

# STORMWATER SOLUTIONS

The following pages tell stories about different solutions people have used to solve stormwater issues in their communities, how they work, and some of the benefits and challenges

# IMPROVING SOILS

## Community Example: Portland, Oregon

A team of community members removed a section of the pavement outside this ice cream shop in Portland, Oregon. They brought in some compost and mulch, which they put on top of the dirt that was underneath the asphalt. This new soil is healthy enough to grow plants in, and will absorb runoff that the pavement did not.



pavement  
driveway



pavement removed,  
soil & plants added

## Find it near you:

The **Feast Arts Center** in the Hilltop neighborhood [de-paved its parking](#) lot to put in healthy soil and plants instead. Around the city, look for hillsides covered in dark soil—that might be compost or mulch to control erosion!



During  
de-paving of  
parking lot

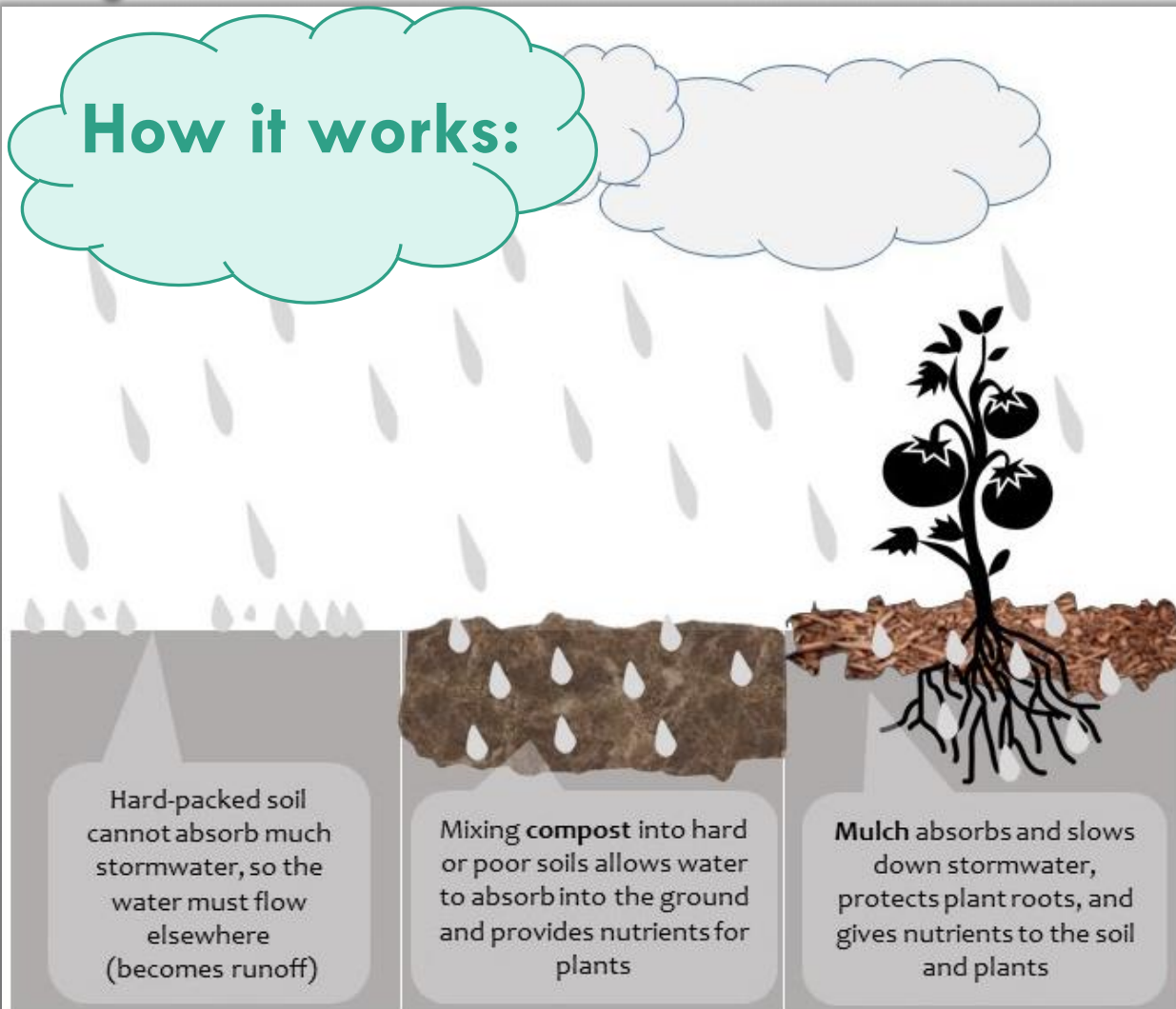
New lawn  
better absorbs  
stormwater





# IMPROVING SOILS

## How it works:



Plant image by Michael Zick Doherty from the Noun Project

## Benefits and Challenges

Adding mulch and compost to improve soil is a cheaper option than most – it doesn't take too much time to do and the materials are affordable or sometimes free. It takes some work and needs to be done every few years, but can be done by anyone. It doesn't take additional space or take away space from anything, and the mulch and compost will help soil and plants be healthier.

Amount of **space** needed: LOW  
Amount of **money** needed: LOW  
**Time** for building and maintaining: LOW

# PLANTING TREES

## Community Example: East Palo Alto, CA (near San Francisco)

In this community, there were very few trees and lots of blacktop. This means that rain water had few places to soak into the ground and students had few places to play that kept them cool. Students and community members planted trees at schools, which help with stormwater while also helping kids stay cool and schools save money on air conditioning.

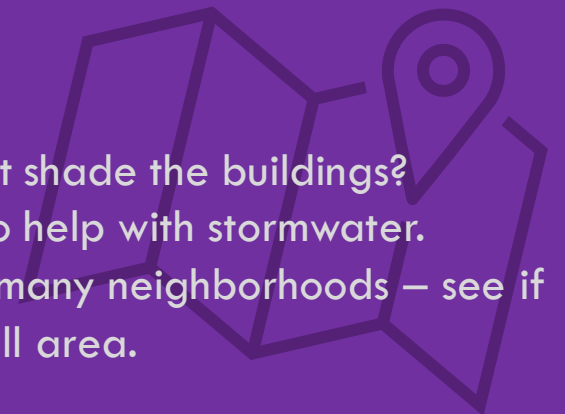


### *Find it near you:*

Trees are all around us!

Are there trees at your school that you play under or that shade the buildings? Look for trees that have been planted next to the road to help with stormwater.

Tacoma Tree Foundation works on planting trees around many neighborhoods – see if you can find new trees lining streets near the Tacoma Mall area.

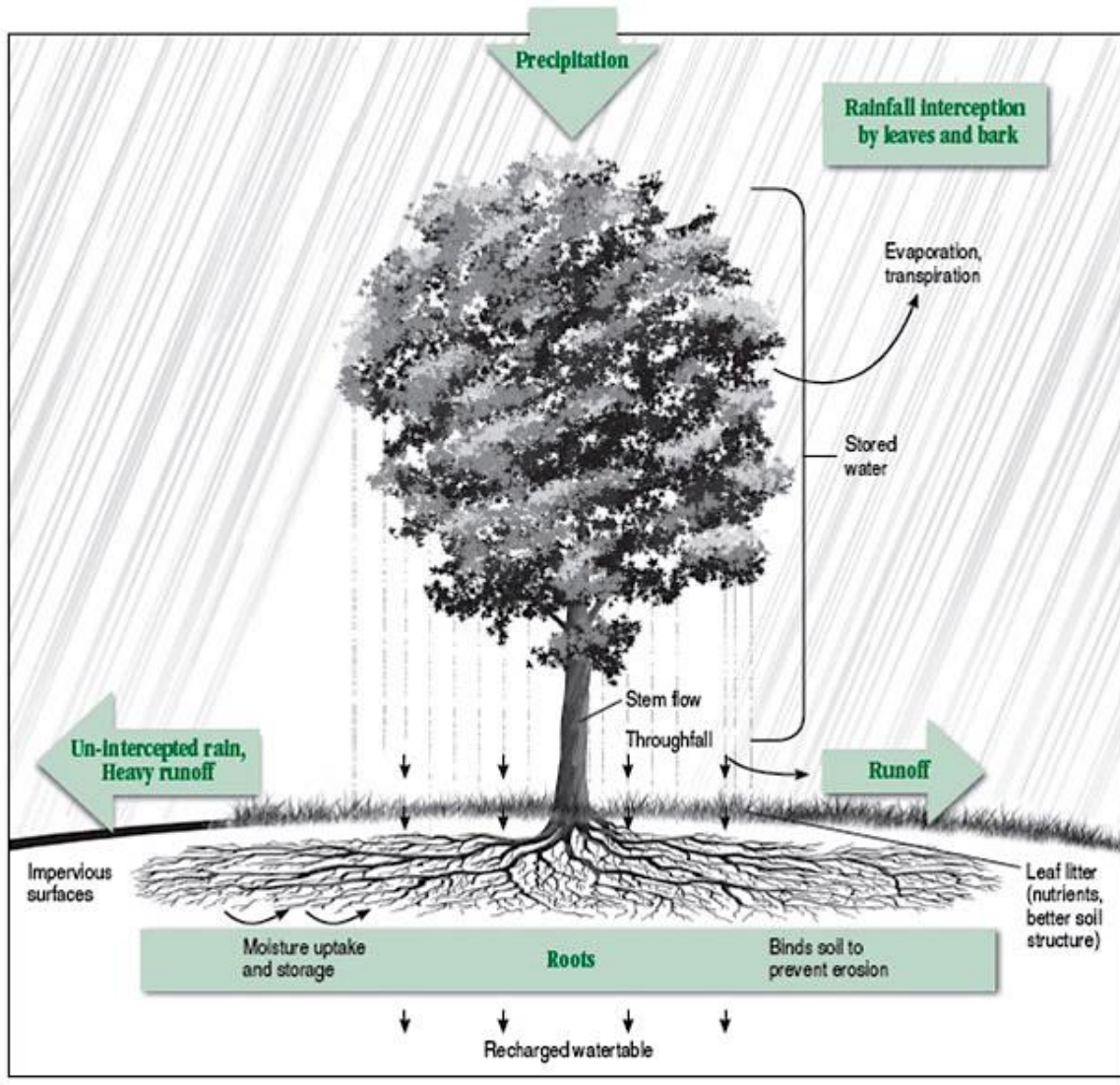




# PLANTING TREES

## How it works:

### Important Ways a Tree Helps with Stormwater Management



Trees slow down the rain water as it falls, and the leaves and bark hold onto the water. The roots soak up water for the tree to use, and the soils hold onto the water like a sponge. In the Northwest, evergreen trees are best to plant since they can help all year long and don't clog storm drains with their leaves.

### Benefits and Challenges

Just about anyone can help plant a tree, and trees are affordable and sometimes can even get donated. Trees create shade and help clean the air, but can't hold onto lots of stormwater. They don't take up much space, but they do need some space to grow.

Amount of **space** needed: LOW  
Amount of **money** needed: MEDIUM-LOW  
**Time** for building and maintaining: LOW

# PERVIOUS SURFACES

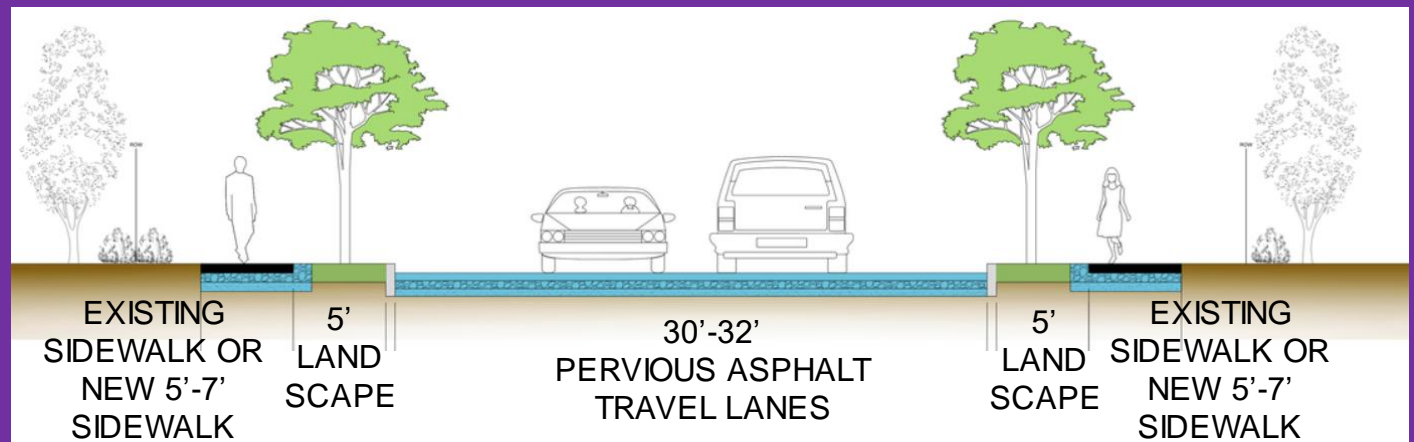
## Community Example: Philadelphia, Pennsylvania

At Albert Greenfield Elementary School, porous rubber play surfaces cover most of the playground area. The porous rubber is made of recycled tires! This school was one of many in Philadelphia trying to limit the amount of stormwater going into the city's rivers by getting rid of some blacktop and using pervious surfaces instead. The school worked with the City of Philadelphia, students, and their parent-teacher group to plan and raise money for the new school grounds.



## Find it near you:

Several areas of Tacoma are getting or have recently gotten permeable pavement! Check it out in the Larchmont, Madison, Oakland and Wapato districts/neighborhoods. These new pervious streets will allow rainwater falling on the street to soak into the ground.



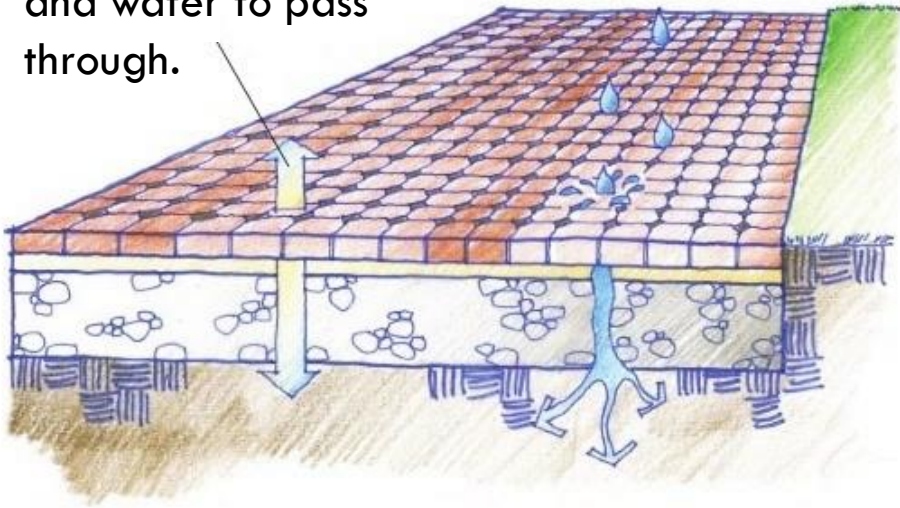


# PERVIOUS SURFACES

## VOCAB CHECK

Pervious, porous and permeable are similar words that mean a surface has small spaces for things, like drops of water, to pass through

Permeable pavement or concrete allows air and water to pass through.



## How it works:

Specially-designed pervious (or permeable) surfaces are solid enough for driving cars or playing basketball, but still allow water to soak into the ground underneath. The spaces between the hard surfaces let water travel into the ground.

## Examples of Porous Pavements



Permeable Concrete



Permeable Pavers



Grass Pavers

Amount of **space** needed: LOW  
Amount of **money** needed: MEDIUM-HIGH  
**Time** for building and maintaining: MEDIUM

## Benefits and Challenges

Pervious (or permeable) pavement and sidewalks are great for areas where cars will be driving or people walking or playing. They can be expensive because they have to be professionally installed. Pervious surfaces don't clean or store the water, but do allow it to soak into the ground.



# RAINWATER COLLECTING

## Community Example: Mexico City, Mexico

In Mexico City it can rain so much that water flows down stairs into the subway! There is a lot of rain at times, which can cause flooding, but some people also lack access to clean water for drinking and cooking their food. Isla Urbana is an organization that helps schools, families and businesses put in rain barrels to store water from the rooftops during the rainy season for use during drier months.



### *Find it near you:*

Many people collect rainwater for their gardens. One place you can see rain barrels is at the City of Tacoma's "[Enviro House](http://cityoftacoma.org)", which demonstrates lots of earth-friendly things!



# RAINWATER COLLECTING

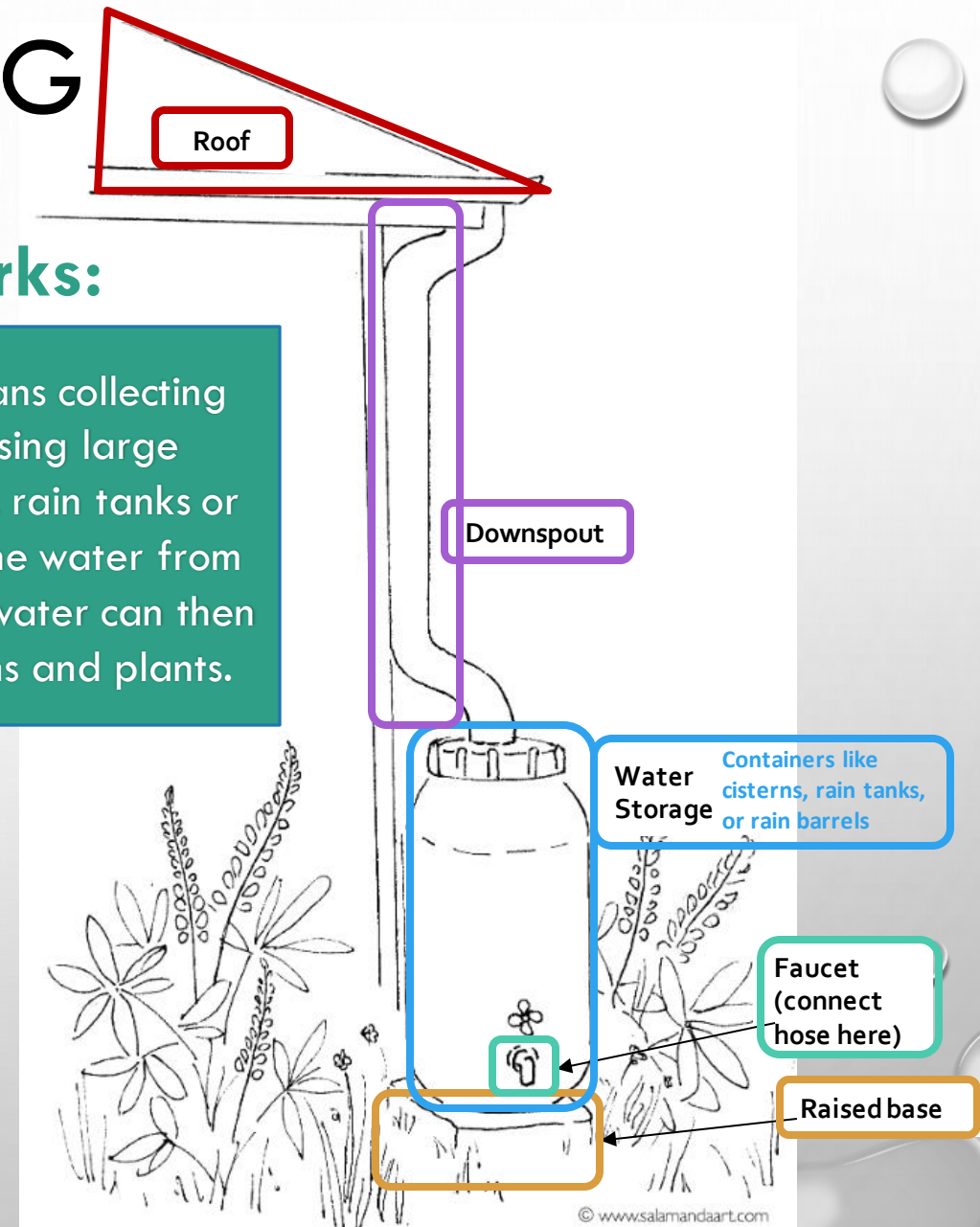
## Benefits and Challenges

Collecting rainwater in cisterns or rain barrels can be great in places where there is not a lot of space, and they can be more affordable than some solutions that use plants. Cisterns can hold more water than rain barrels, but both can only take water off of rooftops. The water that's collected has to be used for something or released slowly into the ground.

## How it works:

Rainwater collecting means collecting water from rooftops using large containers called cisterns, rain tanks or rain barrels. This keeps the water from becoming runoff and the water can then be used to water gardens and plants.

Amount of **space** needed: LOW  
Amount of **money** needed: LOW  
**Time** for building and maintaining: LOW



# RAIN GARDEN

## Community Example: Tacoma, Washington

First grade students at Sherman Elementary helped to design and plant a rain garden at their school to trap and clean the water from their parking lot, and in turn help orcas that would be affected by polluted stormwater. The school didn't have a lot of space to use, so this rain garden is small. Students and community members will now take care of the garden and teach others about the benefits of rain gardens. This rain garden is helping Puget Sound get healthy!



## *Find it near you:*

The group [Orcas Love Raingardens](#) have worked with students to plant many rain gardens at schools in Tacoma!

You can find rain gardens at:

- Baker Middle School
- Blix Elementary School
- Fern Hill Elementary
- First Creek Middle School
- IDEA High
- Mary Lyon Elementary
- Reed Elementary School
- Roosevelt Elementary
- Sherman Elementary
- Stafford Elementary
- Stewart Middle School
- Wainwright Elementary
- Silas High School
- Stafford Elementary
- Reed Elementary School



# RAIN GARDEN

## How it works:

Rain gardens filter the stormwater runoff while also providing habitat for animals, like important pollinators. These gardens hold onto stormwater so it can slowly absorb into the ground. The plants and special soils in rain gardens help to clean the water. Rain gardens can be beautiful as well as helpful!



In a rain garden,  
stormwater runoff...

... filters through  
plant roots and soil ...

... to eventually return back  
to larger bodies of water  
like Puget Sound!

## Benefits and Challenges

Rain gardens come in all shapes and sizes to fit a yard or schoolgrounds. Rain gardens can make good habitat for bugs, birds and other wildlife. In Seattle, there can sometimes be grants (money) to pay for rain gardens to be built.

Amount of **space** needed: MEDIUM  
Amount of **money** needed: MEDIUM  
Time for building and maintaining: MEDIUM

# BIORETENTION

## Community Example: Portland, Oregon

Portland has a problem with pollution in its rivers. To help, students, parents and neighbors removed some of the blacktop at James John Elementary School and planted native plants. Runoff from the playground will collect in the bioswale (a type of bioretention) and slowly soak into the ground. This school is one of many in Portland that have been working to get rid of some of their blacktop and put in plants instead.



### *Find it near you:*

Bioretention comes in many shapes and sizes and are common in many places in Tacoma. Look for **fenced-in ponds with plants** that have **signs saying “Stormwater Control Pond”** – these are built and maintained by the City of Tacoma to help stop flooding and erosion and keep pollution out of Puget Sound.





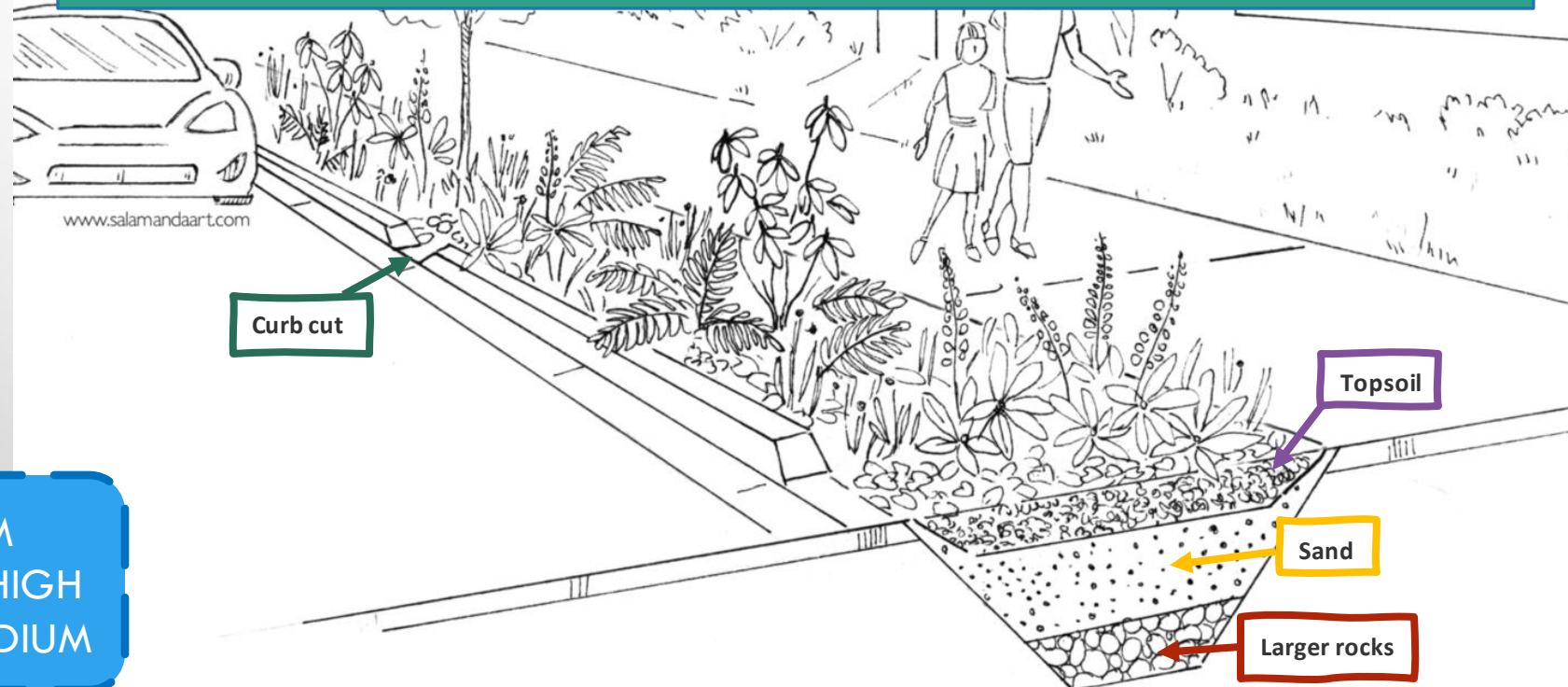
# BIORETENTION

## How it works:

### Benefits and Challenges

Bioretention is similar to rain gardens, but because they are larger and deeper than rain gardens they can handle more water – but also can cost more to build and require more engineering. Depending on where bioretention will be the most useful, people might have to remove concrete. Bioswales, retention ponds and other forms of bioretention make great habitat for bugs, birds and other wildlife.

Bioretention areas are places for water running off parking lots, roads, or playgrounds to collect and slowly soak into the ground. The plants and soils there slow the water down, absorb and clean it, and provide habitat for animals. Stormwater soaks through the soil into a sand or gravel layer underneath it. Some examples of bioretention are bioswales and retention ponds.



Amount of **space** needed: MEDIUM

Amount of **money** needed: MEDIUM-HIGH

**Time** for building and maintaining: MEDIUM