INFRASTRUCTURE

THE CITIES OF BEVERLY AND SALEM HAVE PARTNERED TO CREATE **RESILIENT TOGETHER**: OUR PLAN TO TAKE COLLECTIVE ACTION IN THE FACE OF THE CLIMATE CRISIS.

Enhancing stormwater management, wastewater treatment facilities, bridges and roads through green infrastructure and improved maintenance.

WHAT DOES *INFRASTRUCTURE* INCLUDE?

Stormwater management and ongoing maintenance

Ensuring roads and bridges are resilient to climate impacts

Creating vibrant green amenities like plantings and bioswales

Training designers and engineers on predictive and sustainable infrastructure maintenance

Coastline and waterfront improvements

HOW DOES *INFRASTRUCTURE* CONTRIBUTE TO OUR LONG-TERM RESILIENCE AND SUSTAINABILITY?*

1.
Infrastructure assets have long life cycles that should be designed for future climate conditions and maintained for long-term durability.

2.
Efficient wastewater treatment infrastructure reduces both process emissions and emissions from energy used to operate it.

3.
Predictive infrastructure maintenance ensures safe and efficient systems by anticipating necessary repairs.

4.
Green infrastructure minimizes pollution from stormwater runoff, keeping our rivers and oceans cleaner.

5.
Replacing roads, parking lots, and sidewalks with landscaping and vegetation can mitigate the urban heat island effect and reduce localized flooding by capturing stormwater.
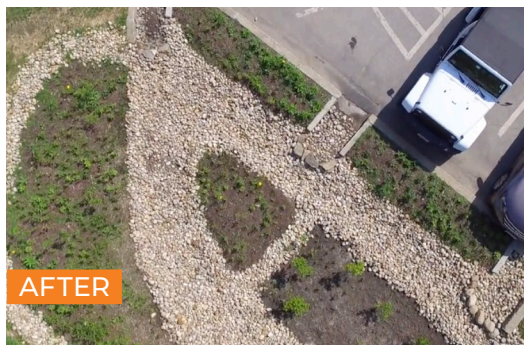
* For information on energy infrastructure (electricity, clean energy, etc.), see the Energy Fact Sheet

WINTER ISLAND RAIN GARDEN

A new rain garden at Winter Island Campground in Salem helps control flooding. A rain garden is a depressed area in the landscape that collects rain water and allows it to soak into the ground.
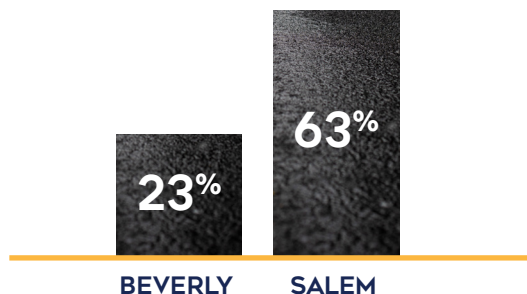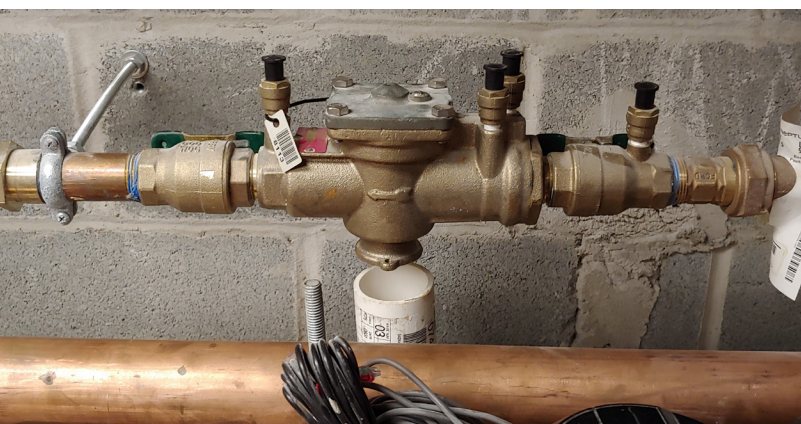

BEFORE

AFTER

AFTER

Impervious Surface Area

Replacing paved areas with green spaces benefits both the environment and people. Approximately 23% of Beverly's surface area and 63% of Salem's surface area is impervious, including roads, parking lots, sidewalks and other paved areas.

23%
BEVERLY

63%
SALEM

Source: GHG Emissions Inventory, 2020

Protecting Public Health with Infrastructure

Salem's Cross Connections Control Program uses backflow prevention devices to prevent contaminants from getting into the drinking water supply. This critical infrastructure reduces pollution while keeping the community healthy.

Some of the infrastructure strategies being considered for the Resilient Together plan include, but are not limited to:

› Ensure all water infrastructure systems are designed to capture peak flow rates for precipitation events based on the latest data.

› Evaluate and repair sewer systems to eliminate water leaks, elevate the pump station and outfall pipes, and protect the system from saltwater intrusion.

› Increase resilience to sea level rise flooding by elevating critical infrastructure like bridges, bulkheads, seawalls, and pile systems.

› Incentivize businesses and homeowners to install their own green infrastructure.

› Introduce work order management or other preventative maintenance tracking systems.

Supplying water requires many kilowatt hours per million gallons of water (kWh/MG):

BEVERLY
579.13
KWH/MG

SALEM
749.28
KWH/MG

Source: GHG Emissions Inventory, 2020
National average is 2,300 KWH/MG. Source: American Council for an Energy-Efficient Economy, 2015.

DID YOU KNOW?

The Water Energy Nexus

The water-energy nexus describes the resource-intensive relationship between energy use and water. Energy generation uses a significant amount of water! At the same time, a large amount of energy is required to pump, treat, transport, and store water.

Transporting sewage, in particular, is infrastructure-intensive! Of Beverly's 27 pump stations, 1 is for stormwater, 1 is for drinking water, and 25 are for sewage.

Green infrastructure

includes nature-based solutions like native plants, and trees, and water retention systems such as grassed swales and green roofs. Green infrastructure returns water to the natural water cycle, cleaner than it started!

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