



**60th Annual Conference & Equipment Show
Mid-Atlantic Chapter - American Public Works Association
May 2nd - 4th, 2018 ~ Fredericksburg, Virginia**

Technical Program Presentation Descriptions



**Thursday 1:00 pm to 2:45 pm
Stormwater/Flood Control - Room A-B**

#04 - The First Steps in Reducing Neighborhood Flooding in Virginia Beach: The City of Virginia Beach has developed a program to perform ditch dredge design maintenance and improvements to several neighborhoods including two that substantially flooded during Hurricane Matthew in October 2016. Design was already at 30% for Windsor Woods Canal and Northgate Ditch; both of which are in central Virginia Beach and tidally influenced. This approach is the first step of an overall initiative by the City to further reduce flooding throughout each of these two basins. As with other coastal cities along the Atlantic Ocean, Virginia Beach is susceptible to major damages and severe coastal storm activity. Residents who live away from the oceanfront do not understand the impacts of tidal influence within these basins. Hurricane Matthew resulted in damaging approximately 675 houses in the Princess Anne Plaza area that includes both the Windsor Woods and Northgate subdivisions. The presentation will provide details regarding the City's dredging and design program that includes detailed design to remove sediment build-up to improve conveyance of stormwater. Discussion of community outreach and results will be shared. Photos before and after will also be presented. **BENEFITS OF PROGRAM** – This dredging program ensures that ditches function as designed, reducing further millions of dollars of damage to the City's neighborhoods. **STATUS** – Construction is approximately 75% complete for Northgate Ditch and construction in Windsor Woods Canal is expected to be completed by the end of 2018. **Speaker – Alan Davis, Hazen and Sawyer, and Jeff Waller, City of Virginia Beach.**

#21 - Coastal Resiliency and Shoreline Restoration: Evolving the Way We Protect Restored Shorelines: The City of Norfolk is projected to experience a sea level rise of approximately 1.5 feet in the next 50 years. Due to concerns related to public safety, loss of property, protection of infrastructure, and water quality the City, has launched a coastal resiliency initiative aimed at improving fish and wildlife habitat, improve water quality, provide flood protection, and minimize erosion along the shoreline. A Hurricane Sandy Coastal Resiliency Grant awarded to the City will allow them to restore miles of shoreline, using living shoreline techniques. A key component of restored shorelines is determining the type of sill to protect the restored marsh and shoreline. The project team coordinated with VIMS to implement and test new design alternatives and strategies for future monitoring and potential future best management and design practices. The designs use engineering principles as a foundation to account for potential sea-level rises and wave heights at different storm events. Wind return periods were derived to generate potential wave heights at each site using the Automated Coastal Engineering System (ACES) model developed by the USACE and used for wave generation on shores and coasts. Sill designs differing from the typical riprap sill were created, resulting in a more natural and sustainable sill providing better connection to created tidal wetlands for fisheries. The presentation will highlight the newer sill design and possible improvements based on construction observations at two of the project sites. **Speaker – Ben Nash, Brown and Caldwell.**

#40 - What the Floc! SWMFs using chemical treatment: Enhanced stormwater quality treatment may be carried out utilizing rapid coagulation, settling, and subsequent removal of common pollutants in non-point source discharges. Enhanced treatment can result in removal rates far above traditional stormwater management facilities for total suspended solids, phosphorus, nitrogen, and pathogens. This presentation will provide an overview of this emerging solution, discuss case studies, and compare the total lifecycle costs of this technology relative to traditional stormwater management solutions for improving water quality. **Speaker – Don Cole, Brown and Caldwell.**

**Thursday 1:00 pm to 2:45 pm
Sustainable Infrastructure - Room C**

#02 -From large counties to urban cities, rural towns, and regional authorities, Envision® supports all municipalities (and private infrastructure owners, too!): After 5 years in use, lessons learned and industry advancements are being incorporated into Envision, the guidance and rating system for sustainable infrastructure. Envision is adaptable for all infrastructure, comprehensive with all best practices, and thorough for all lifecycle phases. The guidance is free online, and the professional credential (ENV SP) and a third-party project verification and recognition are available for a fee. The Institute for Sustainable Infrastructure released Envision® v2 in 2012 with 60 credits organized into 5 categories. The Envision v3 draft (to be finalized in spring 2018) includes 64 credits in similar categories. There are 14 new credits, 6 significantly rewritten credits, 7 credits were eliminated, and other credits were combined. The new credits cover construction safety, equity and social justice, economic evaluations, and resilience. Projects can register under v2 through the end of 2018 and will receive an award for the planning and design phase. Project registration under v3 will be available in summer 2018 for projects to earn an optional provisional award for the planning and design phase and a full award after construction is complete. Details of how several Virginia municipalities are using (and requiring) Envision to promote building infrastructure in a way that improves the environment, public health, and quality of life will be shared. A case study on a private development earning an Envision award will illustrate the benefit to the community and the power of collaboration to change the industry. **Speakers - Denise Nelson, Berkley Group, Carol Davis, Town of Blacksburg, and Chris Meoli, Fairfax County.**

#10 - Revitalize, Restore, Replant!: The Revitalize, Restore, Replant! program transforms existing stormwater facilities on Fairfax County Public School campuses into teaching tools through student-led native plant installations. Facilities like bioretentions and dry ponds that are structurally sound but lack a strong native plant community are desirable locations for this program because maintaining the plant community takes the back seat when it comes to functionality. There are thousands of stormwater facilities around Fairfax County that must be inspected and maintained to ensure their functionality is retained. Maintaining a weed free, native plant community on these facilities is often beyond the level of service that can be provided. Ecologists in the Fairfax County, VA Department of Public Works and Environmental Services created this program that combines maintenance of stormwater facilities and watershed education for students. Ecologists choose specific native plant species to complement existing Virginia Standards of Learning. Once they are planted, the facilities can be used as teaching tools for all grade levels. The ecologists are currently developing educational materials for teachers to help them use these facilities as outdoor classrooms. The program is a win-win-win collaboration as it provides DPWES with an educational opportunity to foster the connection between students and their environment, it provides upkeep above and beyond the level of service that typical maintenance can provide, and it gives students and teachers the opportunity to make local ecosystem connections in their backyard using a non-traditional teaching experience. **Speakers – Chris Mueller and Samantha Duthé, Fairfax County.**

**Thursday 1:00 pm to 2:45 pm
Emergency Management - Room D**

#05 - The Transformation of the District of Columbia's Snow Program: January 2016 proved challenging in more ways than one to the District of Columbia's Snow Program. Dumping over 18.6 inches of snow on the nation's capital in one consecutive 48 hour period- January 22 - 23, the weather event proved colossal by all measures. In spite of an aged fleet [of which more than 40% (36.4%) had exceeded its recommended service life], communication challenges and relative newness to the field of public works, the department leadership team returned all roads, primary secondary and residential a minimum of 85% cleared within 48 hours of the storms end. Recognizing the extent of these challenges, the Director began the first phase of the plan to address operational and support areas of opportunity by conducting the DPW Snow Summit. The design was to improve operational efficiency through the identification of those areas which could be impacted immediately, in the near term (6 to 9 months) and long term (12 months to 3 - 5 years). During the initial June 2016 Snow Summit numerous areas of opportunity were identified – and the first challenge was met, getting the team involved in the identification of areas of need and accepting ownership to address these needs. Through deliberate and unrelenting engagement, the Director empowered the team to begin looking at strategies to improve reliability of in-house equipment, to enhance communication and accountability organization-wide, to clearly delineate areas of responsibility in operations, planning, logistics finance and administration, to strengthen the citywide support network of departments coming together to provide the overall organization responsible for the snow operation during winter months and to continue the process of empowerment of team members to take ownership of their respective areas through active, solicited engagement, training and team-building exercises. The

results of this effort – a highly detailed 'living' plan – demonstrates keen insight into the support operations which, if not successfully managed and executed, dampen an otherwise successful maintenance and clearing operation. The District of Columbia's Department of Public Works would very much enjoy the opportunity to share with others the details of reviewing, revising [where necessary] and training on the updated DC DPW Snow Plan. **Speakers – James A. Jackson, Jr., District of Columbia DPW, and Diana Clonch, Clonch, LLC.**

#16 - Hurricane, Hurricane! The Role of Public Works, Consultants and Contractors in Recovering from the USVI Cat 5 Hurricanes and Other Disasters: On September 5, 2017, Irma hit the U.S. Virgin Islands as a Category 5 hurricane. For two days, it walloped the islands with high winds and rain, ripping roofs from buildings, stripping trees bare, and critically damaging infrastructure. Hurricane Maria, another Category 5 hurricane, further pummeled the islands from September 16th to September 22nd. In order to recover from the damage these storms caused, tremendous public and private resources were mobilized, including FEMA's Public Assistance team. The Robert T. Stafford Disaster Relief and Emergency Assistance Act ("Stafford Act") authorizes Federal financial assistance for states, local and Indian tribal governments, and certain private nonprofit organizations to respond to and recover from emergencies and major disasters. FEMA administers this financial assistance through various Stafford Act grant programs: Public Assistance Program, Hazard Mitigation Grant Program, and Pre-disaster Mitigation. This presentation discusses the Stafford Act, FEMA policies, and day-to-day operations from the perspective of a FEMA Public Assistance Project Specialist deployed to St. Thomas. The audience will also hear "lessons learned" that could apply to Mid-Atlantic disaster recovery efforts. **Speaker – Beth Arnold, CH2M/Jacobs.**

**Thursday 1:00 pm to 2:45 pm
Asset Management - Room E**

#20 - Electronic Work Order & Asset Management - It's not hard, but words of advice before making the investment in your organization: There are over a dozen companies that market and specialize in software development for work order and asset management for managing public works, roadways and infrastructure assets. How do you and your staff avoid the pitfalls of being sold a product that is either too hard to implement, too complicated for staff to use, too difficult to maintain, or too costly that it never is used? Since 2015, the City of Aberdeen, Maryland initiated a process to transition from paper to an electronic work order/asset management platform in public works. Now three years later, come in and hear about the process our staff used to find a tool that was the right fit for our department and our community to assist in day-to-day operations. Learn how to not get pulled into a vendor's solution because it is the shiniest object on the market, know what questions to ask, understand the pitfalls in implementing, and know how to manage expectations both from the field level to the council. **Speaker – Kyle Torster, City of Aberdeen.**

#42 - Let's Talk Prioritization: Creating a prioritization program is an integral part of an asset management program (AMP). Different localities are creating prioritization programs for a variety of asset types in a multitude of ways. Each locality has a unique set of circumstances to consider when tailoring their programs: environment, location, asset type, found common problems, etc. Although each locality is unique in many ways, they are also similar in many ways as many aspects of these programs overlap. Having personally gone through many different presentations for prioritization programs, for a plethora of different asset types, I have always walked away with at least one significant idea from each one. This presentation will provide a look at Fairfax County's Stormwater prioritization plan and how it has evolved from the beginning stages. I will discuss what was found to be important so far and problems that were discovered along the way. From there, I will open the floor to create a discussion with the participants about their assets and programs. With a wide variety of participants from the region with different backgrounds and asset types, partakers should find an assortment of ideas to implement into their programs. **Speaker – Amy Linderman, Fairfax County.**

**Thursday 1:00 pm to 2:45 pm
Water/Wastewater - Room F**

#26 - Combined Sewer? One Municipality Weighed Sewer Separation Against Green Infrastructure: The Ohio Drain located on the south side of Buffalo, NY is a combined sewer overflow (CSO) point designed to discharge both storm and sanitary flow to the Buffalo River during wet weather events. In an effort to reduce the volume and quantity of such occurrences, the combined sewers in the surrounding neighborhood was recommended for overflow control technologies in Buffalo's CSO Long Term Control Plan (LTCP). This particular sub-shed is tributary to the CSO within a neighborhood where an existing sewer patrol point (SPP) controls the flow of water from the combined sewer system to an overflow pipe, which eventually discharges at the CSO.

The main objective for this project was to determine a cost effective control method by utilizing green infrastructure, sewer separation or a combination of technologies to treat and/or remove 3.0 acres of the shed. The team researched existing collection system sewer drawings and analyzed multiple alternatives to provide the Buffalo Sewer Authority (BSA) with the largest drainage area treated while minimizing cost. Evaluating the optimum alignment and configurations to intercept stormwater inflow removal was essential. This project highlights the importance of long term planning for combined sewer systems with frequent outfall discharge. **Speakers – Chris Chapman and Scott Rybarczyk, Wendel.**

#28 - Strasburg Water Resource Recovery Facility Yields Major Cost Savings: The Town of Strasburg needed to expand and upgrade to a 2.0 mgd, state-of-the-art facility to meet Department of Environmental Quality nutrient reduction requirements. A progressive design-build model provided a transparent and inclusive planning process. Strasburg's goals were met and an outdated Department of Public Works complex was also replaced with a new \$5 million facility. Utilizing a portion of the existing facility resulted in innovative design savings, which paid for more than the new facility. **Speakers – Andrew Casolini and Lauren Glose, Wendel.**

#35 - Bar Screens, Grit Removal, and Pumping Upgrades through the Energy Efficiency Lens: The City of Dunkirk (City) owns and operates a 6.0 MGD Water Pollution Control Facility (WPCF). One of the existing bar screen systems at the WPCF was damaged, leaving the bar screen inoperable. In addition, the WPCF's grit removal system was ineffective in removing grit, causing significant operational issues. The bar screen and grit removal systems were in need of immediate rehabilitation to ensure the continuing operation of the WPCF and to mitigate damage to downstream processes. The City was also seeking financial assistance to fund the immediate bar screen and grit removal systems project as well as other upgrades at the WPCF. The main objective of the project was to expedite the rehabilitation of the bar screen and grit removal system. To accelerate the project, the bar screen was designed and pre-purchased by the City. The design of the bar screen was particularly challenging due to the massive height (83 foot tall) and constraints of the existing channel. Furthermore, due to the configuration of the existing channel, a detailed bypass pumping plan was developed to aid in the sequencing of construction while minimizing downtime. The WPCF's existing grit removal system is comprised of three detritus grit removal tanks; with all three in operation to handle peak flow. One of the existing detritus tanks will be replaced with a new vortex style grit removal system. The new grit removal system is sized to handle the design peak flow, thus drastically reducing the amount of equipment in service while simultaneously enhancing the grit removal process. For financial assistance, funding was secured for the project and future upgrades at the WPCF. The total funding amount secured is \$10,175,000 with 25% in the form of a grant and the remaining portion in the form of a 0% interest loan. **Speakers – Lauren Glose and Ryan Laninga, Wendel.**

**Thursday 1:00 pm to 2:45 pm
Exhibit Hall Presentations – Pavement Management**

#01 - Patching Asphalt in Wet and Cold Conditions: Water-activated asphalt cold patch is a new and emerging technology that is permanent. Correct, you do not have to replace it with hot mix asphalt. It can be installed year-round, but offers particular value in winter months when hot mix asphalt is not available. Water-activated cold patches are already on contract with VDOT, MDOT/SHA, and WVDOH. I'd love to share the features, benefits, and cost savings these types of products can provide. **Speaker - Michael Wertheim, Roadstone Production – Aquaphalt.**

#25 - FlexGard - A Thin Overlay Mix That Performs: Thin overlays place severe demands on asphalt mixtures. The mix must be impermeable to prevent water damage to the underlying pavement structure. The mix must be flexible enough to withstand fatigue and reflective cracking, yet be stiff enough to resist rutting under heavy traffic. And the mix must have excellent workability to be placed in a thin layer and achieve density and smoothness. This presentation describes the development and performance of a high performance thin overlay (FlexGard) mix system developed at Rutgers University. Superpave mixes were developed to primarily cure rutting issues and may be too coarse and dry to provide long-term thin overlays. This mix has since been adopted by the New Jersey Department of Transportation, the New York State Department of Transportation and the Pennsylvania Department of Transportation. The mix gradation is a slightly gap-graded 1/4" nominal size and the mix is designed to be placed 3/4" – 1 1/2" thick. The specification requires a minimum asphalt content of 7% of a specially formulated polymer modified asphalt to insure rut resistance, fatigue cracking resistance and durability. This mix saves on milling costs and material costs and actually costs less than a standard 1 1/2" overlay, yet will outperform the standard mix on the roadway. **Speaker – Ronald Corun, Associated Asphalt Partners.**

#43 - Getting started with warm mix asphalt: Evotherm is the industry leader in warm mix asphalt. It is a water-free warm mix asphalt technology offering new advantages to asphalt contractors and road building engineers looking for innovative warm mix solutions. Contractors have paved over 200,000 miles of Evotherm warm mix asphalt around the world. Evotherm promotes adhesion at lower temperatures by acting as both a liquid antistriper and a warm mix additive. Evotherm saves money while delivering longer lasting roads. Contractors take advantage of the benefits of Evotherm with better workability, adhesion/antistriper, compaction (increased density bonus), increased production, extended hauls, increases recycle percentages, longer paving season and removes fiber from the mix. You can decrease environmental emissions 97% and allows a fume-free work environment. Evotherm WMA creates a more comfortable and enjoyable jobsite for your crew and for the surrounding businesses and neighborhoods. The improved workability of Evotherm mixes helps make high recycled content mixes possible-some contractors are using 40% recycled asphalt pavement (RAP) and or adding up to 5% recycled asphalt shingles (RAS). Using more recycled content is good for the environment and even for your bottom line. Ingevity is here to help. Manufactured in Charleston South Carolina and DeRidder Louisiana. Our regional technical marketing managers and field technicians work together with contractors and agencies in their adoption of Evotherm WMA, assisting in the plant and providing field support. **Speaker – Dominic Barilla, Ingevity.**

**Thursday 3:00 pm to 4:45 pm
Stormwater/Flood Control - Room A-B**

#34 - Reporting Progress: A Framework to Track and Report Data after the Midpoint Assessment: As a non-traditional municipal separate storm sewer system (MS4), the Department of Defense (DoD) Chesapeake Bay Program (CBP) coordinates with military installations, the Chesapeake Bay jurisdictions, and the Environmental Protection Agency (EPA) to report the implementation of best management practices (BMPs) at DoD installations throughout the Bay watershed. For the Bay TMDL, the DoD CBP compiles records of historical, progress, and planned BMPs from DoD installations in the Chesapeake Bay and reports the information to each jurisdiction. In 2017, the jurisdictions released updated templates based on the Phase 6 version of the Chesapeake Bay Watershed Model; these templates include some state-specific BMP nomenclature and credit frameworks. The recent approval of the modeling tools associated with the Phase 6 Model creates greater opportunity for decision-makers to assess the impacts of BMP implementation but requires the data be entered and validated through the program's BMP template. Therefore, the DoD CBP must address spatial and temporal variation in its record keeping of BMP information. This presentation will review the unique requirements for DoD, the changes caused by the Midpoint Assessment, the framework developed to address variation in reporting requirements, and the outcomes measured through the data call. For traditional permittees, the approach taken by the DoD can provide a new perspective on BMP implementation, the activity of the Chesapeake Bay Program and its impact on jurisdiction-level reporting, and other metrics to communicate how BMPs and projects improve the Chesapeake Bay. **Speaker – Stephanie Smith, Brown and Caldwell.**

#36 - Redefining Performance – Measuring the effectiveness of infiltration practices: With the increased focus on green infrastructure in the Mid Atlantic, many utilities and cities are spending more resources constructing, inspecting, and maintaining stormwater facilities. A large portion of these facilities are designed around infiltration into the subsurface. However, most current inspection and performance procedures focus on surface only inspections. More interestingly, many times observations of the actual operating performance of the facility do not occur. That is why our team decided to investigate new techniques for determining the effectiveness of an infiltration facility to reshape how we determine the overall performance of stormwater facilities. This presentation will focus on the use of existing technologies to determine the active infiltration rate of stormwater infiltration facilities (e.g. bioswale, sand filter, etc...). Presenters will discuss important background information, initial development, design, and lab testing of the innovative metering technique. Additionally, presenters will share initial results from field trials in Coastal Virginia and any lessons learned from those deployments. Lastly, a discussion on the next steps will be given to facilitate questions from attendees. **Speakers – Kyle Logue and Carlos Toro, Brown and Caldwell, and Kraig Moodie, FloWav Inc.**

#27 - How One Urban Neighborhood is Implementing Green Infrastructure: The Buffalo Sewer Authority (BSA) agreed to a green infrastructure (GI) target of 20% impervious surface control in the Willert Park neighborhood as part of their Long Term Control Plan (LTCP). The \$5 million project was developed to help meet these requirements. A combination of bioretention, impervious area reduction, infiltration/storage galleries, and porous pavement will be used to provide stormwater volume reduction and water quality treatment. These techniques will treat over 26 acres in this neighborhood meeting the goal provided in the approved LTCP. Providing GI in this sewer shed will reduce or eliminate the need for traditional grey infrastructure improvements. The largest of the three projects was the reconstruction of over 3000 feet of William Street. William Street was three lanes wide in each direction with a center

median. Traffic counts in the area showed only one lane of traffic was needed, so the median was expanded and transformed to act as a bioretention area. Porous asphalt was also added to the parking area on William Street to reduce runoff to the combined sewer system. As part of this effort, a local park dedicated to the first WWI African-American soldier from Buffalo to die in combat was expanded and renovated, adding something significant to the community. The other GI projects added raingardens and bioswales to two neighborhood community centers. These were important to the project as they allowed for student education about GI. In addition, a series of GI education sessions were taught at these community centers. **Speakers – Scott Rybarczyk and Chris Chapman, Wendel.**

Thursday 3:00 pm to 4:45 pm
Public Works Advocacy - Room C

#46 - Accreditation – Is it worth the effort?: Will provide an overview of the self assessment/accreditation process, including benefits, inner workings of the process, requirements including time involved and cost. **Speakers – Judi Hines, City of Newport News, and Matt Villareale, Prince William County.**

Thursday 3:00 pm to 4:45 pm
Career Development - Room D

#03 - Moving Beyond Yesterday to Advance Tomorrow – Your Digital Transformation: Imagine for a minute that the world of construction is only beginning to formalize its processes. How would it look different from what we are accustomed to today? Over the past decade, technology has advanced at an exponential rate, yet in reality, we have only seen a fraction of what's been predicted. Despite the advances, we are still constructing using antiquated practices. Join Ralph Kreider, director of digital facilities for MBP to answer the following questions... Why are we slow to see technological advances in the construction industry? While other industries are getting more productive and seeing a decline in product costs, construction productivity continues to decline, and costs continue to soar. What is holding us back? How can we progress in seeing the efficiencies promised by new technologies? Each of us can make a difference, not by doing more, but by doing it differently. Change may be uncomfortable. What discomfort are we willing to bear today, so that we can advance tomorrow? **Speaker - Ralph Kreider, MBP.**

#13 - Millennial to Millennial: A Public Works Young Professionals Discussion Panel: Meet some of the successful and up and coming young professionals in the Public Works field. Hear how this diverse group of Henrico County professionals prepared for their careers with education, progressed professionally, and what challenges they have experienced. The majority of the session will be opened up for the audience to ask their own questions of panelists. **Speaker – Jen Cobb, Henrico DPW.**

Thursday 3:00 pm to 4:45 pm
Asset Management - Room E

#22 - Smart Lighting for a Smart City: This presentation is intended to define what adaptive and connected lighting systems are, explain how they fit into a Smart City, and illustrate the benefits for owners, maintenance staff, and users. It also provides a broad overview of the design standards, technology, and control devices that make up these systems. Lastly, it covers cost, design, and legal issues that owners may want to consider before moving forward with implementing an adaptive and/or connected lighting system. **Speakers – Jeremy Gruzd and Bryan Larsen, Kimley-Horn & Associates.**

#37 - Are You Ready? What you need to know about the new OSHA Fall Protection Standard: Do you have a fall protection plan for your facilities? Falls are among the most common causes of serious work-related injuries and at when at significant heights can have devastating consequences. In 2017, OSHA updated the fall protection regulations that can have a significant impact on whether your current fall protection system complies. Having a managed fall protection plan for employees and/or contractors to access the roof and exterior walls of a building not only is required but it can protect the property, and provide faster and cheaper access for maintenance and capital projects. This seminar will provide a summary of current fall protection regulations and industry standards that govern how rooftops and building facades can be safely accessed, and how they affect building owners. It will discuss the differences between fall protection and fall prevention, and will describe how different engineered and non-engineered solutions can be used to provide the best benefit to the building owner. **Speaker – Matt Kutzler – Facility Engineering Associates.**

Thursday 3:00 pm to 4:45 pm
Water/Wastewater - Room F

#09 - Jacking Concrete Pipe - Trenchless Installations: A growing segment of culvert installation includes trenchless applications. They are less disruptive to traffic, communities, utilities and businesses. Trenchless installation saves time, save money and improves roadway safety. It is important to know this competitive option. As our Nation's infrastructure approaches its service life, the jacking pipe procedure is a beneficial option worth researching.
Speaker –Aimee Connerton, Rinker Materials.

#12 - Design of a 100 MGD Bypass System and Rehabilitation of a 102-inch Sewer: This presentation describes how the Washington Suburban Sanitary Commission (WSSC) supported the lining of its 102-inch Anacostia Trunk Sewer (ATS) by maximizing use of existing infrastructure to design a bypass system with a capacity of up to 100 million gallons per day. This presentation will help other utilities learn how to maximize the use of existing facilities to make their large diameter sewer projects more affordable and technically feasible. The ATS is the largest, most critical pipe in the Washington Suburban Sanitary Commission (WSSC)'s collection system. WSSC directed rehabilitation of the ATS after a condition assessment identified significant hydrogen sulfide corrosion damage in the pipe and a structural evaluation determined that it was overstressed and at the end of its service life. The rehabilitation was constrained by the fact that approximately 1,700 linear feet of the ATS runs under a levee along the Anacostia River and under the historic Bladensburg Waterfront Park, site of the Battle of Bladensburg in the War of 1812. This presentation will cover the condition assessment of the ATS, the modeling to predict hydrogen sulfide corrosion in the ATS, the selection of the rehabilitation technology, and the design of the bypass system, which includes the installation of a new 96-inch gate valve. **Speakers – Mathew Roder, Greeley and Hansen, and Aaron Hughes, WSSC.**

Thursday 3:00 pm to 4:45 pm
Smart Growth Walking Tour - Meeting Room #5

#15 - Smart Growth Walking Discussion: The Sustainability Committee takes this technical session outside for a short walking tour around Central Park. At planned stops, we'll discuss different aspects of smart growth and the role of public works. Each topic is intended to engage participants in discussion of best practices, pros/cons, and lessons learned. The session will start with a definition of smart growth and a discussion on the responsibilities for public works. Members of the sustainability committee have volunteered to introduce industry best practices and lead a discussion on select topics to allow attendees to share lessons learned. This panel of presenters will cover five aspects of smart growth as the group walks around Central Park looking at local development features. Compact developments, redevelopment, mixing land uses, walkable neighborhoods, community character, preserving resources, and preparing for hazards will be discussed. Getting the group thinking on their feet, allowing them to see and touch infrastructure, and engaging each person in discussion will result in greater retention of the information and create a peer network for future conversations. **Speaker – Denise Nelson, Berkley Group, Diane Linderman, VHB, Inc., James Patteson, Fairfax County, Erik Nelson and Marne Sherman, City of Fredericksburg.**

Friday 8:00 am to 9:45 am
Community Resilience - Room A-B

#07 - Where Do I Start? Building Your Community Resilience Plan Part 1: Planning for the social and built environment critical needs: Everyone in a community plays an important part in our day-to-day lives and we are all interconnected. That interconnectivity is one of the reasons community resilience is a recognized critical national priority. Does your community have a plan? Is your public works department ready to respond in an emergency? The workshop provides an overview of community resilience planning targeted for those in public works who are just getting started with their planning efforts. We will communicate the steps involved in developing a community resilience plan using the NIST Community Resilience Planning Guide as a framework. We will also incorporate other industry standards such as the Department of Homeland Security's National Mitigation Framework, the National Flood Insurance Program (NFIP) Community Rating System (CRS), VML's Green Government Challenge, and more. This workshop will focus on three key initial steps in developing your community resilience plan – forming your team, understanding the situation, and developing your unique community strategy. In Part 1, attendees will learn how to form a collaborative team involving stakeholders and to link social functions of the community to the built environment. To build an effective plan, we need to understand social needs, critical infrastructure, and the interdependencies. The workshop includes individual and

group learning activities, as well as interactive discussions to provide a dynamic experience for attendees. Those attending the full workshop will walk away with a handbook that outlines the framework for their own community resilience plan, including a list of helpful resources and tips. **Speakers – Maureen Roskoski, Facilities Engineering Associates, and Nancy McNabb, The Continuity Project.**

**Friday 8:00 am to 9:45 am
Energy - Room C**

#18 - Energy and Buildings and Fleets: Oh My! Local Government Leadership on Energy: Public works professionals manage energy--in various forms--in many ways in their communities, providing critical services and economic and environmental benefits to the public and private sectors. Panelists will address a number of significant ways in which local governments can continue to provide a leadership role on energy in the 21st century. Panelists will discuss emerging trends in the energy efficiency, renewable energy, and electric vehicle technology marketplaces. This panel will be an excellent opportunity for public works professionals to better identify and utilize resources available to their jurisdictions through 1) VA Clean Cities, which provides resources (technical support and incentives identification) for alternative fuel vehicle infrastructure and electric vehicle charging stations for municipal and school district fleets; 2) The Virginia Energy Management Program (VEMP) which provides access to pre-qualified energy performance contracting firms and no-cost technical assistance for facilities managers of public buildings to help reduce operating costs; and 3) Commercial Property Assessed Clean Energy (C-PACE), an innovative financing tool enabled by local governments which allows private and not-for-profit building owners and new building developers to execute energy efficiency and water efficiency retrofits and/or install renewable energy systems with no out-of-pocket costs. Arlington County launched the first C-PACE program in the Commonwealth in January 2018. **Speakers – Rich Dooley, Arlington County, Alleyn Harned, Virginia Clean Cities, and Nam Nguyen, DMME.**

**Friday 8:00 am to 9:45 am
Management - Room D**

#14 - Stretched Thin! How Can You Possibly DO MORE for Your Community?: Local government's resources are shrinking while expectations for delivering real world results are greater than ever before. Public Works directors and managers are facing increasing challenges: staff turnover, constrained budgets, state/federal mandates, and growing expectations. Responding to emergencies day after day, how can you possibly do more with less? The contract staff procurement option, popular in other states, redefines how work gets done. This model for support services helps departments manage daily workloads, plan tomorrow's needs, and take advantage of professional expertise without the commitment of hiring full time employees. The contract provides experienced, flexible staff offering on-site or off-site support tailored specifically to your organizational needs. Professionals work as a true extension of your staff and have access to the full resources available at the contracting company. This is a powerful solution to overcome hiring freezes and the dearth of professionals in the 10-30 year experience level. In addition, the Virginia Public Procurement Act allows municipalities to ride a cooperatively procured contract for non-professional services in another municipality, thus reducing the time and expense associated with procuring support services. Many public works functions can be classified as non-professional services, such as project development and management, permit compliance, stormwater program administration, sustainability and resilience initiatives, and public outreach. Municipalities can quickly bring in part-time, qualified support staff thanks to cooperative procurement for contract staff. Case studies of successful examples in Virginia, such as MS4 program management, will be shared. **Speaker – Drew Williams, Berkley Group.**

#39 - 4 Funds, 3 Departments, and 2 Phases for 1 project. Making teamwork...work: A seemingly simple football field relocation and storm water improvements became a complex and intriguing multi-project that carried on for 2 ½ years and continuing. The existing fifty-year-old football field, shared with the outfield of the existing softball field, was problematic for the youth league football teams due to a rugged uneven surface that was plague with drainage issues. To make matter worse, older cities have a tendency to bury things instead of doing total removal. The project was designed and redesigned more than 7 times due to the overall redevelopment of the sports complex (football field, softball field, 3 baseball fields, parking, office/concession building, press box, drainage) and funding. Adding to the difficulty was creating a phasing schedule to accommodate time constraints and pressure from the community (to make use of the field the following season). The phases went from 3 to 4 to 2 to 5 to 1 and finally back to 2. This was all decided within a period of 6 months during design. The project consisted of the following: 1) Building a new football field with press box; 2) Building a storm water conveyance system to eliminate flooding and saturation; 3) Building a 204 car parking lot; 4) Building sidewalks and ramps for pedestrian accessibility;

6) Restoration of the baseball and softball fields; 7) Installation of an irrigation system for the football, softball, and baseball fields; 8) Installation of new utilities (water, sanitary sewer, storm water, electrical); 9) Installation of lighting for softball field and parking lots; 10) Demolishing existing office building, storage building, baseball backstop, and a leftover concrete platforms; and 11) Installation of trees, shrubbery, plants, and flowers. The proposed location for the football field just happened to be the location of the old Cavalier Manor Elementary School. Soil borings found considerable amount of debris (concrete, steel, iron, brick, glass, terra cotta, asphalt). Therefore, instead of building the football field the standard way, it was more cost efficient to raise the field 2.5 feet above the normal ground than to try and remove the debris from the foundation. As with funding, the project came in over budget due to the unforeseen field changes. Having to pay out of three different funding sources was a task but to cover the almost half a million dollars in additional charges for the necessary change orders was truly a learning experience. Several items were cut from phase 1 and placed in phase 2. The time frame was at the end of the fiscal year and the CIP budgets have been expended. Obtaining the required funding from other sources had to be imaginable and extremely creative. The lessons learned included: cooperation and integration of multiple engineering disciplines was essential to the success of the project; innovative and creative use of materials were utilized to install the storm water system which provided a sound foundation for additional service life; incorporating the concerns of the community in the overall design and time schedule proved to be awarding and self-sustaining; and organizing multiple funding sources to include substantially high change orders. **Speakers – Frank Brown, City of Portsmouth.**

#44 - Mid-Atlantic Public Works Institute, What's in it for You!: The Mid -Atlantic Public Works Institute graduated its first cohort in April 2017. This presentation will provide an overview of the Mid-Atlantic PWI followed by a panel discussion of PWI Participants explaining the benefits of attending, subjects presented and how they have applied lessons learned. **Speaker – Scott Smith, Mid-Atlantic Public Works Institute.**

Friday 8:00 am to 9:45 am
Asset Management – Room E

#23 - Lost and Found with Utility Infrastructure: How many times have you run into a utility conflict during construction that causes unnecessary cost and delays to projects? I bet everyone has. Keeping good project records is a start, but what about consolidating those records into a single file that could be used proactively for future maintenance and minimization of utility conflicts. Tracking infrastructure assets such as utilities is a technological challenge for smaller cities. This presentation will discuss best practices and lessons learned for Utility Mapping and Management. This will include collecting data on linear assets and the related files for the assets. This is can be collected, stored, and analyzed in a GIS. A GIS serves as a repository of location information and asset details, based on a web map with layers corresponding to various systems that can be updated and shared in real-time with workers in the field. The use of technology in both the office and in the field can be a beneficial tool for any works department. The alternative is a technician causing costly damage because of inaccurate or incomplete information. **Speakers – J.D. Hines and David Hurst, VHB, Inc.**

#24 - Who put water in my asset management system?: Asset management systems for stormwater infrastructure are often desired by municipalities and transportation agencies for creating and tracking maintenance work orders, budget planning, and a general understanding of their system, but an asset management system can also be used to track MS4 compliance. Numerous requirements of the MS4 Six Minimum Control Measures can be accomplished or made more efficient by taking advantage of tracking tools in an asset management system. This talk will explain how to enhance an asset management system for MS4 compliance, present cases studies on helping agencies comply with their respective MS4 permits, and review the development process and implementation strategies. VHB has been working most recently with municipalities in developing their drainage asset management systems to accommodate EPA stormwater obligations. Through these experiences, we have learned how to organize data to most efficiently track and report compliance measures that are required by municipalities across the Mid-Atlantic. Although there are many drivers for creating a system, the most important aspect is creating a system framework that can be used to track, plan and report MS4 permit and enforcement requirements. A robust asset management system can allow users to collect data in the field while also updating data in the office and be easily converted into tables for annual reporting. Development of the system requires forward thinking to understand future permit requirements and infrastructure needs, but once implemented, it can be an efficient tool that helps reduce the cost for MS4 compliance while working within maintenance and planning tools. **Speakers – David Hurst and J.D. Hines, VHB.**

#29 - Being proactive with environmental compliance can help save you time and money!: Local municipalities must continually deal with the challenges of staying environmentally compliant while working with a budget. Therefore, it is critical to come up with a plan early and often in order to achieve this. Through our several years of working with the public sector, we have come up with very creative ways on managing risk while maintaining environmental compliance and budget. *Speakers – Michelle Wharton and Katie Crum, Kimley-Horn & Associates.*

**Friday 8:00 am to 9:45 am
Communication – Room F**

#11 - Communicating in a Crisis: Lessons Learned from the Lower Cape Fear Transmission Main Break: After Hurricane Matthew, a 48" raw water main serving southeastern North Carolina failed. More than 12.5 million gallons of daily supply serving 300,000 people was being lost in a location made difficult to work in by flooding, trees, and poor soil conditions. The three affected utilities immediately mobilized to protect their remaining water supply and to plan for the days ahead. A series of emergency response plans were instituted to handle the repair and inform the public. Over the course of the next three weeks, the utilities used a Unified PIO under the National Incident Management System (NIMS) to proactively push out important information while reacting to rising customer concerns. News releases, interviews, photos, videos, posts, feeds, and threads were used to inform the public at all hours of the day and night, even with limited staff. These channels also proved to be essential in keeping the media actively engaged AND away from the sensitive work scene. The public received information in one or more ways that they prefer, increasing its impact. Because of the greater transparency and information flow, the entire utility community earned overwhelmingly positive reviews for their levels of emergency response and customer care. WaterPIO staff (McGill) served as the Unified PIO during the crisis. The presentation will cover the communications tools used to clearly and concisely inform the public. Social media played a particularly important role, allowing the utilities to quickly respond to questions, concerns, and customer anger popping up throughout all of the service areas. *Speaker – Mike McGill, WaterPIO.*

#31 - Professional Wrestling – or How to Communicate with the Press and the Public: Like it or not, we live in a communications/message driven society, and those of us who serve in government (not just Public Works) must always be especially prepared to engage with the different audiences and explain and communicate what we do, when we do it, and how we do it. Citizens and neighborhoods affected by projects have a steady stream of questions and want answers. City/County officials want to know the latest information about the projects they approved so they can answer to their constituents. Reporters are always looking for a story, and no one tells a better story with lots of great pictures than public works. Officials also need to keep in mind the importance of crisis management and planning. What happens if there is a serious injury or death involving public works and the news media is alerted? Weather events always attract the news media; how should it be handled? A civic league is opposed to a project and is attracting a lot of attention from both the news media and local officials – how do you handle it? Storm damage? Street closures? The list goes on . . . and the list of people who want answers is longer. This program will present the different options departments have and what will work best – regardless of size or budget. *Speaker – Drew Lankford, City of Virginia Beach.*

**Friday 10:00 am to 11:45 am
Community Resilience – Room A-B**

#08 - Where Do I Start? Building Your Community Resilience Plan Part 2: Determining Long-term strategy and prioritizing risks: Everyone in a community plays an important part in our day-to-day lives and we are all interconnected. That interconnectivity is one of the reasons community resilience is a recognized critical national priority. Does your community have a plan? Is your public works department ready to respond in an emergency? The workshop provides an overview of community resilience planning targeted for those in public works who are just getting started with their planning efforts. We will communicate the steps involved in developing a community resilience plan using the NIST Community Resilience Planning Guide as a framework. We will also incorporate other industry standards such as the Department of Homeland Security's National Mitigation Framework, the National Flood Insurance Program (NFIP) Community Rating System (CRS), VML's Green Government Challenge, and more. This workshop will focus on three key initial steps in developing your community resilience plan – forming your team, understanding the situation, and developing your unique community strategy. In Part 2, we will move to strategy development, risk assessment, and how to bring together into a framework for your community's plan. Through activities, we will explore how to establish community goals, prioritize risks, and determine where your community currently stands in preparedness. The workshop includes individual and group learning activities, as well as interactive discussions to provide a dynamic experience for attendees. Those attending the full

workshop will walk away with a handbook that outlines the framework for their own community resilience plan, including a list of helpful resources and tips.

Speakers – Maureen Roskoski, Facilities Engineering Associates, and Nancy McNabb, The Continuity Project.

Friday 10:00 am to 11:45 am

Sustainability – Room C

#17 - Lessons Learned: Green Infrastructure Design and Construction in an Urban Environment: Hear about lessons learned and best practices from Volkert's key green infrastructure personnel - leaders in the design and implementation of low impact development (LID) stormwater management (SWM) in urban settings. The purpose of this session is to equip attendees involved in the planning, design and construction of green infrastructure with the critical knowledge needed for implementing high-performing LID facilities within transportation infrastructure. Projects that include a planning phase provide the opportunity to complete a benefits analysis for green infrastructure projects, which helps prioritize locations and start the engagement with the public regarding project goals. These goals may include environmental benefits, community investments, and improvements to facilities and the transportation network. The planning phase is followed by a design phase that looks in greater detail at issues such as parking requirements, traffic concerns, and pedestrian accessibility improvements, along with constructability and maintenance requirements (an often-overlooked component). Well-designed LID facilities become part of the transportation network, and avoid utility and mobility conflicts. They also provide opportunities for beautification and civic engagement and pride. Even when properly planned and designed, LID facilities have unique construction and submittal processes, and require specific construction sequences and methods for successful installation. For example, some LID materials require additional testing and lead time, and other items, such as soils and landscape materials have specific approval processes. These unique processes require contractors and inspection personnel who are trained and knowledgeable, and who also understand the importance of the proper construction sequence and methods. **Speakers – Oliver Boehm and Ben Lineberry, Volkert, Inc.**

#30 - Putting ecological function back into stream restoration: The number and scope of stream restoration projects has increased substantially over the past few decades. Over the same period, municipal participation among restoration activities has increased as well. From commenting and plan review, to design, project development and management, to implementation and maintenance, municipalities now need specialized and refined skill sets in order to meet project goals. The typical approach has been to arrest rates of erosion through designs that stabilize the streambanks using natural channel design (NCD) techniques. However, research reporting on stream restoration projects (mostly for compensatory mitigation) throughout the 1990s and 2000s indicates there has been little success in providing functional uplift to in-stream quality and surrounding corridors, with little to no mention of ecology. New regulatory frameworks are working towards requiring functional ecological uplift. This presentation will outline a conceptual framework for understanding stream processes and the interconnectedness of each, called the Stream Functions Pyramid (Harmon et al. 2012), addressing the hydrology, hydraulics, geomorphology, physiochemical, and biological components associated with stream functions. Additionally, the presentation will detail ecological significance of each component and typical assessment methods used for project implementation and evaluation. Staff from Fairfax County's (VA) Stormwater Planning Division will detail a process by which stream corridor ecology is utilized in all phases of stream restoration projects (site selection & scoping, design, implementation, and monitoring) in order to improve ecological outcomes. Finally, this presentation will indicate how innovative monitoring and ecological feedback mechanisms can be utilized to improve future stream restoration projects. **Speakers – Chris Ruck and Meghan Fellows, Fairfax County.**

Friday 10:00 am to 11:45 am

Management – Room D

#32 - The Unexpected Outcomes of an Unconventional Approach: The Fairfax County Solid Waste Management Program was getting the job done, picking up the trash and burying the ash. But just under the surface, there were significant problems. Costly accidents were a regular occurrence, and no one was sure how much money was coming in – or going out. Leadership that focused on accountability and employee engagement was the key to turning things around. Despite some concerns that “that’s not how we’ve always done it,” the management introduced several new tools to improve accountability. Having employees at all levels see themselves as stakeholders was critical to the program’s success. With compelling examples, this presentation will chronicle the journey of cost cutting, staff reduction, new programs, increased safety, better environmental compliance, and an increase in revenue. By focusing on creating a culture of accountability and safety, things began to turn around. Over the course of two years, the organization was able to save \$3

million dollars of expenses. This involved taking a strategic look at everything we did and asking ourselves if there was a better way to do it. At every level, individuals, leaders, and teams need to institutionalize a common approach to change management. Every work group identified the actions that they could take as individuals and as an organization that would result in the necessary results. Would watching the bottom line lead to improvements in safety and service delivery as well? This presentation will provide some insight into institutional course correction, culture change, and other wildly important goals.
Speaker – John Kellas, Fairfax County.

#38 - The Power Within Us – Changing the Diversity Custom: What if our good intentions towards diversity have not been enough? Have we gotten so complacent with our approach to diversity that we are missing the mark? How many times have we truly been creative and strategic in our thinking and approach to diversity so it supports our organizational priorities? Gender, age and race should not be forgotten but they should also not always just lead the effort. Our beliefs can sometimes be a hindrance to our own achievement and inclusion does not always ensure success. How we develop the strategies needed to interest those we genuinely want to attract is important. As we continue in our career paths, it should include a self-assessment of what we know about cultural awareness, limitations and managing competences that will allow us to break down diversity custom norms. The services we provide our communities should be reflective of how we have successfully formed the necessary relationships among the many diverse groups that makeup local government. **Speakers – Diane Linderman, VHB, Inc., James Patteson, Fairfax County, and Reed Fowler, City of Newport News.**

**Friday 10:00 am to 11:45 am
 Asset Management – Room E**

#06 - Sidewalk Inventory in the Field: A Systematic Approach of Evaluating Sidewalk Quality: Sidewalk quality is a metric that is inherently subjective when it comes to data collection. The Americans with Disabilities Act (ADA) defines the standards a sidewalk should be built according to, but only to a single specification per value. Since the ADA lacks depth for rating quality, the degree of how much a given defect affects a sidewalk's quality is in question. The goal of this project is to be able to define a sidewalk beyond the "yes"/"no" criteria of ADA compliance, and create an objective system for quantifying sidewalk quality. The need for an objective evaluation method for sidewalk quality was a byproduct of Henrico County's effort to build a sidewalk inventory. A sidewalk inventory is a GIS database, which contains a geographic component (map) of sidewalk infrastructure that exists within a defined land area, in this case Henrico County, and also records tabular data on sidewalk condition, metrics, and other pertinent information. In an effort to collect field data on the sidewalk inventory, it became imperative to implement an objective system to insure data integrity in the present and future. My solution was to develop a quality assessment system inspired by previous sidewalk studies and rooted in state and federal standards. This presentation will teach viewers about "ground-truthing" GIS data, notable sidewalk defects, creating and applying a condition assessment system, and what potential lies in a well-designed sidewalk inventory. **Speaker – Brandon House, Henrico County.**

#19 - Integrated Capital and Energy Planning (ICE): Lurking within concrete walls, creeping along underground pipes, and hiding in deteriorating treatment equipment: the unseen threat of failing infrastructure is all around. For decades, we treated each necessary repair as a singular, isolated issue: power washing a tank to make it aesthetically pleasing, replacing a section of waterline to deal with high break areas, chemically treating filter media to get it through another year. With this incremental approach, we failed to look comprehensively at how these systems work together, or whether there was a better way to take care of our assets. What if instead we develop a plan with a new tactic in our toolbox: Integrated Capital and Energy (ICE) planning? ICE is a holistic approach, evaluating the individual capital projects needed to avoid failures through the lens of energy efficiency and optimization that help fund the projects. We will provide a case study of ICE plans for water and wastewater facilities. These improvements not only helped these municipalities or agencies save money, they allowed them to move into the future on a more solid, sustainable basis. Asset renewal integrated with energy efficiency brings economic, social and financial benefits. **Speaker – Lauren Glose, Wendel.**

#45 - Evolution of a UAS (Drone) Program and How it can Benefit Your Organization: Drones, otherwise called "Unmanned Aerial Systems", or UAS by the Federal Aviation Administration (FAA), are becoming more and more sophisticated. The advances in UAS technology and software, coupled with a drop in prices, have resulted in a proliferation of the devices. This presentation will inform attendees of best practices in managing and scaling a drone program for their Utility or Business. Some of the beneficial uses of UAS include routine safety and maintenance inspections, storm damage documentation, disaster management, mapping and surveying, discovery of site security issues, documenting construction progress, reviewing erosion and sediment control effectiveness, assisting in search and rescue, and obtaining high-resolution graphics for public information and City Council meetings.

Some of these beneficial uses of UAS will be reviewed thru specific case studies. Relevant information will be provided regarding what is required to obtain the FAA Part 107 Remote Pilot License, what restrictions are currently in force, in-house vs outsourcing, and what to look for in selecting an outside Firm to perform your UAS work. Additionally, we will take a further look at the challenges of scalability, support, and adoption of UAS technology moving beyond the initial phase. **Speakers – Terry Legg and Andrew Li, Whitman, Requardt & Associates.**

**Friday 10:00 am to 11:45 am
Water/Wastewater – Room F**

#33 - The Use of Field Test Kits for Dry Weather Screening - A Case Study on Effective Source Identification and Tracking: One of the more common and least detectable forms of pollutant loading in natural waterways occurs without a single drop of rain. Referred to as dry weather flow, these flows have required many MS4 operators to implement programs to detect them. One of the biggest challenges for the detection of these flows is their intermittent and sometimes unlawful nature. To mitigate this, the City of Virginia Beach determined that rapid identification (i.e. on-site sampling) of these potentially illicit discharge sources is paramount to finding and mitigating the impacts of these flows to receiving waters. Typically, lab analysis of water samples can take several days to process, by which time the source of the dry weather flow could become difficult to track or literally dry up. This presentation will focus on the effectiveness of using on-site chemical analysis kits to identify illicit discharge and improper connections. Investigators for the City used field test kits to analyze dry weather flows and perform source tracking in real time when flow or physical indicators were observed. For the FY17 program, the City investigated more than 50 municipal separate storm sewer system (MS4) outfalls, resulting in the finding of one exceedance for chlorine. Due to the rapid identification ability of these field kits provided, investigators were able to quickly identify the source and mitigate the downstream impacts. **Speakers – Kristina Kowalski and Kyle Logue, Brown and Caldwell.**

#47 - Lessons Learned: Tuning Up “The Hill City” – Lynchburg’s Downtown Utility and Streetscape’s Project: Aging water mains are a common problem across Virginia, however, the City of Lynchburg has some of the oldest water mains in the country. Fortunately, the City along with local developers are committed to investing in the Downtown. Phase I of the Downtown Utility & Streetscape Project is the culmination of a multi-year planning and design effort to begin “Tuning Up Downtown”. The 16-month-long replacement of aging water, sewer, and storm utilities in the city’s center along with streetscape improvements completed construction in November 2017. Over 3,500 feet of new water line, 37 new valves, 22 storm structures, 4,000 feet of electrical conduit to serve new street lights, and 3,000 feet of new information technology conduit were installed. Design and construction coordination efforts included 45 businesses and residents, including significant coordination with the ongoing construction/renovation of the Virginian Hotel and the Academy Center of the Arts. The streetscape portion created wider ADA compliant sidewalks with improved lighting, landscaping, hardscaping, benches, trash cans, and crosswalks. Additionally, an antique fire hydrant and plaque were installed at the corner of Seventh and Main streets to commemorate the history of the Glamorgan Foundry in Lynchburg. The restored hydrant is now connected to a 7-inch pipe originally installed in 1828 to move water from a pumping station on the James River to a reservoir at the corner of Clay Street and Seventh Street. The Construction Manager at Risk (CMAR) delivery method was used for construction with the project being completed under the projected \$8.5 million construction budget. The construction team included 11 sub-contractors and over 120 crew members. **Speakers – Kevin Williams and Rodney Hill, Whitman, Requardt & Associates, and Clu Pettyjohn, English Construction.**

**Friday 10:00 am to 11:45 am
Active Presentation – Sustainability – Meeting Room #5**

#41 - Understanding Honey Bees and how they relate to Public Works: Many localities with mosquito spraying programs need to coordinate with beekeepers and this program will familiarize attendees with many the facets of beekeeping. The presentation will cover concerns with pesticides, what to do if a swarm of bees is encountered, and the seasonal nature of the honey bee life cycle. In addition, a brief overview of the history of bees, the status of beekeeping in America today, what hives look like, and challenges facing honey bees. Actual beekeeping equipment will be on hand and shown during the presentation. Depending upon weather and availability, a hive will be outside with bees will be on-hand for live demonstrations of beekeeping. **Speaker – Don Cole, Brown and Caldwell.**