

## October Section Meeting: The Purple Line Light Rail Transit Project: Progress through Public-Private Partnership

By Jameelah M. Ingram, PE, M. ASCE

The Purple Line is a 16.2-mile light rail transit line that will extend from Bethesda, in Montgomery County, to New Carrollton in Prince George's County, in Maryland. The Purple Line will promote multi-modal transportation options as it connects the travelling public to WMATA Metrorail, MARC, Amtrak, and local bus services. The transit line will be delivered by 2022, through a Public-Private Partnership (P3) led by the Maryland Transit Administration (MTA).

Due to the nature of a P3 environment, conditions of the Purple Line Light Rail Transit Project continuously change, and the approach to building this transit line must adapt accordingly. This presentation will discuss the approach to building the project in a dynamic design, build, finance, operate, and maintain (DBFOM) environment, including: aspects of the P3 Agreement; property acquisition and relocation; and design in relation to ongoing construction.

MTA and its program management consultants will examine their position at the intersection of the project as they interface with the concessionaire's construction and design engineering teams, multiple agencies, the public, and property owners. Through this collaborative effort, the Purple Line will provide direct, rapid, and reliable east-west transit service to connect major activity centers in Maryland, from east to west, upon completion.

Please find biographies for the following presenters on the following pages:

- Jeffrey D. Ensor
- Jameelah M. Ingram, PE, M. ASCE
- Edward J. Elder, PE



### Jeffrey D. Ensor

*TDD Chief of Staff and Director of Project Delivery & Finance  
Maryland Transit Administration (MTA)  
Office of Transit Development and Delivery (TDD)*

Jeffrey Ensor serves as the Director of Project Delivery & Finance and the Chief of Staff for the Maryland Transit Administration's Office of Transit Development and Delivery, where he helps manage the team responsible for delivering the Washington area Purple Line P3 project. Of particular note, Jeff led the commercial and financial negotiations on the Purple Line's P3 contract, the \$875M TIFIA loan, and the \$900M FTA Full Funding Grant Agreement.

Jeff is also the Immediate Past Chair of the American Public Transportation Association's (APTA) Innovative Funding, Financing, and P3 Committee. Prior to joining MTA, Jeff was a Principal Consultant with Parsons Brinckerhoff's Strategic Consulting practice where he advised public and private clients on a range of financial, P3, and mega-project delivery issues. Jeff was named one of *Mass Transit Magazine's*, "Top 40 Under 40," in 2012, and he is a graduate of Washington State University and MIT.

Please join us on **Tuesday, October 16**, at the Hilton Arlington, 950 North Stafford Street, Arlington, VA, on the second floor in the Gallery Ballrooms. Parking is available at the hotel (\$10), at the Ballston Mall garage (\$1 after 6 pm), and on the street (free after 6 pm). The Hilton is on the same block as the Ballston Station on Metro's Orange and Silver lines. Registration and networking will be from 6–6:45 pm, followed by dinner. The program will end by 8:30 pm. The cost is \$45 for those preregistering, \$25 for Life members, \$10 for students and \$55 for walk-ins, as space allows. One Professional Development Hour is available to attendees. For questions, please contact [Emily Dean](#). Please click [here](#) to register by **October 11**.

*Note that no-shows will be charged the full registration fee. We welcome walk-ins, including any registrations made after the guaranteed number of guests is provided to the hotel. However, the cost for walk-ins is higher because the Section is charged accordingly by the hotel for late registrations.*

### Jameelah M. Ingram, PE, M. ASCE

*Purple Line Project Engineer  
Maryland Transit Administration/  
Program Management Consultant  
WSP USA*

Jameelah M. Ingram was inspired to study architecture and structural engineering by the soaring skyscrapers and beautiful bridges in her hometown of Chicago, Illinois. Her mother, who is a surreal artist, and father, a technical professional and U.S. Navy Veteran, greatly influenced her path. She earned a Bachelor of Science in Civil Engineering

*continued on page 2*

## President's Corner

Hello Members! Over the past decade, I have worn many hats within the ASCE National Capital Section, but I am honored to now be President. I could not have gotten here without the help and support of the past Board of Directors, especially Past-President Brian Barna, and I thank Brian and the rest of the Board for their service and dedication.



Our 2018–2019 year is off to a great start! We had a fantastic turn out at our September Section Meeting on the DC and Flint Water Crises, our Younger Members held their Annual

Planning Meeting and have new leadership, and the Reston Branch hosted a speaker on the Importance of Innovation and Technical Excellence in Engineering.

This year I look forward to getting to know more of you and hope to better understand how the Board of Directors can serve the membership to get more people engaged. I hope each of you will consider attending a new or different event than you usually do. Or consider joining us at an event if you don't usually. The coming months are full of exciting events and activities from our regular monthly Section

Dinner Meetings, Branch Meetings, and committee meetings to a resume workshop and Region 2 Assembly at George Mason University, so there really is something for everyone.

If among all of the activities we have planned you still can't find something that interests you, I encourage you to reach out to the Board of Directors and let us know how we can help find a way for you to become more active. I look forward to your feedback and input, and especially to meeting you!



Emily Dean  
ASCE-NCS President

## October Section Meeting

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from Princeton University and a Master of Science in Civil Engineering from the Georgia Institute of Technology. Currently, Jameelah is a Lead Structural Engineer in the Washington, D.C. office of WSP USA. She has over a decade of experience in bridge inspection, rehabilitation, and design – including an internship in Tokyo, Japan. Jameelah currently works on behalf of the Maryland Transit Administration for the Purple Line Light Rail Transit Project. As a Project Engineer, she assists the Real Estate team in the acquisition of Right of Way and engineering coordination.

In 2013, Jameelah was selected as one of the American Society of Civil Engineer's (ASCE) New Faces of Civil Engineering. In 2018, Jameelah received the Meritorious Service Award from

the ASCE National Capital Section for engineering outreach efforts with students. Presently, Jameelah resides in Washington, D.C. with her husband and a fellow engineer, Jesse Ingram. She enjoys filmmaking and visiting the museums that the Nation's Capital has to offer.

### Edward J. Elder, PE

*Purple Line Project Engineer  
Maryland Transit Administration/  
Program Management Consultant  
AECOM*

Edward is a project engineer consulting with the MTA for the Purple Line project since September 2014. He contributed to the early phases of the Public-Private Partnership by developing the Technical Provisions and coordinating

various review processes through the proposal phase. As the project progressed through procurement, he has transitioned into Right of Way and Engineering coordination, primarily focused on supporting the acquisition process and working through engineering and construction issues with property owners and developers.

Prior to working on the Purple Line, Edward worked in the AECOM bridge department in design and inspection. He holds a Bachelor's Degree in Mechanical Engineering from Lehigh University and a Master's Degree in Civil Engineering from the University of Maryland. Outside of work, he is involved in Engineers without Borders and enjoys biking, snowboarding, and live music. ■

## Newsletter

Sumon Chatterjee, Editor

**November 2018 Issue Deadline:** November 1, 2018

**To Submit Articles:** [newsletter@asce-ncs.org](mailto:newsletter@asce-ncs.org)

**NCS eNewsletter Archives:** go to [www.asce-ncs.org](http://www.asce-ncs.org) and view along the sidebar.

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## National Capital Section

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### Committee Chairs

Please refer to the [NCS website](http://www.asce-ncs.org) for a current list of NCS committees and chairs.

## Review of “Rethinking America’s Highways”

By Ranjit S. Sahai, PE, F.ASCE

When the National Capital Section was preparing the 2016 Report Card for D.C.’s Infrastructure, a name came up in hushed tones. As the chair of the NCS Committee who led the Report Card effort, I was encouraged to explore his radical ideas, but cautiously. That name was Robert Poole.

Then on May 24, 2018, the ENO Center for Transportation honored Robert Poole during its annual awards ceremony with the “[ENO Thought Leader Award](#).” I had the opportunity to listen to him first hand at that event. He won recognition for his work on transportation policy over several decades and his vision of the future of transportation development in the US. He is a proponent of privatization of transportation infrastructure to help America bridge the funding gap between needs and allocation.

This article briefly indicates what you will find in his book, “[Rethinking America’s Highways](#).” The book was published on August 3, 2018.

In the book’s Preface, Robert sheds light on his background from the 1970s thorough 1980s that sparked an interest in transportation policy research and the circumstances, over a decade later, that allowed him to devote full-time to this work.

Unless we revive privately funded, tolled infrastructure, a concept that was used for a considerable number of bridges before the Great Depression, we will continue to see a shortfall in highway funding that is sorely needed to improve its condition nationwide.

The book has 12 chapters and its hard-cover edition has 352 pages. Robert begins with metrics that indicate the magnitude of trouble our highway system is in. He then shares examples of America’s freeways that showcase

how the private sector is reinventing them. He draws a parallel between this reinvention and the pre-Great Depression highway model – and that they are returning to America, after a successful run in Europe, as long-term P3 (Public-Private Partnership) concessions.

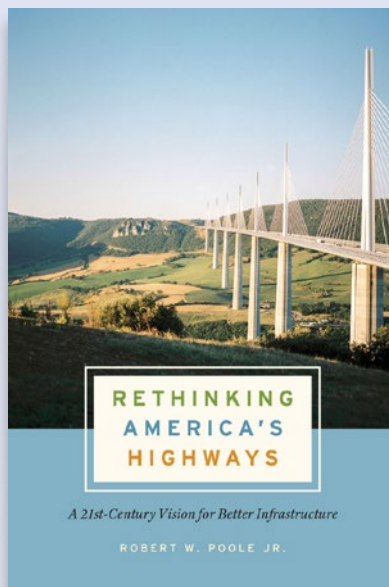
The author highlights the benefits of long-term P3 concessions, and common opposing arguments from critics.

Those of you who are, or will soon work on long-term P3 concession projects, the book offers a lot of ideas you can draw from when conducting public outreach and interacting with public officials.

This article concludes next month with a review of Robert’s vision of what’s next.

### About the Author

Ranjit, a Past President (2013–14) of ASCE-NCS, is a principal and founder of RAM Corporation, a firm serving State DOTs with a focus on traffic engineering design, stormwater facility inspections, and IT solutions for engineering workflows. He is also an [author](#) and speaker.



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# In Memoriam: J.A. “Jay” Padgett, P.E., F.ASCE

By NCS Past President Fernando Pons

The National Capital Section lost a friend as Jay Padgett passed away on September 18th. Jay served as ASCE-NCS President from 1986–1987.

Jay was a native of the Washington, DC, area where he was a practicing civil engineer, geotechnical engineer, and entrepreneur. During an accomplished 45-year career, Jay was committed to life-long learning, professional mentoring, and advancing the vision of civil engineers as leaders and innovators, facilitators, and synthesizers.

Jay earned a Bachelor of Science degree from Dickinson College in 1968, with a major in physics and a minor in mathematics and was enrolled in ROTC. Jay chose the Corps of Engineers as his Army branch, earning a Master’s degree in civil engineering from Rensselaer Polytechnic Institute in 1971, before going on active duty.

He was the president and founder of GeoServices Corp., a respected firm specializing in subsurface exploration services and geo-instrumentation in the Mid-Atlantic. Prior to founding GeoServices in 1993, Jay held a variety of senior leadership and management positions for a prominent geotechnical consultancy in the DC metro area.



Jay’s life-long knowledge of regional subsurface conditions, and his ability to get his resourceful field team to obtain hard-to-get geotechnical information in hard-to-reach and congested places, was unparalleled. He combined this knowledge and ability with a keen intellect and attention to detail. He was also a particularly lucid writer, a trait that further enhanced his ability to solve and synthesize complex problems.

Jay worked on hundreds of prominent projects in the Washington DC metro area, including railroad and highway infrastructure, landfill projects, quarry sites, tunnels, airports, and national monuments. A few of his noteworthy projects included 1) an investigation where subsurface contamination from a firearms range was identified by installing deep wells in a difficult rolling setting and by Jay’s use of a customized soil sampler to successfully map the contamination; 2) an investigation of AMTRAK stressed railroad embankments in MD, using a combination of undisturbed samplers, inclinometers, piezometers, and magnetic extensometers in areas of the track never previously dared to be accessed, with Jay’s work leading to data that clarified problems that had been misunderstood until then; 3) and planning and executing a program to perform the deepest

land-based dilatometer soundings ever done (400 ft), and co-authoring a paper to tell others how to do it.

Throughout his professional career, Jay volunteered countless hours to ASCE and to the civil engineering profession at the local, regional, and national level. He became a Life Member in 2011. At the Society level, Jay served on ASCE’s Board of Directors, and spent over 18 years working on Society governance, helping rewrite and reorganize the Society’s governing documents; helping organize ASCE’s 1996 National Convention; and being an active participant in ASCE’s *Vision for 2025* summit (among many other accomplishments).

Locally, he was ASCE-National Capital Section’s President in 1986 and served prior to, and after this, on numerous committees and roles. He gave presentations to civil engineering students on job seeking and professional employment, entrepreneurship, and engineering management. Notably, for the last 30 years, Jay was a sustaining driving force behind NCS’ flagship Scholarship Trust. This program continues to provide merit-based scholarships to students enrolled in local civil engineering programs. ■

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# Lead Levels in Drinking Water in Flint, Michigan – Background, Report of Virginia Tech Investigation and Status

By Alex Rosenheim

Rebekah Martin, M. ASCE, a PhD student at Virginia Tech in Civil Engineering and member of the Flint Water Study team since their formal work began in the summer of 2015, was the guest speaker at the ASCE-NCS's September 2018 Dinner Meeting held at the Arlington Hilton. Ms. Martin discussed her role and the lessons learned in Virginia Tech's investigations led by Professor Marc Edwards, M. ASCE, into the unsafe lead level discovered in the water supply of Flint, Michigan in 2015.

Ms. Martin began her discussion with an overview of the nature of the danger of excessive lead and heavy metals in drinking water, especially as it pertains to the Lead and Copper Ruler of 1991, which deals with review, oversight and public reporting. She discussed the health issues for the general population and for children specifically. As a precursor to the investigation in Michigan, Ms. Martin discussed efforts led by Dr. Edwards' regarding the Washington, DC, drinking water supply issues with excessive lead around the years 2001 to 2004. WASA had changed from using Chlorine to Chloramine (a combination of chlorine and ammonia) due to Chloramine's reduced resultant of by-products in the water. However, the unintended consequence was an increase in the acidity of the water which resulted in increased dissolved lead in the water. The problem went undiscovered for 3 years.

In June 2004, *Environmental Science and Technology (ES&T)*, published reports that Dr. Edward's team discovered high levels of lead in the U.S.



capital's water, which exposed weak regulations and raised the specter of undiscovered problems elsewhere. *ES&T* wrote, "ES&T's investigation of the problem suggests that the change in chemistry coupled with old lead pipes in Washington, D.C.'s, water system was the source of the crisis. In fact, corrosion expert Marc Edwards at Virginia Tech in Blackwell [sic] has been warning the EPA and the water industry for years that changes in drinking water treatment are likely to cause problems in home plumbing systems and tap water. As a consultant to EPA Region 3, Edwards is the scientist who first called attention to the D.C. problem." Reporting in 2004 by the Washington Post brought local and nationwide attention to the problem which led to corrective action and years of Congressional inquiries to account for and to prevent a repeat of this type of problem. The events in Washington, DC, occurred prior to Ms. Martin joining the

Flint Water Study team which formed in 2015.

The Flint Water study team was created because, LeAnne Walters, a mother who had moved to Flint, MI, with her family in 2011, suddenly in 2014, found discolored and foul-tasting water spewing from her faucet and began observing alarming rashes on her son after bathing. Learning of his work due to public reporting of the Washington, DC, lead crisis, Ms. Walters contacted Dr. Marc Edwards, M. ASCE and Professor of Environmental and Water Resources Engineering at Virginia Tech, due to his career experience with lead in water, water treatment and aquatic chemistry including the DC Lead crisis of the early 2000's. In order to answer this mother's questions, as well as the concerns of the many other citizens of Flint, Dr. Edwards led his team which put together lead

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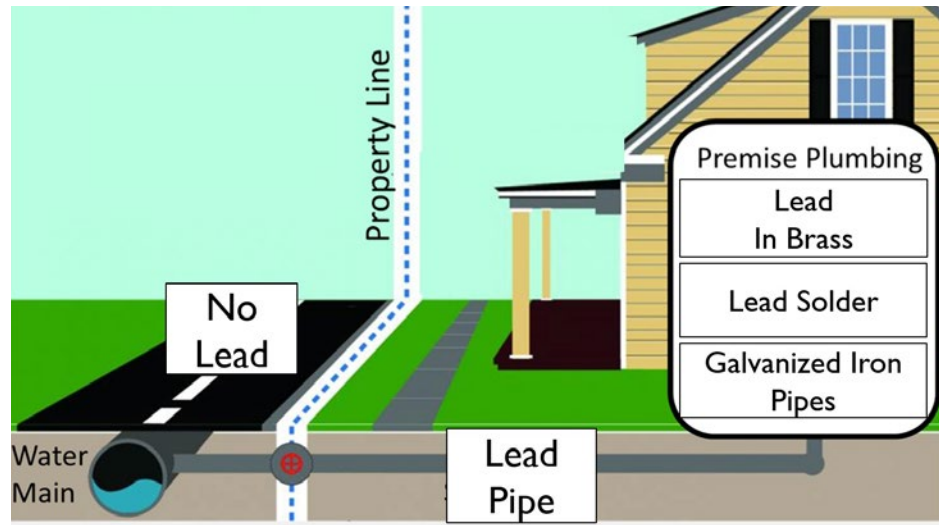
testing kits and sent them to a group of Flint residents who had organized a citizen sampling campaign. Their samples, once analyzed, gave citizens the scientific evidence needed to demonstrate that there was a city-wide water crisis occurring due to the lack of corrosion control in the distributed drinking water.

In order to set up the events that led to the crisis in Flint, Ms. Martin provided some background information about the history of the city of Flint. In the peak of auto industry in the 1950s–1960s, Flint had a population of over 200,000 people and had one of the highest per capita incomes in the world.

But as the auto industry in Flint started declining in the 1980s, the city also suffered steady financial decline. There are now less than 100,000 people living there, and nearly 42% are living below the national poverty line. This means, due to the financial crisis, beginning in the mid 1980s, there were effectively no new houses built in Flint – which has important implications for lead in water. An estimated 50% of homes have a lead services line. Due to the financial state of the city, and lead solder not being banned until 1986, it is likely it at least that many homes contained lead solder unless the old homes in Flint had been remodeled.

As long as Flint was buying Detroit water, which had corrosion control to keep the lead that was in these homes stuck on the pipes and out of the water, there was not much cause for concern. When Flint stopped buying Detroit water due to high costs, and instead collected and treated water from the Flint River, everything changed. Historically, Flint bought their water from Detroit Water and Sewage Department who withdrew freshwater from Lake Huron and treated it prior to pumping it to surrounding areas. Due to Detroit’s increasing water prices as well as the financial state of the city, Flint decided to invest in a long term plan to build a pipeline to Lake Huron and bring freshwater directly to their utility. But this project would not be completed until Late 2016, which forced the city to use the Flint River in the meantime.

Just a few months after the switch, Flint detected high levels of fecal bacteria, and later high levels of carcinogenic disinfectant byproducts. In the meantime, General Motors cut a deal to get back on Detroit water b/c the Flint River water



Graphic Adapted from: <http://www.clevelandwater.com/customer-service/protect-your-home/home-tips>

was actually corroding their engine parts. When the switch was made, federal law was violated because the Michigan Department of Environmental Quality (or MDEQ) didn’t make sure the city applied corrosion control. In addition, we now know that the Flint River is extremely corrosive to metals due to its water chemistry. So, with no corrosion control and an extremely corrosive water source, the result was a recipe for a perfect storm for lead release.

The water chemistry of the Flint River was not properly taken into account when the water treatment plan was approved and made active. Specifically, the chloride concentration of the finished water increased almost 9 times and the Larson ratio ( $\text{Ratio} > [(\text{sulfate} \times 2) + \text{chloride}] / \text{alkalinity}$ ) increased as well from 0.5 to 2.3. And the Chloride to sulfate mass ratio...CSMR...another indicator of corrosion increased to 2.04, far above the recommended value of 0.5

The citizens knew something was wrong. The public was aware of reports of the corrosion affecting the GM automotive plant. They received notices from the utility that their water was violating the national standards, they were developing rashes, and their hair was falling out. They were physically seeing the red, cloudy water, the result of iron water mains being eaten away. Yet, the city and state officials – relying on information from experts – insisted that Flint water is safe to drink.

LeeAnne Walters, who had moved to Flint in 2011 with her family, bought a newly renovated home and added all plastic plumbing as well as a whole home water filter. But, she was not

spared from this water crisis. Her family faced health issues. Her daughter’s hair was falling out, one of her twin boys wasn’t hitting the same developmental milestones as his brother, and when she took him to the doctor, she found out he had lead poisoning. The city tested her water twice and found high levels of lead both times. The city attributed it to the fact that she must have had lead in her plumbing, despite her insistence that they had remodeled their house and replaced all the metal pipes. They wouldn’t help her. So Mrs. Walter’s contacted the Environmental Protection Agency (EPA), and was put into contact with one of their scientists, Mr. Miguel del Toral. Mr. del Toral drafted a memo within the EPA stating that “A major concern from a public health standpoint is the absence of corrosion control treatment in the City of Flint” which went on deaf ears within the EPA. He encouraged her to send some water samples from her house to Dr. Edwards’ lab at Virginia Tech for testing.

The Flint Water Study was launched by Dr. Edwards in August 2015. Its purpose was and is to inform Flint residents about water quality issues and support citizen scientists as well as bring public awareness to the issue. The team is comprised of 7 undergraduate students, 15 graduate students, and 11 Faculty and Staff members (32 members in total) all of whom volunteered their time for this cause. Additionally they contributed over \$200,000 of their own money and 5 person years worth of effort. Their initial effort was to send out 300 sampling kits in random locations throughout the city with instruction on how to properly sample tap water. The

*continued on page 7*



team received 270 (90%) of the kits back and performed their analysis. Testing continued through 2017. Throughout, they publicized their results with news coverage, independent direct distribution of information through Internet pages and social media as well as in-person town-hall meetings with the local residents. In October 2015, based on the initial results from the study, Flint switched back to Detroit water. Residual contamination remained in the system long after the switchback. Repairs continue to this day. The team confirmed in November 2016 that their sampling resulted in observations of lead levels within EPA limits. Residents are very skeptical of any results indicating that the water is safe, and remain engaged in the process of moving beyond this crisis. Many of the health impacts will remain permanent for residents affected by the lead poisoning, and future problems may be discovered as time goes on.

Over the course of the 18 months of the crisis, 100,000 residents were affected, including up to 12,000 children who were exposed, with 200 confirmed cases of lead poisoning. There were 12 deaths attributed to Legionnaire's Disease (also related to the high acidity levels in the water). There have been hundreds of main breaks and the cost of water for residents of Flint is exceeding \$150 per month (among the highest rates in the nation).

Multiple congressional hearings have been held to try to get to the bottom of what happened in Flint, yet few conclusions have been determined. In April 2016, criminal charges were brought against three people involved in the crisis to accompany the resignations which occurred once the crisis hit the national spotlight. In July, more criminal charges were brought against six state employees regarding the Flint Water Crisis.

The American Society of Engineers assigned a grade of a 'D' to our drinking water infrastructure, acknowledging the issue even before the Flint Water Crisis. President Obama said, "Flint is a reminder of why you can't shortchange basic services that we provide to our people and we together provide as a government to make sure public health and safety is preserved."

CNN has since reported that at least 5,300 US water systems are in violation of the Lead and Copper Rule. The Guardian called 81 major US cities and 33 of them reported using testing methods, that are in some cases in clear violation of the LCR, and in some cases taking advantage of loopholes that exploit the rule. The publicity about the crisis in Flint has inspired citizens around the country to speak up about their water quality. For example, in St. Joseph, Louisiana, an LSU professor stepped up to help residents fight the

city for improved water quality due to the high iron concentrations and incidence of red water in homes.

Ms. Martin concluded her talk with comments on the lessons learned from these events. Ultimately, she stated that the Flint Water Crisis occurred because of the dangerous attitude of the very people that are paid to be protectors of public health. An internal email from the EPA stating "I'M NOT SO SURE FLINT IS THE COMMUNITY WE WANT TO GO OUT ON A LIMB FOR" shows a stark contrast to the first fundamental canon of our profession: that we must hold paramount the safety, health, and welfare of the public. This canon was not upheld in the water crisis and needs to be emphasized more in our profession.

Public education, increased transparency, proper sampling and testing methods, and proactive maintenance and upkeep of our nation's water distribution systems are crucial for preventing similar disastrous situations in the future.

### Speaker Biographical Information

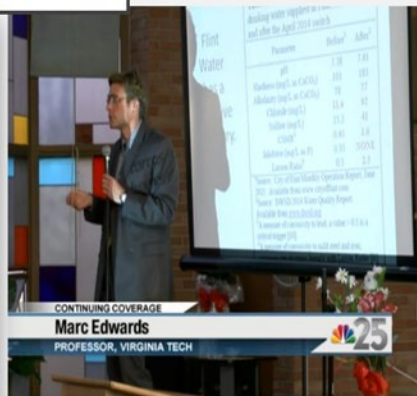
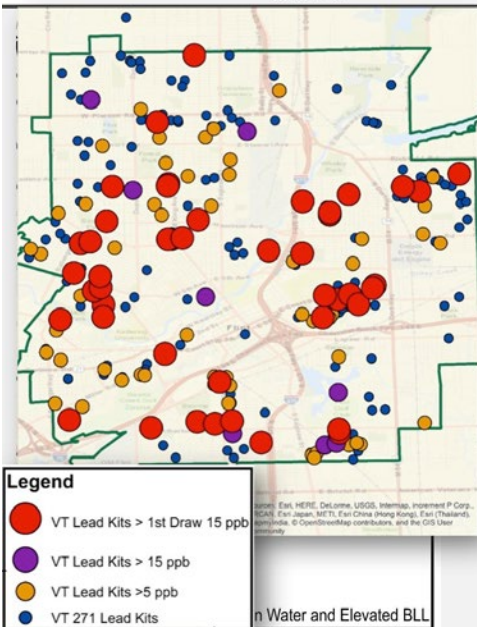
**Rebekah Martin**  
*PhD Student and Graduate Research Assistant @ Virginia Tech, Civil and Environmental Engineering*

Rebekah Martin is a PhD student at Virginia Tech in Civil Engineering. She is from Richmond, Virginia, and attended Bucknell University for her undergraduate studies in Civil and Environmental Engineering. She has been a member of the Flint Water Study team since their formal work began in the summer of 2015.

### Additional Information

- *Flint Water Study Updates* <http://flintwaterstudy.org/>
- *Scientists Now Know Exactly How Lead Got Into Flint's Water* (Smithsonian.com) <https://www.smithsonianmag.com/science-nature/chemical-study-ground-zero-house-flint-water-crisis-180962030/>
- *Researchers say Flint water is much improved, city is nearing "the end of the public health crisis"* <http://www.michiganradio.org/post/researchers-say-flint-water-much-improved-city-nearing-end-public-health-crisis>

## PUBLIC HEALTH ADVISORY: SEPTEMBER 2015



**For 271 samples:**  
**Percentile for First Draw: 26.8 ppb**  
**Highest First Draw: 158 ppb**  
**Highest overall: 1051 ppb**

## Conquering the FE & PE Exams: Prove Yourself Without Saying a Word

We hope our readers had an enjoyable and relaxing summer. The month of September signals the end of summer, the beginning of autumn, and of course the start of a new school year if you are living in the Northern Hemisphere.

I had a very busy summer, working on several projects and as always, I was helping engineering students and practicing engineers, pro-bono, to conquer their FE and PE exams. I must admit, I also had a chance to visit my 95-year old mother living in Istanbul. It was a wonderful trip and my batteries are fully charged!

This month, I would like to answer two most frequently asked questions that we've been receiving from our readers in the United States and from overseas.

### Who prepares, administers, and scores the FE and PE exams?

The National Council of Examiners for Engineering and Surveying (NCEES) develops, administers, and scores the FE and PE exams used for engineering and surveying licensure in the United States.

### In a nutshell, what is FE exam?

The Fundamentals of Engineering (FE) exam is generally your first step in the process to becoming a professional licensed engineer (P.E.). According to NCEES, every year 55,000 people take the FE exam and most of them are college seniors within one year of graduating or are recent graduates. It is designed for recent graduates and students who are close to finishing an undergraduate engineering degree from an EAC/ABET-accredited program. The FE exam is a computer-based exam administered year-round at NCEES-approved Pearson VUE test centers.

The FE exam includes 110-questions. The exam appointment time is 6 hours long and includes a nondisclosure agreement (2 minutes), tutorial (8

minutes), actual exam (5 hours and 20 minutes), and a scheduled break (25 minutes).

The FE exam is offered in seven disciplines. Specifications for the exams are as follows: FE Chemical, FE Civil, FE Electrical and Computer, FE Environmental, FE Industrial and Systems, FE Mechanical, FE Other Disciplines. The NCEES *FE Reference Handbook*, version 9.5 is the only reference material that can be used during the exam. You will be provided with an electronic reference handbook during the exam. For access prior to your exam, you may either purchase a hard copy or download a free electronic copy.

### In a nutshell, what is PE exam?

The Principles and Practice of Engineering (PE) exam tests for a minimum level of competency in a particular engineering discipline. It is designed for engineers who have gained a minimum of four years' post-college work experience in their chosen engineering discipline. The PE exam is offered in the following seventeen disciplines:

Agricultural and Biological Engineering, Architectural Engineering, Chemical Engineering, Civil Engineering, Control Systems, Electrical and Computer, Environmental Engineering, Fire Protection (New), Industrial and Systems, Mechanical Engineering, Metallurgical and Materials, Mining and Mineral Processing, Naval Architecture and Marine, Nuclear Engineering, Petroleum Engineering, Software Engineering, and Structural Engineering.

### PE Civil Exam Specifications

The PE Civil exam is an 8-hour exam with 80 questions. It is administered in pencil-and-paper format twice per year in April and October. It is important to familiarize yourself with your state licensing board's unique registration procedures before registering for a PE exam. Special accommodations are

available for examinees who meet certain eligibility criteria and sufficiently document their request.

The PE Civil exam is a *breadth* and *depth* examination. This means that examinees work the breadth section in the morning and one of the five depth modules in the afternoon. The breadth section contains questions from all five areas of civil engineering. The depth section focuses more closely on a *single* area of practice.

The details on the format, length of the exam, the topics covered, and applicable design standards, depend on the disciplines as listed below:

**Construction** (with design standards for the 2018 exam), **Geotechnical** (with design standards for the 2018 exam), **Structural** (with design standards for the 2018 exam), **Transportation** (with design standards for the October 2018 exam), **Water Resources and Environmental**.

It is important to remember that when registering for the PE Civil exam, you will also be asked to select an afternoon module. Your answer sheet will be scored based on the module that you selected during registration.

PE exam specifications and design standards are posted 6 months before the exam administration. Updates for the April exams are posted in November, and updates for the October exams are posted in May.

I would like to close with an exciting news. Starting this month, Prof. Howard Gibbs, P.E., F-NSPE will be contributing to Dr. Z's Corner on "Ethics." His career highlights are included at the end of the problems section.

Until next time,  
Ahmet Zeytinci (Dr.Z.)  
[az@akfen.com](mailto:az@akfen.com)



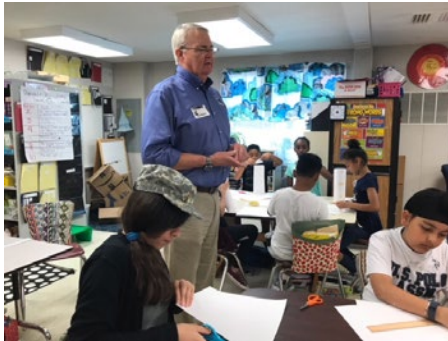


# ASCE-NCS Committee and Branch News and Updates

## Educational Committee K-12

By Victor I. Crawford, P.E., M.ASCE

Last Fall the National Capital Section paid for bus transportation and tickets for students at several Elementary Schools to see the Dream Big movie at the Air and Space Museum. As a follow-



up to this experience for the students, we volunteered to have our members attend events at the schools. This resulted in my going to an Elementary School in Fairfax County where I did the Windy City exercise with the students. Thanks to ASCE Headquarters staff, I had sent the teacher several short videos on civil engineering which were shown to the students as a reminder of the Dream Big movie. This was followed by a short presentation on civil engineering before the students were set to work building their paper towers. Once again, I want to thank the staff at ASCE Headquarters for supplying the material for the Windy City exercise. Not only does this exercise highlight how we do engineering to inspire the next generation, but for me this was a lot of fun, showing off our profession and how we benefit the public.

We plan to continue this outreach by going to Elementary, Middle, and High Schools once the Dream Big movie kits are sent out to all public schools thanks to ASCE and the National Capital

Section. Please join us in this endeavor by let us know you are available to attend a STEM event at your local school. I can be reached at [victor.crawford51@gmail.com](mailto:victor.crawford51@gmail.com).

For those that have more time, we are continuing to work with the American Association for the Advancement of Science (AAAS) program for STEM, which has been bring engineers and scientists into classrooms for over eleven years (<http://www.aaas.org/senior-scientists-and-engineers/programs-dc>). Please consider becoming a AAAS volunteer in supporting STEM in the school districts in the DC metro area, including surrounding counties in both Virginia and Maryland. If you are interested in giving back to the profession while sharing the joy of engineering to eager young minds, please contact Victor I Crawford at [victor.crawford51@gmail.com](mailto:victor.crawford51@gmail.com).

## ASCE-NCS Reston Branch

By Lisa Anderson, PE, LEED AP, M. ASCE, Reston Branch President

Our new At-Large Directors Chris Friend and David Vanaman were officially installed at the September meeting by ASCE-NCS officer Vic Crawford. Greg Ashley, PE, M. ASCE, Bechtel's Manager of Engineering and Technology discussed "The Importance of Innovation and Technical Excellence in Engineering".



The next meeting of the Reston Branch will be held on October 22nd at Reston Overlook in Reston, VA starting at 4:45pm. Adeola Adediran, PhD, PE, SE of Savannah River Remediation will discuss "Overcoming Technical Challenges in Excavation: The Salt Waste Processing Facility Design Integration". Please see the Reston Branch webpage for more information. One PDH will be awarded to attendees.

## Upcoming Events

**October 22nd** – Reston Branch Meeting – Adeola Adediran, PhD, PE, SE of Savannah River Remediation "Overcoming Technical Challenges in Excavation: The Salt Waste Processing Facility Design Integration"

**November 8th** – Reston Branch Meeting – Michael Fontaine, PhD, PE of the Virginia Transportation Research Council

## Geotechnical Committee

We have an announcement about a meeting of the NCS GEC on October 17. Archie Filshill of Aero Aggregates will be discussing the manufacture and use of foamed glass lightweight aggregate at the October 17 meeting of the NCS Geotechnical Executive Committee. The meeting will be held at Maggiano's in Tysons Corner at 11:30 am. Email Kellie Owens at [Kowens@geostructures.com](mailto:Kowens@geostructures.com)

## ASCE NCS Education Committee – Collegiate

By: Jameelah M. Ingram, PE, M. ASCE

Student leaders from the ASCE student chapter at George Washington University (GW ASCE) attended the ASCE NCS September Section Meeting and provided an update on their chapter's plans for the 2018–2019 school year. This included Haniya Ahmad, Thomas Arena, and Madeline Marx. An important theme in the chapter's planned activities included knowledge sharing across class years. GW ASCE provides forums for students to exchange ideas and impart useful insight to one another. This promotes mentoring and teamwork, two essential components for a successful career in engineering. There are plenty of upcoming opportunities for professional members of ASCE NCS to volunteer and follow GW ASCE's lead this fall! Please check out the events below:

*continued on page 10*

## Resume Reviews

GMU ASCE and the ASCE-NCS Education Committee are hosting a College to Career Workshop, at the Fairfax Campus of George Mason University, located at 4400 University Drive, Fairfax, VA 22030. The workshop will be held on **Thursday, October 25, 2018 from 6:00 pm to 8:30 pm**. All students and professionals from across ASCE-NCS are invited to sign up to attend. The workshop will feature the following:

- Useful tips to lead students from the networking stages to the first day at a new job
- Appointment-based resume reviews with ASCE NCS Professional Members
- Networking over light refreshments with ASCE NCS students and professionals

**Student Members:** Please sign up for a resume review appointment at the following link: <http://signup.com/go/jiOqLfd>

**Professional Members:** To volunteer to review a resume with a student at the workshop, please contact Jameelah Ingram at [jameelah.muhammadin-gram@wsp.com](mailto:jameelah.muhammadin-gram@wsp.com).



## Younger Members Forum

By Haley Carpenter, EIT, YMF Secretary/Newsletter

**Monthly Happy Hours.** The NCS Younger Members Forum (YMF) holds monthly happy hours, generally alternating between Arlington, VA and Washington, DC. Happy hours are usually the first Wednesday of each month unless a holiday falls during that week. The NCS YMF enjoyed some time outside during their September happy hour on the roof of [Whitlow's on Wilson](#) in Arlington, VA on September 12. Approximately 15 members attended the event.

The next monthly happy hours will take place on October 10, at [Sauf Haus Bier Hall](#) in Washington, DC, to celebrate Oktoberfest. Join younger members from the area for free appetizers and drink specials. Look for emails with

specific locations for future monthly happy hours!

## 2018–2019 Planning Meeting.

On September 25, the YMF held its annual planning meeting at [Ragtime](#) in Arlington, VA. During the meeting, YMF officers and members discussed the successful events from last year, made plans for upcoming YMF events, and voted on new YMF officers for the 2018–2019 year. Topics of discussion included monthly YMF happy hours, professional development meeting potential topics/speakers, YMF participation in local volunteering events, and involvement with local university student chapters. In addition to the monthly happy hours, the YMF is planning to hold two professional development meetings, with one planned for Fall 2018 and the second for Spring 2019. Another goal for this year is to increase involvement with college students and local ASCE student chapters. The 2018–2019 YMF Officers include:

- President, Joe Whartenby
- Vice President, Ariana White
- Secretary/YMF Newsletter, Maria Raggousis and Haralamb Braileanu
- Happy Hours/Social Chair, Jonathan Miller, PE
- Professional Development, Fady Gad
- Outreach, Chris Gorman, PE

If you have suggestions for professional development meeting topics, or would like to become more involved with the YMF in other areas, please contact the YMF President at [ncsymfpresident@gmail.com](mailto:ncsymfpresident@gmail.com).

**Stay Connected!** Check out photos and stay up-to-date with YMF events by visiting the new [YMF Facebook](#) page. Also, follow us on [Twitter](#) (@asce\_ncsYMF).

**Get Involved!** Are you interested in getting involved with more Younger Members activities? Do you have ideas for social events or volunteering activities? Would you like to be a board member? The NCS Younger Members Group is always looking for new members! Let us know if you are not already on our mailing list! If you would like to become more active with the YMF or would like more information on our events, please email the [YMF President](#). ■

## The D.C. Report Card 2020 Team is Assembling!

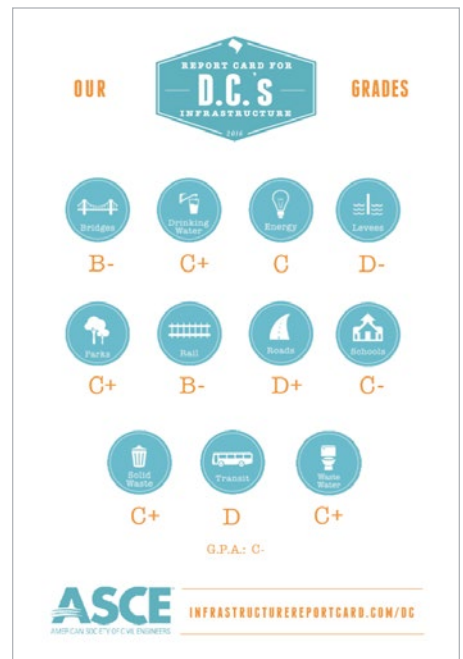
The first D.C. Infrastructure Report Card was released on January 14, 2016. The National Capital Section is now assembling the team that will update the report card for release in the first quarter of the year 2020.

As we look to kick off this effort, you have the unique opportunity to be associated with an effort that has high visibility, conducts public outreach, and helps infrastructure owners secure funding.

If you're interested in learning more, visit ASCE's [Infrastructure Report Card](#) on the Web and also NCS' [D.C. Infrastructure Report Card](#).

To learn more about how to volunteer for this effort, and for details about how the Report Card updating process works, reach out to [Ranjit Sahai](#) via email.

The National Capital Section looks forward to helping you become associated with this vital effort that continues to garner attention nationwide in raising awareness about the state of civil infrastructure and about what it will take to improve its grade. ■







# INTERNATIONAL CONFERENCE ON TRANSPORTATION & DEVELOPMENT 2019

Alexandria, Virginia | June 9–12, 2019

*ASCE's Flagship Conference in Transportation & Development*

## Engineering Smart Mobility for the Smart City



The International Conference on Transportation & Development (ICTD 2019) is organized by the Transportation & Development Institute (T&DI) of ASCE.

**How will society adapt to the engineering and development challenges facing the transportation needs of cities of today and the future? Join your peers and other leading planners, researchers, and policy makers as they discuss innovative and necessary solutions to these needs and how our cities must appropriately adapt.**

Submit an abstract for a podium or poster presentation at the conference at [www.asce-ictd.org](http://www.asce-ictd.org).

### Abstract submission deadlines

Podium or Poster Presentation (with paper): **October 15, 2018.**

Podium or Poster Presentation (without paper): **October 28, 2018.**

### Four Plenary Sessions

- Smart Cities
- Smart Energy
- Smart Mobility
- Smart Data

### Conference Tracks

The following conference tracks will be delivered under the “Engineering Smart Mobility for the Smart City” theme, as it relates to the future of transportation and development in areas such as information and communication technology, sensors, big data and analytics, new energy, financial and legal issues, codes and standards, and more.

- Connected & Autonomous Vehicles
- Transportation Safety
- Rail & Public Transit
- Traffic Operations
- Shared & Clean Mobility
- Planning & Development
- Infrastructure Systems
- Aviation Operations

### Conference Events

- Plenary and Breakout Sessions
- Pre-Conference Workshops
- Awards Banquet
- Younger Member Session
- Icebreaker Reception
- Technical Tours

### CONFERENCE CHAIRS

**Walt Kulyk, P.E., M.ASCE**, Federal Transit Administration, Retd. (CHAIR)

**Eva Lerner-Lam, F.ITE, M.ASCE**, Palisades Consulting Group, Inc. (CO-CHAIR)

**David A. Noyce Ph.D, P.E., F.ASCE**, University of Wisconsin-Madison (CO-CHAIR)

**For information on Exhibits & Sponsorships**, please contact Sean Scully, [sscully@asce.org](mailto:sscully@asce.org).



**Conference Venue:**  
Hilton Alexandria Mark Center  
5000 Seminary Rd  
Alexandria, VA 22311

**Registration Opens January 9th**  
[www.asce-ictd.org](http://www.asce-ictd.org) | #ICTD2019





## Upcoming Events *(Also available on the NCS website under the Events tab.)*

### October 16

**NCS Section Meeting**, 6:30–8:30 pm, Hilton Arlington. The topic of discussion will be the Purple Line. Look for additional information in next month's newsletter.

### October 25

**Education Committee Resume Workshop**, 6:00–8:30 pm, 4400 University Drive, Fairfax Virginia. Professional Members: To volunteer to review a resume with a student at the workshop, please contact Jameelah Ingram at [jameelah.muhammadin-gram@wsp.com](mailto:jameelah.muhammadin-gram@wsp.com).

Student Members: Please save the date! A link to sign up for a resume review appointment will be provided in future ASCE NCS correspondence. See this month's Committee update for more information.

### November 13

**NCS Section Meeting**, 6:30–8:30 pm, Hilton Arlington. A representative of the U.S. Army Corps of Engineers, Headquarters, Engineering & Construction Division will present. Look for additional information in a future month's newsletter.

### November 17

**Region 2 Assembly**, George Mason University, Fairfax VA. The focus of this year's assembly is Leadership and Professional Development. There will be plenty of presentations and activities that foster interaction between ASCE Student Chapters, professors, practitioners, and employers. Please contact Andres Izquierdo at [aizquier@gmu.edu](mailto:aizquier@gmu.edu) and copy Khaled Alamdeen at [kalamdeen@alaengr.com](mailto:kalamdeen@alaengr.com) for more information on how to register.

### November 4

**Emerging Leaders Alliance Conference, Falls Church, VA.** The Emerging Leaders Alliance is a partnership among leading engineering organizations that promotes interdisciplinary leadership training for select professionals.

### January 25 to 26

**Regions 1, 2, 4 and 5 MultiRegion Leadership Conference in Orlando, FL.** The conference includes Workshop for Section and Branch Leaders (WSBL), the Eastern Region Younger Member Council (ERYMC) and the Workshop for Student Chapter

Leaders (WSCL). More information will be available in the next newsletter.

### June 9 to 12

**T&DI Conference.** The Transportation & Development Institute (T&DI) of ASCE is hosting its flagship conference in the national capital region at the Hilton Mark Center in Alexandria, Virginia. The Conference Steering Committee is seeking a local representative to participate as a member of the Conference Steering Committee. The local representative sets up a Local Organizing Committee (LOC), that helps recommend and organize technical tours for the conference, and also helps promote the conference for sponsorships and exhibits by local organizations. Through the course of the next few months, T&DI will need National Capital Section's help to promote the conference at its events, and through its newsletter, eblasts, and other means of outreach and promotion. The immediate need for promotion is for the call for abstracts which was recently released. Further information is available on the conference website at [www.asce-ictd.org](http://www.asce-ictd.org).

## The Order of the Engineer and You

By Phillip Melville, Ph.D., P.E., F. ASCE, Chair of Life Members Forum

Plans for a ceremony to give you an opportunity to be inducted into the ORDER are being worked out. Thanks to the cooperation of ASCE, we might aim for next February. All it involves is a brief ceremony where you recognize your obligation as an Engineer (very similar to the ASCE code of ethics) and a steel ring to wear on the little finger of your working hand (typically the right

hand). There is a small fee to cover costs but it is a one-time fee: It probably will be around \$20. You might ask why should I bother? You might say "recognition" or "prestige". It is not just for Civil Engineers. The Order welcomes all graduate engineers in the US who want to quietly "show off" that they are proud of the profession. Years ago when I was often attending meetings in

Montreal, Canada, of the International Civil Aviation Organization, as a US Airport Committee representative, I was impressed to note that my Canadian colleagues did wear the Engineer ring as silent proof of their qualifications. When I found the equivalent US Order to the Canadian one, I decided to join. What about you? What do you think? [[philipmelville@juno.com](mailto:philipmelville@juno.com)] ■

## Employment Clearinghouse

*The NCS provides the Employment Clearinghouse as a free service to its membership. The Clearinghouse allows members to post short notices for available positions or candidates seeking employment. All employers listed herein are equal opportunity employers. If you have questions, are seeking employment or would like to post a position please contact the [newsletter editor](#) and visit our [jobs page](#).*