OAKLAND COUNTY PARKS

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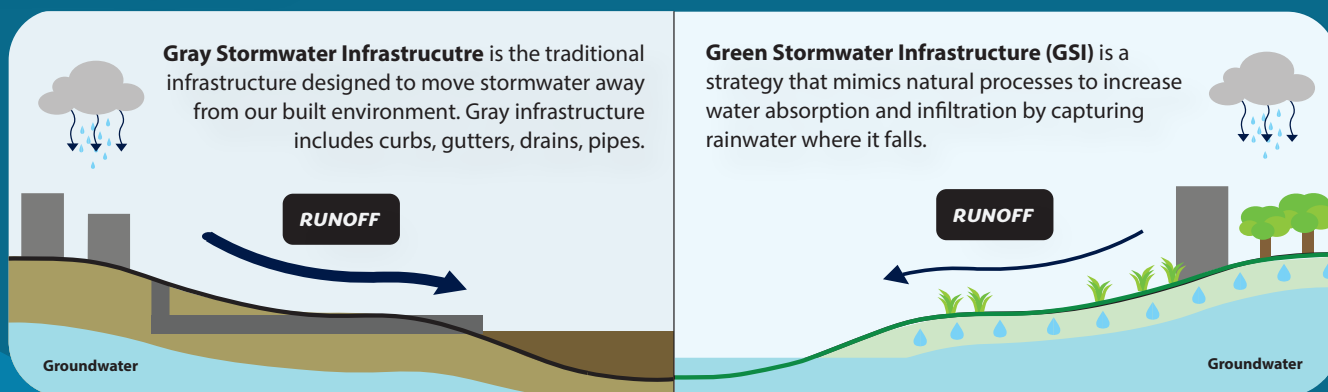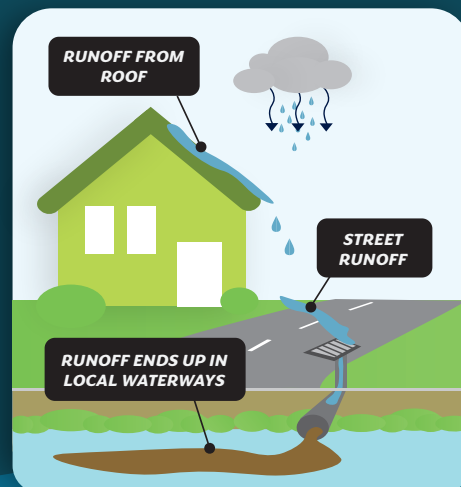WATER RESOURCES COMMISSIONER
Tim Nash

GREEN STORMWATER INFRASTRUCTURE FOR COMMUNITIES

WHAT IS STORMWATER AND STORMWATER RUNOFF?

Stormwater is water generated from precipitation like rainfall and snowmelt. When stormwater is not absorbed into the ground, this is called stormwater runoff. When stormwater runoff flows over impervious surfaces, like concrete or asphalt, it can pick up pollutants such as oil, trash, bacteria, and chemicals which end up in rivers, lakes and streams and threatens clean water (*refer to the image on the right*).

RUNOFF FROM ROOF

STREET RUNOFF

RUNOFF ENDS UP IN LOCAL WATERWAYS

WHY DO WE MANAGE STORMWATER?

Stormwater management is the effort to capture and slow stormwater runoff while improving water quality. Changes in population growth, urban development, and climate, including increased frequency and intensity of rainfall, have increased the magnitude of stormwater-related problems. Effective management of stormwater can reduce the severity of flooding from stormwater runoff and help create cleaner waterways. **Stormwater infrastructure** (both gray and green as shown below) are the engineered systems that handle and manage stormwater.

Gray Stormwater Infrastrucutre is the traditional infrastructure designed to move stormwater away from our built environment. Gray infrastructure includes curbs, gutters, drains, pipes.

RUNOFF

Groundwater

Green Stormwater Infrastructure (GSI) is a strategy that mimics natural processes to increase water absorption and infiltration by capturing rainwater where it falls.

RUNOFF

Groundwater

THE MANY BENEFITS OF GREEN STORMWATER INFRASTRUCUTRE

Green stormwater infrastructure is designed to capture and filter stormwater before it enters the gray stormwater infrastructure system and/or a river, lake, or stream. This in turn eases pressure on existing gray infrastructure. Green infrastructure also provides a number of environmental, social, and economic benefits including:

FLOOD MANAGEMENT
Reduces the water going into storm drains and pooling on impervious surfaces can reduce the risk of flooding.

CLIMATE CHANGE RESILIENCY
Improves air quality, dissipates ambient heat, and stores more carbon in the ground.

WATER QUALITY AND QUANTITY
Reduces stormwater runoff and pollutant loading.

WILDLIFE HABITAT
Native plants used in green stormwater infrastructure provides food and shelter for wildlife, such as pollinators.

THE HYBRID APPROACH: GREEN AND GRAY TOGETHER

While gray infrastructure systems are the traditional method for managing stormwater runoff, it has been found that **green and gray stormwater infrastructure are more effective when used together**. Adding elements of green stormwater infrastructure to existing systems ensures that the existing system can operate at better capacity.

Continue to the back for examples of green stormwater infrastructure applications that can easily be woven into any community.

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APPLICATIONS OF
GREEN STORMWATER INFRASTRUCTURE

IMPLEMENTING GREEN STORMWATER INFRASTRUCUTRE INTO YOUR COMMUNITY

Green stormwater infrastructure can be integrated into existing streets, parking lots, buildings, and parks. It's beneficial to consider green infrastructure when:

1. Repairing, resurfacing, or replacing roadways and parking lots
2. Repairing or replacing damaged sidewalks and curbs
3. Upgrading or replacing utilities in the public right-of-way (e.g., sanitary sewer systems, storm sewer systems, drinking water supply lines)
4. Redeveloping vacant or abandoned properties
5. Repairing or renovating buildings
6. Improving existing space

Listed below are examples of green infrastructure applications that have the flexibility to be scaled up or down based on the changing needs of a community.

LANDSCAPE APPLICATIONS

NO-MOW ZONES
A designated area where grass and plants are allowed to grow freely without cutting. These zones reduce stormwater runoff and carbon output. It is best to locate them in areas with wet soils and near open water to act as a buffer.

URBAN GREEN SPACES
Open-space areas that can be reserved for parks and include plant life and other ponds, streams, and natural features. These areas reduce the amount of impervious surface in a community.

RAIN GARDENS
A garden located in a depressed landscape that is used to collect and infiltrate stormwater runoff from impervious surfaces into the ground.

URBAN TREES
Trees capture and store rainfall in their canopy and release the water into the atmosphere.

BIOSWALES
Long, depressed channels of native plants, grasses, flowers, and customized soils that run parallel to parking lots or roads. These catch runoff and allow it to infiltrate into the ground.

DETENTION BASINS
Man-made pond that collects stormwater runoff from surrounding landscapes, roads, and rooftops. These store excess stormwater temporarily until channels can safely carry it away.

STRUCTURAL APPLICATIONS

DOWNSPOUT DISCONNECTION
Redirect rooftop runoff away from storm drains to a permeable surface, such as a lawn, or direct into rain barrels. This can significantly reduce the amount of stormwater municipalities must manage.

RAINWATER HARVESTING
Capture, store, and use rainfall collected from impervious surfaces (such as rooftops) using cisterns or rain barrels. These provide a practical way to meet municipal non-potable water needs.

GREEN ROOFS
Green roofs partially or completely cover buildings with vegetation planted over a waterproofing membrane. They are also known as living roofs, eco-roofs, or grass roofs.

PERMEABLE PAVEMENTS
Porous pavement that allows rainfall to seep through layers of pollutant-filtering soil before going into groundwater aquifers.

KEY
$ Estimated cost level   💧 Amount of stormwater managed

For access more information and contact us on the above listed green stormwater infrastructure applications, as well as guidance on construction, maintenance, and funding, scan the QR code: