

WASHINGTON STATE

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UTILITY OPTIMIZATION: Lessons from the Seattle Seawall

Inside: Empowering Maintenance Workers to Lead Innovation from the Field | Fall Conference Recap



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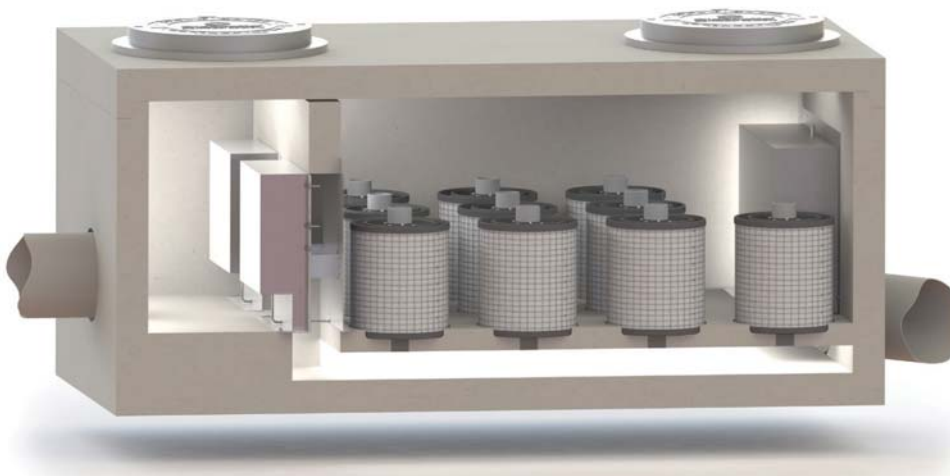
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A look back at the conference held in Kennewick the past October.

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Lessons from the Seattle Seawall 20

This article is a reflection on lessons learned during the design and construction of the City of Seattle's Elliott Bay Seawall replacement, to promote knowledge-sharing with others for future projects. It focuses on utility construction and large, structural excavations through the lens of design and construction optimization with dedicated utility coordination (UC).

Empowering Maintenance Workers

to Lead Innovation from the Field 24

How do you move from imagination to innovation? Top organizations not only encourage innovation, they find creative ways to compensate those who are driving it. It's one thing to understand the benefits of innovation and not be willing to change; it's a whole different story for those who don't even know it's an option.

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Debbie Sullivan, 2017 Chapter President



Delivering Exceptional Value

As 2017 comes to a close, I'm reflecting on the chapter's achievements over the past year. From winning the bid to host PWX 2019, to the inspiring work of agencies, consultants, and contractors recognized at the Project of the Year Awards to the Night of Excellence, I am continually struck by the exceptional work of our chapter members. It has been an honor to serve as your president.

I have also been proud to see accolades garnered by the Washington chapter itself – such as the accreditation of the City of Shoreline. In September, the City of Shoreline's Public Works Department was awarded a prestigious American Public Works Association (APWA) Accreditation. The APWA Accreditation program recognizes public works agencies that go beyond the nationally established requirements of the public works industry as contained in the APWA Public Works Management Practices Manual. The City of Shoreline started this process in 2014 and has worked diligently to complete the self-assessment process. The Shoreline Public Works Department is the 126th agency in North America to be awarded accreditation and is the eighth accredited agency in Washington. In addition to Shoreline, there are currently seven other accredited agencies in Washington including Anacortes, Bellevue, Clark Regional Wastewater District, Kitsap County, Pierce County, Tacoma, and Thurston County.

And in August, I was privileged to accept, on behalf of Past President Kirk Holmes, our 16th win of National's PACE Award. The honor acknowledges the chapter's achievements in the areas of membership, service to chapter members, advancement of public works and sustainability and service to the community. It is an even higher honor because chapters



Debbie Sullivan, WA President, Tina Nelson, National Delegate, Peter De Boldt and Toby Rickman accepting the PACE Award from Ron Calling National Past President at PWX.

can only submit if they're invited by National. Another highlight of PWX 2017 in Orlando was the announcement of Jill Marilley, formerly of the City of Seattle and a former APWA Washington chapter president, as the National president-elect. It is inspiring to see Washington leaders take their skills to a national stage.

It was particularly exciting to attend PWX this year knowing that our chapter will be hosting PWX in Seattle on September 8-11, 2019. Peter DeBoldt and Mike Terrell are co-chairing the Host Committee. Bringing PWX 2019 to fruition is an enormous operation that will require the support, assistance, and creativity of many chapter members. (In particular, the Fundraising Committee, helmed by Scott Sawyer of SCJ Alliance and Genesee Atkins of the City of Seattle, are actively looking for members. Contact either if you would like to help!) In the coming months, be on the lookout for further announcements and chances to volunteer.



As a long-time member of APWA, I've always known our chapter was exceptional. But over the past seven years I've seen it through a new lens – board member, officer, and president. I've witnessed, and been inspired by, committed, selfless, and high-achieving volunteers. The Washington chapter has a national reputation of setting the bar high, innovating, taking risks, and delivering exceptional value to public works professionals. Thank you for giving me the opportunity to be part of it. ▀

Washington State Chapter APWA 2017-18 Calendar of Events

BOARD MEETINGS

Contact Debbie Sullivan at 360-753-8494 or dsullivan@ci.olympia.wa.us

COMMITTEE SUMMIT

Thursday, February 8, 2018

9:00 a.m.-1:00 p.m.

Pierce County Environmental Services Building – University Place

NATIONAL PUBLIC WORKS WEEK

May 20-26, 2018

May 19-25, 2018

ANNUAL APWA SKI DAY

February 2, 2018

Crystal Mountain Resort at 8:30 a.m.

Call Mike Roberts 425-420-0533 or

mroberts@anchorqea.com

PUBLIC WORKS INSTITUTE

Call John Ostrowski 360-573-7594 or

ostrowj@pacifier.com

Mark your calendars for the 2018 NWPI classes. All are held at the Holiday Inn in Issaquah.

Registration will be available January 5, 2018 for all classes. Maximum class size is 40 students. Cost is \$500 per workshop per student.

2018 NWPI CLASSES

Public Works Essentials

February 20-23

Developing Leaders

May 8-11

Public Works Leadership Skills

September 18-21

TRAINING EVENTS

<http://washington.apwa.net/#>

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August 26-29, 2018

Kansas City, MO

Kansas City Convention Center

September 8-11, 2019

Seattle, WA

Seattle Convention Center, WA

CHAPTER CONFERENCES

2018

Spring: April 17-20

Vancouver Hilton

Fall: October 2-4

Wenatchee Convention Center

2019

Spring: April 23-26

Tacoma Convention Center

Fall: October 6-9

Yakima Convention Center

2020

Spring: April 14-17

Vancouver Hilton

Fall: October 6-9

Davenport Grand Hotel – Spokane

For all Chapter Conferences, please contact the following for the specialty areas:

Being a sponsor?

Contact Kiva Lints at klints@hntb.com

Being an exhibitor?

Contact Kelly Robinson at

kelly.robinson@abam.com at BergerABAM

Being a speaker?

Contact Jon Davies 206-505-3400 or

jon.davies@bhccconsultants.com

Doing a preconference workshop?


Contact Jon Davies 206-505-3400

jon.davies@bhccconsultants.com 

Transitions

Otak, Inc., announced recently that **Frank Reinart** has joined Otak. He will be working out of the firm's Redmond, Washington office.

KBA, Inc. is pleased to announce **Mark R. Fuglevand**, PE, has joined the firm as a project manager in our Bellevue office. Mark comes to KBA after a successful 33-year career as a heavy highway contractor, project manager, and engineer. He is the former Vice-President of Marshbank Construction, Inc. and is the national Chairperson-Elect of the National Utility Contractors Association (NUCA).

KBA, Inc. welcomed **Kris Overleese**, PE, as President on September 25, 2017, as part of a planned leadership succession. Kris brings 20 years of experience as a public works director, city engineer, capital projects manager, and management analyst to her position as KBA's new President. She holds a Master's degree in Public Administration, a Bachelor of Science degree in Environmental Engineering, and is a licensed Professional Engineer in the State of Washington. 

New and Returning Members

August through October 2017

Kara C. Abernathy, PE,
Parsons Brinckerhoff

Lauren Case,
Western Territory Mrg., Troxler Labs

Joshua Aubrie Cheatham, Sr.
Construction Mrg., Harris & Associates

Nick R. Colaizzi, Inspector, KBA Inc.

Michael R. Coleman, CPII,
Inspector,
KBA Construction Management

Brandi Colyar,
Capital Program Mgr., Spokane Co.

Christopher Thomas Couvillion,
Storm Drainage Field Supv., City of Kent

Nathan C. Dasler,
Project Mrg./Engineer,
AKS Engineering & Forestry LLC

Jerome J. Didier, PE,
Project Mrg., Perteet Inc.

John Dumas,
Dir. of Operations, Port of Anacortes

Jeff S. Elekes,
Municipal Services Dir.,
Transportation Solutions Inc.

Michelle Faltaous,
Program Development Coord.,
City of Renton

Jeff Fant,
Plans Examiner, City of Olympia

Goel Fisk, PE,
Assoc. Engineer, City of Everett

Thomas Helgeson, PE,
HDR

Lars Hendron,
Principal Engineer, City of Spokane

Ben Iddins,
Civil Engineer,
Davido Consulting Group, Inc.

Jeffery R. Johnstone,
Project Mrg., City of Olympia

Melissa J. Jordan,
Contract Specialist, Sound Transit

Tiffani King,
Plans Examiner, City of Olympia

Mark N. Koelsch,
Communication Mgr., Cowlitz Co.

Cynthia J. Lamothe,
General Mgr.,
Skyway Water & Sewer District

Greg W. Lanning,
Public Works Dir., City of Port Townsend

Keith S. Mabry,
Lead Mechanic, City of Camas

Tobi Maggi,
Project Dir.,
Vanir Construction Management, Inc.

Maureen C. Meehan,
Water Quality Inspection Supv.,
Pierce Co. Public Works & Utilities

John M. Meier,
Principal, AKS Engineering & Forestry LLC

Mark Melnick,
Asst. Construction Engineer,
City of Spokane

Sean Messner,
Traffic Transportation Program Mgr.,
Spokane Co.

Patrick Mitchell,
Maintenance Operations Supv.,
City of Everett

Laura B. Parsons,
Civil Engineer III, City of Port Townsend

John Perala,
Engineering Technician (Capitol),
Clark Regional Wastewater District

Troy Phillips,
City of Pasco

Kevin Picanco,
Engineer, City of Spokane

Teresa K. Reed-Jennings, CPESC, PE,
City Engineer, City of Port Angeles

Frank Donald Reinart,
Senior Water Resources Engineer, Otak

Emily Reiser,
Safety Program Mgr.,
King Co. Department of Transportation

Olivia Salazar de Breau,
Program Assistant, City of Olympia

Eric Schossow,
Davido Consulting Group

Mike Sloon,
City of Spokane

Fred Snoderly,
Municipal Services Dir.,
City of Moses Lake

Ulrich Steidl,
TranTech Engineering

Stephanie S. Sullivan, PE,
Professional Engineer,
City of Sammamish

Brad Tesch,
Project Mgr., Port of Anacortes

Steven R. Thompson,
Project Engineer II, City of Olympia

Scott J. Tkach,
PW/Community Development Dir.,
City of Maple Valley

Elizabeth Willig,
Port of Seattle

John Wynands,
Reg. Administrator,
Washington State DOT



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2018 APWA SKI DAY

Feb 2 at Crystal Mountain

It's time once again for the APWA Ski Day. Block out February 2nd and dust off your gear. We're heading to Crystal Mountain for a day of excitement, camaraderie, and good times. This will be a great time to reconnect with other APWA members.

Who's invited:

Anybody loosely allied with APWA – skiers and boarders alike. Bring your co-workers, consultants, clients, and contractors. All ability levels are welcome.

Transportation:

Carpools are encouraged. A group will meet at 6:30 a.m. at the SE 8th Park & Ride lot and depart by 6:45 a.m. Other southern groups may wish to meet up at the Enumclaw fairgrounds or in Sumner.

The plan:

We will meet in front of the main lodge, booted up, with tickets in hand at 8:45 a.m. and will break into groups. If you are late, get lost, or just want to share the great run you had – call or text Mike on his cell at 425-420-0533. Regroup at the end of the day if you get lost.

Après Ski:

We'll gather at the Snorting Elk Cellar in the Alpine Inn around 2:30 to 3:00 p.m. (depending on how your legs are doing). It's located across the foot bridge from the upper parking lot (you can also ski right to the back door). Some of us may get there early, some of us later.

Sign up:

Sign up will be done on-line through the chapter website. You will also need to sign the liability waiver and e-mail it to Mike Roberts (or bring it with you).

Costs:

You will be responsible for your lift ticket, food, and equipment. The current lift tickets at Crystal start at \$76. See the website for more information on tickets and options – www.crystallmountainresort.com

Lunch:

It's up to you! The group will meet at the lodge at the top of the Forest Queen chair at 11:30 a.m. Keep your eyes peeled for other APWA people (we all tend to look the same in ski gear). There will be some arm bands floating around.

Questions:

If you have any questions regarding this event, please feel free to contact Mike Roberts at 425-420-0533 or mroberts@anchorqea.com.

See you on the slopes!



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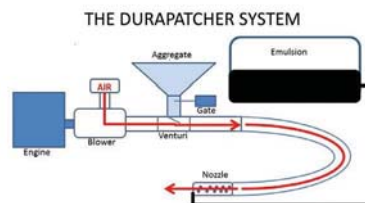
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2017 FALL CONFERENCE RECAP

By Patrick Skillings, Skillings-Connolly

The 2017 Fall Conference in Kennewick was another success for APWA-WA. The beautiful fall weather held out, which always seems to be the case in the Tri-Cities. With just under 500 attendees, this conference was one of the most highly attended fall venues.

It's difficult to recap an entire conference in such a short space. Between keynote speakers, the ROADeo, amazing technical sessions, networking, and the awards banquet, there was a lot to have experienced. On some level, this conference was pretty much the same as ones that have come before it. But this would not describe the 2017 Fall Conference in Kennewick.

Imagination to Innovation was the conference theme, which I think fits well with Washington APWA chapter members. Our chapter continues to be

a leader on the national level. I attribute this to the fact that our chapter members have the imagination to innovate, to try new things, and grow. Why is this important? I believe that this is part of what keeps us inspired as we serve the public: Truly making a difference and making our communities a better place.

Josh Allan Dykstra's motivating keynote presentation on Wednesday was on creating a culture where innovation can thrive. I'm about halfway through Josh's book, *Igniting the Invisible Tribe* and I don't want to give anything away, but I highly recommend it. Josh's take on finding inspiration and balance is one of the key ingredients to improving culture through the act of helping people find inspiration.

Fall conference also means ROADeo! This year's event was one of the most

highly attended, with record participation. Even with a record number of operators, the ROADeo committee and judges were able to get all competitors through the course on schedule. This is no easy task and highlights the dedication our volunteers bring to the event.

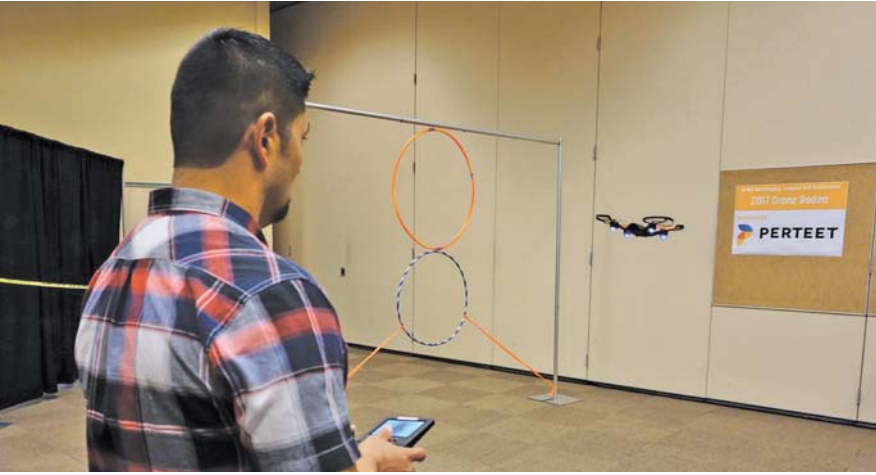
The other highlight of the conference was the awards banquet. With individual awards celebrating leadership in the Washington chapter, the awards banquet continues to gain popularity. Congratulations to all of our award recipients this year.

On a final note, I would like to thank the conference planning committee and all the conference volunteers, without whom this Fall Conference would not have been the success it was. A big thank-you to the City of Kennewick for hosting AWPA-WA: We can't wait to be back. ▀



IMAGINATION TO INNOVATION

APWA FALL
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RECAP APWA FALL CONFERENCE 2017



APWA HOOP DREAMS IN KENNEWICK

By Josh Mattson, Derek Mayo, and Casey Nelson



Finals Participants (L to R): Runners-Up Team John McKenzie (CH2M), Justin Matthews (KPFF), & Aaron McKain (SoilFreeze). Winners Team Bryan Woodard (City of Kennewick), Liam Olsen (KPFF), and Drew Woodruff (City of West Richland).

The nets were on fire at the Southridge Sports Complex in Kennewick on Thursday afternoon at the APWA-WA Fall Conference with an impressive round of 3-on-3 basketball. A total of 18 conference attendees formed six teams for a public works hardwood showdown in the Columbia Basin. A fantastic time was shared as players showed great comradery, enthusiasm, and teamwork.

The final game was a tough matchup of Team Woodard vs Team McKenzie. The teams were equally talented and extra time was needed for Team Woodard to win the conference title with the efforts of Bryan Woodard (City of Kennewick), Drew Woodruff (City of West Richland), and Liam Olsen (KPFF). A close second place went to John McKenzie (CH2M), Aaron McKain (SoilFreeze) and Justin Matthews (KPFF).

The next 3-on-3 Tournament will be held in Vancouver during the Spring Conference. Be sure to sign up for the tournament when you register for the APWA-WA 2018 Spring Conference. We look forward to having more players join us in the future. ▀



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CHAPTER AWARD WINNERS | GROUP AWARDS

These awards were presented at the Night of Excellence Awards banquet during the Fall Conference.

OUR HEROES WEAR DIRT



Glen Hutchinson, Tyler Matthews, and Bob Thorpe

This new award recognizes outstanding service among our Operations & Maintenance employees.

On the evening of April 13, Street Division Employees Glen Hutchinson and Tyler Matthews were checking and cleaning creek culverts during a high water event. As they were approaching one of the culverts, Glen observed what looked like a person in the creek upstream from their location. Tyler ran upstream to check on the individual and realized that she was indeed stuck, waist deep, in the creek. Glen, Tyler, and an off-duty gas division employee, Bob Thorpe, were able to get the individual over to the extremely steep creek bank and secured. Once EMS and the Ellensburg Police Department arrived, they were able to safely remove the woman from the creek bank. Glen, Tyler, and Bob exemplify the spirit of outstanding service in public works.

COMMITTEE IN ACTION AWARD



Management and Public Administration Committee

The Committee in Action Award recognizes a committee that provides exceptional value to our membership and public works professionals.

Chapter Committees offer dynamic, relevant, year-round public works expertise. Their activities help to shape and define our interaction with other professionals, trade organizations, government entities, and the public. This year's award goes to the Management and Public Administration Committee, commonly known as MPAC. MPAC does a remarkable job of educating and networking within public works. They sponsor regular lunches, dinners, and tours in the Seattle area. In 2016, MPAC coordinated seven events that drew over 300 participants. MPAC has been a model committee for many years and they truly deserve to be recognized for their successes.

ACHIEVING DREAMS THROUGH EMPOWERED PUBLIC WORKS TEAMS



Eric Pierson, Josh Patrick, Jill FitzSimmons, and Penney Goehner

The Achieving Dreams Award recognizes public works teams who are making advancements in the public works industry by harnessing new technologies, processes, or materials to improve public works' services.

This award goes to the Chelan County Public Works Team of: Eric Pierson, Josh Patrick, Jill FitzSimmons, and Penney Goehner.

Chelan County Public Works has limited resources and staff. This team developed a programmatic way to capture service requests, complaints, suggestions, and concerns. They overhauled their database to include a "service request" portal, overhauled their website to be forward-facing to the consumer, and hired a public information officer. They now have a strong, consistent line of communication using social media, a website, and listserv that informs the public of projects, traffic impacts, and emergency situations. They stand out as leaders in the region. Chelan is a sprawling, rural county and having a centralized hub of communication goes a long way to reducing community frustration and complaints, as well as encouraging cooperation.

CHAPTER AWARD WINNERS | INDIVIDUAL AWARDS

JAMES ROBERTSON AWARD



Jon Davies

The James Robertson Award recognizes outstanding service to the chapter. Named in honor of the original petitioner to establish our chapter, the award was first instituted in 1962 on Public Works Day at the Seattle World's Fair. This year's winner is Jon Davies.

Jon started working on the conference program committee 10 years ago. He has been on the job ever since; coordinating all of the educational sessions for two conferences each year. During his tenure he has transformed the process from a last-minute scramble, where he was searching to fill 24 technical slots, to having an ongoing waiting list of presenters. Jon's years of service to our chapter, coupled with his calm, steady dedication to the job has continuously provided our members top-notch technical education that rivals the national PWX conference.

JUNE ROSENRETER SPENCE AWARD



Scott Egger

The June Rosentreter Spence Award recognizes efforts to recruit individuals into the public works profession, especially women, minorities, and people with disabilities. June broke barriers. She was the first woman APWA chapter President in 1982 and the first woman National APWA Executive Board Region IX Director. This year's winner of the June Rosentreter Spence Award is Scott Egger.

When the WA Chapter Diversity Committee first started, Scott was an early champion. Scott often took to the stage at various conferences to encourage attendees to stop by the diversity booth or attend a technical session on diversity. Scott has demonstrated his commitment to recruiting diverse individuals into public works in the way he conducts himself on a daily basis as the PW director for the City of Lacey, where he cultivates an environment based on respect for each individual's cultural background, belief system, and ethnicity.

**CONGRATULATIONS
TO ALL AWARD WINNERS!**

RICHARD "DICK" ANDREWS AWARD



Bob Degroselier

The Dick Andrews Award recognizes individuals who exemplify leadership, mentoring, and serving behind-the-scenes without seeking recognition. Dick Andrews was a longtime Washington State chapter member, board member, and 2002 president. He died on October 1, 2014 after losing a hard-fought battle with an aggressive cancer. This year's winner is Bob Degroselier from Yakima.

Bob has been an active member of the APWA-WA chapter for over 25 years. His passion for his profession is highlighted by his work with our Contract Administration Education Committee, more commonly referred to as the CAEC Committee over those many years. Bob works behind the scenes and does not seek acknowledgement for his work. He has been instrumental in increasing our membership in Central and Eastern Washington. Bob works tirelessly on logistics for the various events sponsored by CAEC and suggests excellent training content that is apropos with the challenges facing the local public works professional. Bob is forever gracious, supportive, and a proven asset for our chapter.

YOUNG LEADER AWARD



Lauren Loeb sack

The Young Leader Award recognizes and encourages young professionals who demonstrate a commitment to public works and show potential for leadership within APWA. The winner of this award receives a scholarship to attend PWX and serves as an ex-officio board member. This year's Young Leader recipient is Lauren Loeb sack.

Lauren works for Link Transit as a Planning Manager and she is an accomplished project manager; having overseen large and small public projects. She is a proven public outreach coordinator who seeks out innovative solutions to complex problems. We are delighted she has chosen to bring those skills to our organization and look forward to watching her grow as a member of APWA.

THE PRESIDENT'S AWARD



Peter DeBoldt

The President's Award recognizes a current Officer or Board Member for chapter contributions. Chapter officers and board members are the paramount leaders of our chapter and the shapers of chapter vision and activity. They contribute substantial time, effort, and in some cases, personal expense, to support and oversee the administration of the chapter and its activities. A few distinguish themselves by attending all the meetings with remarkable enthusiasm; engage constantly in the discussions; and contribute substantial wisdom and creative ideas to address various chapter challenges. Presidents owe their success, in part, not only to those who show up for the job, but especially to those officers and board members who contribute in distinct and valuable ways to the ever-changing needs of our members.

Presidents must lean on every board member and officer for their expertise and skills, but one person in particular stood out to Debbie Sullivan, our current chapter president: Peter DeBoldt.

Peter is a National Delegate, former board member, and co-chair of PWX 2019. Peter not only agreed to chair PWX, he led the effort to negotiate a memorandum of understanding with National that secures Washington the hosting duties for PWX 2019. He has also helped develop a fundraising plan and is leading the efforts to plan for the event. For his hard work and exemplary leadership, Ms. Sullivan has chosen him for the President's Award.

ROY MORSE AWARD



Kathleen Davis

The Roy Morse Award recognizes outstanding technical or professional accomplishments in public works. Roy Morse was one of the first Presidents of the Washington State chapter as well as a former National president. He served as a role model for an entire generation of public works engineers and administrators. The winner of this award is forwarded to National as the chapter's nominee for the Top Ten Public Works Leaders of the Year.

The recipient of this award is Kathleen Davis, Director of Local Programs at WSDOT. Kathleen is an inspirational leader with an ability to conquer complex topics, to advocate tirelessly for businesses and individuals, and to build bridges and partnerships inside and outside of an organization. ▀

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GONZAGA'S PITCHER WINS JACK PITTIS MEMORIAL SCHOLARSHIP

By Janice Brevik, Co-Chair, Scholarship Committee

A record number of 25 applications were received for this year's \$10,000 scholarship.

The Jack Pittis Memorial Scholarship, begun in 2007, is named after a man who was one of the founders of APWA-WA and loved by many members individually. He also served as President of APWA National and was a Top Ten Leader of the year. Winners of the scholarship receive the book, *Lessons from the Life of Jack Pittis, The Perfect Public Servant*, written by John Ostrowski.

The 2017 winner is Danielle Pitcher, a senior at Gonzaga University, who is pursuing a degree as a civil engineer with a focus on transportation systems. She is set to graduate in May 2018. Pitcher received her award at the recent APWA-WA Fall Conference in Kennewick, where her parents joined her during the award ceremony. She has had summer internship

experience working in both public and private sectors in the public works field.

Here is an excerpt taken from her essay that was submitted as part of the scholarship application:

"I see myself getting involved in this organization by becoming a member, attending conferences and networking with other public works officials to further the vision for the communities I am serving. I think that my contributions will help the public works industry as a whole because I am passionate about creating better transportation systems. We need people who are not afraid to make the changes that need to happen. APWA is a vital association in this country and has and continues to contribute to bringing public works officials together. I hope to be a part of this as a professional in my field and do my part to create the best quality of life possible."

You represent the future of our profession Danielle, and we are lucky to have you. Congratulations on becoming our 2017 scholarship winner! ▀



Danielle Pitcher

- ◆ Engineering
- ◆ Water & Natural Resources
- ◆ Landscape Architecture
- ◆ Planning
- ◆ Urban Design
- ◆ Architecture
- ◆ Surveying
- ◆ Project Management





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Utility Optimization

Lessons from the Seattle Seawall

By Scott Goss, SG3 Strategies and
Lorelei Williams, Seattle Department of Transportation

This article is a reflection on lessons learned during the design and construction of the City of Seattle's Elliott Bay Seawall replacement, to promote knowledge-sharing with others for future projects. It focuses on utility construction and large, structural excavations through the lens of design and construction optimization with dedicated utility coordination (UC). The author co-presented the topic with Lorelei Williams, Director, SDOT Capital Projects and Roadway Structures at the APWA Washington Chapter's 2017 Spring Conference.

PROJECT OVERVIEW

The Elliott Bay Seawall project was the critical first step in Seattle's expansive waterfront redevelopment program, which extends geographically from Safeco Field north to Bell Street. The rebuilt seawall literally provides the seismically upgraded foundation for the city's water's edge "front door."

The seawall was originally constructed in 1916 and expanded in 1934 with a Depression-era engineering compromise that resulted in a foundation built using over 20,000 wood pilings. By 1954 it had already begun to fail. Decades of ongoing repairs were ultimately deemed inadequate to protect the waterfront and the Alaskan Way Viaduct from seismic hazards. After the 2001 Nisqually earthquake (magnitude 6.8), the City of Seattle and WSDOT began planning to replace the viaduct and improve or replace the seawall.

WATERFRONT UTILITIES: THE UNKNOWN PIECE OF THE PUZZLE

Replacement and redevelopment projects, regardless of size or scale, often present challenges in dealing with existing underground infrastructure during design and construction. Lacking a comprehensive, verified set of surveyed as-builts that reflect all buried facilities makes horizontal and vertical positions unpredictable. Almost invariably, field adjustments during construction become necessary. Experienced constructors know that utility construction (UC) is a common source of delay and additional cost. Seattle's waterfront is a 100+ year-old jungle of historic active or abandoned and buried utilities and improvements.

From the outset the design team chose to integrate dedicated UC as a lead element in the project approach, emphasizing a focus on utility impacts. This became one of the proposal selection differentiators as well as a critical contributor to ultimate project success. Why?

Effective utility coordination improves overall project design, keeps things moving, and shortens construction sequences by providing proactive direction on design flexibility, reducing conflict, and improving safety by tracking a wide range of utility issues and how they impact construction. This specialization is a proven, reliable means to help prioritize decision-making, facilitate timelines, and improve project delivery value. It becomes a matter of knowing the chess pieces and determining all the possible moves in ongoing, rapid succession. Think of it in simple terms – moving a water service as opposed to a



drilled structural shaft may be an obvious choice, but it's critical to be aware of the cascading impacts of any design or field modification. Multiply that scenario hundreds or even thousands of times, depending upon the scale of the project, and it's easy to grasp the huge positive potential impact of quick, responsive, and comprehensive utility solutions.

This was proven continuously over the course of seawall design and construction as the UC role evolved into a critical, interdisciplinary review function with the best-informed central technical perspective over the entire effort. Currently, this perspective is contributing to the expanded waterfront design effort.

The following are a few examples of seawall build challenges that UC helped the design and construction teams overcome.

WASHINGTON STATE FERRIES' COLMAN DOCK 13.8 KV ELECTRICAL DUCT BANK

This was a significant unexpected impact. The initial design called for protecting in place a 13.8 kV electrical duct bank serving the ferry terminal. During construction it was found to be in poor repair, requiring reconstruction. The UC role led the initial conflict identification then coordinated the duct bank repair and seawall structural design modification, as well as the temporary, support requirement, to accommodate the new configuration.

ELECTRICAL VAULT AND DUCT ADAPTATION

Although several electrical vault lids were expected to match the roadway surface, the foundation jet grout operation lifted them, requiring new lids. The UC role identified the condition and coordinated Seattle City Light installation of falsework for safety so the seawall contractor could demolish the lids and construct new lids at grade.

At Madison Street, the seawall structure provides critical lateral restraint for an existing fire station on Pier 53. The electrical duct bank running through the intersection

was discovered to have a vertical curve up into the planned structure location. The team first added protective concrete around the duct bank, then redesigned the reinforcing steel to incorporate this duct bank.

The UC role defined alternatives and constraints for the structural designer, enhancing constructability.

JET GROUT AND UTILITIES

As 5,800 jet grout columns were installed to form the seawall foundation, a wealth of experience was gained about how pressure grouting impacts utilities. Grout is difficult to remove from pipes and vaults. One electrical vault heaved up several inches while the floor was completely broken out of another. It became critical to protect utilities by sealing vault penetrations, maintenance hole collars, checking for cracks, and plugging pipes.

HIDDEN OBSTRUCTIONS

Utility locates are required before excavation but may not accurately



Rebuilding electrical vault lids.



Utility Optimization

represent the true, subsurface position of the marked utility. WAC 19.122.020 (23) defines "reasonable accuracy" for utility locate marks as within 24 inches of the outside dimensions of both sides of an underground facility. Even if the locate marks do represent the line of a duct bank, they may not define the actual outer limits of CDF trench backfill or hard concrete duct banks that may have been poured larger than necessary. The UC role typically leads design-stage, subsurface exploration (potholing) to help define actual conditions.



There is a foot of liquid grout in this electrical vault. Seattle City Light cleaning and repair was necessary.

SOIL FREEZING INSTEAD OF DEWATERING

Seawall excavation was situated close to the Alaskan Way Viaduct. SDOT was concerned that traditional dewatering methods would cause unacceptable viaduct settlement and so chose soil freezing to provide groundwater cutoff. It took a few weeks for the ground to freeze and a month (or longer) to thaw (note that ice columns continue to grow over time). The UC role helped identify the condition and devise protection strategies for critical water services and other cold-sensitive utilities.



Madison Street duct bank surprise.

TOOLS FOR SUCCESS: UTILITY REPORTS, ROLLPLOTS, AND LIVE UTILITY MAPS

One aspect of the UC role was to ensure that the contract documents included a reasonably accurate *Existing Utility Report* with detailed utility drawings, which the contractor distributed to subcontractors. SDOT relied upon the report's comprehensive, clear documentation of utilities in question to avoid many potential claims. The seawall contractor expanded upon the utility report to maintain a Live Utility Map that depicted daily changes of



Soil freezing required several 600 amp services for chillers, as well as significant space for chillers, switchgear, and piping.

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Lessons from the Seattle Seawall

new or removed utilities, drawn directly on the utility report plan sheets. The combination of these documents is now being used to update the waterfront program design basemap.

A primary tool for success was a single, project roll-plot with every CAD layer turned on. It was a cluttered presentation but offered the most comprehensive view of this extremely complex site. It was invaluable for finding and avoiding conflicts, and showing all existing and designed elements in one view. By avoiding the need to flip through plan set sheets, it was easier

and more streamlined to deal with changes during construction.

CONCLUSIONS: LESSONS LEARNED

- Utility coordination is ideally positioned as independent of core design functions but “design services during construction” is another part of the job. Be ready to get into the details and develop solutions.
- Homework and preparation is essential. Knowledge of how project elements – particularly the unfamiliar – are designed, constructed, and operated is critical in understanding the real constraints. This helps to facilitate

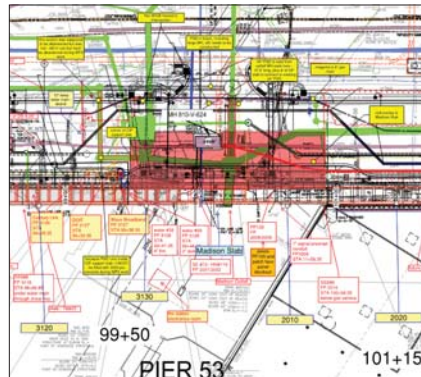
transfer of knowledge into overall design and construction.

- Existing utility research homework is helpful but field modifications are unavoidable. Utility protection and relocation requirements may expand beyond initial scoping. Flexible, creative thinking is required.

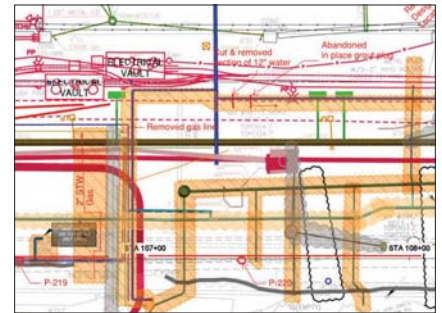
Dedicated utility coordination delivered huge benefits on this project by helping the design and construction teams stay ahead of project complexities. It also helped improve construction safety and efficiency and, ultimately, delivered better continuity of service to customers. ▀



The excavator bucket is resting on a duct bank that was found to be seven feet wide. It was very heavy so required a massive support structure. In other locations, duct banks were two feet from expected locations, changing construction for shoring walls and the seawall concrete support slab. In this location, advance utility records research did not reveal the actual condition, so it became necessary to change the protect-in-place support requirements during construction.



This is a great day-to-day tool **IF** it is used. By not referring to the report, subcontractors dug or drilled through 13.8 kV ducts and there was major damage done to a 12" high pressure gas main. One soil freeze pipe was drilled right through a water service. These incidents might have been avoided if the report had been checked first.



Portion of the Seawall rollplot.

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Pictured above: SR 520 Eastside Transit & HOV Design-Build in King County, WA

Empowering Maintenance Workers to Lead Innovation from the Field

By Ken Witt, City of Olympia



“Here’s to the crazy ones – the misfits, the rebels, the troublemakers, the round pegs in the square holes, the ones who see things differently. They’re not fond of rules, and they have no respect for the status quo. You can quote them, disagree with them, glorify or vilify them, but the one thing you can’t do is ignore them because they change things. They push the human race forward, and while some may see them as the crazy ones, we see genius, because the ones who are crazy enough to think they can change the world are the one who do.”

– Steve Jobs, Co-founder of Apple Computer Co.

So how do you move from imagination to innovation? The above quote from Steve Jobs captures it the best. It takes the right mindset and the courage to put yourself out there. Even though most see the benefit, some still feel threatened by innovation. To truly embrace it you must first recognize the need for change and then be willing to act on it. This can be very difficult for some. Going with the flow keeps everything running smoothly, which doesn’t cause ripples. Top organizations, however, not only encourage innovation, they find creative ways to compensate those who are driving it. It’s one thing to understand the benefits of innovation and not be willing

to change; it’s a whole different story for those who don’t even know it’s an option.

Zig Ziglar, legendary motivational speaker and business consultant, told a story once that really illustrated our unknowingness to change. Early on in his career he won a prize ham through a contest at work. He took the ham home and handed it over to his wife to prepare for dinner. The first thing she did was cut the end off. When he asked her why, she replied, “That’s how you cook a ham: I learned it from my mom.” Not willing to accept the answer, he called his mother-in-law and got the same answer from her, “My mom does it that way; that’s just how you do it.” He asked his wife to call her grandma and get to the bottom

of it. When asked the same question, the grandma replied, “I don’t know why you guys are cutting the end off of the ham. I did it because my pan was too small.”

For years the City of Olympia was “cutting the end off of the ham” with our valve and hydrant maintenance program. Our procedure was to exercise and inspect every valve and hydrant in the system once every three years. Valves were turned by hand using a crew of two employees who worked out of a large van. With this approach we gave the same priority of importance to a 2-inch valve on a dead-end main as we did to a 12-inch valve near a hospital or school.

When I took over as the Lead in the Drinking Water Section, I knew there was a



This valve is in a homeowner's nice landscape behind their fence. Without the automated turner crews would have to stand in the flowerbed to operate the valve.



In this picture we have a common situation where a business puts up a new sign right next to our valve but does not understand the room needed to access it. A standard valve wrench would not clear the sign but can easily be exercised with our automated valve turner.



Another example of a valve that's too close to a fence. A truck mounted turner would not be able to access the cross country main either.

better way of doing business. By focusing on employee strengths, I selected two individuals for the valve and hydrant team that I knew would not automatically accept the existing procedures if better ones could be found. Together, we focused on finding an automated valve exerciser to get away from the laborious process of hand-turning valves.

We visited a neighboring city that owned two different automated turners. Each unit mounted to the front bumper of a truck and each had a limited vertical range of motion. This meant that a valve slightly up or downhill from the truck could not be accessed. Also these turners were very slow to operate and, as a result, the crew from the neighboring city was exercising roughly the same number of valves with these automatic machine as our Olympia crew was exercising by hand. In fact, the neighboring city could only exercise 60-70% of its system using the machines. Plus, the automated machines cost \$15,000 each.

"After much thought, we decided to build our own automated turner and mount it to the front of a street-legal John Deere Gator. We powered the hydraulic motor with a bank of deep-cell, golf cart batteries that could be recharged overnight if necessary."

After much thought, we decided to build our own automated turner and mount it to the front of a street-legal John Deere Gator. We powered the hydraulic motor with a bank of deep-cell, golf cart batteries that could be recharged overnight if necessary.

After implementing the process using our custom-built, automated turner, we doubled the number of valves and hydrants we could exercise daily. In addition, the automated turner eliminates the potential for repetitive motion injuries, more thoroughly exercises the valves than hand-turning,



We built a custom diffuser for exercising hydrants and mounted it to the rack of the Gator. Not only is this a faster option, it is also cleaner as we can usually park over a catch basin or at least stay in the street with the water.

and has led to a reduction in fuel costs since the Gator can run all day on just a few gallons of diesel. Our turner also includes a built-in turn counter that eliminates the potential for human error

and gives us an accurate count on the number of turns each valve requires.

The cost savings of the custom-built, automated turner was impressive. It cost just \$3,500 to build, compared to \$15,000 to

purchase a new, manufactured turner. We also gained the ability to access all of our valves, including cross-country mains. The increased efficiency not only changed how we do business, it completely reshaped why we do it. We now prioritize valves and hydrants by potential consequence of failure and give the most attention to our downtown core areas, schools, hospitals, etc. These priority areas are now inspected every year instead of every three years.

I empowered my team to design and build the turner and their experience in this process gave them the momentum to pursue other innovative ideas. Since that project my team has taken on more responsibility, which, in turn, elevates our level of service. All of their dedication paid off when my team received APWA-WA's "Leading Innovation from the Field" at the 2016 APWA-WA Fall Conference.

When leading change and empowering innovation, remember these few rules: know that what you are doing is for the right reasons, put your customer at the center of your efforts, stop cutting the end off of the ham, and listen to the crazy ones every once in a while – they might just teach you something. ▀

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SEWER RATE STRUCTURE ALTERNATIVES FOR UTILITIES

By Chris Gonzalez, FCS Group

Recognizing the predominantly fixed nature of a sewer utility's annual operating and capital costs, most sewer rate structures include a base rate that applies to customers regardless of the amount of water that they use.

Base rates can include a charge per account to recognize that some costs (e.g., utility billing) are attributable to all customers equally, regardless of their demand or service characteristics. However, a charge per equivalent residential unit (ERU) typically comprises the majority of the base rate.

Conceptually, the ERU standardizes the customer base by equating a customer's demands to those of a typical, single-family home.

ERU ASSIGNMENTS PER CUSTOMER

Single-Family Unit: This is typically 1 ERU per home, by definition, though some utilities have adopted tiered ERU definitions to differentiate low water users from high water users. Some utilities have also established

policies for assigning a greater number of ERUs to homes with accessory dwelling units (ADU).

Commercial Unit: ERU assignments for "normal" commercial customers are most commonly based on water meter size and fixture counts, though some utilities assign ERUs based on estimated demand defined by business type or a variety of other metrics (e.g., number of employees, number of seats, square footage). For large commercial or industrial customers, utilities often reserve the right to determine an appropriate assignment of ERUs based on expected demands.

Multifamily Unit: These can be treated like a commercial or a residential customer for the purpose of assigning ERUs. Some utilities assign ERUs based on water meter size or fixture counts while others assign a fraction of an ERU to each dwelling unit. Comparative analyses of a multifamily structure's demands relative to the winter-average demand of a single-family home

typically justify an assignment of 0.6 - 0.8 ERUs per multifamily dwelling unit.

Some utilities include a certain amount of water usage in their base rates that would be scaled up in line with dwelling units or meter size. Base rates can also vary by customer class to reflect cost differentials associated with wastewater strength or billing frequency (for example, if residential customers are billed bimonthly and nonresidential customers are billed monthly).

VOLUMETRIC RATES FOR ALL CUSTOMERS?

Volumetric rates have historically been more commonly used for commercial and multifamily customers (when treated similarly to commercial customers for ratemaking purposes). Volumetric rates are applied to usage over any amount built into the base rates.

Single-family customers are less likely to be separately metered for fire flow or irrigation water and, as a result, their water demand less accurately represents

their sewer flows. For this reason, flat sewer rates have historically been most common for these customers; however, an increasing number of utilities have been shifting to (or at least considering) volume-based, single-family sewer rates in recent years. Reasons for this shift include improved equity in cost recovery, reinforcement of conservation-oriented price signals embedded in water rates, and enhanced affordability for low users.

VOLUMETRIC RATE OPTIONS

Utilities have two primary options for instituting volume-based, single-family

sewer rates: a Tailored Fixed Rate and a Volumetric Rate.

Tailored Fixed Rate: This is the most common approach. In it, a utility calculates winter-average usage for each customer on an annual basis and uses that calculated volume to determine the fixed rate to apply to the customer for the following year. The winter-average usage is usage that occurs during a defined “winter” period when a customer is unlikely to use irrigation. Utilities that use this approach typically update a customer’s winter-average volume on an annual basis and will

use a system-average volume for new customers that have yet to establish their own demand history.

Volumetric Rate: Some utilities impose a volumetric rate for single-family residences based on actual water usage. Though not explicitly required, capping the amount of water usage subject to sewer charges helps to avoid charging for incremental irrigation water use.

The cap could be customer-specific, using winter-average water use, or uniform for the entire, single-family class. In lieu of a cap, some utilities apply a “sewer return flow factor” to a customer’s water usage based on the estimated percentage of water demand that enters into his/her sewer system.

Approaches taken in the tailored fixed rate and the volumetric rate are consistent with industry ratemaking practices, and each approach has both pros and cons. The “tailored fixed rate approach” retains revenue stability but requires utilities with a significant number of “snow bird” customers to establish a policy for imposing charges on these customers (as their winter usage does not provide a representative basis for billing).

The volumetric rate approach does not rely on customers exhibiting representative demand patterns during a defined period, but instead, it comes with increased revenue volatility and seasonality, which can then be managed with an appropriate structure of reserves.

WHAT ARE YOUR POLICY OBJECTIVES?

In deciding whether or not to adopt a volume-based, sewer rate structure, it is worth considering your utility’s policy objectives in a broader sense. Equity is a relatively straightforward and desirable goal, however, the most equitable rate structures are often more complex to administer than those that have historically been the most popular alternatives in the industry.

The enhanced conservation incentives of a volume-based structure synergize well with affordability for low users but conflict directly with the need for revenue stability and reliability to cover what is primarily the fixed cost of providing service. Because there is no universally correct balance of these objectives, it would be prudent to engage your utility’s management staff and elected officials in a discussion to determine the balance that best reflects your utility’s conditions and values. ▀



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Contracts Awarded, Cost of Living Rates, Sidewalk Maintenance, and Prevailing Wages

Q: *We have just completed our annual audit. Our auditor has provided an exit item that “the use of the Small Works Roster for acquiring Public Works contracts requires the City publish a list, once a year, detailing the contracts awarded during the year.” Can you please clarify this requirement? RCW 39.04.155 notes publishing a list every 24 months of contracts awarded under a limited process.*

A: The statute you reference pertains to a process that applies only to the limited public works portion of small works rosters. Even then, the statute says a list of contracts must be maintained, it does not call out a requirement to publish the list.

The auditor is referring to RCW 39.04.200, which states:

“Any state agency or local government using the small works roster process established in RCW 39.04.155 to award contracts for construction, building, renovation, remodeling, alteration, repair, or improvement of real property must make available a list of the contracts awarded under that process at least once every year.”

Again, there is no specific reference to publishing the list of awards.

Q: *How would cost of living increases be determined in relation to construction projects?*

A: In a recent cost-estimating workshop I attended, the Engineering News-Record Construction Cost Index (ENR CCI) was highly recommended for use in



construction cost reviews, as its reports are based on construction materials. It tracks the change in price for a specific combination of construction labor, steel, concrete, cement, and lumber.

In contrast is the use of the Consumer Price Index – All Urban Consumers (CPI-U). CPI-U is compiled by the Bureau of Labor Statistics and tracks the change in consumer prices for “a representative basket of goods and services” for urban consumers. The basket of goods and services includes a combination of food, beverages, housing, apparel, transportation, medical care, recreation, education and communication, and other goods and services.

Thus, the CCI would seem better suited for tracking changes to the costs of building infrastructure.

Q: *The issue is sidewalks and who is responsible for the maintenance thereof, specifically sidewalks that abut a state highway. Our public works director believes the State is responsible for the sidewalks because the State has an easement on either side of the highway.*

The statute (RCW 35.68) uses language that is ambiguous: “Any city or town... is authorized to construct, reconstruct, and repair... and to pay the costs... from any available funds...”

I understand the alternative provisions of requiring abutting property owners to pay, as well. However, I can find nothing that speaks directly to responsibility when those sidewalks abut a state highway.

A: In discussion with an MRSC Legal Consultant, we concur that the responsibility would rest with the city. This opinion is based on RCW 47.24: City Streets as Part of State Highways. Section 2 of RCW 47.24.020 states, in part:

“The city or town shall exercise full responsibility for and control over any such street beyond the curbs and if no curb is installed, beyond that portion of the highway used for highway purposes.”

Q: *We are looking to have a local quarry deliver gravel to a landscape project where our in-house maintenance team will be doing all of the labor. Does the delivery driver*

have to be paid prevailing wage or is this considered a service where we only need to pay the delivery charge?

A: I posed this question to L&I, and the following is their response.

“Under RCW 39.12.020(2), the work by the regular employees of the public entity will not require prevailing wages. This exception is limited to the actual regular employees of the public entity and cannot be imputed to include any contracted work that supports such activities.

Contracted work (work performed at a cost to the public entity by a private entity) will require prevailing wages for the work of any laborer, worker, or mechanic upon

all public works (see RCW 39.12.020).

The public entity needs to include prevailing wage specifications in their contracts to perform any construction, reconstruction, maintenance or repair (see RCW 39.12.030).

Whether the delivery of gravel is part of a public works project that requires prevailing wages depends on whether that work meets the narrow definition of a ‘stockpile’ in WAC 296-127-018. The stockpile is just barely outside of the prevailing wage universe that involves the performance of work upon a public work.”

Basically, unless the delivery qualified as going to a stockpile, prevailing wage would be necessary. ▀



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 **JOHN DEERE**

Columbia Basin Irrigation System: From Delayed to Delivered

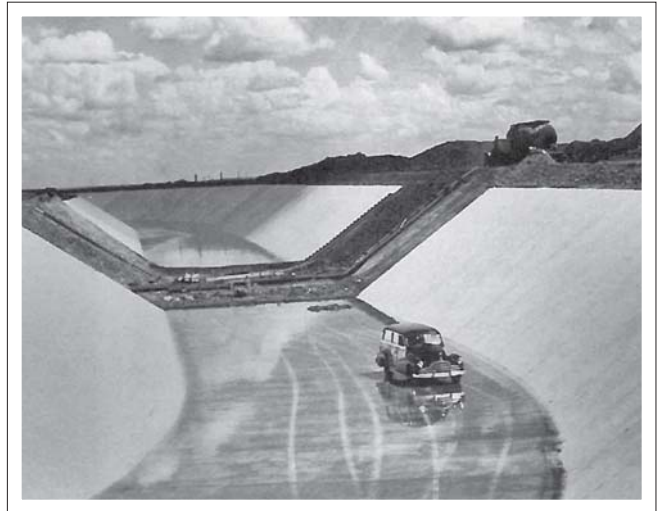
It took an untold number of years planning and lobbying to begin the Grand Coulee project but irrigation features were not the primary focus of the nation at the time of construction on the dam.

Once the Roosevelt administration was convinced of the worthiness of the Grand Coulee project, work began on the dam on July 16, 1933. The dam was started partly because the government wanted to put the thousands of unemployed citizens to work during the Depression. Later it was rushed to completion in 1941 because of the country's need for power during the war.

The original inspiration for the project came from local residents who, during World War I, wanted to turn central Washington into a great breadbasket that could potentially help feed the nation. However, it wasn't until 1947 that the Columbia Basin Commission resumed its activities with a stepped-up campaign of lobbying Congress for the necessary appropriations to continue the irrigation survey work and planning.

Their plan called for turning part of the river's flow back into the Grand Coulee, which would become a reservoir from which the water would flow out in huge canals to basin lands. The Banks Lake reservoir was constructed by building an earth-and-rock-fill dam across each end of the coulee. It provided equalizing storage and eliminated the need for a steady quantity from Lake Roosevelt to supply the canals.

When the pumping plant at the Grand Coulee Dam first began operating in 1952, it was the largest in the world. Just one pump could lift enough daily water to supply 100,000 acres. The Columbia Basin project currently brings water to almost 700,000 acres of basin lands through 333 miles of main canals, 1,959 miles of laterals, and approximately 3,500 miles of drains and wasteways. ▀



Nearing completion on the concrete lining for the project's main canal.

Excerpted from *Building Washington*, by Paul Dorpat and Genevieve McCoy. ©1998, Washington State Chapter APWA.

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The New **O**strowski's Outlook 15

The drones are here. The robots are coming.

Recently I was watching a presentation on public relations in a Public Works Institute class. It included some video that had been shot from a drone. What impressed me was that nobody was awed by it. It was just another thing someone did that was now commonplace. Just a few years ago that video would have been remarkable.

I started this article the way I did to catch your attention. My comment about robots was actually an understatement. Robots have been with us for a long time too. We just don't see them walking down the street.

I find this all fascinating because we've grown to expect the future to look like what science fiction portrays it as. The future might actually not look that much different but behind the scenes a lot of amazing things will be going on. Wait, isn't that's what's happening now?

I rely on an invisible network every day to purchase class materials, check on traffic conditions, and find out how old Spencer Tracy was when he played a young man in some old movie. I still have trouble finding a long lost cousin of mine, but then, so does organized crime so maybe that witness protection program actually works.

My point is that it's hard to predict the future and we have a tendency to either glamorize it or cast it as dystopian. Public works people have always had to deal with change and evolving technology but we still manage to carry on and get things done with whatever tools are available.

Sometimes those tools might allow us to do things that we shouldn't do, just because we can. I recently heard about a think tank that suggested only autonomous vehicles would be allowed on freeways in the not-too-distant future. I can see that as technically possible, and it would probably make our freeways much more efficient.

I wonder if such a thing could ever be implemented in a situation where not all vehicles are autonomous. The "old style" cars would have to clog up surface streets to get from Prosser to Port Orchard... or from Seattle to Tacoma... or Bellevue to Seattle.

On the other hand, autonomous vehicles wouldn't have to be autonomous all the time. Essentially, we'd all be driving around with a robot tucked away under the hood and we'd just turn it on when we wanted to use an electronic super highway.

Long ago I predicted that such a time would come and it would eliminate the need for speed bumps. If you have an automated system in your vehicle because it improves your travel time you'll want to have it, which means that cities could use those same systems to make vehicles go slower in neighborhoods.

In a previous article I bemoaned the fact that public works agencies don't do much research. Maybe we don't have to. There's plenty of research going on to see what drones and robots and autonomous vehicles can do. Public works officials wind up being the beneficiaries of that research when they come into the marketplace.

There are a lot of things today that we take for granted but wouldn't exist without the government-funded research that developed the technology necessary to make smart phones and satellite TV operational. That government funding wasn't provided by city and county public works departments, however.

Research is a crapshoot. Some things just don't work out and whoever does the research often has to operate on a shoestring budget or doesn't have buckets of money to throw at a variety of projects with the hope that one or two of them will pay dividends.

That's just not something that fits into the budget priorities of almost all public works departments. So we have to wait



to see what the market will provide and figure out a smart way to use it to make things work better.

Ironically, that means that we are all constantly doing research. We're all involved in a huge trial and error experiment with every new thing that comes out. We share our successes and rationalize our failures at conferences and others go out and try to replicate our successful applications.

Not everyone keeps up with the latest advances in public works innovation, however. This could explain why consultants find clients who need help and the help they need has been around for a few years but either the clients didn't know about it or thought it would be too hard to implement.

Not all technological change makes our lives easier. I remember the first time I sent an email to a public official at 11:00 p.m.

I'm retired and can do that if I want to. I got a response from that email within minutes. I felt really sorry for the guy who responded because he was working at 11:00 p.m. Someone had impressed on him the expectation that he was supposed to be on the job around the clock.

Maybe he was doing it by choice and maybe he was kind of sly and was doing it to impress me. However, I see too many

people who are prisoners to their jobs. They are available for work at all times. That might sound great to a citizen who expects an immediate response, but I don't think it's healthy.

Every successful invention has both good and negative impacts. Our real challenge in the future isn't to predict what kinds of inventions we'll have. It isn't even how we'll make the best use of

those inventions. The real challenge will be how to mitigate the negative impacts and unintended consequences of each new improvement.

Whether you agree with me or not, remember that you can state your position in future articles by sending me an email at ostrowj@pacifier.com and I'll put you on the mailing list for advance copies of future Outlooks.

Reader Responses

Bob Moorhead, PE

In addition to unintended consequences of new technology in terms of working time, there are also unintended consequences in terms of agency and public expectations. Three examples from my own experience:

1972: I was the first staffer at the Clearwater National Forest Supervisor's Office in Orofino, Idaho, to purchase my own HP-35 hand calculator. It was the first one to have trigonometry functions built-in, so there was no need to use that

hardcover book with trig functions to five decimal places any more. Guess who had to do more than his share of the roadway design calculations?

1982: While at Tudor Engineering in Lewiston, Idaho, we had a large desktop HP computer that calculated and printed contractor pay estimates. It even had a change order sub-routine. But, after 10 change orders involved more than 100 line items, the machine stopped working and printed a message "You have issued too many change orders." The last five monthly pay estimates had to be done by hand.

1987-1993: When it took 2-3 weeks for the City of Olympia Public Works Department to produce a large color city map by hand, there were only two or three requests per year. When a pen plotter could produce a map in 10 hours, the demand for maps increased more than tenfold. When an electrostatic printer could do the job in three minutes, the demand for maps increased exponentially.

When technology advances, demand increases to exceed available capacity.

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John Milne

I recently attended a conference where these issues came up in a couple of discussion streams – “Smart cities” and “The future of work”. I remember way back in the slide rule days being told that you might hate these new computers now (FORTRAN, punch cards, etc.) but you’ll love them later. The contention then was that computers would save us so much work that we’d all have four-day workweeks; plenty of time to fit in an afternoon golf game, etc. Well, as we saw, somehow that particular utopian view didn’t pan out and work increased for many folks as we started to take it home to our home computers, check e-mails at 11:00 p.m., etc. And blue-collar factory workers lost their jobs rather than work reduced hours while also

sharing in the company’s productivity profits. Negative impacts and unintended consequences abounded.

The consensus at the conference appeared to be that this next wave of computers and artificial intelligence would have still more far-reaching effects and would spur an even more radical reorganization of the work tasks needing to be completed by men, and women, and machines. This time many white-collar workers, including us engineers, would also experience the joy of being replaced with a robot, and there would generally be far fewer jobs needed and available throughout all professions. The difficulty then becomes how to keep a very large portion of the citizenry provided for, healthy and happy when they don’t get a regular wage from anyone, and may not throughout their entire life. How much are doctors, lawyers and we engineers going to enjoy shifting to

service jobs at a quarter of our current salary, like our blue-collar neighbors did? And how does a nation maintain stability with 50% of its population no longer working (“unemployed” in today’s parlance).

Solid policy discussions on the distribution of wealth appear to be in our future as a result of this next wave of technology. This is something that we have so far managed to resist (anyone for free national health care?), but may no longer be able to. Engineers always seem to be on the leading edge when new technology arrives. I do agree with your contention here, and think that it would be good for us to take a thoughtful part in discussions of the social policy impacts beyond the technology when we meet at our conferences over the next few years.

Pete Butkus

I agree that it is hard to predict the future and can cite examples of predictions that failed to materialize as well as work of early predictors that just happened to be right. The latter are rare.

I will focus my comments on this Outlook on the latter part of your musing.

“Ironically, that means we are all constantly doing research” (Ostrowski, OCT 17). This is a great, or in the language of research: a valid observation. Research all too often is visualized as taking place on in a social service laboratory, a chemical laboratory, at the metals stress testing site or in the forest. Obviously, research is more than a structured environment and can occur in our offices, in the car while on the road or just sitting on a bench and observing interactions.

Now, to my point: in the APWA Public Works Essentials class and other courses, the learners are encouraged to form networks in one’s own workplace. Networks that can expand one’s research capabilities in breadth and depth. Unfortunately, all too few of our upcoming leaders in the public works arena have benefited from the Essentials or other similar classes.

So, here is my challenge to our fellow professionals: A key part of organizational success is for leaders to mentor and encourage future leaders. Having future leaders participate in the APWA courses is an excellent way to meet this challenge. Select and enroll one of your employees this week for the next open course. Repeat the following year. Repeat.

Finally, a piece on your comment about inventions. “The real challenge will be how to mitigate the negative impacts and unintended consequences

of each new improvement” (Again, Ostrowski, OCT 17). My observation is that this applies to new improvements as well as “doing things the same old way.” Mitigation can take place early in either case by using an A Team (Advocacy) or a B Team (Baloney) to seek out challenges and resolutions to those challenges. Interestingly, as advocated in the knowledge transfer process through the APWA courses.

I did not start my response to your Outlook to be a salesperson for the APWA courses, especially Public Works Essentials. However, the coursework, the in-class networking, and the strong encouragement for class members to continue networking using the A and B Team models just seemed to fit.

AD INDEX

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