

Contest Topics and Descriptions

There are six categories for innovation contest entries. Please review the descriptions and determine which topic best fits your innovation. Your selection will secure that the judges who review your submission will have a background in the topic selected. As you are considering which topic best connects to your innovation, please also become familiar with ASCE's Future World Vision (www.futureworldvision.org) and ASCE's Grand Challenge (www.ascegrandchallenge.com). Each of these projects are forward-thinking activities that ASCE identify as strategically important to the future of the civil engineering profession.

Internet of Things (IoT)/Artificial Intelligence (AI)

IoT/AI is a broad category that covers the use of sensors in order to improve the built environment. IoT sensors and AI programming include a wide variety of devices including sound, video, pictures, vibration, temperature, location and more. IoT sensors and AI programming collect data that can be used to improve a process, technique, add capability, or create a new service or function.

Using the FWV report as a resource and the more recent work related to the Floating City, assess what data-driven solutions you may already be working on that could be utilized to solve the future challenges related to the Floating City or the any of the other cities to be developed.

Sustainable and Resilient Engineering

Sustainability and resilience are wide-ranging topics that cover everything from carbon reduction to improved energy use and generation. It includes LEED certification (visit <https://www.usgbc.org/cert-guide> for more information) as well as the Envision framework (visit <https://sustainableinfrastructure.org/> for more information). Innovation comes from creating new methods, materials, reuse, or business practices that help the Civil Engineering built environment operate in a more sustainable way.

Innovations that deliver solutions to the challenges of building a sustainable and resilient future have a broad range of targets, including: growing food in new environments, materials that save energy or reduce waste, building processes that save energy, or re-engineered approaches to current methods that deliver the same value for lower cost. Think about the sustainable challenges connected to living in a floating city, in a frozen city, or in your current environment.

Next Generation Transportation

Transportation is going through dramatic changes including the development of electric and hybrid vehicles. This includes self-driving as well as connected vehicles. It covers the use of information systems like mapping and GPS to improve the systems. It also includes mass transit on both the large scale (rail, mass transit) and disruptive models like Uber & Lyft, as well as cars-to-go, and bike and scooter rental (Lime, Byrd, etc.).

How will transportation change with the user disengaged from the action of driving? Innovation delivers solutions to unrealized challenges. What will the user of future transportation begin to expect, or need, in order to integrate and/or navigate this new paradigm?

Improvements in Clean Water

Many parts of the world do not have access to clean water or good water treatment systems. Possible innovations include taking the water systems off-grid, creating new technology to provide clean water, improving sanitation and reducing disease. Solutions include new ways to disinfect, new models for hyper-local solutions, huge reductions in cost, technology, and models and methods for improving water systems.

No matter how advanced the world becomes, without access to water civilizations will perish. The need to purify, transport, and store clean water is essential to every future scenario. Think about how our advancing world places stress on existing water systems and what solutions might provide relief to that stress.

New Construction Materials & Methodology

Recently, there have been huge advances in materials. Civil Engineering needs to incorporate these advancements to meet the Grand Challenge of 50% reduction in lifecycle costs. Innovations in the use of materials, use of new materials, new construction methods because of new materials etc. are all included in this category. Also included is the consideration of building in harsh environments (underwater, floating, and coastal flooded) as well as in non-terrestrial applications like on Mars, the moon, and asteroids. Improvements in construction methodology, especially because new materials, are also included.

General Civil Infrastructure Improvement

This is a general topic category for innovation submissions that do not fit in the other five categories. The intent for this category is to connect closely to the charge or civil engineering and look for innovations that offer improvements in the built environment and infrastructure, either now or in the next thirty years.