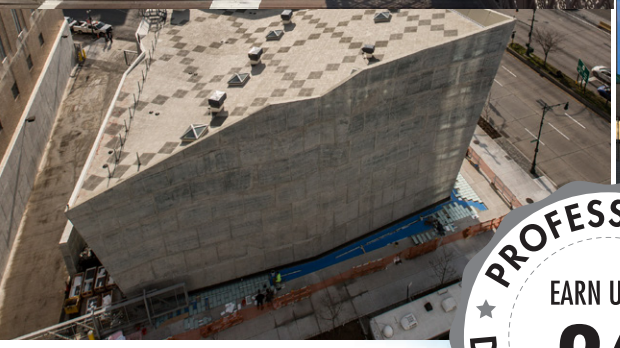
FINAL PROGRAM

ASCE | INTERNATIONAL CONFERENCE ON SUSTAINABLE INFRASTRUCTURE 2017

New York City | October 26-28, 2017

Sustainable Cities for an Uncertain World



PROFESSIONAL DEVELOPMENT HOURS
EARN UP TO
26

New York Marriott at the Brooklyn Bridge

www.icsiconference.org

Schedule-at-a-Glance

(Subject to Change)

Wednesday, October 25

9:00 a.m. – 5:00 p.m.	Act Locally: Workshop for Sustainability Leaders' from ASCE Sections, Branches, and Institutes
9:00 a.m. – 5:00 p.m.	ISI Envision Training Workshop in collaboration with ASCE Committee on Sustainability and NSF SRNs

Thursday, October 26

7:00 a.m. – 6:00 p.m.	Registration *(Closed from 1:00 p.m. - 2:00 p.m.)*
7:30 a.m. – 9:00 a.m.	Continental Breakfast
8:00 a.m. – 1:00 p.m.	Plenary Sessions **Sponsored by** Bentley Advancing Infrastructure
10:00 a.m. – 5:00 p.m.	Poster Displays
2:30 p.m. – 5:45 p.m.	Concurrent Technical Sessions
6:00 p.m. – 7:30 p.m.	Welcome Reception **Sponsored by** Zofnass Program for Sustainable Infrastructure, Harvard University

Friday, October 27

8:30 a.m. – 5:00 p.m.	Registration *(Closed from 1:00 p.m. - 2:00 p.m.)*
9:15 a.m. – 5:30 p.m.	Concurrent Technical Sessions
10:45 a.m. – 11:15 a.m.	Networking Break
10:00 a.m. – 4:30 p.m.	Poster Displays

Saturday, October 28

8:30 a.m. – 12:30 p.m.	Registration *(Closed from 1:00 p.m. - 2:00 p.m.)*
9:15 a.m. – 12:30 p.m.	Concurrent Technical Sessions
12:45 p.m. – 2:15 p.m.	Closing Plenary Luncheon
2:30 p.m. – 6:00 p.m.	Technical Tours

Conference Organizing Committee

Chair: **Feniosky Peña-Mora, Sc.D., FCIOB, NAC, M.ASCE,** Columbia University

Technical Chair: **Lucio Soibelman, Ph.D., F.ASCE,** University of Southern California

Sponsorship Chair: **Paul Zofnass,** President, EFCG

Local Organizing Committee Chair: **Tim Ward, P.E., M.ASCE,** Langan

Conference Steering Committee

Chair: **Feniosky Peña-Mora, Sc.D., FCIOB, NAC, M.ASCE,** *Columbia University*

Rick Bell, FAIA, *Executive Director, Design and Construction Excellence, New York City Department of Design and Construction*
Lucio Soibelman, Ph.D., F.ASCE, *ICSI 2017 Technical Program Chair, University of Southern California*
John Crittenden, P.E., M.ASCE, *Georgia Institute of Technology*
Bill Wallace, ENV SP, F.ASCE, *Wallace Futures Group, LLC*
Doug J. Sereno, P.E., ENV SP, M.ASCE, *Former Port of Long Beach*
Michel Khouday, Eng., M.Ing., PMP, Adm.A., M.B.A., *Chief Roadway Network, Montreal, Norda Stelo – Canada, Canadian Society of Civil Engineering*
Katherine Sierra, *Former Vice President Sustainable Development, The World Bank*
Elizabeth Ruedas, EIT, CSI, ENV SP, LEED GA, A.M.ASCE, *ASCE Committee on Younger Members*

Technical Committee

Chair: **Lucio Soibelman, Ph.D., F.ASCE.,** *University of Southern California*

Samuel T. Ariaratnam, Ph.D., P.E., P.Eng., F.ASCE, *Arizona State University*
David B. Ashley, Ph.D., Dist. M.ASCE, *University of Southern California*
Glen T. Daigger, Ph.D., *University of Michigan, former CH2M Hill Chief Technology Officer*
Cliff I. Davidson, Ph.D., M.ASCE, *Syracuse University*
Reginald DesRoches, Ph.D., M.ASCE, *Georgia Tech*
Christine Flaherty, CCM, *Assoc. Comm., NYC Dept. of Design and Construction*
Jack Fritz, Ph.D., P.E., NAE, M.ASCE, *Former World Bank, USAID*
Theresa Harrison, P.E., M.ASCE, ENV SP, *City of South Bend, Indiana*
Dan Hoornweg, P.E., M.ASCE, *University of Ontario Inst. of Tech, formerly with The World Bank*
Arpad Horvath, Ph.D., M.ASCE, *UC Berkeley*
Beatrice E. Hunt, P.E., *Principal Hydraulic Engineer, AECOM*
Chris Hendrickson, Ph.D., NAE, M.ASCE, *Carnegie Mellon University*
Bill Kelly, Ph.D., P.E., F.ASCE, ENV
John Lazzara, P.E., ENV SP, *Vice President, HDR*
Angela Licata, *Deputy Commissioner, NYC Deparatment of Environmental Protection*
Rosa Rijos, P.E., *Assistant Commissioner, NYC Department of Transportation*
Gina Bocra, *Chief Sustainability Officer, NYC Department of Transportation*
Ray Palmares, *Deputy Director of Engineering at the NYC Department of Parks and Recreation*
Marie Jean-Louis, P.E., *Assistant Commissioner for Facilities Planning and Engineering at the NYC Department of Sanitation*
Josh DeFlorio, AICP, LEED AP, *Chief, Resilience and Sustainability at the Port Authority of New York and New Jersey*
Encer Shaffer, Chief, Design Branch, *U.S. Army Corps of Engineers*
Patrick Askew, *Executive Vice President of the Capital Division of the NYC Economic Development Corporation*
Mikhail Chester, PhD, M.ASCE, *Assistant Professor, Civil, Environmental, & Sustainable Engineering, Arizona State University*
Thewodros K. Geberemariam, Ph.D., P.E., D. WRE, PMP, QPSWPPP, QCIS, M.ASCE , *Senior Civil Engineer, New York City Department of Environmental Protection*

Sponsorship Committee

Chair: **Paul Zofnass,** *President EFCG*

Peter Binney, P.E., ENV SP, F.ASCE, *Vice President Sustainable Infrastructure, Merrick & Company*
Paul Boulos, Ph.D., Hon.D.WRE, Dist.D.NE, NAR, Dist.M.ASCE, *President, COO Innovyze, Inc.*
Terry F. Neimeyer, P.E., ENV SP, BCEE, F.ASCE, *CEO & Chairman of the Board KCI Technologies, Inc.*

Local Organizing Committee

Chair: **Tim Ward, P.E., M.ASCE,** *Associate, Director, Langan*

Joseph Good, P.E., M.ASCE, *Project Manager, Langan*
Armen K. Boyajian, P.E., F.ASCE
Arthur, J. Alzamora, Jr., P.E., *Vice President, Langan*
Sam Singer, P.E., *Project Manager, Langan*
Anahid Andonian, P.E., *HDR*
Rob Ervolina, P.E., *GEB Engineers*
Beatrice E. Hunt, P.E., *Principal Hydraulic Engineer, AECOM*
Brendan Smith, *WSP/PB*

Conference Advisory Committee

Chair: **Richard T. Anderson, FAICP, FCIOB, NAC, HonAIANY,** *President Emeritus, New York Building Congress*

Stephen T. Ayres, CCM, *Chair-Elect, CMAA*
Rick Chandler, P.E., *Commissioner, NYC Department of Buildings*
Kathryn Garcia, *Commissioner, NYC Department of Sanitation*
Lorraine Grillo, *President/CEO, NYC School Construction Authority*
LTG (Ret.) Henry J. Hatch, P.E., *Dawson Assoc., former Commander, U.S. Army Corps of Engineers*
Michael Horodniceanu, Ph.D., *President, MTA Capital Construction*
Bryan N. Jones, P.E., D.P.E., D.CE, MP.E., ENV-SP, *HDR, Northeast Ports & Maritime Lead*
Vilas S. Mujumdar, D.P.A., P.E., F.SEI, Dist.M.ASCE, *ASCE At-Large Director*
Benjamin Prosky, *Executive Director, American Institute of Architects New York*
Vincent Sapienza, P.E., *Acting Comm., NYC Dept. of Environmental Protection*
Mitchell J. Silver, FAICP, *Commissioner, NYC Dept. of Parks and Recreation*
Ponisseril Somasundara, Ph.D., *Columbia University*
James Starace, P.E., *Chief Engineer, PANY&NJ*
Maria Torres-Springer, *President, NYC Economic Development Corporation*
Polly Trottenberg, *Commissioner, NYC Department of Transportation*

ASCE Staff

Michael Sanio, ENV SP, CAE, F.ASCE, *Director, Sustainability*
Jennifer Upmeyer, *Coordinator, Sustainability*
Meredith Johnson, *Manager, SEI Conferences*
Rachel Hobbs, *Administrator, Corporate Meetings*
Sean Scully, *Manager, Sponsorship and Exhibits Sales*

Welcome to the 2017 International Conference on Sustainable Infrastructure!

Dear Colleagues,

Welcome to New York City! The workshops, keynote lectures, panel discussions, and tours that we have planned for the International Conference on Sustainable Infrastructure 2017 will broaden our understanding of best practices in the field and research underway. I thank all of you for being here and for the work that you do. You are the engineers, architects, researchers, and other design and construction professionals who shape the built environment in an increasingly uncertain world. Over the next three days, you will hear public- and private-sector clients, practitioners, theorists, and policy-makers discuss how they are addressing the diverse and critical issues of sustainability. Keynotes and seminars will bring to the table the way we envision, design, and build the infrastructure needed to enable growth and prosperity. Experts from around the world will describe how they are driving change, delivering projects, and developing the knowledge that will reimagine the future.

Plenary speakers will focus on how what we do advances sustainability, resiliency, and equity in the built environment. Work sessions and seminars will hone in on advances in technology, methodology, education, policy, and finance to generate an open and engaged sharing of ideas. Case studies will highlight recent work in a variety of global cities. Cities learn from each other one project, one policy, one program at a time, and civil engineers function as catalysts and change agents.

International Conference on Sustainable Infrastructure – Sustainable Cities for an Uncertain World – addresses what we know about an uncertain future, and probes the edges of what we do not know. Uncertainty prods engineers to go deeper, seek higher, and initiate research collaborations to assure that best efforts can be brought together to combat the impact of climate change and energy unpredictability.

The conference will draft roadmaps that address the United Nations Sustainability Goals of developing sustainable cities and building resilient infrastructure while supporting the ASCE Grand Challenge of working together toward the shared goal of "reducing life-cycle costs by 50 percent by 2025 and fostering the delivery of infrastructure for society."

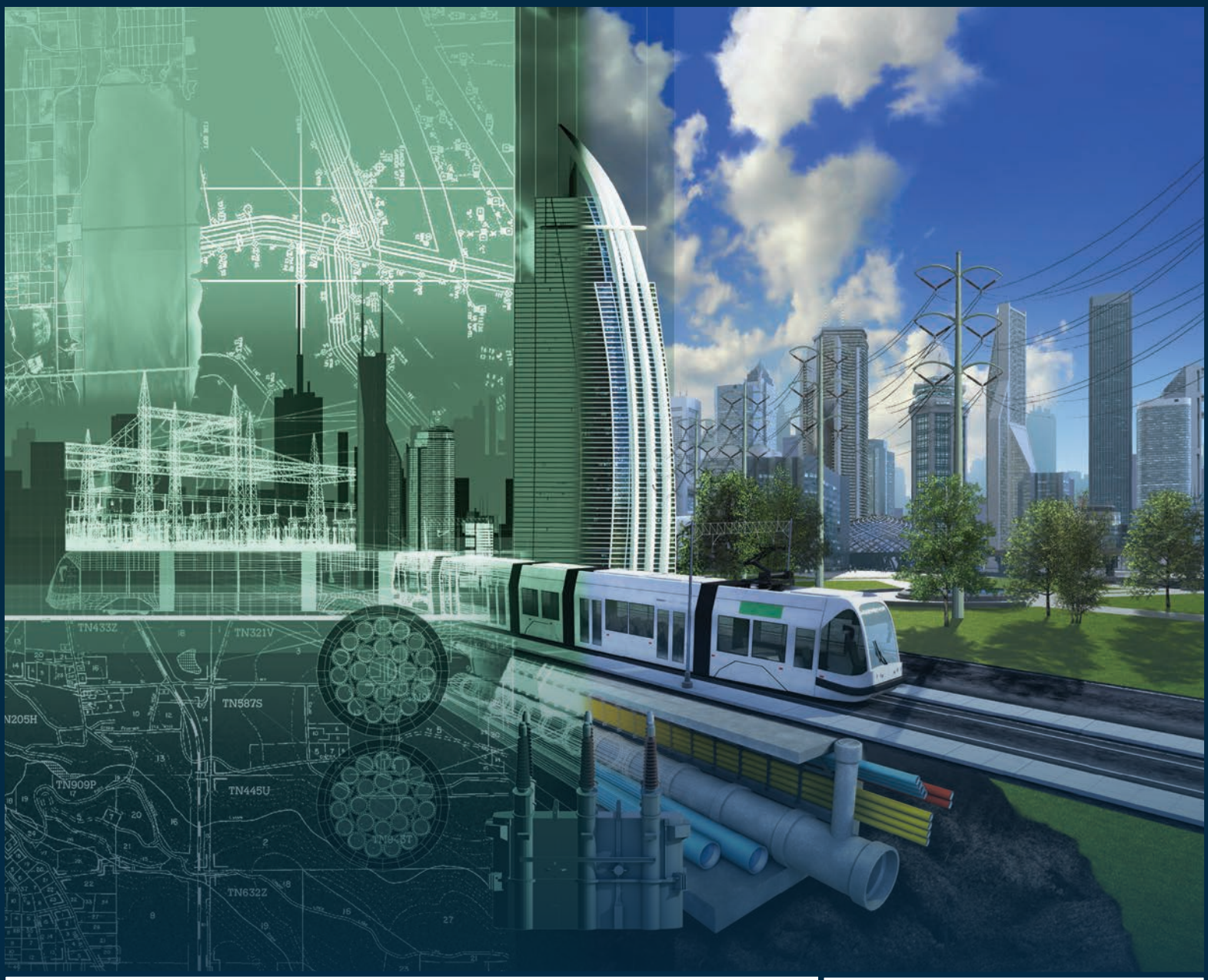
The American Society of Civil Engineers was founded in New York City in 1852. The ASCE headquarters remained in the "city that doesn't sleep" for 144 years. As proud immigrants to New York, we hope that you will take some time to see first hand what makes this city special. Participate in the nine wonderful tours organized by our ASCE Metropolitan Chapter. From ASCE landmarks such as the Brooklyn Bridge and the Croton Water Supply System, to the structures and monuments that define New York's distinctive skyline, take time to avail yourself of all that New York has to offer.

On behalf of the team of conference organizers, sponsors, authors, and presenters, we welcome you and encourage you to learn, challenge, share, and together, build the future.

Feniosky Peña-Mora, Sc.D., NAC
Lucio Soibelman, Ph.D., F.ASCE

Table of Contents

Bentley is *Advancing* Infrastructure



Advancing infrastructure is now a world priority. We need high performance infrastructure that can meet the demands of a global population while preserving a vital and healthy environment for generations to come.

Bentley provides innovative innovative software and services for the enterprises and professionals who design, build and operate the world's infrastructure — advancing the global economy and environment, for improved quality of life.

Bentley®
Advancing Infrastructure

Find out more at: www.bentley.com

Conference Highlights

Wednesday, October 25

Envision™ Sustainable Infrastructure Credential Training Workshop: Using the Envision™ Rating System

(6.0 PDHs)

9:00 a.m. - 5:00 p.m., *Greenpoint and Williamsburg Rooms*

A full-day workshop that will prepare participants to take the Envision™ Sustainability Profession (ENV SP) credential exam. Learn how you can incorporate the principles of sustainability into your next civil engineering project. At the completion of this workshop, participants will be able to:

- Use the Envision™ rating tool to plan for long term resiliency and sustainability
- Explain the Envision™ rating and scoring system
- Use knowledge & skills gained from previous studies, experience, and this workshop to earn the ISI ENV-SP Credential

The workshop will be presented and led by ISI-approved trainer, Karen C. Kabbes, P.E., D.WRE, ENV SP, M.ASCE

Act Locally: Workshop for Sustainability Leaders' from ASCE Sections, Branches, and Institutes *in collaboration with National Sciences Foundation Sustainability Research Networks (SRNs)*

By Invitation Only

9:00 a.m. - 5:00 p.m., *Salon C*

This workshop will allow invited industry leaders to share methods and successes from their respective sections, branches and institutes; and to discuss ways to engage their membership and advocate for sustainability in civil engineering design and infrastructure planning. During the workshop, six selected leaders will present and discuss best practices from their local section, branch, or institute sustainability committee activities.

NSF is sponsoring three urban focused SRNs: Urban Resilience to Extremes (UREx), Urban Water Innovation Network (UWN), and Sustainable Healthy Cities. These networks are advancing urban sustainability science across a number of critical challenge areas (including climate change, extreme events, water, and health) and each has a heavy focus on infrastructure. Each SRN brings together academics and practitioners across a number of cities to develop new knowledge and insight to tackle the critical challenges. The objective of the SRNs is to establish long-lasting networks of researchers and practitioners, in addition to developing new science for cities. The SRNs are interdisciplinary groups and civil and environmental engineers are key players in each.

This workshop will provide an overview of the SRNs and have an open dialogue about how the SRNs can support ASCEs strategic sustainability objectives. Of particular interest is identifying how the SRNs (each with an extensive practitioner base across many US cities) can be positioned to help ASCE support local action.

Thursday, October 26

Continental Breakfast

7:30 a.m. – 9:00 a.m., *Promenade*

Sponsored by Bentley Advancing Infrastructure

Opening Plenary Session

8:00 a.m. – 11:00 a.m.. *Salons D&E*

Welcome & Introduction, Kristina L. Swallow, P.E., ENV SP, F.ASCE, *ASCE President*

Welcome from the Conference Chair, Feniosky Pena-Mora, Sc.D., FCIOB, NAC, M.ASCE, *Columbia University, and* **Doug Sereno**, *Chair, Committee on Sustainability*

Jean-Louis Missika, *Deputy Mayor of Paris*

Jean-Louis Missika is the Deputy Mayor of Architecture, Planning, Economic Development and the Projects of Grand Paris for the City of Paris and formerly served as Deputy Mayor for Innovation and Research. Missika serves on the boards of the Research Foundation Pierre-Gilles de Genne, the Institut Curie, and l'École des Ingénieurs de la Ville de Paris. He is a permanent member of the Conseil scientifique de Paris.

Richard Anderson, *President Emeritus, NY Building Congress, Moderator*

Richard T. Anderson is President of the New York Building Congress, a public policy organization in its 95th year of promoting the design, construction, and real estate community. He is an advocate of strategic infrastructure investment and economic development and has dedicated his career to promoting the long-term growth of America's foremost urban centers, primarily New York City.

Gregory A. Kelly, P.E., *President and Chief Executive Officer of the USA and Latin America region of WSP, formerly WSP | Parsons Brinckerhoff*

Gregory A. Kelly, P.E., is President and Chief Executive Officer of the USA and Latin America region of WSP, formerly WSP | Parsons Brinckerhoff. "Sustainability and resiliency are ongoing challenges and key goals 6 Sustainable Cities for an Uncertain World for infrastructure owners nationwide, as they work to ensure the most efficient use of resources." Kelly directs the operations of the firm and oversees a workforce of 8,000 employees and nearly $2 billion in annual revenue for infrastructure owners nationwide.

Elise Wagner, *Partner, Land Use Department at Kramer Levin*

Elise Wagner is a partner in the Land Use Department at Kramer Levin, where she concentrates her practice in land use, zoning, environmental, and historic preservation law. She has substantial experience counseling for-profit and non-profit property owners on the planning and development of new buildings and the reuse of existing buildings. She has coordinated the public approval processes for major public-private development projects involving cooperation between private developers and agencies of New York City and state. She has negotiated numerous multi-party transactions for the transfer of development rights, and has performed due diligence on the purchase and financing of major properties.

Conference Highlights *(continued)*

Christopher O. Ward, *Executive Vice President Chief Executive, Metro New York*

Christopher Ward is Executive Vice President and Chief Executive, Metro New York, for AECOM (NYSE: ACM), a $17.4-billion, fully integrated infrastructure and support services firm with the ability to design, build, finance, and operate infrastructure assets globally.

Plenary Session 2

11:00 a.m. – 12:30 p.m., *Salons D&E*

Moderator:

Paul Zofnass, *President, EFCG*

"Never has there been greater need for building and renovating our infrastructure to strengthen our economy and wellbeing, while preserving a healthy, livable, and sustainable environment on earth for the next generation. That is the challenge of today, and the topic of this conference." Paul Zofnass is president of the Environmental Financial Consulting Group, Inc. (EFCG), the firm he founded in 1990 to provide financial and strategic advice to the environmental and infrastructure engineering/consulting industry, and which has served as an advisor to more than 200 engineering/consulting firms. An alumnus of Harvard College, Law School and Business School, he helped initiate Harvard's Environmental Studies Program in 1990 and in 2009 founded the Zofnass Program for Sustainable Infrastructure at Harvard, which is the co-founder, with the Institute for Sustainable Infrastructure (ISI), of the Envision™ sustainable infrastructure rating system.

Speakers:

Chris Barron, *Chief Communications Officer, Bentley Systems Inc.*

"Delivering and operating sustainable infrastructure is not only environmentally responsible, it is a sound business practice. To realize the full value of sustainable infrastructure, we must define sustainability broadly to include the notions of resilience and adaptability, and consider not just environmental sustainability, but economic and operational sustainability, as well." Chris Barron joined Bentley Systems as Vice President of Corporate Marketing in 2008 and was appointed to Chief Communications Officer in 2016. A registered architect, Barron left architectural practice in 1983 to pursue a career in the marketing of computer-aided-design software to the AEC industry. Barron holds a bachelor's degree in biology and geography from Middlebury College and a master's degree in architecture from Harvard University.

John D. Macomber, *Senior Lecturer of Business Administration, Harvard Business School*

John Macomber is a Senior Lecturer in the Finance unit at Harvard Business School. His professional background includes leadership of real estate, construction, and information technology businesses. At HBS, Macomber's work focuses on the private finance and delivery of public infrastructure projects in both the developed and emerging worlds.

Benjamin J. Harper, *Director - Product Underwriting – Environmental, Zurich Insurance*

Ben Harper is the Environmental leader in Zurich's Technical Underwriting division, and is based in Atlanta, GA. He is responsible for providing technical, policy, and underwriting guidance in support of Zurich's global environmental and pollution coverages. Prior to this, Harper was the product officer in Zurich's Climate Office, where he was responsible for developing new risk transfer products to address climate change and sustainability risk. Harper and his team have developed products to address concerns ranging from renewable energy sources and carbon emissions to geologic sequestration. Harper began his Zurich career in ZNA's Environmental business unit where he managed a group of engineers and geologists responsible for all aspects of environmental risk management in support of Zurich's environmental business. Harper has served on multiple stakeholder committees including the U.S. Department of Energy's National Risk Assessment Partnership (NRAP), the European Zero-Emissions Platform (ZEP), and the National Science Foundation (NSF) Hydraulic Fracturing Focus Group. Before joining Zurich, Harper worked in engineering consulting with a focus on large-scale environmental remediation projects, impairment assessments, remedial design, regulatory compliance and civil/environmental construction. Harper holds a Bachelor of Science in Civil Engineering and is a Certified Cost Engineer (CCE).

Cris B. Liban, D.Env., P.E., *LA Metro Executive Officer, Environmental Compliance and Sustainability Program Management*

"We are in the midst of an infrastructure renaissance in Los Angeles, LA Metro's half cent sales tax initiative will generate $120 billion in four decades. LA Metro is entrusted by Angelenos to deliver projects that are the least environmentally impactful and most socially equitable while ensuring economic growth especially in the most disadvantaged and vulnerable of our populations." Cris Liban, D.Env, P.E., D.Env., ENV SP, is the executive officer for Environmental Compliance and Sustainability Program Management for LA Metro, a commissioner on the Los Angeles Board of Transportation, and a member of the USEPA Council for Environmental Policy and Technology.

Feniosky Pena-Mora, Sc.D., FCIOB, NAC, M.ASCE, *Columbia University*

Joining in Mayor Bill de Blasio's vision for a healthy, sustainable city for all New Yorkers. As Commissioner of New York, Peña-Mora's led the creation and expansion of resilient infrastructure projects that will protect New York City against extreme weather emergencies. Under Peña-Mora, DDC has played a key role in the East Side Coastal Resiliency project, as well as expanded the city's Build-It-Back program, which helps residents who have been affected by the devastations of Hurricane Sandy.

Peña-Mora is the Edwin Howard Armstrong Professor of Civil Engineering and Engineering Mechanics, Professor of Earth and Environmental Engineering, and Professor of Computer Science at Columbia University. He was the Gilbert W. Winslow Career Development Associate Professor at the Massachusetts Institute of Technology, where he earned his Master of Science and Doctor of Science degrees in civil engineering in 1991 and 1994, respectively. Peña-Mora was born in the Dominican Republic and continues to be an internationally renowned key figure in engineering and construction.

Jennifer Molnar, *The Nature Conservancy*

Jennifer Molnar is lead scientist at The Nature Conservancy and managing director of TNC's new Center for Sustainability Science. Molnar has almost 20 years of experience using science to improve environmental decision-making. She is the science lead for The Nature Conservancy-Dow Chemical Company collaboration. She received a master's degree from Yale's School of Forestry and Environmental Studies, and has a B.S. in environmental engineering from Harvard, and previous private-sector experience in remediation.

Marty Janowicz, *Vice President, Sustainable Development, Stantec*

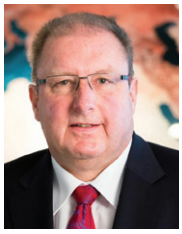
Marty Janowicz has been responsible for guiding Stantec's efforts to become an exemplary model of sustainability in all its operations and with focus on evolving trends, leading initiatives to develop an integrated sustainability consulting practice. He serves as a member of the Sustainable Infrastructure Advisory Board of the Zofnass Program at the Harvard Graduate School of Design and the Institute for Sustainable Infrastructure Envision Review Board. As a hands-on practitioner, he was senior advisor on the first two Canadian projects to achieve Envision verification and award and for more than 10 other and ongoing Envision-related designs, reviews, and verifications. Janowicz was selected to be a member of first Canada's Clean 50 – outstanding contributors to sustainable development and clean capitalism.

Giridhar Srinivasan, *Global Partnerships Team, International Finance Corporation*

Giridhar Srinivasan supports IFC's global infrastructure portfolio with over $14 billion in investment, he is responsible for raising and structuring capital for IFC's work in infrastructure, including debt platforms, equity platforms, guarantee facilities and project development funds. Srinivasan has degrees from the Wharton School and Swarthmore College.

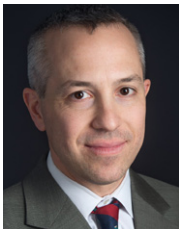
John W. Mogge Jr., PhD, RA, REM, *Senior Vice President, CH2M, Global Environmental Market Director*

John Mogge is a16-year veteran of CH2M. His doctoral work was driven by his belief that the governmental entities and industries of the built environment must transform and become orders of magnitude more resource efficient. His dissertation examined the economics of sustainable planning, design, and construction. He has specialized experience in large program delivery management, prototypical, and definitional project development as sustainable outcomes, including the successful delivery of multiple large scale military weapon system bed down programs for the U.S. Army and the U.S. Air Force, large program sustainability planning and start-up operations, including the London 2012 Olympics Sustainability Program Plan, and the MASDAR City (UAE) Sustainable Transportation Technical Integration Program Plan.



Hart Schaefer, *Vice President of Global Themes, World Bank*

Hartwig Schafer oversees the World Bank's engagement in the corporate priority areas of fragility, conflict and violence (FCV), gender, infrastructure/ PPPs/guarantees, climate change and knowledge management. Prior to this he was responsible for the World Bank's business policies, practices and procedures for lending products and knowledge services for client countries. He has also served as the World Bank's Director for Strategy and Operations in the Sustainable Development Network.



Daniel A. Zarrilli, *P.E., Senior Director of Climate Policy and Programs, Chief Resilience Officer, New York City Office of the Mayor*

Daniel Zarrilli oversees the New York City's integrated action on climate change mitigation and adaptation, as well as the coordination of the city's OneNYC program. Until recently, he served on NOAA's advisory committee for the Sustained National Climate Assessment and FEMA's National Advisory Council. Prior to this, he served as the first Director of the Mayor's Office of Recovery and Resiliency, following his work on the Special Initiative for Rebuilding and Resiliency after Hurricane Sandy. Previously, he was Senior Vice President for Asset Management at the New York City Economic Development Corporation and worked at Bechtel Infrastructure Corporation. Zarilli holds an M.S. in Civil and Environmental Engineering from MIT and a B.S. in Civil Engineering from Lehigh University.

Poster Displays

10:00 a.m. – 5:00 p.m., *Promenade*

Technical Sessions

2:30 p.m. – 5:45 p.m.

Welcome Reception

6:00 p.m. – 7:30 p.m., *Salons D&E*

Sponsored by ZOFNASS PROGRAM FOR SUSTAINABLE INFRASTRUCTURE Harvard University

Friday, October 27

Continental Breakfast

7:30 – 9:00 a.m.

Technical Sessions

9:15 a.m. – 5:30 p.m.

Poster Displays

10:00 a.m. – 4:30 p.m., *Promenade*

Networking Break

10:00 – 10:30 a.m., *Promenade*

Saturday, October 28

Continental Breakfast

7:30 – 9:00 a.m.

Technical Sessions

9:15 a.m. – 12:30 p.m.

Closing Plenary Luncheon

12:45 – 2:15 p.m., *Salons D&E*

Best Paper Award Presentation

Technical Tours

2:30 p.m. - 6:00 p.m.

Saturday, October 28

2:30 – 6:00 p.m.

Bayonne Bridge

The Bayonne Bridge Navigational Clearance Project allows taller vessels to pass under one of the world's longest steel arch bridges, designed by Othmar Ammann and designated an ASCE National Historic Civil Engineering Landmark. The "Raise the Roadway" effort widens vehicular lanes, adds a bikeway and walkway, and anticipates mass transit.

Times Square

Times Square is the "Crossroads of the World," greeting approximately 330,000 New Yorkers and visitors daily. With the closing of Broadway to vehicular traffic, a much larger public square was created. At the same time, aging utilities below-grade were radically updated and new event infrastructure provided for expanded public activities.

SIMS Recycling Facility

Completed in 2013, the Sunset Park Material Recovery Facility is a state-of-the-art 140,000 square foot processing center for metal, glass and plastic recyclables. These arrive by barge, eliminating 150,000 annual truck trips and diminishing vehicle emissions and street congestion. A viewing platform offers visitors a chance to see the recycling process.

Bayonne Bridge looking north as crane lifts a new section on March 10, 2016. Photo Credit: Jim Henderson via Wikipedia.

Rockefeller University New Lab Building

Since its founding in 1901, 24 Rockefeller University scientists have received the Nobel Prize. The 4-block campus extension over FDR Drive will provide the next generation with cutting-edge, flexible research facilities. The overbuild was assembled using 20 three-story 800,000 lbs. modules, lifted into place overnight via an East River barge.

Guiding Principles for Design and Construction Excellence

Performance-based standards for sustainable infrastructure are being developed by public works agencies in cities around the world. In New York City, the Department of Design and Construction has recently published non-prescriptive guidelines that address the principles of sustainability, in addition to equity. This session will highlight the need for standards, and the potential role ASCE could play in advancing sustainability principles through the standards process.

Innovate for 2025 and Beyond - Do the Right Project

The future of our world is limited only by our imagination. Sustainable, resilient infrastructure that fosters healthy living is emerging but will it have the resources and stewardship required across its lifetime and will it perform to meet anticipated needs in the decades ahead? Innovation is a key element in the development of transformational infrastructure solutions for the future urban community. This session will explore key elements of innovation, why innovation is important and how to become more innovative.

Envision 101: The What, How, and Why

Infrastructure owners and designers will describe the Envision tools and provide specific examples of how Envision can be used to change the way we develop infrastructure to create high performance projects. They will share the benefits of using Envision on individual projects and the vision for making communities more sustainable from the infrastructure up. Speakers will provide introductory-level presentations on Envision concepts, mechanics, and applications.

Climate Change – Understanding Infrastructure Vulnerability

This session will focus on infrastructure adaption options to heat and flooding hazards, examining both hard and soft options for protecting infrastructure against extreme events. Participants will learn of the strategies available for protecting components of infrastructure and larger systems against extreme events and long term gradual changes.

How US Cities are Approaching the UNSDG's

Cities are an important part of the path to sustainable development as laid out in the UN Sustainable Development Goals. Two of the seventeen goals deal directly with cities and another five with related infrastructure issues. Baltimore is one of three cities in the United States working with the Sustainable Development Solutions Network Sustainable Cities Initiative to implement the UNSDGs at the city level and a number of U.S. cities. This session will share Baltimore's experience with sustainable planning and the sustainable development goals, as well as examine the New York City and Los Angeles County approaches to sustainable infrastructure.

Resilient By Design: Agency Approaches to Climate Resilient Infrastructure

Major New York-area infrastructure agencies will present guidelines, standards, and practices for designing and delivering climate resilient infrastructure projects, with particular emphasis on balancing cost-effectiveness and risk aversion in the face of uncertain future climate outcomes. Attendees will gain an understanding of how major infrastructure agencies design for an uncertain climate future while adhering to today's codes and standards, invest in climate resilience while managing constrained capital programs, and achieve buy-in from internal stakeholders and external constituencies.

One City Built to Last: Transforming New York City's Buildings For A Low-Carbon Future

This session explores the role of building-based greenhouse gas (ghg) emission reduction strategies in helping cities achieve their goals for reducing carbon emissions. The presenter will share the methodology and results of a technical study conducted on behalf of the New York City Mayor's Office of Sustainability in order to help the city meet their goal of cutting GHG emissions by 80% from 2005 levels by 2050 (80x50). Topics covered will include analysis of current energy consumption using building-level benchmark data, energy code standards for new construction and major alterations, system-specific opportunities for existing buildings that will be necessary to transform the city's building stock to achieve deep carbon reductions, policy considerations for implementation of strategies.

Financing Sustainable Infrastructure

Which lessons can be captured from global experience and applied to a local level in the U.S.? This session will explore how procurement can be approached to incentivize financing for sustainable infrastructure.

Business Case for Sustainable Infrastructure

This panel session will discuss the business case of sustainable infrastructure: Does it exist? If not, what is the impact? Through discussion and case examples, attendees will learn how sustainability is viewed as an essential element by public and private entities, the basic steps for establishing the business case for sustainability, and how to get the most out of existing and new assets. Panelists will also discuss how climate resilience adds value to your assets.

Sustainable Infrastructure – Leapfrogging from Unreliable to 'Smart' in the Global South

The Global South will see massive migrations to its urban areas in the coming decades. Effective essential urban infrastructure services must be planned, designed, and financed sustainably. Of particular interest are the causes and solutions to massive adaptation of populations to failed, unreliable infrastructure and how sustainable, reliable, and livable levels of service can be achieved for existing, as well as new, infrastructure. How can we ensure that projects whose goal is a 'smart' and sustainable city do not miss persistent and insidious hurdles to success?

Building Capacity for Civil Engineering Leadership in Sustainability - We Need You

Session 1: Higher Education
Session 2: Engineering Practice

How do we incorporate broad, detailed and meaningful knowledge on sustainable infrastructure and design into already crowded curricula and continuing education programs? Can we do this efficiently and economically without sacrificing on other important topics? These sessions will explore these questions from the perspectives of higher education and the professional community. Please join us as we gather input to shape a successful vision to guide the future of sustainability education.

Flash Talks: Engaging Young Professionals as Leaders

Three emerging leaders, aged 35 or under, will share their vision of a sustainable future in a series of flash talks on the state of the profession. Examining wide-ranging views on leadership and professionalism, technology and innovation, these dynamic presentations will inspire and engage the audience while demonstrating the significant impact that young engineers are already making towards a sustainable future.

Thursday, October 26

Salon	2:30 – 4:00 p.m.	4:15– 5:45 p.m.
I	Papers only session	Case Study: Los Angeles EnvisionTM – Sustainable Public Works in Los Angeles: The Benefits of Taking EnvisionTM Beyond the
H	Panel 1: Building Capacity for Civil Engineering Leadership in Sustainability: We Need You! – Higher Education	Panel 2 - Building Capacity for Civil Engineering Leadership in Sustainability: We Need You! – Engineering Practice
G&F	Guiding Principles for Design and Construction Excellence	Innovate for 2025 and Beyond – Do The Right Project
A	Harvey and Irma: Catastrophic Storms in Houston, Florida and the Caribbean – Building Back Better – Sustainably!	Papers only session
B	Papers only session	Papers only session

Tracks

Methodology	Finance
Technology	Policy
Education	Case Study
ASCE Vision 2025	

Friday, October 27

Salon	9:15 – 10:45 a.m.	11:00 a.m. – 12:30 p.m.	2:30 – 3:45 p.m.	4:00 – 5:30 p.m.
I	Papers only session	Case Study: Baltimore How U.S. Cities are Approaching the UNSDG's	Case Study: PA, NY, NJ Papers only session	Bridge to Vision 2025: Engineering Sustainable Solutions
H	The Future of Green and Gray Infrastructure: Why You Need To Know About It!	Papers only session	Business Case for Sustainable Infrastructure	Case Study: PA, NY, NJ Papers only session
G&F	Papers only session	Envision™: The What, How, and Why - Envision™ 101/ Commitments to Envision™	Sustainable Infrastructure in New York City: The Benefits of Multiple Agencies Collaborating on Envision™	Papers only session
A	Papers only session	Papers only session	Papers only session	Papers only session
B	Papers only session	Papers only session	Papers only session	Papers only session

Saturday, October 28

Salon	9:15 – 10:45 a.m.	11:00 a.m. – 12:30 p.m.
I	Case Study: NYC Beneficial Use of Organic Wastes: DSNY Programs for Composting and Anaerobic Digestion of Food Scraps, Yard Trimmings, and Related Organics	Public Private Partnerships for Sustainable Infrastructure – Canadian Experience
H	Case Study: Global South Leapfrogging from Unreliable to "Smart" in the Global South	Case Study: South America UN SDGs in South America
A	Climate Change – Understanding Infrastructure Vulnerability	Climate Change – Infrastructure Adaption
B	Papers only session	Papers only session
G&F	Papers only session	Younger Members Shaping the Future of the Profession

Top 6 ASCE Sustainability Publications

SUSTAINABILITY PUBLICATIONS

For a complete list of ASCE Publications, visit **www.asce.org/Bookstore**

Engineering for Sustainable Communities: Principles and Practices

Edited by William Kelly, Barbara Luke, and Richard Wright
This book provides a comprehensive resource for sustainable engineering methods throughout the life cycle of infrastructure projects and systems.
2017 | 466 pp.| List $120 | ASCE Member $90
Soft Cover: ISBN 9780784414811 | Stock # 41481
E-book PDF: ISBN 9780784480755 | Stock # 48075

Engineering for Sustainable Human Development: A Guide to Successful Small-Scale Community Projects

By Bernard Amadei
Amadei offers a framework and guidelines for the delivery of small-scale development projects that combine concepts and tools traditionally used by development agencies with techniques from engineering project management and systems thinking.
2014 | 522 pp.| List $80 | ASCE Member $60
Soft Cover: ISBN 9780784413531 | Stock # 41353
E-book PDF: ISBN 9780784478400 | Stock # 47840

Field Guide to Environmental Engineering for Development Workers Water, Sanitation, and Indoor Air

By James Mihelcic, Lauren Fry, Elizabeth Myre, Linda Phillips, and Brian Barkdoll
In this complete handbook for international engineering service projects, James Mihelcic and his coauthors provide the tools necessary to implement the right technology in developing regions around the world.
2009 | 564 pp.| List $60 | ASCE Member $45
Soft Cover: ISBN 9780784409855 | Stock # 40985
E-book PDF: ISBN 9780784472408 | Stock # 47240

Green Technologies for Sustainable Water Management

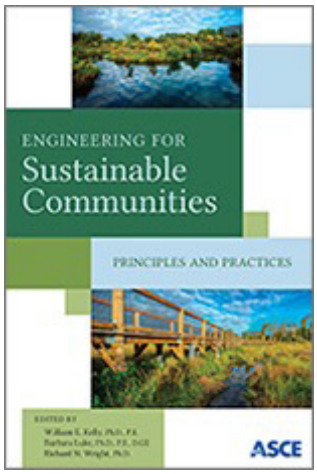
Edited by Huu Hao Ngo, Wenshan Guo, Rao Surampalli, and Tian Zhang
Green Technologies for Sustainable Water Management describes science-based principles and technological advances behind green technologies that can be effective solutions to pressing environmental problems.
2016 | 894 pp.| List $225 | ASCE Member $168.75
Soft Cover: ISBN 9780784414422 | Stock # 41442
E-book PDF: ISBN 9780784479780 | Stock # 47978

ICSI 2014: Creating Infrastructure for a Sustainable World

Edited by John Crittenden, Chris Hendrickson, and Bill Wallace
This collection contains 104 peer-reviewed papers presented at the 2014 International Conference on Sustainable Infrastructure, held in Long Beach, California, November 6-8, 2014.
2014 | 1121 pp. | List $210 | ASCE Member $157.50
E-book PDF: 9780784478745 | Stock # 47874

Sustainable Solid Waste Management

Edited by Jonathan Wong, Rao Surampalli, Tian Zhang, Rajeshwar Tyagi, and Ammaiyappan Selvam
Sustainable Solid Waste Management describes basic principles and recent advances for handling solid waste in an environmentally sustainable way.
2016 | 750 pp.| List $170 | ASCE Member $127.50
Soft Cover: ISBN 9780784414101 | Stock # 41410
E-book PDF: ISBN 9780784479308 | Stock # 47930



New Sustainability Title from ASCE

Engineering for Sustainable Communities

Principles and Practices

Edited by William E. Kelly, Ph.D., P.E.; Barbara Luke, Ph.D., P.E., D.GE; and Richard N. Wright, Ph.D., NAE

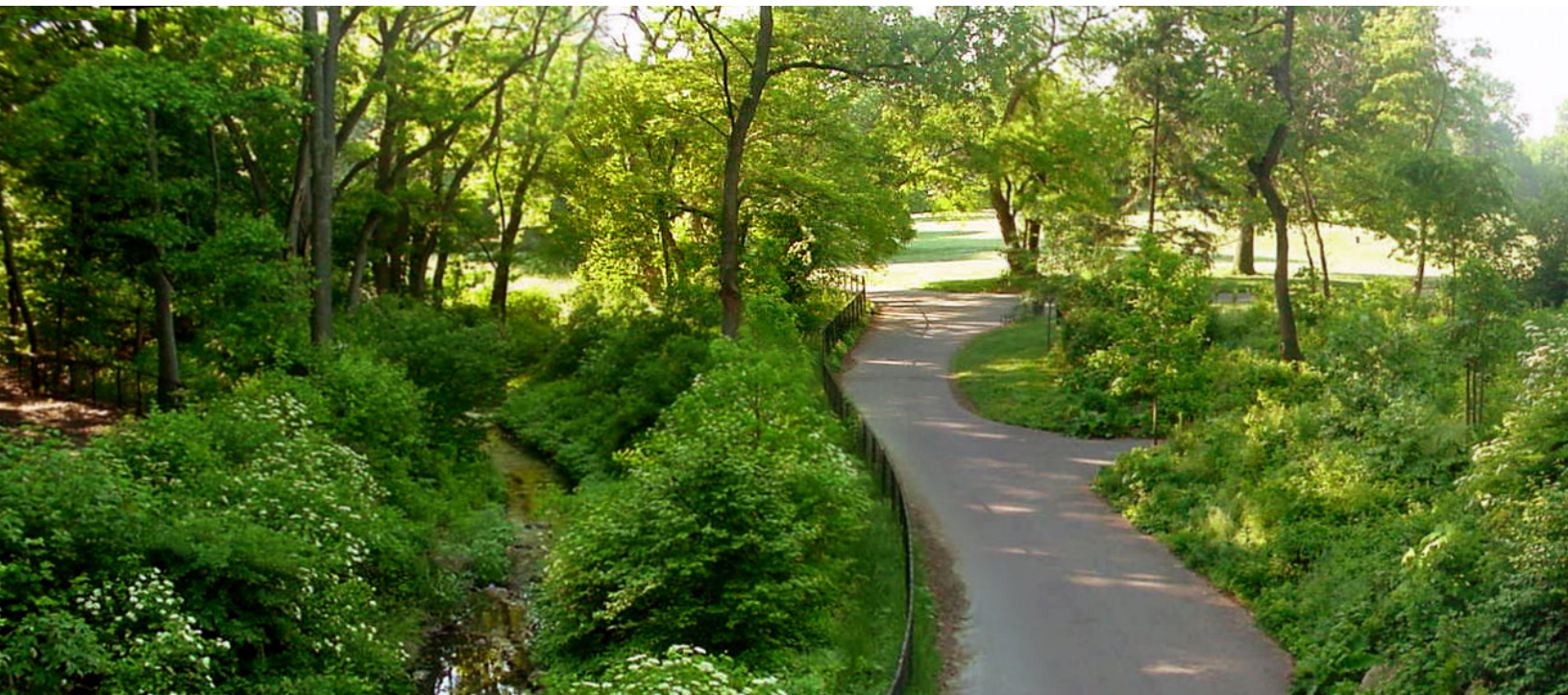
Engineering for Sustainable Communities: Principles and Practices is a comprehensive resource for sustainable engineering methods throughout the lifecycle of infrastructure projects and systems. The authors define sustainability and give historical background on the roles played by civil engineers, infrastructure systems, and pioneering projects in making communities sustainable and resilient. A collection of case studies focuses on sustainable engineering practices in real-world situations. These case studies cover buildings, transportation networks, water resources, urban development, and industrial facilities. This resource will be valuable to all practicing civil engineers, as well as engineering faculty and students interested in planning, design, construction, operation and maintenance of sustainable infrastructure projects and systems.

2017 | 466 pp. | List $120 | ASCE Member $90
Soft Cover: ISBN 9780784414811 | Stock # 41481
E-book PDF: ISBN 9780784480755 | Stock # 48075

MOBILE APP

Download the mobile app for everything you need in the palm of your hand.

Look for ASCE ICSI 2017 in your app store. Start personalizing your conference schedule, browse session information, see important last-minute changes, view speaker profiles, and contact other attendees. Stay in touch with ICSI 2017!



ADA Compliance

New York Marriott at the Brooklyn Bridge is barrier-free in compliance with the Americans with Disabilities Act (ADA). ASCE will make every reasonable effort to accommodate your needs. If you require special assistance, please contact us at **conferences@asce.org** no later than 20 business days prior to the event. ASCE cannot ensure the availability of appropriate accommodations without prior notification.

Attendee Packets

Early Bird and Advance registrants will receive their name badges and tickets at the registration desk during registration hours. To expedite the check-in process, it is recommended you bring your email confirmation with you – especially if you registered after **October 4**.

Conference Attire

The dress code for the conference is business casual (slacks, casual dresses). Meeting room temperatures will vary, so wear layered clothing to ensure your personal comfort. We also recommend attendees wear comfortable shoes.

Meeting Room Overcrowding

ASCE will make every effort to schedule popular events in rooms large enough to accommodate anticipated attendance. Since many events are extremely popular, it is wise to select alternative events as you plan your conference schedule. ASCE and the hotel personnel are **required** to follow local fire regulations and may ask participants in rooms filled to capacity to choose another event.

Medical Emergencies

ASCE hopes that your visit to Brooklyn and the International Conference on Sustainable Infrastructure will be free of medical incident. However, if you become ill at the New York Marriott at the Brooklyn Bridge, please contact the front desk and tell them you have a medical emergency that requires immediate attention.

New York Methodist Hospital – .6 mi
15 MetroTech Center
Brooklyn, NY 11201

No Smoking Policy

ASCE supports a "No Smoking" policy. Smoking is prohibited in the New York Marriott at the Brooklyn Bridge and all venues hosting ASCE events.

Professional Development Hours (PDHs)

You may earn up to 26 PDHs which are nationally recognized units of record, by attending Congress concurrent sessions and workshops. ASCE follows NCEES guidelines on continuing professional competency. Since continuing education requirements for P.E. license renewal vary from state to state, ASCE strongly recommends that individuals regularly check with their state registration boards on their specific continuing education requirements that affect P.E. licensure and the ability to renew licensure. For details on your state's requirements, please go to **www.ncees.org**.

Badge Policy and Ribbons

Your conference registration name badge is your admission to the educational sessions. Please wear your badge at all times. Tickets are required for the pre- and post-conference events, meals, and special events. Please be sure to bring your tickets with you to each event as you will not be admitted without a ticket. Ribbons will be available at the registration desk. ASCE recommends you remove your badge when leaving the hotel.

Recycle Your Badge Holder

Please help ASCE stay "green" and reduce extra costs by returning your badge holder at the end of the conference in the receptacles provided by the registration desk.

Recording Policy

Photographic, video or audio recording of any education session is strictly prohibited without prior written permission from both ASCE and the session presenter(s).

Release/Waiver

Photographic Release: By submitting the registration form for this conference, I hereby release any photographs or recordings that may be incidentally taken of me by ASCE during these events to be used for any purpose.

Liability Waiver: I agree and acknowledge that I am participating in ASCE events and activities at my own free and intentional act; and I am fully aware that possible physical injury might occur to me as a result of my participation. I give this acknowledgment freely and knowingly that I am, as a result, able to participate in ASCE events, and I do hereby assume responsibility for my own well-being. I also agree not to allow any other individual to participate in my place.

Program and Session Cancellation

ASCE reserves the right to cancel programs and/or sessions because of low registration. In the unlikely event of a cancellation, all registrants will be notified and will receive a full refund, if applicable. Programs and sessions are subject to change, and ASCE reserves the right to substitute a program, session, and/or speaker of equal caliber to fulfill educational requirements.

Registration Hours

Thursday, October 26	7:00 a.m. – 6:00 p.m.
**Closed for lunch*	1:00 – 2:00 p.m.
Friday, October 27	8:30 a.m. – 5:00 p.m.
**Closed for lunch*	1:00 – 2:00 p.m.
Saturday, October 28	8:30 a.m. – 12:30 p.m.

Included in Your 2017 Registration Fee

	Full Registration	*Daily – Thursday*	*Daily – Friday*	*Daily – Saturday*	*Student Full*	*Sponsor Full*
Thursday Welcome Reception	✔	✔			✔	✔
Saturday Closing Lunch	✔			✔	✔	✔
Proceedings	✔	✔	✔	✔	✔	✔

ASCE | INTERNATIONAL CONFERENCE ON SUSTAINABLE INFRASTRUCTURE 2017

New York City | October 26-28, 2017

Thank You to Our Sponsors!

Platinum

Bentley® Advancing Infrastructure

Gold

Innovyze®

HDR

ch2m.

ZOFNASS PROGRAM FOR SUSTAINABLE INFRASTRUCTURE Harvard University

vhb

AECOM

Silver

MOTT MACDONALD

KCI

Pennoni

Thornton Tomasetti

Bronze

HAKS

Louis Berger

Parsons

LA Metro

Join us in Los Angeles in November, 2019!