

Benefits of Green Infrastructure

Whenever buildings are constructed, infrastructure must be built to serve them. The US Environmental Protection Agency defines green infrastructure as an array of products, technologies, and practices that use natural systems (or engineered systems that mimic natural processes) to enhance overall environmental quality and provide utility services. It is associated with a variety of inter-related environmental, economic, and human health benefits that are accentuated wherever green space is limited and environmental damage is more extensive. The benefits of green infrastructure include:

- ❖ **Reduced and Delayed Storm Water Runoff Volumes** – By increasing the amount of pervious ground cover, the natural retention and absorption capabilities of vegetation and soil can be used to reduce storm water runoff volumes and peak flows.
- ❖ **Enhanced Groundwater Recharge** – By increasing storm water infiltration near its source or after treatment, our groundwater aquifers can be recharged. In Rochester, groundwater is our only source of drinking water and commercial/industrial process water. It also provides a significant amount of the water needed to maintain normal base flow rates in our rivers and streams.
- ❖ **Storm Water Pollutant Reductions** – Green infrastructure helps reduce storm water pollution, a major source of water pollution in the US, by infiltrating runoff close to its source so that plants and microbes can naturally filter and break down many common pollutants. It also helps prevent pollutants from being transported to surface water.
- ❖ **Reduced Sewer Surcharge Events** – Utilizing the capabilities of plants and soils limits the frequency of sewer surcharge events by reducing runoff volumes and by delaying flows.
- ❖ **Increased Carbon Sequestration** – Plants and soils capture and remove carbon dioxide from the atmosphere via photosynthesis and other natural processes, sequestering carbon and eliminating it as an agent of global warming.
- ❖ **Urban Heat Island Mitigation and Reduced Energy Demands** – Impervious surfaces absorb and retain heat that is generated from pavements, vehicles, and buildings. Preserving or adding urban green space and vegetation can help mitigate the effects of urban heat islands and reduce energy demands and emissions.
- ❖ **Improved Air Quality** – Trees and vegetation absorb certain pollutants from the air through leaf uptake and contact removal. If widely planted throughout a community, trees and plants can even cool the air and slow the temperature-dependent reaction that forms ground-level ozone pollution.
- ❖ **Wildlife Habitat and Recreational Space** – Protecting shorelands, floodplains, wetlands, groundwater recharge areas, and wildlife habitat with greenways, parks, urban forests, and vegetated swales provide increased access to recreational space and wildlife diversity.
- ❖ **Improved Human Health** – Recent research suggests that green space has a positive impact on human health by reducing inner-city violence, creating a stronger sense of community, improving academic performance, and reducing attention and hyperactivity disorder symptoms.
- ❖ **Increased Land Values** - A number of case studies suggest that green infrastructure can increase surrounding property values.

Even though changing from traditional to green infrastructure presents challenges, their many benefits are compelling reasons to begin incorporating them into our infrastructure networks.