

An Informed, Engaged Public is Key to Modernizing Infrastructure

by Michael S. Burke, AECOM Chairman and CEO

Too often, we only notice infrastructure when something goes wrong.

Apart from being an inconvenience, congested roads, overcrowded rail services, power outages, flooding, and cyberattacks cost us billions of dollars every year.

There is an urgency in finding new, creative solutions to deliver modern infrastructure systems, but it can only happen with an engaged and supportive public.

A market-based approach to infrastructure investment presupposes an informed and active electorate. Working with the private sector and government, people must have access to data and tools to help them better understand how infrastructure 'works' and is financed. Our cities are too dependent on infrastructure systems for those most affected by them to just accept things the way they are. This is especially true when service levels are subpar or when urbanization poses new stresses.

What's more, as AECOM's Future of Infrastructure 2019 research highlights, the public is interested in being more fully engaged.

Providers can best address long-term infrastructure needs by better involving the public in three key ways: knowledge—providing greater transparency, primarily by making infrastructure data widely available; understanding—of infrastructure broadly and of how it is funded and financed, and engagement—encouraging the public to join the discussion through planning, advocacy and politics.

PILLAR 1: Knowledge—Awareness of the Problem

Infrastructure data abounds, and there's a need to leverage this rich material to improve our networks and systems, to inform public discussion about needs and procurement, and to improve government decision making and accountability.

Infrastructure agencies should make as much data publicly available as possible so constituencies including academia, think tanks, and the private sector can convert it into actionable information. Areas where access to

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UPCOMING EVENTS

**Geotechnical Stability of Waste Fills—
Lessons Learned and Continuing Challenges**
May 9, 2019

**Legislative News from The Massachusetts
Transportation Committee**
May 14, 2019

Tech Talk and Social
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**Engineers and Land Surveyors Day at the
State House + Water's Worth It Day**
May 22, 2019

2019 BSCES Spring Outreach Awards Banquet
May 30, 2019

Geo-Institute Social at Slumbrew
June 7, 2019

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President's Report

by Geoffrey B. Schwartz, PE, Sr. Project Manager, GZA



Dear Members,

We have two months left before our BSCES fiscal year turns to FY2020 on July 1, and we are actively planning many new endeavors for next year as we continue to roll out plenty of great events in May and June. Please keep your eyes peeled for an invite to our 170th (!) Annual Awards Dinner, currently slated for July. As for these new endeavors, we are looking for BSCES volunteers interested in joining committees or work groups to help with the following:

- Preparing of a Massachusetts State Infrastructure Report Card;
- Reviving the Western Massachusetts Branch;
- Creating a Diversity and Inclusiveness Committee;
- Becoming either a Mentor or a Mentee to fellow BSCES members; and
- Supporting our many other technical and non-technical committees.

Please don't hesitate to reach out to me at president@bsces.org if you are interested and I will put you in touch with the right group chair. No experience needed, just a willingness to participate!

You have spoken, and we are listening! Based on the feedback we received from the membership survey a few months ago, next year we will be publishing a few of our monthly *BSCESNews* issues in html format so that articles and content are more easily accessible and easier to read via smartphone and tablets. While the 'look and feel' may take some time getting used to, we are confident that this practice will make our content more searchable and user-friendly going forward. Thanks to all for expressing your opinions in the survey.

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Modernizing Infrastructure

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wider data can make a positive difference include the following:

- **Quality of life.** Performance reports on critical infrastructure can provide public sector officials, planners, and the public with a reference point for measuring impact. For example, traffic data can be analyzed to quantify the true economic cost of road congestion, possibly supporting the case for investment in new transit or road infrastructure.
- **Budget clarity.** Governments face growing obligations, such as debt service and pension funding. This means that less capital is available for infrastructure operations and maintenance, which leads to reduced service levels. An informed public needs to know this, as well as the available solutions.
- **Project governance and accountability.** Too often, and for numerous reasons, major infrastructure projects come in over budget and late. With meaningful data from previous projects, accountability would be enhanced and everyone involved in delivering new projects would be able to make realistic assumptions.
- **Innovation.** Entrepreneurs have developed smart city technologies using data collected about critical infrastructure systems. More data leads to innovation. For example, flow rates through water utility mains have been used to develop leak-detection systems, while transmissions from internet-of-things sensors on LED street lights can alert cities to outages.
- **Private investment in public infrastructure.** Investors in large-scale, privately financed developments need sufficient data to calculate the risk and reward inherent in their projects. For example, inferences from interpretation of road- and air-traffic data encouraged private investors to develop new inter-urban and high-speed rail and Hyperloop systems. Similarly, historical traffic data is a prerequisite to private investment in toll road concessions.

PILLAR 2: Understanding—How Infrastructure is Funded and Financed

At the heart of most conversations about infrastructure is how best to pay for it.

With price tags for major transportation, power, and wastewater projects running into billions of dollars, it is important to understand how infrastructure is funded and financed. Most citizens only confront these questions when they

see their utility bills rise or are asked to approve infrastructure funding measures at the polls.

For governments, translating complex funding and financing models for the public can be daunting, but it is a critical step in boosting understanding as new models gain traction. Transparency is an important concern. For example, any public-private partnership discussion must include the true implications for lifetime costs and risk-transfer characteristics. That's not an easy conversation.

It is very difficult to introduce private financing to infrastructure that does not have a secure source of funding in the form of tolls, tariffs, or other user fees. Sometimes, such as in the case of a seawall, there is no obvious revenue source and innovative financing techniques need to be considered.

Greater understanding about financing options expands the toolbox of potential capital solutions, including the following:

- **Asset recycling,** which uses proceeds from the sale of existing assets to finance new development. This model is understood and used in Australia. It is not yet used in the United States.
- **Value capture** is another under-appreciated and misunderstood financing technique. It leverages the value of property made viable by new infrastructure, such as a subway-line extension, to finance that new infrastructure.
- **Tax-increment financing** earmarks incremental property tax revenues to service debt incurred to develop new transit infrastructure.
- **Better asset management** municipalities own substantial properties that are often under-utilized. With more proactive asset management, cities could extract significant value that can be invested in infrastructure.
- **The Canadian experience:** There is much value in learning from Canada, which has established an infrastructure bank and has been a pioneer in direct investing by public pension plans into infrastructure, even greenfield projects.

PILLAR 3: Engagement—Politics, Planning, and Public Advocacy

While infrastructure delivery depends heavily on leadership from the public sector, there is an inherent conflict between the interests of those who control infrastructure assets—and public

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Climate Resilient Design Standards and Guidelines for Protection of Public Rights-of-Way

by Julie Eaton, Lead Resiliency Engineer, Weston & Sampson

In an innovative step to address acute and chronic flooding due to climate change, the City of Boston has developed Climate Resilient Design Standards and Guidelines, a framework that translates conceptual flood resilience ideas into feasible, segmental projects that can be incrementally constructed over time. The first of their kind in the nation, the guidelines are organized to guide users through the process of evaluating applicable technical and design considerations, operations and maintenance (O&M) procedures, and related annual and capital costs for a proposed flood barrier concept. Engineers and design professionals should use these considerations to augment the existing standard of care provided for projects, understand technical challenges associated with barriers, and identify opportunities to create value wherever feasible.

The City of Boston experienced significant coastal flooding during two Nor'easters in 2018 and is preparing for an expected 40 inches of sea level rise by 2070. Climate change, including projected changes in sea level rise, precipitation, and temperature, will impact the existing criteria used to design built infrastructure. With the growing number of conceptual solutions, emphasis on shore-based flood protection, and urgency for action, the City of Boston proactively recognized the need for a framework for designing flood barriers.

The Boston Public Works Department (BPWD) led the effort, with support from the Boston Planning and Development Agency (BPDA), Climate Ready Boston, Weston & Sampson, and a technical advisory group. The goals of the guidelines include:

- Establish resilience design guidelines for discrete priority projects and for segmental adaptation projects to achieve flood protection



A rendering of the HARBORWALK in Boston, the nearly completed 43-mile linear park along Boston's shoreline

by 2070, with the option to add an additional 2 ft. of protection in the future

- Translate the Climate Ready Boston concepts into feasible engineering and operational solutions that focus on protecting public right-of-way from flooding due to tidal and storm surge events
- Provide a menu of sample flood protection options with engineering design considerations, preliminary cost estimates, as well as O&M guidance

Climate Projections & Useful Life

The project team used previous climate studies developed for the City of Boston and surrounding municipalities as a starting point for selecting preliminary climate adjustments. The guidelines' climate design adjustments are structured by "useful life" with projections for the 2030, 2050, and 2070 time-horizons (where data were available) for consistency with Climate

Ready Boston studies. Useful life represents the extended service life of most infrastructure, which is generally longer than design life (e.g., 50 years versus 30 years). The useful life estimates should inform the selection of design elevations for increased infrastructure resilience, with a goal of 2070 flood protection. Recognizing that climate projections do not end at 2070, the guidelines also encourage all designs to consider how flood protection can be adapted beyond a 50-year useful life, such as how to achieve an additional two feet of flood protection in the design process.

Barrier Selection & Design Considerations

Prior to implementing the guidelines, designers should assess the flood exposure and impact to the public right-of-way, consider legal issues and tolerance for failure, consider public perception and acceptability, and identify a conceptual barrier.

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Millis Experience with Stormwater Utility Implementation

by Betsy Frederick, LEED AP, Principal Planner, Kleinfelder, James F. McKay, Director, Department of Public Works, Town of Millis, MA; and Michael J. Guzinski, Town Administrator, Town of Millis, MA

The National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) General Permit has been a catalyst for raising the profile of stormwater infrastructure and management in the public consciousness. The MS4 Permit stipulated a considerably greater resource investment (in financial and personnel terms) by system owners than ever before. The Town of Millis, Massachusetts recently went through the process of evaluating various means of funding their stormwater management program and determining that which was most apt for their community. The Town had several primary goals: maintain regulatory compliance (including improved water quality); improve system level of service to the community; and, manage drainage system assets in a fiscally responsible manner that would optimize their useful operating life. The Town chose a Stormwater Utility (enterprise fund) as their mechanism of choice. This is a brief story of the lessons learned through the process.

The Town initiated the evaluation of funding sources with the assistance of a state grant-funded feasibility analysis awarded in January 2017. The evaluation included a first-ever full review of the Town's current investment in stormwater management, including master planning, engineering/design, construction, operations, maintenance and administrative tasks. As with many communities, responsibility for stormwater-related activity spanned multiple departments. In Millis, the Planning Board, Board of Health, Building Department, Department of Public Works and Board of Selectmen all had some role to play in stormwater management. A full accounting of the personnel shared costs, inter-departmental review authorities, and investments of time, money or equipment was a significant undertaking.

That exercise provided a critical "learned lesson": there was a greater investment in stormwater management than generally recognized, but no one department fully "owned" responsibility for stewarding system performance. Without that baseline understanding of how much was actually being spent under current conditions, and to what purpose, any proposed budgeting estimates immediately sounded inflated. The baselining exercise was an extremely important step in the education process. Through this effort, the Town also recognized that investment in drainage infrastructure relied upon a complete and accurate inventory. Concurrent with the development of the Utility, the Town began the process of updating their GIS inventory, evaluating the condition of their assets, and prioritizing future investments through an Asset Management Grant.

The inventory of stormwater activity also included an evaluation of funding-constrained deferred investments, and an estimate of future costs of NPDES MS4 regulatory compliance. Several different funding options were considered, including the primary options in Massachusetts such as tax revenue (General Fund appropriations), a Municipal Water Infrastructure Investment Fund, and the Stormwater Utility (user fee). A GIS-based stormwater billing unit analysis was undertaken to generate a planning level approximation of likely fees for an average property owner.

Fast forward to the presentation of results from the Feasibility Study (during which multiple public workshops were conducted), when the Board of Selectmen voted unanimously to pursue the Stormwater Utility option. The primary basis for the decision involved the equitable distribution of the cost burden, institution of a stable revenue stream for long-term planning, and the ability to create a

transparent and accountable basis for spending and re-investment in existing assets. The Selectmen embarked on a phased program of public outreach and education with the initial goal of achieving the necessary Town Meeting vote in favor of a local By-Law authorizing establishment of the Utility.

Prior to the Town Meeting, the Selectmen and Department of Public Works sponsored multiple events to share the purpose, need and mechanisms related to stormwater management. Events included Council on Aging-sponsored Q&A sessions, local cable interviews, presentations at public meetings and development of informational flyers mailed to all properties in the community. The result was a positive vote at Town Meeting and the decision to proceed with design and implementation of a new Stormwater Utility.

The Town proceeded with a working group within Town Hall that included the Selectmen, DPW Director, Town Treasurer, Town Assessor, and Town Administrator among others. All these entities had a role to play in the successful roll-out of the Utility and would need to be communicating effectively to meet the Town's proposed deadline for getting bills in the mail by a date less than one year from the by-law authorization. Issues of policy, administration, mechanics for data development/maintenance (recordkeeping), billing and customer service had to be addressed efficiently and collaboratively. Town staff provided input on policies and operations to implement the Utility. Many of the decisions made during these working group meetings were later incorporated into additional fact sheets—although, we were reminded through this process, to err on the side of overcommunication and communicating through multiple venues and channels.

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Climate Resilient Design Standards

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The guidelines describe considerations that affect barrier selection and incremental phasing of a project, including site-specific and boundary constraints, stormwater management, utilities, structural and geotechnical considerations, accessibility and mobility, groundwater, and vegetative considerations, as well as O&M procedures and associated costs. They do not include all possible scenarios or challenges but rather demonstrate how users might apply the framework to a diverse set of barrier types and locations in the future.

The conceptual barrier may be advanced or modified based on design, O&M, and cost considerations identified through use of the guidelines. Additional feasibility studies and respective costs should be identified to advance design and steps towards implementation. Designers may consider redevelopment of the area, system redundancy and reliability, short-term versus long-term approaches, permitting strategy, and incremental phasing with a timeline for adaptation.

The team selected four sample barriers and sites to provide practical real-world context with related opportunities and challenges: vegetated berm barrier, harbor walk (raised seawall) barrier, raised roadway barrier, and deployable barrier.



Rendering of a vegetated berm that serves as a flood barrier

Each sample includes a description of the barrier and assumptions, sample design considerations, sample drawings, sample O&M considerations, incremental adaptation considerations, and sample opinions of probable cost.

Long-Term Impact

The City of Boston has recognized that the approach for flood barrier selection should include a unified vision for waterfront protection and public improvement, but the implementation will occur as a series of segmental projects over time. The framework and considerations provided in the guidelines help ensure a standard level of care across diverse sites in the city and offer a range of possible barrier designs. They also provide guidance to help users identify a solution that integrates with the physical environment and

community needs and desires. Flood resilience is a multi-jurisdictional and agency problem, and coordination with city departments, state agencies, private property owners, and others will be required for implementation, funding, and O&M. Considerations related to stakeholder engagement, ownership, and legal and local acceptability lay the groundwork for future policy initiatives and standards to be enacted. The guidelines are intended to be an online living document that is regularly updated with new information as climate projections are revised and projects are implemented, thus ensuring they remain a valuable resource for years to come.

The guidelines are available on the [City of Boston website](#).

Millis Experience with Stormwater Utility Implementation

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Any new program implementation faces a variety of challenges, some of them purely mechanical. In this case, the Town came to find that the billing system and software integration were more problematic than anticipated due to older software. Deployment wrinkles like this are certainly surmountable, but they add additional stress at inconvenient points in the process!

The Town chose to go with a flat billing rate structure (\$1,000 / sq. ft. of impervious area [IA]) that is unrelated to underlying land use of the property. For a variety of reasons, this was deemed the most equitable distribution of costs for Millis and its current and anticipated build-out of land uses. This approach required an investment in GIS data development to ensure an accurate and credible calculation of impervious area per parcel. This data is never “perfect” and did result in an anticipated percentage of property owners appealing the fee on the basis of data error. Confusion about the basis of an appeal, and how it differed from a

credit, also contributed to some of the call volume to Town Hall after bills were mailed. This led to another significant lesson: there can never be too much communication about a change like this when the end result is a “new bill” to all property owners.

In this inaugural year, the Town received appeals on less than 1% of stormwater utility bills. As the data is always in a “continuous improvement” mode, about half of those appeals did result in a change in calculated IA for the property. Of those, however, only a handful resulted in an actual change in the billed fee based on the revised IA. Through the process the Town has increased their institutional capacity to provide customer service, answer questions, and resolve issues without appeals.

That is definitely a good news story! But...and there is usually a “but,” as with the world at large, social media can be a “force multiplier” on all manner of issues. Those who were unhappy either with the fact of the fee itself, the basis for

the fee development or the degree to which the Town advertised the initiation of the program were very vocal on some social media platforms. To a certain degree, this overshadowed the otherwise successful implementation of the Stormwater Utility and has led the Town to consider additional education and outreach activities as a necessary step in the full acceptance of the Utility. Despite an overwhelming vote in favor of the by-law at the Annual Town Meeting, it became apparent that until the bill arrived in the mail, the issue was still not well understood by residents and property owners.

Program development is an ongoing effort. The Town will continue to work with the community residents and property owners to make sure the program is responsive to their needs, and contributes to the health, safety and quality of life in Millis. Ultimately, the Town does believe that the Stormwater Utility will be recognized as a fair and equitable means of funding the important functions this infrastructure serves.

Here and Now: The Future of Mobility as a Service

by Veronica Siranosian, Vice President, AECOM Ventures; Stephen Engblom, Senior Vice President/Global Cities Director, AECOM

In an increasingly digital world, we are becoming accustomed to accessing what we want at the touch of a button. Transportation is no exception. Following the rapid expansion of transportation network companies (TNCs), such as Uber and Lyft, and on-demand shared bikes and scooters, the app has become key to how millions of people move around, challenging fixed transit systems and timetables.¹

With services launched in cities almost overnight, initial collaboration between TNCs, bike share, e-scooter companies and city governments has been sparse to none. City authorities have had to quickly develop policies and legislation to regulate the new transportation solutions. These services can add to congestion and pollution. A recent study notes that ride-hailing apps generated an additional 5.7 billion miles of driving, often without passengers, in the most populated cities.

A New Way to Travel

A potential answer to these challenges is shared Mobility as a Service (MaaS). This approach unites individual public and private MaaS options, such as trains, buses, ride hailing and sharing schemes for cars, bikes, and scooters and taxis, for first- and last-mile connections to high-capacity, fixed route or point-to-point service in one place; leveraging digital innovations to provide an integrated service to users that is accessible via a single mobile app and payment channel.

Cities Transformed

Shared MaaS creates the potential to shift from ownership and single provider transport models to paying for travel as a service. Done well, shared MaaS promotes sustainable decision-making enabling users to compare transport modes on costs, emissions and flexibility; and

cities to incentivize and encourage travel behaviors that promote the long-term success of citizens and cities.

An inclusivity-focused MaaS approach could increase access to education, work and healthcare for groups underserved by public and private mobility solutions. This includes women whose travel patterns don't always match fixed routes and schedules, older people, those with low incomes, or those with disabilities.

Parking in cities is also linked to urban sprawl, constrained economic growth and environmental changes. The average car is currently unused around 95 percent of its time, with huge swathes of urban spaces dedicated to supporting vehicle storage.

MaaS, when coupled with high-capacity, fixed-route public transport services, could provide cities with the catalyst needed to deliver substantive reform: increasing existing vehicle usage via share schemes and providing a cost-effective alternative to car ownership that could open up valuable real estate for community-focused redevelopment. MaaS is a chance for private operators to secure increased market share in a competitive industry, ensure efficient resource use and benefit from a more collaborative relationship with city and transportation authorities.

Mapping a MaaS Blueprint

Money is tight and cities cannot continue to build roads to ease transportation challenges. Instead, they must innovate and increase existing infrastructure efficiency. Cities also rely on transportation planning, regulatory and modeling approaches that are being overtaken by the rapidly changing transportation landscape. Change is possible and necessary. Here are five key steps to follow to create a MaaS blueprint:

1) Think Big and Prepare for the Future

Cities need to understand individual communities' mobility needs. This includes identifying people's travel requirements, gaps in existing provision, and whether MaaS is a sustainable business model. This exercise will inform a detailed mobility vision, including possible partners to enable delivery and a phased plan to get there. The city's focus must shift to building a seamless, equitable and efficient transportation system that optimizes users' journeys and the city's resources as a whole.

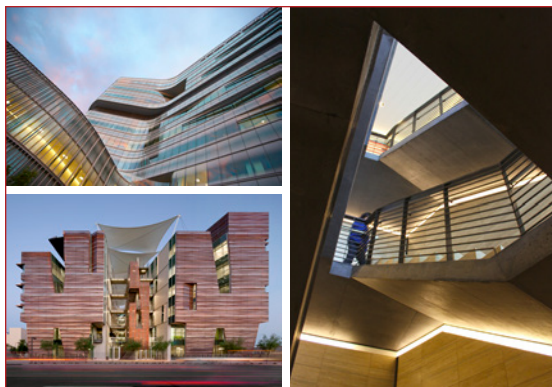
Authorities also need to futureproof plans, policies, and the procurement guidelines that support them. Consideration is needed for the social, economic, environmental and public health impacts of proposed changes on communities. For example, is the mobility package affordable and accessible to those who need it most?

Finally, cities must take a holistic approach to planning, bringing together not only infrastructure and planning experts but also specialists in data science, cybersecurity, environment, public health, and socio-economic issues. This should mitigate risks from planned changes, ensuring we deliver a system that works for everyone while producing key performance indicators equipped to flex with the tech and assess whether the system is meeting objectives and users' needs.

Tackling the Uncertainty

There is great uncertainty about the future evolution of MaaS and other technologies, as well as the impacts of customer acceptance, changing business models, and shifting demographics. Building on experience with technology development, travel-demand forecasting and long-range planning, AECOM developed MobilitiesTM, a scenario planning

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Here and Now: The Future of Mobility as a Service

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tool that helps agencies understand these uncertainties and the potential impact of new policies and technologies on the transportation system and other related concerns such as jobs, taxes and vehicle ownership.

2) Be Flexible, Open and Collaborative

Public transit should be a core component of every city's MaaS approach, alongside greater collaboration with private companies to create mutually beneficial partnerships, help drive innovation and gain greater insights into mobility needs. This will require cities and their partners to develop more flexible, integrated governance structures and partnership models, ranging from data-sharing agreements to integrated systems architecture.

Collaborate to Innovate

Capri, an AECOM-led 19-partner consortium, which includes public, private and research organizations, is collaborating to deliver a pilot that could enable the use of connected and autonomous vehicles, i.e. driverless shuttles, to move people around contained environments such as airports, hospitals and business parks.

3) Make and Use Your Infrastructure Smarter

Cities were traditionally designed and developed in a rigid way—a road is a road and the sidewalk is the sidewalk. In the future, the fixed purpose of many city spaces will need to become more fluid. For example, in Chicago and San Francisco, demand-responsive pricing for parking is securing revenue for reinvestment in public transit and infrastructure. Future 'flex zones' could take an even-more-innovative approach. Instead of fixed-parking zones, curbsides could be designed to accommodate multiple transportation modes and optimize use throughout the day.

4) Promote the Most Sustainable, Efficient, Affordable and Accessible Solutions

Revenue sharing collaboration with private transportation providers will help determine the pricing structure and payment systems of city-led MaaS packages. This collaboration must create win-win situations for the city, private service providers, and users. Universal payment systems, such as Apple Pay, for transit in cities like Chicago should ease revenue sharing. In an increasingly cashless society, the public will want innovative payment options, but transportation organizations will still need to make services accessible to those without bank cards, smart phones or unlimited-data plans.

MaaS package pricing structures should be designed in line with the city's policy priorities, whether smoothing out flow during peak periods or ensuring affordable solutions. There must be a clear incentive for people to change their behaviors to choose the option that is the 'smartest' for them and meets the city's objectives.

5) Data is King, But People Matter Most

No matter how impressive the technologies or transportation services, acceptance requires a major shift in behavior, built around education, research and engagement.

It's already happening. Fewer young people are driving. By 2030, the stock of cars on the road is set to fall by 22 percent in the U.S. Mobility services like ride or bike sharing are getting people used to the idea that you can get to your destination in the way that you want, when you want. Artificial Intelligence can accelerate system optimization and enhance the human experience.

But cultural shifts take time, and some will resist it. Car ownership remains an embedded desire, and many do not consider public transport or shared mobility viable options. The MaaS approach must be customer-friendly, intuitive to use and widely available. It is important to ensure that private providers help the city provide equitable access to transportation solutions. Technology solutions must support a citywide mobility solution or MaaS framework to benefit all customers.

Using the system can be a fun experience. A huge part of the Waze app's popularity is its GPS services gamification. Drivers earn points based on driving time and help given to others. They can select different voices for directions and share their mood with others. A similar approach could incentivize users to switch to MaaS, offering points for more efficient routes, as well as information on the impact of their choices such as calories burnt or money spent. A website with real-time updates and customer reviews can also help with effective system use.

Realizing the Vision

Transportation is shifting gears. MaaS gives cities opportunities to: more efficiently move their citizens to and from existing transportation systems; provide point-to-point, multi-modal services accessible via a single system; and partner with private companies.

To make this change a reality, cities need clear, strategic visions, flexible, sustainable and holistic approaches to urban planning, a focus on smart infrastructure, affordable solutions, and greater collaboration with private providers. Crucially, they must show the public that MaaS can make their city a better place to live, work and visit.

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Massachusetts Requires PE Stamp for Gas Company Plans and Specifications

by Bryon Clemence, PE, Consulting Engineer

Following the natural gas explosions and fires in the Merrimack Valley in the fall of 2018, Massachusetts passed a law (Chapter 339 of the Acts of 2018) in December that changes how gas companies prepare construction documents. The law requires that a professional engineer stamp both plans and specifications prepared by a gas company for work “that could pose a material risk to public safety.” This is an ‘emergency law’ and went into effect immediately.

The new law has two parts. Section 1 essentially eliminates an exemption from professional licensure requirements for gas companies. The exemption no longer applies to plans and specifications for “engineering work or services that could pose a material risk to public safety, as determined by the department of public utilities, performed by or on behalf of a gas company” (Chapter 339 of the Acts of 2018). It does this by amending existing state law that governs professional engineers in Massachusetts. The other exemptions of the existing law are unchanged and remain in effect.

Section 2 requires that “plans or specifications for engineering work or services that could pose a material risk to public safety, as determined by the department [of public utilities] ... developed by or on behalf of a gas company shall bear the stamp of a professional engineer” (Chapter 339 of the Acts of 2018). It does this by adding a new section to existing state law that governs gas and electric companies. It has other requirements, as well, for filing, reviewing, and auditing plans, and the Massachusetts Department of Public Utilities (DPU) may promulgate regulations to implement the new law.

The language of the law indicates that DPU will determine what engineering work or services of a gas company “could pose a material risk to public safety.” Promulgating regulations would be a way to address that, along with any other issues there may be with implementing the new law. According to the American Council of Engineering Companies of Massachusetts (ACEC/MA), DPU “will be issuing draft regulations that clarify how Professional Engineers are to be in responsible charge of these projects” (*ACEC MATTERS*, January 2, 2019).

The new law follows recommendations by the National Transportation Safety Board (NTSB), which is investigating the accident. The NTSB issued an urgent Safety Recommendation Report on November 14, 2019, prior to completing the ongoing investigation. It stated in a press release that, “The NTSB does not need to wait to develop probable cause for an accident to issue safety recommendations.” The report contained five recommendations. One of the recommendations was for Massachusetts to, “Eliminate the professional engineer licensure exemption for public utility work and require a professional engineer’s seal on public utility engineering drawings.” The other four recommendations were for the gas company, as discussed below. [Click here](#) to view the NTSB report.

According to its website, the NTSB had requested Massachusetts to respond to its recommendation within 90 days. According to ACEC/MA, Governor Baker filed legislation on November 20, the Legislature approved it, as filed, and the Governor signed it into law on December 31, 2018. It is an emergency law, meaning that it took effect immediately. [Click here](#) to view the new law. This is session law; the required updates to the General Laws are not available yet.

According to ASCE, Massachusetts also announced that “natural gas companies within the state would review their safety protocols and adopt Recommended Practice 1173 from the American Petroleum Institute’s 2014 *Pipeline Safety Management Safety Requirements*” (*ASCE Civil Engineering* magazine, February 2019).

Professional engineers and land surveyors in Massachusetts are governed by MGL chapter 112, sections 81D through 81T. Requirements for professional licensure do not apply to certain types of services and engineering work. These so-called exemptions are found in section 81R, subsections (a) through (m). Under subsection (l), these include persons or firms under jurisdiction of the DPU or the Department of Telecommunications and Cable (DTC). According to the DPU website, these include investor-owned natural gas, water, and electric power companies. The new law essentially eliminates the exemption for natural gas companies by amending subsection (l), such

that it no longer applies to “engineering work or services that could pose a material risk to public safety, as determined by the department of public utilities.” The other exemptions of subsections (l) and Section 81R, as a whole, are unchanged and remain in effect.

The new law also amends MGL chapter 164, which governs the manufacture and sale of gas and electricity in Massachusetts, by adding section 148. This includes an explicit requirement for the stamp of a professional engineer, as described above.

According to ASCE and the NTSB, most states have some form of professional licensure exemption for public utilities, as Massachusetts does. ASCE and other organizations “have been critical of these exemptions for some time.” The NTSB report criticized them as well. ASCE also raised the broader issue of how utilities are located during design and shown on plans and who has responsibility for locating them during construction.

One caveat of the new law is worth noting. The new law pertains only to gas companies, whereas the NTSB recommended that Massachusetts eliminate the professional licensure exemptions for public utilities, generally. The new law does not apply to the exemptions for other utilities under jurisdiction of DPU and DTC.

The NTSB made the other four recommendations in its report to NiSource, Inc., the parent company of the owner of the gas company: (1) Revise the process for reviewing construction documents, including having the documents or plans be sealed by a professional engineer; (2) ensure that records and documentation are traceable, reliable, and complete; (3) apply management of change process; and (4) implement control procedures for gas main modifications, including monitoring and the capability to shut the system down immediately if abnormal operations are detected. The NTSB identified these four recommendations as urgent.

The new state law is a step forward in protecting public safety. However, the information provided by ASCE and the NTSB suggests that more could be done regarding the exemptions from professional licensure that apply to public utilities.

Featured Group

Government Affairs and Professional Practice Committee

by AnaCristina Fragoso, Geotechnical Engineer, WSP and Government Affairs & Professional Practice Committee Chair

The BSCES Government Affairs and Professional Practice (GA&PP) Committee serves to extend the reach of our professional engineering expertise to those who develop and administer public policy affecting the built environment. Our goal is to educate and inform individuals in the public policy realm about issues that are important to our membership, to our communities, and to our Commonwealth. Toward that end, the GA&PP Committee participates in a number of activities throughout the year to engage state and federal legislative officials, as well as officials in the executive departments.

One of our key activities during the year is to participate in Engineers and Land Surveyors' Day, which will occur on May 22, 2019. This event provides the membership of BSCES with an opportunity to speak with their state legislators and/or their staff in a structured environment, with prepared materials explaining issues of interest to our profession. For those of our members who have participated, you are aware how important this event is for BSCES and the engineering community as a whole. For those of you who have not participated, we strongly encourage you to take this rare opportunity to make sure your voice is heard as the Massachusetts House and Senate deliberate important legislation affecting our lives and livelihoods.

Another of our key events is participation in the American Society of Civil Engineers (ASCE) Fly-In, which is essentially a national version of the BSCES Engineers and Land Surveyor's Day.

Members from across the country participate in the ASCE Fly-In in Washington, DC to speak to their Congressional representatives. This year it was held on March 12 through 14. Participants attended small group briefings with the staffs of their members of Congress and the Senate. Like Engineers and Land Surveyors Day at the state level, meetings are scheduled for the participants. Briefing materials and position papers are provided by ASCE and an entire day is dedicated to presentations on the issues before Congress concerning the civil engineering industry.

As for the state of infrastructure federally, ASCE continues to highlight the D+ grade given in 2017. They are urging the new congress to make infrastructure priority number one and is advocating for more sustainable solutions while addressing needs. The distinguished Brookings Institute has hosted several bi-partisan panels on infrastructure investment. There are some indicators that, while everyone is aware of the need to increase the level of investment on infrastructure, the perception is that many in congress lack the bravery needed for the will to raise taxes for that purpose. Infrastructure is definitely a landmine issue, but the recent natural disasters may increase awareness and the willingness to act. Emergency aid for the extreme loss of infrastructure in almost every corner of the country (and territories) is currently under debate but expected to move, and it will likely highlight how closely infrastructure is intertwined and needs addressing.

We continue to represent the voice of BSCES at the Regional Transportation Advisory Council, which is an independent body that brings public viewpoints and advice on transportation planning to the Boston Region Metropolitan Planning Organization, of which secretary Pollack is the head. Its membership includes municipalities, professional organizations, transportation advocacy groups, neighboring MPOs, and state agencies.

The primary focus of the GA&PP Committee has always been and continues to be the legislative and regulatory process of government. Throughout the year, the GA&PP Committee tracks legislative and regulatory initiatives, reviewing new proposals to determine their impact on the civil engineering profession and the built environment. Currently, the committee is tracking several initiatives including funding for water resources infrastructure, sustainability and resiliency, and public private partnerships (P3) initiatives in the water resources domain. We have not yet determined which bills we will push on Engineer and Land Surveyors' day, but we will send out a message and have a briefing prior to visiting the state house, where we hope you will join us.

If any of our activities sound interesting to you, we would welcome your participation! The GA&PP Committee is always looking for new members. Anyone interested can contact me at ac.fragoso@wsp.com or at 617/459-8513.

President's Report

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Also of note, voting for the 2019–2020 BSCES Board of Government and Nominating Committee is underway with the emailing of a hyperlink to the online election ballot to voting BSCES members (affiliate and student members are not eligible to vote).

Finally, I would like to say a "Thank You!" to Bonnie Ashworth, who after 11 years and with over 45 articles published (and countless articles reviewed) is stepping down from our BSCES Newsletter Editorial Board. There is a lot of time and effort spent developing the *BSCESNews* each month, and Bonnie has truly been a very active

volunteer and really a big part of the success of the newsletter. Thank you very much Bonnie!

The April *BSCESNews* theme is State of Infrastructure and its featured group is the Government Affairs & Professional Practice Committee. Please read the page 9 article by GA&PP Committee Chair AnaCristina Fragoso from WSP. If you are interested in submitting an article, please contact our Newsletter Editorial Board chair, Bruce Jacobs, at sr.vp1@bsces.org.

I'd like to once again thank our Society Sponsors especially AECOM, which is the sponsor of this

month's newsletter. I would encourage you to read AECOM's page 1 article entitled, "An Informed, Engaged Public is Key to Modernizing Infrastructure," which was written by AECOM Chairman and CEO Michael Burke.

Please do not hesitate to reach out with comments, questions, and feedback, so that we may continue to serve you.

Respectfully submitted,
Geoffrey
president@bsces.org

Recent News and Updates

BSCES Election Information

Voting for the 2019–2020 BSCES Board of Government and Nominating Committee began on April 30, 2019, which is the date BSCES Subscribing Members who are eligible to vote in this election received an election announcement email containing a hyperlink to an online ballot. BSCES associate members, members, fellows, and honorary members with voting privileges have until 5:00 PM on Friday, May 17, 2019 to cast their votes.

2019 Bertram Berger Young Engineer Award Submission Deadline is May 10, 2019

Until Friday May 10, the Transportation & Development Institute Boston Chapter is accepting nominations for the 2019 Bertram Berger Young Engineer Award. This annual award serves to recognize an outstanding younger member of the Boston Society of Civil Engineers Section/ASCE for his or her professional achievements and service to the community. To learn more about the requirements, please see the insert at the end of the newsletter.

2019 Ernest A. Herzog Award Submission Deadline is May 10, 2019

The Transportation & Development Institute Boston Chapter will be accepting papers for consideration for the 2019 Ernest A. Herzog Award through May 10, 2018. Submitted papers should present an infrastructure project, innovation or idea in which the author was actively involved in as an owner, advocate, engineer, or end-user. The paper must address specific benefits to current professional practices, lifestyle, and/or sustainability through the application of existing or innovative technologies or methods. To learn more about the requirements, please see the insert at the end of the newsletter.

BSCES Thanks Ashworth for her Service to the Newsletter Editorial Board

The BSCES Board of Government and Newsletter Editorial Board would like to thank Bonnie Ashwood, who after 11 years of service, recently stepped down from the Newsletter

Editorial Board. During her time on the board, Bonnie wrote over 45 articles that were published in BSCESNews, including numerous BSCES member profiles. Thanks Bonnie!

BSCES Welcomes its New Members

The BSCES Board of Government is pleased to welcome the following new members who joined BSCES during the past few months:

Affiliate Members:

Dawit Birru
Morgan Collings
Brandon Lambert, Hayner Swanson
Stephen McLaughlin
Craig Miller, Waterfield Design Group Inc.

Ian Skinner

Peter Sun

Hau Trang

Kyle Webb

Associate Members:

Muhannad Abuhaikal, PH.D
Matthew Baker, EIT, COWI North America, Inc.
Rickey Caldwell, PH.D, Merrimack College
Ryan Cavanaugh, EIT, Childs Engineering
Jennifer Clark
Robert Davies, EIT
Patrick Gilbride, PG, Senior Services
Benjamin D. Goffin, EIT, Weston & Sampson
Cameron Gray
Kathleen Pearson, EIT
Daniel Sievers, EIT
Ryan Van Der Heijden

Members:

Nicholas Dellacava, PE, Atlantic Coast Dismantling, LLC
Jason Flietstra, PE
Michael Igo, PE, Aqueous Consultants
Billy Krukowski, Town of Spencer
Colin O'Hearn, PE

Students:

Joseph Afring, Duke University
Mukul Agrawal, Rajiv Gandhi Proudlyogiki Vishwavidyalaya - R.G.P.V.
Jacob Aubertine, University of Massachusetts Dartmouth
Aleks B., University of Massachusetts Dartmouth
Gabriel Barragan, University of Massachusetts Lowell
Ronan Bates, University of Massachusetts Lowell
Lydia Bird, Northeastern University

Donald Borenstein, Lehigh University
Aron Brenner, Massachusetts Institute of Technology
Sophie Buckingham, Tufts University
Jason Bushey, Northeastern University
Ruth Cahill, Northeastern University
Peter Colatarci, University of Massachusetts Lowell
Sylvia Costa, Wentworth Institute of Technology
Karla Cuarezma, University of Massachusetts Lowell
Liam Cullinane, University of New Hampshire
Duncan Dean, Northeastern University
Samantha Devens, Pennsylvania State University--University Park
Evan DiMatteo, Wentworth Institute of Technology
Haileyesus Ephrem, University of Massachusetts Lowell
Steven Fallon, University of Massachusetts Lowell
Samuel Ferro, Wentworth Institute of Technology
Dale Gable, University of Massachusetts Lowell
Tara Garani, University of Connecticut
Nick Gearin, Rochester Institute Of Technology
Jonathan Gendron, University of Massachusetts Dartmouth
Margaret Geyer, Northeastern University
Samantha Grice, University of Maine
Luke Groder, Merrimack College
Nick Haddad, Bucknell University
Gavin Harris, Northeastern University
Edwidge Hercule, Wentworth Institute of Technology
Rayna Higuchi, Massachusetts Institute of Technology
Carolyn Holden, Northeastern University
Claire Holley, Massachusetts Institute of Technology
Amanda Isak, University of Massachusetts Amherst
Christopher Jackson, Virginia Polytechnic Institute and State University
Yaxin Jin, Northeastern University
Nicholas Johnson, Rensselaer Polytechnic Institute
Abbas Joorabchian, University of Massachusetts Amherst
Magreth Kakoko, Massachusetts Institute of Technology
Regan Kelly, Northeastern University
Aaron Kline, Northeastern University
Stephanie Kosmin, University of Maine
Zoe Lallas, Massachusetts Institute of Technology
Kayla M Lapan, University of Massachusetts Lowell
Carmen Leung, Wentworth Institute of Technology
Edward Mahoney, University of New Hampshire
Abdullah Majrashi, Merrimack College
Juliette Marquis, University of Massachusetts Lowell

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Recent News and Updates *(continued from page 10)*

Nathaniel Mastico, University Of Maine, Orono
 Hannah Mellecker, Northeastern University
 Nicholas Menz, University of Massachusetts Amherst
 Delaney Meyer, University of Connecticut
 Chris Milliken, Virginia Military Institute
 Michael Morgan, Catholic University of America
 Michael Mugo, University of Massachusetts Lowell
 Conor Mullaney, University of New Hampshire
 Francis Myers, Northeastern University
 Meghan Pescatore, University of Massachusetts Lowell
 Zachary Pierce, Northeastern University
 Daniel Pitts, Northeastern University
 Mohammad Rahman, University of Massachusetts Dartmouth
 Alexandre Renaud, Northeastern University
 Mark Rosado, Wentworth Institute of Technology
 Sierra Rosenzweig, Massachusetts Institute of Technology
 Shania Ruiz, University of Massachusetts Lowell
 Michael Salvatori, Rochester Institute of Technology
 Anna Schwarzweller, Northeastern University

Elizabeth Sherman, Cornell University
 Ranajay Singh, Northeastern University
 Eoin Stack, University of Massachusetts Lowell
 David Steinberg, Northeastern University
 Dorjan Sulaj, Lowell Technological Institute
 Matthew Sylvia, Wentworth Institute of Technology
 Guensly Thelemaque, University of Massachusetts Lowell
 Sebastián Torrente, EIT, Massachusetts Institute of Technology
 San Lin Tun, University of Massachusetts Lowell
 Amy Vogel, Massachusetts Institute of Technology
 Nicholas Walsh, Wentworth Institute of Technology
 Gerald Wang, Massachusetts Institute of Technology
 Xinzhaio Wang, Northeastern University
 Michael Ward, University of Massachusetts Lowell
 Chiharu Watanabe, Massachusetts Institute of Technology
 Talisa Watts, Tufts University
 Ian Weston, Worcester Polytechnic Institute
 Harrison Woelfel, University of Massachusetts Lowell

Jiarui Yang, Northeastern University
 John Zafiris, University of Massachusetts Lowell

Renew Your BSCES Membership Today!

As an ASCE member you received a notice to renew your society membership. When renewing your ASCE membership, please don't forget to also renew your BSCES membership to continue to receive the numerous member benefits that BSCES has to offer and be among the leaders of your profession who make a difference. Thank you for your contribution.

ASCE Election Information

The 2020 ASCE Election begins on May 1, 2019 and is open until June 1, 2019. BSCES Members will have the opportunity to vote for both the ASCE President-Elect and Region 1 Governors. To learn more about the election and the candidates, [click here](#).

Modernizing Infrastructure

continued from page 2

sector finances—and the interests of citizens whose lives are impacted by these assets.

In my view, a long-term perspective is essential in the case of capital-intensive, monopolistic assets whose development is often irreversible. The physical location and layout of entire cities is effectively unchangeable once inter-urban and urban highways and local roads are developed.

One way to ease this conflict is through long-term planning by organizations independent of government that include representatives of major stakeholder groups. These municipal planning organizations can take an unbiased perspective, create long-term plans, and educate the electorate as well as elected officials. New York's Regional Plan Association is a great example of an informed public advocating for change. A similar body could be established in other large metropolitan areas, and could share best practices, to everyone's benefit.

Another example of knowledge leading to change is in Los Angeles County, by far the most populous

county in the U.S. with more than 10 million people. In 2016, after a three-year effort that placed a premium on public education, voters overwhelmingly approved Measure M, a dedicated sales tax that provides up to \$120 billion for future transit and road infrastructure needs.

An important consideration for long-term planners is the need to be realistic with the time horizon and the public's ability to project into the future. It is inadvisable to make plans based on population trends and—more controversially—environmental models that peer too far into the future. For example, projections of coastal cities being under water 100 years from now are less likely to lead to action than are calls for coastal protection for the coming 20 years.

Cities that meet the needs of their residents and that listen to their voices are more likely to thrive than those which do not. This is as true with respect to infrastructure as it is with other urban systems, such as public safety, healthcare and education. An informed population can

take a long-term perspective, will advocate for its infrastructure needs, and is likely to be supportive of new development.

And Finally

It's time for a truly knowledge-based and interdisciplinary approach to infrastructure.

For too long, government, financiers, engineers, and policy experts have operated in independent silos, and often without the benefit of an involved and educated public. Effective policy development and implementation require breaking down these artificial boundaries and bringing everyone around the same table to operate from a common base of knowledge, develop integrated plans, and ensure complete accountability. This way, we will make sure that the combination of infrastructure innovation and delivery leading to positive benefits is everyone's business.

Specialist consultant Clive Lipshitz contributed to this article.

Upcoming Events

For more information and to register for events, please visit www.bsces.org

To register online for an event at the BSCES member rate you must login using your BSCES assigned username and password.

If you do not know your BSCES member login information, call 617/227-5551.

Geotechnical Stability of Waste Fills— Lessons Learned and Continuing Challenges

Sponsored by the Geo-Institute Boston Chapter

Thursday, May 9, 2019

Breed Memorial Hall, Tufts University,
Boston, MA

5:30 PM Social Hour

6:30 PM Dinner

7:45 PM Presentation

Rudolph Bonaparte, PhD, PE, D.GE,
FASCE, NAE

The lecture will briefly review several historical US waste fill stability failures and the lessons learned from them. Several failures from the current decade will be reviewed to show how geotechnical engineers are re-learning the earlier lessons, while at the same time there are new lessons to be learned related to evolving waste streams and waste operations practices. The lecture will conclude with an evaluation of the current standard-of-care for US waste fill design, construction, and operation, and with recommendations to improve the practice.

Please see the Insert at the end of this month's newsletter for further details.

Legislative News from The Massachusetts Transportation Committee

Sponsored by the Transportation & Development
Institute Boston Chapter

Tuesday, May 14, 2019

Massachusetts State House, Boston, MA

2:00 PM – 4:00 PM

State Representative William M. Straus,
Co-Chair of Transportation Committee

Please join the Transportation & Development Institute Boston Chapter and the Massachusetts Legislature's Joint Committee on Transportation at the State House with State Representative William Straus. A Co-Chair of the Joint

Transportation Committee, he will speak about the latest activities the committee is working on. This event provides an opportunity for BSCES members to hear about some of the latest transportation bills under consideration and to discuss key aspects of funding transportation and other infrastructure maintenance and improvements. Networking will follow afterwards at the Carrie Nation Pub for those interested.

Please see the Insert at the end of this month's newsletter for further details.

Tech Talk & Social

Sponsored by the Younger Member Group

Wednesday, May 15, 2019

HNTB, Boston, MA

5:30 Registration & Dinner

6:30 PM Presentations & Social

Jonathan Kapust PE, Project Manager, HNTB;
Justin Slack PE, State Tunnel Preservation
Engineer, MassDOT; Benjamin Revette,
Telecommunications Dept. Manager, Dewberry

Join us for a set of presentations from project managers working in the Greater Boston area about unique and interesting projects followed by a Q&A.

Please see the Insert at the end of this month's newsletter for further details.

Save the Date!

Tuesday, June 11, 2019

**2019 Joseph C. Lawler Lecture—
Expansion and Improvements to the
Conley Container Terminal**

An Engineering Management Group
Special Fund Event

Fairmount Copley Plaza, Boston, MA

Please see the Insert at the end of this newsletter
for more information.

Engineers and Land Surveyors Day at the State House + Water's Worth It Day

Sponsored by the Government Affairs &
Professional Practice Committee

Wednesday, May 22, 2019

Massachusetts State House, Boston, MA

9:00 AM – 11:45 AM, Engineers and Land
Surveyors Day

11:45 AM – 1:30 PM, Water's Worth It Day

On Tuesday, May 22, 2019, BSCES, ACEC/MA, and MALSCE members gather at the Massachusetts State House for the annual Engineers and Land Surveyors Day at the State House along with leaders from other engineering and design-related associations. Meetings are arranged with members' Massachusetts state representatives and state senators based on where members live and vote.

[Click here](#) for details.

2019 BSCES Spring Outreach Awards Banquet

Sponsored by the Public Awareness & Outreach
Committee

Thursday, May 30, 2019

The Chateau Restaurant, Waltham, MA

5:30 PM Social/Registration

6:30 PM Dinner; 7:15 PM Presentation

Robin A. Kemper, PE, LEED AP, FSEI, FASCE,
ASCE President

Join us as we celebrate the civil engineering profession and the dedication of professionals and young individuals who have strived for excellence this year. We will be honoring the student winners of the Ralph Salvucci Online Bridge Contest, the Model Bridge Competition, and the New England Regional Future City Competition. ASCE President Robin A. Kemper will deliver the dinner's keynote address.

Please see the Insert at the end of this month's
newsletter for further details.

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2018–2019 BSCES Program Sponsors

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Tufts University | VHB | Wentworth Institute of Technology B.S. and M. Eng. in Civil Engineering Programs | Weston & Sampson | WSP

Upcoming Events *(continued from page 12)*

Geo-Institute Social at Slumbrew

Sponsored by the Geo-Institute Boston Chapter

Friday, June 7, 2019

Somerville Brewing Company (Slumbrew),
Somerville, MA

6:00 to 9:00 PM

Come join the Geo-Institute of BSCES to end the 2018–2019 fiscal year at our social hosted at Slumbrew. Enjoy appetizers and refreshments in a reserved space with colleagues from the geotechnical industry. Registration to this event includes appetizers and a drink token. This event is open to anyone and everyone who is interested in learning about the Geo-Institute Boston Chapter, how to become more involved, or just wants to socialize with fellow geo-professionals.

Please see the Insert at the end of this month's newsletter for further details.

2019 Bertram Berger Seminar— Leadership in the Storm: Combating Climate Change in the Bay State

*A Transportation & Development Institute Boston
Chapter Special Fund Event*

Wednesday, June 12, 2019

University of Massachusetts Club, Boston, MA

8:00 AM Registration

9:00 AM Panel Discussions & Social

12:00 PM Luncheon & Keynote Address

*Stephanie Pollack, Secretary and Chief Executive
Officer, Massachusetts Department of Transportation*

An examination of the plans and policies in place to prepare Massachusetts for climate projections and geographical vulnerabilities, as well as resilient transportation projects that have shifted the narrative from planning to action. This seminar will feature a keynote by Stephanie Pollack, secretary and chief executive officer of

MassDOT along with two panels with leading professionals. The first, moderated by Luisa Paiewonsky, the director of the Center for Infrastructure Systems and Technology at US DOT/Volpe Center will discuss "Planning for Change through Plans, Policies & Design Standards." The second panel will focus on "Designing & Building Projects that are Resilient to Change" and will be moderated by the Commonwealth Massachusetts' Undersecretary of Climate Change Katie Theoharides.

Please see the Insert at the end of this month's newsletter for further details.

Classifieds

DO YOU WANT TO BECOME A LEADER IN ENGINEERING THE BEAUTY OF WATER?

Aqueous Consultants in Andover is seeking a **Design Team Leader / Project Manager** to help build and lead our growing water features, fountains, and irrigation engineering business. Aqueous is a progressive water resources engineering firm dedicated to the preservation and conservation of water for institutional, commercial, residential, and open space projects worldwide. We work for the most talented and creative architects in the world and use our love for engineering to make their aesthetic dreams and goals for a sustainable future a reality and have experienced significant growth since our establishment in 2014.

Short-term responsibilities will be to provide design, consulting, and drafting services in the specialized field of water engineering science. Long-term responsibilities will be to become a team leader, become an industry leader, and develop new business.

Qualifications:

- * Bachelor's Degree in Engineering, Landscape Architecture, Architecture
- * 6–10 Years Design Experience, preferably Civil Engineering
- * AutoCAD Expert
- * Professional Licensure or Ability to Attain
- * Team Player with Professional, Upbeat Attitude for Clients and Co-Workers
- * Team Building and Leadership Experience

To learn more, visit <http://aqueous.net/news> or email your cover letter and resume to info@aqueousconsultants.com



2 Dundee Park Drive, Suite 301B
Andover, MA 01810
978-470-1695

Classifieds (continued from page 13)



YOUR ROLE AND INFLUENCE

Milone & MacBroom, Inc. is currently seeking a mid-level Traffic/Signal Design Engineer to work in our Transportation Group located in our Cheshire, Connecticut headquarters. There will also be opportunities to work out of our downtown Springfield, MA office. With a full palette of diverse and challenging transportation projects, we are looking to strengthen our industry-leading workforce with creative and hardworking individuals who offer new perspectives and innovative ideas.

The **Traffic/Signal Design Engineer** will be responsible for traffic signal and communication designs, intersection/roadway designs, traffic studies, safety studies, and multi-use bicycle and pedestrian projects.

Successful candidates will work alongside a multi-disciplinary team of licensed professional engineers, architects, planners, and scientists and contribute to various transportation engineering and design projects.

YOUR SKILLS AND PROFICIENCIES

The Traffic/Signal Design Engineer should possess the following qualifications:

- Bachelor's Degree in Civil Engineering or related field
- Minimum five years of experience in the field of transportation engineering
- Professional Engineer (PE) Licensure (preferred) or ability to obtain licensure within a year
- Proficiency in Microstation, AutoCAD, Synchro, HCS, and other related software (preferred)
- Problem-solving skills and strong attention to detail with excellent analytical and judgment capabilities
- Demonstrated ability to understand and integrate information to advance projects from origination to implementation to completion
- Excellent written and communication skills

To learn more about this opportunity, please submit your cover letter and resume to www.miloneandmacbroom.com/careers

Milone & MacBroom, Inc. is an Affirmative Action/Equal Opportunity Employer M/F/D/V.



HORSLEY WITTEN GROUP

HW is seeking a **Project Engineer/Project Manager** for our Sandwich, MA office. Requires supervision of civil/site designers and direct site design in drainage, stormwater management, water supply, and/or wastewater management.

Successful candidate will provide oversight, assessment, design, modeling, and technical writing on a range of projects conducted for public and private sector clients on topics such as groundwater and surface water protection, wastewater management, stormwater management (including green infrastructure work), watershed management and wetlands regulatory issues.

Requires:

- Graduate civil engineer with a minimum of 8 to 12 years of experience;
- Professional Engineer registration in MA preferred but not mandatory;
- Technical expertise in AutoCAD, Civil 3D;
- Strong writing and oral communication skills;
- Experience with local and state permitting agencies,
- Professional Engineer registration in MA preferred but not mandatory

Email resumes and cover letter to hwinfo@horsleywitten.com

Horsley Witten Group, Inc. is an Equal Opportunity Employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, national origin, veteran status, or disability.



Entry Level Civil Engineer Wanted—Engineer-in-training (civil), wanted for growing site-design company based in Winchester. Ideal candidate is someone with accredited BS or MS degree in civil engineering and some intern experience. We work throughout New England and the world on a wide variety of important projects. Salary is commensurate with experience and qualifications. Waterfield Design Group is a fully integrated land development & design company.

Besides our extensive US portfolio, **join our team and contribute to the life changing work we do in emerging and developing nations**—make a difference in the world using your civil engineering skills and abilities.

Send inquiries to Craig at cmiller@wdgrp.com





TRANSPORTATION
& DEVELOPMENT
INSTITUTE
Boston Chapter

2019 Bertram Berger Young Engineer Award Nomination Form

The Transportation & Development Institute Boston Chapter is now accepting nominations for the **2019 Bertram Berger Young Engineer Award**. The annual Bertram Berger Young Engineer Award serves to recognize an outstanding younger member of the Boston Society of Civil Engineers for his or her professional achievements and service to the community.

The successful candidate should (1) be less than 35 years old on June 1, 2019, (2) have attained exemplary professional achievements as a young engineer, (3) demonstrate leadership in the practice of civil engineering with emphasis on transportation, (4) enhance the stature of civil engineers within the community, (5) be active with professional organizations such as BSCES or similar, and (6) be a registered, or soon-to-be registered, professional engineer.

In addition to recognition within the engineering community, the Award winner will receive a **\$2,500 stipend** to be used for continuing education and/or professional development. The award winner will be notified by the end of May 2019 and will be presented with the award at the upcoming annual BSCES Bertram Berger Seminar and Lunch on June 12, 2019.

To nominate an individual for the 2019 Bertram Berger Young Engineer Award, please fill out the attached form or provide up to a two (2) page narrative statement describing how the nominee meets the above described criteria. Nominations will be accepted until 5:00 p.m. on **Friday, May 10, 2019** and should be submitted via mail or e-mail to:

Bryan Zimolka, P.E., Nitsch Engineering, 2 Center Plaza, Suite 430, Boston, MA 02108
e-mail: bzimolka@nitscheng.com, phone: (857) 206-8706.



TRANSPORTATION
& DEVELOPMENT
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Boston Chapter

Nomination Form

Name: _____

Age of Nominee as of June 1, 2019: _____ Years of Full-Time Experience in Field: _____

Is the nominee a registered Professional Engineer? (circle one)

1. Yes, registered P.E.
2. Took exam and is waiting for results
3. Eligible for P.E. within a year
4. No, but has passed E.I.T.
5. No, and has not passed the E.I.T.

Please list all professional organizations and length of membership (in years):

Committees served on and length of time served (in years):

Please describe how the nominee has attained exemplary professional achievements as a young engineer:

Please describe how the nominee has demonstrated leadership in the practice of civil engineering (with emphasis on transportation):

Please describe how the nominee has enhanced the stature of civil engineers within the community:

BACKGROUND

Ernest A. Herzog was a nationally recognized civil engineer. During his career, he served a term as president of the Boston Society of Civil Engineers Section and was also a fellow of the American Society of Civil Engineers (1987).

Mr. Herzog began his career with Spencer, White and Prentiss at the atomic energy facility in Oak Ridge, Tennessee. After World War II, he transferred to a Boston-based firm named Chas. T. Main Inc. Eventually, Mr. Herzog joined the firm of Alonzo B. Reed Inc. where he progressed into the highest role of president and remained in that role for 20 years thereafter.

While in the transportation field, Mr. Herzog was actively involved in the design and construction of the monorail used at the 1962 Seattle World's Fair. This monorail, which is still in use today, has served as the prototype for several other monorail systems including those at Disney Land in Anaheim, California, Disney World in Orlando, Florida, and one in Tokyo, Japan. In fact, Mr. Herzog was a strong and persistent advocate of a monorail system to serve Boston's south shore communities to relieve the traffic congestion on the Southeast Expressway.

In 1973, Mr. Herzog co-founded Herzog-Hart, a full-service engineering firm that specializes in the design and construction of research and production facilities for the pharmaceutical and process industries.

Mr. Herzog was well known for his generous support of and encouragement to young college students and young professionals just at the onset of their careers. He lectured at Tufts University, Dartmouth College, University of Massachusetts, and Northeastern University. He also wrote and published numerous papers, particularly concerning the effects of transportation systems on society.

In memory of Mr. Herzog's commendable career achievements, the Ernest A. Herzog Award was established to promote an awareness of and to recognize innovative improvements to infrastructure. This award is given annually to the author(s) whose submitted paper is chosen to best recognize innovation and awareness of infrastructure.

PAPER GUIDELINES

Submitted papers shall present an infrastructure project, innovation, or idea in which the author was actively involved in as an owner, advocate, engineer, or end-user. The paper must be well written and address specific benefits to current professional practices, lifestyle, and/or sustainability through the application of existing or innovative technologies or methods. Areas of application may include design, construction, operation, maintenance, management or financing of infrastructure components or systems.

RULES

- A.** The paper should be original and not be less than 2,000 words and not more than 6,000 words. The paper should clearly describe the project, innovation, or idea and highlight benefits to the current engineering and construction practices. Graphic material including photographs should

be included to highlight specific areas of the project. The paper may have been previously published in a journal.

- B.** Three copies of the papers shall be submitted to:
BSCES/ASCE
The Engineering Center
One Walnut Street
Boston, Massachusetts 02108-3616
Attn: Boston Chapter TD&I
Herzog Award Committee

An electronic copy should also be sent to bsces@engineers.org.

Deadline for submittal: May 10, 2019.

REVIEWERS

The BSCES Herzog Award Competition Subcommittee.

EVALUATION CRITERIA

Topics for the papers shall be related to one or more of the 17 infrastructure systems defined in ASCE's infrastructure report card (see <http://www.infrastructurereportcard.org/>). Papers are evaluated by the reviewers on the basis of the following criteria:

- A.** Technical writing; organization, graphics, grammar, and technical accuracy (30%)
- B.** Benefits to the current design, construction, operation, maintenance, or financing practices of infrastructure (20%)
- C.** Innovation; uniqueness of concepts (10%),
- D.** Benefits to lifestyle of the general public or other end-users (20%)
- E.** Sustainability, life-cycle cost benefits, or cost effectiveness (20%)

AWARD

The recipient will receive a \$500 award, which will be presented at the BSCES Outreach Awards Dinner on May 30, 2019 in Waltham.

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Geotechnical Stability of Waste Fills – Lessons Learned and Continuing Challenges

Rudolph Bonaparte, Ph.D., P.E., D.GE, F.ASCE, NAE

Thursday, May 9, 2019

**Breed Memorial Hall, Tufts University
51 Winthrop St, Medford, MA 02155**

Social Hour: 5:30 PM to 6:30 PM

Dinner: 6:30 PM

Presentation: 7:45 PM

Presentation description:

The lecture will briefly review several historical U.S. waste fill stability failures and the lessons learned from them. Several failures from the current decade will be reviewed to show how geotechnical engineers are re-learning the earlier lessons, while at the same time there are new lessons to be learned related to evolving waste streams and waste operations practices. The lecture will conclude with an evaluation of the current standard-of-care for U.S. waste fill design, construction, and operation, and with recommendations to improve the practice.

Registration Deadline: Friday, May 2, 2019

\$90 Members, \$100 Non-Members

\$80 Public Sector Members, \$90 Public Sector Non-Members

\$25 Senior Members (65+), Students

Information/Registration:

Register to attend this meeting and pay by credit card online [here](#). To register online for an event at the BSCES member rate you must login using your BSCES assigned username and password. If you do not know your BSCES member login information call 617/227-5551. You can also register for this event by mail or email. To do so, download and complete a [BSCES Event Registration Form](#) and follow the submission instructions. Cancellations received after May 2, 2019 and no-shows will be billed.

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Legislative News from The Massachusetts Transportation Committee

State Representative William M. Straus,
Co-Chair of Transportation Committee

Tuesday, May 14, 2019

Massachusetts State House, Room 437, 24 Beacon Street, Boston, MA

2:00 PM Registration and Social

**2:30 PM – 4:00 PM Meet with Rep. William M. Straus, Co-Chair and Member of
Transportation Committee**

4:00 PM Meet at Carrie Nation Cocktail Club, 11 Beacon St, Boston, MA

About the Event:

Please join the Transportation & Development Institute Boston Chapter and the Massachusetts Legislature's Joint Committee on Transportation at the State House with State Representative William Straus. Co-Chair of the Joint Transportation Committee, he will speak about the latest activities the Committee is working on. Other members of the committee have also been invited. The event provides an opportunity for BSCES members to hear about some of the latest transportation bills under consideration and to discuss key aspects of funding transportation and other infrastructure maintenance and improvements. This informal event is scheduled for Tuesday, May 14th at the State House beginning at 2:00PM. Networking will follow afterwards at the Carrie Nation Pub for those interested.

Registration Deadline: Friday, May 10, 2019

Early registration is encouraged to guarantee a space at the event.

The event is FREE, but registration required.

Information/Registration:

Register to attend this meeting by emailing TDI@bsces.org. If you have any questions, please send us an email provided above.



Boston Society of Civil Engineers Section
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Tech Talk and Social

Wednesday May 15, 2019

5:30 PM Registration & Dinner; 6:30 PM Presentations & Social

Join us for a set of presentations from Project Managers working in the Greater Boston area about unique and interesting projects followed by a Q&A.

Presenters for the evening include:

Jonathan Kapust PE, Project Manager, HNTB: Casey Arborway Multimodal Roadway Bridge Replacement Project, Jamaica Plain Boston.

Justin Slack PE, State Tunnel Preservation Engineer, MassDOT: Long Term Strategies on Infrastructure Development and Maintenance in the Greater Boston Area.

Benjamin Revette, Telecommunications Dept. Manager, Dewberry: Impacts of Wireless Technology and EV on Infrastructure & Transportation Systems

Registration Information

Register and pay by credit card online at bit.ly/YMGTechTalk. To register online at the member rate you must login using your BSCES assigned username and password. If you do not know your login information, call 617/227-5551. To register by mail or email, complete an [Event Registration Form](#) and follow the submission instructions.

Where:

HNTB

31 St James Ave, #300
Boston, MA

Registration Fees:

\$15 Member

\$25 Non-Member

\$10 Public Sector
Member

\$15 Public Sector
Non-Member

\$10 Student Member

Registration

Deadline:

May 10, 2019

Online Registration:

<http://bit.ly/YMGTechTalk>

Registration fee includes dinner. Space is limited, register today!

For more
information, contact
YMG@BSCES.org

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2019 BSCES Spring Outreach Awards Banquet

Keynote Speaker:

ASCE President Robin A. Kemper, P.E., LEED AP, F.SEI, F.ASCE

Thursday, May 30, 2019

The Chateau, 195 School Street, Waltham MA

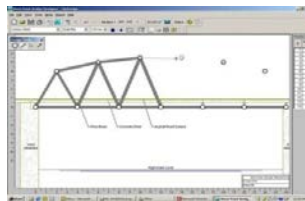
5:30 PM Social/Registration; 6:30 PM Dinner; 7:15 PM Presentation

Join us as we celebrate the civil engineering profession and the dedication of professionals and young individuals who have strived for excellence this year. We will be honoring the student winners of the Ralph Salvucci Online Bridge Contest, the Model Bridge Competition, and the New England Regional Future City Competition. This year's Herzog Award winner will be revealed at the dinner and there will be a presentation of the winning paper by the author. ASCE President Robin A. Kemper will deliver the dinner's keynote address.

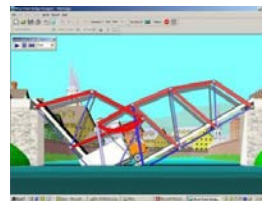
The Ralph Salvucci Online Bridge Competition provides middle school and high school students with a realistic, engaging introduction to engineering. The contest is open to all students in grades 6-12. Students use free software to design the cheapest bridge that can carry the truck. When you click on the truck button, your design comes to life and if it can't make it – CRASH!

2019 Ralph Salvucci Online Bridge Competition

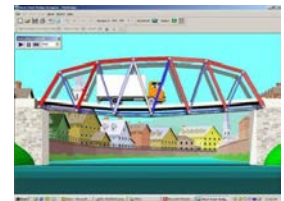
Create a bridge.



Test and improve.



Compete to win!



Registration Deadline: Thursday, May 23, 2019

\$35 BSCES Members, \$45 Non-Members

\$30 Public Sector Members, \$40 Public Sector Non-Members

\$350 Table of 10

Information/Registration:

Register to attend this meeting and pay by credit card online at bit.ly/2019OutreachAwards. To register online for an event at the BSCES member rate you must login using your BSCES assigned username and password. If you do not know your BSCES member login information call 617/227-5551. You can also register for this event by mail or email. To do so, download and complete a [BSCES Event Registration Form](#) and follow the submission instructions. Cancellations received after May 23, 2019 and no-shows will be billed.



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Geo-Institute Social at Slumbrew

Friday, June 7, 2019

15 Ward Street, Somerville, MA 02143

6:00 to 9:00 PM

Come join the Geo-Institute Boston Chapter to end the 2018-2019 fiscal year at our social hosted at Somerville Brewing Company (Slumbrew). Enjoy appetizers and refreshments in a reserved space with colleagues from the geotechnical industry. Registration to this event includes appetizers and a drink token.

This event is open to anyone and everyone who is interested in learning about the Geo-Institute, how to become more involved, or just want to socialize with fellow geo-professionals.

Registration Deadline: Friday, May 31, 2019

\$20 Members

\$25 Non-Members

\$15 Students and Public Sector

Information/Registration:

Register to attend this meeting and pay by credit card online [here](#). To register online for an event at the BSCES member rate you must login using your BSCES assigned username and password. If you do not know your BSCES member login information call 617/227-5551. You can also register for this event by mail or email. To do so, download and complete a [BSCES Event Registration Form](#) and follow the submission instructions. Cancellations received after May 31, 2019 and no-shows will be billed.



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2019 Joseph C. Lawler Lecture: New Berth 10 at Conley Container Terminal

**Massachusetts Port Authority – Department of Capital Programs
and Environmental Affairs CP&EA**

Nhuy Hoang, P.E., Program Manager, Maritime

Chet Myers, P.E., CCM, Senior Waterfront Project Manager

Tuesday, June 11, 2019

**The Fairmont Copley Plaza, Venetian Room,
138 Saint James Avenue, Boston, MA 02116**

6:00 PM Social/Registration; 6:45 PM Meal; Presentation to Follow

The Massachusetts Port Authority's (Massport) Department of Capital Programs and Environmental Affairs (CP&EA) programs and implements Massport's infrastructure and capital improvements. Among their wide-ranging responsibilities, CP&EA provides project and contract management, and technical expertise in engineering and architectural design and construction.

Ms. Hoang and Mr. Myers's presentation will provide an overview of the Authority's Conley Terminal Modernization Program, and an in-depth look at the new Berth 10 construction project at Conley Container Terminal, a \$215 million project designed to modernize the Port of Boston's container handling facilities to meet the needs of 21st century and beyond. The project involves siting a new 1,275 foot long pile-supported berth, procuring three new low-profile Ship-to-Shore cranes, underwater rock blasting, and dredging a new berth for Post-Panamax sized container vessels.

Registration Deadline: Tuesday, June 4, 2019

Registration Fees: \$110 Members, \$140 Non-Members

\$95 Public Sector Members, \$110 Public Sector Non-Members

\$40 Senior Members (65+), Students

\$1,100 Table of 10

Information/Registration:

Register to attend this meeting and pay by credit card online [here](#). To register online for an event at the BSCES member rate you must login using your BSCES assigned username and password. If you do not know your BSCES member login information call 617/227-5551. You can also register for this event by mail or email. To do so, download and complete a [BSCES Event Registration Form](#) and follow the submission instructions. Cancellations received after June 4, 2019 and no-shows will be billed.



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2019 Bertram Berger Seminar

Leadership in the Storm

Combating Climate Change in the Bay State

Keynote Speaker:

Stephanie Pollack

*Secretary and Chief Executive Officer, Massachusetts Department of
Transportation*

Wednesday, June 12, 2019

University of Massachusetts Club, 32nd Floor, 1 Beacon St, Boston, MA 02108

8:30am Registration; 9:00am Panel Discussions & Social

12:00pm Luncheon, Bertram Berger Tribute, Keynote Address, and Awards

Panel 1: Planning for Change through Plans, Policies & Design Standards (9:00 AM – 10:15 AM)

Moderator: Luisa Paiewonsky, Director, Center for Infrastructure Systems and Technology, U.S. DOT/Volpe Center

Panel: Jill Valdes Horwood – Director of Waterfront Policy, Boston Harbor Now
Richard A. Dimino – President & CEO, A Better City
Katie Choe – Chief Engineer/Director of Construction Management at City of Boston Public Works

Panel 2: Designing & Building Projects that are Resilient to Change (10:45 AM – 12:00 PM)

Moderator: Katie Theoharides, Undersecretary of Climate Change, Commonwealth of Mass

Panel: Jeffrey Parenti – Deputy Chief Engineer, Department of Conservation & Recreation (DCR)
Erik Stoothoff – Chief Engineer, Massachusetts Bay Transportation Authority (MBTA)
Peter Debruin – Climate Mitigation & Resiliency Manager, Massachusetts Port Authority
Steve Miller – Supervisor, Massachusetts Department of Transportation – *Invited*

Registration Deadline: Monday, June 3, 2019

\$110 Member, \$140 Non-Member

\$95 Public Sector Members, \$110 Public Sector Non-Members

\$85 Senior Members (65+), \$40 Students

\$550 Table of 5, \$1,100 Table of 10

\$475 Public Sector Table of 5, \$950 Public Sector Table of 10

Information/Registration:

Register to attend this meeting and pay by credit card [online here](#). To register online for an event at the BSCES member rate you must login using your BSCES assigned username and password. If you do not know your BSCES member login information call 617/227-5551. You can also register for this event by mail or email. To do so, download and complete a [BSCES Event Registration Form](#) and follow the submission instructions. Cancellations received after Monday, June 3, 2019 and no-shows will be billed.



This presentation provides (Insert number of PDHs) Professional Development Hours (PDH)

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BSCES Program Committee
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Inaugural BSCES and massFM Joint Training Workshop

Featuring presentations by Eric Carlson and Joy Duperault from the Department of Conservation and Recreation (DCR) Flood Hazard Management Program.

Tuesday, June 4, 2019

Aldrich Center at TEC, One Walnut Street, Boston, MA 02108

8:30 AM Welcome, Check-in, Breakfast, Introductions (BSCES/massFM)

9:00 AM Eric Carlson, "Elevation Certificates"

11:00 AM Break

11:15 AM Joy Duperault, "NFIP Beyond the Building Code"

Elevation Certificates

Eric Carlson

Engineer, DCR Flood Hazard Management Program

A thorough review of the current FEMA Elevation Certificate—how to complete the form, common mistakes, tips for best practices, how the form is used by owners, insurance agents, communities.

NFIP Beyond the Building Code

Joy Duperault, CFM

State NFIP Coordinator, DCR Flood Hazard Management Program

Participating NFIP communities agree to manage all development in their floodplains. This session covers floodplain development in its comprehensive federal definition: "any man-made change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations or storage of equipment or materials."

Registration Deadline: Friday, May 31, 2019

Registration Fees: \$50 BSCES Members and massFM Members, \$75 Non-Members

Information/Registration:

Register to attend this meeting and pay by credit card online at <http://bit.ly/2GSd4Ts>. To register online for an event at the BSCES member rate you must login using your BSCES assigned username and password. If you do not know your BSCES member login information call 617/227-5551. You can also register for this event by mail or email. To do so, download and complete a [BSCES Event Registration Form](#) and follow the submission instructions. Cancellations received after May 31, 2019 and no-shows will be billed.



This presentation provides 3 Continuing Education Credits (CECs) and 3 Professional Development Hours (PDHs)

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