The 2016 Public Works Projects of the Year and the Annual Transportation Issue
Whitaker Construction has more than 60 years’ experience in underground construction. As one of the largest utility contractors in their region, they have to operate with a cutting edge. Jim says the EC380E gives them that edge — working up to a 480 class size, while fitting in tighter spaces — allowing them to tackle challenging jobs with more efficiency. Find tips to get the most from your excavator at volvoce.com/ExFactor.

Please visit us at Public Works Expo in booth 525.

Our Volvo E-Series excavator has allowed us to do things that are just plain amazing.

THAT’S OUR EX FACTOR.”

– Jim Whitaker, fleet manager, Whitaker Construction

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Volvo Construction Equipment
On the cover: Westland City Hall, City of Westland, Michigan, one of the 2016 Public Works Projects of the Year (photo by Beth Singer Photographer, Inc.)

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.
Federal Transportation: Long on planning, short on specifics

Brian R. Usher, PWLF
APWA President

“M y optimism wears heavy boots, and is loud.”
– Henry Rollins. If I could modify Henry’s quote (which I wouldn’t dare), I would add that my optimism wears steel-toed boots and runs a jackhammer.

A year after the APWA presidential column on transportation bemoaned the same cyclical routine for our national transportation legislation, low and behold a quasi-long-term bill has now been passed in the form of the FAST (Fixing America’s Surface Transportation) Act. This five-year reauthorization doesn’t quite cover all the bases as we at APWA would like, but it does allow for the dust to settle a bit for transportation professionals and restores some optimism that transportation funding is a key issue for all members of Congress. The future transportation funding landscape is still limited and operational issues are likely to continue but some stability has been provided. The FAST act doesn’t identify funding for the full five years that it covers so expect some quick fixes by Congress to keep the highway trust fund alive over the bill’s life. Thus we at APWA remain cautiously optimistic for the next five years as we continue to deliver important projects that support social mobility, a strong economy and a healthy environment.

Alternative funding sources to the gas tax such as vehicles miles travelled (VMT) continue to be developed and as these take shape we hope the real discussion shifts from funding source to appropriate funding levels. Oregon and now California are piloting the user fee-based revenue approach to determine the appropriate technology and costs to implement. Meanwhile Washington State, Iowa, Utah and the City of Portland are just two of many agencies that continue to adjust gas tax levels to obtain needed funding for regional transportation systems. In other states/cities like Maryland, Virginia and Kansas City, Mo., sales tax increases with focused projects provide much-needed roadway funding. Meanwhile in many areas of the U.S. where elected officials are unwilling to make these critical policy decisions to support revenue, infrastructure—specifically roadways—continues to decline taking environmental, social and economic well-being with them.

Despite all our technology and seemingly modern approaches to revenue, education of the realities of underfunded maintenance programs and the rising costs of construction will continue to be a crucial part of public works day-to-day activities. APWA continues to provide resources to its members on how to educate the public and elected officials on how transportation dollars are spent and what is needed to provide a secure network in the future. Be sure to look to your Government Affairs and Transportation Committees for these resources.
Funding opportunities within the FAST Act are similar to previous bills with an added freight mobility program that targets key economic corridors. Knowing the vitality of strong national and regional economies, we applaud the addition of these types of funding programs. Unfortunately, high funding matches may dissuade some agencies from applying for these funds.

Alongside the FAST Act, FHWA has been busy identifying unspent earmarks from before September 2005 and working to move those to active projects in order to close out unspent funds on languishing projects.

So for the time being, we can get back to planning key transportation projects, both large and small, for our community with some surety of funding and process. We continue to be the best stewards we can be for the local and regional roadway systems that we are responsible for and that mean so much to our citizens. The industry continues to advance with smarter roadways, connected vehicles and the ever-approaching self-driving car.

Rating systems such as Envision, Invest and Greenroads continue to evolve and integrate themselves in project delivery. These systems allow for the benchmarking of sustainable transportation design that allows designers and agencies from all parts of North America and the globe to speak the same language. These systems are part of the larger ongoing movement to modernize our transportation infrastructure, design for the next generation, and ensure long-term economic, social and environmental sustainability. This is the public works charge for all types of infrastructure, including roadways. With that, welcome to your transportation issue for 2016 and enjoy the many articles that cover current thinking in transportation funding, design, planning, operation and maintenance.

Correction
The Emerging Leaders Academy article in the June issue (p. 10) was co-authored by Karen Kase, PWS, CPESC, Natural Resources Manager, Hampton, Lenzini and Renwick, Inc., Elgin, Illinois; Leslie Green, Manager, Transportation Projects, City of Mississauga, Ontario; and Jordan Ottow, Water Quality Lead, City of Monroe, Washington.
APWA hosts Capitol Hill Roundtable to commemorate National Public Works Week

Andrea Eales
Director of Government Affairs
American Public Works Association
Washington, D.C.

Since the Fixing America’s Surface Transportation Act (FAST) was signed into law (Public Law 114-94) by President Obama this past December, the primary and ongoing questions of what is in the law and what will the law mean for our country’s transportation needs over the next five years, have been asked by many in the APWA and public works community. Many APWA members have been digging into the law, reviewing proposed rulemakings and regulations sent out from the U.S. Department of Transportation (DOT) in recent months, and sharing with the APWA Government Affairs team what the FAST Act means to them. So, to learn more about the new law from those who wrote, passed and are now overseeing its implementation, the APWA Washington, D.C. office hosted a FAST Act Roundtable on Capitol Hill during this year’s National Public Works Week.

The roundtable was moderated by APWA Executive Director Scott Grayson and the panel of speakers consisted of U.S. DOT Deputy Secretary Victor Mendez, Chairman James Inhofe (R-OK), from the Senate Environment & Public Works Committee, Subcommittee Chairman Sam Graves (R-MO) from the House Transportation & Infrastructure (T&I) Subcommittee on Highways & Transit, Representative Earl Blumenauer (D-OR) who is a Member of the House Ways & Means Committee, and Representative Dina Titus (D-NV), Member of the House T&I Committee, as well as a Co-Chair for the recently established House “Public Works & Infrastructure Caucus.” More details on the Caucus later.

Each of the speakers shared their perspective on the FAST Act and what it means for the country, individual states, and districts the panel members represent, and in the case of Deputy Secretary Mendez, the goals of the Executive Branch. The speakers were also asked to look ahead into the coming five years for which the law has authorized policy making authority and funding.

All speakers agreed the FAST Act was a very large achievement and it took a lot of negotiating to make it happen. Undoubtedly the biggest success for
APWA members is the certainty a five-year bill brings to transportation planning and projects. The law is also seeking greater innovation on the part of localities and states when it comes to leveraging funding dollars and speeding up environmental review processes. Representative Titus commented specifically about the importance of the FAST Act for her district in Nevada, which includes Las Vegas, and the key role infrastructure investment plays in providing a strong economic foundation to communities in her district.

Representative Blumenauer spoke to the need for flexibility at the local and state levels to allow for transportation innovation to continue. He directly commented on the impact of technology and how it can be used to equitably increase the amount of dollars citizens pay towards building, maintaining and operating our infrastructure. As the Congressman noted, the gas tax will only continue to decline, and a replacement or set of replacements has to be found. He believes the states and localities are already innovating and finding solutions, but the federal level needs to be vested as well.

Deputy Secretary Mendez noted that Secretary Foxx’s past experience as a Mayor has truly shaped the work of the U.S. DOT. Additionally, Mr. Mendez shared that U.S. DOT’s dedicated personnel are working diligently to push out proposed rulemakings and regulations during the waning months of the Obama Presidency. Within his comments, Mr. Mendez called upon APWA’s membership to be engaged in the regulatory process in order to best help shape forthcoming rules and regulations so they most effectively meet the needs of public works.

Chairman Inhofe touted the successful bipartisanship of the FAST Act, making specific reference to his Committee’s Ranking Member Barbara Boxer (D-CA). Though Senator Boxer was unable to participate in the Roundtable, she and Chairman Inhofe not only came together, despite their ideological differences, to draft the FAST Act and urge their Senate colleagues to pass a much-needed long-term surface transportation bill, but they also jointly introduced Senate Resolution 471 recognizing “National Public Works Week.” The resolution was passed by the Senate on May 18, on the eve of the APWA Capitol Hill roundtable.

Subcommittee Chairman Graves shared his insight into how the FAST Act is intended to alleviate regulatory burdens placed on transportation projects, while still taking care of our nation’s environment, and focusing on safety. Congressman Graves also commented that the new law aims to aid localities in getting their communities transportation goals achieved through more leveraging funding opportunities such as public/private partnerships and changes that the FAST Act makes to State Infrastructure Banks (SIBS) in order to achieve greater efficiencies.

Finally, during the Roundtable, Congresswoman Titus announced the official establishment of the bipartisan House “Public Works and Infrastructure Caucus.” During her remarks, Ms. Titus urged her House colleagues to join her and Caucus Co-Chair Congressman Ryan Costello (R-PA), as members of this key caucus designed to raise awareness of public works and infrastructure matters. The Congresswoman also noted that she very much looks forward to working with APWA as a resource that will help the Caucus be successful.

This year’s roundtable was the first of many future events that the APWA Washington, D.C. team will be hosting to continue to raise APWA’s profile on Capitol Hill and to continue building relationships with key policymakers and agencies impacting the public works profession. APWA will certainly be working with the new Caucus and its members to hold legislative briefings seeking to share the expertise APWA members bring to policy discussions on public works and infrastructure issues, throughout the year, in addition to hosting an annual Capitol Hill event during future National Public Works Weeks. Stay tuned as APWA’s advocacy outreach continues to grow.

For any questions regarding APWA’s Government Affairs engagement, please reach out to me anytime at aeales@apwa.net or (202) 218-6730.
Candidates for the APWA Board of Directors named

Nine nominees are on the ballot for election to the APWA Board of Directors in 2016. Five candidates selected by the National Nominating Committee include Bo Mills, PWLF, Director of Public Works, City of Germantown, Tenn., for President-Elect; David L. Lawry, P.E., Director of Engineering and Public Works, Village of Schaumburg, Ill., for Director-at-Large, Engineering & Technology; William E. (Bill) Spearman, III, P.E., Principal, WE3 Consultants LLC, Saluda, S.C., for Director-at-Large, Environmental Management; Stan Brown, P.E., PWLF, City Manager, City of Oakwood, Ga., for Director-at-Large, Leadership & Management; and Kathleen B. Davis, Director of Local Programs, Washington State Department of Transportation, Olympia, Wash., for Director-at-Large, Transportation. The President-Elect will serve one year as President-Elect, one year as President, and then one year as Past President.

Four candidates nominated by regional nominating committees as directors include Keith Pugh, P.E., PWLF, Engineering Services Director, City of High Point, N.C., for Director of Region III; Doug Layton, P.E., PWLF, Retired, City of Atlantic Beach, Fla., for Director of Region IV; Maher Hazine, P.E., PWLF, Chief Strategic Officer, REI Development Services, Pine, Ariz., for Director of Region VII; and Jill M. Marilley, P.E., MPA, PWLF, Senior Project Manager, HDR, Inc., Shoreline, Wash., for Director of Region IX.

The nine-member National Nominating Committee includes one representative of each of APWA’s nine regions as recommended by the Regional Directors and appointed by the APWA National President. The two most recent APWA Past Presidents serve as facilitators and advisors to the committee. For 2016, the Past Presidents were Edward A. (Ed) Gottko, PWLF, Adjunct Professor, New Jersey Institute of Technology, Westfield, N.J.; and Larry Stevens, P.E., PWLF, Project Director, HR Green, Inc., Johnston, Iowa.

National Nominating Committee members include Julie Piacentini, Administrative Manager, Town of Brookline, Mass.; William (Bill) Rafferty, P.E., PWLF, Retired County Engineer, County of Cumberland, N.J.; Jeffery P. Brown, P.E., Engineering & Infrastructure Director/Interim Solid Waste Director, Cumberland County, N.C.; Samuel (Sam) May, PWLF, Public Works Director, City of Margate, Fla.; Thomas (Tom) Talsma, Vice President, Engineering Enterprises Inc., Sugar Grove, Ill.; Lance Meyer, P.E., City Engineer, City of Minot, N.D.; Jarrod Likar, P.E., Associate, Huitt-Zollars, Inc., Rio Rancho, N.M.; Robert (Bob) Beamer, PWLF, Senior Project Manager, Calleguas Municipal Water District, Thousand Oaks, Calif.; and Dean Berrecloth, Public Works Superintendent, Town of Killam, Alberta.

Bo Mills, PWLF President-Elect

Bo Mills is the Director of Public Works with the City of Germantown, Tenn., and has been in that position for 12 years. His duties include the direct supervision of the programs and personnel associated with the following areas: Animal Control; Parks/ROW Grounds Maintenance; State Street Aid; Stormwater Maintenance; Street Maintenance; Water Production and Distribution; Sewer Collection; and many utility-related CIP projects. Prior to becoming the Director of Public Works, Mills served the City of Germantown as Assistant Director of Public Services for seven years and Solid Waste Coordinator for six years. He has spent his entire working career with the Germantown Public Works Department.

Mills has been an APWA member since 1989. At the chapter level, he served as the Tennessee Chapter’s West Branch director for six years, working through the chapter’s officer positions until becoming Chapter President in 2005. He served as the Chapter Delegate.
from 2000 through 2010, and has also served on the chapter’s Membership, Awards, Education, and Past President’s Advisory Committees. At the national level, Mills has served on the Board of Directors for the past five years as Director of Region III. He served three years on the Membership Committee and two years on the Transportation Committee, chairing the Roadway Safety Subcommittee for both of those years. He served as Board liaison to the Small Cities/Rural Communities Committee for two years, served as a member of the Finance Committee for the past two years, and is currently serving as Board liaison to the National Equipment Rodeo Exploratory Committee. He served on the Professional Development Committee which worked to facilitate the establishment of the Donald C. Stone Center for Leadership Excellence. In 2008, Mills was selected to the House of Delegates Executive Committee and was named HOD Chair in 2010-11.

David L. Lawry, P.E.
Director-at-Large
Engineering & Technology

Lawry has been a member of the Chicago Metro Chapter Executive Committee since 1999, and has served in all the officer positions at both the branch and chapter levels, including Chapter President in 2007 and Chapter Delegate in 2008. He has served on various chapter committees including
the 75th Anniversary Committee. He is a former member of the national Projects of the Year Awards Committee as well as the Chapter Advocacy Task Force. Along with his service to APWA, Lawry is a member of the American Society of Civil Engineers, National Society of Professional Engineers, and the American Water Works Association. He was a Top Ten Public Works Leader of the Year recipient in 2012.

**William E. (Bill) Spearman, III, P.E. Director-at-Large Environmental Management**

Bill Spearman’s professional career has spanned 40 years, all of which have been in the public works arena. He has spent 16 years in public service (eight years with the Federal Highway Administration and eight years with the South Carolina Land Resources Conservation Commission); 22 years in the private sector (one year with Wilbur Smith Associates and 21 years with Woolpert, Inc.); and two years as owner and principal of WE3 Consultants LLC. During his 22-year period in the private sector, Spearman served four years as the Vice Chairman of the Saluda County Water and Sewer Authority and four years as the County Engineer for White County, Ga., under a contractual relationship.

Spearman has been an active member of APWA at the chapter, regional and national levels. He has served on the national Water Resources Management Committee, the Government Affairs Committee, and the Finance Committee. He led the effort to develop the Certified Stormwater Manager certification program; taught environmental short courses and Click, Listen & Learn presentations; supported APWA’s advocacy staff with coalition partners on funding and regulatory issues; and led the effort to create the Stormwater Summit at APWA’s annual International Public Works Congress & Exposition (now called PWX).

**Stan Brown, P.E., PWLF Director-at-Large Leadership and Management**

Stan Brown has worked in local government for more than 28 years, holding various public works, engineering, and management positions in Georgia, Colorado and Wyoming. He is a licensed professional engineer in the state of Georgia, and a retired Lieutenant Colonel in the U.S. Air Force Reserve whose recent military service included deployments to Iraq, Kuwait and Kyrgyzstan. Brown was awarded the U.S. Army’s Bronze Star medal for exceptional and meritorious service as a facility engineer commander during Operation Iraqi Freedom. He has served as City Manager for the City of Oakwood, Ga., since 2004.

Brown is active in the Greater Hall Chamber of Commerce Economic Development Council, has served as Chairman of the Lake Lanier Convention and Visitors Bureau, serves as Executive Secretary for the Hall County Joint Municipal Association Executive Committee, founding Chairman of the Hall County Green Alliance, Chairman of the APWA Small Cities/Rural Communities Committee, Chairman of the APWA Georgia Chapter Awards Committee, and President of the APWA Georgia Chapter Northeast GA Branch. Designated a Public Works Leadership Fellow (PWLF) by APWA, Brown mentors public works professionals enrolled in the APWA Donald C. Stone Center for Leadership Excellence in Public Works. In 2015, he was recognized by APWA as a Top Ten Public Works Leader of the Year.

**Kathleen B. Davis Director-at-Large Transportation**

As the Washington State Department of Transportation’s Director of Local Programs, Kathleen Davis has been the advocate and voice of local governments with the Department. With 30 years of experience, she is recognized as a national leader in local, state, and federal transportation policy. As the WSDOT Director of Local Programs, she is personally responsible for administration of state and federal funds that support city and county transportation systems.

Davis has been an APWA member since 1996 and has been active in the Washington State Chapter,
participating on both the Government Affairs and Transportation Committees for over a decade. Her passion is attracting and retaining the next generation of public works leaders and she is also involved with the chapter's Student Outreach Committee. Davis has demonstrated her commitment at the national level by serving on the Finance Committee this year and previously serving on the SAFETEA-LU Task Force for over 10 years. She is currently serving as the liaison to the Transportation Committee.

**Keith Pugh, P.E., PWLF**
**Director of Region III**

Keith Pugh has spent his entire 28-year career with two organizations: the City of Greensboro, N.C. and the City of High Point, N.C. In 1988 he was in charge of the City of Greensboro’s traffic safety program and the request for services program. After receiving his Professional Engineer’s license in 1995 he worked for Greensboro’s Engineering and Inspections Department as the Construction Contracts and Assessments Section Manager. In 2000 he was named Greensboro’s Facilities Engineering Manager overseeing renovation and construction of public facilities. In 2004 he began working for the City of High Point as the Engineering Services Director. As the head of the Engineering Services Department, Pugh oversees design specifications; in-house infrastructure design and construction administration; plan review of public utilities, stormwater, roadway, and sidewalk projects; enforcement of erosion control regulations; collection and maintenance of survey data; and inspection of city and private projects.

Pugh’s leadership in APWA began in 2001 when he was selected to serve on the Engineering and Technology Committee. At the chapter level, he began attending conferences and workshops immediately after joining APWA in 1996. He was elected to the North Carolina Chapter’s Administrative Management Division board in 2003, and has served in various capacities including Administrative Management Division President (2006), Chapter Director (2007), Chapter Awards Committee (2008-present), Chapter President (2011), and Chapter Delegate (2014-present, currently serving on the Council of Chapters Steering Committee). Pugh has served on APWA’s Government Affairs Committee since 2011 (committee chair from August 2013-August 2015).

**Doug Layton, P.E., PWLF**
**Director of Region IV**

Doug Layton has worked in many areas of public works. He has worked as a direct city employee, as an engineering consultant, and in the design office and field assignments for design/build contractors. As a city employee, he served as a Public Works Director and as a Program Manager for the planning,
design and construction of a $600 million transportation bond program. As a consultant, Layton has provided public works services including utilities, transportation and electrical to over 50 local governments. He has served at the Department Head level or higher for over 20 years. He served as the Office Manager and Regional Manager for several engineering firms including Jones Edmunds, HDR, HNTB and AECOM.

Layton has actively served in diverse leadership roles for the Florida Chapter for approximately 25 years, including Chapter President in 2001-02 after serving in succession as Vice President and then President-Elect. He has provided leadership as Chairman of the Chapter Research, Scholarship, League of Cities, and Strategic Planning Committees, and has provided guidance to the chapter as a member of the Scholarship, Awards, and EXPO VIP Relations Committees. Layton has also chaired the chapter’s conference (EXPO) twice and served on the host committee four times. He has served as his chapter’s Delegate to the Council of Chapters for six years, chaired the Council of Chapter’s Chapter Mentoring Committee, and was a member of the Awards Committee.

Maher Hazine, P.E., PWLF
Director of Region VII

Maher Hazine serves as the Chief Strategic Officer for REI Development Services, a consulting firm in Pine, Ariz., specializing in wastewater treatment systems. He is currently an elected Board member of the Pine Strawberry Water Improvement District. Prior to this position he served as the Public Works-Utilities Deputy Director for the City of Peoria, Ariz., where he supervised a 146-member staff of managers, supervisors, technicians and field staff in the Fleet, Solid Waste, Street Operations, Facilities and the Transit Divisions. He previously served as the Assistant City Engineer for the City of Peoria for seven years.

Hazine has been committed to APWA in various capacities both at the chapter level as well as nationally. He served as a member of the House of Delegates (current Council of Chapters) for 10 years. He has served as an APWA Accreditation program evaluator and has chaired the Arizona Public Works Institute (PWI). Hazine has also been a member of the Arizona Education Committee and has chaired the Arizona Municipal Advocacy Committee. He served on the PWI Task Force and the PWI Review Committee.

Jill M. Marilley, P.E., MPA, PWLF
Director of Region IX

Jill M. Marilley is a Senior Project Manager with HDR, Inc. in the Seattle, Wash., area. She has over 30 years of experience as a civil engineering professional, with 20 years in the public sector. She has served in positions such as City Engineer with the City of Shoreline, Wash., and Public Works Director with the City of Mill Creek, Wash. In her current role with HDR, Inc., she is a senior construction and design project manager, and recently led the construction inspection team for a $110 million bascule bridge replacement in Seattle.

Marilley has been very active in APWA at the chapter and national levels. She has served as Washington State Chapter President in both 2011 and 2012 and was on the chapter’s Executive Board for nine years. At the national level she has served four years on the Board of Directors, has served on and is currently the Chair of the Finance Committee, served on the 2011 National Nominating Committee, and served for two years on the Projects of the Year Awards Committee. Marilley has also been very active with the American Society of the Civil Engineers and the Delta Zeta National Sorority at the local and national levels as well as with various other local community organizations. She currently leads the Pacific Northwest Homebrewers Conference improving the skills of her fellow homebrewers.

Get out and vote!
As an APWA member, you will have the opportunity to vote for members of the APWA Board of Directors between July 8, 2016 and August 7, 2016 by logging on to the www.apwa.net website and following the voting instructions.

Additional reminders of the voting process will be sent through the APWA website and via e-mail to every member for whom we have an e-mail address. If you have questions, please call (800) 848-APWA.
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Transportation Committee: Surveying the needs of APWA members

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

The Transportation Committee represents the largest practice area in public works. Together with its four subcommittees and dedicated chapter liaisons, it provides education and information through sessions at PWX; Click, Listen & Learn programs; postings on the Transportation infoNOW Community on APWA Connect; and technical articles in the July edition of the APWA Reporter. Volunteers and experts in the many fields related to transportation have been busy providing members with resources for developing and exchanging ideas, knowledge and cutting-edge technologies. They also develop and advocate environmentally sound, sustainable, cost-effective, and safe systems that enhance the livability and quality of life in our communities. Committee members sponsor both advocacy and guidance position statements on transportation-related topics.

At PWX in August, the Transportation Committee will be sponsoring three different sessions:

• Drones for Bridge Inspection
• Paying by the Mile – An Inside Look at California’s Road Charge Pilot Program
• Millennials Are Taking Over – One Bike Lane at a Time

The Transportation Committee issued a survey to APWA members in January of this year. The survey questions were tailored to get input on member awareness of the committee, preference/utilization of various education methods, and preferred future topics to be covered by the committee. The survey found that the top five areas of importance are:

• Safety
• State and Local Funding
• Maintenance
• Design
• Construction

The committee will use the survey response data to shape their 2016-2017 work plan and they hope this survey generates dialog on the most effective way to promote and utilize both the Technical Committees and APWA’s media outlets.

If you have considered participating in APWA on a national level, you may be interested in serving on one of the four active transportation subcommittees. Most subcommittees meet bimonthly by conference call. The subcommittees are:

• Project Delivery – This subcommittee actively works to streamline the project delivery process and follows the activities of the Every Day Counts program.
• Roadway Safety – This subcommittee focuses on ways of reducing accidents and eliminating roadway hazards through cost-effective solutions.
• Sustainable Transportation – This subcommittee looks at recycled materials specifications, electric vehicles and plug-in networks, porous asphalt pavement/pervious concrete, roundabouts, sustainable infrastructure rating systems, USEPA-HUD-DOT partnership, urban LID infrastructure and maintenance, and LED lighting.
• Winter Maintenance – The oldest of the subcommittees, Winter Maintenance focuses on all issues related to snow and ice. Each year, the committee supports the educational sessions of the North American Snow Conference and also participates with other national organizations. The subcommittee developed and supports the Winter Maintenance Supervisor Certificate Program.

All of the subcommittees are open to new members. Interested members may ask to join at any time and are not part of the annual nomination process. The staff liaison may be contacted for more information. Additionally, members may serve as a Transportation Liaison for their chapter or branch. For information on the program, contact staff liaison Rita Cassida at rcassida@apwa.net.

The current members of the Transportation Committee are:

• Freeman Anthony, P.E. (Committee Chair), Project Engineer, City of Bellingham, Washington
On May 12, as part of the Minnesota Chapter’s 2016 Spring Conference, a large number of the attendees volunteered to participate in a service project at Gull Lake Recreation Area. Last July a storm caused extensive damage in the Brainerd lakes area. The volunteers joined in at the Gull Lake Recreation Area (managed by the U.S. Army Corp of Engineers) to help them recover and open in time for this season’s camping. The project focused on repairing a split-rail fence (and it was really helpful that a power auger was made available). The volunteers all enjoyed helping get the park ready for the season, including APWA Executive Director Scott Grayson (kneeling, second from left, in photo below).
National Public Works Week celebrated in 56th observance across North America

Laura Bynum, M.A.
Media Relations/Communications Manager
American Public Works Association
Washington, D.C.

Across North America, during the 56th observance of National Public Works Week (NPWW), thousands of public works professionals in cities, towns, counties and municipalities celebrated and honored the public works profession, staff and employees during May 15-21, 2016. This week is held annually during the third week in May to honor public works professionals and educate the public about their important contributions to our daily lives, which includes the planning, design, building, maintaining and operating of infrastructure. Instituted originally in 1960 as a public education campaign by APWA, the week continues to call attention to the importance of public works in our communities.

“Public Works... Always There”

Many of this year’s NPWW celebrations included daily or week-long events, open houses, awards luncheons and ceremonies, government proclamations, media campaigns, equipment tours and rodeos, parades, school and student programs, as well as award luncheons. The NPWW activities and events often highlighted the National Public Works Week theme of “Public Works... Always There,” which represents public works professionals who are always on the job, as “Everyday Heroes” in their communities.

“Public works employees across North America dedicate themselves every day to providing services that enrich and protect their communities,” said APWA President Brian Usher, PWLF, Public Works Director in Largo, Florida.

“From before a person wakes up until after they go to bed, they are touched by public works every day in countless ways. They may work through cold nights, hot days, blizzards, and floods, but I am proud to say they are there every day fulfilling their role in the community.”

“Every year, APWA’s National Public Works Week recognizes all of the tens of thousands of men and women public works professionals who are key to ensuring that infrastructure today is vital to a sustainable and vibrant tomorrow for our future generations,” said APWA’s Executive Director Scott A
Grayson. “Having been a city council member, I know the enormous contributions that these public works professionals make in serving our communities every day by providing and maintaining our transportation, water systems, utilities, emergency response operations and other essential infrastructure and services.”

Recognizing National Public Works Week: Media Outreach and Proclamations

The media and social media outreach has continued to increase each year for National Public Works Week. Along with this year’s events and activities that focused on showcasing and honoring their public works departments, equipment and employees—many private companies, organizations, APWA chapters, branches, members and nonmembers across North America posted their activities on social media. APWA National gathered all of those posts and placed them in our #NPWW 2016 Storify story. That Storify included every post made to social media using the official #NPWW hashtag and included photos, videos, Facebook, Twitter, Instagram and Google+ posts about events throughout the week. This year’s official National Public Works Week hashtag (#NPWW) was shared on Twitter timelines more than 8.1 million times (a 579% increase from 2015), and reached almost 2.9 million Twitter accounts.

Other media that mentioned NPWW in over 520 articles include larger media organizations and syndicates such as the Washington Post, Chicago Tribune Online, Associated Press, Sacramento Bee, Orange County Register, Salt Lake Tribune, Idaho Press Tribune, San Diego Union-Tribune, Atlanta Journal Constitution, Orlando Sentinel, Defense Department and Naval Aviation News, Mississauga News, and many radio and TV broadcast segments and online news sources, as well as industry press such as American City & County, Informed Infrastructure, Forrester News, Construction Business Owner, Public Works Magazine, Mass Transit Online, ICMA, many community news sources, such as the Georgetown Times in South Carolina that covered the Georgetown County Backhoe Rodeo, as well as blogs and news websites.

This year, 31 state governors in the U.S. issued proclamations recognizing the week including Georgia, Washington, North Carolina, Mississippi, Massachusetts, Vermont, Nevada, Tennessee, Iowa, Missouri, Florida, Utah, Rhode Island, New Hampshire, Oregon, Alaska, Arizona, Illinois, Alabama, Indiana, Kansas, Maine, Louisiana, Connecticut, Texas, Nebraska, Wisconsin, Pennsylvania, North Dakota, Hawaii and Delaware, and numerous cities and counties also issued local proclamations—including Washington, D.C. In addition, the U.S. Senate issued S.Res. 471, a resolution designating the week of May 15-21, 2016 as National Public Works Week that was introduced by Senator Inhofe (R-OK) and Sen. Boxer (D-CA) which noted that “…public works infrastructure, facilities and services are of vital importance to the health, safety, and well-being of the people of the United States…”

In Canada, Prime Minister Justin Trudeau sent a Letter of Greeting
to honor the week, and many provinces issued proclamations or sent Letters of Greeting including Prince Edward Island, Nova Scotia, British Columbia, Alberta (Letter of Greeting), Newfoundland and Labrador, Saskatchewan, Ontario (Letter of Greeting) and Manitoba, along with proclamations from many municipalities throughout Canada. These municipal government recognitions honor the role that public works professionals make to improve the nation’s public infrastructure and the communities they serve. To view the list of the cities, counties, towns, states and provinces, as well as Prime Minister Trudeau’s Letter of Greeting recognizing National Public Works Week, visit http://www.apwa.net/discover/National-Public-Works-Week/NPWW-proclamations.

**Special Highlights of National Public Works Week**

A few special highlights of NPWW this year included a Washington, D.C. Department of Public Works kick-off and press conference of the first annual “Great Graffiti Wipe Out Event” led by Department of Public Works Director Chris Shorter, which featured several City Council Members, APWA Executive Director Scott Grayson and others speaking about the impact of public works. Shorter honored all the “men and women who work hard to maintain the country’s roads, bridges, and waterways.” He noted also that Mayor Bowser had proclaimed National Public Works Week in the District of Columbia. In 2015, the DC DPW removed 6,606 instances of graffiti, posters and stickers at a cost of $264,994 for labor and equipment.

Another highlight of the week included a National Public Works Week Congressional Roundtable on Thursday, May 19, at the Congressional Visitors Center on Capitol Hill focusing on the recent Surface Transportation FAST Act Implementation. The roundtable featured Senator Inhofe, Chair of the Senate Environment and Public Works Committee; U.S. Department of Transportation (USDOT) Deputy Secretary Victor Mendez; Representative Earl Blumenauer of Oregon; Representative Titus of Nevada; and Representative Graves from Missouri. Other congressional leaders and staff also attended the event.

**Top Ten Public Works Leaders Announced**

The Top Ten list of exceptional public works professionals has also been a cornerstone of National Public Works Week since it began. The program has identified more than 560 men and women who reflect the highest standards of professional conduct for public works officials. These honorees have been recognized for discharging critical responsibilities in connection to the design, construction, maintenance and/or operation of major public works projects and activities in large and small municipalities throughout North America. “These accomplishments are often particularly noteworthy in relation to the limited manpower and financial resources available,” Grayson said.

Laura Bynum can be reached at (202) 218-6736 or lbynum@apwa.net.
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MONDAY
JEFF HAVENS
Uncrapify Your Life!

WEDNESDAY
CHARLES MAROHN
Strong Towns

www.apwa.net/PWX
Share your experience at PWX

Jonathan Knowles, P.E.
Civil Engineer, Alaska Department of Transportation & Public Facilities
Anchorage, Alaska
Delegate, APWA Alaska Chapter

My first experience at Congress, now PWX, was great. It was an adventure setting aside the time from my busy schedule, but it all worked out. I met some wonderful people and learned new things.

The General Session Speakers were interesting and inspiring. I recall the feeling of awe that came over me as I entered the room and saw a vast number of attendees. Being from the Alaska Chapter with a small number of members, it was uplifting to see so many gathered together in support of public works.

One of the most memorable educational sessions I attended that first year was titled “Caught on Video – Emergency Response and Expecting the Unexpected.” The speaker, James Wood (Director of Maintenance for the North Texas Tollway Authority), delivered a fascinating and engaging presentation. He shared case studies, videos, and facts regarding incidents within his jurisdiction. As you can imagine from the title, the videos were an eye-opening view of what his staff stands ready to respond to on a daily basis.

The chapter dinner was a fun event. The Washington and Oregon Chapters invited the Alaska and Rocky Mountain Chapters to join them for their combined dinner. I jumped at the opportunity and had a very enjoyable evening visiting folks. Plus, I was glad to meet a few members from the state I was raised in, Idaho.

As Congress transitions to PWX this year, I look forward to another great experience. Similar to Congress in the past, there will be educational sessions, the exhibit hall, and plenty of opportunities to meet new friends. It will also be great to see some changes as the annual event transitions to encourage us as public works professionals to be prepared to work in a constantly changing environment.

It doesn’t matter if this year will be your first experience attending an APWA national event or your thirtieth. Something each of us will have in common this upcoming August in Minneapolis is that we will all be experiencing our first-ever PWX. The annual event will provide us with opportunities to meet new people, learn new skills, have some laughs, and become better public works professionals.

If you have comments or suggestions regarding your experience at the first-ever PWX, don’t hesitate to contact APWA staff member Dave Dancy or a PWX Participation Committee Member from the following chapters (Leo McMillen in Kentucky, Craig Kennedy in Newfoundland, Tony DiPietro in Ohio, Robin Bain in Arizona, Ed Walton in San Diego/Imperial Counties, Jarrod Likar in New Mexico, John Joiner in Iowa, Dean Berrelocloth in Alberta, or Jon Knowles in Alaska).

Jonathan Knowles can be reached at (907) 562-7187 or jonathanwknowles@yahoo.com.
Show your team colors

The Minnesota Chapter welcomes APWA to Target Field for the Get Acquainted Party

Dave Hutton, P.E., Senior Professional Engineer, SEH Inc., Minnetonka, Minnesota, and Co-Chair, 2016 APWA PWX Get Acquainted Party Committee; Justin Messner, P.E., Senior Project Manager, WSB & Associates, St. Paul, Minnesota, and Co-Chair, 2016 APWA PWX Get Acquainted Party Committee

For this year’s PWX in Minneapolis, APWA members are in for a real game-time experience at the Get Acquainted Party being held at Target Field, the home of the Minnesota Twins. Target Field is usually in the national discussion when it comes to most beautiful baseball stadiums in the league and in 2010 when it first opened, ESPN Magazine called it the #1 baseball stadium experience in North America. It was also the site of the 2014 All-Star game. At the time it was only the second major league ball park to obtain the LEED Silver Certificate. Located on the edge of downtown, fans are treated to outstanding views of the downtown skyline. Target Field is also served by our national award-winning, multi-modal transit hub, called Target Field Station (the Interchange), serving two light-rail lines, a commuter rail, our regional bus system, multiple parking garages and bike routes/trails. In other words, you CAN get there from HERE (or ANYWHERE for that matter).

Unfortunately, the Twins are on the road that week, so the only way you will be able to see this spectacular stadium is to come to the Minnesota Chapter’s Get Acquainted Party.

The Minnesota Chapter is proud to sponsor the Get Acquainted Party from 5:00 to 7:00 p.m. on Sunday, August 28, during PWX. The following are key elements of the event:

• Live music by local favorite, the Johnny Holm band
• Ball park-fare food, including famous Kramarczuk’s sausages, hot dogs, Cracker Jacks® and make-your-own-sundaes in a miniature ball cap
• Tours of the stadium (sign up when you first arrive—they are limited to 25 persons each with eight total tours scheduled)
• Lumberjack demonstrations
• Minnesota team mascots—always a fan favorite

“We have to convince our leadership throughout the years that there is a strong business benefit to valuing diversity. They will be attracting the best and brightest employees. We will have better customer relationships over the long term because our employees mirror our customer demographics. As a result, there are bottom-line benefits to our shareholders.”

– Michael J. Critelli, President and CEO, Dossia Service Corporation
• Get your picture put on the big screen
• Twins pro shop souvenirs—10% discount for APWA members. Bring your family home gifts from the Minnesota Twins.

We are also encouraging attendees to cut loose from your stuffy conference attire and wear your team jerseys to the event. We don’t care if it’s baseball, football, hockey, soccer, rugby or any other sport. Show your team colors, APWA! See you in August!

Dave Hutton can be reached at (612) 255-8747 or dhutton@sehinc.com; Justin Messner can be reached at (612) 388-9652 or jmessner@wsbeng.com.

Minnie and Paul shake hands over the Mississippi River after each home run—representing baseball’s historic past in Minnesota, namely the two original minor league teams: the Minneapolis Millers and the Saint Paul Saints that played here before MLB established the Twins.

View of the downtown Minneapolis skyline from the third base side of the stadium (photo credit: Ben Krause)
A simple idea for Flint

Charles Marohn, P.E.
Founder and President
Strong Towns, Brainerd, Minnesota
General Session Speaker, 2016 APWA PWX

There is a theory that the decline of the Roman Empire was, in part, because of lead poisoning. The Roman aqueducts were often lined with lead and many of the pipes used to convey this water was also Pb. While it seems unlikely—Romans were, after all, pretty sophisticated and there is good reason to believe they used rainwater and clay pipes for consumption—the notion of a string of raving mad emperors living in debauchery while their empire crumbled around them makes for a compelling narrative.

That's because it allows us to think that we are so much more intelligent today than those who came before us. We're not as stupid as the Romans were. We're modern. Sophisticated, in contrast to their barbaric ways.

Yet, if your house was built prior to 1980, there's a good chance the joints in your plumbing are soldered with lead. The further back you go, the more likely it is that your pipes are made out of lead as well. Lead was a really easy element to work with. It was pliable, it resisted pin holes and was easy to seal if it ever leaked.

Until the early 1900s and the advent of modern water treatment and distribution systems, people regularly consumed alcohol—morning, afternoon and evening—because it was safe, unlike water, which was often contaminated. Even though the health implications of lead were known, the urgent need to provide safe drinking water as an alternative to booze—this was the time of prohibition, City Beautiful and other public health initiatives—rightly discounted the long-term risk of lead poisoning.

With water systems there is often a buildup of material on the inside of the pipe over time. I've seen ten-inch pipes pulled out of the ground that had so much buildup that less than two inches of diameter remained. This buildup can protect people using old systems by creating a barrier between the lead and the water being transported.

Apparently, when the city of Flint, Michigan, switched from getting their water from Detroit—which sourced from Lake Huron—to the Flint River, the change in pH and chloride from the new water source was corrosive. Lead now shows up in readings where apparently none did before.

Ostensibly, since Flint has switched back to Lake Huron water, the way this problem is likely to be fixed is to let time restore the buildup that provided protection before the switch. That seems unsatisfactory—and rightly so—for the people, including children in the vulnerable early stages of development, who may have to wait a long time for this to happen.

I've seen two cost estimates for dealing with the lead. The first: $60 million to replace lead service lines. The service line is the small pipe that runs between the city’s water pipe and the house. Given the age of Flint's system, it is possible that some of these are completely lead. This would make a significant impact, but it wouldn’t address the lead in the pipes within the house or in the city's system.

The second estimate is quite different: $1.5 billion for “fixing” the city’s water infrastructure. Given the size of Flint, that number likely includes replacement of much of the distribution system—which certainly has lead problems—as well as repairs/replacements to treatment and storage systems. I find this number to be wholly plausible.

Which is a huge problem. A repair cost of $1.5 billion is $14,000 per Flint resident. Given that a median house in Flint is worth just $29,000, the water system is going to be worth more than the houses being served by it. And that's just the water. You have roads, streets, sidewalks, curbs, drainage, sewer as well as gas and electric...
infrastructure that are all reaching the end of their useful life. A median household income of $23,000 suggests that a conventional approach is not viable.

I’m not sure what can be salvaged in Flint or the thousands of U.S. cities on this same trajectory. (Flint, like Detroit, is a canary in the coal mine for American cities and not an anomaly, as is widely asserted.) There are a number of things about water systems that are not well understood and, if they were more widely known, could help us hack some solutions for Flint as well as the tsunami of financially fragile cities in America with too much infrastructure and not enough wealth.

Most importantly, the primary function of the water system in your city is not—as is widely believed—to provide safe drinking water. If that were the case, the system would be designed much differently with a much smaller price tag. No, the system of pipes that make up your water system are there to fight fires.

Let’s say you live on a 50-foot lot and there is a small, eight-inch water pipe running in front of your house. There is 130 gallons sitting in that pipe right now. If the water was just for drinking, that’s enough for 260 people (half a gallon each). If we counted water for sanitation, it’s still enough for 26 people. And that’s just in the pipe. There are many multiples of that stored for you in other parts of the system. If the problem is getting people water for drinking and bathing, our current approach is overkill.

In rural areas with bad water—agricultural areas with contaminated aquifers, for example—we will sometimes build what I’ve seen called “rural water systems.” These are small pipes under low pressure that provide basic water needs at really affordable prices to widely dispersed populations. You can’t fight a fire with it, but if your barn catches on fire, it’s not like the fire department is going to arrive in time to save it anyway. It’s also not likely to burn down your home.

Flint already has a water system for fighting fires. If Flint is like most of the country, it also overpays for redundant firefighting equipment, given that it has this water system designed in an era of horse-drawn pumper trucks. It doesn’t really matter if there is lead coming out of the hydrant; nobody is drinking from the fire hose anyway. What if all we need to do in these mature systems is to start thinking separately about how we fight fires and how we deliver safe drinking water?

It’s possible that large parts of Flint, and many other cities as they deal with this same problem, could be served with really high-quality water for drinking and sanitation at a fraction of the cost while preserving the existing, lead-infested system for firefighting purposes only.

Two systems. Two purposes.

This would require some ingenuity as well as changes in thinking that would be reflexively resisted by many. In the end, however, I think some smart people with a free hand to work creatively could come up with something that would improve people’s lives on a budget they can afford. In other words, a Strong Towns approach.

Charles Marohn is a Professional Engineer (P.E.) licensed in the State of Minnesota and a member of the American Institute of Certified Planners (AICP). He is the Founder and President of Strong Towns. He has a bachelor’s degree in civil engineering from the University of Minnesota’s Institute of Technology and a master’s degree in urban and regional planning from the University of Minnesota’s Humphrey Institute. He is the author of Thoughts on Building Strong Towns (Volume 1) and A World Class Transportation System as well as the host of the Strong Towns Podcast and a primary writer for Strong Towns’ web content. He has spoken in dozens of towns and cities across North America, and speaks regularly for diverse audiences and venues.
I’m experimenting with those annoying headlines they run on news sites now. “Kid eats pancakes, and then this happens...” What do you think?

Anyway, there are an absurd number of people billing themselves as “innovation experts.” Many of them have worked for successful companies, and so what they’re really doing is going around and telling others about the good (and sometimes not-so-good) innovations they were a part of during their tenure. They could just as easily be billing themselves as industry experts eager to share their own hard-won knowledge with people like you and me. But “innovation expert” sounds sexier, and so that’s what they are.

Now I don’t want to suggest that these people aren’t intelligent or innovative. But I’ve sat in on a few of these innovation seminars, and I’m starting to believe that there’s not much to the whole concept. I’ve been encouraged to ask thoughtful questions and imagine unusual scenarios and brainstorm game-changing products—I’ve even been asked to try riding a bicycle that goes left whenever you turn the handlebars right and vice versa, which is extremely weird and much harder than you’d think—but when you boil it all down, what I’m really being asked to do is think. Just think. Nothing more complicated than that. Innovation is the result of creative thought, and that’s almost all there is to it.

After that, most “innovation experts” propose to teach you how to think creatively, and that’s where I start to get irritated. Creative thought is not the province of a chosen few, and it’s not a difficult skill for anyone to master. Humanity is instinctively creative, something which is blindingly evident anytime you watch children playing together. Creative thought isn’t something that we need to be taught how to do; it’s something we need to give ourselves permission to do. Again, nothing more complicated than that.

Well, almost. There is one essential condition for creative thought to exist and thrive, and it’s one that happens to get in our way almost constantly—you can’t be doing anything else at the same time. When our brains engage in any activity that requires even a moderate amount of our attention, we simply don’t have the capacity to let our minds wander the way they need to if we want innovation to happen. That’s why Archimedes discovered the principle of buoyancy while he was relaxing in a bath, and it’s why some of your own best ideas have come to you while you were walking or lingering in the shower or having an idle conversation in a bar or driving along
A Phi Beta Kappa graduate of Vanderbilt University, Jeff Havens has quickly become one of the most in-demand presenters in North America. His truly unprecedented ability to deliver high-quality education in an undeniably entertaining way has earned him dozens of repeat clients, all of whom appreciate Jeff’s insistence that education is the only way that we improve at anything and that we’ll all improve better and faster if we enjoy the learning process. By combining the content of the traditional presentation with the entertainment value of a comedy show, Jeff has found enthusiastic audiences in government, academia, small businesses and several Fortune 500 companies, all while still being one of the youngest members of the professional speaking circuit. More information can be found at www.jeffhavens.com.
I’d like to begin by saying that this article isn’t an attack on you or your current leadership training. It’s an attack on leadership training in general, a $150 billion industry which has almost entirely failed to create the better leaders that it continually promises. Recent Gallup polls have found that two-thirds of us are disengaged at work, which corroborates nicely with previous Gallup’s polls that found the same thing. As leadership is the biggest driver of employee engagement—and as employee engagement is the biggest factor in determining overall productivity—it’s safe to say that our predominately disengaged workforce is a glaring indictment of our systemic failure as leaders.

Well, let me amend: we’re leading people, we’re just not doing it well. Give someone a leadership position and they’ll lead—sometimes well and sometimes badly, but the leading and managing will ultimately happen. In fact, we don’t necessarily need to train our leaders at all; we could just give them the responsibility and sit back to see what happens. But most of us want more out of our leaders than a body to fill a vacancy.

I am not the first person to say that most leadership education is failing to accomplish its goal, and I won’t be the last. But I’ve not yet seen anybody put the issue into a framework that is simple enough to both understand and remedy. Fundamentally, there are only three underlying problems with the way we teach leadership:

We Don’t Do It All – Or at best we throw some in whenever we find time. Far too often, leadership training is considered a “nice to have,” despite the fact that improving leadership development is a top priority for almost every company ever surveyed by any consulting group ever.

We Do It Sporadically – When we do get around to developing our leaders, we do it in bits and pieces—a leadership book here, a conference there, a daylong training session once or twice a year. A Boston Consulting Group survey found this to be one of the main reasons leadership education fails to reach its potential—because leadership is a skill that requires constant attention in order to properly develop, and because one-off sessions are necessarily high-level and rarely if ever allow people to dive into the specifics of their leadership challenges. The fact that we expect children to attend math classes every day while corporate leaders undergo leadership training a few times a year is an interesting irony.

We Focus Exclusively On What We Should Be Doing – Which, on the surface, sounds like the right way to go. Unfortunately, though, all of us stopped liking lectures when we were approximately 12. Somewhere around a billion studies have revealed lectures to be a relatively poor teaching method, but we still keep at it. By endlessly stressing the behaviors we are supposed to emulate, most leadership education ends up coming across as pedantic at best and condescending at worst, thus enervating and ultimately alienating the people it’s designed to teach.

Congratulations! Now you know why your leadership training hasn’t given you what you’d hoped for. Now let’s fix it.

We Focus Exclusively On What We Should Be Doing – Which, on the surface, sounds like the right way to go. Unfortunately, though, all of us stopped liking lectures when we were approximately 12. Somewhere around a billion studies have revealed lectures to be a relatively poor teaching method, but we still keep at it. By endlessly stressing the behaviors we are supposed to emulate, most leadership education ends up coming across as pedantic at best and condescending at worst, thus enervating and ultimately alienating the people it’s designed to teach.

Recognize That Leadership Is Its Own Skill – Being a good leader has exactly nothing to do with being a good engineer, or doctor, or musician, or balloon animal maker, or anything else. Leadership is exclusively a function of communication, and that communication falls into two categories—how we communicate our vision and the importance of what we do, and how we communicate to the people we lead their essential role in the execution of that vision. As long as we keep thinking that good workers will naturally figure out how to be good leaders, we will continue to struggle
with the same lack of enthusiasm we’re facing now.

**Focus on Leadership Daily** – Nowhere in our formal education do we ever cover how to motivate others, handle difficult situations, articulate a strategy, balance competing expectations, or any of the other communication skills that sit at the core of what leadership is. And just as we got good at everything else we’re good at through time and constant practice, we need to be doing the same with leadership skills. A quality leadership education program will involve *daily* exercises in verbal, nonverbal, and written communication.

**Showcase and Discuss Worst Practices** – Effective leadership education will tell people how to do things well—but if that’s all it does, it will eventually bore and frustrate anyone who doesn’t feel like being lectured to—which is all of us. So the best education will *also* include some examples of how to screw everything up. Mountains of research (and plenty of personal experience) have shown us that we pay more attention to negative things than positive ones. Showcasing worst practices, therefore, will help learners remember lessons better and longer than if they only focus on how to do things well. It’s also more entertaining, which never hurt anything.

We’ve done a very poor job of helping ourselves become better leaders, but the solution is not difficult. Great leaders are made, not born, and they’re made at the same speed and in the same way that concert pianists and web designers and chocolatiers are made—slowly and steadily, through patience and constant practice, and without a lot of lectures.

A Phi Beta Kappa graduate of Vanderbilt University, Jeff Havens has quickly become one of the most in-demand presenters in North America. His truly unprecedented ability to deliver high-quality education in an undeniably entertaining way has earned him dozens of repeat clients, all of whom appreciate Jeff’s insistence that education is the only way that we improve at anything and that we’ll all improve better and faster if we enjoy the learning process. By combining the content of the traditional presentation with the entertainment value of a comedy show, Jeff has found enthusiastic audiences in government, academia, small businesses and several Fortune 500 companies, all while still being one of the youngest members of the professional speaking circuit. More information can be found at www.jeffhavens.com.
Hey there, American Public Works Association, I’m Mel Robbins and I’m so excited to see you all at the Public Works Expo in Minneapolis in August!

I wanted to introduce not just myself, but what we are going to discuss during my keynote at the PWX. Conventions are packed to the brim with incredible content, speakers, learning and networking opportunities, and with that comes information overload. Because your organization is so unique and catering to a multitude of sectors within the public works industry, my goal is to show you how to walk away from the convention with a sense of relief instead of wondering what to do with all of the eye-opening things you’ve learned and connections you’ve made. We’ll send you back to your offices with actionable tools to use in your everyday life and work, and you’ll actually use them—I’ll show you how.

My TEDxSF in 2011 (“How to Stop Screwing Yourself Over”) has been viewed by over six million people around the world, and I hear from hundreds of them every day. What was once a talk about winning the war of your mind versus doubt, hesitation, and fear has become a phenomenon.

During my session we’ll talk about “The Five-Second Rule: THE ONLY WAY TO REACH YOUR GREATEST POTENTIAL.” You won’t be motivated by the time we end the session—you’ll be launching out of the doors like a rocket ready to surpass the goals you’ve been leaving on the sidelines for too long.

There are two invisible forces that are holding you back, that you don’t even realize you fight against every single day and lose. One of the invisible forces is how life in modern society is shutting down your higher-brain functioning and your impulse for action. And the second thing that’s an invisible force that is stopping you is fear. We’re going to be going through some really incredibly cool interactive exercises that are going to get people out of their comfort zone and get them to really see how fear—particularly for people who are successful—is actually a major obstacle in your changing, in your innovating, and in your reaching your greatest potential.

We all think that there are a gajillion fears out there—that you have fear of failure, fear of success, fear of intimacy, fear of disappointing people, fear of spiders, fear of snakes, fear of elevators. Actually, no, you only have two fears. The first fear is the fear of death itself. Now, let me unpack that a little bit for you, because the fear of death is a hard-wired, biologically driven kind of fear that paralyzes you. But what it actually is, is simply the fear that something unknown is about to happen and you’re afraid you can’t survive it. You’re fearing that if you took a risk, if you went out and swung for the fences and tried something crazy, different, new, exciting in your work, you fear that it could be wrong. So you get paralyzed and you don’t do it.

And there’s another fear that we’re going to discuss that’s actually the good fear; it’s the fear you want. It’s called FOMO—the fear of missing out. And it’s what drives every single social network.

In fact, if you really think about it, what is the psychological driving force of Facebook, of Twitter, of Snapchat, of Periscope—of all of these things? The driving force is the fear of missing out. That’s why everybody is logging on to these things; it’s fundamental.

Don’t fret; we’ll be talking about a lot more than fear. We’ll discuss the new rules of influence, how to move on quickly from a seemingly dire situation, and how you can trick your own mind out of negative thinking and into productive action.

The main takeaway from this talk is a shortcut that I developed for dealing with your brain called the “five-second
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Mel Robbins is one of the most sought-after motivational speakers trusted by global brands to design and deliver business-expanding, life-changing, interactive keynotes that inspire change, challenge thinking and accelerate personal and professional growth. Her TEDx Talk on “How To Stop Screwing Yourself Over” has over 10 million views across 37 countries, and her book on the brain and productivity, Stop Saying You’re Fine, is a business bestseller that has been translated into four languages. She started her career as a criminal defense attorney and went on to launch and sell a retail and internet technology company. Mel has led multi-year coaching programs at Johnson & Johnson, AG Edwards, Bear Stearns and Partners Healthcare. The media has tapped Mel to host award-winning shows for FOX, A&E, Cox Media Group, and CNN.

rule.” We’re going to explain it deeply during the conference, but the bottom line is, remember the five-second rule that we all grew up with: You drop food on the ground, you have five seconds to eat it before it’s contaminated. Well, there’s a very similar rule that is extraordinarily effective in life, and that is that you’ve got five seconds to act on any impulse that you have, because if you don’t, your brain will kill the idea. And after hearing part of my speech, what you will understand are the four ways in which your brain tricks you into killing those ideas.

I want every person in this audience to be reminded just how remarkable they are. And I want them to feel inspired again about the opportunity and how cool it is to be part of the fabric of infrastructure, functionality, and well-being of the country.

Until we meet in August, please check our website www.melrobbins.com to see what you’re in for. It’s going to be a great time. See you soon!
The 2016 APWA PWX will take place in Minneapolis, Minn., August 28-31. On these pages you’ll see just a few of Minneapolis’s attractions you can visit before, during and after your PWX experience. For more information on each of these attractions, visit the Explore Minnesota website at www.exploreminnesota.com. For more information on our upcoming PWX and to register online, go to www.apwa.net/PWX. Why not combine business with pleasure and incorporate your PWX trip into your vacation plans?

The Guthrie Theater, founded in 1963, is a center for theater performance, production, education, and professional training in Minneapolis. In 2006, the Guthrie finished construction of a new $125 million theater building along the Mississippi River in downtown Minneapolis. The design is the work of Jean Nouvel, along with the Minneapolis architectural firm Architectural Alliance, and is a 285,000-square-foot facility that houses three theaters: the theater’s signature thrust stage, seating 1,100; a 700-seat proscenium stage; and a black-box studio with flexible seating. It also has a 178-foot cantilevered bridge (called the “Endless Bridge”) to the Mississippi which is open to visitors during normal building hours. (Photo credit: Explore Minnesota)
The Como Park Zoo and Marjorie McNeely Conservatory are located in Como Park in St. Paul, Minnesota. The park, zoo and conservatory are owned by the City of St. Paul and are a division of St. Paul Parks and Recreation. The attractions located there include the zoo, the conservatory, an amusement park, a carousel, Lake Como, a golf course, a pool and more. The park receives more than 1.9 million visitors annually. (Photo credit: Charles Hezsely)

Left page, left:
The Weisman Art Museum is located on the University of Minnesota campus in Minneapolis. A teaching museum for the university since 1934, the museum is named for Frederick R. Weisman, and was designed by renowned architect Frank Gehry. Often called a “modern art museum,” the 20,000-plus image collection has large collections of Marsden Hartley, Alfred Maurer, Charles Biederman, Native American Mimbres pottery, and Korean furniture. (Photo credit: Kristine Leuze)

Left page, Right:
The Mall of America is located in Bloomington, Minnesota, across the interstate from the Minneapolis–St. Paul International Airport. Opened in 1992, the mall receives over 40 million visitors annually, the most of any mall in the world. Eighty percent of the visitors are from Minnesota, Wisconsin, Iowa, the Dakotas, Illinois, Ohio and Canada. (Photo credit: Explore Minnesota)
## CALENDAR OF EVENTS

### SATURDAY
**AUGUST 27**
- **Registration**: 7:00 a.m. – 5:00 p.m.
- **Self Assessment Workshop**: 8:00 a.m. – 4:30 p.m.
- **Golf**: 9:00 a.m. – 5:30 p.m.
- **Fishing**: 8:00 a.m. – 10:00 p.m.
- **MicroBrew**: 2:00 – 6:30 p.m.

### SUNDAY
**AUGUST 28**
- **Registration**: 7:00 a.m. – 5:00 p.m.
- **First-Timers Meeting**: 7:00 – 8:20 a.m.
- **Education Sessions**: 8:30 – 9:45 a.m.
- **Opening General Session**: 10:00 a.m. – Noon
- **Exposition Grand Opening**: Noon
- **Non-compete Exhibit Time**: Noon – 3:00 p.m.
- **Exhibits Open**: Noon – 4:00 p.m.
- **Exhibitor Solutions & There’s an App for That Theaters**: 1:00 – 3:50 p.m.
- **Education Sessions**: 3:00 – 4:50 p.m.
- **Get Acquainted Party**: 5:00 – 7:00 p.m.

### MONDAY
**AUGUST 29**
- **Registration**: 7:00 a.m. – 5:00 p.m.
- **General Session**: 8:00 – 9:30 a.m.
- **APWA Blood Drive**: 9:00 a.m. – 3:00 p.m.
- **Education Sessions**: 9:45 – 11:00 a.m.
- **Fleet Workshop**: 9:45 a.m. – 4:50 p.m.
- **Exhibits Open**: 9:00 a.m. – 3:00 p.m.
- **Exhibitor Solutions & There’s an App for That Theaters**: 10:00 a.m. – 2:50 p.m.
- **Non-compete Exhibit Time**: 11:00 a.m. – 2:00 p.m.
- **CPWA Luncheon**: Noon – 1:30 p.m.
- **Public Works Stormwater Summit**: 2:00 – 4:50 p.m.
- **Tennis**: 3:30 – 8:00 p.m.
- **Awards & Recognition Ceremony & Reception**: 5:00 – 7:00 p.m.
- **Young Professionals Networking Reception**: 8:00 – 9:30 p.m.

### TUESDAY
**AUGUST 30**
- **Fun Run**: 7:00 – 8:30 a.m.
- **Registration**: 7:00 a.m. – 4:00 p.m.
- **General Session**: 8:00 – 9:30 a.m.
- **APWA Blood Drive**: 9:00 a.m. – 3:00 p.m.
- **Education Sessions**: 9:45 – 11:00 a.m.
- **Exhibits Open**: 10:00 a.m. – 2:00 p.m.
- **Diversity Brunch & SCRC Town Hall Brunch**: 10:00 – 11:30 a.m.
- **Exhibitor Solutions & There’s an App for That Theaters**: 10:00 a.m. – 1:50 p.m.
- **Non-compete Exhibit Time**: 11:00 a.m. – 2:00 p.m.
- **Education Sessions**: 2:00 – 4:50 p.m.
- **Public Works Stormwater Summit**: 2:00 – 4:50 p.m.
- **Chapter Dinners Evening**: Evening

### WEDNESDAY
**AUGUST 31**
- **Registration**: 7:00 a.m. – 12:30 p.m.
- **Workshop Tours**: 8:00 – 10:45 a.m.
- **Education Sessions & Classroom Workshops**: 8:30 – 10:45 a.m.
- **Closing General Session**: 11:00 a.m. – 12:15 p.m.

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Check for updates at www.apwa.net/pwx
Introduction
How true the saying goes, “being in the right place at the right time.” Having been out of the water field for many years, I was in contact with a colleague at the City of Santa Monica’s Environment & Public Works Department. He mentioned an opening in the engineering division as an analyst. Not being an engineer, but knowing how wonderful working for the city can be, I jumped at the chance to get my foot in the door. An interview was scheduled. Just before the appointment, the city called to ask if I would be interested in a temporary position in stormwater management. Would I? Absolutely! Water, I’m there. And so I landed my perfect job—managing water, promoting its sustainable use, and working at the beach and with people dedicated to this sustainable mission. That was 17 years ago; how fast the time has passed.

Watershed management the year-round
I have been with the City of Santa Monica since March 1999, as the Stormwater Management Program Coordinator. The title has since changed to guarantee year-round employee! You see, it only rains, e.g., stormwater, in Southern California, generally December-March, and only 10-20 days for only a few hours each time, if that. I would have nothing to do the rest of the year. Of course, year-round watershed management is an annual task with many components, and not just activities during a rain event. Presently, I am a senior sustainability analyst in the Office of Sustainability and the Environment, which is situated within the City Manager Department. My work involves:

- Post-construction, structural Best Management Practices (BMPs) inspections (new and substantial construction projects)
- Data compilation about and oversight of all BMPs
- Compliance with the NPDES permit regulations, requirements
- Rain harvesting rebates and inspections, retrofits

My work begins as precipitation and discharged wasted water during dry weather, and terminates with urban runoff flowing into the Pacific Ocean, carrying with it a dangerous mixture of numerous pollutants, trash, micro-organisms, heavy metals, organic compounds and nutrients. Managing a watershed involves managing activities between these two points, over the entire eight square miles of highly urbanized, paved-over surface.

Bringing my past to the present
In my previous professional career, I was a marine biologist and marine policy analyst for The Jacques Cousteau Society, studying and researching the global water system, developing policies on water management, and
researching for books and television specials. Working for an international NGO, which focused on wise use of our global oceans, gave me skills to apply locally in watershed management, specifically on sustainable stormwater oversight.

**Pursuing an APWA certification**

I had attended conferences and workshops to raise my value to the city, as well as strengthen my personal commitment and resolve to this field, as a way to advance myself professionally. But these activities did not result in any official recognition or designation of my value and experience at the city nor amongst outside colleagues. To enhance my professional experience and knowledge, and improve my value to be a better asset to the city as well as a more complete watershed manager, I applied for and was successful in achieving the APWA Certified Stormwater Manager. Through this certification, I have been able to raise my efficiency in making the city’s watershed program the best around, including being sustainable and focused on local water supplies and using and reusing nonpotable water to replace potable water. The CSM process recognizes and acknowledges one’s experience in an official capacity via the designation after one’s name.

Having been to numerous state, national and international conferences, and speaking at many, I had already built a strong foundation in stormwater management. Through attending conferences, one gains additional experience on efforts nationwide by taking preconference workshops, focused hours and training on specialty subjects. Besides being prepared through years of participation in conferences, I did my homework. I reviewed the certification guidance materials and suggested readings; it is important to do the recommended preparatory homework. Make sure you review all subject matters on the exam. Where you feel weak in a category, get support and guidance from your colleagues or from professional groups specializing in this area, such as APWA.

**Benefitting from the certification: personally, locally at work and in the community, and globally**

Having years of experience working at your employer is important to build one’s experience and expertise. However, having the appropriate certifications adds professionalism amongst one’s colleagues, as well as demonstrates to non-professionals seeking out experts in this field for guidance that you, having a certification, validates one’s expertise through a non-bias entity. One’s professional expertise at a “job” is validated through completion of a certification.

The city has benefitted from my certification by having a staff person with a nationally-recognized designation able to address complex challenges and issues related to watershed and stormwater management. And with this designation, I am able to better assist residents and businesses, locally, but also participate regional, statewide, nationally and internationally in activities to improve watershed management and move toward a sustainable program with long-term strategies to maximize sustainable management of local water resources, eliminate water pollution and enhance local habitats and wildlife.

My work has evolved from a local-focus to an international level. As I work to develop local water quality and rain-harvesting standards to promote local water sustainability, one cannot help but become involved in standards around the country and abroad. A piece-meal, patchwork of standards has drawbacks. Uniform, consistent national standards have benefits for manufacturers of equipment, where product use crosses boundaries. When standards vary around the country, it is harder for the regulated to meet standards with the same solution. Different solutions result in higher expenses. And then the leap to the international stage, where standards vary even more. For businesses that work internationally, having U.S. standards different from international ones, makes it more expensive to market products in numerous markets with different standards requiring many variations of a solution. Using one’s expertise, validated by the CSM, at the international level can help bring more consistency in stormwater management and help build and strengthen new markets for stormwater products.

Having a national certification brings uniformity and consistency to management, which makes running a program easier and more likely to succeed. The APWA Certified Stormwater Manager is an example of a program to bring such qualities to stormwater management. It puts those with a CSM on the same playing field, so that we all implement similar standards to achieve similar goals. And through this management strategy, we can achieve higher water quality and regulatory compliance, and enhance local water supplies.

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Mind the Gap: Finding and resolving gaps in stormwater project management

Milas Smith, MBA, CPESC, QSD/QSP
Stormwater Manager
Twining, Inc.
Long Beach, California

A little history
The phrase “mind the gap” was coined in 1968 in the London Underground for a planned automated announcement, after terrible accidents and fatalities occurred due to slips and falls between the rail car and platform. Because some platforms on the rail line are curved, and the rolling stock or rail cars that use them are straight, an unsafe gap was created when a train stopped at a curved platform. It had become impractical for drivers and station attendants to warn passengers of the gap, hence the “mind the gap” campaign. Mind the gap is now used worldwide in dozens of transportation systems and dozens of languages. The message simple and clear can be applied to stormwater management.

How does “mind the gap” apply to stormwater?
Well, fortunately, there are a lot of very smart people working hard to achieve the State of California and its Regional Water Control Board’s (RWCB) mission: “To preserve, enhance, and restore the quality of California’s water resources and drinking water for the protection of the environment, public health, and all beneficial uses, and to ensure proper water resource allocation and efficient use, for the benefit of present and future generations.”

The problem lies in the gaps between the creation of the Erosion and Sediment Control Plan and subsequent Storm Water Pollution Prevention Plan (SWPPP), and “boots in the dirt” implementation. From the project owner aka “Legally Responsible Party” (LRP) or financier deciding to go forward with a project, to the Qualified SWPPP Practitioner (QSP) in the field performing the weekly inspection, there are some 15 or more gaps or transitions of implementation responsibility—each one creating a small gap of lost intent, lost efficiency, and increased liability.

In the beginning the gaps are small. For example, the LRP of a project places all stormwater management, Erosion and Sediment Control, and SWPPP responsibility/creation on the engineering firm. Typically at this level a Professional Engineer (P.E.) for the engineering firm is acting as a Qualified SWPPP Developer (QSD) while also preparing the project’s other various plans and drawings. The firm is also then retained to file the Notice of Intent (NOI) and obtain the State Permit via the RWCB. If you just glance at this transition you can easily miss it, but the first gap has been created. The LRP has just created, knowingly or unknowingly the first gap between themselves and the project. The intent, in this example of the Construction General Permit (CGP), is to keep the Owner and stormwater monitoring and environmental best practices/requirements closely tied together. In fact, per the CGP, violations are set up so that they are assessed directly back to the LRP. This first gap in most cases (not to mention the Industrial or MS4 permits, but the same gaps reside there as well) is that the LRP doesn’t know what an SWPPP is, where it is filed, who it is filed with, what is contained within it, or that a subsequent permit is even issued with an estimated beginning and end date.

The gaps multiply exponentially as a project progresses
Right off the bat the gaps begin and only increase in width and depth from the first scenario described above. Of course, not all LRPs are uninformed of various plans and drawings. The firm is also then retained to file the Notice of Intent (NOI) and obtain the State Permit via the RWCB. If you just glance at this transition you can easily miss it, but the first gap has been created. The LRP has just created, knowingly or unknowingly the first gap between themselves and the project. The intent, in this example of the Construction General Permit (CGP), is to keep the Owner and stormwater monitoring and environmental best practices/requirements closely tied together. In fact, per the CGP, violations are set up so that they are assessed directly back to the LRP. This first gap in most cases (not to mention the Industrial or MS4 permits, but the same gaps reside there as well) is that the LRP doesn’t know what an SWPPP is, where it is filed, who it is filed with, what is contained within it, or that a subsequent permit is even issued with an estimated beginning and end date.
the state’s stormwater management requirements. Many LRP’s know they are supposed to certify, or assign a signatory to certify, a plethora of stormwater documents throughout the course of the project.

As the project progresses, the Erosion and Sediment Control plan and SWPPP move through the City’s permitting process, then the Construction Manager, the General Contractor, and finally to the QSP (best case scenario) tasked with responsibilities of the SWPPP implementation. As the project moves through these various phases and on to construction, the baton of responsibility for the SWPPP implementation and monitoring gets passed from party to party. Gaps are created from the LRP to the QSD down to the project site QSP. This dilutes the original intent of the Construction General Permit.

Real project example
In the example image at right you can see the effects of gaps in terms of wasted time and ultimately money. This project was a flat parcel, two down five up hotel, with approximately 1700 linear feet of project perimeter. Just to the left is the pit, leaving two feet of exposed soil around the perimeter of the project. On the other side of the wind screen fence is fully intact curb and gutter. What is wrong with this picture? To start, you do not need five Best Management Practices (BMPs) to protect this project from discharging sediment. It would also help to have the BMPs installed correctly; the silt fence is backwards.

Why are there gaps, and how do we mind them?

Quite simply, we go back to the original intent of the permit. The LRP, QSD, and QSP should be in close and continual communication. The QSP working for or on behalf of the LRP should be monitoring, managing and making certain the SWPPP is being implemented in the most efficient way possible. This in most cases cannot be accomplished by the CM, GC, or an all-in-one-firm self-performing these activities. A subsequent intent of the CGP is to avoid the fox guarding the hen house.

When an SWPPP is implemented correctly everyone wins. Money is saved by not wasting resources. Time and money is saved in project efficiency. Money is made by avoiding fines, project delays and project shutdowns.

This method is not to be feared or even resisted. Again, the intent, the purpose, the motivation is “To preserve, enhance, and restore the quality of the state’s water.”

Milas Smith can be reached at msmith@twininginc.com.
Unless you have served in a branch of the United States Armed Services, it is difficult—no, impossible—to understand the sacrifices these brave men and women make and the sacrifices that military families have to make.

There are so many day-to-day activities that most of us just take for granted that present a challenge to military families. When a family member is deployed far from home, there are still things that need to be done around the house like simply mowing the lawn. And who shovels the snow during the winter?

There are many people who are willing to help. But, how?

The City of Fishers, Ind., a northern suburb of Indianapolis and a community of just over 90,000, has stepped up in a big way offering a unique program to help make life maybe just a little easier for these families.

The Hometown Help for Heroes program was developed to marshal the community’s public resources in order to alleviate some of the practical burdens that families of a deployed head of household will face.

Services provided include:

- The Hometown Help for Heroes program will provide snow removal to eligible families within 24 hours after completion of a snow event for any amount over 1”.
- The Hometown Help for Heroes program will provide lawn care services to eligible families during the summer months.
- The services will be provided to eligible families for the duration of the active duty deployment of the head of household.

Eric Pethtel is the Director of Public Works for the City of Fishers and an active member of the APWA Indiana Chapter. The Fishers Public Works Department is responsible for managing this program. That includes collecting applications and verifying eligibility, scheduling and allocating resources and ensuring quality control.

Pethtel said the public works crews were enthusiastic supporters of the program.

“This is the most rewarding program I have been involved with in my 25 years on the job and my staff feels the same way,” he said. “Just seeing how much it means to these families in our community and how much they appreciate it makes it a very gratifying venture.”

There are limits to the program. Lawn care consists of lawn mowing and trimming on as-needed basis as weather permits and the snow removal is for driveways and sidewalks only.

The city’s Department of Public Relations makes sure the program is adequately publicized in order to create awareness to get the attention of eligible families.

The program has garnered media attention and it shows the public works force in a really positive light.

“Yes, that’s a nice residual benefit,” Pethtel said. “It is good that people see our crews doing these things for the military families. But to me the most important aspect is that while our heroes are deployed they know that their community, and in particular their Department of Public Works, has their back.”

The program is great for the community but it is also personal for
Pethtel and for Fishers’ Department of Public Works. When a coworker was called to active duty, leaving behind a wife and three young children, the community rallied around the family that was left behind. A rotation of city employees and family friends is offering child care, dinners, “Mom’s Night Out” evenings and other help, in addition to the lawn care and snow removal services.

This recipient—who must remain anonymous because of the sensitive nature of his mission—e-mailed Pethtel to tell him how much the efforts meant to him and his family.

“Along with my wife having to pick up my slack and become both mother and father to our kids during my absence, she also has to take on the tasks and chores of maintaining a house all by herself,” he said. “As the deploying member, I often think I have the easier job.

“She, just like thousands of other military spouses, is an incredible individual who will handle my absence with courage and grace, but it will certainly come with challenges. In our particular situation, with three small children ranging from nine months to five years old, tasks such as shoveling our driveway and mowing our lawn suddenly become pretty significant burdens. Not insurmountable for the military spouse of course, but definitely an added stress that wouldn’t otherwise exist if the military member was home.

“The City of Fishers, by creating the Hometown Help for Heroes program, has taken that burden off of our shoulders.

“(Back in March), we received about three inches of snow overnight. By the time my wife and kids woke up that morning (a day in which my wife would need to leave the house by 8 a.m. to have the kids to their pre-K school), our driveway had been plowed clean by your City’s Public Works team. It is difficult to put into words how grateful my wife was when she looked out the window to see what our City had done for us, and has committed to do for us throughout my deployment.

“It will never be easy to leave my family while I deploy, but to know my City ‘has my back’ certainly makes it more bearable. The gesture is incredible, and the peace of mind it creates for me while away from my family is beyond words. Although clearly far from any naval base, I proudly consider the City of Fishers a ‘military town,’ and as a result of the Hometown Help for Heroes program, I’m both proud and thankful to call it home.”

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

Photo of the Fishers, Ind., public works force mowing the yard at the house of a deployed serviceman
Debtors to our profession

“I hold every man a debtor to his profession.” – Sir Francis Bacon, English lawyer and philosopher

John T. Davis, P.E., PWLF, Director of Engineering Services, City of Denton, Texas; member, APWA Donald C. Stone Center Quality Council and APWA Transportation Committee’s Project Delivery Subcommittee

Have you ever encountered a quote with a charge you felt was directed specifically at you? The above quote struck me as a very compelling charge many years ago when I first read it on a framed placard from the American Society of Civil Engineers (ASCE) which I received upon transitioning from a college student member to a full member of ASCE. As my career in engineering and public works has progressed over the years, I’ve found the charge to be especially compelling and applicable.

The full quote is even more compelling: “I hold every man a debtor to his profession; from the which as men of course do seek to receive countenance and profit, so ought they of duty to endeavor themselves, by way of amends, to be a help and ornament thereunto.” – Sir Francis Bacon

Through almost 45 years of service in public works, I have felt those words were especially applicable to me. The many successes I’ve enjoyed in my professional career in public works have been because of the profession I chose and the many rewards it has provided me.

So, how does one repay the debt owed to his or her profession? I’m sure there are many ways possible. But, let’s mention a few in this article.

Involvement in technical/professional societies

A person could join and be active in a number of the available technical/professional organizations, like APWA. Joining an organization has many benefits through the publications and resources available from it. But, so much more can be gained and contributed by becoming involved in the organization at the local, state or national levels or a combination of those levels (isn’t our time the most valuable contribution we can make?), depending on the amount of time available to devote to those activities. Encouraging and supporting agency colleagues and subordinates to join and participate are also good debt payments to our profession of public works and contributions to their professional growth in the profession.

Mentoring

A good friend and mentor, who I served under in the Florida Army National Guard, Brigadier General Spessard Boatright, used to frequently say, “If you see a gopher (a land tortoise) on top of a fence post, he didn’t get there by himself.” General Boatright’s point was that most, if not all, of us owe our successes to those who mentored and enabled us to enjoy the successes we achieved (we didn’t get there by ourselves). I owe my many successes to General Boatright and many, many others. Without their guidance, encouragement and support, I would not have achieved nearly as much success as I’ve enjoyed.

As an example of mentoring that I have received, I will mention a few more mentors, who have been especially helpful to my career over the years.

Tim Russell, P.E., County Engineer, my first boss out of college, taught me to be truthful in preparing agency budget requests that you could defend to the end and never “pad” those requests and lose your credibility. Rhett Miller, P.E., Public Works Director, taught me that a public works professional should not be political, but should be “politically astute” to the political arena in order to successfully manage public works services. Dan Kleman, City Manager, taught me to make solid, factual recommendations to elected officials, based on professional judgement. But, if the situation was politically sensitive and the recommendation was not likely to be politically acceptable, to also provide the elected body with other acceptable options that you could still implement, rather than leave it to the elected body to craft an option on their own that might not be nearly as successful. Brian Henry, City Attorney, taught me to avoid ethical problems by, “Avoiding even the perception of evil.”

And, I would be severely remiss if I didn’t mention my father and mother, who sacrificed so much for me, taught me life values, taught me how to learn, taught me the value of hard work, made it possible for me to go to college, and so much more.

Opportunities to repay our debt through mentoring exist everywhere— in our own departments, agencies, nearby agencies and public works organizations, such as APWA branches...
and chapters. Mentoring can be initiated by the prospective mentor or mentee. Often, the mentorship is informal, but can be formalized if the two parties choose to do so.

I’ve had the good fortune to mentor several people over the years. Some have become public works directors, city engineers, and vice-presidents of large consulting firms; some have started and developed successful private consulting firms; and others have succeeded in other ways. I like to think I had a small part in some of their successes.

APWA provides an excellent opportunity for experienced senior public works executives to mentor others in the public works arena through the Donald C. Stone (DCS) Center, as a Public Works Leadership Fellow (PWLF). If you have 20 years or more of relevant public works experience, and have not applied to be a PWLF, I encourage you to review the program, seriously consider applying to the program and becoming a mentor to other APWA DCS credential candidates. To review the program, go to www.apwa.net and click on the “Donald C. Stone (DCS) Center” link in the drop-down menu beneath the “Learn and Grow” tab across the top of any of the APWA website pages. It’s an excellent program for both mentors and mentees, with a number of resources on how to mentor.

Debtors
Yes, I would say that all of us who have enjoyed any success in public works are “debtors” to our profession and owe a great deal to the profession and others entering it. While I cannot possibly repay my many mentors with anything other than “Thanks,” I can “pass it along” by being active in APWA and mentoring others in my profession to help them become successful, improve the profession and provide better public works services to our citizens. I certainly owe that to my mentors and profession.

Thanks, Sir Francis Bacon, for reminding me of my responsibilities to my profession! I just hope I’ve been at least a small “help and ornament” to the public works profession that’s been so good to me.

John T. Davis can be reached at John.Davis@cityofdenton.com.
In an era steeped in ethical issues for professional sports—doping, violence against women, traumatic brain injuries—why is it that basketball’s Golden State Warriors have been so inspiring? In this article we will take a look at the lessons in leadership that transportation and other professionals can learn from the 2015 NBA champions, using the example of the efforts of the Transportation Agency for Monterey County, also known as TAMC, to create a winning transportation sales tax measure.

Good leaders seek to shape ideas, motivate people and help provide options for the future. For those of us in a leadership position, it is not just MVP Steph Curry’s amazing pre-game dribble-fest which draws crowds early to the arena to watch, the splash brothers’ (Curry and Klay Thompson) three-pointers from mid-court, or power forward Draymond Green’s triple-doubles that impress us with this team. It is a philosophy that Coach Steve Kerr embraces and passes on to the entire organization that gives us pause to think: “How can our team learn and grow by embodying the Warriors’ spirit?”

Each public works agency faces annual and multi-year challenges that these winning principles can be applied to. The championship the Transportation Agency for Monterey County wants to win is the quest to become a “self-help” county. In California, adopting a local transportation sales tax is the ticket to realizing improvements to a transportation system in an era of dwindling state and federal resources. Twenty counties in California have achieved self-help status by adopting 1/4% to 1% in local sales taxes devoted exclusively to transportation. These monies give counties local control over their transportation improvements, leverage state and federal matching funds, and create a set of shelf-ready projects by funding project development costs.

The challenge of reaching this self-help goal is that in California, due to a constitutional amendment passed back in 1975, these single purpose (or “special”) taxes must be approved by two-thirds of the voters. The President of the United States doesn’t need to get a two-thirds vote, but in California a local special tax does. As a result, while a majority of Monterey County voters has supported a tax to improve the local transportation system, obtaining a 66.7% supermajority has been elusive despite four attempts. A new strategy is needed to win in 2016. Here are three leadership strategies from the Golden State Warriors that the Transportation Agency is utilizing in its latest effort to cross the supermajority threshold.

**Strength in Numbers**

“Guys helping each other out. Everybody making that extra effort.....You know how to help each other out.” – Warriors power forward, Draymond Green, on how you win.

The Warriors’ winning strategy starts with the team motto: Strength in Numbers. Despite three All-Star players—Curry, Thompson, Green—the team depends on its backup players on the bench to get an average of 34.5 points per game. When their top scorer, point guard Steph Curry, got injured, the other Golden State players—especially the bench—stepped up and helped the team stay strong.

As a small organization with only 14 people, the Transportation Agency for Monterey County sets up teams for all of its major projects. The key of this teamwork has been to empower the backup players to step up and shine. This occurred several times during their efforts to create a transportation sales tax and place it on the ballot.

One of the legal requirements before a sales tax plan can be placed on the ballot is to secure approval from the County and a majority of the cities representing a majority of the population. In a county with 12 cities and an often-divided board of supervisors, this approval is no easy feat. The Agency approached this task with teamwork. Everyone on the team was drafted to help make the case to the cities, each team member...
could give the presentation, and the team was able to back each other up in cases of illness and conflicting council meetings. By dividing up the work, the team was able to reach its goal: all 12 cities and all five county supervisors approved the spending plan.

Continuous Improvement

“It’s about not being complacent and always trying to get better, no matter how hard the task may be.” – Stephan Curry, 2016 MVP award speech

A team needs to continuously revise and update its strategy if it is going to be successful over time; the same is true for an agency. As the reigning NBA champions, the Warriors found that every opponent approached games against them as though they were in the playoffs. They didn’t face many easy games, and they seemed to thrive on the competition. Yet, after many of the winning games, Coach Steve Kerr was talking about how they could make more improvements.

True leaders focus on continuous improvement, regardless of.
past successes—or failures. The Transportation Agency for Monterey County has seen its share of failures—four attempts and four failures to gain approval of a local transportation sales tax—so continuous improvement has been critical. Every measure, from 1989 to 2008, has inched up closer to the required 66.7%, with the attempt in 2008 reaching 63%.

The leader’s role is to help the team analyze its losses and focus on addressing the areas of weakness. One of the first steps taken after the 2008 loss was to ask an outside consultant to prepare an objective analysis of where the effort fell short. Based on that analysis, the key areas for improvement were defined: start early on stakeholder outreach; gain support from environmental groups previously neutral or in opposition; and, for the private campaign, raise enough money for voter education.

**Have Fun!**

“We have core values as a team....The first one and the most important one is probably joy—he wants us having fun. It’s a long season, this game’s meant to be fun.” – Warriors Assistant Coach Luke Walton, about Coach Steve Kerr’s core team values.

Most of us think about professional sports as a means to wealth or fame, but one of the things that makes the Warriors special is how much they talk about having fun together. When working extra hours, attending evening meetings, and giving up personal time to record a big win, it is important to make it fun for the team—not only to keep people motivated, but also to make the job rewarding.

There are plenty of ways to make it fun on the job, while being responsible and dedicated. For example, TAMC took its sales tax outreach team to the leading self-help transportation sales tax conference: Focus on the Future. The purpose of this field trip was not only to learn how to develop a winning plan, but to trade war stories and build the strong team spirit needed for future collaboration.

Having a sense of humor can also help the team push through difficult times, such as when someone bought the team a “whack-a-mole” toy when consensus building was in a rough patch.

“Joy” was definitely the theme of the celebration held when the team posted the name of the twelfth and last city to vote in favor of the sales tax plan on a “Path to Self-Help” poster. After months of long and sometimes contentious stakeholder meetings, a friendly competition to see who can persuade key community groups to officially support the adopted transportation investment plan has helped to raise enthusiasm for reaching interim goals. Success is important, but having fun can be a team goal in and of itself.

**What is Success?**

“Success comes after you conquer your biggest obstacles and hurdles.” – NBA’s 2016 Most Valuable Player, GSW’s Steph Curry, on winning.

As we write this article in mid-May, we have no idea whether or not the Warriors will cap this year’s winningest season in NBA history (73-9 win/loss record) with another national championship. But even if they lose in the playoffs, their team style and Coach Kerr’s leadership style will live on in history.

The Transportation Agency for Monterey County won’t know until well after APWA’s Public Works Expo whether or not it will win the chance to invest local money in its transportation future. But if they do win, they know they will have done so in a way that has grown their team skills to take on the challenges of building the projects in their plan—through teamwork, continuous improvement, and having fun.

**For more information on the Monterey County Transportation Safety and Investment Plan, visit the TAMC website at tamcmonterey.org. Debbie Hale is the Executive Director of the Transportation Agency for Monterey County, a regional transportation planning agency in California. She is a former chair of the APWA Transportation Committee, and was recently named the 2016 APWA Professional Manager, Transportation. She can be reached at (831) 596-4542 or debbie@tamcmonterey.org.**
Keeping diversity in the forefront of public works

Lori Daiber
Business Development Manager
Civil Design, Inc., Granite City, Illinois
Member, APWA Diversity Committee

The APWA National Diversity Committee was formed to provide insight and resources to our chapters, branches and members. Our committee members are featured in the December 2015 issue of the APWA Reporter. The article highlights the diverse background of each member and their commitment to the success of the committee.

Members of the Diversity Committee may serve up to a three-year term unless other opportunities in their career field preclude them from fulfilling their term. I can honestly say, it has been an honor to serve with the talented members across our nation to ensure that our organization is diligent in keeping diversity in the forefront of our public works.

Over the past year it has been a top priority to keep our members aware of the Toolbox that is managed by the Diversity Committee. You can find a wealth of information to assist cities, municipalities, public works departments and members, and also educational tools for successful inclusion within public works departments in the Toolbox. The Diversity Committee members have contributed presentations and written articles that use their years of experience and research for the purpose of educating other members across the nation. Some of the presentations available to our members in the Toolbox include “Creating Solutions by Embracing Diversity,” “Progressive Women in Public Works,” and “Bridging the Generations” and can be found at http://www.apwa.net/discover/Diversity/Diversity-Toolbox.

The Public Works Expo is coming to Minneapolis, Minn., August 28-31! If you have never been to the Expo, pack your bags for an educational conference of networking and camaraderie with neighboring public works departments.

On Sunday you will find our Diversity Committee members welcoming the first timers for breakfast and then off to the educational sessions.

Join us on Tuesday, shortly after the General Session, for the annual Diversity Brunch. Our guest speaker will be Ms. Vicki LaRose, President of Civil Design, Inc. Vicki is the president and owner of a WBE/DBE company she formed in her basement in St. Louis, Mo., and has grown to 52 team members with four offices in three states. Hear how Ms. LaRose also formed a 501(c)3 charitable foundation to help build stronger communities in our surrounding municipalities.

Looking forward to seeing you at the Expo!

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

Walter Veselka, P.E., PWLF, Public Works Director, City of Bristol, Conn., and Tim Webb, Public Works Director, Town of Ellington, Conn., were recently honored with an award for their efforts to bring convention business to the State of Connecticut and the City of Hartford. Veselka and Webb, Co-Chairs of the New England Chapter’s 2016 Snow Conference Host Committee, were presented the “2016 Bring It Home Award” on April 27 for bringing the 2016 North American Snow Conference (which took place May 22-25) to the Connecticut Convention Center in Hartford. From Left to right: H. Scott Phelps, President of the Connecticut Convention & Sports Bureau; Charles B. Beckman, M.D., of Guilford; Eugene P. Doris of Fairfield; Carolyn M. Thomas of Hartford; Africka S. Hinds of Hartford; Walter E. Veselka of Bristol; Tim Webb of Ellington; and Paul O. Robertson, Chair of the Connecticut Convention & Sports Bureau.
Recognize Your Leaders

Nominator's Name: Steven Thigpen
Candidate's Name: Eric Adams
Candidate's Title: Transportation Engineering Manager
Candidate's Agency/Organization: Charleston County Transportation Development
Candidate's City/State: North Charleston, South Carolina

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

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

Please describe the reason that the candidate is being considered for recognition.
Eric strives to improve the department by recommending new programs. Eric was the driving force to introduce pervious pavement for projects in areas of limited ROW.

How was the candidate's leadership ideas/actions brought to the forefront?
Eric is a self-motivated employee. When he encounters an obstacle with a project or process, he looks at how to overcome that obstacle or make the process better.

Who did the candidate work with to help bring this idea/action forward?
Eric worked with his peers to determine if the pervious pavement concept was needed for the department’s projects. He vetted the process change with his peers prior to presenting the idea to management for approval and implementation.

Did the candidate experience any challenges when trying to implement this?
There are always challenges with introducing a new process. Obtaining “buy-in” from elected officials and determining the locations where construction challenges exist have been the biggest obstacles. Eric worked hard to overcome these obstacles.

Are there steps/processes that, when looking back, the candidate could have done differently to make this idea/action even more successful (lessons learned)?
What makes Eric such a valued employee is that he thinks about the steps ahead of time and goes the extra mile to involve all stakeholders. The “bugs” usually have been resolved prior to implementation.

E-mail submissions to bstein@apwa.net
EDUCATION CALENDAR

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

2016

- **July 18-21**: CSM, CPII and CPFP Certification Exams (computer-based testing)
- **August 28-31**: 2016 PWX, Minneapolis Convention Center, Minneapolis, MN
- **September 19-22**: CSM, CPII and CPFP Certification Exams (computer-based testing)
- **November 14-17**: CSM, CPII and CPFP Certification Exams (computer-based testing)

2017

- **April 23-26**: 2017 North American Snow Conference, Iowa Events Center, Des Moines, IA

**= 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/
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Small shifts in deeply held beliefs and values massively alter societal behavior and results—in fact, may be the only things that ever have.

– Dee Hock, founder and former CEO, Visa

**Pigs and Bugs**

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

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

From sewer pipes to engine compartments to signal cabinets, public works people have plenty of hard-to-reach places to look after. Finding better ways to see what is going on and fix problems in these places would reduce a lot of aggravation.

Putting devices in pipes to send video images and ream out blockages, for example, is now common practice but “pigging,” as it is often called, is limited to larger diameter pipes. (The term seems to derive from the squealing sound as early devices went through the pipelines.) But perhaps one day another animal may come to mind.

Cockroaches have some remarkable abilities. As many an apartment dweller can attest, these insects can make their way into the most confined spaces, seemingly spread through walls and floors, and scuttle quickly out of sight when pursued.

Scientists have observed that cockroaches—besides being able to climb up walls, race along ceilings, and swing quickly under ledges—are able to compress their bodies to pass into and through horizontal spaces narrower than a quarter of their height in less than a second. Once inside a vertically-confined space, cockroaches are slowed down but can still move rapidly—20 body lengths per second, about 1.3 mph—by using the friction of their outstretched legs to crawl along. The creatures can tolerate compressive forces of 300 times their body weight to squeeze through these spaces. (Note to self: Do not try to beat a cockroach in a limbo dance contest!)

Scientists at the University of California at Berkeley, inspired by the cockroach, designed a soft-bodied, six-legged “compressible robot with articulated mechanisms” (CRAM). They fabricated their design using “smart composite microstructure (SCM)” manufacturing techniques that included laser-cutting, lamination, and the folding of composite plates to form an exoskeleton. (SCM techniques have been used by a number of researchers to create other biologically-inspired robots that can, for example, crawl like an inchworm, fly like a hummingbird, or jump like a flea.)

Creators of the cockroach robot have in mind applications such as a search-and-rescue aid to finding people trapped in the debris of buildings damaged by an earthquake or explosion. The bugbots could also be useful for monitoring environmental conditions in confined spaces. Many small robots developed so far require electronic or pneumatic tethers to deliver power and control signals, but the California researchers have made a palm-sized device that is completely self-contained. If the scientists can outfit their devices with proper tools, swarms of tiny mechanical roaches or other creatures might someday be part of the public works toolkit for unblocking stormwater inlets, pulling cable, replacing fan belts, and dozens of other tasks requiring work in confined, hard-to-reach places.

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.
"Whether I’m training a Special Forces driver in tactical roadway maneuvers, or my son how to drive, I need to know my students can hear me. I choose to train on asphalt roads because they produce less pavement-tire noise, guaranteeing I’m heard, even when my son pretends he isn’t listening. That matters."

–Guy Frank | Tactical Driving Instructor | Dad

A QUIET RIDE
It’s just one of the ways asphalt delivers drivability.
Some people will tell you that liquids are the most important innovation in winter maintenance in the past two decades. That is both true and not true, but before we get too Zen about it all let’s consider why liquids are not really that new after all.

When rock salt is applied to the road, before it can bring about any benefit it must go into solution. It is only when the solid salt (or some of it) has dissolved that it can lower the freezing point of the snow or ice on the road. And the salt goes into solution in some of that snow or ice, so somewhere in the snow, the ice, and the salt there has to be some liquid to get the whole freeze-point-lowering process going.

What this means is that whenever rock salt has been used on roads for winter maintenance, it has had to be a liquid as part of the process. So, liquids have been a part of winter maintenance ever since folk first started using rock salt in winter maintenance.

Now some people might say that is being just a little picky, and they would probably be right, but this does illustrate a very important point about chemical usage in winter maintenance. The solid chemical, whatever it is, and it is most likely rock salt, has to become a liquid to work.

And that raises another issue—what do we mean by rock salt “working”? What exactly do we intend for the rock salt to do when we put it on the road? You might think that the purpose of putting the salt on the road is to melt the snow and ice on the road, but if you think that you are not quite correct.

In fact, the purpose of putting any chemicals on the road, whether solid or liquid, is to prevent (or, if needed, to break) the bond between the snow and/or ice and the pavement. If the snow or ice freezes to the pavement, it is much harder to plow off than if it is separated from the pavement by a thin liquid layer. We can create that liquid layer by applying the chemical in a liquid form initially, or by applying solid salt and ensuring there is enough liquid around to allow that solid salt to go into solution and create a liquid that way.

Note that we do not use the chemicals, whether liquid or solid, primarily to melt the snow and ice. Now you may know some folk who do use chemicals to melt the snow and ice—it is a practice that is known as “chemical plowing” and it is extraordinarily wasteful of material. It takes a lot of salt (or any other chemical) to melt a little bit of snow or ice. It is much better to remove the snow and ice by plowing it off than by “chemical plowing.” Better in what way? Well, because you use much less material if you are focused solely on breaking or preventing the bond between the snow and the pavement than if you are trying to melt...
all the snow on the pavement, you will save substantial money and you will also have a greatly reduced impact on the environment.

With that preamble out of the way, let’s talk now about how we do use liquids in winter maintenance. Our goal in using such “freeze point depressant materials,” as the various liquids and rock salt are known, is to prevent the bond from forming or break the bond if it has already formed. The first of these approaches is known as anti-icing, while the second is deicing.

One of the ways in which we can use liquids most effectively is to place them on the road prior to a storm. This pre-treatment of the pavement (which creates lines on the road, sometimes referred to as “safety stripes”—see Figure 1) serves as a pavement prophylactic to prevent that bond from forming.

Anti-icing is both effective and efficient. It prevents the bond from forming and allows plowing to be
much more effective as a result. And it does this using significantly less material than deicing would. According to some studies, by using anti-icing an agency would be able to achieve their levels of service using about a quarter to a fifth of the materials they would use if they were deicing, over the course of the whole storm.

The key part of anti-icing is getting material onto the pavement before the storm begins. Obviously liquid is very effective in this role, since it will not be dispersed very quickly by passing traffic. However, in some circumstances, liquids are not ideal. For example, if a storm is going to begin with rain and then turn to snow, there is a good likelihood that any liquid placed on the road would be washed off the road very quickly. In such cases, pre-wet solid material, as opposed to direct liquid application, is the best method of anti-icing.

So, let’s talk about pre-wetting materials. What this means is adding a liquid brine to a solid material. Typically the solid material is rock salt, although some folk will pre-wet sand or abrasives too. You can pre-wet in three ways. You can add a liquid to the stockpile of solid material, you can add liquid to a whole load of material in the back of the truck (using a shower type of system) or you can add liquid on the truck, either at the spinner or the auger.

These three methods of adding liquids each have benefits and drawbacks. Adding material to the stockpile means you do not need to have storage for the liquid onsite although it must be mixed with the solid material thoroughly. You can only add so much liquid to the stockpile before it starts to leach out of the stockpile—depending on the liquid being added this is typically about five gallons a ton of dry material although it may be as much as eight gallons in a few cases.

Adding liquids to the truck load means you do not need liquid storage on the truck (so too does treating the stockpile) but you will need liquid storage onsite and the ability to apply that liquid through some sort of shower system. The truckload method has two drawbacks. First, you do not treat the material in the truck evenly—the top of the load gets soaked, while the bottom of the load may get very little liquid. Second, once a load has been treated you cannot untreat it, so it needs to be handled carefully if you do not use the full load during the storm. You will have to unload it to a special location that can handle any liquid leaching from the material. What often and regrettably may happen is that instead of putting the treated load in a special location, there is a tendency to use the load and bring the truck back empty, whether the roads need the application of material or not. In other words, this method of pre-wetting may encourage over-application of materials which is both expensive and potentially harmful to the environment.

The third method of pre-wetting, adding liquid on the truck either at the auger or the spinner, requires both storage capacity for liquids at the maintenance facility, and also storage and delivery equipment for liquids on the truck. The benefit of this is that the solid material gets pre-wet at the best possible time (just before deployment). Additionally, the amount of liquid added to the material can be adjusted to achieve optimal results for a given road and weather situation. While typically pre-wetting is done at a rate of about 6 to 10 gallons of liquid per ton of material, some agencies have used rates as high as 70 gallons of liquid per ton and have gotten excellent performance with those rates.

Having touched on the “how” of pre-wetting, let’s talk about the why. Studies by the Michigan DOT back in the 1970s showed that pre-wetting allowed much more material to remain on the road when it was applied pre-wet as opposed to when it was applied dry. Results of that work, and many other studies over the years, have shown that if you pre-wet your solid material, you can apply at rates up to 30% less than your dry application rates and get the same or better performance. A 30% reduction in your salt requirements should be attractive enough to encourage you to examine this further if you are not already doing it!

There is lots more that can be said about liquids, and many of these factors will appear in other parts of the toolbox, but for now it is worth remembering three things: when they are working, all ice control materials, including rock salt, are liquids (in solution); anti-icing, which includes direct application of liquids before a storm (think “safety stripes”) can allow you to achieve levels of service with about a quarter of the salt you would use to get there in other, more reactive, ways; and pre-wetting solid salt allows you to reduce your salt application rates by up to 30% and still get the same end result you want. Put another way, liquids are a great part of your toolbox and if you do not use them yet, you will likely benefit substantially by starting to!

Wilfrid Nixon can be reached at (703) 549-4648 or wilf@saltinstitute.org.
The Board members of the International Federation of Municipal Engineering (IFME) were invited to visit the Municipality of Køge, Denmark to understand municipalities’ economic development drive within a modern European municipality.

The Members were ably assisted in this understanding by Torben Nohr, a past IFME board member, who is the Technical and Environmental Director of the Municipality of Køge. Torben gave a number of presentations and an escorted site tour.

The ambitious strategy is to substantially enhance the existing Køge area and increase its relevance and importance to Denmark overall within a 23 billion Krona (£2.3Bn) investment over 20 years.

The economic development is spearheaded through the redevelopment of the existing harbour area, enhanced residential and transport infrastructure provision as well as commercial, education and health provision upgrades. This tremendous development is anticipated to generate growth by adding 10,000 new jobs and welfare to the entire local area.

The Municipality of Køge is strategically located just south of Copenhagen for efficient and effective transport links within Denmark but also to wider northern Europe. Therefore, it was argued over many years, that developing the port and related infrastructure will enhance the greater Zealand area’s prospects.

A key ambition of Køge is to expand the present population of 59,285 to 63,000 by 2025 thereby taking advantage of the way Køge is considered for future commercial decisions.

The range of projects, with an estimated budget of 23 billion Krona (£2.3Bn), are initiated in conjunction by contributions from the state, regional and municipal authorities and in close cooperation with private and public partners consisting of:

- New commercial port
- Expansion of the Scandinavian Transport Hub
- New University Hospital of Køge
- New railroad – Copenhagen to Ringstead, now via Køge
- Expansion of the Køge–Bugt Motorway
- New urban area, Køge Kyst (Køge coast – the harbour area)
- New urban area in Køge North
- New educational centre campus Køge

A major advantage is that the Municipality of Køge has ownership of the developable land and as such directs what is to be constructed there for the greater benefit of the community. Additional land that is required to develop the industrial areas was purchased by the Municipality for enhancing development control. The existing port facilities are being redeveloped to residential and commercial areas.

New urban area Køge Kyst (Køge coast – the harbour area)

Køge Municipality identified a new town area, referred to as Køge Kyst, which is located between the historic city centre and the waterfront, and mostly used as in industrial area. Køge was historically planned as a new town and this aspect is considered when deriving the new urban layout which extends to some 240,000 m². The focus is on retaining the existing town centre by increasing population density rather than expanding into sprawl over farmlands and connecting the centre to the waterfront.

The Køge Kyst development consists of three distinct areas: the Station Area; the South Harbour; and the Collstrop Site. Key requirements for each site varied, for instance:

- **Station Area** – coherent pedestrian area, accommodate larger volume
The Køge Kyst development consists of three distinct areas: the Station Area; the South Harbour; and the Collstrop Site.

The Køge Kyst development consists of three distinct areas: the Station Area; the South Harbour; and the Collstrop Site.

retail stores on the ground floor, roof gardens offices and homes on top, three-floor development.

• South Harbour – open blocks with variations in shape and façade, preservation of some existing buildings, three to seven floors.

• Collstrop Site – business park adjacent to the station, pedestrian streets between station and the port, five to seven floors.

In the South Harbour development, the blocked layout was selected as it addresses a range of urban benefits such as integrating parking, provides shelter from wind, and enhances the community benefits associated with higher density housing whilst maintaining a feeling of quality.

The Municipality considered that it was critically important that the Køge area should have an entirely different character and role. Consequently a range of social activities such as an outdoor movie theatre, raised herbal allotments and a barbecue area were successfully introduced to the South Harbour area which ironically is the current industrial port area.

The land forming the Collstrop and Station strips is land the Municipality has control over and has been predominantly used for surface car parking. However, by setting requirements of retaining and enhancing car parking through the development contract, underground car parking can be positioned to retain (possibly enhance) existing parking capacity as well as providing all the anticipated offices, shops and residencies on that land. This is another example of a municipality achieving added land value.

Accordingly, the contract states that parking must be tentatively distributed as follows: 20% parking at ground level; 30% in multi-story car parks; and 50% in underground car parks. Parking norms must be assessed in light of the close proximity to the station and the possibilities of using parking spaces for both residential and non-residential users. Having just recently introduced car parking charges, the parking solutions are assumed to be economically neutral to Køge Kyst thus reflecting the recovery of the construction costs.

The Køge Kyst development’s close proximity permits easy walking connection routes to Køge centre and is reflected in the development’s parking allocation. The road widths are not standard and are agreed individually as each section is developed.

Importantly, to connect and enhance the new development’s function, a range of new connections over the existing main road and railway lines is required. This is done by constructing a number of bridges and underpasses.

The intention is to make Køge one of the most attractive residential and business towns in the region. The new development consists of 1,500 new residences, 100 new shops and approximately 4,000 new jobs within the office area for knowledge, service and creative professionals. This area is to be developed over the next 20-25 years.

The Municipality of Køge entered into an agreement with Realdania Arealudvikling to raise the town development project on a mutual vision. The development plan was
the result of an interdisciplinary, international design competition. As the master-planned development is taken forward, stages will be sold off to investors and developers to construct. The Station area is the first stage and constructed started in 2014.

The Køge Municipality considered it very important to generate a change of activity and life to the Køge Kyst area before development commences; therefore citizens and partners have introduced a range of community activities such as outdoor cinema, allotments and picnic areas in a trial project they entitled “Life before town – Town for Life.”

**New urban area in Køge North**

An additional 80 Ha urban area is being developed north of Køge centre which consists of housing, offices and industry. This is taking advantage of the transport hub and the new Køge North railway station proximity and will evolve into an industrial city for Køge companies, transportation and logistics. Housing construction commences in 2017. The Køge North railway station and surrounding area are expected to accommodate 2,700 park and travel spaces, 6,000-7,000 workplaces and 800-1,000 homes.

**The new and redirected railroad**

Copenhagen–Køge–Ringstead railroad is being constructed by Banedanmark. This is a dual track railroad high-speed route designed for 250Km/m trains with 20 minute journey times to Copenhagen (today: 38 minutes) and direct international connections to Hamburg and the rest of Europe. This railroad is due to open in 2018.

This new 60Km railroad will relieve existing rail pressure on the existing Copenhagen–Ringstead via Roskilde route which is currently one of the most-used stretches in Denmark. With the new railroad comes a new station, Køge North, the subject of an architectural competition. It is located near the STC and includes a park-and-ride facility which facilitates easy transfer from car to train by being located near the motorway.

**New Soil Deposit**

As a part of the strategy in managing the overall masterplan and address contaminated material issues found in the existing port, a soil deposit for contaminated soil at 40 Ha is established, which eventually should become a new modern Køge harbour. An additional 120,000m2 of clean soil

A range of social activities such as an outdoor movie theatre, raised herbal allotments and a barbecue area were successfully introduced to the South Harbour area.

The intention is to make Køge one of the most attractive residential and business towns in the region.
is shared between Køge harbour and Køge Marina. This is programmed for completion in 2020.

Modern commercial port
A new modern commercial port is currently being constructed and due for completion in 2022. This ambitious project relocates the existing port northwards, thereby making room for the new urban developments there. The new port consists of a 1200 metre quay with a water depth of 8.5 meters. This doubles the port facilities with a total new harbour area of 925,000m2.

Due to concerns relating to cancer inducing, four new wind turbines due to be located on the new quay have been deferred by local politicians long term pending completion of this investigation. On enquiry, this concern was raised in relation to frequency waves emitted by rotating turbine blades. IFME board members asked to be updated on the outcome of this university research project.

The expansion of the Køge–Bugs Motorway system is considered critical to the area. This carries about 100,000 vehicles per day, resulting in extensive traffic congestion. The existing motorway is being expanded from six to eight lanes wide. In addition, it includes a four-metre noise screen and sound-reducing road surface to lessen noise nuisances for motorway neighbours. This work is due to open in stages in 2016 and 2018. The IFME members witnessed this ongoing construction work during their journeys. This motorway was last expanded in 2008 with the addition of an extra lane confirming the ongoing development of this area.

STC expansion
The expansion of the Scandinavian Transport Centre (STC) is the fastest growing industrial area in Northern Europe—and one of Zealand’s largest combined business and transport parks. Uniquely located close to three motorways, rail connections and a harbour, STC has dynamically expanded since 2001 and the current 1,300,000m2 is to be expanded by 500,000m2 to meet demand. Care is taken to screen the area with trees and bushes and this manages new building heights.

This industrial enterprise has driven the economic development of the Køge area. Contrary to traditional industry, STC has maintained a positive growth in occupation and production value, resulting in the community of Køge taking a proactive approach in meeting related challenges. Currently more than 1,000 people work at the transport centre.

New University Hospital
The New University Hospital’s construction is comprised of 176,435m2 floor space and over 11 floors with 900 beds. In addition, this hospital will provide for 4,000-5,000 new local jobs. The construction of this project is already committed with work starting in 2015 with completion expected in 2020.

New Educational Central Campus Køge
Eleven schools, 6,000-plus students, and 700 employees will be part of a development over the next 5-10 years.

Plans for a new football stadium have not progressed pending a private benefactor.

As the extensive projects take shape towards 2020, the Køge area will have an entirely different character and role.

CO₂ emissions in Køge Municipality
Køge community used 480,900 tonnes of CO₂ in 2008. The target is to reduce this by 20% by 2020.

To assist achieving this target Køge has undertaken two projects. The first is to connect properties to the district heating scheme and the second to develop electricity through wind turbines at Køge harbour.

The district heating system is in partnership with 12 municipalities consisting of 350,000 taxpayers, 150,000 end users and provides 2,500 GWh. The intention is to connect the Køge system to the greater Copenhagen District Heating system which consists of 19 municipalities, four integrated systems, and 500,000 end users generating 9,600 GWh. This is currently programmed for completion by 2020.

The wind turbines were intended to be four turbines of 3MW each. These are 150m high with 112m rotor; however, this has been suspended pending the completion of a report following concerns raised about health concerns from the turbine frequency emissions. The IFME board will be keen to have the results of this report once it is complete.

Further information can be found at http://uk.koegekyst.dk/en.aspx.

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The summer season is here—the perfect time to stroll through the park, jog down the street, or bike to the neighborhood store. For many Americans, summertime means spending time outdoors and travelling on or along roadways.

Safer roads benefit everyone, and a simple roadway modification can potentially reduce crashes by 19 to 47 percent.

This technique is called a Road Diet and it is typically simple and inexpensive to implement. In some cases, this safety technique has even reduced the number of crashes by nearly 70 percent.

What does a Road Diet look like?
A Road Diet is a roadway reconfiguration that improves safety, convenience, and quality of life for all road users, including pedestrians, cyclists, and public transportation passengers. A popular Road Diet takes a four-lane undivided road and converts it into a two-lane road with a left-turn lane in the middle. This configuration often makes room for bicycle lanes or additional parking.

Road Diets are frequently implemented to calm traffic. Transportation departments and engineers will consider a Road Diet if a road corridor has frequent crashes, high incidents of speeding, or passes through sensitive areas, like school zones or parks.

Depending on how it is applied, a Road Diet may make it easier for pedestrians to cross the street and create room for cyclists. Additionally, Road Diets are generally inexpensive, especially when planned in conjunction with reconstruction or simple overlay projects. Although there are variations, such as pedestrian refuge islands and roundabouts, the Road Diet itself normally consists primarily of restriping (or repainting) roadways.

Road Diets are extremely successful. Two excellent Road Diet examples are found in Reston, Virginia, on Lawyers Road and Soapstone Drive. These particular Road Diets have reduced crashes by nearly 70 percent since their implementation in 2009 and 2011.

The two projects both took away one lane in each direction and added a center turn lane. These two Road Diets in Reston were so successful that in late 2015 they received a National Roadway Safety Award for Infrastructure and Operational Improvements.
Randy Dittberner, a Regional Traffic Engineer at the Virginia Department of Transportation (VDOT), led the effort in developing these Road Diets. In a recent interview with the Office of Safety, Randy stated, “If you build a Road Diet with a paving project, it can be done at almost no cost. There are huge safety and livability benefits, as well as ‘extras’ like bike accommodations. Why wouldn’t you want to apply a Road Diet when there are so many benefits?”

Gaining public support
Public outreach is a critical part of a Road Diet implementation plan. The term Road Diet can be misinterpreted to imply more congestion. Public outreach is a critical part of countering this misconception. In many cases, Road Diets can be implemented without restricting the flow of traffic.

In the Reston projects, the VDOT team led efforts to clearly explain to the public how a Road Diet could improve their community. Travelers found comfort in knowing that this effort was not an attempt to impose travel restrictions but rather a roadway safety solution for all road users.

Agencies should focus on promoting the increased safety and livability benefits when conducting outreach with the public.

Decreasing the number of road lanes reduces pedestrian exposure to traffic when crossing the street, and the extra space can be used to add pedestrian refuge islands.

For bicyclists, Road Diets can provide an opportunity to add bicycle lanes that are separate from motor vehicle lanes, which can be appealing to local bicyclists. Transit users can look forward to safer commuter stops that do not hinder the flow of traffic.

Location is paramount
Although the benefits to pedestrians and bicyclists are apparent, engineers and public works officials should be sure to consider whether a Road Diet is the best solution for a specific area’s traffic flow and capacity.

A Road Diet is not a solution for all roads. Generally, roads with an especially high traffic volume are not ideal locations for a Road Diet. However, when installed in the right location, Road Diets have little to no impact on traffic flow. In some cases, a four-lane undivided road already operates as a de facto three-lane roadway due to turning movements and driver behavior, so roadway vehicle capacity can often be maintained.

To find out if a Road Diet is right for your area and to learn more about the history of Road Diets, go online to the Office of Safety website and download our Road Diet Informational Guide (http://safety.fhwa.dot.gov/road_diets/info_guide/) today.

To learn more about Road Diets use cases and scenarios, download the Road Diet Case Studies Guide: http://safety.fhwa.dot.gov/road_diets/case_studies/roaddiet_cs.pdf.

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Top Eight Reasons to go on a Road Diet

1. Reduce crashes by 19 to 47 percent
2. Decrease speed and calm traffic
3. Reduce rear-end and left-turn crashes with a dedicated left-turn lane
4. Make it easier for pedestrians to cross the street with pedestrian refuge islands and/or wider sidewalks
5. Open an opportunity to install bicycle lanes
6. Create space for on-street parking or transit stops
7. Improve livability with a more community-focused, “Complete Streets” environment
8. Budget friendly, especially when planned with simple overlay projects or combined with other road projects
Making our local roads safer through Local Road Safety Planning

**Rosemarie Anderson,** Local and Rural Road Program Manager, Office of Safety, Federal Highway Administration, Washington, D.C., and member, APWA Road Safety Subcommittee; **Matthew Enders,** P.E., Local Programs Technical Services Manager, Washington State Department of Transportation, Olympia, Washington

Many state departments of transportation (DOT) have embarked on a comprehensive approach to the development of local road safety plans whereas in other states the local agencies are taking the initiative to develop their own plans and have experienced changes in their road safety programs. Washington State DOT (WSDOT) has taken a hybrid approach with both the state DOT and local agencies involvement resulting in local agencies receiving over $25 million per year in Highway Safety Improvement Program (HSIP) funds for safety projects.

**What are Local Road Safety Plans?**

With the passage of the transportation legislation in 2005, the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), safety was established as a new core funding program through the new HSIP. Subsequent transportation legislation, the Moving Ahead for Progress in the 21st Century Act (MAP-21) and currently the Fixing America’s Surface Transportation Act (FAST Act), continue these provisions. The HSIP is structured and funded to make significant progress in reducing highway fatalities and requires states to develop a Strategic Highway Safety Plan (SHSP), focusing on results. The SHSPs are statewide-coordinated safety plans that provide a comprehensive data-driven framework for reducing highway fatalities and serious injuries on all public roads. Local Road Safety Plans (LRSPs) are based on the same concept as the state SHSPs.

The State SHSP can assist local practitioners in addressing safety on local roads, but a locally-focused plan is often needed to address the unique conditions in each community. Local road practitioners across the country play a critical role in addressing crash risks at the local level and may be able to identify the specific or unique conditions that contribute to crashes in their jurisdictions which result in fatalities and serious injuries. An LRSP

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6 Steps of the LRSP Development Process
(Source: FHWA Office of Safety)

1. Establish Leadership
2. Analyze Safety Data
3. Determine Emphasis Areas
4. Identify Strategies
5. Prioritize and Incorporate
6. Evaluate and Update
offers a foundation for consensus and focus. It defines key emphasis areas and strategies that impact local roads and provides a framework to proactively accomplish safety enhancements to save lives in local communities.

In general, the success of an LRSP is dependent on critical components including the following:

• Having a champion: A champion advocates for the LRSP and gathers support to assist in its implementation.

• Developing a clear vision and mission: A strategic vision and mission unite all stakeholders with a common goal.

• Assembling collaborative partners: Partners collaborate to implement the plan.

• Allocating appropriate resources: Manpower and management are essential for ensuring a plan’s success.

• Establishing open communication: The LRSP owners should foster open and frequent communication with stakeholders, community partners, and citizens as they develop and implement the plan.

Washington State Experience

Why LRSPs? Since 2009, counties applying for HSIP funds in Washington have been required to implement low-cost, widespread safety improvements. Since then, all 39 counties have participated and have been awarded HSIP funds for the implementation of safety projects. Counties were allowed to identify which countermeasures were implemented and where they were implemented, but they must address fatal and serious injury crash types using proven countermeasures. The counties were also responsible for the identification of priority locations using the risk-based approach to safety.

In 2014, WSDOT required county governments to develop an LRSP to apply for HSIP funds for safety projects. This was to ensure a data-driven approach to the location identification process in order to maximize the benefits from the HSIP investment.

The Process. WSDOT did not fund the development of the LRSPs; however, the counties were provided
with training, technical assistance, and data summaries to assist with the development process. Counties were provided with summary data to help them prioritize crash types, roadway characteristics, and conditions that were prevalent in fatal and serious injury crashes. Included in the data summaries were comparisons to all county roads and all statewide roads. Roadway factors with higher crash occurrences were highlighted for further investigation.

Workshops were held to share the requirements of the LRSP and provide practitioners with tools and resources. LRSP development instructions included:

- Use of existing resources without additional data collection
- Utilize existing databases along with local knowledge and engineering judgment
- Qualitative values could be applied to key roadway characteristics with no data (good/fair/poor) for ranking purposes
- LRSP should be customized for each individual county’s needs

Additionally, counties were provided with resources, such as the Systemic Safety Project Selection Tool and the state SHSP recommended countermeasures.

After the workshops, training specific to the Systemic Safety Project Selection Tool was made available to counties. This provided counties with more knowledge and understanding of how to use the tool to complete a systemic safety analysis. In addition, technical assistance was provided for any county that requested assistance in the development or review of the LRSP and HSIP application.

**Successes/Challenges.** With 80 percent of counties in Washington developing and submitting an LRSP with their own resources the program has been a success. By creating their own plans, counties became invested in the process and became more aware of safety issues. HSIP funding was directed to high priority locations around the county road system. Several factors contributed to the success:

- Counties had prior experience with the HSIP process—all 39 counties had previously delivered HSIP projects
- Training and technical assistance provided: Safety Data Analysis and LRSP workshops; LRSP and HSIP application review and development

The program was not without challenges and WSDOT and counties are working to address them. Main challenges:

- Lack of example plans to guide the LRSP development process
- Counties had to invest their own time and resources to develop LRSP to access HSIP funds

**Lessons Learned.** A review of the program and county-based survey provided the following:

- Providing the counties a template for the development of LRSPs will be beneficial to the process. The best LRSPs will be shared with counties to use as a template.
- Additional helpful data elements were identified during the statewide workshops. These will be incorporated into the data summaries for the next round.

- Quality HSIP projects were selected as a result of the LRSP effort.
- For the most part, the process will remain consistent with the 2014 process. Counties indicated they would submit an application again if the process remained the same.

**Resources**

Various organizations and agencies may be able to assist in the creation of an LRSP: Local Technical Assistance Program (LTAP) Center; Regional Planning Organization; State DOT. Additionally, FHWA Office of Safety developed Developing Safety Plans: A Manual for Local Road Owners, an easy-to-read, step-by-step guide to developing LRSPs with templates, tables, and additional resources. The manual can be accessed for download: http://safety.fhwa.dot.gov/local_rural/training/fhwasa12017/. Hard copies are also available.

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Acronyms are a favorite means of shortening our communication, especially in public works. These new acronyms are preparing to change our world in many ways, so it’s important to understand what they mean:

- **V2V** – vehicle to vehicle communication
- **V2I** – vehicle to infrastructure communication
- **I2V** – infrastructure to vehicle communication

**V2V** – Auto manufacturers already have vehicles on the road that “communicate” with each other in the form of blind spot monitors and adaptive cruise control.

**V2I or I2V** – Auto manufacturers have started developing applications to install in their future vehicles that will be able to communicate with the roadside infrastructure. Important to note, this communication will be two-way with the vehicle telling the roadside basic information about itself and the roadside telling the vehicle about its location, roadway configuration, traffic signal timing and other important geometric information. I believe the infrastructure will eventually have more data to share with the vehicle than the vehicle will ever have to share with the roadside.

I recently attended the V2I DC meeting in Detroit where we spent part of one day in a demonstration of the four technologies the V2I DC has decided to deploy first. These four technologies are: (1) construction zone speed warning; (2) lane closure warning; (3) red light signal warning; and (4) curve speed warning. They were picked because of their positive impact on safety. In the demonstration, all four were operational and quite impressive in providing effective warnings to the drivers and their passengers. Of these, the first two are for use in construction zones, the third is intersection control, and the fourth is for sharp curves.

Construction zones are inherently dangerous for the workers and the drivers. These two technologies function to get the attention of the distracted or inattentive driver and either get them to slow down or change lanes due to upcoming conditions.

This will benefit both workers and drivers and should result in fewer work zone accidents. The speed warning has an interesting feature. If the driver slows down initially to obey the limit and then speeds up again, it will reactivate and warn the driver again. An aspect of these that is still being discussed is who should own, operate and maintain these construction zone warnings. Cases can be made for the contractor, construction observer/inspector, and owner with significant pros and cons for each. Stay tuned for a future decision on these.

Intersections are dangerous because of the vehicle conflicts and stopping and starting which result in crashes each year. At the V2I DC meeting, the demonstrated red light signal warning provided a countdown on the screen in the vehicle until the light would be red. According to the presenters, this warning will also be able to activate, when approaching cross traffic is moving at a speed such that they will run their red signal, to warn the vehicle with the green light to slow and avoid the collision, although this wasn’t demonstrated at this time. It is anticipated this will be the least costly to begin installing since many traffic signals already have communication equipment in them for emergency vehicle activation, camera detection, and others.

The curve speed warning is anticipated to reduce vehicles leaving the road especially on more rural routes with...
sharp curves. The demonstration of this technology shows a visual warning of the maximum curve speed ahead to the driver as the vehicle approaches the curve. The interesting part of this application is that the vehicle computer calculates the safe speed for that particular vehicle to go through the curve based on the sharpness of the curve, the friction coefficient of the pavement, the pavement wetness or weather factor, and the vehicle characteristics (tire tread, overturning aptitude, vehicle weight, etc.). This also requires significant engineering work to calculate and be able to justify values transmitted to the vehicle by the agency installing this device. The OEM application then has to communicate a reasonable speed for the driver to use as guidance when entering the curve. I foresee significant discussion among these agencies while deciding how much risk they are willing to take on when providing this information to the passing vehicle.

So you say, how do I get involved or start this process in my community? I am glad you asked. The V2I DC is recommending a goal of at least one agency in all 50 states have an initial series of 20 intersections equipped with V2I in the next two to three years. This will allow some data collection to verify how well it works and that vehicles can operate across multiple states successfully. Why so soon you ask? The ambitious timeline is a result of Cadillac planning to roll out new vehicles this fall with V2I equipment in them and many, if not all, other manufacturers planning to have them in their vehicles by 2020. It makes perfect sense for the vehicles to have the equipment and infrastructure to talk to, so let’s see some implementation by the infrastructure experts.

So where do you learn about this technology? Hopefully by the time you read this the U.S. Department of Transportation will have issued the V2I Deployment Guidance for everyone’s use. In addition, there are multiple webinars available on the Federal Highway Administration website. There are pilot programs starting in Wyoming; Tampa, Florida; and New York City in addition to a V2V pilot program in Ann Arbor, Michigan. The Wyoming DOT is establishing their program on I-80 working with trucking companies to alert their drivers to weather and road conditions. For an example of what they are trying to prevent, you can look for the April 16, 2016 Blizzard YouTube video (I-80 Crash as it Happens by Joshua Scheer dated 4/17/16) and you will understand immediately the importance of this technology and why they are working on it.

In addition, the U.S. DOT’s FAST Act, which recently became law, has two grant programs available which you may be interested in at http://www.fhwa.dot.gov/pressroom/fhwa1615.cfm and http://www.fhwa.dot.gov/pressroom/fhwa1616.cfm. Another program available is the Connected Vehicle Pilot (CVP) Deployment Program at http://www.its.dot.gov/pilots/index.htm#sthash.aFHWMRoX.dpuf.

The APWA Transportation Committee is interested in your thoughts and viewpoint, so please share them with us on APWA Connect. We will also post new information there as it becomes available.

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The gas tax is running out of gas! What alternative is sustainable?

Sam Yaghmaie, P.E., LEED AP, Director, Harris & Associates, Seattle, Washington; Chair, APWA National Sustainable Transportation Subcommittee; Chair, APWA Washington Chapter Construction Management Committee

Federal motor vehicle fuel taxes have been the primary means of paying for highway maintenance and construction since 1956. The failure to increase the federal gas tax since 1993 has reduced its purchasing power by 33% and drastically undercut its ability to keep pace with rising infrastructure costs and inflation. Are you paying the same amount for goods compared to 1993? (See table below.)

Another impact that has reduced the effectiveness of gasoline tax revenue is the emergence of alternative fuel vehicles, notably plug-in hybrid, hydrogen, battery electric passenger cars and light-duty trucks that grew at a compound annual growth rate of 106% between 2010 and 2015, resulting in sales of more than $3.24 million vehicles during that period. While the impact of alternative fuel vehicles on gas-tax revenues is likely to be low in the immediate future, such vehicles will pose a greater risk in years to come as demonstrated on page 67.

Bloomberg states that electric vehicle (EV) sales worldwide reached just under half a million dollars in 2015—a 60 percent rise on the previous year. Although electric-powered cars make up only one percent of the global vehicle total at present, it is predicted that worldwide EV sales will be more than 40 million by 2040, making up approximately 35 percent of all light-duty vehicle sales.

In addition, the Environmental Protection Agency (EPA) issued new rules requiring automakers to improve the fleet average fuel economy of their new models, resulting in lesser gas consumption.

Aging infrastructure, uncertainty of the federal transportation program and Highway Trust Fund sustainability (HTF), national and international recession, inflation and political reluctance to raise the federal gas tax, have all contributed to a decline in gas tax revenues, which has emerged as a major national problem. The funding shortage to maintain and build transportation infrastructure projects is a serious challenge to public agencies nationwide. The hardship is more severe for smaller municipalities.

The recently passed $305 billion FAST Act Highway Bill offers not much of an increase over the last transportation bill, keeping us at the same funding levels of the last eight years. Unfortunately, the bill does nothing to address the broken HTF, but it does a great deal to make its financial situation worse. Under FAST, the HTF will be close to exhaustion in 2021 and will require an even larger bailout. Rather than provide billions in more bailouts, the HTF needs fundamental and lasting reform to function as a source of sustainable funding. The time to explore a new infrastructure funding source is upon us, but along this journey, other fundamental changes need to be adapted and implemented:

- We need a shift in the public’s mindset towards selecting multimodal commute options (light rail and bus rapid transit, for example).
example). Single-occupant vehicle driving is one of the key burdens on the country’s transportation infrastructure and network. The more we build and widen the corridors, the more vehicles will appear!

- New infrastructure technology and innovation has arrived, and it’s up to us to learn, adjust, and implement these new available approaches. To ensure a more sustainable and effective transportation system, transportation funding and traffic congestion measuring should be made neutral, placing all transportation modes on equal footing. Associated regulations and guidelines should have the flexibility to include multimodal solutions other than vehicle lanes, such as dedicated transit lanes; bike lanes; sidewalks; transit cutouts and stops; and/or traffic calming measures.

- We must maximize spending money on maintenance, preservation, and restoration of our existing transportation infrastructure—not on building new roads. Building new infrastructure uses most of the available (and not enough) revenue for structures that we can’t even afford to maintain for the long term. Earmarks, competitive grant programs and other political distributions of funds have focused on building new, often unnecessary, projects rather than maintaining the infrastructure we already have. This occurs despite the fact that maintenance projects often require less funds compared to new projects.

- We must change our finance policies to allow less bonding of the revenue stream. By not over-bonding revenue streams, we will ensure that we have more available revenue to pay for future expenses. This will provide a more stable revenue stream on an ongoing basis to pay for transportation infrastructure.

- We must enforce accountability of elected and appointed officials for the long-term viability and sustainability of the investment programs, which should lead to support of transportation agencies’ “performance-based” programs.

Vehicle miles traveled (VMT) is emerging as the consensus and predominate choice for a future transportation funding mechanism. It is a funding system based on direct “user pay” charges, in the form of a charge for each mile driven. VMT is the most viable approach to effectively fund surface transportation improvements in the long run; it is based more directly on miles driven (and potentially on other factors such as time of day, type of road, and vehicle weight and fuel economy) rather than indirectly on fuel consumed. Current gas taxes can impose a larger burden, relative to income, on people who live in low-income or rural households. Even for households that do not own passenger vehicles, gas taxes impose an indirect burden because they raise public transportation costs as taxes are reflected in the prices of those purchased goods.

In implementing VMT taxes, policymakers are confronted with several questions: what are the goals of the system, which vehicles and roads to include, what methods and technology would be used to administer the system, and how should the system be introduced to the public?
As of 2012, 18 states have considered a framework to study and/or implement a VMT pilot program in order to successfully design this funding alternative in ways that: it protects users’ privacy and civil liberties; incorporates any necessary cross-subsidies (for instance, to benefit the national network or to meet social equity objectives); does not interfere with interstate commerce; accounts for inter-jurisdictional travel; analyzes urban/rural equity; considers transition from gas-tax to VMT; investigates on-vehicle technologies; and last but not least, supports carbon reduction goals.

Greater use of pricing mechanisms, such as VMT pricing zones, could also spur more efficient use of the transportation network and, by shifting demand to less congested periods of the day or to other modes, may enable more efficient investment, thus reducing the additional capacity that needs to be built.

To collect VMT fees, it’s currently the vision that an onboard vehicle device would capture the distance driven by a vehicle through GPS or other technology and relate that to a method of charging, which could involve payments at the gas pump, billing, or automatic deductions for a prepaid customer account. GPS units on board a vehicle can record distance, assign it to the appropriate taxing jurisdiction, and calculate the amount owed. Only the final billing information would have to be released outside the unit, to protect privacy.

The FAST Act Highway Bill has allocated some funds for states to continue using for such studies. Several states, most notably Oregon and California, have already experimented with, or are launching VMT pilot programs. The Oregon Department of Transportation (ODOT), which conducted a small-scale pilot program, found that a VMT system is workable, can be successfully integrated with the fuel tax, and can be paid at the pump, as now occurs with the fuel tax. The federal Department of Transportation is funding the University of Iowa for a VMT study involving drivers in a number of states. Below is a summary of significant events in evolution of the VMT funding alternative in the United States.

According to University of Virginia Miller Center of Public Affairs’ Well Within Reach report2, VMT fees “…could generate significant revenues. A fee of just one penny per mile would equal the revenue currently collected by the fuel tax; a fee of two cents per mile would generate the revenue necessary to support an appropriate level of investment over the long term.”

The potential benefits of a VMT system include significant revenue potential and stability; more equitable distribution of highway costs among drivers of different types of vehicles; the ability to optimize highway use (e.g., by charging higher fees during peak traffic times); and use of proven technology, such as GPS systems.

Oregon is actually the first state that introduced and implemented their own gas tax ($0.05/gal) in 1919! Now they are, kudos to them, on the lead to introduce and implement the VMT as an alternative but sustainable transportation funding source. It’s time for more states to join the move, or at the very least begin implementing more research and studies around VMT. We have waited long enough for funding to appear. It’s time to act.

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Notes:
1 http://ecowatch.com/2016/03/09/electric-car-revolution-bloomberg/
2 http://www.infrastructureusa.org/well-within-reach/

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
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<tr>
<td>2007</td>
<td>Oregon conducted a VMT tax pilot project.</td>
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<td>2008</td>
<td>The University of Iowa Public Policy Center began a national evaluation of VMT fees.</td>
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<td>2009</td>
<td>The National Surface Transportation Infrastructure Financing Commission released its final report, recommending VMT as a means of financing road infrastructure that would eventually replace the fuel tax.³</td>
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<td>2011</td>
<td>The U.S. Congressional Budget Office issued a report comparing the relative merits of fuel taxes, vehicle excise taxes, vehicle tire excise taxes, and hypothetical vehicle miles traveled tax.</td>
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<td>2012</td>
<td>Oregon conducted a second road user fee pilot. The pilot was completed successfully in January 2013.</td>
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<td>2013</td>
<td>Oregon passed the first legislation in the United States to establish a permanent road usage charge system for transportation funding. The law authorizes the Oregon Department of Transportation (ODOT) to set up a mileage collection system for 5,000 volunteer motorists beginning July 1, 2015. ODOT considered assessing a charge of 1.5 cents per mile for up to 5,000 volunteer cars and light commercial vehicles and issuing a gas tax refund to those participants.</td>
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<td>2016</td>
<td>The California Department of Transportation has selected four private account managers to launch a pilot program in July of 2016. The California road charge pilot will be looking for 5,000 volunteers — similar to Oregon, but will differ from the Oregon pilot in that it will only simulate payments.</td>
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For those APWA members who are not familiar with the Transportation Research Board (TRB), it is one of six major divisions of the National Research Council—a private, nonprofit institution that is the principal operating agency of the National Academies in providing services to the government, the public, and the scientific and engineering communities. TRB’s varied activities annually engage more than 7,000 engineers, scientists, and other transportation researchers and practitioners from the public and private sectors and academia, all of whom contribute their expertise in the public interest by participating on TRB committees, panels, and task forces. State transportation departments, federal agencies including the component administrations of the U.S. Department of Transportation, support the program and other organizations and individuals interested in the development of transportation. The mission of the Transportation Research Board is to provide leadership in transportation innovation and progress through research and information exchange, conducted within a setting that is objective, interdisciplinary, and multimodal.

Over 12,000 transportation professionals attended the 2016 TRB annual meeting held every January in Washington, D.C. For many years several TRB committees have focused on safety on local and rural roads. They include the Transportation Safety Management Committee, which has several subcommittees (Rural Road Safety Policy, Programming and Implementation Joint Subcommittee; and the Transportation Safety Planning, Toward Zero Deaths, School Transportation, Emergency Management, Global Safety, and Roadway Safety Cultures Subcommittees). The following activities, initiatives, and publications of interest to local road practitioners are summarized. Specific projects are normally funded through the National Cooperative Highway Research Program (NCHRP) unless otherwise indicated.

**Transportation Safety Management**

This parent standing committee is being reconstituted under its new chair, Dr. Susan Herbel. Visit the committee website for more information. [https://sites.google.com/site/trbcommitteeanb10/](https://sites.google.com/site/trbcommitteeanb10/)

One recently completed synthesis project (No. 486), “State Practices for Local Road Safety,” explores state programs and practices that address local agency road safety. The report focuses on changes in local road safety programs since the legislation of Moving Ahead for Progress in the 21st Century (MAP-21), and the use of Engineering, Enforcement, Education and Emergency Services (4E) approaches to local road safety. Three-quarters of all road miles in the United States are owned and maintained by local entities. More than half of all fatal crashes occur on rural roads, which are mostly owned by local entities. NCHRP Synthesis 486 documents the state transportation agency programs and practices that address local agency road safety. The report includes information on state program size, funding sources, and administrative procedures; and noteworthy local/state program partnerships and initiatives to improve safety. [http://www.trb.org/Publications/Blurbs/173789.aspx](http://www.trb.org/Publications/Blurbs/173789.aspx)

**Rural Road Safety Policy, Programming & Implementation Joint Subcommittee (ANB10 & AFB30)**

This mission of this joint subcommittee is to provide a focal point/forum within TRB for research-based activities and current activities related to improving rural roadway safety through policies, programming, and countermeasure implementation.

The National Center for Rural Road Safety (Safety Center) opened in December 2014. Funded by the Federal Highway Administration, this Center of Excellence is focused on enhancing safety on rural roadways by supporting local, state and tribal road owners and their stakeholders. [http://ruralsafetycenter.org/](http://ruralsafetycenter.org/)

Noteworthy Roadway Safety Practices are included in the following FHWA link. [https://rspcb.safety.fhwa.dot.gov/noteworthy/default.aspx](https://rspcb.safety.fhwa.dot.gov/noteworthy/default.aspx)

**Low-Volume Roads Committee (ABF30)**

This committee is concerned with all aspects of low-volume roads including planning, design, construction, safety, maintenance, operations, environmental and social issues.
To view the committee website visit http://sites.google.com/site/trbcommitteeafb30/.

One NCHRP synthesis project, No. 485, “Converting Paved Roads to Unpaved,” found that the practice of converting paved roads to unpaved is relatively widespread; recent road conversion projects were identified in 27 states. These are primarily rural, low-volume roads that were paved when asphalt and construction prices were low. Those asphalt roads have now aged well beyond their design service life, are rapidly deteriorating, and are both difficult and expensive to maintain. Instead, many local road agencies are converting these deteriorated paved roads to unpaved as a more sustainable solution. To view this publication visit http://www.trb.org/main/blurbs/173716.aspx.

Transportation Safety Planning Subcommittee (ANB10 (3))
Several reports were noted of interest including NCHRP Report 811: “Instituting Safety in Transportation Planning Processes: Techniques, Tactics and Strategies.” It can be viewed at http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_811.pdf.

Federal Highway Administration (FHWA)
FHWA has produced several resources for use by local officials. For more information on these publications contact Rosemarie Anderson, FHWA Office of Safety, at rosemarie.anderson@dot.gov.

- Local Elected Officials: Leading the Way in Local Road Safety Video available at http://safety.fhwa.dot.gov/local_rural/
- Local-focused safety tools and information available at http://safety.fhwa.dot.gov/local_rural/

Systemic Safety Analysis Tool
FHWA has developed the Systemic Safety Project Selection Tool. The tool includes three main components: The first is the systemic planning process, which provides step-by-step instructions and illustrative examples to identify and prioritize systemic safety improvement projects. The second element of the tool presents a mechanism for agencies to determine the appropriate balance of funding between site analysis and systemic projects. Lastly, the tool presents a mechanism to evaluate systemic safety improvements. For additional information contact Karen Scurry at Karen.scurry@dot.gov or visit http://safety.fhwa.dot.gov/systemic.

Using Intelligent Transportation Systems (ITS) on local roads has been a focus for several reports by the FHWA. They include:

- http://safety.fhwa.dot.gov/local_rural/training/fhwas14086/

Finally, the FHWA has available online its Safety Compass newsletter providing an important resource for the latest information on national, state and local issues in roadway safety. http://safety.fhwa.dot.gov/newsletter/safetycompass/

Roadway Safety Cultures Subcommittee
The current mission of the subcommittee is to provide a public forum for framing issues, identifying research needs, and disseminating research findings related to all aspects of roadway safety cultures. Through the creation of partnerships between organizations and people capable of influencing roadway safety cultures, this committee will assist in the elimination of roadway fatalities, and increase safe driving experiences, by putting roadway safety in the broader context of social change, public health, and quality of life.

Last fall the subcommittee coordinated the “2nd Annual National Roadway Safety Culture Summit” held at the TRB Keck Center in Washington, D.C. The Summit’s focus was “Moving Toward Zero Deaths through Organizational Transformation”—what this means, what it looks like, and how to make it happen. In particular, participants engaged in active dialogue addressing three key factors impacting safety culture changes in transportation organizations:

- Leadership – The role leadership plays in creating and sustaining changes in organizational safety culture
- Communications – Effective ways to foster and use all forms of communication to support organizational transformation
- Impetus for Cultural Change – The use of data and other information and events to highlight and create an impetus for change

In February 2016 the AAA Traffic Safety Foundation issued its Safety Culture Index for 2015 outlining major findings in speeding, distracted driving, etc. The report can be viewed at https://www.aaafoundation.org/sites/default/files/2015_TSCI.pdf.

A current active NCHRP project, “A Strategic Approach To Transforming Traffic Safety Culture to Reduce Deaths and Injuries,” is conducting research to develop a strategic approach that state DOTs and their traditional and
non-traditional traffic safety partner organizations can use to transform public and organizational traffic safety culture to enable sustainable improvements in traffic safety for all road users, including non-motorized users.

Other Organizational News
The Roadway Safety Foundation’s (RSF) publication Roadway Safety Guide was completed last year and can be viewed at the RSF website. This publication is a revision and rewrite of the publication produced 10 years ago. It serves as a resource for elected officials, community leaders, civic groups and all stakeholders interested in improving safety on their highways and roads. Visit http://www.e-digitaleditions.com/i/418038-roadway-safety-guide for the publication.

The RSF also developed a transportation safety clearinghouse, in partnership with the US DOT and two leading technical firms. It is a one-stop shop for everything related to older driver, pedestrian, and cyclist safety. It is user friendly and easy to navigate for all, including older adults, highway professionals, policymakers, medical professionals, and law enforcement. The Clearinghouse for Older Road User Safety (CHORUS) can be found online at www.roadsafeseniors.org.

NCHRP project 03-104 “Unsignalized Intersection Improvement Guide” is completed and can be viewed online at the Institute of Transportation Engineers (ITE) website at the following link: www.ite.org/uiig. The objective of this research was to develop a comprehensive guide to enhance the safe operation of unsignalized intersections. The guide can aid practitioners in selecting design, operational, maintenance, enforcement, and other types of treatments to improve safety, mobility and accessibility.
Involving tribes, improving road safety

Clark Merrefield, Writer and Editor, Volpe, the National Transportation Systems Center, Cambridge, Massachusetts; Melonie Barrington, Transportation Specialist, Federal Highway Administration, Washington, D.C.

State departments of transportation that are moving toward zero deaths are committed to reducing fatalities and injuries on all roads inside their state boundaries—including those that run through tribal lands. That’s important, because crashes are the leading cause of unintentional death for American Indian and Alaska Native (AI/AN) people ages 1 to 44, and states cannot achieve zero road deaths without comprehensive road safety programs.

Washington, Montana, South Dakota, and North Dakota are four states whose departments of transportation have made real connections with tribal governments, planners, law enforcement, and emergency services in developing road safety plans. State Strategic Highway Safety Plan (SHSP) updates are a prime opportunity for these states to bring together a diverse group of stakeholders, identify road safety challenges, and find solutions. Tribes are also increasingly developing their own Transportation Safety Plans, which can give them access to additional federal resources.

A first step in producing an SHSP update that accounts for tribal road safety challenges is to establish cordial and parallel government-to-government collaboration. In Washington, the Centennial Accord is the foundation of a collaborative environment for transportation and traffic safety efforts between tribes and the State of Washington. Signed in 1989, the Accord established government-to-government relations between the state and tribes, in an effort to resolve disagreements before they reached the courtroom. That framework of collaboration was applied to enhance tribal involvement in traffic safety planning.

The Centennial Accord gives state agencies a protocol for officially interacting with tribes, including having a tribal liaison. Washington transportation officials connect with tribal committees, boards, law enforcement groups, and planning organizations during SHSP updates to engage representatives from the 29 federally recognized tribes in Washington. Traffic safety boards and organizations provide a framework for communicating with tribal staff involved with the 4 E’s of highway safety: education, enforcement, engineering, and Emergency Medical Services (EMS).

Once government-to-government collaboration is established, safety summits are an effective way for state and tribal planners to share information and strengthen personal relationships. In the lead-up to the Montana Comprehensive Highway Safety Plan (CHSP) update in 2014, state and tribal representatives collaborated on and conducted four safety summits. These summits were hosted by tribes in Montana, with rotating sponsorship each year to encourage tribal ownership over road safety best practices.

Tribes also host summits and meetings in South Dakota. Meetings often include FHWA division staff, representatives from the Bureau of Indian Affairs, the South Dakota Departments of Transportation (SDDOT) and Public Safety, tribal historic preservation officers, tribal chairs and presidents, and sometimes council members.

This year, SDDOT will hold its 6th Tribal Transportation Safety Summit. The event will be hosted by the Standing Rock Sioux Tribe. The summit is an opportunity for state and tribal representatives to build relationships, and to bring together representatives from the 4 E’s.

Before South Dakota completed its most recent SHSP update in 2014, SDDOT presented its draft SHSP at the Tribal Safety Summit to get input on how to integrate tribal road safety needs into the SHSP. Tribes were eager to provide feedback, and asked if SDDOT would be at the table—to provide technical assistance, data, and answer questions—as tribes created their own transportation safety plans.

Ongoing communication and collaboration can help solve many, but not all, tribal road challenges. Data quality is a persistent challenge in...
reaching tribal road safety goals. Only one out of the four tribes in North Dakota has equipment compatible with the state’s electronic crash reporting system. The state is exploring options for improving the ability of tribes to access and use data in project planning and selection.

Data-sharing is also a challenge in Washington. State and tribal planners need crash data on tribal roads to make the case for federal and state grant money. But there are not always the staff and resources needed to process data. To help, the Washington Traffic Safety Commission funded an ongoing project that allows each tribe’s crash codes to be uploaded automatically to the state’s electronic ticketing and crash reporting system.

The benefits of involving tribes in road safety planning are numerous. In Washington, tribes gain increased awareness of the SHSP process and they take ownership of the final SHSP plan. With ownership, tribes are more likely to use the SHSP as a guide and source of information for their own transportation safety plans. Tribal planners, enforcement, and EMS become familiar with target zero strategies, which can be valuable when applying for state grant funding. Washington’s data on behavioral factors in fatal and serious injury crashes is now more complete and accurate.

In Montana, tribal involvement brings the entire state population closer to a cohesive vision zero goal: zero fatalities, zero serious injuries. Tribal issues and strategies are integrated into CHSP emphasis areas, and there has been a downward trend in AI/AN fatalities. Participation from tribal safety representatives helps build trust between state agencies and tribal governments.

In South Dakota, tribal involvement ensures that tribal concerns and strategies are addressed in the SHSP. Close coordination with tribes has led to broad support of the annual traffic safety summit. The safety summit is a vehicle for SDDOT staff and tribal representatives to interact, and for tribes to share low-cost safety improvements. SDDOT staff also make a point to be available to help resolve any road safety or general transportation issues.

In North Dakota, ongoing coordination and collaboration is a success that begets success. Tribal involvement ensures that NDDOT is aware of concerns on reservations, especially regarding state-owned roads that go through tribal land. Years of outreach leads to SHSP updates that include strategies to reduce crashes on tribal lands and across the state, and there are now full-time Traffic Safety Outreach Program Coordinators (funded through federal grants) who serve as contacts on two of the state’s reservations.

For more on these success stories of tribal-state collaboration, and other case studies highlighting the best safety practices from around the country, please see FHWA’s Noteworthy Practices Database: go.usa.gov/czYNd.

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How states are addressing local road safety

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According to the 2014 National Highway Traffic Safety Administration’s Fatality Analysis Reporting System (FARS) report, approximately 52% of all fatal crashes occur on rural roads; 72% of which are owned by local entities. Noting that nearly 76% of all road miles in the United States are owned and maintained by local entities (U.S. Department of Transportation Bureau of Transportation Statistics 2015), it is apparent that there is a need to systemically improve road safety on local roads. Moreover, Moving Ahead for Progress in the 21st Century (MAP-21) requires states to prepare a Strategic Highway Safety Plan (SHSP) that addresses the safety needs of all public roads as part of the Highway Safety Improvement Program (HSIP) requirements.

This article is based on the findings of the National Cooperative Highway Research Program (NCHRP) Synthesis project conducted by the author, assisted by Anthony R. Giancola and James S.G. Davenport, where its main objective was to document the state programs and practices that address local agency road safety. More specifically, the project focused on information of state program size, funding sources, and administrative procedures; changes in local road safety programs since the legislation of MAP-21; noteworthy local and state program partnerships and initiatives to improve safety; and the use of 4E (Engineering, Enforcement, Education, and Emergency Services) approaches to local road safety. It should be noted that local roads in this article herein refers to the roads and highways that are non-state owned, such as a county, city, or township agency.

As part of the NCHRP study, a list of noteworthy practices of state-coordinated programs aimed at local road safety was developed from the state survey and an in-depth analysis of ten states whose safety programs have achieved reductions in local road crashes. The following major observations were made based on the department of transportation (DOT) survey data, in-depth interviews with state and local agencies of ten selected states, and literature review:

• MAP-21 has positively affected states in their ability, through significantly increased funding levels especially
in the HSIP, to address local road safety and the need for data-driven decisions that implement proven countermeasures to reduce crashes on local roads. Federal funding was identified as the major source in many states (more than 80% of fund source) for the local road safety programs.

- Several states experienced a reduction of fatal and serious injury crashes since the implementation of MAP-21 and reported the promotion of systemic low-cost safety improvements and initiation or expansion of state coordinated local road safety programs and partnerships as key factors in crash reduction. Increased HSIP funding and improved access to crash data for local agencies were also identified as elements that contributed to crash reductions.

- States are using a variety of approaches to engage local government agencies. Many states are holding summits, conferences, workshops, and meetings to help educate and train local agencies in applying for safety funds and discussing safety requirements (Figure 1). In addition, many states are coordinating with their Local Technical Assistance Program (LTAP) centers to address issues with local agencies on local road safety. Furthermore, many states have adopted and/or support the Toward Zero Deaths initiative within its own SHSP, in which states address reducing crashes on all public roads by employment of a 4E approach.

- The majority of states responded that the administration and reporting requirements for the use of federal-aid dollars have been a deterrent to the participation of local agencies. Practices identified to encourage such involvement were a year-round fund application timeframe, streamlining and consolidating the solicitation process [e.g., a universal application (one application) for federal safety funds]; lowering local match requirements (e.g., providing state funds to match federal funds so that a local match is not required); and providing training, technical assistance, and certification programs for Local Public Agencies.

- Key challenges faced by state DOTs in addressing local safety projects were the lack of local agency resources, followed by the limit of state DOT resources (Figure 2 on page 76). Tools identified to address these challenges were providing workshops, training, and technical assistance; enhancing communication; outreach and engagement with local agencies; procedures documented in local road manuals; and comprehensive guidance and policy for local agencies.

During the in-depth interviews with state and local agency staff of ten selected states (Connecticut, Florida, Iowa, Louisiana, Michigan, Minnesota, Ohio, Oregon, Utah and Washington), a total of five topic areas of practices were reviewed. Table 1 on page 77 summarizes these areas along with practice examples.

The project also identified the following future research needs to support local road safety:

- Development of a cost-effective traffic and roadway inventory database system to facilitate the implementation of a data-driven systemic safety approach. Advances in sensor technology and research initiatives on effective traffic counts on local roads (e.g., traffic count estimation based on small
scale sample counts and land use variables) are reported as possible solutions to address the lack of a roadway inventory system.

- Development of new performance indicators for program/practice evaluation in addition to the currently used crash fatality and serious injury numbers and rates. The corresponding research results will also assist in establishing an effective methodology to document and estimate the level of safety enhancement at the project location or program level other than one based on crash numbers or rates. Research results will also assist in developing proactive safety methods for enhancing the safety on local roads.

- Further analysis is needed on drivers’ behavior on all roads to identify countermeasures and/or strategies that would have significant impacts on human behavior. Research results will help provide guidelines for implementing safety programs targeted at reducing human factor attributed crashes.

- The use of the Highway Safety Manual (HSM) by local agencies has been very limited. Although the state of Michigan, through the LTAP, developed and has been implementing a training program to educate local agencies in the use of the HSM, future efforts could be explored for ways to make this important safety tool more readily usable by local agencies.

- Investigation on the impacts of various advances in technology, such as autonomous vehicles and the use of low-cost intelligent transportation systems technology to improve local road safety.

The findings of this synthesis will provide state DOTs and their local agencies with useful information on successful partnerships to address the reduction of crashes on local roads.

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References:

FARS Quick Facts 2014 (http://www-nrd.nhtsa.dot.gov/Pubs/812234.pdf)


Table 1. Summary of Five Topic Areas and Practice Examples

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<thead>
<tr>
<th>Topic Area</th>
<th>Practice Example</th>
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<tr>
<td><strong>Program Development and Funding</strong></td>
<td>• Louisiana: Local road safety program (<a href="http://www.ltrc.lsu.edu/ltap/lrsp.html">http://www.ltrc.lsu.edu/ltap/lrsp.html</a>)</td>
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<td>• Michigan: Local Road Safety Plan (<a href="http://www.michigan.gov/documents/mdot/What_are_Local_Road_Safety_Plans_473532_7.pdf">http://www.michigan.gov/documents/mdot/What_are_Local_Road_Safety_Plans_473532_7.pdf</a>)</td>
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<td>• Minnesota: County Roadway Safety Plans (<a href="http://www.dot.state.mn.us/stateaid/county-roadway-safety-plans.html">http://www.dot.state.mn.us/stateaid/county-roadway-safety-plans.html</a>)</td>
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<td>• Ohio: Township Safety Sign Grant Program (<a href="http://www.dot.state.oh.us/Divisions/Planning/LocalPrograms/Pages/Township_Safety_Sign_Grant_Program.aspx">http://www.dot.state.oh.us/Divisions/Planning/LocalPrograms/Pages/Township_Safety_Sign_Grant_Program.aspx</a>)</td>
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<td>• Oregon All Roads Transportation Safety (<a href="http://www.oregon.gov/ODOT/HWY/TRAFFIC-ROADWAY/Pages/ARTS.aspx">http://www.oregon.gov/ODOT/HWY/TRAFFIC-ROADWAY/Pages/ARTS.aspx</a>)</td>
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<tr>
<td><strong>Project Delivery and Operations</strong></td>
<td>• Florida: District 7 Design Build Push Button (<a href="http://www.tampabaytrafficsafety.com/DBPB/SitePages/Home.aspx">http://www.tampabaytrafficsafety.com/DBPB/SitePages/Home.aspx</a>) a contract template that allows state DOT to implement safety projects in a more streamlined process</td>
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<td><strong>Data Support</strong></td>
<td>• Connecticut: Crash Data Repository (<a href="http://www.ctcrash.uconn.edu/">http://www.ctcrash.uconn.edu/</a>)</td>
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<td>• Iowa: Statewide Traffic Records Coordinating Committee and Crash Mapping Analysis (<a href="http://www.iowadotgov/tsda/">http://www.iowadotgov/tsda/</a>)</td>
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<td>• Ohio: Geographic Information System (GIS) Crash Data Analysis (GCAT, <a href="http://www.dot.state.oh.us/Divisions/Planning/ProgramManagement/HighwaySafety/HSIP/Pages/GCAT.aspx">http://www.dot.state.oh.us/Divisions/Planning/ProgramManagement/HighwaySafety/HSIP/Pages/GCAT.aspx</a>)</td>
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<td><strong>Education, Outreach, and Technical Assistance</strong></td>
<td>• Connecticut: Traffic Signal System Circuit Rider Program (<a href="http://www.t2center.uconn.edu/signalcircuitrider.php">http://www.t2center.uconn.edu/signalcircuitrider.php</a>)</td>
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<td>• Florida: District 7 Safety Summit (<a href="http://www.tampabaytrafficsafety.com/SafetySummit/SitePages/Home.aspx">http://www.tampabaytrafficsafety.com/SafetySummit/SitePages/Home.aspx</a>)</td>
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<td>• Iowa: Traffic Engineering Assistance Program (<a href="http://www.iowadot.gov/traffic/teap.html">http://www.iowadot.gov/traffic/teap.html</a>)</td>
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<td>• Michigan: Local Safety Initiative (<a href="http://www.michigan.gov/mdot/0,4616,7-151-9615_11261_45212-161513--,00.html">http://www.michigan.gov/mdot/0,4616,7-151-9615_11261_45212-161513--,00.html</a>)</td>
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<td>• Utah: United States Road Assessment Program (usRAP) safety protocol application to local roads (<a href="https://www.aaafoundation.org/sites/default/files/usRAPIIIUtah.pdf">https://www.aaafoundation.org/sites/default/files/usRAPIIIUtah.pdf</a>)</td>
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<td><strong>Toward Zero Deaths (TZD)</strong></td>
<td>• Louisiana: Destination Zero Deaths (<a href="http://destinationzerodeaths.com/">http://destinationzerodeaths.com/</a>)</td>
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<td>• Minnesota: Toward Zero Deaths (<a href="http://www.minnesotatzd.org/">http://www.minnesotatzd.org/</a>)</td>
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<td>• Utah: Zero Fatalities Safety Summit (<a href="http://ut.zerofatalities.com/summit/">http://ut.zerofatalities.com/summit/</a>)</td>
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<td>• Washington: Target Zero Program (<a href="http://www.targetzero.com/">http://www.targetzero.com/</a>)</td>
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The future is bright! But how do we pay for it?

Reema Griffith
Executive Director
Washington State Transportation Commission
Olympia, Washington

Technology’s influence on the world of transportation cannot be denied. It is most visible in the automotive industry. The fast-paced progression in driverless, highly-efficient and alternative-fuel vehicles holds great promise for improving highway safety, reducing environmental impact, and bringing great efficiencies to our mobility. However, this same progress also threatens to undermine our hallmark-funding source for roads and bridges: the gas tax. How we bring harmony between our tax structure and our vehicles is the focus of policymakers across the country. The good news is that it can be achieved.

Driverless cars are no longer the vision of futurists or crystal ball gazers. Today, we see many autonomous features in new cars like self-parking, lane departure warning, and adaptive cruise control that serve as early signals of the paradigm shift occurring before our eyes. And advancements in vehicles are not just about the driving experience, they are also about increased fuel economy and advancing viable alternatives to fossil fuels.

The United States has a long history of pushing for advancements. In 1975 in the wake of the Arab oil embargo, Congress enacted CAFE (Corporate Average Fuel Economy) standards aimed at improving the average fuel economy of cars and light trucks. CAFE standards have recently been increased with the current requirement for all new cars set to achieve an average of 54.5 miles per gallon (MPG) by 2025. In 2015, new vehicles sold in the United States averaged 25.3 MPG—so we are talking about more than doubling vehicle fuel economy in less than ten years, and the automobile manufacturers are up to the challenge.

What does this mean in revenue terms? Using Washington State as an example, conservative forecasts suggest the state will see its current average fleet MPG increase from 19.8 to 35 MPG by 2035—equating to a nearly 50% reduction in state gas tax revenues. Like many states, maintaining and improving roads in Washington is a challenge under current revenue levels. Imagine the impact when the state has 50% less revenue to spend in an environment of increasing costs for services and materials.

As automakers and technology companies work feverishly to advance autonomous vehicle technology, while also advancing improvements in vehicle fuel economy, a road reality check is needed: much of our current transportation infrastructure is in a state of disrepair, making a trip in a driverless car akin to riding a bike in the mud.

In order for those critical on-board vehicle sensors and cameras to work in a driverless car, our roads and bridges must be in tip-top condition with smooth surfaces and clear striping, embedded pavement sensors, interactive signage, and real-time communication systems with near-perfect connectivity. When one adds the cost of all these needed enhancements to the current massive backlog of deferred construction and maintenance, it becomes clear that a perfect storm may be brewing and at the center of it is our unsustainable funding structure for transportation.

The problem we face going forward is simple: as vehicle fuel economy increases each year, gas consumption decreases, and consequently, so do gas tax revenues. While increases in the gas tax can help infuse much-needed dollars into the transportation system in the near term, over time we face a cycle of diminishing returns.

Some advocates argue for raising the gas tax more often to keep ahead of diminishing fuel consumption, or index it to inflation. But political realities make that challenging at best, and simple economics make it a non-starter. In Washington State, where the gas tax will be 49.4 cents this July, it would take annual increases of about 1.5 cents per gallon every year starting in 2019 just to keep transportation funding at the levels produced today. If this were to happen, Washington State’s per gallon gas tax would be 64.4 cents per gallon by 2029. Sadly, raising the gas tax that high still doesn’t generate enough funding to cover transportation needs.

And gas is no longer the only game in town. Plug-in hybrids and electric cars sales are growing. Tesla has a backorder program where nearly 400,000 people
have placed a $1,000 deposit to own a Tesla 3 in late 2017. Several automakers have announced they are investing heavily to transition their vehicle line-up to hydrogen fuel cell, starting this year with the Toyota Mirai.

Fortunately, there is at least one solution that will address this tale of woe. That solution is a Road Usage Charge (RUC)—also referred to as a “mileage based user fee” (MBUF) or a “vehicle miles traveled” (VMT) tax. RUC is a per-mile charge drivers would pay for the use of roads, rather than paying per gallon of gas consumed. It will take leadership and foresight to begin the evolution of moving away from the gas tax, but it seems the time to start is now.

Several states have begun exploring the possibility of RUC, with the biggest body of work found in the West Coast states. Washington, Oregon and California have been working on assessing and testing RUC systems for years. Oregon has led the country with its work on this topic since 2001, and is now the first state in the nation with a permanent RUC program in which up to 5,000 Oregonians can voluntarily sign up to pay the RUC instead of the gas tax.

California began assessing RUC in 2013 and will launch a statewide RUC pilot project this summer. Washington State has been conducting a detailed assessment of RUC since 2012 and is preparing to launch a statewide RUC pilot project where up to 2,000 volunteers from five different regions in the state will test four mileage reporting options as follows:

- **Time Permit**: a flat fee to drive an unlimited number of miles for a given period of time.
- **Odometer Charge**: a per-mile charge measured by odometer readings.
- **Automated Distance Charge**: a per-mile charge measured by in-vehicle technology that can distinguish between in-state and out-of-state travel with periodic billing.
- **Smart Phone Application**: a smartphone application would be used for total mileage collection.

While RUC will serve as a solution, it is certainly not an easy one to advance given its controversy. Common myths surrounding RUC are:

- It must utilize GPS technology to work and thus will track individuals’ driving habits and location.
- It will unfairly impact rural drivers who have to drive farther to get to essential services.
- It will cost drivers more money and generally be unfair compared to the gas tax.

**Per-mile revenue from 49.4 cents/gallon fuel tax, by vehicle MPG**

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**Vehicles below average MPG pay more fuel tax per mile driven**

**Vehicles above average MPG pay less fuel tax per mile driven**

At the Wash. state average of 19.8 MPG, a driver pays 2.5 cents/mile in state fuel tax
But facts quickly debunk the myths.

FACT 1: We are already paying by the mile today—we just don’t think of it that way. Because the gas tax is consumption based, the more you drive, the more you pay. Your vehicle’s MPG determines your per-mile tax costs.

As indicated in the chart on page 79, at 19.8 MPG the average Washington driver is currently paying the equivalent of 2.5 cents per mile in gas taxes. Vehicles that get less than 19.8 MPG, shown in the red area of the chart, are paying more in gas tax compared to the cars in the blue section that get above 19.8 MPG. Essentially, older, less fuel-efficient cars are subsidizing the roads for more fuel-efficient and electric cars that pay little to nothing in gas taxes.

FACT 2: RUC can be collected without the use of any technology. One approach both California and Washington State will test in their pilots is an odometer-read approach where drivers would simply report their total annual miles driven to their state licensing agency as part of the vehicle registration renewal process. RUC would be calculated by multiplying the per-mile rate by total miles traveled. This is a simple, no-tech solution that serves the purpose of paying for road usage.

FACT 3: The real cost impact of RUC will be determined by what you drive. RUC ensures that everyone pays their fair share for the use of the roads, regardless of their MPG or fuel type. Thus, under an RUC system, 15 MPG pickup trucks will pay the same per-mile driven as a 45 MPG Toyota Prius. The chart below compares the cost impact between the gas tax and an RUC by car model.

When considering the fast-paced advancements in vehicle technology and fuel economy, coupled with our nation’s growing backlog of critical infrastructure investment, all indicators point to the need for significant changes in how we fund our transportation system. While the gas tax has been an efficient and reliable workhorse for decades, technology and environmental policies have created a new reality in which we must operate. An RUC is a logical next step to achieving a financially sustainable future that will increase equity and provide a reliable funding mechanism to support our infrastructure. RUC enables us to pave a smooth path to the future of driverless cars that will honk as they pass the deserted gas stations.

Reema Griffith has been the Executive Director of the Washington State Transportation Commission (WSTC) since 2005. Prior to the Commission, she was an Executive at the Department of Licensing and worked for the State House and Senate Transportation Committees as a Senior Policy & Fiscal Analyst. She can be reached at (360) 705-7070 or griffir@wstc.wa.gov.
Taking partnering to a new level

County and municipal transportation projects are benefiting from a type of partnership that brings state, federal and local agency stakeholders together to streamline the process and optimize the use of Federal-Aid Highway Program funds for all involved

Michael Smith, Project Management Engineer/Team Leader, Federal Highway Administration Resource Center, Atlanta, Georgia

State departments of transportation (DOTs) work with local governments one-on-one to deliver Federal-Aid Highway Program projects, from bridge rehabilitation and highway resurfacing to bike paths and walking trails. This project-level partnering helps local governments follow state processes for meeting the requirements that come with using federal funds.

While project-level partnering offers opportunities for feedback and information exchange, a different type of partnering is underway in many states that enlists local government experience and expertise in improving the federally funded project delivery process statewide. These program-level collaborations are based on enhanced communication within the local, state and federal relationship.

The Stakeholder Partnering Solution
The Federal Highway Administration (FHWA), state DOTs and local governments, also known as local public agencies (LPAs), each have program and project requirements that must be addressed simultaneously in order for LPA projects to be delivered successfully.

State DOTs coordinate the administration of federally funded projects with LPAs, guiding project delivery as needed to help ensure they meet program requirements so that federal funding is maintained. The challenge is developing processes and communication channels that help LPAs via effective program administration, without burdening staff at either the state or local level with extra work.

FHWA is promoting stakeholder partnering as a way to combine the perspectives and knowledge of LPA, state DOT and FHWA representatives into solutions for delivering federally funded projects as quickly and efficiently as possible. When representatives from each level—local, state and federal—come together as stakeholder partners, their collaboration helps ensure the Federal-Aid process works for all involved.

Ohio’s LPA Advisory Group
The Ohio DOT (ODOT) established a stakeholder partnering committee in 2014 called the LPA Advisory Group as a way to apply local experience and expertise to implementing
programs for the state’s transportation infrastructure.

The LPA Advisory Group provides a platform for working together on common goals and interests concerning federally funded projects to help ensure the local program is as flexible as possible for LPAs while still meeting requirements.

“The idea is to bring all the parties to the table to discuss the issues,” said Victoria Beale, assistant administrator of ODOT’s Office of Local Programs. “There’s nothing like having a personal connection with those who have to follow the rules that you set forth and hearing from them on how difficult or how easy those rules really are to follow.”

ODOT’s LPA Advisory Group has 25 members representing diverse stakeholders such as the County Engineers Association of Ohio, the Ohio Municipal League, the Ohio Township Association, Ohio’s Local Technical Assistance Program (LTAP), and FHWA’s Ohio Division, as well as ODOT’s Office of Local Programs and its district offices.

The State of Ohio has more than 70,000 miles of local roads and the second-largest number of bridges in the U.S., after Texas, and most of them are local. Input from the LPA Advisory Group helps ensure that when LPAs use federal funds for projects on their systems, the processes they follow are efficient and effective.

“When you’re working with a lot of different monies—you might have federal dollars, state dollars and local dollars all contributing toward a major project—it can be challenging,” said Dean Ringle, County Engineer for Franklin County, Ohio, and a member of the LPA Advisory Group. “So one of the ideas behind stakeholder partnering is to be able to talk about those issues: How can we streamline the process? How can projects be done quicker and be less complicated?”

ODOT’s decentralized system has 12 district offices that reach out to locals on a regular basis, but their stakeholder partnering effort is providing a broad-level, two-way dialogue for working through policy and programmatic issues for the department.

“This is a more formal approach to consider policy and programmatic issues and how we can advocate for the locals on their transportation projects,” said Andrea Stevenson, administrator of ODOT’s Office of Local Programs.

“We solicit feedback from the members to find out what’s important to them and focus on those particular initiatives,” Stevenson said. “We also roll out any new updates from the department that they would need to be aware of and add them to the agenda.”

Among the first items the LPA Advisory Group decided to address were environmental and real estate requirements, which they described as particularly challenging. Local Programs staff worked with their ODOT colleagues to develop additional technical guidelines to help LPAs avoid complications during construction.

“A streamlined environmental process and a streamlined real estate process are critical components of delivering projects quickly. When locals can deliver a project quickly, they save time, money and resources, and ultimately they can operate more efficiently and more economically and get motorists back on the road faster,” Stevenson said.

Another outcome of the stakeholder partnering group is that ODOT worked closely with LPAs to identify and provide more funding opportunities. As a result, ODOT developed two new programs: one that applies toll revenue credits toward local projects and one that provides additional funds for repairing local bridges.

“One of the successes we’ve had is securing toll revenue credit provided by the Ohio Turnpike Commission as local matching funds,” Stevenson said. “For example, for a Transportation Alternatives Project for a small city...
or municipal bridge, 80 percent of the funding comes from Federal-Aid, and for the 20 percent local match, we're providing 15 percent and the locals provide five percent. This is a great benefit to them when they are sometimes limited in available resources, staff or funding.”

In addition to the toll revenue credit, ODOT worked with the County Engineers Association of Ohio to implement the Ohio Bridge Partnership program. This initiative aimed to reduce the number of deficient county and city bridges using 100 percent federal funds through ODOT, with no local match required.

“Through the Ohio Bridge Partnership Program, ODOT provided $120 million of additional money for local bridges over three years,” Ringle said. “We were able to tackle approximately 200 of the 5,000 local bridges that are in poor or critical condition or structurally deficient.”

“Sometimes the rural counties and the smaller municipalities don’t have the funds to match even at 20 percent or 10 percent. Stakeholder partnering resulted in reduced matching funds needed for particular projects, and that will help those smaller communities,” Ringle said. “For urban counties and the more populous cities, the streamlining process—condensing the environmental process and the right-of-way acquisition process time period—has really helped.”

“We've had some good ideas working back and forth,” Ringle said, “and the state has been very open to listening to us and coming up with suggestions.”

“The locals give us a lot of great feedback that helps us identify and discern where to take our policy and programmatic issues next as a department,” Stevenson said. “The more we’re talking and communicating, the better their program is going to be, the better our program is going to be, and the better the transportation system is going to be for the citizens of Ohio.”

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Stakeholder partnering is a process

As part of FHWA’s Every Day Counts initiative to shorten project delivery, stakeholder partnering offers a proven strategy for enhancing efficiency within state DOT local Federal-Aid programs. Several states are seeing positive results from this type of broad-level collaboration.

A case study and video on Ohio’s LPA Advisory Group are available in the EDC Stakeholder Partnering Resource Library at http://www.fhwa.dot.gov/innovation/everydaycounts/edc-3/partnering_library/. The library includes information on stakeholder partnering groups, sample charters, webinar links, and other resources for implementing stakeholder partnering in your state.
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- Always expect a train and look both ways before crossing railroad tracks.
- Wait for trains and do not attempt to beat approaching trains.
- Do not stop your vehicle on the railroad tracks.
- Ensure there is enough room on the other side of the crossing to allow your vehicle to completely clear the tracks.
- Avoid distractions such as loud music, texting or talking on cell phones when crossing the railroad tracks.
- Pedestrians should only cross the tracks at designated railroad crossings. (Designated railroad crossings are places where pedestrians and vehicles have the right of way.)
crossings have warning signs and signals and are located where the street intersects with the railroad tracks.)

- Never walk between the rails in other areas that are not designated railroad crossings. Being on railroad property is not only illegal, it is dangerous. The only legal place to cross is at a marked grade crossing.

- The law requires motorists and pedestrians to yield to trains at grade crossings, as it can take a freight train a mile or more to come to a complete stop. Driving past flashing lights or around downed gates is illegal. A flashing red light is just like a solid red traffic light—it means “stop.”

For public works professionals in the more than 7,000 communities where Union Pacific operates, please know that railroad representatives are always available to discuss projects in your community near our railroad right-of-way. We encourage you to contact Union Pacific to alert us to any activity on or near our right-of-way to ensure the proper notifications and safety precautions are in place. There are two primary ways to contact Union Pacific:

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- Contact the Public Affairs Director for your area. Visit our website at www.up.com, choose “About Us,” then “In Our Communities” and “Public Affairs – Community Contacts” to find the name, e-mail and phone number of the individual who supports your community.

We appreciate public works professionals’ shared commitment to public safety and look forward to working with you across our 23-state railroad network.

Calli B. Hite can be reached at (402) 544-3026 or callihite@up.com.
Each year, APWA presents the Public Works Projects of the Year awards to promote excellence in the management and administration of public works projects, recognizing the alliance between the managing agency, the contractor, the consultant, and their cooperative achievements. This year’s award winners will be recognized during APWA’s PWX, which takes place August 28-31 in Minneapolis, Minnesota.

The 2016 Public Works Projects of the Year Awards Committee consists of Co-Chair Eric Cowles, Civil Engineer II, City of Ames, Iowa; Co-Chair Matthew Fisher, P.Eng., Project Engineer, CIMA+, Burlington, Ontario; Co-Chair Paul “Andrew” Parker, EIT, Assistant Public Works Director, City of Dalton, Georgia; Caroline Barlow, P.E., Associate Civil Engineer, Seattle Public Utilities, Seattle, Washington; Lauren Behm, Airport and Ferry Analyst, Pierce County Public Works & Utilities, Tacoma, Washington; Jason Dohrmann, Project Manager, HR Green Inc., Chesterfield, Missouri; Amy Foster, CMS4S, CESSWI, Stormwater Coordinator, City of Coralville, Iowa; Jay Goldie, CPM, Deputy City Manager/Director of Public Works, City of Cherry Hills Village, Colorado; Patricia Hilderbrand, MPA, P.E., Division Manager, Coordination Services, City of Kansas City, Missouri; Ronald Kaczmarek, Facilities & Capital Project Division Chief, City of Gaithersburg, Maryland; Stephen Lippy, P.E., BCEE, SC, Lutherville Timonium, Maryland; Lisa McClintock, Business Development Director, Unico Engineering, Folsom, California; Marcus McNamara, Project Engineer, Orchard, Hiltz & McCliment, Livonia, Michigan; Karen Mondora, P.E., Assistant to the Director, City of Farmington Hills, Michigan; and Dr. Ram Tewari, Pembroke Pines, Florida.

The winners of the 2016 Public Works Projects of the Year Award are:

**Disaster or Emergency Construction/Repair**
- <$5 million: Horse Mesa Dam Rock Debris Talus Stabilization
- $5 million but less than $25 million: Tacoma Central Wastewater Treatment Plant Flood Protection Project
- >$75 million: Texoma to Wylie Water Treatment Plant Pipeline Extension

**Environment**
- <$5 million: Squalicum Creek Reroute
- $5 million but less than $25 million: Marblehead Pipeline Replacement Project
- $25 million–$75 million: Scioto Greenways
- >$75 million: Thornton Composite Reservoir

**Historical Restoration/Preservation**
- <$5 million: St. Augustine Downtown Improvement District
- $5 million but less than $25 million: Washington Bridge Bike Path and Linear Park
- >$75 million: San Francisco War Memorial Veterans Building Seismic Upgrade and Improvements Project

**Structures**
- <$5 million: Surprise Farms Park Phase II
- $5 million but less than $25 million: Westland City Hall
- $25 million–$75 million: Cermak-McCormick Place Elevated Green Line Station
- $25 million–$75 million: RTS Transit Center
- >$75 million: San Francisco General Hospital Trauma Center

**Transportation**
- <$5 million: 56th Street Reconstruction
- $5 million but less than $25 million: Kings Beach Commercial Core Project
- $25 million–$75 million: City of Yakima Railroad Grade Separations
- >$75 million: Kenneth F. Burns Memorial Bridge Replacement

**Small Cities/Rural Communities Projects of the Year:**

**Disaster/Emergency:** Cameron Creek Colony Emergency Water Supply

**Environment:** South Red Deer Regional Wastewater System

**Historical Restoration/Preservation:** Bayfield Historic Streets Reconstruction

**Structures:** Bud Hendrickson Memorial Nature Trail & Pedestrian Bridge

**Structures:** West Park Wet-Weather Storage Facility

**Transportation:** Greenspot Road Bridge over Santa Ana River
Horse Mesa Dam Rock Debris Talus Stabilization

The Horse Mesa Dam Rock Debris Talus Stabilization project required stabilization of a large, migrating rock-fall debris talus deposit located in extremely remote terrain at Salt River Project’s (SRP’s) Horse Mesa Dam (HMD). This emergency action of stabilizing the deposit was required to establish and maintain safe and reliable access to the dam, eliminate constant road clearing maintenance actions and costs, and provide additional parking and storage areas. The deposit was approximately 200 feet wide across the bottom and over 100 feet high, existing at a near equilibrium slope of ±1:1.

The owner (SRP) was unsure that the excavation could be completed. Even other contractors declined submitting bids citing work could not be completed without significant increases in project scope and budget. The DBA Construction team developed a highly detailed execution plan for stabilization of the deposit to allow work and completion of the project.

In addition to the stabilization and excavation challenges, work was required in a very limited area with a high potential for rockfall within the work zone. SRP required that this limited area remain open at all times for operating and maintenance personnel and equipment to access the dam. The limited area also provided a significant challenge for storing and processing excavated materials.

DBA proposed and used several methods to complete the project within budget and ahead of schedule. These methods allowed DBA to control natural movement of the deposit, reestablish and protect the roadway, maintain safe passage, preserve the environment, and prevent debris from accumulating within the river below during construction. Methods included retaining a Registered Geologist on the construction team to provide surveillance and geological monitoring, scaling the talus deposit removing “loose” debris, and installing a protective rock mesh drape system over the deposit to reduce the probability of rolling and sliding particles during work.

DBA’s challenges with this talus slope included working within geological conditions that were, quite simply, unknown and unstable. Working meticulously through each section of the project, with a modified design-build method, allowed the project to proceed without interruption and met every challenge along the way.

Controlling the natural process with scaling, slope protection, and slope excavation innovations are what ultimately allowed the project to be built. A combination of each of these ideas and completing the project one tight section at a time provided SRP with an excellent solution to the slope/rock-fall problems and addressed their budget concerns without sacrificing safety or quality.

Managing Agency: Salt River Project, Phoenix, Arizona
Primary Contractor: DBA Construction, Inc.
Primary Consultant: Geological Consultants, Inc.
Nominated By: Arizona Chapter
Tacoma Central Wastewater Treatment Plant

Flood Protection Project

Managing Agency: City of Tacoma, Washington, Environmental Services
Primary Contractor: IMCO General Construction
Primary Consultant: CH2M HILL
Nominated By: City of Tacoma, Washington

The Central Treatment Plant (CTP) is the single most critical component of wastewater infrastructure within the City of Tacoma. The CTP treats approximately 80 percent of the wastewater from the citizens of Tacoma. During wet weather months this facility treats an average of 30 million gallons per day of wastewater. During large winter storm events, the CTP will receive and treat over 130 million gallons of wastewater in a single day.

The CTP is located on the west bank of the Puyallup River in the Tacoma tidelands floodplain area. The floodplain is protected from routine flooding by a series of levees constructed by the U.S. Army Corps of Engineers, including a levee on the northeastern side of the CTP that separates the plant from the Puyallup River. Despite the existing levee system, the CTP was still at risk from flooding due to possible failure or overtopping of the levee system upstream of the CTP.

In early January 2009, the Tacoma area experienced severe wet weather conditions, which led to very high water levels in the Puyallup River. These conditions were severe enough to require sandbagging operations at the CTP to be initiated. While in the end actual flooding at the CTP was avoided, this storm event was a reminder of the vulnerability of the CTP to flooding events. It was also a reminder that it would be nearly impossible to fully protect the CTP from a severe flood via the use of temporary sandbags.

This was the second close call flooding event experienced since the mid-1990s at the CTP.

Major flooding at this critical facility would have numerous negative environmental related impacts, including millions of gallons of untreated wastewater entering South Puget Sound. Because of this, flood preparedness at the CTP was crucial. Therefore, the City of Tacoma proposed flood improvements specifically designed to protect the CTP, likely in the form of a vertical barrier. Working in a design partnership with CH2M HILL, the design team refined this initial idea to a steel sheet pile wall. The resulting flood protection project provided for the construction of a floodwall, ranging from two to eight feet in height above ground and around the currently unprotected perimeter of the CTP as well as a mobile surface water pumping station.

The floodwall alignment included 23 locations where existing operating utilities had to penetrate the below-grade portion of the floodwall. One of these penetrations was a 48-inch high-pressure water main and another was a 42-inch sanitary sewer line. These two larger penetrations of critical utilities posed significant design and installation challenges. Sheet piles had to be driven within 12 inches of these critical and fully active utilities.
PROJECT OF THE YEAR:
DISASTER OR EMERGENCY
CONSTRUCTION/REPAIR
MORE THAN $75 MILLION

Texoma to Wylie Water Treatment Plant Pipeline Extension

Managing Agency: North Texas Municipal Water District
Primary Contractor: Garney Construction
Primary Consultant: Freese and Nichols, Inc.
Nominated By: Texas Chapter

The Texoma to Wylie Water Treatment Plant Pipeline Extension project responds to two emergencies: the environmental emergency caused by the presence of zebra mussels, an invasive species, in Lake Texoma, and the emergency resulting from loss of 25 percent of raw water supply during a severe drought.

When zebra mussels showed up in Lake Texoma in 2009, the North Texas Municipal Water District—water provided for 1.5 million North Texans via municipalities and other wholesalers—lost approximately one quarter of its raw water supply. Pumping from Lake Texoma, along the Oklahoma border, to Sister Grove Creek, which flows into Lake Lavon, posed a potential for infestation of Lake Lavon, which is used for raw water storage. Pumping ceased and would not resume until the U.S. Army Corps of Engineers (USACE) permitted reopening of NTMWD’s Lake Texoma pumping station.

Responding quickly, NTMWD commissioned studies of potential solutions to restore the raw water supply and prevent further infestation. The District examined several ways of removing zebra mussels, including systems of mechanical and media filters and chemical treatment. Ultimately, however, none of the treatment options could guarantee total removal of the mussels before discharge into Sister Grove Creek. The only practical way to protect the creek and Lake Lavon and resume the raw water supply was to transport the water directly from Lake Texoma to the District’s water treatment plant in Wylie, where conventional water treatment would destroy the zebra mussels. As these facts emerged, NTMWD explored scenarios for accomplishing design and construction of an emergency pipeline, pumping station and balancing reservoir to bypass Lake Lavon.

Following the studies, the fast-tracked design and construction of this project was scheduled for completion within 2.5 years. The project was designed on a highly accelerated schedule of 13 months, and the design phase was coupled with selection and contracting with a Construction Manager at Risk (CMAR), which enabled execution of the equipment and work packages requiring the longest lead time prior to final design, avoiding delays. Eight months into the design, the CMAR was able to begin the process for ordering pipeline materials.

The project includes approximately 48 miles of 84-inch and 96-inch pipeline from the existing pipeline near the Sister Grove Creek outfall to NTMWD’s water treatment plants in Wylie. The project also includes design and construction of a 240-MG earthen balancing reservoir and modifications to the four existing water treatment plants to facilitate blending of the raw water sources. The overall system transports 120 MGD of Lake Texoma water to Wylie, and has the capability to carry an additional 70 MGD of Lake Texoma water, if needed, to a future water treatment plant near Leonard.
The Squalicum Creek Reroute project implements high-priority restoration actions that will directly improve temperature, dissolved oxygen, sediment transport, salmon habitat, and public health in Squalicum Creek by working collaboratively to prevent water pollution at its source. The project addresses the highest thermal loading issues in Squalicum Creek and exceeds the recommended implementation plan in the Squalicum Creek Temperature TMDL, as well as supporting implementation of Channel Migration Zone (CMZ) regulatory protection.

The reroute project is the most cost-effective way to address the highest thermal loading issues in Squalicum Creek. The Squalicum Creek Temperature TMDL allocated shade based on current stream width with the goal of attainable effective shade. The project dramatically decreased stream width from an average width of 375 feet through Sunset Pond to 20 feet across in the new channel. This goes beyond meeting the target of 0-20% effective shade from a very wide water body to meeting full riparian conditions providing 45% effective shade over a 20-foot stream channel.

This decreased residence time of the water in the ponds and thus decreases thermal loading, which, in turn, improves dissolved oxygen. Creation and enhancement of riverine wetlands adjacent to the channel provide filtering. The project will establish mature vegetation over time and the warm and low-oxygen-content waters of Bug Lake and Sunset Pond are effectively circumvented.

Rerouting the water flow simultaneously improves Endangered Species Act fish habitat because it bypasses and decommissions deleterious areas such as passage barriers, degraded channels, and toxic point sources. The project opens over 22 miles of upstream spawning and rearing habitat by circumventing two fish passage barriers.

The Reroute project is a prime example of sustainable restoration design. The new creek winds through a wet forest and is designed to dynamically interact with its floodplain and evolve as unconstrained streams always do. The placement of large woody debris, scour pools and remnant channels are designed to mimic a stream that is cutting into the bank. Hydraulic capacity for the new channel is the 1.5-year storm event and assumes that the creek will regularly overtop its banks and will maintain the connectivity with the surrounding wetlands and wet forest.

All restoration plantings of disturbed areas are trees and shrubs that are native to this region. When mature, they will provide shade to the stream, habitat, and bank stabilization. When they die they will naturally replenish the large woody debris within the creek while still providing habitat.
Marblehead Pipeline Replacement Project

Managing Agency: South Essex Sewerage District, Salem, Massachusetts
Primary Contractor: Caldwell Marine International
Primary Consultant: WSP/Parsons Brinckerhoff
Nominated By: New England Chapter

On March 3, 2013, the South Essex Sewerage District was forced to act immediately with the threat of an environmental crisis looming. The broken pipeline drastically changed the course of the South Essex Sewerage District, immediately placing all hands on deck to fix the pipe and evaluate the rest of the line. But the District soon learned that despite fully understanding that the magnitude of the circumstances was profound, correcting the problem would not come easily. Replacing the 6,000-foot-long twin pipeline would have been difficult enough to install across an active harbor never mind the rest of the hurdles that had to be overcome before the District, state and federal regulators, and local officials could finally breathe a sigh of relief.

After completing the permitting process, contractor Caldwell Marine was awarded the contract for the installation of the new pipeline. Just as they began to mobilize into Salem, the winter of 2014-15 produced a record amount of snowfall in the Boston area at over 110 inches. Most of that snow fell during the last weeks of January and throughout February. Caldwell proceeded to assemble their barges and equipment through the difficult winter weather conditions. Slow and steady progress began to ramp up until finally the weather broke in spring of 2015 when Caldwell was then able to set up a staging/pipe assembly area.

Caldwell faced difficult staging issues and submitted many different plans to accommodate 12,000 feet of 24” HDPE pipe. This pipe was delivered in 50-foot lengths and had to be butt-fused in a fashion to allow it to be floated out to barges. Trucking materials this large through a tourist city such as Salem was a concern, so shipments were staggered over a period of two months, which allowed the contractor to take delivery at a regulated pace and without overwhelming the City’s streets or the staging area. Fortunately, Caldwell Marine was able to work out a deal with Footprint Power, a direct abutter to the SESD Treatment Facility, which turned out to be a pivotal opportunity for the contractor to maintain a useful staging and assembly area on Footprint property with direct access from District property. Between the Footprint Power staging area and District-owned land, Caldwell was able to pre-assemble 500-foot lengths on land where they were pressure tested and eventually floated out to barges where they were fused into longer strands.

Despite the difficult conditions, the contractor managed to reach substantial completion by the contract completion deadline. It was a great feat completed by a strong team effort. From condition assessment to closeout, all members of the team had to perform diligently to ensure the well-being of the residents and environment.
Hundreds of millions of dollars of public and private development in the RiverSouth area over the past decade has helped revitalize the Scioto Riverfront in Downtown Columbus. However, while substantial public and private investments along the Scioto River had created world-class amenities, the river remained a slow-moving, overly wide pool of sediment-laden water due to the presence of low head dams.

The Scioto Greenways project involved three primary components: (1) Removing the Main Street Dam; (2) Restoring the Scioto River channel; and (3) Creating 33 acres of new green space.

The Main Street Dam was removed in late 2013, which restored the natural flow of the river and helped improve the ecological systems and river habitat. The new riverbanks and restored river channel provide new recreation options, as well as opportunities to further leverage existing investments in the area through the creation of a stunning 33-acre greenway through Downtown Columbus.

Across the country, dam removal and river restoration projects have been shown to increase property values, encourage investment, and create vibrant communities. A healthy river that enables recreation and improves connectivity will allow Downtown Columbus to thrive and ensure maximum economic, ecological, and social benefits. The additional green space created through the Scioto Greenways project better connects Downtown to the Scioto Peninsula and East Franklinton, builds on recent park investments, creates links to the existing regional trail system, and will serve as a catalyst for further private investment in Downtown.

When the Main Street Dam was in place, river levels never dropped below the elevation of the crest of the dam. When both the Rich Street and Broad Street bridges were built, their pier caps were not extended far below the existing water surface elevation because they would never be seen. The Scioto Greenways Project changed this condition when the dam was removed.

With the lower water surface elevations, the bridge’s drilled shaft foundations became exposed. The team recognized this issue during the design phase, and although it was not a structural issue for the bridges, it was an aesthetic issue for the public. The team had to figure out a way to skirt the drilled shafts to provide a visually pleasing covering of the foundation systems. The design team and the construction team worked together to design a system of precast panels that would be fixed to the pier caps and extend below the new, lowered water surface elevation.

The Construction Team was able to manage site logistics that allowed for thousands of trucks to drive in and out of the site safely, while preventing the public from entering the project site. No pedestrians were injured during the duration of the construction.
PROJECT OF THE YEAR:
ENVIRONMENT
MORE THAN $75 MILLION

Thornton Composite Reservoir

Managing Agency: Metropolitan Water Reclamation District of Greater Chicago
Primary Contractor: F.H. Paschen/Cabo Construction Corporation, Joint Venture; Walsh/II in One, Joint Venture
Primary Consultant: Black & Veatch Corporation Inc.; MWH Americas Inc.
Nominated By: Chicago Metro Chapter

The Tunnel and Reservoir Plan (TARP) was adopted in 1972 as the Metropolitan Water Reclamation District of Greater Chicago’s (MWRD) cost-effective plan for complying with federal and state water quality standards with respect to the region’s combined sewer area consisting of the city of Chicago and 51 suburban municipalities. TARP’s main goals are to protect Lake Michigan’s drinking water supply from raw sewage, improve the water quality of area waterways and provide an outlet for area floodwaters to reduce street and basement sewage backup. The Thornton Composite Reservoir, part of Phase II of TARP, is a major step towards achieving these goals.

Phase I of TARP included 110 miles of 8-foot to 33-foot diameter rock tunnels, 150-foot to 350-foot below the ground, providing 2.3 billion gallons (BG) of combined sewer overflow (CSO) storage. Phase I, partially operational since 1985 and completed in 2006, captures and stores CSOs that previously discharged to the waterways at hundreds of outfall locations. After the tunnels receive the first flush from combined sewers during significant storm events, the captured flow is pumped to water reclamation plants for full secondary treatment of the combined sewage.

Phase II of TARP consists of three large reservoirs that connect to the Phase I deep tunnel system and ultimately increase the TARP system storage volume to 20.5 BG. One of those three reservoirs is the Thornton Composite Reservoir. Completed in 2015, the reservoir has a storage capacity of 7.9 BG and is the largest CSO facility in the world. The reservoir, with a surface area of approximately 83 acres, serves a 90-square-mile area in Cook County. The reservoir provides an estimated $40 million per year in flood control benefits to 556,000 people in 14 communities, including the South Side of Chicago and 13 suburban communities.

The reservoir measures approximately 2,480 feet long, 1,580 feet wide and 300 feet deep. In addition to 4.8 BG CSO storage from the Calumet deep tunnel system, the reservoir was also designed to provide 3.1 BG storage for overbank floodwaters from Thorn Creek. The design approach for the reservoir focused on four major elements: sealing the perimeter of the reservoir to protect adjacent groundwater from possible pollutant seepage; sealing the reservoir to protect ongoing mining operations in the adjacent quarry; connecting the reservoir to the existing MWRD Calumet TARP deep tunnel system; and connecting the reservoir to the Thorn Creek overflow structure and diversion tunnel.

During construction of the drop shafts and tunnels to the reservoir, the contractor was vigilant in monitoring gas levels in the tunnels. If levels exceeded the allowable limit, contractors and engineers were required to evacuate the work areas for designated periods of time.
St. Augustine Downtown Improvement District

PROJECT OF THE YEAR:
HISTORICAL RESTORATION/PRESERVATION
LESS THAN $5 MILLION

Managing Agency: City of St. Augustine, FL
Primary Contractor: J.B. Coxwell Contracting, Inc.
Primary Consultant: England-Thims & Miller, Inc.
Nominated By: City of St. Augustine, FL

In 2012 in the City of St. Augustine, Fla., a group of business and property owners along Hypolita and Spanish Streets united to develop a concept for an improved western entrance to the historic core. The City, building off of the business and property owner’s concept and with the assistance of a National Park Service grant, developed and adopted the Historic Downtown Streetscape Guidelines document in July 26, 2013. The purpose of the document is to provide streetscape design alternatives for the “visible” streetscape, including the cartway, sidewalks, streetlighting, street furniture, and landscaping that are consistent with historically used materials. A central component of the guidelines is the elimination of the vertical curb, instead replaced with a 12” flush curb. This achieves three main goals: (1) providing ample maneuvering room for emergency vehicles; (2) reflecting the historic curbless character of St. Augustine; and (3) providing a larger pedestrian area increasing the public use of the space, even in the narrowest roadways, without overly restricting the vehicular traffic.

Ultimately, the project limits were expanded to include Hypolita Street (880 LF), Treasury Street (840 LF) and Spanish Street (775 LF), totaling 2,495 LF, which are located within the St. Augustine Town Plan Historic District, a National Historic Landmark generally bounded on the north by Castillo de San Marcos, on the south by St. Francis Barracks, on the west by Cordova Street and on the east by the Matanzas River.

The project’s scope of work included the following underground improvements: replacement of water and sewer utilities, modification of existing stormwater collection system, Comcast improvements, future conduit for Florida Power & Light upgrades, and installation of new TECO natural gas mains. The streetscape consisted of a curbless street with an inverted crown including pedestrian scaled stormwater inlets located 25’ on center along the inverted crown. The vehicular lane was reduced to 9’ in width and was delineated by clay pressed brick pavers bordered by a 12” coquina flush curb. Outside of the flush curb, coquina concrete sidewalks sloped at 2% towards the many historic buildings surrounding the project. The intent of the narrow traffic lane was to slow vehicles as they pass through the historic core of the city. Street poles with LED light fixtures including hanging baskets for flowers and other plantings were placed on the back of the flush curbs. Palm trees, benches, trash and recycling receptacles were placed throughout the streets. Bicycle racks were included on all the streets and a pocket park on the corner of Hypolita and Spanish Street was included and landscaped by a community-led fundraising effort.
**WASHINGTON BRIDGE BIKE PATH AND LINEAR PARK**

**PROJECT OF THE YEAR:**
**RESTORATION/PRESERVATION**
**$5 MILLION BUT LESS THAN $25 MILLION**

Washington Bridge Bike Path and Linear Park

**Managing Agency:** Rhode Island Department of Transportation
**Primary Contractor:** Cardi Corporation
**Primary Consultant:** VHB
**Nominated By:** New England Chapter

Washington Bridge Bike Path and Linear Park, an 1800-foot-long spandrel arch structure over the Seekonk River, initially served as a bustling city bridge with a movable bascule span that was constructed in response to increasing population and industry on both sides of the river. The fifth of seven bridges in the area named for the country’s first president, the Washington Bridge replaced bridges that were constructed in 1795, 1810, 1820, and 1885. Listed on the National Register of Historic Places in 1989, the bridge was a vital structure needed to improve and expand Rhode Island’s roadway infrastructure, serving as an important local example of an open spandrel arch bridge with many granite architectural features.

With the nation’s evolving transportation needs came the construction of I-195 in the 1970s, which would connect Providence and I-95 to Massachusetts’ southern port cities. By the 1990s, wear and deterioration required rehabilitations and, with the completion of recent design, the bridge will serve as a multi-use path and linear park preserving the landmark for future generations. The rehabilitated, repurposed structure is anticipated to attract both recreational users and non-motorized commuters, connecting the Providence and East Providence bike route networks.

Heavy traffic volume necessitated that the eastbound bridge replacement project be performed without a reduction in the number of highway lanes. To avoid purchasing rights-of-way, the replacement bridge was realigned using a 45-foot-wide, vacant area between Bridge 200 eastbound and Bridge 700 westbound, which allowed phased construction of a completely new eastbound bridge. This process saved time during construction, allowing the Washington Pedestrian Bridge Project to be performed unaffected by traffic and keeping the project completion on track for June 2016.

The new construction required the removal of four of the six arch ribs. Keeping two of the arch ribs fulfilled a historical mitigation agreement. The memorandum of agreement between FHWA, RIDOT and the Rhode Island State Historic Preservation Office required the 1930 bridge to be historically documented, and the southerly façade preserved. The project’s innovative design preserved and retained two concrete arch ribs to support an independent bikeway and pedestrian path. The unique project also preserved the operator’s rooms/house exterior, and modified the structure to include an overlook plaza span above the navigable channel to feature the operator’s rooms/house, and landscape planters incorporating salvaged granite from the demolished portion of the bridge.

An important transportation link for 85 years, the bridge has been modified in response to the evolving transportation needs of the region. Preserved and restored to highlight significant architectural elements, the bridge will provide a safe crossing for pedestrians and cyclists. The linear park will encourage users to enjoy the classic features and surrounding views for many years to come.
San Francisco War Memorial Veterans Building
Seismic Upgrade and Improvements Project

Managing Agency: San Francisco War Memorial Performing Arts Center
Primary Contractor: Charles Pankow Builders, Ltd
Primary Consultants: San Francisco Public Works, Building Design & Construction; Simpson Gumpertz and Heger Inc.
Nominated By: Northern California Chapter

The San Francisco War Memorial Veterans Building (WMVB) is located in the San Francisco Civic Center Historic District and is regarded by many scholars as the finest and most complete manifestation of the Beaux Arts architecture and civic design in the United States. In this context, one of the challenges was incorporating major seismic and systems upgrades into the building. The extent of intervention required for the upgrades was extreme. New shear walls were constructed around the center auditorium with protection to existing historic framework. Unreinforced hollow clay tile were braced. Additional horizontal diaphragms were installed. Electrical, plumbing, fire sprinkler and HVAC systems were installed. The historic finishes were protected and demolition and build back was minimized as much as possible to maintain historic fabric. The construction that was demolished contained significant amounts of hazardous materials, presenting ongoing issues for containment and disposal.

The building is situated over a creek and a high water table. Underground water intrusion was a constant issue, as the slab, footings, underground vaults and elevator pits were constructed. Extensive dewatering was required while the slab was open.

The historic nature of this building combined with the scale of the intervention required, meant that constant attention to unique issues was required. Of particular concern was preservation of the historic Brangwyn Murals from the 1915 Pan Pacific Exposition. With new concrete shear walls directly behind these murals, there were concerns about damage to the murals from vibration or curing concrete. A watertight separation with temporary mechanical ventilation was constructed behind the murals. The mural face was treated with a protective tissue and a plywood enclosure.

Acoustic separation was a concern and a particular challenge for this project. The building houses multiple assembly spaces, including the Herbst Auditorium, the Green Room, the new San Francisco Opera performance space and education/media center on the fourth floor, and multiple meeting rooms. Acoustic separation during simultaneous events was imperative. The shear walls surrounding the Herbst served double duty as both seismic strengthening and acoustic separation. At other strategic locations, zones of acoustic mitigation were identified and treated with acoustic dampening elements, such as limp mast barriers, acoustic doors and seals, acoustic wall types, and acoustic ducts & registers.

The overall result achieved is a building that fully complies with current building codes, meets current theatric standards, is handicap accessible, improves life safety and building resilience, and maintains and restores the character of the original historic architecture.
Surprise Farms Park Phase II

Managing Agency: City of Surprise, Arizona
Primary Contractor: Haydon Building Corp
Primary Consultant: Logan Simpson Design
Nominated By: Arizona Chapter

It was important to the City of Surprise, Ariz., that Phase II of Surprise Farms Park fostered a physical climate that engaged the needs of its residents. The park’s inward and outward design is one that instills community pride, encourages environmental stewardship, and exhibits a commitment to valuing each visitor. Through an extensive public process, the project team received input on the park program. The following activities and amenities were deemed to be critical for the City, Logan Simpson Design, and Haydon Building Corp to deliver the project under budget: park; skate park; splash pad; playgrounds with benches (2-5 year and 5-12 years); basketball court; shade structures with tables and BBQ grills; passive recreation (open multi-purpose lawn areas); restroom building; parking (46 spaces, including three ADA stalls); landscape and security lighting.

The design for the new park had already been condensed to nestle the 155,826 SF footprint—a fraction of the existing 789,285 SF developed park site—leaving in-place existing sidewalks and adjacent retention basins and right-of-way amenities, which left little opportunity for basic cost reduction strategies like reuse of existing square footage that are typically available on new park sites.

The team worked with the geotechnical engineer to review the recommendations for site preparation, as the existing onsite soils were clayey and expansive, requiring extensive remediation and import to allow the onsite material to be suitable for use under sidewalks and structures. Haydon worked with the design team to develop a strategy to use a mixture of material from the deep cuts from the skate park, the onsite clayey material, and some import material to “cap” the fill for placement of structures and flatwork throughout the park. Then, Haydon worked with the civil engineer to revise some of the grades around the basketball court to further reduce the import quantities required for the project. These import quantity reductions reduced the overall earthwork costs by 10%.

To strengthen the pedestrian friendly design of the park, the new layout maintains access design with regards to ADA circulation. The playground’s surface was installed with engineered wood fiber that knit together to provide a surface springy enough to cushion falls, yet firm enough for wheelchairs to access all of the components. The design and layout of the playground, splash pad, and skate park components are universal to the greatest extent possible to not functionally limit age groups, children with disabilities, or skill levels. The skate park design primarily provided gentle drop-ins, ramps, and railings for the progressive skaters while balancing the design with street-type spaces and terraced transition elements for both the beginner and expert skaters.
Westland City Hall

Managing Agency: City of Westland, Michigan
Primary Contractor: McCarthy & Smith, Inc.
Primary Consultant: OHM Advisors
Nominated By: Michigan Chapter

On April 11, 2013, the City of Westland purchased the 64,000-square-foot former Circuit City/Cost Plus warehouse on Warren Road for $1.6 million. This facility had been vacant for over ten years, creating blight in the middle of the City’s Shop & Dine District. Rather than let the facility continue to be an eyesore, the City scooped it up and spent $10.1 million, using tax revenues generated by the city’s Tax Increment Finance Authority (TIFA), to transform the drab structure into a 64,000-square-foot City Hall. Relocating municipal operations including those not housed at the former city hall to the new Warren Road site would provide a convenient “one-stop shop” for residents and businesses and create operational efficiencies with all administrative offices housed in the same facility.

The retrofit is a modern, energy-efficient facility that captures the contemporary, environmentally sustainable city hall styles of today. The new facility has become a one-stop shop for residents and businesses to conduct all of their business under one convenient roof. Also housing a state-of-the-art banquet facility, the new location is giving a much-needed economic boost to the city’s shop and dine district, enticing private investors into this emergent sector.

The former City Hall located on Ford Road was built in 1966 and had become operationally antiquated. At 13,500 square feet, it lacked the space needed for today’s municipal operations and more significantly, was built over an underground stream leading to an ongoing flooding problem in the basement that could no longer be utilized for storage or other purposes.

The redevelopment of this former retail site incorporates the latest in green technology including energy-efficient lighting, lights that extinguish themselves, auto flush toilets and sinks, and makes use of the significant technology infrastructure that was installed to service the former Circuit City.

The new City Hall has set the bar for public facilities with its environmental sensitivity, use of green technology, incorporation of flexible use rooms and eye-pleasing but practical amenities. City Hall is a reflection of how an abandoned building may be cost-effectively renovated into an attractive, functional public amenity while boosting local economic development.

Over the past year, more than $100 million in new investments has taken place in the City of Westland.

Westland City Hall is a significant architectural highlight anchoring the City’s Shop & Dine district and a functional public-use facility that will well serve the city’s 84,000 residents and businesses for many decades to come.

Photo by Beth Singer Photographer, Inc.
Cermak-McCormick Place Elevated Green Line Station

Managing Agency: Chicago Department of Transportation
Primary Contractor: F.H. Paschen, S.N. Nielsen
Primary Consultant: T.Y. Lin International
Nominated By: Chicago Metro Chapter

The Chicago Transit Authority’s Cermak-McCormick Place Green Line Station fills a crucial transportation gap in the Near South Side of Chicago that has been present since the 1977 demolition of the previous station at this location. The $50 million investment made by the Chicago Department of Transportation for the construction of the station will boost the economic investment Chicago Mayor Rahm Emanuel has made in the McCormick Place Convention Center as well as the developing residential neighborhoods in the Near South Side. The new station also adds to the City’s efforts to revitalize the adjacent historic Motor Row area into a bustling entertainment district.

This project consisted of building a new, fully accessible station into and around a historic 100-year-old elevated rapid transit structure, while maintaining full transit service. All new work was completed within the limits of the existing right-of-way.

The new station’s most distinguishing element is the structural steel tube that serves as a windbreak for the passenger boarding areas. By pushing the structural components outside the platform, the enclosure provides passengers with the maximum open area for boarding and de-boarding while addressing the constrained site, which could only accommodate a 15-foot platform width. Work to accommodate the tube and platforms included adding six reinforced concrete piers located between the existing steel bents.

T.Y. Lin International was retained by the Chicago Department of Transportation for both Phase I and II Design Services for the new station.

For Phase I Preliminary Engineering, the T.Y. Lin team prepared three alternative station layouts and space plans for each level. T.Y. Lin also submitted documents to show compliance with ADA requirements needed to secure permitting with the City of Chicago Department of Buildings.

T.Y. Lin performed a detailed structural inspection of the over 100-year-old existing steel elevated rail structure and provided a detailed structural analysis of the existing steel framing system. The existing structure was rated to determine if any retrofits were warranted. Based on the load rating, it was decided that the new station’s platform would be built completely independent from the existing track structure so that no additional loads would be applied to the track stringer or bents.

Additional work during Phase I included special waste determination, determination of construction phasing to maintain CTA service as well as determine potential weekend shutdowns to accommodate erection of structural elements for the new station. Other work included a CTA system analysis and recommendations for signal, communication and train traction power improvements, a topographic survey, and a geotechnical program. During Phase I, the team coordinated with impacted utilities, performed sewer televising, coordinated with the City of Chicago Board of Underground, and developed a utility mitigation plan.
The Downtown Bus Transit Center finally provides Rochester, N.Y. with a facility that is common to other cities of similar size. There were over 24,000 passengers a day utilizing bus shelters along Main Street with most transferring to other connecting buses, frequently in very harsh weather conditions. The new facility centralizes this activity in a start-of-the-art station. Spanning an entire city block between St. Paul Street and South Clinton Avenue, the fully enclosed facility is temperature controlled and customer focused. It also stands to help the Center City District develop a healthier and more diverse street life by focusing more intensive transit activities in an appropriately designed facility.

The original design objectives for the facility were: (1) to improve the efficiency and overall quality of Regional Transit Service (RTS) operations for customers by providing a better transfer experience at the hub of the network; (2) to minimize the impact of bus operations on pedestrian safety and vehicular traffic in the City of Rochester; (3) to revitalize the street-level activity and promote redevelopment in Downtown Rochester by establishing new focal points and providing pedestrian linkages; and (4) to provide a quality architectural expression which, while modern in design, is complementary to the architectural history of transportation and to the City of Rochester.

The Pike Company provided design-build services for the construction of the new one-story, 87,000-square-foot Transit Center in downtown Rochester. The facility consists of an enclosed 54,000-square-foot busways on the south and north sides of a glass-enclosed 24,000 concourse where RTS customers can wait for buses in a controlled environment. The facility also includes a 12,000-square-foot operations support building.

The Transit Center was originally scheduled to be opened in early 2015, but with the successful cooperation of RTS, The Pike Company, Bergmann Associates, and the 20 construction subcontractors, all opportunities were explored to expedite turnover of the final product without need for acceleration and extra cost to the owner. The RTS Transit Center officially opened on November 28, 2014, two and a half months ahead of Pike's original schedule to the Owner and five months ahead of RTS's original scheduled opening.
PROJECT OF THE YEAR: 
STRUCTURES 
MORE THAN $75 MILLION

San Francisco General Hospital Trauma Center

Managing Agency: San Francisco, California, Public Works
Primary Contractor: Webcor Builders
Primary Consultant: Fong and Chan Architects/ARUP
Nominated By: Northern California Chapter

The San Francisco General Hospital and Trauma Center is the only Level 1 Trauma center serving San Francisco and northern San Mateo County. The SFGH Rebuild Program replaces the existing main hospital building at the medical center with a facility that meets state seismic safety requirements for acute care facilities. State law requires that all general acute care patients be relocated from the existing, non-compliant hospital to a compliant hospital before January 1, 2020. The new San Francisco General Hospital and Trauma Center met the target for completion in 2015.

The City and County of San Francisco Department of Public Works is responsible for delivering this major capital improvement project on behalf of the SF Department of Public Health. Webcor Builders oversaw construction and Jacobs provided construction management.

The new hospital building will be located west of the existing hospital and will be nine stories tall, including two basement levels. It will have approximately 40,000 square feet per floor and will provide 284 general acute care beds, 32 more than the current hospital. The emergency department’s size will increase from 27 to 60 beds and operating rooms will increase from 10 to 14. A pedestrian bridge will connect the new facility with the existing hospital at the second floor level and a tunnel will connect at the basement level.

The 460,000-square-foot steel structure consists of two levels below grade and eight levels above grade including a mechanical penthouse. The hospital will feature a 40,000-square-foot emergency room, a 20,000-square-foot radiology department, and units providing Intensive Care, Critical Care, Neonatal Intensive Care, and Forensic services. Other service areas will include Obstetrics, Pediatrics, Sterile Processing, Pharmacy, Laboratory, Pulmonary Function, Biomedical, Morgue and Autopsy. Successfully integrating the site utilities was a significant challenge.

The campus has been in continuous operation since 1872, so documentation on what might be under the old facility was sketchy. The team collaboratively used BIM survey and modeling tools. This allowed the team to evaluate various alternatives for routing the active steam lines, IT conduits, 12kV electrical power, and sewer connections. In the end, Webcor was able to mitigate construction logistic impacts, relocate and upgrade the entire utility network serving the hospital without service disruption. This was done ahead of schedule and with a savings of over $1 million.

Photo credit: Tim Griffith
The 56th Street Reconstruction Project transformed the worn-down segment of 56th Street between McDonald and Lincoln Drives into a highly functional, safe, visually appealing, multi-use connector. The Town of Paradise Valley used the project as the impetus to create new “Iconic Visually Significant Corridor” guidelines to serve as the groundwork for future roadway development in the area. Under the CMAR delivery method, the town very successfully brought together general contractor Achen-Gardner Construction, designer The CK Group, development stakeholders, residents, and the general public to create the new guidelines and the first enhanced roadway according to these new standards.

The CMAR project delivery method allowed the Town to bring the contractor on board during the design phase to provide important constructability and value engineering input during design. The value engineering and cost evaluations didn’t stop at the design phase, they continued throughout construction. Following are some of the project elements the team value-engineered or completed designing after construction began:

**Base construction materials and design for the roadway paver section.** The north 400 LF of 56th Street was paved with interlocking pavers. The final design called for a 6” MAG A concrete trough-style base with wire mesh, 1” of sand, and the final interlocking pavers. This reduced the opportunity for movement and minimized maintenance. Additionally, a field-redesign was evaluated and implemented that added polymeric grout rather than sand. This eliminated the washing away of the sand and associated additional maintenance.

**Pavement section design for pavement patch in the intersections.** Full-depth asphalt was utilized to minimize traffic control and impact to traffic flows.

**The shade and screen structures were designed by EPG (landscape architect) to achieve the desired look.** The foundations were designed by a structural engineer to properly support the structures. Constructability input was provided to assist with the final details of fabrication, installation, and designing spread footings to avoid subsurface utilities. As the structures were surveyed and laid out in the field, ongoing field collaboration among the Town, the CK Group, EPG, and Achen-Gardner contributed to making necessary field adjustments that resulted in installation without delays.

**The elevation change from back of curb to ROW was too steep around the APS equipment.** The team evaluated constructing curbs vs. gabion basket walls under screen walls using safety, visual appeal, and cost as criteria. The gabion basket walls provided the physical structure around which to provide the proper grade change.

**Each residential driveway was unique.** The project team field-designed some of the details and tie-in points of each driveway based on existing features and joints.
Kings Beach Commercial Core Project

Managing Agency: County of Placer, California, Department of Public Works
Primary Contractor: Q&D Construction
Primary Consultant: Dokken Engineering
Nominated By: Sacramento Chapter

The SR-28/Kings Beach Commercial Core Improvement Project is located within Placer County’s unincorporated area of Kings Beach, on the North Shore of Lake Tahoe near the California/Nevada state line. The project represents a public investment in excess of $24 million to revitalize Kings Beach through construction of stormwater conveyance and treatment infrastructure, reconfiguring and rebuilding State Route 28 (SR-28), and adding 10-foot-wide sidewalks, Class 2 bike lanes, and public bus pull-outs. The project is centered on transforming a one-mile segment of the highway from four lanes to three lanes with two roundabouts and limited on-highway seasonal parking. There is now an ADA accessible path of travel along both sides of the highway, from one end of town to the other, where previously there had been none. In addition, portions of the “grid” County roads that intersect the highway were also improved with stormwater infrastructure, curb, gutter and sidewalks, formalized parking areas and traffic calming measures.

Since 2002, Placer County Public Works has embraced this project as the highest priority effort in North Lake Tahoe. The project was designed to improve stormwater runoff conditions in a densely built area, address safety and the need for enhanced multimodal mobility, and help rejuvenate the Kings Beach community. After the project, SR-28 will function more as a main street of a local town.

Project delivery near Lake Tahoe is always challenging, especially with improvements being constructed in the Sierra Nevada Mountains at over 6,200 feet in elevation. There are many reasons, including permit requirements, short construction seasons, area visitors, and unique project sites, that made this project a challenge. Excavations in the Tahoe Basin are limited to between May through October. However, seasonal conditions still control whether excavations can proceed or not. If it rains or snows, no excavation is allowed until the site has dried out, even if it is in the middle of June. Another restriction was that no highway work was allowed between Independence Day and Labor Day, the height of the area’s tourism season.

For construction seasons in both 2014 and 2015, the project started in April, a month earlier than planned, due to favorable weather patterns. Working through the random late spring snow storms and high groundwater, the project was able to progress forward and even get ahead of schedule. At times, the contractor had more than 100 workers on the project to ensure the project would be completed on schedule. The first year, starting early allowed enough time to construct one of the roundabouts before the July 4 tourist season. With the first roundabout complete, the second roundabout was able to begin construction in early September and was completed by October 15.
PROJECT OF THE YEAR: 
TRANSPORTATION 
$25 MILLION–$75 MILLION

City of Yakima Railroad Grade Separations

Managing Agency: City of Yakima, Washington
Primary Contractors: Apollo, Inc.; Mowat Construction Company
Primary Consultant: BergerABAM
Nominated By: City of Yakima, Washington

The Yakima Railroad Grade Separations was a public works project that entailed the construction of an underpass for the eastbound Lincoln Avenue traffic lanes in Yakima, Washington. Due to the increased vehicle crossings of the BNSF railway, the underpass containing three bridge structures was designed to allow unobstructed traffic flow under the railroad crossing at Lincoln Avenue.

The grade separation spans roughly three city blocks and is constructed using a series of drilled secant pile retaining walls and concrete pile caps used to retain the existing ground elevations on either side of the project. A tremie-poured concrete bottom seal was also incorporated into the design to prevent water infiltration into the newly constructed underpass. Due to the high water table within the project limits a lift station was constructed to remove excess water from the site to a series of retention and infiltration ponds.

The challenge encountered using permeation grouting and the decision not to try jet grouting or any other ground improvement techniques to construct the Lincoln bottom seal steered the project team to find a course that led to the use of an existing technology in an innovative new way. The discovery of this design solution revolutionized the construction of bottom seals. The new methodology would come to be known by the project team as “drill and fill.”

The existing technology constructs augercast piles with a continuous flight auger (CFA). A CFA is a large-diameter (four-foot diameter for this project) drill bit with continuous drill spirals around a hollow central pipe. An augercast pile is constructed by drilling the auger into the ground without bringing any of the soils to the surface (like a corkscrew into a cork). When the auger reaches the desired depth, concrete is poured down the central pipe and fills the void created as the auger is lifted with all the soil held on top of the auger’s spirals. This results in a concrete column—an augercast pile—in the ground.

Having performed extensive drilling in these difficult soils, Scheffler (the secant pile wall subcontractor) eventually became confident they could construct the bottom seal using an overlapping grid of CFA piles. The primary issues were that the power of the CFA drill equipment cutting (secanting) into adjacent columns, and all secanting had to be balanced on the opposite sides of any pile being drilled to keep the drill bit from deflecting out of vertical alignment. This method was much less risky than ground improvement methods because it almost totally replaced the existing soils with concrete (96 percent of the seal volume).
The Kenneth F. Burns Memorial Bridge Replacement featured challenges on multiple fronts. The previous, nearly century-old structure was a graceful, multi-span concrete deck arch. The bridge was an appreciated part of the landscape, but it was narrow, deteriorating and it was time for replacement. The two new structures (two separate bridges carrying eastbound and westbound traffic respectively) reflect on the old bridge’s grace, but with a modern updating of sweeping, sleek steel box deck arches in place of the old bridge’s concrete framing.

The project was procured via the design-build project delivery method, with a tight construction schedule that may have taken twice as long to design and build, or more, using conventional approaches. The complex construction staging required maintenance of traffic on the key Route 9 connection between Shrewsbury and Worcester while the new bridge was built around it. Among other challenges, designers developed a unique solution for the low-rise arch spans: full-bridge-length post-tensioned arch ties. During construction, lake disturbance was minimized by using perched pier caps instead of sheeting and digging into the lake bottom.

The finished bridge is quickly assuming a role of infrastructure icon for Worcester and Shrewsbury. The designers used extensive 3D modelling, visualization and animation to detail the railings, approach structures, position of post-tensioning, proportioning of details, and overall guidance of project development. The bridge features designated bike lanes and oversized sidewalks with overlook viewing areas at each pier cantilevering out above the lake, with kiosks detailing local historical information, and seating. Architectural steel “sail” sculptures are placed at the bridge’s four corners, reflecting the lake’s traditional use for recreational boating and crew regattas. At night, the sail and superstructure are illuminated by a programmable color changing lighting system.

In order to accommodate the flat roadway profile, the design features a continuous five-span low rise arch system, consistent with a lengthy public review process. The unique post-tensioning system carries six million pounds of thrust-resisting tension tie force on the full length of the bridge.

To reduce impacts in the lake, a precast perched pier pile cap foundation system was constructed. This foundation system minimized the amount of piles required for construction and also allowed the caps to be constructed without the need for sheet pile cofferdams.

Designers created a three-dimensional finite element structural analysis model to analyze the proposed step-by-step construction staging sequence, and other critical elements of the superstructure. The staged construction model closely matched construction steps as built, at a level of detail unusual for a bridge project.
Cameron Creek Colony Emergency Water Supply

Managing Agency: City of Farmersville, California
Primary Contractor: West Valley Construction
Primary Consultant: Quad Knopf, Inc.
Nominated By: City of Farmersville, California

Cameron Creek Colony is an unincorporated community that is adjacent to the City of Farmersville in Tulare County. The community currently has 105 mixed use units comprised of single- and multi-family homes, a commercial establishment and a church. The existing lots have been served by individual domestic wells and septic tanks since the development of the community in 1939. According to the 2010 census (Census Tract 14), this area has an average of 2.9 people per dwelling unit, which puts the population of Cameron Creek Colony at around 300 people.

In 2013, largely due to the drought that has plagued California since 2010, Cameron Creek Colony residents began noticing that the existing shallow groundwater wells were failing. In some cases neighbors helped neighbors by providing water from their wells that hadn’t yet failed. While this community comradery positively helped one another with the immediate aid, this seemed to increase the rate of well failures as more demand was put on the available groundwater supply. The situation was dire.

The City of Farmersville had been concerned about the adjacent community for some time. The City’s Housing Element update (2009-2014) called for the City of Farmersville to begin addressing the numerous problems in Cameron Creek Colony.

The project involved obtaining emergency funding necessary to provide for the engineering design, construction of the essential infrastructure including connection fees, construction management and completion of all facilities to provide domestic water service to Cameron Creek Colony without an impact to Farmersville’s budget or without incurring a debt service that the severely disadvantaged community could not afford.

As part of the PEA that was prepared in 2011, the City worked with Self Help Enterprises and California State University Fresno student interns to conduct door-to-door surveys of the community to assess their willingness to receive City services. As part of the survey, an income analysis was prepared that indicated that the community qualified as a Severely Disadvantaged Community (SDAC).

The $1 million project involved the design and construction of 7,262 lineal feet of eight-inch water main, installation of six fire hydrants, 10 control valves and 106 new water services to serve the community. Emergency funding was applied for and obtained from the United States Department of Agriculture (USDA) and the State of California Department of Public Health (CDPH), later to become the State Water Resources Control Board (SWRCB). Each funding agency had just acquired emergency funds for such projects, but was limited to a maximum available amount of only $500,000 for each project. As such, both funding sources were required to support the project with the maximum allotment in order to complete the project.

Photo credit: Reggie Ellis, the Foothill Sun-Gazette
Eight years ago, the South Red Deer Regional Wastewater Commission (SRDRWC) and Stantec started designing a system that would impact communities for years to come. Linking the Central Alberta communities of Olds, Bowden, Innisfail, Penhold, Mountain View County, and Red Deer County to the City of Red Deer’s Wastewater Treatment facility, this 56-mile regional line alleviated the pressure faced by these communities and their overloaded treatment systems.

The sheer length of the South Red Deer Regional Wastewater System (SRDRWS) posed a huge design challenge on its own, never mind the fact that construction occurred in a highly populated corridor, and crossed several environmentally sensitive areas. Each government body—municipal, provincial and federal—had individual requirements that had to be met. The final product: a unique and highly sophisticated system.

Designed for a 25-year horizon, the $140-million SRDRWS will allow the communities along it to grow at a steady rate for years to come through a number of complex systems, including: four major wastewater lift stations equipped with odor treatment; approximately 56 miles of force main with an outside diameter ranging from 22 inches to 34 inches; Alberta’s first dual-media Odor Management Facility; a triple barrel siphon under the Red Deer River; Stantec-designed, state-of-the-art operation and monitoring system with a user friendly interface for operators; a pipeline alignment that would minimize the impact on the environment (wetlands, wildlife, plants) and extensive environmental monitoring for the impacted areas; and ensuring that the City of Red Deer wastewater treatment plant could accept the wastewater from the SRDRWS by completing extensive upgrades.

Following 15 years of concepts, studies, consultations, design/construction phases, and testing, the SRDRWS went online in the summer of 2015. With the system now operational, wastewater from each of the six communities is being treated to higher standards at the City of Red Deer wastewater treatment plant. This helps protect the aquatic environment and the quality of the source water for much of Central Alberta.

The successful completion of the SRDRWS can now be used as a model for the north and west legs of the Central Alberta Regional Wastewater System. But most importantly, the system will ultimately help to protect one of our valuable natural resources, while supporting growth in the region for years to come.

“The South Red Deer Regional Wastewater System is an exemplary model of building a regional wastewater system through partnership and technical excellence,” said the judges of the 2016 Consulting Engineers of Alberta.
Situated on the shores of pristine Lake Superior, the City of Bayfield, with a population of only 487, depends on local tourism to support the community’s economy. Since 2000, the City has invested millions of dollars in local utility and street infrastructure improvements in an effort to restore the original character of the streets. The Historic Bayfield Streets Reconstruction project serves as the crowning achievement of this effort.

The project, which included the key tourist areas of S. Broad Street, N. Broad Street and S. Second Street, contained the last remnants of the c. 1920 clay brick pavers, which were once prevalent throughout the City’s Historic Downtown and Waterfront District. However, years of traffic loading warped the existing road profiles, and numerous utility reconstruction projects left the streets as a patchwork of brick and asphalt. In addition, minimal streetlighting and antiquated pedestrian features limited the district’s appeal to visitors.

In 2008, the City began the planning process for the district that culminated in the Downtown Waterfront Plan, which Vandewalle & Associates, Inc. assisted with in 2009. Plan development included meetings with local business owners and residents to identify the community’s goals and priorities for the district. The plan outlined pedestrian and bicycle circulation routes, developed streetscaping concepts for the district, and identified the need for renovation of the existing brick roadways.

The focus of the project was to address the condition of the brick pavement. During the project, all the brick pavers were removed manually by hand, sorted for quality, cleaned with wire brushes and chisels, and then stacked on pallets for reuse. The pallets were wrapped for additional protection and then stored in a secure location with other pallets of pavers that had been removed during a utility replacement project in 2010 and saved in anticipation of this full pavement rehabilitation. Once the bricks were removed, the remaining existing curb and gutter and sidewalks were removed and the roadbed excavated to the new subgrade depth. An aggregate base course layer was placed over the compacted subgrade and a new concrete base layer placed above that. Finally, a sand leveling course was placed over the concrete base and the original brick pavers reset to finished grade.

Modern stormwater drainage was installed, including nearly 2,000 feet of perforated polyvinyl chloride (PVC) underdrain, which promoted infiltration to reduce the downstream sediment discharge that previously ran into Lake Superior. Weeper holes coupled with a geotextile fabric layer to provide drainage from the sand setting bed into the underdrain were also set into the concrete base layer at regular intervals to protect the bricks from potential frost damage. This cross section, while substantial, was chosen in order to maximize the design life of the roadways while providing the greatest support structure to the nearly 100-year-old brick pavers.
Providing a key link between the City of Onalaska and downtown La Crosse, the Bud Hendrickson Bridge Memorial Pedestrian Bridge crosses the BNSF rail yard between North Salem Road and Oak Street. It connects to about a mile of paved trail through the upper North Side neighborhood, allowing riders to get from Enterprise Avenue to Gillette Street.

Paid for with state, federal and local funds, construction of the 600-foot bridge began last fall, but planning for the project began nearly two decades ago. It was named for Bud Hendrickson, who started dumping leaves and grass clippings between abandoned rail beds behind his Harvey Street home sometime in the 1950s. Over the years, it became a trail system.

Lightweight concrete was used on the bridge deck to reduce the load on the bridge trusses, reducing the size of the truss members. Trusses and structural members are core 10 steel, eliminating the need for coatings or paint. The bridge handrail is galvanized to reduce maintenance expenses, and anti-graffiti coating was used to make dealing with graffiti easier.

Concrete was pumped through an existing stormwater culvert located outside of and adjacent to the railyard, underneath the BNSF rail yard to a central work area inside the rail yard. A crane with concrete bucket positioned in the central work area then delivered concrete to the bridge site.

The BNSF rail yard passes through significant wetlands, being part of the La Crosse River marsh. To minimize the impact on the wetland during construction, a geotextile filter fabric was laid down over the wetlands area.

Granular, engineered fill was placed over the fabric creating a level working surface, a temporary staging area, distributing the construction loads, and minimizing the settlement of the underlying wetlands. When the project was complete, the fill and fabric were removed from the wetlands. The wetlands vegetation recovered very well as a result of these measures. Additionally, 0.275 acres of wetlands impacted by the project were mitigated at the Mill Bluff wetland banking site including a 1.2:1 ratio resulting in 0.287 acres mitigated.

The Bud Hendrickson Memorial Nature Trail and Pedestrian Bridge is a significant collaboration between the BNSF Railroad, Dairyland Power Cooperative, and the City of La Crosse. Dairyland Power owns significant land that boards the west side of the BNSF rail yard from Gillette Street north. They recognized the benefits to the community that are gained by having a network of bike/pedestrian trails and encouraging alternative forms of transportation. They donated a strip of land to the City for the development of a trail.
The West Park Wet-Weather Storage Facility is a 5.5 million gallon, concrete, underground storage tank located below a multi-use public recreation facility on the west side of the Village of Wilmette, Illinois. The tank, which provides needed collection system capacity during wet-weather events, was designed and constructed under a joint-venture design-build partnership between RJN Group, Inc. and Boller Construction Company in just over a year.

The constructed West Park Wet-Weather Storage Facility consists of a 5.5 million gallon underground concrete storage tank; a three-pump lift station that pumps flow back into the system, recirculates flow in the tank, and flushes and cleans the tank; and an odor control system. This unique system uses a single set of pumps to complete all three O&M processes providing savings during construction as well as ease and efficiencies for ongoing maintenance. The environmentally-friendly solution also uses system water for mixing and the initial cleaning steps minimizing potable water usage. Potable water connections were provided to facilitate adding clean water to complete the flushing cycle.

The tank fills by gravity flow and does not require mechanical or electrical services. All system controls are automated and include a backup generator and a carbon scrubber for odor control. System controls are housed in a control building at the West Park site that was designed to match the neighboring Park District building. All facilities are underground or located on the periphery of the park and do not impact usable Park District field space.

While the design-build project delivery required significant planning to develop partnerships early in the project, it proved to be very effective in meeting the project requirements. The tight time frames were met, and the project was delivered early and under budget. Design-build benefited the Village and the IGA through cost certainty, lower risk, and selection of subcontractors to maintain a level of competition and keep costs under control. Design-build was also a benefit during the design process because real construction experiences could be leveraged when making tough design decisions. This resulted in minimal change orders during construction.

Acquiring detailed data to determine where and what problems existed was critical to finding the right solution for the backup and overflow problems. This facility could not have been designed properly without capturing accurate flow data during the major rain events in 2013. Accurate data allowed representative modeling simulations to be conducted on the Village system resulting in appropriate recommendations and solutions. A smaller facility with no backflow protection, as originally envisioned, would have provided very little relief to the Village residents.
The Greenspot Road Bridge over Santa Ana River project is located in the eastern part of the City of Highland, where the prevailing speed is mostly above the posted limits of 55 mph. There is a relative sharp curve on the two-lane Greenspot Road north of the old steel bridge across the Santa Ana River that can only accommodate a reduced speed of 35 mph. The old bridge, with a width of 16'8”, was too narrow to allow safe passage of two opposing standard-sized vehicles crossing the bridge at the same time. It also had a restrictive vertical clearance of 11.5’ and a low weight limit of 10 tons. Across the old bridge, the speed limit was restricted to 15 mph. According to the 2004 Caltrans Bridge Inspection Report, this bridge had an extremely low Sufficiency Rating of 2 out of 100 indicating its severe level of deficiency. This segment of Greenspot Road at and near the old bridge was the frequent site of traffic accidents.

This project constructed a much-wider new bridge (98’-wide) eliminating a serious bottom neck across the existing narrow old bridge (16’8”-wide). Traffic on Greenspot Road no longer has to negotiate the relatively sharp turn near the north end of the old bridge, as the 3,487’ of realigned roadway is designed for 65 mph with much smoother curves. The new bridge can accommodate legal loads, and does not have any vertical clearance restriction. With construction of the project, safe travel over the Santa Ana River is now possible, whether by vehicle, bicycle or foot.

The construction process of this project was designed to minimize impact to the travelling public as much as possible. As a result, this project did not cause any traffic impact to the commuters on Greenspot Road during the entire construction period that lasted for 13 months, except for five days when two short portions of Greenspot Road, one on each end of the new bridge, had to be closed to accommodate pavement removal, reconstruction, and connection to the newly realigned roadway segments. This process began by first constructing the new bridge and realigned roadway segments while the existing bridge remained in service with no interruption of traffic on Greenspot Road. After the realigned roadway segments were connected to the existing Greenspot Road, the center two lanes on the new concrete bridge structure were immediately opened to traffic, while the outer two lanes remained closed to allow the contractor to complete the exterior bridge barriers. By switching the traffic on the new bridge structure as soon as practical, and closing the old Greenspot Road to perform rehabilitation work on the old steel historic bridge, the public got the benefit of an easier passage through the area three months sooner.

Managing Agency: City of Highland, California
Primary Contractor: KEC Engineering
Primary Consultant: Harris & Associates
Nominated By: City of Highland, California
“Our local economy is finally beginning to rebound and our current staff is trying to do all the things necessary for the upturn but with many fewer staff people due to cutbacks in positions that have not been replaced yet. We sense our staff is feeling they have to do and be everything to keep the department functioning at the highest level. We are seeing burnout and lack of interest in good job performance. Any suggestions as to what we might due to perk things up for our folks?”

Don’t compete with everyone or even with anyone. Do what you do best. Give as much as you get. Don’t chase after the next thing. Change your attitude and do your best to make a difference where you are. Start each day with a positive intention and notice what happens to your day. Make the choice. Wake up and see the glass as half full rather than half empty. Remember why you do what you do and take one action that helps you reconnect with your purpose and mission. Don’t forget or ignore why you do what you do. Remember why you’ve chosen the path you are on. Identify the ways you help and contribute your best to the world. Express your values and passion for what you care about most deeply to people. Whatever your reasons for doing what you do, take one action each day that helps you feel renewed and recommitted to your passion, purpose and mission. When all else fails, remember that everything you do in public works provides essential services that benefit every citizen in your community and no other department can say that! Public works always makes the most with the least and, eventually, the slots will be refilled and you will have survived another crisis.

“Honest question, why is it that I spend most of the day at meetings and then at the end of the day is when I do my work? Surely I can’t be the only one having this problem.”

This seems to be a common problem. However necessary meetings are to move a project forward, they also easily consume much of the time necessary to actually implement a project. Some of the technology designed to create better meetings can be counterproductive. Let’s talk about conference calls. While they are much simpler to schedule than in-person meetings, they can be nightmarish for those calling in. For one thing, callers can’t see reactions to their comments that resist a particular thought. It’s rare for anyone to actually say “please stop talking,” so that message often comes across with rolling eyes and shaking heads. These callers can have difficulty joining the conversation if they can’t see the signs that any particular moment is a good time to chime in. The inability to read the room can stymie the willingness for people to be fully involved. One solution to this communication tool is video conferencing. People on video conferences ask questions and it’s as though they were in the room.

Another technological aid that can often impede productivity is the PowerPoint™ presentation. We all know that a few, notice I said “few,” slides can help illustrate a complex concept. But taken to an extreme, putting together a presentation entirely based on slides gets in the way of efficiency and progress. I call this “Death by PowerPoint.” While these examples can be effective, nothing is going to work if participants are going...
Roger K. Brown, who served as APWA National President in 1987-88, passed away on March 4, 2016 in Midland, Ontario. He was 87.

In 1954, Brown became the City Engineer for Stratford, Ontario, following graduation from the University of Toronto. In 1960 he and his wife, Jane, moved to Scarborough, where he served as Deputy Commissioner of Works. In 1964 he was appointed Scarborough’s Commissioner of Works, a position he held until his retirement in 1990. Under his leadership, the department pioneered in natural environmental protection, municipal driver testing and permitting, closed-circuit TV for sewer inspection, research in manhole hydraulics, development of sidewalk repair equipment, use of hydrobrakes in stormwater management, and building of fiberglass bus shelters.

Brown had the respect and admiration of his peers during his career, receiving APWA’s Top Ten Public Works Leader of the Year award in 1980. He was also awarded the Engineering Medal in 1987 and the Exemplary Service Award in 2010 by the Association of Professional Engineers of Ontario.

He is survived by his wife, Jane; son, Richard Brown; daughters, Diane Ellis and Carol Brown; two grandchildren and two great-grandchildren.
The concept of solar pumping is not quite new anymore, and officials responsible for landfills and toxic remediation sites have given solar piston pumps a try, with initially good results.

Conceptually, there is a lot to like about low-cost, lightweight, portable, adaptable piston pumps that pump virtually any fluid without the expense of electric or pneumatic power.

No greenhouse gas emissions, no air vented back into the well, no below-surface air or electricity, no problem running dry, little maintenance, any angle to horizontal—the list is strong.

But do solar pumps really work? Do they last? Are solars practical outside the Sun Belt?

A Problem in Iowa
The Cedar Rapids/Linn County Solid Waste Agency, which serves Iowa’s second largest county, installed gas-collection systems in 2010 for both active and closed landfill cells as an expected revenue generator. Methane production, however, came up short of the results predicted by modeling.

In 2011, close monitoring determined that high levels of liquid from one of the Agency’s landfills was negatively impacting gas production. In addition, the Agency suspected leachate was migrating slowly toward groundwater.

The Agency contacted regional engineers with The Foth Companies to investigate as well as offer and implement solutions. Foth engineers postulated that lower liquid levels in the collection wells would improve the efficiency of the gas system and, secondarily, reduce potential groundwater impacts. The study suggested the use of low-flow piston pumps to reduce levels. Lead engineer Brian Harthun further suggested testing the viability of pumping with solar power for efficiency and cost savings.

One Tough Test
Foth initiated the test in December 2011. Four months in the dead of winter—at 42° North latitude (roughly equivalent to Toronto), with 65 to 76 percent cloudy days and only 10 to 11 hours of sunlight a day—provided a rough challenge.

Linear-rod reciprocating-piston-drive motors employed by the engineers were identical, but each used a different power source: (1) electric grid, (2) solar-charged battery and (3) solar panel alone.

The pumping flow rates were between one and two gallons (3.78 to 7.57 liters) per minute. Liquid levels were measured periodically through March 2012, and pressure transducers were installed on March 6, 2012 to measure liquid elevations every 15 minutes.

“...But with decided advantages, including low cost, safety, reliability, durability and free power, solar piston pumps are worth serious consideration.”
Results: Migration Remedied; Up to 20% More Gas
By early April 2012, the results were in. The analyses showed that the low-flow piston pumps—from Blackhawk Technology Company—reduced average 24-hour liquid levels sufficiently to remedy the migration issue, and that those lower levels were consistently maintained by all power options, including solar only. Although overnight liquid levels increased somewhat at the solar-alone well, they dropped again in the morning when the pump “woke up.”

At the same time, the lower liquid levels from all three power options exposed an additional 15-18 feet of screen in each well—between 75 and 90 percent more—which resulted in additional gas flows of 15 to 20 percent. “We were quite pleased both with the operational and financial performance of the solar pump,” said Harthun. He cited steady, uninterrupted performance and lower costs of installing and maintenance. Eliminating the need to run electric or pneumatic lines to the closed cell was a major attraction.

Update to 2016
That was then. What about now, more than four years later? The lead engineer is still pleased. The Agency installed several more solar piston pumps in 2012 after the successful tests, and the pumps are operating at levels consistent with the early results. Onsite management also is pleased with low maintenance requirements and low incidences of repair.

Is a solar pump right for your application? If you have well depths beyond 400 feet or need flows greater than 2.7 gallons per minute, then probably not. There is a latitude limit as well. Batteries—which can be expensive and usually must be purchased separately—are required for continuous, 24-hour operation. A bit of insulation might be needed in the coldest months. And, of course, there must be no obstruction between the panel and the southern sky.

But with decided advantages, including low cost, safety, reliability, durability and free power, solar piston pumps are worth serious consideration.

Contact: Mark Bertane, mbertane@blackhawkco.com

Cedar Rapids solar pumps keep liquid levels low.
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The EZ-Carriage Control is a lightweight ultra-responsive Paint Striper Carriage Control that replaces the old steering wheel carriage control of the past. It has high-resolution carriage position repeatability that works similar to setting the cruise control on your car. You can save as many as six carriage memory positions. It is easy to set so the carriage returns to your exact memory positions each and every time. Even after shutdown! It can be used on single and dual operator paint striping vehicles. Questions? Please e-mail us at sales@ezliner.com.

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Holehat patent pending utility manhole safety cover

Holehat provides a raised visual deterrent and fall protection for utility manholes. The retractable manhole safety cover is lightweight, portable, and simple to use. Aluminum construction gives the unit high strengths while the three-position retractable cover provides space for maintenance, cleaning, and inspection equipment. The bright yellow nylon cover has a large warming and reflective fabric for daytime and nighttime visibility. When a utility line is accessed via an open manhole a fall hazard is created; the Holehat will eliminate this hazard, keeping personnel and pedestrians safe. A short demonstration can be viewed at www.holehat.com. Call (480) 650-7122 or e-mail questions to jhaskins@holehat.com.

Bergkamp Inc. takes strategic step to expand globally

Bergkamp Inc., is proud to announce the formation of Bergkamp Bituminous Solutions, a new business enterprise to stand alongside our current enterprise, Bergkamp Pavement Preservation Solutions. Bergkamp Bituminous Solutions will be based in Salina, Kansas, with Scott Bergkamp acting as General Manager. “The introduction of Bergkamp Bituminous Solutions is our next step toward achieving our vision to make roads better globally, by allowing owners of roadways to be more efficient in the construction, maintenance and preservation of their road infrastructure,” says Scott Bergkamp, President and CEO of Bergkamp Inc. For more information, call (785) 825-1375, send e-mail to salesbbs@bergkampinc.com, or visit www.bergkampinc.com.
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