

## April Section Meeting

### Smithsonian National Museum of African American History and Culture (NMAAHC)

The Smithsonian's National Museum of African American History and Culture (NMAAHC) in Washington, DC is an elegant building with a rich collection of much importance to society, and in documenting and presenting the history and culture of African Americans. The Assistant Director of Council Operations and Museum Initiatives, Carla Thomas McGinnis, will share a brief virtual walk through of the museum, its exhibitions, and upcoming programming. She will also discuss details around the inspiration behind the building's façade and aesthetic design. Thereafter, Paul E. Totten, PE, LEED AP, and Dave Nichols, CBCP, LEED BD+C of WSP USA, will present on two aspects of the museum. This includes the HVAC design and the commissioning of the design, as well as the consultancy on the corona, the exterior cladding finish for the significant screen wall visible from grade. The majority of the museum and much of its collection is contained below grade. The dominating architectural feature for the museum is derived from African art and architecture, with two superstructures shaped like crowns, referred to as the "corona." It rises from a porch-inspired base in the form of a canopy that provides shelter from the summer sun and channels breezes flowing from a water feature below. The corona is bronze in color and extends towards the sky and is meant to be a shimmering vision of reflection. The facade form and color have a significant impact on the vision for NMAAHC and the Smithsonian.



#### About the Speakers

##### Carla Thomas McGinnis

*Assistant Director of Council Operations and Museum Initiatives, Smithsonian's National Museum of African American History and Culture*  
Carla serves as the Assistant Director of Council Operations and Museum Initiatives at the National Museum of African American History and Culture (NMAAHC). She has spent her career in the arts and culture sector, working in and between education, theater, and museum spaces. She got her start at The Charles H. Wright Museum of African American History, in Detroit, MI, her hometown. In the DC area, she worked as a directing fellow and project manager for Arena Stage at the Mead Center for American Theater. Working with one of DC's first charter schools, she pioneered an arts integration curriculum and drama program.



Previously, at the NMAAHC she served on the grand opening planning team, as well as leading efforts in fundraising, donor stewardship and advisory board management, including helping to successfully grow their Ambassadors Program to almost 1,000 people. In addition to her role at the Museum, Carla also teaches in the graduate program of the College of Visual and Performing Arts at George Mason University.

##### Paul E. Totten, PE, LEED AP

*Vice President, Building Enclosures, WSP USA*  
Paul E. Totten is a Vice President at WSP and leads the Building Enclosures Division. He has over 24 years of experience in the fields of structural engineering, building enclosure design and commissioning, and building



Please join us virtually on **Tuesday, April 13th** from 12:00 pm to 1:30 pm for a virtual celebration of our Annual Awards! The program will approximately consist of the award recipient announcements followed by a keynote speaker in a webinar format. This event will be free for all members, non-members, and students. For questions, please contact [president@asce-ncs.org](mailto:president@asce-ncs.org). Please [click here](#) to register by **Monday, April 12th**.

science. He is a member of NIBS, ASHRAE, and USGBC including the EA TAG. Paul was a committee member of the National Institute of Building Sciences (NIBS) Guideline 3 – Exterior Enclosure Technical Requirements for the Commissioning Process.

##### Dave Nichols, CBCP, LEED BD+C

*Vice President, Commissioning, WSP USA*  
Dave Nichols is a Vice President at WSP and leads the Southeast Region Commissioning Practice. He has over 31 years of experience in the fields of planning and coordination of activities concerned with the construction, commissioning and maintenance of structures, facilities, and systems. He has concentrated his expertise on the evaluation and analysis of mechanical, electrical, and plumbing systems through the development and implementation of advanced building management and analytics systems. He is a member and contributor to the Building Commissioning Association National Capital Chapter and a past chair for the Building Commissioning Association professional ethics committee. ■



# Resiliency in ASCE 2021 Report Card

## Excerpts from “Comprehensive Assessment of America’s Infrastructure” for the ASCE’s 2021 Report Card for America’s Infrastructure

Article edited by Alex Rosenheim, M. ASCE, PE, CCM, ENV SP

Every four years, America’s civil engineers provide a comprehensive assessment of the Nation’s 17 major infrastructure categories in ASCE’s Infrastructure Report Card. Using a simple A to F school report card format, the Report Card examines current infrastructure conditions and needs, assigning grades and making recommendations to raise them. The [ASCE Committee on America’s Infrastructure](#), made up of 31 dedicated civil engineers from across the country with decades of expertise in all categories, volunteers their time to work with ASCE Infrastructure Initiatives staff to prepare the Infrastructure Report Card and the US infrastructure grade scale. The Committee assesses all relevant data and reports, consults with technical and industry experts, and assigns grades using the following key criteria:

- **Capacity:** Does the infrastructure’s capacity meet current and future demands?
- **Condition:** What is the infrastructure’s existing and near-future physical condition?
- **Funding:** What is the current level of funding from all levels of government for the infrastructure category as compared to the estimated funding need?
- **Future Need:** What is the cost to improve the infrastructure? Will future funding prospects address the need?

- **Operation and Maintenance:** What is the owners’ ability to operate and maintain the infrastructure properly? Is the infrastructure in compliance with government regulations?
- **Public Safety:** To what extent is the public’s safety jeopardized by the condition of the infrastructure and what could be the consequences of failure?
- **Resilience:** What is the infrastructure system’s capability to prevent or protect against significant multi-hazard threats and incidents? How able is it to quickly recover and reconstitute critical services with minimum consequences for public safety and health, the economy, and national security?
- **Innovation:** What new and innovative techniques, materials, technologies, and delivery methods are being implemented to improve the infrastructure?

With each of these criteria in mind, the infrastructure examined ranges from: *Grade A (EXCEPTIONAL/FIT FOR THE FUTURE* – The infrastructure in the system or network is generally in excellent condition, typically new or recently rehabilitated, and meets capacity needs for the future. A few elements show signs of general deterioration that require attention. Facilities meet modern standards for functionality and are resilient to withstand most disasters and severe weather events.) to *Grade F (FAILING/*

*CRITICAL, UNFIT FOR PURPOSE* – The infrastructure in the system is in unacceptable condition with widespread advanced signs of deterioration. Many of the components of the system exhibit signs of imminent failure.)

The 2021 ASCE National Report Card has increased to an overall Grade of “C-” (an improvement over the 2017 Grade of “D+). The definition of a Grade of “C” is *MEDIOCRE/ REQUIRES ATTENTION:* The infrastructure in the system or network is in fair to good condition; it shows general signs of deterioration and requires attention. Some elements exhibit significant deficiencies in conditions and functionality, with increasing vulnerability to risk.

Based on the results of this recurring and on-going analysis, ASCE has provided recommendations on how to Raise the Grade. To improve our quality of life and strengthen our international competitiveness, ASCE states that we, as Owners and Practitioners, need a strategic and holistic plan to renew, modernize, and invest in our infrastructure. This plan should make basic maintenance a centerpiece as we improve our legacy systems.

Importantly, policymakers must understand our society is only as strong as its weakest link – if our roadways become too rough to travel, if our bridges close

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## Upcoming Events

Until further notice, all in-person ASCE NCS events have been cancelled. Opportunities for virtual events will be announced as they are planned.

## Newsletter

**Maria Raggousis**, Editor

**May 2021 Issue Deadline:** April 19, 2021

**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.

**Address Changes:** Call 1-800-548-ASCE, e-mail [member@asce.org](mailto:member@asce.org), visit [www.asce.org](http://www.asce.org), or write: ASCE – Membership, 1801 Alexander Bell Drive, Reston, VA 20191. Include your membership number.

## National Capital Section

### Officers (2020–2021)

**Mike Venezia**, President  
**Jameelah Ingram**, Vice President  
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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.

## Resiliency in ASCE 2021 Report Card

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to heavier traffic like ambulances, or if our levees protect a community at the expense of the one next door, the economy grinds to a halt. ASCE is urging bold leadership and action, sustained investment, and a focus on resilience to raise the national infrastructure grade over the next four years, so that every American family, community, and business can thrive.

Anna Denecke, Director of Infrastructure Initiatives for ASCE, notes, "In the 2021 Report Card, the ASCE Committee on America's Infrastructure elevated resiliency to a key recommendation to raise the grades. Resiliency had previously been housed under the "preparation for the future" key recommendation. However, as elected officials and decision-makers grapple with increasingly severe storms and costly recoveries, ASCE is urging a "build back better" approach. Relatedly, should a major infrastructure package pass in Congress, funding should be prioritized for projects that improve a community's resilience."

The ASCE Report Card provides recommendations of action as it relates to Resiliency by stating that we must utilize new approaches, materials, and technologies to ensure our infrastructure can withstand or quickly recover from natural or man-made hazards. Advancements in resilience across all infrastructure sectors.

The ASCE 2021 Report Card provides the following detailed recommendations regarding resilience:

A. Enable communities, regardless of size, to develop and institute their own resilience pathway for all their

infrastructure portfolios by streamlining asset management, implementing life cycle cost analysis into routine planning processes, and integrating climate change projections into long-term goal-setting and capital improvement plans.

- B. Incentivize and enforce the use of codes and standards, which can mitigate risks of major climate or manmade events such as hurricanes, fires, sea level rise, and more.
- C. Understand that our infrastructure is a system of systems and encourage a dynamic, "big picture" perspective that weighs trade offs across infrastructure sectors while keeping resilience as the chief goal.
- D. Prioritize projects that improve the safety and security of systems and communities, to ensure continued reliability and enhanced resilience.
- E. Improve land use planning across all levels of decision-making to strike a balance between the built and natural environments while meeting community needs, now and into the future.
- F. Enhancing the resilience of various infrastructure sectors by including or enhancing natural or "green" infrastructure.

Resiliency is a consideration in all categories of infrastructure investigated in the Report Card. Here are some details on how the issue of resiliency is reflected in these focused areas:

**Aviation (Grade D+):** The nation's aviation system continues to be tested by natural and man-made disasters. Specifically, cybersecurity issues have the potential to cause harm to all aspects of air travel. Aviation

communication and passenger services, like ticketing, are highly dependent on a strong cybersecurity network, so ensuring safeguards to this system ensures traveler safety and system resilience. Furthermore, during and after natural disasters and other emergencies, airports play a major role as a gateway for urgent relief and access to critical supplies. Therefore, it is important that airports develop and exercise rapid facilities assessments and recovery strategies that can be efficiently and effectively implemented after these types of events.

**Bridges (Grade C):** Many of the country's older bridges are susceptible to extreme weather events and more prevalent flooding, which can result in overtopping, washout, and other storm-related damage. In fact, nearly 21,000 bridges were found to be susceptible to overtopping or having their foundations undermined during extreme storm events. In seismic regions, earthquakes are a significant threat, and a bridge's ability to withstand these extreme events is a significant safety issue. Additionally, bridges are being subjected to trucks that are heavier than those they were originally designed to sustain. These heavier trucks, which can surpass 40 ton loads, threaten to overstress bridge elements, cause metal fatigue and cracking, and decrease the service lives of bridges. The U.S. Department of Transportation found that the introduction of double 33-foot trailer trucks results in a projected 2,478 bridges requiring strengthening or replacement at an estimated onetime cost of \$1.1 billion. As future opportunities to plateau connected or

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autonomous trucks become more commonplace, bridges could see further stress. Engineers are using new design requirements, materials, and technologies to enhance the security and resilience of bridges as they are being built. The great challenge moving forward is to address the hundreds of thousands of existing bridges so they can provide decades of continued, safe service despite a greater frequency in extreme weather events or an increase in design loads.

**Dams (Grade D):** In some areas, engineers, dam owners, regulators, and emergency management professionals are making efforts to engage communities near dams to raise awareness of the potential damage from failure. By expanding community collaboration, stakeholders can support land use decisions, emergency action planning, and maintenance and rehabilitation funding, that all help reduce community risk and improve resilience in the long term. Further increasing resilience of dams throughout the country is the shift toward a risk-based decision-making process for the design, rehabilitation, and operation of dams. This risk-based approach is innovatively coupled with web-based tools developed by federal agencies, like RiskMAP, DamWatch, and ShakeCast, that aid dam owners in identifying, mitigating, and reacting to potential structural and downstream risks. RiskMAP, or Risk Mapping, Assessment, and Planning, is a FEMA program that provides communities with flood information and tools they can use to enhance their mitigation plans to protect public safety. The program looks at the lifetime of the asset and identifies other risks within

the watershed, which could include dam failures.

**Drinking Water (Grade C-):** As the nation faces more frequent extreme weather events, water utilities are taking action to increase the resilience of their systems to ensure safety and reliability. In fact, a 2019 survey found that emergency preparedness is one of the top 10 issues facing the water industry. The America's Water Infrastructure Act of 2018 required community water systems serving more than 3,300 people to develop or update risk assessments and emergency response plans (ERPs). The law sets deadlines, all before December 2021, by which water systems must complete and submit the risk assessment and ERP to the EPA. The law also specifies the components that the risk assessments and ERPs must address. Utilities are also developing innovative smart water technologies such as leak detection, seismic resilient pipes, smart water quality monitoring, and real time data sensors, just to name a few. These technologies improve resilience by allowing utilities to respond to changing climate conditions, improve efficiency of operations by reducing water losses, and deliver real-time data that allows for interactive decision-making.

**Energy (Grade C-):** While weather has always been the number one threat to the energy sector's reliability, climate change has only exacerbated the frequency and intensity of these events and associated costs. The Department of Energy (DOE) found that power outages are costing the U.S. economy \$28 billion to \$169 billion annually. Rather than focusing on repairing the grid after a major disaster, more utilities are

taking proactive steps to adapt to climate change, by strengthening the grid through resilience measures and incorporating consensus-based standards during long – and short-term planning. Incorporating these consensus-based standards in the design and construction of T&D infrastructure, which should be used for all overhead infrastructure (transmission, distribution, and communication) will improve the physical strength of the systems and allow them to better withstand natural disasters. The cost to properly design a typical distribution line by following the applicable standards increases by only \$681 per mile. This is not only considered cost-effective, but also could prevent the loss of life.

**Hazardous Waste (Grade D+):** The core purpose of the nation's hazardous waste infrastructure is public safety – preventing the release of, and exposure to, hazardous and toxic substances. Therefore, the infrastructure is generally fit for that core purpose. However, its resilience is less certain. A 2019 Government Accountability Office (GAO) report found that about 60% (945 of 1,571) of all non-federal National Priorities List (NPL) sites are located in areas that may be impacted by flooding, storm surge, wildfires, or sea level rise related to climate change effects. Hazardous waste infrastructure also has an impact on climate. As reported under EPA's Greenhouse Gas Reporting Program, the waste sector contributed 134 million metric tons of CO<sub>2</sub>-equivalents in 2018, representing about 2.0% of direct, reported U.S. emissions.<sup>21</sup> New technologies and waste reduction strategies have the potential

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to reduce the hazardous waste management sector's contribution to climate change and strengthen the resiliency of our hazardous waste infrastructure.

**Inland Waterways (Grade D+):** The inland waterway network is very safe to operate. According to USDA, on a million-ton-mile basis, there are 21.9 rail fatalities and 79.3 truck fatalities for every one fatality on the waterways system. But, a changing climate is contributing to less predictable water levels and impacting the efficiency of the waterway system. When water levels are too high or too low, a river shuts down for barge traffic, and shippers are forced to utilize other modes of transport to get goods to market. Traditionally, flood and drought periods were more predictable, but today's extreme weather incidents are more frequent and more severe. For example, the Mississippi River in Baton Rouge was flooded for 67 days during 2018, which in turn forced hundreds of barges to offload and shippers had to put their goods on trucks. The inland waterways are also susceptible to natural disasters. A major seismic event in California, for instance, could cause a breach or failure of one of the levees that channel the state's rivers. The results would be incredibly costly and difficult to recover from, both from a budgetary and environmental perspective, particularly for the neighboring farming communities.

**Levees (Grade D):** Levees are vital components of public safety and help safeguard millions of people, other critical infrastructure systems, and trillions of dollars of property. Over 9 million people – or 86% of the population living behind USACE levees – are concentrated behind about 150 levees, or just 7% of the total USACE levee portfolio. Even well-maintained levees can breach, and water can seep through and underneath them; these effects are hard to detect but can weaken the levee's stability. Frequent extreme weather events put many communities at an increased risk of flooding and levee breaches, including those communities that were previously not in high flood risk areas. Nearly 40% of the levees in the USACE's portfolio have either a comprehensive emergency plan or recent evacuation success. Thirteen percent of assessed levee systems in the portfolio have either no flood warning plan or their

plan is out of date, which impacts more than 600,000 people living and working behind these levees. About 10 million people live and work behind a levee in the USACE portfolio that has some type of flood warning plan; however, nearly 7 million people live in areas that do not have a detailed flood warning plan. Flood warning systems, which include flood inundation maps, contact information for emergency responders, and other key information, are strongly recommended to be included in the development of an Emergency Action Plan for all levee systems. Additionally, more than 3 million people live and work behind levees in communities that are unaware of flood risk.

**Ports (Grade B-):** Ports have a key role to play in helping a community recover from a natural or manmade disaster. Goods can be transported via oceans and inland waterways to communities in need when other trade routes are blocked. Similarly, berths can accommodate emergency vessels and personnel, as was observed in 2020 when the 1,000-bed hospital ship USNS Comfort docked at Port 90 in Manhattan to serve patients during the COVID-19 crisis. Ports are also able to support force deployment in the instance homeland protection is needed. Nine federal agencies, including the U.S. Army, U.S. Army Corps of Engineers, and the Maritime Administration work together to ensure preparedness for national defense emergencies. In the coming years, port owners and city planners will need to decide how to handle sea level rise. Relocating an entire port to higher ground is almost certainly cost prohibitive, but port owners may decide to raise docks or relocate facilities offshore. Connecting modes, such as on-dock rail and service roads, would similarly need updates to continue providing access to ports. Some limited investments are being made today to head off potential complications of sea level rise.

**Public Parks (D+):** As the frequency of extreme weather events increases, so does the need to reduce Combined Sewer Overflows (CSOs). CSOs discharge untreated wastewater and stormwater, often containing agricultural runoff and toxic substances, directly into nearby bodies of water. While the primary way to deal with

combined sewers is the separation of storm and sanitary sewers, the use of parks as rain gardens is an innovative way to manage stormwater sustainably. These green infrastructure systems use the natural environment to manage stormwater and provide a diverse range of ancillary benefits such as aesthetic value to communities; increasing property values by up to 20%; filtering rain which reduces water pollution and protects drinking water sources; providing up to \$3.8 billion in air pollution savings; and keeping cities cooler by reducing the heat island effect. Implementing green infrastructure by building parks across the nation is also becoming more cost competitive with gray forms of infrastructure in certain contexts. Green and open spaces, including floodplains, floodways, and estuaries, are being more fully embraced. Efforts are being made, especially in areas of repeated flooding, to return those areas to their original uninhabited state so that they can not only act as buffers between bodies of water and inhabited areas, but provide wildlife habitat. In this way, our parks can contribute greatly to the sustainability and resiliency of communities and mitigate the effects of climate change.

**Rail (Grade B):** Rail technology development continues to focus on improving system efficiency and safety. Industry technological advances include identifying freight car, locomotive, cargo, and track problems before accidents, damage, or delays occur. Numerous track and infrastructure improvements have been advanced including the use of defect detection vehicles, which detect internal flaws in rails; improved metallurgy and fastening systems, which have enhanced track stability; and research to extend rail life, reduce maintenance costs, and improve safety. Examples include the development of ground-penetrating radar and terrain conductivity sensors that identify below ground surface problems, and cybersecurity systems advancements, including the establishment of the Rail Information Security Committee (RISC) to identify and address future threats. Railroad-focused technology research and development is supported by the railroad industry-owned Transportation Technology Center in Pueblo, Colorado. As required by the FAST Act, DOT

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released the National Freight Strategic Plan (NFSP) which identifies opportunities for the national multimodal freight system to improve safety, security, and resilience; modernize freight infrastructure and operations to grow the economy and increase competitiveness; and support data, technology, and workforce capabilities development that improve freight system performance.

**Roads (Grade D):** The increase in severe weather events is damaging key roadways that serve as community lifelines, while simultaneously increasing maintenance needs, interrupting the normal operation of the nation's roads, creating delays, and negatively impacting the economy. For example, rising temperatures are estimated to add approximately \$19 billion to pavement costs each year by 2040. Therefore, engineers are increasingly incorporating the resilience of the road network during the materials selection and design process and using data-driven analysis to make investments. Furthermore, the Federal Highway Administration now requires state transportation departments and planning organizations (DOTs and MPOs) to consider resilience in the planning process and include resilience considerations in asset management plans.

**Schools (Grade D+):** To provide a safe and effective learning environment for the nation's K-12 students, public schools need to be in good condition. Though the current school infrastructure funding gap is nearly \$40 billion annually, the true cost is undoubtedly higher due to school systems' loss of income during the 2020 pandemic and its impact on tax revenues as well as significant costs for returning students to in-person learning. Public schools often serve a secondary function as emergency shelters and community resource facilities during man-made or natural disasters. This critical function has a significant role in public health, safety, and welfare, and requires facilities to be maintained to function in emergencies and help communities recover quickly. Schools require upgrades to effectively fulfill this important community purpose, including windows that can withstand high winds, structures designed to survive earthquakes, and rooms specifically designed as shelters from tornados.

**Solid Waste (Grade C+):** Landfills are often vulnerable to natural disasters such as hurricanes, earthquakes, and especially floods. Such events can have a large impact on groundwater conditions as well as the overall public health near landfills. Additionally, damage to other infrastructure systems such as roads, bridges, rail, the electric grid, inland waterways, and other systems causes interruption to MSW collection and disposal, which can lead to significant impacts on the public health. Meanwhile, solid waste sustainability practices are evolving and new processes can help reduce waste, particularly plastics. There are researchers and companies in the U.S. that are implementing practices such as pyrolysis to break down polystyrene waste into its foundational material, styrene. Others are looking to use engineered enzymes that can break down polyethylene terephthalate (PET) into purified terephthalic acid (PTA). The advantage of using depolymerization processes to break down PET compared to mechanical processes is that it extends the usefulness of the reprocessed PET, it can deal with the impurities that occur as a result of single-stream recycling, and it can be used with a variety of different types of plastics, not just the high quality plastics like single-use bottles. However, the problem with these technologies is they are still very expensive alternatives, and the scale of facility with throughput capable of processing all the plastic discarded by Americans is not yet available. Therefore, some municipalities across the country are trying to reduce the amount of plastics entering MSW landfills by implementing bans on single use plastic. On a global scale, for example, since 2018, Starbucks has been working to replace all plastic straws with strawless lids and to develop a fully recyclable and compostable cup.

**Stormwater (Grade D):** Impacts from climate change will have variable effects on the form and frequency of extreme events across the nation. To withstand these effects, stormwater infrastructure is increasingly implemented with a context-sensitive approach, that leverages a localized understanding of flood risk, land use practices and regulatory expectations. This approach informs the types, designs, locations, and long-term sustainability of stormwater systems. Resilience for stormwater infrastructure

is reflected by a mix of optimized green, gray, and natural infrastructure, land planning and urban growth, updated asset management and, in water-scarce areas, the productive reuse of stormwater. Current innovations employed by utilities include the use of real-time control systems, complex modeling, cloud computing, data storage, and predictive analysis. Large datasets can be used to optimize the capacity of stormwater conveyance, storage and treatment systems, investments in O&M activities, and other costs. The affordability of sensors has also improved, expanding the potential for system implementation of real time data and control. Finally, some areas employ a regional approach to stormwater management through volume and nutrient trading within watersheds. This can economically incentivize stormwater innovation.

**Transit (D-):** Transit systems' resilience has been strained in recent years due to a variety of hazards, such as sea level rise, extreme winter weather, and the global health pandemic. Transit resilience must accommodate the needs of individual communities, including system availability and accessibility, to promote healthy, economically viable, and environmentally friendly communities. Recent studies have shown that improved transit access has the potential to increase employment opportunities and broaden overall economic activity. Seen over a 20-year period at current wage rates, for every \$1 billion invested in public transportation, roughly 49,000 jobs are created. In recent years, transit agencies have taken strides to minimize their environmental impact, moving fleets toward less reliance on fossil fuels, which accounted for a reduction in fuel consumption by 4.16 billion gallons in 2017, and a decrease of another 1% the following year. Twenty-five years ago, 95% of the nation's bus fleet was diesel powered, but that number has dramatically decreased now to only 42%. Furthermore, hybrid electric buses saw an increase from just 1% in 2005 to 18% in 2019. Meanwhile, natural-gas-powered buses saw an increase from 18% in 2009 to 29% in 2019. New resilience challenges have also emerged amid the COVID-19 pandemic. While transit has played a key role in safely moving essential workers, an emerging task

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from the pandemic will be to establish and maintain new passenger safety measures amid large revenue declines. Additionally, transit agencies will need to build consumer confidence in the public health and safety of riding on transit systems.

**Wastewater (Grade D+):** Utility managers, Wastewater Treatment Plant operators, engineers, and elected officials are increasingly incorporating aspects of resilience – a system’s ability to withstand and adapt to the impacts of natural and/or man-made disasters – into the design, siting, and planning phases of their wastewater infrastructure. However, the suite of wastewater infrastructure vulnerabilities varies by geographic location, type of treatment system, age, and ownership status, so there is not a “one size fits all” solution.

For instance, some wastewater systems are in low-lying areas that are especially prone to the impacts of flooding, while others may be in drought-prone regions or areas with increasingly frequent wildfires. Rather than continuing to operate under a “business as usual” framework, some critical infrastructure decision-makers are shifting their efforts from singularly addressing short-term metrics like population growth, capacity demands, and affordability, and are incorporating long-term, resilience-related factors into planning such as sea level rise, frequency, intensity, and likelihood of natural disasters, cybersecurity threats, and post-interruption recovery time. For instance, the drinking water sector recently set a resilience precedent that may be instructive for many wastewater stakeholders. In 2018, resilience planning was streamlined within

drinking water utilities with the signing of America’s Water Infrastructure Act (AWIA) which requires drinking water systems to routinely develop and update Risk and Resilience Assessments and Emergency Response Plans. ■

For more detailed content and sources for the above excerpts, see the full “Comprehensive Assessment of America’s Infrastructure” for the ASCE’s 2021 Report Card for America’s Infrastructure [here](#).

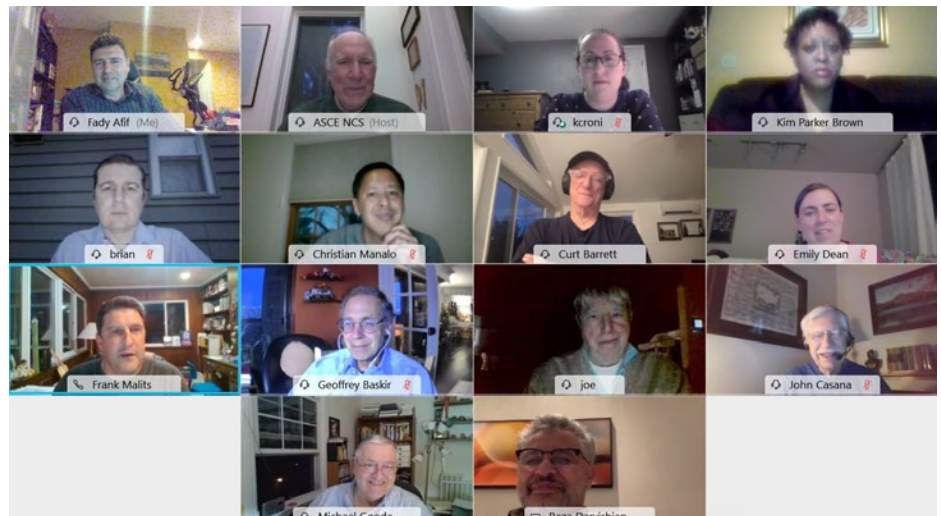
For more information on the 2021 Report Card, see <https://infrastructurereportcard.org/>.

## NCS Past Presidents Virtual Reception

As is customary, the Past Presidents gather for a reception each year before the Awards Ceremony. This year in keeping with the “new normal” the gathering was a virtual reception.

The virtual format allowed several Past Presidents to join us from afar, some who have not been able to attend for years. Joe Doane and his wife Pat took a break from packing to move to call in, surrounded by boxes. Kurt Barrett calle in from his farm in Westminster, MD. By far the longest call came in from Ray Darvish who was in Maputo, Mozambique.

Attached is a screenshot so you can see the friendly faces who joined the event. We had a good visit, catching up on old times and welcoming two new Past Presidents to our group: Emily Dean & Kelly Cronin. We missed Emily’s welcome last year due to the last minute COVID cancellation of the Awards Banquet, but she called in from



Baltimore and joined with Kelly to give a good State-of-the-Section overview to all gathered.

In continuing with tradition, we had our Past Presidents Collection in support of the Scholarship Trust. This year the

contributions are over \$1,000 and still coming in as of the posting of this newsletter article. A big Thank You to all the Past Presidents who contributed. ■



## Scholarship Trust Awards \$17,000 in Scholarships

During this year's Awards Celebration on March 23rd, scholarships were announced for 12 students totalling \$17,000. These remarkable Junior and Sophomore students excelled in studies, extra curricular activities, and community service. Their application packages were exceptional and, get this, they all maintain a GPA greater than 3.2 with three of them over 3.9 – remarkable!

This year you'll notice that we have awarded two new Memorial Scholarships for Neal FitzSimons and Jay Padgett. These were approved by the Section Board in May 2020. Please visit our Section website and read the brief bios of the 6 Memorial endowments: <https://asce-ncs.org/index.php/special-features/scholarship-program/37-scholarship/229-memorial->

[scholarships](#). For more information on the Section's Scholarship Program, please look under Special Features on the Section website.

Congratulations to these scholarship winners. ■



**Christina A. Brown**  
Catholic University of America



**Kelsey H. Martin**  
Catholic University of America  
Williams Memorial Scholarship



**Julia A. Schottmann**  
Catholic University of America  
Hathaway Memorial Scholarship



**John Devlin**  
Catholic University of America  
Outstanding Graduating Senior



**Beverly A. Duran**  
George Mason University  
Padgett Memorial Scholarship



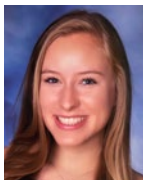
**Rayan A. Elmisurati**  
George Mason University



**Caleb J. Hanneman**  
George Mason University



**Samuel A. Demuke**  
George Mason University  
Outstanding Graduating Senior



**Lauren G. Feeley**  
George Washington University



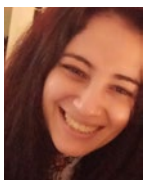
**Noah D. Leslie**  
George Washington University



**Savana R. Stewart**  
George Washington University  
FitzSimons Memorial Scholarship



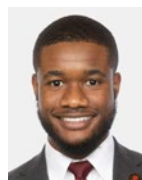
**Lobna Youssef**  
George Washington University  
Outstanding Graduating Senior



**Christine G. Hanna**  
The University of the District of Columbia



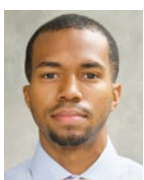
**Chavar O. Henry**  
The University of the District of Columbia



**Horace O. Mitchell**  
The University of the District of Columbia  
Hummel Memorial Scholarship



**Amin Fazulurrahman**  
The University of the District of Columbia  
Outstanding Graduating Senior



**Kamau Sykes**  
Howard University  
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**INTERNATIONAL**



## It's the Economy Again, Stupid!

The phrase, 'It's the economy, stupid' has been attributed to James Carville, Bill Clinton's successful 1992 presidential campaign strategist. And indeed, it is. The economy is both blessing and curse. It creates both well-being and disaster. If we ever needed a reminder of the omnipresent impact our daily economic activities have on our lives, the global COVID-19 pandemic is just such a reminder. So, what then, is the economy?

Economic theory distinguishes between three sets of activity: production, resource allocation, and consumption. These distinct sets of economic activity can also be described as the 'what', 'how' and 'for whom' questions of economics. The first describes production activity and its many interesting issues related to the production of goods and services including production costs, efficiency, innovation, and competition. The second describes the recipe of production, and includes such interesting topics as labor inputs, energy, and renewable vs nonrenewable resources. The third describes the demand portion of the economy including what kind of products and services consumers need or want, and how responsive they might be to price changes.

This past year has highlighted all three of these economic spheres. For example, what goods and services do we produce in the United States and where do we produce them? Which ones do we import and how reliable are the supply chains of these imports? Take our food, for example. Eighty percent of our fruits and vegetables are produced in California where water is increasingly scarce. Most of our meat comes from Texas. Both are a far distance from the distribution centers in high population areas on the east coast. Much of our food is also imported and what is produced domestically requires the labor input of migrant workers who come to the US from Mexico and other central American countries. Without them, our strawberries, salad greens, and beans would not get harvested and would

rot in the fields. We learned firsthand how vulnerable some of our supply chains are as workers in meatpacking plants and distribution centers became known as the essential workforce we depend on to get our food delivered to local grocery stores or to our doorsteps. These essential workers are some of the lowest paid and their working conditions make them highly vulnerable to COVID-19 transmission.

Nature too suffers the consequences of a highly centralized food system characterized by long supply chains. Eleven percent of US greenhouse gas emissions are associated with the food system. Globally, agriculture is responsible for 25 percent of all CO<sub>2</sub>, 65 percent of methane, and 90 percent of nitrous oxide emissions and uses 70 percent of our freshwater. The positive impact of reduced travel was also noticeable during the pandemic as greenhouse gas emissions markedly declined.

Consumer demand shifted as well. Demand for home improvement related goods and services soared while tourism, hospitality and other customer facing service sectors suffered. The increasing bifurcation of our demand sector also came into stark focus as some households depend on food from local food banks and are forced to live in shelters or their cars, while others were able to bolster their savings. Women left the workforce in especially high numbers in part because they occupy a high portion of service sector jobs, and in part because they took over the bulk of home schooling and other child rearing responsibilities. Labor demands in and outside of the formal workforce are not evenly distributed.

So, what have we learned? My hope is that we were reminded of what economists call negative externalities. These are the unintended and usually negative side effects of our economic activity. These side effects show themselves in the pollution of our air, rivers, and soil, plastic islands and chemicals in our oceans, global climate change, growing inequalities,

and social unrest. Negative externalities don't just disappear. They are displaced over time and space. Their consequences are rarely suffered by those who create them, but by future generations and those least able to defend themselves.

My hope is that we will begin new collaborations. Economists from Malthus (1766–1834) to the Club of Rome (1968) have warned of this disastrous prospect of resource depletion and a rate of population growth that outpaces our rate of productivity growth and especially our ability to increase food production. Yet even as we face the prospect of a world population of ten billion people, we have reason for optimism. Technology and its efficiency increases has enabled us to produce more oil, more food, and more consumer goods. In fact, we have produced so much more that prices have fallen, and demand grows steadily. Yet new collaborations are needed to address the real frontiers of technology and efficiency.

The true limit to growth may not lie on the resource side of the economic process, but on the sink side. Sinks are the earth's genius ways to absorb the emissions and waste by-products of our economic activity. As waste and emissions are released, they are processed, absorbed, buffered, and accumulated in a set of context systems we call our environment. Oceans absorb CO<sub>2</sub>, soils absorb water and the emissions it contains, the air takes up and dissipates NO<sub>x</sub> and SO<sub>x</sub> emissions. And there are social sinks as well as workers are loved and cared for in families and communities who absorb the stress and strain of their exhaustion and injuries.

This means that the field of economics, and the field of engineering, must be concerned with more than the resources necessary to sustain economic production and consumption. We must also concern ourselves with the sink capacities that provide the capacity to reduce the negative impacts created by growing emissions

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and waste. Can emissions not only be reduced but reversed? Can waste be reused with minimal energy inputs? Can buffer capacities of the soil be restored? Can we not only reduce CO<sub>2</sub> emissions, but reabsorb excess CO<sub>2</sub> without creating new unwanted side effects?

In other words, we need a new concept of economic activity that shifts our focus from sources to sinks and the value these sink functions create. Such a sustainable economy will increase efficiency so fewer inputs can result in the same or higher output levels of goods and services; it will reduce emissions and waste resulting from the production and consumption of these goods and services; and it will restore and improve the ecosystems services that deliver the sink capacities necessary to process emissions and waste and maintain the health and vitality of our physical and social

environment. Such a new economy will certainly require circular designs and systems approaches.

Food is a good place to start. At the University of the District of Columbia and its College of Agriculture, Urban Sustainability and Environmental Sciences (CAUSES) we launched an Urban Food Hubs model that creates small scale circular food systems consisting of (1) food production, (2) food preparation, (3) food distribution, and (4) closing the loop through waste and water management. The urban food hubs are ideally located in neighborhoods that lack access to fresh food. They model a circular, decentralized food system that can supplement rural production with greens, tomatoes, peppers and ethnic crops so that the most perishable and nutrient rich food plants can be produced right where the majority of consumers live. I invite you to join in

this journey of re-envisioning such a circular, decentralized economy that understands how nature works, and how people live well – one community and one product at a time. It's the smart economy of the future!

### **About the Author**

Sabine O'Hara, is Distinguished Professor and Program Director of the PhD in Urban Leadership and Entrepreneurship in the College of Agriculture, Urban Sustainability and Environmental Sciences (CAUSES) at the University of the District of Columbia (UDC). As founding dean of CAUSES she led UDC's efforts in building a cutting edge model for urban agriculture that improves urban sustainability and the quality of life of urban communities.



## **The Abridged Calumet "K": Episode 6**

**The fascinating novel Calumet "K" by Samuel Merwin and Henry Webster was published in 1901. Its hero? An efficacious engineer.**

An 8-episode condensed edition with text by Ranjit Sahai © 2021. All Rights Reserved. [Illustrations by Harry Edwards, from novel.]

On Wednesday of the week after the Reilly incident, Bannon found an agent from the carpenters' union in his office.

"You probably know why I've come," the agent began. "Mr. Reilly has charged you with treating him unjustly and with drawing a revolver on him. Of course, in a case like this, we try to get at both sides before we take any action. Would you give me your account of it?"

Bannon told in twenty words just how it had happened. The agent said cautiously: "Reilly told another story."

"I suppose so. Now, I don't ask you to take my word against his. If you'd like to investigate the business, I'll give you all the opportunity you want."

"If we find that he did drop the hammer by accident, would you be willing to take him back?"

Bannon smiled. "There's no use in my telling you what I'll do till you tell me what you want me to do, is there?"

Bannon never heard whether the agent from the carpenters' union had looked further into Reilly's case, but he was not asked to take him back on the payroll.

The new night work schedule at the elevator was more of a hardship to Peterson than to anyone else. With none of those pleasant little momentary interruptions that used to occur in the daytime was mere unrelieved drudgery, but the afternoons, when he had given up trying to sleep any longer, were tedious enough to make him long for six o'clock.

Being gregarious in disposition, he hadn't cultivated the habit of thinking, and his time alone led to brooding. From the beginning he had been hurt that Bannon had been sent to supersede him, and with plenty to do and in

Bannon's company every hour of the day he hadn't had time to think. But now he thought of little else, and as time went on, he succeeded in twisting nearly everything the new boss had said or done to fit his theory that Bannon was jealous of him and was trying to take from him the credit which rightfully belonged to him.

About four o'clock one afternoon, Peterson sat on the steps of his boarding-house, trying to make up his mind what to do. Glancing up, he saw Grady, the walking delegate, coming along the sidewalk.

"The elevator is coming right along. Mr. Bannon is a fine man," said Grady who had seated himself on the step below Peterson. "He's a good hustler," said Peterson. "Well, that's what passes for a fine man these days. But how does it happen that you're not down there

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## The Abridged Calumet "K": Episode 6

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superintending? I hope some carpenter hasn't taken it into his head to fire the boss." Grady was shaking his head solemnly. "Oh, no, I ain't quite laid off – yet. He's put me in charge of the night shift." "I suppose some rich man is in a hurry for it and you must do your best to accommodate him."

"You bet, he's in a hurry for it. Says the bins have got to be chock full of grain before January first, no matter what happens to us. He don't care how much it costs, either."

"I must be going along," said Grady, getting to his feet. "That man must be in a hurry. January first! That's quick work, and he don't care how much it costs him. Oh, these rich devils! Well, good-night to you."

When, about an hour after his conversation with Grady, Peterson started down to the elevator to take command, he knew he ought to tell Bannon of his conversation with Grady. But his determination oozed away as he neared the office, and he decided to say nothing about it whatever. Nevertheless, ever since Grady had repeated the phrase: "He don't care what it costs him," Peterson had been uneasily aware that he had talked too much.

Grady went away jubilant from his conversation with Peterson, for it seemed that all the cards were in his hands. Men who were trying to accomplish the impossible feat of completing, at any cost, the great hulk on the river front before the first of January, would not be likely to stop to quibble at paying the five thousand dollars or so that Grady, who, as the business agent of his union was simply in masquerade, would like to extort.

Next week during his talk with Bannon at the office one evening, Peterson braced himself to tell the boss what Grady had said, but it was not till just as Bannon was going home that it finally came out. "Grady had come by to meet me and wanted to know if I was laid off, and I told him I was on the night shift. He wanted to know what we was in such a hurry about, working nights, and I said we had to be through by January first. Then he said he supposed it must be for some rich man who didn't care how much it cost him; and I said yes, it was."



*"How'd it suit you to have all your laborers strike about now?"*

Bannon was leaning on the rail, his face away from Peterson. After a while he spoke thoughtfully. "Well, that cinches it. I guess he meant to hold us up, anyway, but now he knows we're a good thing." Then he wheeled around to face Pete and said, "Why don't we pull together better? What is it you're sore about? I want to feel that I've got you with me. Come around in the afternoon if you happen to be awake, and fuss around and tell me what I'm doing wrong. I want to consult you about a good many things in the course of a day."

Pete's face was simply a lens through which one could see the feelings at work beneath, and Bannon knew that he had struck the right chord at last. "Sure," said Pete. "I never knew you wanted to consult me about anything, or I'd have been around before."

Friday afternoon Bannon received a note from Grady saying that if he had any regard for his own interests or for those of his employers, he would do well to meet the writer at ten o'clock Sunday morning at a certain downtown hotel. It closed with a postscript containing the disinterested suggestion that delays were dangerous, and a hint that the writer's time was valuable and he wished to be informed whether the appointment would be kept.

Bannon ignored the note, and all-day Monday expected Grady's appearance at the office. He did not come, but when Bannon reached his boarding-house about eight o'clock that evening, he found Grady in his room waiting for him. "I can't talk on an empty stomach," said the boss, cheerfully, as he was washing up. "Just wait till I get some supper." "I'll wait," said Grady, grimly. When Bannon came back to talk, he took off his coat and sat down astride a chair. "Let's get to business Mr. Grady."

"I'll get to it fast enough. And when I do you'll see if you can safely insult the representative of the mighty power of the honest workingman of this vast land. I hear you folks are in a hurry, Mr. Bannon and that you'll spend anything it costs to get through on time. How'd it suit you to have all your laborers strike about now? Don't that idea make you sick? Well, they will strike inside two days. Do you think it would be worth something to the men who hire you for a dirty slavedriver to be protected against a strike? Wouldn't they be willing to pay a round sum to get this work done on time? What do you say to five thousand as a fair sum?"

"They'd be willing to pay fully that to save delay," said Bannon, cheerfully.

Grady could not help looking crestfallen. It seemed then that he might have got fifty. "All right," he went on, "five thousand it is; and I want it in hundred-dollar bills." "You do!" cried Bannon, jumping to his feet. "Do you think you're going to get a cent of it? I might pay blackmail to an honest rascal who delivered the goods paid for. If I'd thought you were worth buying, I'd have settled it up for three hundred dollars and a box of cigars right at the start. That's about your market price. But as long as I knew you'd sell us out again if you could, I didn't think you were even worth the cigars. Get out of here." Bannon took the little delegate by the arm. He marched him to the head of the long, straight flight of stairs. Then he hesitated a moment. "I wish you were three sizes larger," he said.

At half-past eight next morning Bannon entered the outer office of R. S. Carver, president of the Central District of the American Federation of Labor and

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## The Abridged Calumet "K": Episode 6

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walked into the president's office with as much assurance as though it had been his own. He shut the door after him. The president did not look up but went on cutting open his mail. "I'm Bannon from MacBride & Company of Minneapolis." "Sit down," said the president. "Are you superintending the work?" "Yes." "One of your foreman drew a revolver on a man?" "I did, myself." The president let a significant pause intervene before his next question. "What do you want with me?"

"I want you to help me out. It looks as though we might get into trouble with our laborers." "You've come to the wrong man. Mr. Grady is the man for you to talk with. He's their representative." "We haven't got on very well with Mr. Grady. The first time he came on the job he didn't know our rule that visitors must apply at the office, and we weren't very polite to him. He's been down on us ever since. We can't make any satisfactory agreement with him." Carver turned away impatiently. "You'll have to," he said, "if you want to avoid trouble with your men. It's no business of mine. He's acting on their instructions." "No, he isn't," said Bannon, sharply. "What they want, I guess, is to be treated square and paid a fair price. What he wants is blackmail."

"I've heard that kind of talk before. It's the same howl that an employer always makes when he's tried to bribe an agent who's active in the interest of the men, and got left at it. What have you got to show for it? Anything but just your say so?" Bannon drew out Grady's letter of warning and handed it to him. Carver read it through, then tossed it on his

desk. "You certainly don't offer that as proof that he wants black mail, Mr. Bannon."

"That letter doesn't prove blackmail," said Bannon, "but it smells of it. And there's the same smell about everything Grady has done. Then by straining his neck and asking questions, he found out we were in a hurry, that the elevator was no good unless it was done by January first, and that we had all the money we needed. Look at it again. Why does he want to take both of us to Chicago on Sunday morning, when he can see me any time at my office on the job?" Bannon spread the letter open before Carver's face. "Why doesn't he say right here what it is he wants, if it's anything he dares to put in black and white? I didn't pay any attention to that letter; it didn't deserve any. And then will you tell me why he came to my room at night to see me instead of to my office in the daytime? I can prove that he did. Does all that look as if I tried to bribe him? Forget that we're talking about Grady and tell me what you think it looks like."

Carver was silent for a moment. "That wouldn't do any good," he said at last. "If you had proof that I could act on, I might be able to help you. But I don't see that I can help you as it is. I don't see any reason why I should."

"I'll tell you why you should. Because if there's any chance that what I've said is true, it will be a lot better for your credit to have the thing settled quietly. And it won't be settled quietly if we have to fight. It isn't very much you have to do; just satisfy yourself as to how things are going down there. See whether

we're square, or Grady is. Then when the scrap comes on you'll know how to act. That's all. Do your investigating in advance. If you can't do it yourself, maybe some man you have confidence in would do it for you."

Carver drummed thoughtfully on his desk for a few minutes. Then he carefully folded Grady's letter and put it in his pocket. "I'm glad to have met you, Mr. Bannon," he said, holding out his hand.

Next morning while Bannon was opening his mail, a man came to the timekeeper's window and asked for a job as a laborer. "Guess we've got men enough," said Max. "Haven't we, Mr. Bannon?" The man put his head in the window. "A fellow down in Chicago told me if I'd come out here to Calumet K and ask Mr. Bannon for a job, he'd give me one."

"Are you good up high?" Bannon asked. The man smiled ruefully, and said he was afraid not. "Well, then," returned Bannon, "we'll have to let you in on the ground floor. What's your name?" "James." "Go over to the tool house and get a broom."

"Give him a check, Max."

### Novel's condensed text by

Ranjit Sahai, ASCE-NCS Past President (2013-14), is a principal with RAM Corp serving State DOTs on projects in traffic engineering design, stormwater facility inspections, and information technology. ■



## Employment Clearinghouse

### City of Stamford, CT Bureau Chief/Director of Transportation, Traffic & Parking

The City of Stamford is seeking a highly motivated and experienced professional for the position of Bureau Chief of Transportation, Traffic and Parking. This is a highly responsible managerial and administrative position, and will require the

candidate to work collaboratively with various stakeholders and be responsible for the day-to-day activities of the department, including analysis, planning, execution and administration of site and construction plans and programs to enhance safety and operations for the City's multi-modal transportation functions. [Click here](#) for more information and to apply on the website.

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](#).



# ASCE-NCS Committee and Branch News and Updates

## History and Heritage

Did you enjoy the January Section Meeting – Steve Pennington speaking on Ben Wright? Interested in how civil engineering has evolved over the years and the technology that built it? Then you'll want to join the H&H Committee for upcoming programs:

- Local Landmarks – Part 1
- The Old Naval Observatory
- Local Landmarks – Part 2
- Inside ASCE's H&H Landmark Program
- Surveying Special

These programs will start in April and will consist of a 1.5 hour Webex virtual session starting with a short social as we gather and committee business session followed by the presentation. To ensure you are notified of upcoming events and virtual meetings, please send an email to Bernie Dennis at [berniedennisjr@gmail.com](mailto:berniedennisjr@gmail.com) and Steve Pennington at [steve.pennington@geo-instruments.com](mailto:steve.pennington@geo-instruments.com). If we can't reach you, we both lose.

Join us today as we look back on yesterday.

## Reston Branch

By Christopher J. Friend, P.E., Reston Branch Vice President

On March 10th, the Reston Branch hosted Michelle Bolding, P.E., from Schnabel Engineering for a virtual meeting. Ms. Bolding has 15 years of geotechnical engineering experience, where she started her career in the New York/New Jersey metropolitan area and relocated to central Virginia in 2010. Her geotechnical experience includes deep foundations, ground improvement, shallow foundations, slope stability, settlement management, historic structure monitoring, pavement design, stormwater infiltration, and project management. Some of her project experience includes roadway and bridge construction; sanitary infrastructures including pump stations, large diameter sewers, and dams; multi-story mixed-use, commercial, residential, structures; slope stability studies, litigation research, and damage studies.



Ms. Bolding presented on Geotechnical Challenges in Roadway Design and

Construction, providing an overview of various geotechnical challenges associated with roadway projects, including how geotechnical items specifically relate to structural design, site development, environmental permitting, stormwater management, pavement design, and construction sequencing. Overall, she provided a well-rounded presentation that received great feedback from our Branch!

On April 6th, the Reston Branch will host Jessica Klinefelter, Vice President in charge of Wallace Montgomery's Environmental Department, for a virtual presentation. Ms. Klinefelter will present "Having an Environmental Mindset during Planning and Design Processes". In her position at Wallace Montgomery, she provides oversight and leadership in natural resources studies, environmental documentation, delineations, environmental design, permitting and environmental monitoring. She received a Master's in Wildlife Biology and published articles on the federally-threatened bog turtle. From that time, she has continuously provided environmental consulting for public works and transportation clients for 23 years. She is familiar with regulations that protect natural, social, and cultural resources. Jessica has experience in both environmental planning and environmental permitting; responsible for dozens of NEPA documents and environmental permits.



The presentation will highlight the importance of incorporating an environmental mindset at project scoping to help avoid lengthy schedule delays and reduce costs on transportation and public utility projects. With a focus on Natural Resources, Wallace Montgomery will discuss their approach to involve environmental staff early in the planning and design process to ensure a smooth project delivery down the road. Typical environmental risks to wetlands and waterways that are encountered on linear projects will be discussed, as well as how they can be appropriately mitigated with an environmental mindset. We'll investigate the Section 404 permitting process and how avoidance and minimization of impacts

can reduce mitigation costs and potentially eliminate the need for permits altogether. Real-world project examples will be shared where these methods have been used successfully to save time and money in Maryland and Virginia.



The Reston Branch has launched a [group](#) on LinkedIn to provide regular updates for the Branch as well as offer a place for branch members to connect. See the following link for additional information: <https://www.linkedin.com/groups/13759693/>.

## Upcoming Events:

**April 6, 2021 at 12 PM** – Virtual Meeting – Having an Environmental Mindset During Planning and Design

**May 11, 2021 at 12 PM** – Virtual Meeting – Investigating Methods for Quantification of SARS-CoV-2 in Wastewater: A pandemic partnership between Howard University and AlexRenew



## Geo-Institute

**Settlement/Consolidation Analysis of a 140' Engineered Fill Embankment at WEST RIDGE Business Park, Morgantown, WV**

Mr. Gallagher was involved in the design and supervision of the construction of a 140' engineered fill for a 1,000" acre commercial development. The fill was completed with on-site excavated rock and soil borrow materials. The borrow materials consisted of a blasted rock and soil matrix. The fill was placed in 18" lifts with a maximum particle size of 8" and compacted to a minimum dry density of 95% standard proctor. The

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finished fill site provided 26 acres of developable land and the concern for the site was the timing and extent of settlements prior to building construction. Mr. Gallagher and his team were tasked with providing a predictive model using time/rate consolidation values and ultimately installing geotechnical instrumentation for the purpose of collecting settlement data during and after fill construction. The collected monitoring data was analyzed and compared to the pre-construction predicted model. The goal was to provide an opinion to the owner as to when they could safely build on the site without settlement impacts. The objective of this presentation is to review the geotechnical information and demonstrate the final analysis and recommendations.

[Click here to register!](#)

**About the Speaker:**

**Mr. Patrick E. Gallagher P.E., CPGS**

Over 46 years, Mr. Gallagher has successfully completed projects that include: Geotechnical Investigations & Design, Civil Site Design, Foundation Design, Stormwater Management, Wastewater Design, Roadway Design, Site Stability Analyses, Mine Subsidence Evaluations, Failure Investigations Environmental analyses, and Expert Witness Testimony. Prior professional positions include CTL Engineering, Mr. Gallagher was the chief of the Abandoned Mine Reclamation Program for the State of Maryland, Department of Natural Resources, and Bureau of Mines. In addition, he was also responsible for overall engineering & geologic support to the Maryland Bureau of Mines Program. His career began in Pittsburgh as a project geotechnical engineer with Orbital Engineering.



**Education:**

- B.S., Civil Engineering, 1975, Virginia Polytechnic Institute and State University, Blacksburg, Virginia
- B.S. Geology, 1975 Virginia Polytechnic Institute and State University, Blacksburg, Virginia
- Postgraduate: Penn State University Advanced Geotechnical Studies, Mining Engineering Dept.

**GeoVirginia Conference.** Had it not been for the unfortunate influence of the pandemic, we would all be

meeting soon at the next GeoVirginia Conference in Smithfield, VA. We were forced to postpone but the GeoVirginia Conference Committee believes we can continue sharing valuable geotechnical content, news and events with you on occasion.

Today, I wanted to share a link to the GeoVirginia web page where you will find an informative video of an SPT torque test recently performed in Virginia. Several previous GeoVirginia presenters have viewed the video and like the procedure and we believe all geotechnical engineers should be aware of its existence.

If you have any questions, please contact Roger Failmezger: [raf@insitusoil.com](mailto:raf@insitusoil.com).

[Click here](#) to watch and learn how standard penetration testing (SPT) is supplemented with the measurement of torque (SPT-T)!



**Younger Members Forum**

By Kush Vashee, P.E., CAPM, M. ASCE

**Monthly Happy Hour.** The NCS Younger Members Forum (YMF) holds monthly happy hours, alternating between Arlington, VA and Washington, DC. Happy hours are usually the first Wednesday of each month unless a holiday falls during that week.



On March 3rd the NCS YMF held their third virtual happy hour of the year on Webex! We had a solid turnout but hope for even more when the group hosts their next virtual happy hour starting at 6PM on April 7th on Webex Look out for some emails soon with registration details. We hope to see you there!

**Professional Development:** We have the first part of a three-part Career Booster series. Part One will be geared towards Professional Skills in Leadership and Management and will be held at 6PM – 8PM on March 31st on Webex. Additionally, we have a Diversity and Inclusion themed webinar learning about D&I within the AEC industry scheduled for April 8th from 12–2PM. [Click here to register!](#)

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 (ASCE National Capital Section Younger Members Forum), following us on Twitter (@ASCE\_NCS\_YMF), LinkedIn (ASCE National Capital YMF), and Instagram (@asce\_ncs\_ymf)

**Get Involved!** Are you interested in getting involved with more Younger Members activities? Do you have ideas for social events or volunteering activities? 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.

**Environmental & Water Resources Institute**

The Environmental & Water Resources Institute (EWRI) held an online event to discuss the *Virtual Water Innovation Revolution*.

Dr. Cat Shrier, with more than 30 years experience in Water Engineering and Science, Planning, and Policy, presented on the challenges and triumphs of the Water Citizen Academy’s Virtual Water Education Lab. This program helps leaders and innovators to develop virtual water education programs using

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a human-centered design approach and providing opportunities for greater diversity and accessibility to water-related initiatives, particularly for small, rural and disadvantaged communities and for women & people of color, within the water workforce.



## WATER CiTiZeN FOUNDATION

Dr. Cat Shrier has more than 30 years experience in Water Engineering and Science, Planning, and Policy. Dr. Shrier knows how critical educational programs and events are to gaining support for innovative water products, projects, programs, and policies. Dr. Shrier completed her Ph.D. in Civil Engineering/Water Planning & Management at Colorado State; was on a National Academy of Sciences Study Committee & Federal Advisory Committee on Water Information Sustainable Water Resources Roundtable; and has served in advisory positions for policy leaders on water technologies and water experts in policy developments. Having served as Head of Water

Business Development for a Global Environmental Consulting Firm and led grant-writing and other revenue-generating efforts for Water Research Institutes, Dr. Shrier also knows where the money in water is and how to acquire this funding, as well as how to gain critical partnerships and public support for water innovation. For the last 10 years, as Founder of WaterCitizen and the 501(c)3 WaterCitizen Foundation, she has worked with top Virtual Education & Coaching Industry leaders and pioneers to develop, launch, and deliver high-engagement, results-driven virtual water courses and trainings, news-sites, summits and speaker series. In 2020, Dr. Shrier launched WaterCitizen Academy's Virtual Water Education Lab, empowering Water Leaders and Innovators to build relationships, generate revenue, and position themselves as go-to experts through virtual water education programs. It is Dr. Shrier's mission to train 10,000 Water Leaders & Innovators to leverage the internet to build relationships, generate revenue, and launch sustainable water solutions within the next 5 years. (See: [watercitizen.org/waterinnovation-revolution](http://watercitizen.org/waterinnovation-revolution) to join a free live training on these methods)

## Architectural Engineering Institute

The Architectural Engineering Institute (AEI) committee board members have been volunteering as virtual guest lecturers for Catholic University of America's senior design class hosted by Dr. Jason Davison since mid-February. The class meets twice a week and presentations were approximately 1 hour with some time for questions at the end. The students' focus range from a mix of construction management, engineering, architecture, and how the three come together. AEI DC committee member presentations have ranged from a history of disasters and how disasters shape building codes to building enclosure basics and envelope detailing. We even had a virtual construction tour by Davis Construction! The students presented their senior design projects on March 30th and several AEI DC committee members were in attendance. We look forward to welcoming these talented students into the engineering profession in the year to come and will strive to maintain periodic guest lectures even after the virtual platform is no longer mandatory! ■

## FGIA Virtual Southeast Region Meeting taking place April 22

Registration is now open for the Fenestration and Glazing Industry Alliance (FGIA) 2021 Virtual Southeast Region Meeting, which will be held April 22. Topics to be covered include wind-driven rain climatology in Florida, changes between the 2010 and 2016 versions of ASCE/SEI 7 as they relate to fenestration, the keys to understanding the Texas Department of Insurance's (TDI) requirements for fenestration and more. [Register now.](#)

"Manufacturers selling products into the southeast region want to stay up to date on industry matters specific to the area, such as global weather trends and hurricanes," said Mark Fortun ([Endura](#)), FGIA Southeast Region President. "We are proud to provide that opportunity by

hosting a meeting for those invested in the region."

Other presentations will touch on the following topics:

- Key industry-related changes in the Florida Building Code 7th Edition
- Florida Fish and Wildlife Commission's recommendation to change visible transmittance (VT) for glass from 45 percent to 15 percent
- Florida legislation highlights of interest to the fenestration and glazing industry

This event is open only to FGIA members, who can [register](#) for the FGIA 2021 Virtual Southeast Region Meeting for \$99. An upgrade option, which allows for an unlimited number of a company's



employees to participate from multiple locations, is also available for \$149. Sponsorship opportunities are also available for the event. ■