ASCE’s Initiatives in Sustainability and Resiliency of Infrastructure

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Outline

• Introduction
• Vision 2025
• Sustainability, Risk, and Ethics
• ASCE Body of Knowledge
• ABET Program Outcomes
• Technical Committees
• ASCE Journals (total of 38 journals)
• ASCE Publications
• Infrastructure Report Card
• Issues and Advocacy - Key Programs
Introduction - ASCE Activities


- Chief Editor, ASCE Journal of Performance of Constructed Facilities, May 2016 - present

- ABET Inc. - Program Evaluator (PEV) for civil engineering programs, Fall 2011 - present, Engineering Accreditation Commission Commissioner, 5 year term 2016 - 2020
Introduction - ASCE Activities

- Member of the Forensic Engineering Division (FED), formerly Technical Council on Forensic Engineering (TCFE), Past Chair of Executive Committee, International Delegations (China, India, UK, Italy, Costa Rica, Ecuador, Guatemala, etc.)
- Member of ASCE Committee on Education (2012 - 2014), board level committee, appointed by the President of ASCE
- Member, 3rd Edition Body of Knowledge (BOK3) Task Committee (August 2016 - present)
- Member, Committee on Accreditation (October 2017 - present)
Vision 2025 - 2007 and 2009

THE VISION FOR CIVIL ENGINEERING IN 2025

What will the civil engineering world be like in 2025?

What roles will civil engineers play in that radically transformed world?

ASCE asked those questions to a gathering of 60+ thought leaders from diverse backgrounds and countries—civil engineers, engineers from other disciplines, architects, educators, and other leaders. The result was:

THE VISION FOR CIVIL ENGINEERING IN 2025

Entrusted by society to create a sustainable world and enhance the global quality of life, civil engineers serve competently, collaboratively, and ethically as master:

- planners, designers, constructors, and operators of society's economic and social engine — the built environment;
- stewards of the natural environment and its resources;
- innovators and integrators of ideas and technology across the public, private, and academic sectors;
- managers of risk and uncertainty caused by natural events, accidents, and other threats; and
- leaders in discussions and decisions shaping public environmental and infrastructure policy.

LEADERSHIP THROUGH VISION 2025

The aspirational Vision 2025 challenges you, the civil engineer, to rise to a new level of leadership and professionalism—to be entrusted by society to achieve a sustainable world and raise the global quality of life. To earn that confidence, civil engineers, as a body of professionals, should exhibit mastery in five key areas:

PLANNERS, DESIGNERS, CONSTRUCTORS, AND OPERATORS
Entrusted by society
to create a sustainable world and
enhance the global quality of life,
civil engineers
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- planners, designers, constructors, and operators of
  society's economic and social engine—the built
  environment;

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  the public, private, and academic sectors;

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  events, accidents, and other threats; and

- leaders in discussions and decisions shaping public
  environmental and infrastructure policy.
Sustainability, Risk, and Ethics

• ASCE Code of Ethics Canon 1: Hold Safety Paramount

• Engineers shall hold paramount the safety, health and welfare of the public and shall strive to comply with the principles of sustainable development in the performance of their professional duties.

• a. Engineers shall recognize that the lives, safety, health and welfare of the general public are dependent upon engineering judgments, decisions and practices incorporated into structures, machines, products, processes and devices.

• e. Engineers should seek opportunities to be of constructive service in civic affairs and work for the advancement of the safety, health and well-being of their communities, and the protection of the environment through the practice of sustainable development.

• f. Engineers should be committed to improving the environment by adherence to the principles of sustainable development so as to enhance the quality of life of the general public.
ASCE Body of Knowledge

• 2nd Edition 2008, working on 3rd edition, due late 2018

• Outcome 10, Sustainability, “Analyze systems of engineered works, whether traditional or emergent, for sustainable performance.”

• Outcome 12, Risk and Uncertainty, “Analyze the loading and capacity, and the effects of their respective uncertainties, for a well-defined design and illustrate the underlying probability of failure (or nonperformance) for a specified failure mode.”
ABET Civil Engineering Program Criteria

• PROGRAM CRITERIA FOR CIVIL AND SIMILARLY NAMED ENGINEERING PROGRAMS
• The curriculum must prepare graduates to... apply probability and statistics to address uncertainty... include principles of sustainability in design
Technical Committees

- Forensic Engineering Division: The purpose of the Forensic Engineering Division is to develop practices and procedures to reduce the number of failures, disseminate information on failures and their causes, provide guidelines for conducting failure investigations, and provide guidelines for ethical conduct in forensic engineering.

- Infrastructure Resilience: The Infrastructure Resilience Division was established in 2014 to develop a unified approach in advancing the concepts of resiliency within lifeline and infrastructure systems. The Infrastructure Resilience Division develops resources for improving the resilience of civil infrastructure and lifeline systems to all hazards.
The *Journal of Sustainable Water in the Built Environment* presents activity and research developments in water issues, challenges, and opportunities throughout the developed landscape. The scope covers sustainable stormwater management and broader water systems interactions. Subjects include urban stormwater quantity, quality, hydrology, characterization, treatability, and impacts; water harvesting; urban water ecosystem services; sustainable urban watershed management; urban streams; combined sewer overflow/stormwater interactions; urban energy/water interactions; lifecycle analysis; and related policy, implementation, and economics. All papers are encouraged to have design or regulatory implications that are applicable to moving the profession forward.
The *Journal of Performance of Constructed Facilities* attempts to improve the quality of the constructed product through interdisciplinary communication. Papers examine the causes and consequences of failures and other performance problems. The principal purpose of the Journal is to disseminate information on failures and performance deficiencies of constructed facilities. The term “failures” in this context may mean catastrophic events, but also includes any performance deficiency from which a significant lesson can be learned, such as serviceability problems. Both the technical causes and procedural causes of failures are of interest. Procedural causes include human errors in design, construction, and/or operation that allow the failures to occur.

The Journal welcomes manuscripts that deal with failures, methods of investigation of failures, special techniques for failure investigations, reconstruction and repair, and issues of ethics.

Also of interest are manuscripts on design and construction practices that could lead to or have led to failures. Papers that discuss the interface between various professionals in the construction industry are of special interest. Manuscripts discussing risk management and failure prevention techniques are also encouraged. In addition, manuscripts on monitoring the performance of existing facilities and maintenance of the infrastructure are within the intended scope of the Journal.
The Natural Hazards Review stands on the realization that natural disaster losses result from interactions between the physical world, the constructed environment, and the character of the societies and people who occupy them. The journal is dedicated to bringing together the physical, social, and behavioral sciences; engineering; and the regulatory and policy environments to provide a forum for cutting edge, holistic, and cross-disciplinary approaches to natural hazards loss and cost reduction. The journal offers a means for researchers and practitioners working together to publish the results of truly interdisciplinary and partnered approaches to loss reduction and long-term disaster resiliency. Engineering topics covered include the characterization of hazard forces and the planning, design, construction, maintenance, performance and use of structures in the physical environment. Social and behavioral sciences topics addressed include a range of issues related to hazard mitigation and human response as well as significant issues related to the built environment such as land use, building standards, and the role of financial markets and insurance. The specific physical science topics covered include those pertinent to understanding the hazardous character of the world and the performance of the structures that we build to accommodate our way of life. More importantly, the journal features papers co-authored by people from a variety of specializations who bring a cross-disciplinary perspective to the complex factors that contribute to disasters in today's- and especially tomorrow's-world.
ASCE Publications

- Standards, reports, guides
ASCE Press, conference proceedings
- Sustainability - 176 results
- Resilience - 31 results
- Can search on and purchase individual papers from journals or conferences
Beyond Failure – all proceeds to the Isabella and Joe Delatte education fund and Norb and Lynn Delatte second honeymoon fund
America's Infrastructure Scores a D+
By Category - Bridges are C+
Infrastructure Report Card

• Nice videos on the web site
• App available
• Report every four years
• “Failure to Act” report answers this key question—how does the nation’s failure to act to improve the condition of U.S. infrastructure systems affect the nation’s economic performance?
• State infrastructure report cards - Oklahoma 2013 Report Card GPA: C-
Issues and Advocacy - Key Programs

KEY PROGRAMS
- GRAND CHALLENGE: Work together to close the infrastructure gap from planning to design to delivery
- INFRASTRUCTURE: Propose practical solutions to maintain & modernize our nation's deteriorating infrastructure
- SUSTAINABILITY: Embrace and encourage civil engineers' role as contributors to a sustainable world
- RAISE THE BAR: Increase education requirements for engineering licensure to better protect the public in the future

TOP ISSUES
We need your help to get Congress and state legislatures to take action on the things that matter most to civil engineers.

FEDERAL ISSUES
- Support NEHRP Reauthorization
- Make an Infrastructure Bill Congress's Top Priority
- Tell Congress to Pass WRDA 2018

STATE ISSUES

MORE ASCE ADVOCACY

HIGHWAY TRUST FUND
#FIXITrustFund
While the Fixing America's Surface Transportation (FAST) Act provided five years of certain funding for roads, bridges, and transit, it didn't address the long-term solvency of the Highway Trust Fund. Tell Congress you want to see a long-term solution to fund our nation's transportation needs. Take action with ASCE at www.fixithetrustfund.org

REPORT CARD
America's Infrastructure Report Card is out! Find out the grades and how you can help
The investments needed to improve our infrastructure continue to increase well beyond available funding. How do we close the infrastructure gap? The ASCE Grand Challenge asks all civil engineers to join in the solution to:

- Significantly enhance the performance and value of infrastructure projects over their life cycles by 2025
- Foster the optimization of infrastructure investments for society.

To reach this goal, the profession must influence major policy changes and infrastructure funding levels, while challenging civil engineers to focus on innovation, rethink life cycle costs, and drive transformational change—from planning to design to delivery.
Infrastructure

- Infrastructure Report Card
- State and Regional Infrastructure Report Cards
- Infrastructure Policy Reports
- Infrastructure News
- Tools & Training
- Tell your legislators
  - Support NEHRP Reauthorization
  - Make an Infrastructure Bill Congress's Top Priority
  - Tell Congress to Pass WRDA 2018
Sustainability

- Sustainability Roadmap
- International Conference on Sustainable Infrastructure (ICSI 2019), November 7-9, 2019, Los Angeles, CA
- Envision
- Awards
- New Sustainable Infrastructure Certificate Program
Sustainability Resources

• Convince your client or your boss about the benefits of sustainability
• Incorporate sustainable principles into your RFP or proposal
• Expand your skills or build a career focus on sustainability
• Make your project more sustainable
• Learn more about the importance of sustainability for civil engineering
• Find inspirational examples of sustainable projects
• Join a community of civil engineers committed to sustainability
Questions?

VISION 2025
Civil Engineers: Trusted Leaders for a Modern World

Entrusted by society to create a sustainable world and enhance the global quality of life, civil engineers serve competently, collaboratively, and ethically as master:

- planners, designers, constructors, and operators of society’s economic and social engine—the built environment;
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