefit analysis frameworks such as Sustainable Return on Investment.

Because the concept of sustainability still lacks general consensus, it has been difficult to incorporate into project valuations. The missing piece has been an objective, transparent process that can demonstrate how sustainable projects will generate economic growth while conserving limited resources. The modern cost-benefit frameworks provide that process and allow public officials to express, in dollar terms, non-cash costs and external benefits. These frameworks facilitate compliance with emerging federal and local requirements while justifying their expenditures in sustainable initiatives to stakeholders, articulating the merits of proposed initiatives to funding agencies, and building confidence in their commitment to sustainability.

Stephane Larocque can be reached at (613) 558-8905 or steph.larocque@impactinfrastructure.com.
Improving subgrade strength using cement slurry paste

Kerry Werner, P.E.
Project Manager
Public Works Engineering Division
City of Eugene, Oregon

The City of Eugene routinely considers the triple bottom line—balancing environmental, social and economic needs and benefits of a project to maximize sustainable practices in our programs. And the project teams work to maximize return on the public's investment by minimizing costs while still achieving quality through long-life pavement design.

Mixing cement into sub-base soils has been a technique used to strengthen soils for roads and runways since World War II. Substantial savings in cost and time can be realized with in-place cement treated base (ICTB) when strengthening the layers below the pavement is necessary.

Background

The City of Eugene started using the ICTB recycling process in 2008 to realize the environmental, economic and social benefits to the community that can come from this type of process. The reduction in land filling, material mining, and truck hauling all have direct environmental benefits; the reduction in excavating existing roadway materials and importing virgin construction materials have direct economic benefits; and the reduction in construction time and associated traffic impacts has a direct social benefit.

Prior to 2014, the City used powdered cement in its stabilization projects. But there was the problem of fugitive dust being released in a confined urban environment.

In summer 2014 the City developed a cement/soil/aggregate mix using a paste of cement, water, sand and hydration stabilizer admixture, with the intention of reducing airborne cement dust during the cement transfer and soil-mixing process. A paste slurry application was chosen over a thin cement and water slurry application to deal with the steep grades of the road being treated (i.e., thin slurry would not stay in place before mixing with the reclaimer).

Construction Details

It became evident during the bidding process that this project would be the first known cement slurry ICTB project in Oregon. The key concern was how the slurry paste was to be placed. The bid documents specified a towed box scraper (similar to what is used to grade gravel roads). The ICTB subcontractor, Best Grinding (now known as West Coast Soil Solutions), proposed spreading the paste with an old asphalt paver. After a test, this method was accepted and worked very well.

To hit the design percentage of cement added, only the height of the paving screed needed to be adjusted. This test project had two types of soil/aggregate to be enriched, so the screed was set at either 1.75 or 2.5 inches. Concrete barrel truck “pull distances” were pre-calculated and monitored to assure that the right quantities of paste were being applied.

The construction sequence was as follows:

First, the existing asphalt (recycled asphalt paving, or RAP) was ground with the reclaimer. Then the reclaimer mixed the RAP, aggregate base and soil to a depth of 18 inches. A tamping foot roller compacted the blend. Surplus material (approximately 7”) was removed by an excavator and trucks. The remaining blended base was graded and compacted to grade and cross-slope.

During the ICTB operation cement, sand and water was mixed at the batch plant and delivered to the project in “barrel trucks.” The barrel trucks delivered paste to the paving machine hopper (the same as for an asphalt paving operation). The paver spread
the cement paste. The reclaimer followed closely behind, mixing paste and soil. The 15-ton tamping foot roller followed the reclaimer. A grader and smooth drum roller reshaped the road to final grade and cross-slope. Emulsified asphalt (CSS-1) was spread over the surface as a cure seal for the hydration process.

With the ICTB completed, base and top-lift paving was constructed as usual.

Lessons Learned
As with any new process or product, once the dust settles you reflect back on what went well and what you would like to improve on next time. Here are a few of the lessons learned:

- The airborne dust issue was solved.
- The specification of a slurry paste created a new way of executing the ICTB process. With material delivery coming in barrel trucks, this operation looked more like a paving operation than a soil-modification process. This fit the urban (confined) environment the City of Eugene works in.
- Use of cement slurry paste and delivery of the paste to the grade with a paving machine improved quality control in that the depth of screed is preset but can be adjusted within a few feet. Powder cement application rate is determined by the speed of the distributor truck driver, and adjustments need to be made 100 feet ahead or by backing up over the powder cement.
- The addition of hydration stabilizer to the paste was critical to the operation advancing in a timely manner in two areas. Once powder cement comes in contact with moist soil, it begins the hydration process and a tight timeline must be followed. Since the slurry was delivered in nine cubic yard batches, the operation was not under such tight time constraints. A breakdown of the reclaimer occurred once causing a 2½-hour delay in the operation and trapping three barrel trucks en route. The dosage of stabilizer was enough that once operations resumed, no slurry paste was rejected. If this was a powder cement operation, all cement spread would have been wasted.
- When soft spots in the grade are encountered and it is clear that more cement is needed, the situation can easily be corrected by backing up the “paving train” and applying another barrel truck of paste to the soft spot.
- Delivering a new, fully rebuilt street in five days was appreciated by the neighborhood.

In summary, the cement and sand ICTB slurry eliminated potential impacts of the cement dust. This process looked more similar to an asphalt paving operation than a soil-modification process and fits the urban environment well. Quality control was easily achieved by adjusting the height of the screed, and if soft spots were encountered, the “paving train” could be reversed and additional slurry applied where needed. The City of Eugene delivered a newly constructed and paved 1,300-foot street in five days, to very appreciative residents. The City will continue to utilize this process for future projects.

Kerry Werner can be reached at (541) 682-5477 or kerry.t.werner@ci.eugene.or.us.
In March 2015, the Federal Emergency Management Agency (FEMA) announced updates to its disaster preparedness program. Starting in 2016, funds for disaster preparedness (not recovery funds) will be approved only for those states with hazard mitigation plans that address climate change. With the rise in extreme weather events and associated deaths and substantial costs from damage across the country, the time has come to not only look to the past, but consider the future when developing our hazard mitigation plans. Fortunately, we have plenty of examples to point to and resources to support this effort.

A 2013 study conducted by Columbia Law School researched to what degree each state mentioned climate change in its hazard mitigation plan. At that time, Alaska, California, Colorado, Connecticut, Hawaii, Maryland, Massachusetts, New Hampshire, New York, Vermont, and Washington included a “thorough discussion of climate change impacts on hazards and climate adaptation actions.” Another ten states mentioned it and indicated it should be included in future plan iterations.

In recent years we have also seen an increase in local hazard mitigation planning going beyond historical trends and actively integrating projected changes in climate to their plans, allowing them to think more broadly about their current and future risks and identify strategies to address both.

**Why it makes sense**

By its very nature, a hazard mitigation plan is designed to identify the number and types of hazards that a jurisdiction is at risk for and develop strategies to mitigate that risk. The science is clear that changes in climate will be reflected through an increase in the occurrence and severity of extreme events. At this point, we have all experienced it directly and see it reported on the news on a daily basis. Fortunately, climate models are improving and increasingly becoming available at the local level. We are now able to extrapolate projected changes down to the local jurisdiction level in most places. Coupling historical trends with these local climate projections aids in the development and implementation of effective local strategies that will reduce risk and enhance resilience.

**Hazard mitigation and climate resilience**

Over the last decade, there has been a significant increase in the development of state and local vulnerability assessments and climate adaptation or resilience plans. While these are important and necessary efforts, these additional planning processes cost money and can pull resources from other activities. When budgets are tight and resources are limited, leveraging existing tools (especially when they are already in the budget) to deliver on new priorities is essential, providing that the needs of both processes (hazard mitigation and climate resilience planning) are met.

The City of Baltimore provides a great example of this integration in their Disaster Preparedness & Planning Project. In their assessment, combining the hazard mitigation plan with a climate adaptation plan was a “win-win” as there are so many similarities among the two planning processes. According to their plan, Baltimore developed their plan by utilizing the following process:

- Identify and profile existing hazards.
- Conduct an inventory that identifies all assets such as hospitals, schools, etc.
- Utilize modeling to identify risk from existing hazards and predicted climate impacts.
- Complete a vulnerability analysis of identified assets and critical facilities. Identify exposure, sensitivity and adaptive capacity.
- Identify actions and recommendations to deal with existing hazards and predicted impacts.
- Develop implementation plans for these actions, as well as recommendations for stakeholder involvement and funding strategies.

This is a model that other communities can follow and those that do will find themselves heading down a path towards a more sustainable
community. After all, to be truly sustainable means taking what we now know and allowing it to inform and refine existing processes, rather than constantly creating new ones.

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Notes:


Resources & Example Plans:

- California: http://hazardmitigation.calema.ca.gov/plan/state_multihazard_mitigation_plan_shmp
- New York State: http://www.dhsses.ny.gov/oem/mitigation/plan.cfm
- Baltimore, MD: http://www.baltimoresustainability.org/disaster-preparedness-and-planning-project

Relevant Definitions:

Mitigation: Sustained actions taken to reduce or eliminate long-term risk to life and property from hazards.*

Preparedness: Actions taken to plan, organize, equip, train, and exercise to build and sustain the capabilities necessary to prevent, protect against, mitigate the effects of, respond to, and recover from those threats that pose the greatest risk to the security of the Nation.**

Recovery: Actions necessary to assist communities affected by an incident to recover effectively.**

Resilience: The ability of any system to either bounce back or bounce forward (i.e., get better) after a disturbance.

* Source: 44 CFR §201.2 Mitigation Planning - Definitions.
While there is no national database of intersections in the U.S. or Canada, it is estimated that there are well over three million roadway intersections in the United States alone, with about 300,000 of those being signalized. Further estimates are that approximately 0.001 percent (3,000) of those intersections are designed as modern roundabouts, with installations present in all 50 U.S. states and Canadian provinces. With so few roundabouts currently in use, there are tremendous opportunities to apply this proven intersection design to thousands, if not hundreds of thousands, of intersections in North America.

About half of all crashes and half of all injury crashes in the U.S. occur at intersections according to the Federal Highway Administration (FHWA). Most fatalities and injuries are due to right-angle crashes that occur at signalized and stop-controlled intersections. In the United States, over the last several years an average of approximately 21% of the fatalities and roughly 50% of the serious injuries have been attributed to intersections. Beyond the crash statistics, traditional signalized or stop-controlled intersections can also become very congested when traffic volumes are high, creating inefficiency that results in user delay, frustration, economic loss and environmental impacts.

Modern roundabouts are a type of intersection design that can be effectively used at all types of intersections, particularly those controlled by traffic signals and stop signs, and will aid in greatly reducing fatalities and injuries while improving traffic flow and the environment. The widespread use of roundabouts will bring a host of sustainable benefits to communities.

In addition to safety concerns, traffic congestion is also a growing and widespread problem in North America, especially in urban areas. Opportunities to improve traffic flow and safety are often missed when traffic signals or stop signs continue to be installed at locations that are suitable for roundabouts. Studies have shown that if many newly signalized intersections had been constructed as modern roundabouts, intersection crashes, vehicle stops and delay, and emissions would all have been greatly reduced at those locations.

For example, a study that examined ten signalized intersections in northern Virginia that were newly constructed or recently modified estimated that roundabouts would have reduced vehicle delays by 62-74 percent, depending on the intersection, thus eliminating more than 300,000 hours of vehicle delay on an annual basis. Annual fuel consumption would have been reduced by more than 200,000 gallons, with commensurate reductions in vehicle emissions. And, based on previous research on crash risk, it is estimated that use of roundabouts in place of traffic signals could have prevented 62 crashes, 41 with injuries, over four years at just five of the intersections for which crash data were available. These results show the magnitude of the traffic flow and safety costs when traffic signals are installed at locations where roundabouts are suitable alternatives.

Roadway Safety – A National Challenge

Motor vehicle crashes are the leading cause of death for age four and every age 11 through 27 in the U.S. according...
to the National Highway Traffic Safety Administration (NHTSA). In 2012 (the latest reporting year for NHTSA), 33,561 people were killed on U.S. roadways in the estimated 5,615,000 police-reported motor vehicle traffic crashes; 2,362,000 people were injured in those crashes; and 3,950,000 crashes resulted in property damage only. An average of 92 people died each day in motor vehicle crashes in 2012—one every 16 minutes.

With over 21% of these fatalities and roughly 50% of the serious injuries attributed to roadway intersections, FHWA has identified modern roundabout intersections (as opposed to larger traffic rotaries or smaller traffic circles) as one of nine proven life-saving roadway safety strategies. Modern roundabouts have consistently been proven to be substantially safer than traditional signalized and stop-controlled intersections, where appropriate for traffic needs and properly designed. They also typically operate more efficiently, have lower life-cycle costs, increase fuel efficiency and lower vehicle emissions. Overall, for many intersections, modern roundabouts are clearly the most sustainable intersection choice that a roadway designer can make.

**Roundabout History**
Traffic circles have been part of the roadway system in the United States since the early 1900s when one of the first circles, known as the Columbus Circle, was installed in New York City (Roundabouts: An Informational Guide, NCHRP Report 672, 2010). After that installation a number of large circles or rotaries were built in the United States that allowed for high-speed merging and weaving of vehicles. In those designs priority was given to entering vehicles, facilitating high-speed entries. Examples of high crash experience and congestion in the traffic circles led to many fewer rotaries being designed after the mid-1950s. Internationally, the experience with large traffic circles was equally negative, with many countries experiencing circles that became congested as traffic volumes increased.

While traffic circles were falling out of favor, the “modern” roundabout was developed in the United Kingdom in the 1960s to rectify problems associated with these traffic circles. In 1966, the United Kingdom adopted regulations that required entering traffic to give way, or yield, to circulating traffic at all circular intersections. This rule prevented circular intersections from “locking up” by not allowing vehicles to enter the intersection until there were sufficient gaps in circulating traffic. In addition, smaller radius circular intersections were proposed that required smaller horizontal curve features which achieved slower entry and circulating speeds.

These design changes significantly improved the safety characteristics of the circular intersections by reducing the number and the severity of crashes. The modern roundabout represents a significant design and operations improvement over rotaries and traffic circles. As a result many countries including the U.S. and Canada have adopted the modern roundabout as a common intersection form, and many agencies have developed extensive design guides and operational analysis methods for modern roundabouts.

Modern roundabouts have several distinguishing characteristics and benefits, setting them apart from other intersection types. Traffic can typically move more freely through roundabouts which makes them more efficient than signalized or stop-controlled intersections. Unlike other types of intersections, roundabouts are designed to slow the speed of vehicles entering by deflecting them from a straight-line path into the roundabout. Drivers approaching the roundabout have time to judge for gaps in the circulating traffic and either yield or adjust their speed before entering the intersection, thus allowing for safer entries into circulating traffic.

Roundabouts are also considered the “greenest” intersection alternative and not only because of their landscaping opportunities and aesthetic appeal. Reduced vehicle idling means fewer emissions and less wasted fuel. Less acceleration and fewer sudden “hard stops” means quieter, more peaceful transportation through communities. Landscaping in the central island, approach splitter islands, and along the approaches can further benefit and enhance community livability.

A common concern for people who have not experienced driving through...
a properly designed roundabout is that they won’t be able to get used to the new traffic pattern. But studies consistently show just the opposite—the public overwhelmingly supports roundabouts after they are constructed. Older Americans, in particular, are supportive of roundabouts.

By 2025, a quarter of all legal drivers in the United States are projected to be over the age of 65. Intersections are the single most dangerous traffic environment for drivers of any age with left-hand turns being the single most dangerous traffic maneuver that any of us can make. Forty percent of all crashes that involve drivers over the age of 65 occur at intersections. This is nearly twice the rate of experienced younger drivers.

Despite their benefits, roundabouts may not be the best solution at all locations. Roundabouts may not be feasible at locations where topographic or site constraints limit the ability to provide appropriate geometry. Also, intersections with very unbalanced traffic flows (i.e., very high traffic volumes on the main street and very light traffic on the side street) may preclude roundabouts for reasons of traffic flow. However, as the proportion of minor street traffic volumes increase, roundabouts typically become more feasible and provide greater reductions in vehicle delays compared with traffic signals.

**Sustainability Benefits of Roundabouts**

There are numerous benefits of modern roundabouts which contribute to a community’s sustainability.

**Safety.** As noted above, roundabouts have been proven to typically be far safer than traditional stop sign or signal-controlled intersections. In a number of documented studies roundabouts reduced injury crashes by 75 percent at intersections where stop signs or signals were previously used for traffic control, according to the Insurance Institute for Highway Safety (IIHS). Studies by the IIHS and Federal Highway Administration have shown that roundabouts achieved these safety benefits:

- A 37 percent reduction in overall collisions
- A 75 percent reduction in injury collisions
- A 90 percent reduction in fatality collisions
- A 40 percent reduction in pedestrian collisions

There are several reasons why roundabouts help reduce the likelihood and severity of collisions:

- **Lower travel speeds** – Drivers are required to slow down and yield to traffic before entering a roundabout. Speeds in the roundabout are typically in the 15 to 20 miles per hour range. The collisions that occur in roundabouts are typically minor and cause few injuries since they occur at such low speeds.

- **No traffic signal to speed through or cause sudden stops** – Roundabouts are designed to promote a continuous, circular flow of traffic. A driver’s primary obligation is to yield to traffic before entering a roundabout; if there is no traffic in the roundabout, drivers are not required to stop. Because traffic is constantly flowing through the intersection, drivers don’t have the need to speed up or come to a stop quickly when a signal cycles to yellow or red.

Roundabouts are also generally safer for pedestrians. Pedestrians walk on sidewalks around the perimeter and cross only one direction of traffic at a time. Crossing distances are relatively short, and traffic speeds are lower than at traditional intersections.

**Reduce delay, improve traffic flow.** Contrary to some perceptions, roundabouts normally move traffic through an intersection more quickly, and with less congestion on approaching roads. Roundabouts promote a continuous flow of traffic whereas intersections with traffic signals and stop signs have to wait for a green indication or come to a full stop before proceeding through the intersection. Traffic is only required to stop or yield when necessary so many roundabouts usually process more traffic in the same amount of time.

Studies by Kansas State University measured traffic flow at intersections before and after conversion to roundabouts. In each case analyzed, installing a roundabout led to at least a 20 percent reduction in delay. Additional studies by the IIHS of intersections in three states found that roundabouts contributed to an overall 89 percent reduction in vehicle delays and 56 percent reduction in vehicle stops.

**Cost.** A roundabout may need more property within the actual
intersection, but often takes up less space on the streets approaching the roundabout. Because roundabouts can handle greater volumes of traffic more efficiently than signals, where drivers may need to line up to wait for a green light, roundabouts usually require fewer lanes approaching the intersection.

The cost difference between building a modern roundabout and a traffic signal is often comparable depending on right-of-way conditions. Where long-term costs are considered, roundabouts have the benefit of eliminating signal hardware, maintenance and electrical costs.

Roundabouts also remain effective during power outages. Unlike traditional signalized intersections, which must be treated as a four-way stop or require police to direct traffic, roundabouts continue to work in their normal condition.

**Pedestrians and Bicyclists.** In general, pedestrians face less risk crossing roundabouts than traditional intersections, primarily because of the slower speeds and the elimination of left turns across the pedestrian crosswalks. Entry “splitter” islands both shorten the crossing distance for pedestrians and allow them to cross one direction of traffic at a time. Bicyclists can dismount and use the pedestrian crosswalk, or experienced bicyclists can ride through the roundabout.

There is ongoing research to determine the most effective strategies for making roundabouts accessible for visually impaired pedestrians. The U.S. Access Board has been active in the development of design guidelines for roundabouts. The National Cooperative Highway Research Program (NCHRP) also continues to research a range of geometric designs, traffic control devices, and other treatments to make roundabouts more accessible to pedestrians with vision impairments.

**Trucks, Buses and Other Large Vehicles.** Roundabouts can be designed to accommodate the turning radii of large trucks, trailers and buses just like any other intersection. Roundabouts generally are designed with truck “aprons”—a slightly raised area around the inner circle that provides trucks, buses, and other large vehicles additional room to navigate the roundabout.

**Emergency Responders.** Roundabouts can be designed such that emergency service providers are able to navigate through roundabouts with their largest vehicles. In emergency call situations, roundabouts can be safer and more efficient for an emergency vehicle than traveling through traditional intersections.

**Good locations for roundabouts**

Roundabouts are safe and efficient, but as noted earlier they are not the ideal solution for every intersection. Several factors should be evaluated when deciding to build a modern roundabout at a specific intersection. Designers typically consider these characteristics when determining the best design solution for a particular intersection:

- **Crash history** – data about the number and types of crashes, speeds, and other contributing factors are analyzed.
- **Intersection operation** – the level of current and projected travel delay being experienced, and backups on each leg of the intersection.
- **Types of vehicles and users traveling through the intersection** – the vehicle mix and number and type of pedestrians and bicyclists that use the intersection. This is especially important for intersections frequently used by large trucks or buses.
- **Cost** – this includes the societal cost of accidents, right-of-way (land purchase) requirements, and long-term maintenance and operations requirements.
The importance of proper design cannot be overstated. Good design is critical to the success of a modern roundabout. Other keys to success include public involvement and stakeholder support. FHWA through its Safety website offers numerous resources, including a one-day informational workshop for state and local transportation agencies.

**Public Acceptance**

While not necessarily an indicator of sustainability, public acceptance is a critical element of an effective approach to implementing modern roundabouts in a jurisdiction. Good design and good public involvement throughout the entire planning and design process will ensure the best chance of success at starting and growing a roundabout program in a community. The information below illustrates just how effective roundabouts can be and how supportive the public can become once they actually experience effectively located and designed modern roundabouts.

**Summary**

Every agency should routinely consider the use of modern roundabouts for any new or retrofitted intersections in their jurisdiction. It will often be the most sustainable choice and provide much greater long-term safety and other benefits than a traditional stop-controlled or signalized intersection.

Marshall Elizer is a member of APWA’s Center for Sustainability and the AASHTO Committee on Geometric Design, and is a former member of APWA’s Board of Directors. He can be reached at (615) 604-6721 or meliz@gspnet.com.

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<td>18%</td>
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<td>3%</td>
<td>7%</td>
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Source: City of Roswell, GA Survey via e-mail newsletter, Twitter and Facebook. 742 responses – 99% had driven through the roundabout.
GET CERTIFIED IN 2015!

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North America’s aging urban infrastructure is under pressure. In 2009, American infrastructure quality merited a “D” in a report card by the American Society for Civil Engineers, a rating that had moved to a “D+” by 2013. While this represents at least some progress over four years, the majority of U.S. infrastructure still ranks as “poor” in the latest assessment. From a global perspective, the World Economic Forum rates American infrastructure quality as 25th out of 144 countries, just one spot ahead of Qatar.¹ Population growth, climate change and the need to attract and retain dynamic businesses in a competitive environment compound the urgent need for solutions, which have tended to focus on new financing models, prioritizing only high priority upgrades, and determining who should pay for what.² In such a challenging situation, new thinking and promising approaches are needed and welcome. As good fortune would have it, there are initiatives underway on Canada’s west coast that hold potential to recast the infrastructure debate from one that is about managing crises to one that is about saving money, getting equivalent services, and preserving natural assets.

The outwardly sleepy Town of Gibsons, British Columbia, best-known for a long-running TV show about people who salvage beach logs for a living, is figuring out how to not only measure the value of the municipal services provided by “natural assets” such as green space, forests, topsoil, aquifers, foreshore and creeks, but also how to integrate this information into municipal asset management through governance system changes.

The Town decided that if good asset management requires a holistic and strategic view of all assets, then they must consider not only built or engineered infrastructure but also natural assets wherever these provide equivalent municipal services on which the Town relies.

And so, in 2014, the Town of Gibsons became the first municipality in North America, and possibly anywhere in the world, to explicitly deem nature to be an asset, giving natural assets the same consideration as traditional capital assets. Using their new natural asset management policy as a basis, the Town committed to operate and maintain its natural assets in the same manner that it does for storm sewers, roads and other traditional engineered solutions.

The Town is now mapping all of its natural assets, including the aquifer that provides water to the town and the forest area that retains stormwater runoff. Based on this, the Town then calculates the value of these assets in terms of the municipal services provided and the risk and replacement cost if the assets were to fail. Then, they determine management objectives for the assets and what these cost. Finally, the Town places the natural asset in their asset management plan, alongside roads, bridges and other traditional, engineered assets.

Early results from the Gibsons initiative are promising. The natural assets have
no up-front cost, never depreciate and never need to be written off. Moreover, they provide the same municipal services as engineered assets, at a fraction of the cost. For example, the aquifer costs about $28,000 per year in monitoring costs, compared to multiples of this to operate a filtration and treatment plant.

Moreover, the Town’s natural assets provide a wide range of other benefits. For example, the forest area that absorbs stormwater runoff is a beautiful recreation area, and the foreshore that protects against storm surges and sea-level rise is a picturesque spot popular with kayakers and walkers.

These findings provided all the encouragement that the Town needed to start documenting their efforts, and figuring out how to share their success and challenges with others. They released recently a report entitled “Towards an Eco-Asset Strategy in the Town of Gibsons” that describes their methods, the issues they face, and what is now required to make this approach move into the mainstream. They are also exploring opportunities to develop a toolkit or methodology that can be used by other municipalities.

Earlier this year, the APWA Reporter described efforts in St. Peters, Mo., to use asset management approaches for the stream corridor, and to model retention basins and waterways in the corridor. The approach yielded initiatives that solved multiple challenges and proved sufficiently useful that a funding mechanism was agreed upon to improve the quality of the natural waterways.

The Town of Gibsons has effectively "built out" this approach, by developing a municipal governance system around natural asset management system, and documenting and sharing the process and tools. With a little more momentum around this approach, it is entirely possible that future report cards on North American infrastructure will demonstrate that an entirely new eco-assets approach to infrastructure yields very positive, and much-needed improvements.

Roy Brooke can be reached at (250) 896-3023 or roy@brookeandassociates.com. “Towards an Eco-Asset Strategy in the Town of Gibsons” is available at http://www.gibsons.ca/eco-assets.

Notes:


Gibsons' natural foreshore protects businesses and infrastructure from the sea, which is projected to rise one meter (three feet) from current level, and bring more storm surges. Innovative approaches to preserve and maintain the natural foreshore are a cost-effective alternative to building engineered assets, and help to manage risks.
Sustainable community in action: Tempe, Arizona’s Clark Park Community Garden project

John Osgood, Deputy Public Works Director – Field Operations, and Shauna Warner, Neighborhood Services Director, City of Tempe, Arizona

"We cannot seek achievement for ourselves and forget about progress and prosperity for our community... Our ambitions must be broad enough to include the aspirations and needs of others, for their sakes and for our own.” The City of Tempe’s Clark Park Community Garden project exemplifies the spirit of volunteerism, community engagement, and sustainable, forward thinking reflected in Cesar Chavez’s inspiring words.

Tempe’s Clark Park swimming pool was constructed in 1974, and served the community as a full-service aquatic complex for thirty-four years when it ceased operations in 2008. As the facility was nearing the end of its useful life, City staff and the neighborhood worked together on developing a comprehensive master plan to rehabilitate both the park and the swimming pool. Construction was scheduled to begin in 2010, but the nationwide economic downturn intervened and, coupled with a severe decline in local property tax revenue, forced this and many other capital projects to the sidelines. Over the next several years, the City spent about $40,000 annually just to pay for electricity and pool chemicals; ultimately the pool was drained and the residents in the area faced a blight condition right in the heart of their neighborhood.

In 2012, City staff approached the Clark Park and Marilyn Ann Neighborhood Associations to get their ideas as to how to reenergize this once vibrant community space, and to think about what they wanted that space to become. After several neighborhood
meetings and much discussion, the neighborhood decided to transform the space from blighted empty hole in the ground to sustainable, life-affirming community garden. Through a creative and collaborative partnership between the City of Tempe, the neighborhood associations and area residents, and the Tempe Community Action Agency (TCAA)—a long-serving social service organization in Tempe—plus a lot of hard work on the part of volunteers who moved earth, cleared debris, built planters, and planted fruits and vegetables, the community garden has become a reality.

Tempe Mayor Mark Mitchell captured the essence of the community engagement element of the garden project when he wrote, “A garden tended by residents of all ages brings out the best in that community, becoming a source of fresh food, physical activity, recreation and civic pride for all who participate. It also serves an important purpose allowing Tempe residents and youth to improve nutrition and gain control over the quality and variety of their food supply, while also supplying ample nutritious food to our food bank.”

With regard to its utilitarian purpose, the community garden is split into two sections: one section is reserved for individual planting beds that neighbors can pay to use; everything they grow and harvest stays with them. The other section is managed by TCAA and is volunteer-based. Food grown in this section is earmarked for the local food bank. Their winter harvest recently yielded an abundance of broccoli, carrots, squash, kale, beets, and assorted greens.

While this transformative effort could have been successful based solely on the level of volunteerism and community engagement devoted to it over the past few years, it has been even more successful given the sustainable, forward thinking of the Tempe City Council and community volunteers. In partnership with Tempe High School and other educational groups, the garden is designed to be an educational space where students come to the gardens for hands-on math, science and nutrition lessons. The garden also promotes backyard gardening including a composting demonstration area and an aquaponics station.

Relatedly, over the past two years Tempe has reinvented its community bulk trash and green organics program in a way that provides residents with ample and sustainable uncontained/bulk trash service and a convenient green organics to compost diversion program. Diverting the community’s green organic material from the landfill and processing it into nutrient-rich compost helps to close the recycling loop in Tempe. More than two hundred yards of Tempe’s homegrown compost is hard at work in the planting beds in the community garden, helping to produce healthy plants and nutritious food.

The Clark Park Community Garden project is a labor of love, a work in progress, and a shining example of what can be achieved when volunteerism, community engagement, and sustainable, forward thinking are requisite attributes for community-based problem solving, as they are in Tempe. For information on the community garden visit: http://www.tempeaction.org/clark-park-community-garden/.

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Smarter Water: Driving sustainability with infrastructure and information

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FATHOM
Phoenix, Arizona

Introduction
“Truly sustainable water management and use requires efficiency, smart economics, advanced technology, and better governance and water management.”1

Water volatility is a looming problem for all of us. Just recently, Jay Famiglietti, the senior water scientist at the NASA Jet Propulsion Laboratory/Caltech, wrote that California “has only about one year of water supply left in its reservoirs, and [its] strategic backup supply, groundwater, is rapidly disappearing.”2 Texas is in equally dire condition with the “Texas Lower Colorado River Authority—a water supplier to power plants and farms, as well as to Austin, the fast-growing capital city in the United States—announcing that the deep drought which has gripped the state’s Colorado River watershed since 2008 is the worst on record.”3

Historically, we have relied on massive engineering works and the relative resilience of the water cycle to withstand changes in water availability. Despite this, the world has many stories of mass human migrations being triggered when either the engineered systems or water’s resilience failed. São Paulo, Brazil, may be on the cusp of that scenario today.4

Our goal for the future must be to eliminate the threat that of disruption from water scarcity. This requires a different approach to the way we manage water. A move from “engineered solutions” must give way to “collaborative solutions” that combine infrastructure and information to attain sustainability. While there can be no doubt that we will be using engineered systems to create new water, the costs and environmental implications demand that we maximize our current resources first.

Opportunity
The developed world has been presented with a unique opportunity: much of the world’s first generation water and wastewater systems are approaching their end of life. We face an option to simply perpetuate the Victorian-era model of water delivery, or take the opportunity instead to configure our infrastructure and information systems for the twenty-first century and beyond. This includes developing a “right water for the right use” philosophy as well as deploying data systems to work as conduits of behavioural change.

Peter Milly noted this in 2008: “The world today faces the enormous, dual challenges of renewing its decaying water infrastructure and building new water infrastructure. Now is an opportune moment to update the analytic strategies used for planning such grand investments under an uncertain and changing climate.”5

The developing world can, learning from the experiences of development and taking lessons from the telecom sector, leapfrog the current predicament in the west, and deploy infrastructure plans and societal mechanisms to maximize sustainability from the outset. This will not only save resources, but in fact is cheaper to operate and maintain.6

Infrastructure
From the perspective of efficiency and conservation, the design of water distribution systems is inherently flawed. By providing only one piped source of water for use, communities are locked into a model in which all water must be treated to potable standards; all water must be maintained at a suitable pressure for instantaneous use; and new water must be found and accessed for each new person. Noted water expert Peter Gleick opined on this very issue in 2007: “In the twentieth century we built this water system and it brings incredibly high quality potable water to our homes, and we use it to drink and to flush our toilets and to water our lawns. It’s a crazy use of a wonderful resource.”7

The limitations of this infrastructure model are most evident when one considers that the majority of water provided to customers is not consumed. Rather, it is used as outside irrigation, or as a means of...
transporting waste away from homes, or in other non-consumptive tasks.

Inside the typical American home, toilet use represents 15% of the total (internal + external) demand. Outside irrigation can be as much as 39% of the total demand.

These non-potable demands are ideal applications for recycled water and represent an opportunity to replace 54% of the total water consumption with a non-potable supply (Figure 1).

To achieve this, however, requires a reimagining of the water distribution system engineering practices of the past. It requires the embodiment of the right water for the right use in physical infrastructure. This can be achieved by installing dual water mains—one for high quality potable demands, and one for uses that can use lower quality water.

Deploying this infrastructure model significantly reduces the amount of potable water required by a community. In 2000, the area in and around Maricopa, Ariz., had a population of 500. By 2010, that population had swelled to 50,000. As a community built exclusively on groundwater, a fundamental change in the way that water was used and reused was required to ensure the community maintained the 100-year assured water supply requirements demanded by the state. Global Water Resources undertook a revolutionary approach to water management—maximizing the reuse of treated wastewater. Prior to the implementation of a recycled water plan, Global Water–Santa Cruz Water Company’s overall consumption of potable water per connection customer was 0.45 acre-feet per year (AFY). As recycled water infrastructure advanced, Global Water–Santa Cruz connections used 0.24 AFY of potable water and 0.13 AFY of recycled water.8

Information
In order to be effective, water managers must increase the visibility of water consumption. Unfortunately, the economic value of water and the customer’s experiential understanding of where, when and how they consume water stands in the way. There is simply not enough information available to generate the real-time behavioural changes necessary to reduce consumption.

To change this requires utilities adopt smart metering—Advanced Metering Infrastructure (AMI). With AMI, we have the ability to provide customers near-to-real-time feedback on their water consumption. This means that a customer can be informed when they are approaching higher cost tiers; they can be notified of leaks; they can correlate their activities with water use. Prior to AMI, this type of information was not available to customers.

And most importantly, with AMI, innovation can be applied to rate designs. Rate designs such as rebate threshold rates, water budget-based rates, and time of use rates can now be developed because the data can now support them. Finally we have systems that can provide both the consumption data necessary for customers to understand their water use, but we have the means to tie rates directly, and in real time to that consumption. And with AMI, customers have tools such as mobile applications to allow them to see and make conscious decisions about their water use and manage their own behaviour.

Conclusions
The world of water resources management is changing rapidly—scarcity and volatility are a certainty.
To adapt, utilities must seek to increase sustainability through diversifying their water delivery paradigms—using the right water for the right use—as well as increasing the availability of data for customers.

For the first time in recent history, we have the opportunity to change the way we deliver water—both the drops and the data. When implemented, these choices result in significant water savings; and with the ability to monitor and immediately report water use, we can dramatically increase the visibility of water. In doing so, we can dramatically improve our utilities' sustainability potential.

Graham Symmonds can be reached at graham.symmonds@gwfathom.com.

Note: A book in the APWA Bookstore, entitled The Smart Grid for Water: How Data Will Save Our Water and Your Utility, can provide more information on this topic. The book’s placement in the bookstore was made possible due to the efforts of APWA’s Water Resources Management Committee.

References:

1 P. Gleick, “The Real Cost of Water We Use,” presented at the Stanford Graduate School of Business, 2010


7 Fresh Air Interview, NPR/WHYY, 27 November 2007

8 Global Water Resources
The San Diego Sustainability Committee has a mission to advance the practice of sustainable engineering in the planning, design, construction, operation, and maintenance of civil works within the San Diego and Imperial Counties regions of California. The committee was created to assist the engineering community and public agencies in recognizing the significance of addressing sustainability in all aspects of infrastructure and natural resource administration (e.g., master planning of public facilities, capital construction, and infrastructure asset management, and operation and maintenance of existing and future public and publicly-beneficial utility and natural resource agency assets). Our focus is on achieving the many goals associated with engineering projects, including optimizing the infrastructure system as a whole, while controlling capital and annual operation and maintenance costs.

The goals of the committee will be designed to achieve the six tasks outlined below.

1. Promote the use of the Institute of Sustainable Infrastructure’s Envision® Rating System.
2. Present educational and training workshops to local APWA/ASCE/ACEC members explaining how to apply the Envision Rating System in both CIP planning and project-specific planning.
3. Develop and implement, in coordination with ISI, an Envision accreditation program (accreditations will be offered for positions to be titled “Assessors” and “Verifiers”).
4. Create a forum for local municipalities and public agencies to learn from one another how their sustainability policies are implemented and to share their respective lessons learned. We may coordinate with a similar group in the Seattle area to benefit from how their organization was formed and set up to ease our set-up and transition.
5. Coordinate with ASCE’s Government Relations Committee and APWA Advocates to coordinate efforts that support funding for sustainable practices.
6. Advocate for sustainable engineering principles to be applied as a standard of practice in our local engineering community.

"My compliments as I have seen a lot of sustainability seminars and not many as animated or original." – Jeralee Anderson, Executive Director, Greenroads Foundation

Sustainability seminar provides a fresh breath of green practices in San Diego

René A. Vidales, P.E., QSD, LEED GA, ENV SP, STP
Program Coordinator, County of San Diego
San Diego, California
Seminar Co-Chair, Joint APWA/ASCE/ACEC San Diego Sustainability Committee

A captivated audience during one of the many presentations at the “Infrastructure for the 21st Century” full-day seminar, which drew a total of 80 participants from the greater San Diego Region including both members and nonmembers of the APWA community.

The “Leadership” panel. Left to right: County Supervisor Ron Roberts (CA Air Resources Board Member), Tim Smith (ASLA Stewardship Committee), Stephen Heverly (Equinox Center), Cory Jones (SDSC Chair), Danielle Buttacavoli (AIA Committee on the Environment), and Doug Kot (Former San Diego USGBC Executive Director)
The San Diego Sustainability Committee (SDSC) held the “Infrastructure for the 21st Century” sustainability seminar on October 29, 2014 in San Diego, Calif., at the Hearing Room of the County of San Diego Operations Center, a certified LEED Platinum facility within a campus filled with LEED Gold facilities. The full-day seminar brought together discussions from local politicians, regulators, and industry leaders from Southern California and beyond.

SDSC Chair Cory Jones from GHD gave the opening remarks which were immediately followed by an Ice Breaker Session titled “Cards to Save Humanity,” a sustainable alternative to the popular game “Cards Against Humanity.”

Keynote speaker Jason Anderson from Clean Tech San Diego talked about the area’s innovations in clean technologies and adoption of sustainable business practices for the benefit of the economy and the environment.

The following four presentations focused on “Infrastructure Rating Systems,” beginning with René Vidales from the County of San Diego, who gave an overview on Envision®, Greenroads, LEED, the Sustainable Sites Initiative and the Living Building Challenge.

This was followed by the Executive Director of Greenroads Foundation, Jeralee Anderson, who gave a presentation titled “Greenroads for the 21st Century” which included more in-depth details about the rating system and shared some success stories and examples from local California projects.

Sean Vargas from PSOMAS presented an Envision Platinum-certified project, the “Los Angeles Wetlands Park.” The project was a result of a ballot initiative whose projects were conceived to remove pollution from the city’s watercourses. Even though René and Sean had just met, it was conveyed to the audience that both of them would be presenting back to back in the same panel within a few days at the ASCE International Conference of Sustainable Infrastructure in Long Beach, Calif.

“Placer County Stream Restoration” also received Envision Platinum certification and was presented by Stefan Schuster of CDM Smith, who summarized the Snow Creek project and discussed the benefits and lessons learned from the sustainability rating evaluation.

“Construction Procurement Committee’s Number 2 Issue: Sustainable Infrastructure,” by Dave
Umstot from Project and Facilities Solutions, explained how to integrate sustainability into our facilities' infrastructure required to meet the demands of our population.

The second half of the seminar focused on the five categories of Envision:

**Leadership:** Five panel members took turns to speak on this very engaging topic.

Stephen Heverly (Equinox Center) presented key findings from the 2014 San Diego Regional Quality of Life Dashboard, Equinox Center’s principal publication which combines research efforts with outreach strategy to advance intelligent policy in the region.

Tim Smith (ASLA Stewardship Committee) talked about the effects of having multi-disciplinary workshops on sustainable design approach with landscape architects, civil engineers, landscape contractors, geotechnical engineers and government agencies.

Danielle Buttacavoli (AIA Committee on the Environment) gave a speech on recent collaboration in the San Diego community of Pacific Beach and an overview of EcoDistricts.

Doug Kot (former San Diego USGBC Executive Director) shared that dedication and passion of many volunteers and partners have provided support over the years, like the efforts currently in progress in the San Diego community of North Park, which is taking the first steps in forming an EcoDistrict.

County Supervisor Ron Roberts (CA Air Resources Board Member) talked about recent projects such as the County Administration Center Waterfront Park and the County Operations Center plus the potential for a Gondola project that would take residents and visitors between Balboa Park and Downtown.

**Quality of Life:** “History of Living Walls” was presented by Mark Woolbright from the Living Wall Company. He explained that a living wall is simply vertical space covered by vegetation, although cultivating plants in vertical space is not always so simple.

**Resource Allocation:** “Chula Vista Recycled Pavement Program” featured Jose Gomez from the City of Chula Vista who presented on how pavement recycling has become a part of their pavement asset management plan and strategy, and Craig Harrington from Pavement Recycling Systems talked about the sustainable engineering of in-place recycling technologies.

Leslie McLaughlin with NAVFAC discussed “Future Technologies for Solid Waste Management,” including efforts with NAVFAC SW Division to increase recycling and reuse of solid wastes and illustrated how a number of commonly used objects can be used to extract energy in other countries.

**Natural World:** Bruce Wilcox from the Imperial Irrigation District presented “Salton Sea Restoration and Mitigation” and shared a brief history of the Salton Sea and its history, issues surrounding the lake such as declining inflows and increasing salinity, the state’s proposed restoration plan with alternatives, and the Salton Sea Authority’s action plan for restoration and renewable energy initiative.

**Climate and Risk:** Randy Keller from CalEnergy presented “Geothermal Energy Production in Southern California,” focusing on possible use of geothermal energy resources to assist the region reach its renewable energy goals.

The discussions were very engaging followed by questions from the audience. Panel members and all speakers received carbon off-set credits as a thank you for participating and all guests received reusable Chico bags and candy in honor of the Halloween season.

The event concluded with a Happy Hour at Council Brewing, one of the many local breweries in San Diego County.

After the success of the 2013 “Sustainable Resilience” seminar and the 2014 “Infrastructure for the 21st Century” seminar, the committee is looking forward to the next event and including even more focused discussions to educate our region on this topic. If you are interested in hearing more about our committee, please visit our website at: www.sdsustainableinfrastructure.org.

René Vidales can be reached at (858) 694-3246 or Rene.Vidales@sdcounty.ca.gov.
2015 Top Ten Public Works Leaders named

One of the most coveted and prestigious public works awards is sponsored each year by APWA and is presented to ten individual leaders whose excellence in public works earns them the distinction of the Top Ten Public Works Leaders of the Year. The honorees are awarded this recognition for their professionalism, expertise and personal dedication to improving the quality of life in their communities through the advancement of public works services and technology. This year, the Top Ten Review Committee consists of Committee Chair Lawrence E. Bombara, Retired, Douglas, Massachusetts; Kurt A. Corey, P.E., PWLF, Director of Public Works, City of Eugene, Oregon; Larry T. Koehle, P.Eng., President, L&N Koehle Consulting Services, Brampton, Ontario; Howard S. Lazarus, PWLF, Director of Public Works, City of Austin, Texas; and Richard E. McKinley, MPA, PWLF, Surprise, Arizona.

For 2015, the selected recipients of the Top Ten Public Works Leaders of the Year Award are:

James E. “Jeb” Blackwell
City Engineer
City of Charlotte, North Carolina

As City Engineer for the City of Charlotte, N.C., James E. “Jeb” Blackwell has responsibility for managing the City’s bond-funded Community Investment Plan projects; the operations and maintenance of City facilities totaling six million square feet; the acquisition, disposition, stewardship, and beautification of City-owned land and its nationally-recognized tree canopy; the City’s stormwater utility; and the regulation of commercial and large-neighborhood development. For more than 30 years, Blackwell has helped build the foundation for a city that has grown from 338,000 people and 145 square miles to 760,000 people and 306 square miles.

When the Democratic Party picked Charlotte as the site of its 2012 National Convention it put the national spotlight squarely on Charlotte and the facilities for which Blackwell’s business unit, Engineering and Property Management, is responsible. Blackwell oversaw the renovation and restoration of Time Warner Cable Arena, relocating the center city Transit Center, leasing office space for federal agencies, securing storm drainage systems, analysis of proximity hazards and aesthetics, coordinating public works operations, modifying electrical systems to support security upgrades, and managing temporary facilities for police, media and convention staff.

When Charlotte was vying for an NBA franchise in 2002, it was apparent that a new Charlotte arena would have to be part of the package. Blackwell was a leader on the project team that was adamant on the necessity of locking in steel prices early, eventually saving the project millions of dollars. He was a principal liaison with the NBA, the Charlotte Bobcats (now Hornets) and the City’s Coliseum Authority. Blackwell played a crucial role in the effort to secure the site and build the arena on a fast track. He was also responsible for negotiating with the NBA team on a “shared savings concept” to provide incentive to the team to work with the City to finish under budget.

Stan Brown, P.E., PWLF
City Manager
City of Oakwood, Georgia

Stan Brown has worked in local government for over 27 years, holding...
Thomas C. Collins has 39 years of service in the public works profession in the communities of Brookline and Natick, Mass. He began his career as a mechanic in the Town of Brookline’s Fleet Division in 1976 and worked his way up to his current position of Deputy Director of Public Works for the Town of Natick. During his tenure with the Town of Natick he has served as Interim Director of Public Works on two occasions: December 2013 to May 2014 and August 2014 to December 2014. Collins is a highly respected member of Natick’s management team who is sought after for advice on numerous issues both in and out of the public works field.

In August 2013, Collins and the Department of Public Works switched Natick to in-house curbside recycling collection. This initiative has resulted in an estimated annual savings of over $105,000 when compared to the cost of the contracted service previously used. The net savings for the in-house service has been calculated after accounting for salaries, benefits, capital cost (three new packers), automated recycling containers for each residential property, fuel and other associated cost items. In addition, a contract with the recycling facility was negotiated that pays $2.00 for every ton of recycling delivered to the recycling facility.

Under Brown’s leadership, the City of Oakwood broke new ground with over 30 public-private partnerships for delivery of City services. He developed and implemented a growth strategy for Oakwood that resulted in over 100 annexations in one year. He completed the build-out of the City’s 250-acre industrial park in less than seven years with a $1.5 million net profit. His work culminates in the City’s Oakwood 2030 program setting the vision and implementation strategy for creating a downtown and commercial center in the future (www.oakwood2030.com).

On the state level, Brown worked with Georgia DOT to streamline the Local Maintenance and Improvement Grant funding distribution method, thus enhancing the program’s effectiveness and reducing administrative costs for the state and local governments. Each year he teaches newly elected County Commissioners about transportation and public works for the Association of County Commissioners of Georgia. He serves on the Georgia Municipal Association as Executive Secretary and as President of the APWA Georgia Chapter.

The program has improved safety by reducing injuries associated with the manual disposal method of collection.

In 2011, Collins took on the responsibility of coordinating and remodeling Natick’s Conley Training Center into a fully operational Emergency Operations Center (EOC). The remodel included computer, radio, electric, phone, monitoring screen upgrades and improvements to the facility structure. The EOC is a 50-person amphitheater that can accommodate 50 emergency management staff—all Town command staff and other required agencies. The EOC can be online with the Massachusetts Emergency Management Agency (MEMA) and U.S. Army Soldier Systems Command Center in Natick. Additionally, the EOC is also used for regional agency training.

Darwin K. Durnie started with Stantec Consulting in 2003 and is now Director, Business Development, Red Deer Office. He continues to lead the delivery of services in municipal operations, administration and legislation in Alberta. For the past 12 years he has managed large-scale capital projects ($30M-$100M) to
completion on time and on budget. He is responsible for organizing infrastructure development and building improvements for existing communities. Through his track record in navigating large- and small-scale infrastructure projects, Durnie is a valued asset in leading multidisciplinary ventures through all stages including funding, procurement, technical design, regulatory approval, construction and commissioning.

During his time at Stantec in his leadership roles, Durnie introduced the use of GIS and GPS on large-scale regional water projects occurring in dozens of participating municipalities covering a combined 300 km of transmission pipelines. He also created a right-of-way purchase and assembly system that was adopted as the model approach for competitors' projects under the Alberta Water for Life Program. He also directed the development of a web-based virtual as-built system and automated recording and reporting system attached to SCADA coined SCADARR which has become the state of practice for the regional water commissions that have been developed in the past decade.

Mentoring and coaching of his colleagues, peers and newcomers have always been at the fore of Durnie’s career. This is demonstrated by his continuous delivery of training and education to staff, elected officials and peers and his support of programs such as the Emerging Leaders or Young Professionals at the APWA/CPWA national and chapter levels. It is also well recognized through his creation of the Alberta Public Works Supervisors Program, Level I, II and III, his work on the APWA National Education Committee, and being named the first Chair of the APWA Certification Commission that this is the area that he has focused and dedicated the majority of his career. Durnie is a Past President of CPWA (2010-2014) and the Alberta Chapter (2008).

**Gregory S. McCaffery, P.E., PWLF**  
**Director of Municipal Services**  
**City of Junction City, Kansas**

As Director of Municipal Services for the City of Junction City, Kans., Gregory S. McCaffery manages and supervises the Building & Codes, Engineering, Planning & Zoning, Public Works and Water/Wastewater (contractual) Departments, consisting of five department heads and 44 employees, and an annual operations budget of $14.5 million and an annual capital budget of $21 million. McCaffery is part of the City Senior Management Team, charged with oversight of approximately 53% of the City general fund operations, staff mentoring, policies and standards, and right-sizing the various departments.

McCaffery headed up the City’s assumption of “The Core” Public Works Operations—Streets, Water, Sanitary and Sanitation—back into the City, through the creation of a new, fully operational Department of Public Works after 8-10 years of being privatized. This reduced overall Public Works operational costs by $1 million annually for the City through privatization contracts. McCaffery also oversaw the restructuring of the water and wastewater treatment private operational contracts. This project involved recruiting and hiring, equipment, materials bidding and purchasing, development of various programs, activities, and departmental fund budgets.

McCaffery has developed an Annual Street Maintenance Program through a rating system, implementation of preventive maintenance programs, and use of various street pavement treatment systems. He also started up the City’s Annual Street Maintenance Open House, which is now held annually at the City Hall, allowing City staff (Engineering & Public Works) to talk in an informal setting with citizens and property owners about street issues, coming projects, maintenance concerns, and snow removal operations. This has been a huge success, whereby the citizens are able to understand what truly takes place in street life-cycles.

**Natalie Meeks, P.E.**  
**Public Works Director**  
**City of Anaheim, California**

As Public Works Director for the City of Anaheim, Calif., Natalie Meeks directs and oversees the operations of the Public Works Department including six divisions providing a broad scope of municipal services including traffic engineering, design and development services, transit planning, contract administration and inspection, streets and sanitation operations, and fleet and facility maintenance. She
provides administrative support to the City Manager and City Council; communicates directly with City Council regarding transportation initiatives and infrastructure investment; and provides support to City Council members for their participation in regional boards and commissions.

Meeks has been instrumental in accomplishing many significant projects which change the way people travel and experience Anaheim, including the LEED Platinum-designed Anaheim Regional Transportation Intermodal Center, transformation of The Anaheim Resort Area, the Anaheim Convention Center Grand Plaza, and advancing the proposal to construct a modern streetcar connecting Anaheim’s destination centers. The innovative and progressive planning and design of these projects provide the foundation for Anaheim’s world-class destinations.

Meeks strongly supports APWA’s efforts to share information, educate and mentor on the local, national and global levels. She has been a valuable participant in the Southern California Chapter’s Public Works Institute as an instructor. She was also instrumental in bringing the 2012 APWA International Public Works Congress & Exposition to Anaheim. Approaching the event with focused goals and priorities, Meeks ensured that the team of dedicated committee members and hundreds of event volunteers succeeded. Her efforts helped raise over $250,000 in event funding and engaged more than 400 volunteers for APWA’s annual conference.

As Director of Public Works for the City of Grandview, Mo., Dennis Randolph is responsible for streets, sewers, sidewalks, and other infrastructure for a community of 25,000 located in the Metropolitan Kansas City area. He has led initiatives to improve Main Street and to incorporate “complete street” ideas into projects around the city. He has also conducted sewer improvement projects for sanitary sewer inflow and infiltration reduction, and storm sewer restoration. Working with the City’s Parks Department he has led development of a combined parks and public works maintenance facility, and also devised a plan to provide walking and non-motorized vehicle facilities for city parks.

Randolph’s major achievements and accomplishments for the City of Grandview include directing a successful campaign to renew the City’s half-percent Transportation Sales Tax with expected revenue of $10 million in the next ten years; obtaining approximately $17 million in federal highway aid for City projects; completing the rejuvenation of the first three phases of the Main Street Upgrades including two new “pocket parks”; consolidating fleet maintenance activities for the City, which had been split between departments; and developing and placing into work numerous GIS “layers” for use in planning and public works functions.

As a strong proponent of public works at all levels of education, Randolph recently taught modules for the APWA Kansas City Metro Chapter’s Public Works Institute. He has more than 25 years of classroom, adult education instruction, and teaching of a wide variety of civil and construction engineering subjects. Most recently, at the University of Missouri-Kansas City he has incorporated real-life projects into his courses on Estimating and Planning, and Means and Methods, working with contract documents and field visits to bring theory to hands-on experience for students. In line with his work in education, he has also been a prolific author and has more than 80 published books, papers, and articles on a wide range of topics including engineering, management, and public works.

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Dennis Randolph, P.E., PTOE, PWLF
Director of Public Works
City of Council Bluffs, Iowa

Gregory W. “Greg” Reeder serves as the Public Works Director for the City of Council Bluffs, Iowa. He oversees a staff of 120 employees in seven divisions including Engineering, Building Permits and Inspections, Water Pollution Control Plan, Fleet, Streets, Sewers, and Traffic Maintenance. He manages an operating budget of over $12 million and an annual capital budget of $15 million. Prior to becoming the Public Works Director, Reeder served as the City Engineer for...
Council Bluffs, providing direction, coordination and supervision of the Engineering Division of the Public Works Department, including environmental, transportation, construction, development, and permits.

Perhaps Reeder’s greatest career challenge was the 2011 Missouri River Flood Event. The second highest flood level in the history of Council Bluffs occurred that summer. It was not the height of the flood water that was the biggest concern, but the length of the flood event. For one hundred days, the river level was above flood stage making it the longest duration flood event in U.S. history. Reeder spent ten to twelve hours a day that summer in the Emergency Operations Center directing the Public Works Department flood-fighting activities in coordination with the efforts of the U.S. Army Corp of Engineers, the Iowa National Guard, City Police and Fire, and the dozens of other City employees assigned to the effort. The successful effort to keep the floodwaters at bay is one of the greatest stories in the city’s history.

Another recent accomplishment by Reeder includes securing the new Public Works Department facilities. In 2009, Reeder led the effort to construct a new $5 million, 24,000-square-foot Fleet Maintenance Facility, more than doubling the size of the old building. The new Fleet Maintenance Facility was located on property that Reeder acquired which would allow the eventual relocation of all Public Works operations facilities to be located on a single campus site.

Paul Smeltzer is the Director, Water and Wastewater Services for Niagara Region, Thorold, Ontario. He is accountable for general management and leadership in the engineering, operations and maintenance working groups, and compliance and delivery of water and wastewater services for the Region. He ensures that divisional programs and services respond to strategic priorities, objectives, and initiatives of the Region and that all federal, provincial and municipal requirements, including health and safety, are met. Prior to his role with Niagara Region, Smeltzer served as Principal Consultant with AMEC Environment and Infrastructure, responsible for the day-to-day operation of the Municipal Infrastructure Group.

Smeltzer was the lead project manager on a project between the Town of Milton and the Region of Halton for the design and construction of a 3.6 km four-lane cross section and water main installation. The contract value for this project is $15 million. It commenced in 2009 and now approaches completion. Louis St. Laurent Avenue is an important roadway that, once complete, will provide an essential corridor linking east and west Milton, from Tremaine Road through to James Snow Parkway. Together with his AMEC support team, Smeltzer was responsible for all design, including the use of subconsultants for street illumination, traffic signals and streetscaping, as well as tender documents, contract administration and construction inspection.

Smeltzer has been active in sharing his experience and knowledge, and leading others through presentations and training programs for engineering students at Ontario universities. He has presented during National Engineering Week multiple times on the value of mentoring, and from 1999 to 2005 annually presented to university and college programs on Being a Technical Professional and Concrete Pipe Design. Smeltzer was instrumental in developing and administering a training program at Niagara College for water and wastewater operators—now a full-time diploma program in environmental technology—and also led a training program for Ontario Good Roads Association from 2002 to 2007 on Storm Sewer Design.

John A. Trujillo
Public Works Director
City of Phoenix, Arizona

John Trujillo has more than 23 years of public works experience. For over eight years he served as the Public Works Director for Gila County, Arizona (comprising 4,796 square miles) where he was responsible for fleet, facilities, roadways and floodplain management. He began serving the City of Phoenix in 2002 and is currently serving as Public Works Director, where he leads a department.
with over 1,100 employees who provide fleet, facilities and solid waste services for the nation’s sixth-largest city with a population of over 1.4 million residents and a land area of 525 square miles.

Trujillo led the Phoenix initiative to convert their solid waste fleet to low-pollution, CNG fuels. He is a national leader in the application of managed competition for the collection of solid waste and has made numerous presentations at regional, state, national and international levels. He pioneered a process which required the Solid Waste Department to competitively bid against the private sector for curbside collection services. The result was a cost-effective program which combines the services of private waste haulers with the City’s own collection services.

Trujillo is currently heading a regional effort to achieve a 40 percent recycling diversion rate by year 2020 (40 by 20). He has forged a partnership with other municipalities and has engaged the private sector as well as Arizona State University’s Global Institute Sustainability. The 40 percent recycling diversion goal will triple the current recycling rate in the City of Phoenix. This is expected to extend the life of landfills and save taxpayer money. One key component of 40 by 20 is a Green Waste collection and processing program which will demonstrate the feasibility of processing organic material for beneficial reuse.

**Editor’s Note:** For a list of the Top Ten recipients from 1960 to 2015, go to APWA’s National Awards Program web page at www.apwa.net/About/awards.asp?Display=top10list.
Q “We recently had a serious accident with one of our big trucks because of a wobbly wheel. The driver visually inspected the truck before heading out that morning but apparently some of the lug nuts were loose and it resulted in a very serious accident. How are other fleets protecting against this?”

A There is no doubt that loose wheels can kill. It isn’t always easy to see when lug nuts are coming loose. However, several companies have now designed “loose nut indicators” which are proving to be very cost effective and show at a glance when a lug nut is loosening. The device, formed from bright plastic that stands out visually, is a ring that fits tightly around the nut. A mechanic installs the devices so that the pointed ends form a simple pattern. A driver doing an inspection should be able to tell if a nut is loose because the pattern will be broken. Those who have used the lug nut indicators indicate it only takes about five minutes to install them per wheel and usually costs less than a dollar apiece. When the drivers do their morning inspection, it makes it easier and quicker to make sure the lug nuts are tight. Let me know if you are using them and how effective you find them.

Q “I was recently in San Francisco and noticed that many of their road warning signs are different than the ones we use. It looks like the stick figure at an intersection is hurrying in some way. What’s the difference and why are they using them?”

A You have seen the new action-packed signs that have been found to be very successful in helping to prevent pedestrian accidents. “How,” you ask? The results from a year-long introduction of the signs in New York and San Francisco have indicated that when a sign evokes more perceived movement it increases the observer’s perception of risk, which in turn brings about earlier attention and earlier stopping. The study argues that drivers react faster to signs showing greater movement because the threat of a last-minute accident seems more real—and often, a quicker reaction, even by a few seconds, can make a major difference. If it looks like they’re walking, then your brain doesn’t worry about them shooting out into the road. But, the study found, if they’re running, then you can imagine them being in front of your car in a hurry. The signs are eye catching for certain. One indicates an older couple using canes. Another shows the figures actually appearing to run while another shows them jogging at a more leisurely pace. If the research from the Vision Zero campaigns is any indicator, the warning signs cause fewer pedestrian accidents. It will be interesting to see whether they are adopted by the Manual on Uniform Traffic Control Devices.

Q “Our small city is facing some proposed new growth that will very likely change the face of our community. Not every resident is happy with the plans to develop a new golf course because of the likelihood of a change in traffic congestion or patterns, as well as the cost of providing new infrastructure and services that may well mean tax increases for everyone while some think only a few will benefit. How can a small city sort through all these issues?”

A Major change in a small city or a rural community can be very difficult for the residents to embrace. Local planning and government officials, as well as public works professionals, often don’t have the expertise or resources available to help them with the plans that are presented by developers. Not everyone is excited about new growth and development as it indicates a loss of the community’s original character, and change is difficult for many. The Mid-America Regional Council Creating Quality Places project, titled “The Successful Small Cities Initiative,” brought residents of three small cities together with funding support from the Environmental Protection Agency, to provide technical assistance in four aspects of development: environment, land use, transportation, and housing with an emphasis on the physical environment. Public workshops were hosted by the small cities for their residents. The outcome was positive for each city but even more beneficial was the technical toolkit titled “Sustainable Growth for Small Cities” which highlights the process followed and could be a great tool for others to review and adapt for their own needs. You can find the toolkit at www.marc.org/Government/Local-Government-Services/Small-Cities/Small-Cities-Toolkit. Special thanks to the Mid America Regional Council for the great document.
ClearSpan™ Fabric Structures
new products: Giant Doors

ClearSpan Fabric Structures, the industry leader in fabric and metal building solutions, is happy to introduce Giant Doors to their extensive line of buildings and accessories. The Giant Doors can be custom-designed for any need and provide an entryway that is large enough for any type of vehicle, machinery or equipment to access.

The Giant Doors, which can only be paired with ClearSpan buildings, can be built to any width and height and feature a bi-fold design that maximizes headroom and wall clearance. The design allows the door to elevate within its threshold, so it saves interior and exterior space. The door is powered by a heavy-duty electric drive unit with controls, and the doors can be outfitted with a lock and wireless remote.

These economical doors are constructed from a corrosion-resistant, galvanized steel frame and come with multiple cladding options, including fabric, polycarbonate, steel and more. They have an energy-efficient weather seal, can withstand 90 mph winds and come with an industry-leading warranty.

Installation is quick and requires no onsite welding, and ClearSpan Giant Doors can be retrofitted to existing ClearSpan buildings. Contact ClearSpan Fabric Structures at 1-866-643-1010 or www.ClearSpan.com.

ClearSpan’s Giant Doors can be built to any width or height.
MARKETPLACE

Products in the News

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

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

Redi-Rock retaining wall blocks

Redi-Rock retaining wall blocks weigh about one ton each. They stack up like giant Legos and require no geogrid reinforcement in many applications—even for tall walls. When reinforcement is required, the Redi-Rock Positive Connect (PC) System is a proven solution that allows walls to perform up to the ultimate tensile strength of the geogrid. 130 Redi-Rock manufacturers create retaining wall solutions throughout North America, Europe, and Asia. With headquarters in Charlevoix, Michigan, Redi-Rock was recently named one of Michigan’s “50 Companies to Watch.” For more information, please call (866) 222-8400 or visit www.redi-rock.com.

ROUSH CleanTech propane autogas-powered vehicles

ROUSH CleanTech designs, engineers, manufactures and installs propane autogas fuel systems for light- and medium-duty Ford commercial vehicles. All ROUSH CleanTech propane autogas vehicles maintain the same horsepower, torque and towing capacity of similar gasoline platforms. Ford’s factory warranty remains intact. ROUSH CleanTech vehicles meet stringent EPA and CARB clean fuel certification levels, and FMVSS, NHTSA and NFPA-58 requirements. For more information, please call 800-59-ROUSH or visit www.ROUSHcleantech.com.

Modular Clean Labs for wastewater treatment

Modular Clean Labs feature chemical resistant modular construction for ease of onsite assembly. Modular Clean Labs is the ideal choice for water treatment, laboratory and industrial applications such as Clean Rooms, C.M.M. Rooms, Walk-in Mini Labs, Pilot Plant, Hazardous Procedure Enclosure, or specialty equipment enclosure. Modular Clean Labs can achieve strict environmental control by incorporating HEPA and/or carbon filtration to regulate air quality. Humidity can be regulated with desiccant systems available for lower humidity requirements. Options include a wide selection of doors, lighting, plumbing, electrical and lab furniture systems that can be factory installed. For more information, please call (800) 779-4362 or visit www.HEMCOcorp.com.
When you contact an advertiser regarding a product, please tell them you saw their ad in the APWA Reporter. Thanks! – The Editor

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

Fast, easy, safe sign post pulling
Lightweight, powerful all steel construction
Increase efficiency & reduce costs
Pulls U channel, square & round posts

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Pulls U channel, square & round posts

Post Pulling Made Easy!

• Fast, easy, safe sign post pulling
• Lightweight, powerful all steel construction
• Increase efficiency & reduce costs
• Pulls U channel, square & round posts

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

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

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Delivering on our promises
We go the extra mile to discover what matters most to our public works customers. Our sustainable solutions help communities become wise stewards of their resources—financial and environmental. Our decades of experience with public works agencies across the US give us the perspective to solve the most pressing challenges.
Designing the right pavement for the job just got easier thanks to PaveXpress, a free web-based pavement design tool for roadway and parking lot pavements.

PaveXpress is always up to date and can be accessed from any computer or mobile device.

**FEATURES**
- Free, web-based tool accessible from any computer or mobile device
- Project designs can be printed, shared, and saved
- Ability to customize traffic inputs to model

**DESIGN WITH CONFIDENCE**
- Residential Streets
- Local Roads
- Arterial Highways
- Interstates
- Parking Lots

PaveXpressDesign.com