



Defining Sustainable Infrastructure

Broadly defined, infrastructure is the interconnected system of the physical, natural and social components that societies need to survive and function. To make infrastructure truly sustainable, it must not only provide these services, but also take into account the risks and opportunities it generates arising from the bricks, mortar, and financing required to build and sustain the system as well as the environmental and human impacts of the system itself.

By applying a systems approach to modernize and build new infrastructure, we create the opportunity for:

- Innovation and advancements in technology, architecture and infrastructure service delivery, driving evolution in scientific discovery;
- Education and training to ensure a ready and dynamic workforce that can respond to and meet the needs required to maintain new and upgraded infrastructure;
- A higher quality of life for people including greater equal access to resources; and
- Reduced impact on nature and finite natural resources.

Sustainable development is a decades-old concept based on the goal of creating an economy that can meet the needs of the present without compromising the ability of future generations to meet theirs. Today, sustainable infrastructure builds upon that definition by applying systems thinking to create infrastructure that can meet current needs and is designed to anticipate the needs of future generations to support growth and prosperity, including access for all in a changing world.

Over the next few decades, America will need to undertake the largest rebuilding of infrastructure in its history. The American Society of Civil Engineers has identified over \$4.5 trillion in needed infrastructure investments across every system imaginable, including transportation, water, energy, and even public buildings. Decades of deferred maintenance, new challenges from a changing climate, and increasing public pressure are creating a perfect storm, resulting in higher levels of investment in built infrastructure systems than at any time since the post-World War II boom.

This period of expansion, rebuilding and modernization affords America perhaps its greatest opportunity to lead the world by example. By addressing today's infrastructure needs, we can achieve sustainability goals, demonstrate low and zero carbon development, mitigate human impact on the environment, and advance a strong, stable economies.

As communities replace ageing infrastructure with new systems designed both to last over a century and manage the impacts of a changing climate that century will bring, there is an opportunity to embed sustainable design and principles in those projects for generations.

Sound public policy choices guiding the science, education and training, engineering, planning, and lifecycle management required to create these new infrastructure systems can transform the way people interact with and impact the environment. As cities, states, the federal government, and the private sector plan for new infrastructure, it is up to partnership with the scientific and academic communities to develop the technologies, materials, design processes, policy analysis, and planning tools to enable a sustainable infrastructure future.