



# Clean water Connections from raindrop to river



happyivers.org

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Spring 2016



## Exploring Eugene's Amazon Creek

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*Amazon Creek and Fern Ridge Path provide easy-to-access walks that are a great way to introduce family members, friends and visitors to a creek's ecosystem. Get out your walking shoes and enjoy!*

**A**mazon Creek is a humble treasure that begins in the forested hills of south Eugene. Flowing through the southeastern and western areas of the city, the creek collects water from 21 square miles of urban landscapes and storm drains. That's an area about the size of 1,400 Autzen Stadiums. The majority of this water flows directly from the urban landscapes and storm drains of Eugene into the creek. Amazon may have a modest appearance, but don't be fooled. This creek provides flood control, habitat, recreation

and beauty for the City of Eugene. Enjoy a walk or ride along its banks to see what this often overlooked gem has to offer.

Many sections of Amazon Creek allow you to see the natural features of a waterway. Trees along the path benefit the creek by intercepting rain and providing habitat and shade. The Willamette Valley Ponderosa Pine is a common native tree growing on the bank. Look for this tree with needles in bundles of three. As you continue, notice the occasional donut-shaped piles of

*continued on page 7*



Spill clean up

## Stormwater Fees Protect Clean Water

Local residents sometimes ask us about the stormwater fee that is part of the EWEB bill. Some folks think stormwater fees are about "paying for rain," others don't understand why those on unimproved streets—without storm drains—pay for these structures. Actually, stormwater fees go to much more than storm drains—they support a system of City services, permits, and pollution prevention that keeps our local waterways and aquifers clean now and for future generations.

### Stormwater infrastructure

*A large portion of the stormwater system is underground.*

Improved streets (those with sidewalks and curbs) traditionally have a storm system of pipes and culverts that direct rain from impervious surfaces to the nearest waterway. These pipes and culverts also catch leaves, sediment and litter, so they must be

*continued on page 2*

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cleaned regularly. To keep cleaning (and clogs) to a minimum, we encourage residents to recycle leaves and keep sediment from running into streets. Street sweeping, leaf pick up and vector cleaning are three of the stormwater operations that the city provides to maintain this system.

Open waterways such as Amazon Creek are important for flood control and are inspected on a routine basis. Many are maintained using techniques that try to achieve the multiple objectives of flood water conveyance, water quality protection, and natural resource enhancement. The West Eugene Wetlands are also a natural stormwater system, as they provide a place for much of this runoff to be absorbed, filtered and returned to underground aquifers.

### Protecting water quality

Most stormwater runoff from public and private properties—unless it is absorbed on site—discharges into the City’s stormwater system and ultimately enters the Willamette River. All runoff from new or replaced impervious surface areas 1,000 square feet or larger must be treated before it goes into the City’s system through some type of on-site facility. The City encourages the use of grassy swales, stormwater planters and constructed wetlands, to name a few. Some businesses have more potential to introduce pollution into the City’s piped stormwater system and open waterways. Stormwater runoff from these businesses must be managed in a way that prevents it from being a hazard for the waterway. These sites receive permits and are monitored regularly to make sure that pollutants are not present in the area. Stormwater and wastewater inspectors and lab technicians work together to collect and test samples (see article on page 7).

Discharging anything other than stormwater into the stormwater system is prohibited by Eugene City Code. When spills or illegal discharges occur — for example paints or automotive fluids — near or in a storm drain or waterway, our stormwater team is called to isolate the spill area and pick up the fluid before it can reach the river. Occasionally a HAZMAT (Hazardous Materials) team is needed if the spill is particularly dangerous. Special monitoring may be required to determine the effect of any pollutant that escapes capture in these instances.

### Erosion control

The City’s erosion prevention team has specialized expertise in the engineering systems needed to control runoff in construction zones and other areas where loose soil creates trouble for waterways. Activities including grading, excavating or filling may require a permit if they affect more than one acre of land or are in sensitive areas. From October 15 to April 30, disturbed soil in construction areas must be covered or otherwise kept from running into waterways.

### Education and outreach

Most people are aware of the harmful effects that industry can have on water quality in lakes and streams. Many of those sources of pollution have been substantially reduced due to regulation and more effective systems to keep pollution out of waterways. Today the number one source of pollution found in local waterways is non-point pollution—that is, pollution that comes from a great many sources rather than one particular source.

Non-point pollutants include pesticides, fertilizers, automotive fluids, loose soil, yard waste and pet waste. Individual homes, yards, and driveways are the primary culprits. To reach as many individuals as possible who live in Eugene, we publish this newsletter; go to home shows and other events throughout the year. We also provide a stormwater education curriculum free to teachers at local schools so that young residents can learn about the importance of keeping pollution out of local waterways. 💧



Stormwater creek improvement

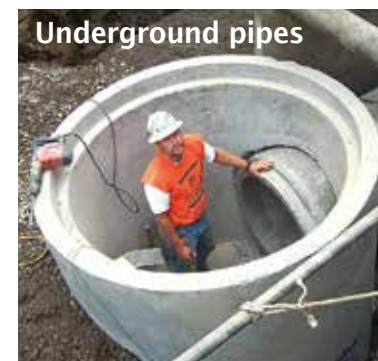
### Stormwater rates set to increase

In order to maintain service levels, the City of Eugene plans to increase utility rates this July. The City Manager is considering a seven-and-a-half percent stormwater user fee increase. This will increase the monthly stormwater bill for a typical residential customer about \$0.96 per month, from \$12.91 to \$13.87. For more information, call 541-682-4900.

The City of Eugene provides stormwater education services to Lane County residents within the urban growth boundary through an intergovernmental agreement. As a result, Clean Water Connections newsletter is mailed to some local residents who will not be affected by this increase.



Education



Underground pipes

**Did you know**  
Eugene’s stormwater  
system includes  
**601** miles of  
underground pipes?



Street sweeping



Rain garden on Manzana Street

## City rain gardens are beautiful and practical

The right combination of plants, soils and concrete containers in well-placed locations are helping to reduce flows and keep pollution from reaching local waterways.

In several places around town, vegetated rain gardens have been constructed to capture water from sidewalks and streets. As water passes through, it is filtered and cleansed as it slowly soaks into the ground, naturally recharging the ground water table.

The filtration occurs as runoff passes through plants and soils. In slow moving water, pollutants physically stick to plant roots and soil particles. Chemically, some pollutants and water are absorbed by plants and used in energy cycles. Below the surface where plant roots reside, beneficial bacteria and other microorganisms break down many of the pollutants and make them harmless.

Soil is also important in this filtering process. A porous soil mix allows water to soak deeper in the ground where biological activity provides even more water treatment. The rain gardens also retain and slow down the rain water, adding capacity to the stormwater system and helping reduce flooding and erosion in our streams. ♦

**According to the Environmental Protection Agency, a typical city block with streets, rooftops, driveways and sidewalks generates nine times more runoff than a woodland area the same size.**

## Water Flows Can Cause Neighborly Woes

Eugene's hilly terrain and heavy winter rains can cause water problems outside the City's stormwater system. Add to this the clay soil with poor drainage and you may have a serious issue in a downpour. Properties affected may temporarily flood as water passes through to a location downhill or stops in a low area. In addition, some areas of Eugene have natural springs that add to the problem.

For properties with water flow problems, it's worth noting that Oregon has adopted the civil law doctrine of drainage. Adjoining property owners are entitled to have the normal course of natural drainage maintained. The lower (downhill) owner must accept water that naturally comes to his/her land from above, and may not obstruct the runoff from the upper land, if water from that property is being discharged properly.

In addition, three basic rules must be followed:

1. A property owner may not divert water onto adjoining land that would not otherwise have flowed there. "Divert water" includes but is not necessarily limited to: 1) water diverted from one drainage area to another; and 2) water collected and discharged which normally would infiltrate into the ground, a pond and/or evaporate.

2. The upper property owner may not change the place where the water flows onto the lower owner's land. Most diversions not in compliance often result from grading and paving work and/or improvements to water collection systems.

3. The upper property owner may not accumulate large quantities of water, then release it, greatly accelerating the flow onto the lower owner's land. This does not mean that the upper property owner cannot accelerate the flow of water at all; improper drainage almost only occurs when acceleration and concentration of the water are substantially increased.

In cases where certain drainage patterns have been established over long periods of time (usually 10 years or more) that are not the original natural drainage, there may be legal rights acquired to allow the altered drainage pattern. Legal counsel should be consulted in these situations. ♦



## Planning a Benefit Car Wash?

Borrow our stormwater-friendly kit for your fund-raising event

Our free, fish-friendly car wash kits keep soap suds out of storm drains and rivers. To learn more, check out our online video at [happyrivers.org](http://happyrivers.org). To reserve a kit, call 541-682-4929.

# Garden Success = Nurturing Nature

Some advance planning outdoors can protect your investment in plants and grass, reduce your water bill and save time. Here are a few tips for keeping your landscape healthy that also help keep our water clean.

## Be Water Wise

Water plants and your lawn when they need it, and apply water according to your soil type and the weather. Deeper, less frequent watering will grow plants with healthier and deeper roots so they are more resilient to stress and drier conditions.

Choose the right watering method. A soaker hose applies water directly to the soil and reduces evaporation. If you are planting a few plants in an existing garden bed, hand watering can get the new plants the water they need while not overwatering the rest. If you are using a sprinkler, be sure that you are not watering the sidewalk and driveway.

To have a clear idea of how much watering needs to be done, check soil moisture before watering. Probe soil with a spade or trowel. Generally, you want the soil to be dry an inch or two below the surface before you water. Recheck soil after watering. An hour after you water (or two hours with clay soil), probe soil to see how deeply the water penetrated. If it didn't reach the root zone, you may need to increase your watering. If the area is soggy, cut back on watering next time.

## Lawn Care for the Long Haul

This time of year, grass is growing in leaps and bounds. Although lawns can require plenty of attention, you don't have to become an expert to have a healthy lawn.

### Quick and easy may cost you more

Adding chemical fertilizer to your lawn can boost nitrogen levels in the soil. That lush lawn may look nice but it comes at a cost to the homeowner and the environment. Many chemical-based fertilizers green grass quickly at the expense of healthy stem and root growth. That makes them more prone to disease, thatch buildup and drought damage. Treated lawns quickly become hungry again, needing more fertilizer to maintain their color. For a long-lasting effect, use a slow-release organic fertilizer. In most cases, fertilizing once a year is plenty. To help build the lawn's nutrient reserves, fertilize in the fall.

What about weeds? They may be an indicator that something is out of balance in your soil. For example, dandelions thrive in soil with low calcium. Correct nutritional deficiencies and consider vinegar instead of toxics to keep weeds away.



## Spray with Care

Planning to use pesticides and fungicides? Spray sparingly. Never use insecticides without scouting to see if the problem justifies treatment (small problems often resolve themselves). If you use pesticides, treat when the pest is most vulnerable and always read the label first! Many homeowners admit they don't read or follow label directions when applying pesticides and synthetic fertilizers. To prevent pollution, never apply pesticides when the ground is frozen or before a heavy rain.

## Much Ado About Mulch

Mulch can limit weeds, conserve soil moisture, moderate soil temperature, decrease soil compaction and may also reduce the spread of some soil-borne diseases. Mulching materials may be organic, from living sources such as wood chips, or inorganic, such as plastic sheeting. In the long run, organic mulches can help build a better soil structure that pays off in healthy, vigorous plants that may be better able to live with insect and disease infestations and lessens the need for chemical fixes (fertilizers, pesticides and fungicides) down the road.

For the best weed control, remove weeds and water thoroughly before mulching. For general use in planting beds, apply a layer that settles to two to four inches deep.

Fine mulches decompose more quickly and need to be replenished more often than coarse, woody mulches. Coarse mulch is best for weed control; it prevents annual weed seeds from germinating. Organic mulches work best in annual flower beds because they break down easily when tilled in the soil at season's end. Shredded leaves, partially decomposed compost and grass are all easy to turn in. Chopped leaves, partially decomposed compost, dry grass clippings and straw are all excellent choices for vegetable gardens.

Keep in mind that you can have too much of a good thing. Use less mulch on poorly drained soils. The right mulch will save water and create a healthier garden for you and your plants! ♦

## Looking for help with a tough gardening challenge?

Tips and expert advice are available at the Lane County Extension Office, online or in person. Check the web site for hours and upcoming clinics: [extension.oregonstate.edu/lane/gardens](http://extension.oregonstate.edu/lane/gardens)

# A clean water calendar

While rain is rare in the summer months, water pollution makes its way into local storm drains and waterways all year round. Did you know that some activities around your home might be adding to the problem?



Whether you are blowing, washing or sweeping debris around your home, collect solids rather than sending them into the street.



In the summer months about 70 percent of the water used by EWEB customers is used for outdoor watering. Don't send your money down the drain!

WINTER

## Erosion

Heavy rains carry loose soil, so be sure to cover any garden projects that are close to a sidewalk or driveway that could run toward the street. Mulch fresh plantings or use a tarp on large piles of soil.

## Oil leaks

Oil and other automotive fluids are common pollutants that can be prevented with routine auto maintenance. If you spot a leak on your driveway, use kitty litter to soak it up and deposit it in the trash before rain carries it away.

## Car washing

Love a sparkly car on a bright spring day? Just don't let soap flow into your nearby storm drain. Re-route runoff with a towel or simply wash in a grassy area, where the soil is a natural filter. Use as little soap as possible and skip the tire cleaners. Or go to a professional car wash, where water is contained and often recycled.

## Yard care

Fertilizers, "weed and feed" products and more are carried by runoff from sprinklers into storm drains. Water carefully and find recommendations for safer products to grow a healthy lawn and garden at [growSMARTgrowsafe.org](http://growSMARTgrowsafe.org)

## Pesticides

Pesky bugs bothering your favorite flowers? Less is more. Use the least toxic option and apply with care. Find safer alternatives at [growSMARTgrowsafe.org](http://growSMARTgrowsafe.org)

## Power washing

While that blast of spray is great for loosening dirt, mold and gunk, the water may carry it to a nearby storm drain. Intercept the flow with a rolled towel that will collect the solids so you can sweep them up and throw them in the trash.

## Leaves and yard debris

Fall clean up may overflow your yard cart, but resist the urge to dump debris in the street or swale. Clogged drains can cause localized flooding, so consider composting leaves and cutting up larger sticks for packing into your cart. Check [eugene-or.gov/leaf](http://eugene-or.gov/leaf) in the fall for your local leaf pick up schedule.

## Dog waste

Cool weather have you feeling frisky? Take Rover for a run! Remember to bag any solid waste, as dog poo is loaded with fecal coliform and other nasties that linger and wash into our water systems with the first heavy rain. Picking up is easy—be a good human for your good dog! 💧

SPRING

SUMMER

FALL



Washing on a gravel or grassy area allows soapy water to soak into the soil rather than flowing to a storm drain.



Choose a less toxic option and spray carefully when treating garden pests.



# wetlands & waterways

## Working together to improve Amazon Creek

**T**he City of Eugene's natural resources, maintenance and engineering staff all pitch in to keep Amazon Creek flowing smoothly. Here are seven of the many tasks that keep us busy all year long.

**Tree and willow planting:** Each winter, City staff and volunteers plant hundreds of native trees and shrubs along the banks of Amazon Creek and its tributaries in an effort to improve aesthetics, wildlife habitat, slope stability and water quality. After just a few years, the willows planted along the water's edge grow high enough to really change the look and feel of the creek. After a decade or two, trees at the top of the banks mature into stately Oregon white oaks, valley pines and Oregon ash.

**"Green piping":** During summer months, City staff walk the entire length of Amazon Creek and other major waterways pruning woody vegetation that could block stormwater during high flows and lead to localized flooding. The vegetation, through pruning and maturation, eventually develops a "pipe-like" character where large volumes of rainwater can be conveyed during a storm, but the banks still have plenty of vegetation to stabilize the slopes and provide wildlife habitat.

**Bank repairs:** Given the soil type, hydrology and steep banks of much of the Amazon Creek system, it isn't uncommon for small sections of the creek bank to slump into the channel during winter months. These slumps can cause threats to the top of the bank, block part of the channel, and send sediment

into the waterway downstream. Staff work with local, state and federal regulatory agencies to repair these slumps during the dry summer months when conditions allow heavy equipment to operate bedside the creek. Bioengineering techniques such as soil wraps, careful placement of rocks and planting native woody plant species stabilizes and improves the creek bank.



Planting



Restored creek near Garfield Street

**Beaver protection:** One of the successes in Amazon Creek has been the return of native beavers, which fill an important ecological role and are considered a sign of a fairly healthy waterway. But beavers' habit of cutting down mature trees can be challenging in our small systems, and can pose a risk to the public when a falling tree strikes nearby structures. City staff and volunteers install wire fencing around strategic trees in order to prevent loss or public hazards.

**Storm event monitoring:** When the creeks and waterways around town are at full capacity, staff monitor and document how well the system is carrying stormwater and preventing flooding. Staff inspect 20 locations throughout town where major channels are constricted by bridges or other infrastructure and document their observations. This helps us determine where more significant green piping or other modifications are required in order to avoid flooding.

**Debris and trash removal:** In any urban area, waterways are subject to pollution by debris dumping, litter and abandoned camping materials. Staff, volunteers and the Lane County Sheriff's work crew spend significant time and effort removing this debris from Amazon Creek and the Willamette River corridor weekly. Consider the volume of garbage removed during the month of March this year: 47 cubic yards. That's about five large dump truck loads!

**Tree risk assessment and hazard abatement:** Urban creeks near roadways, buildings and houses benefit from large trees. We are also aware of the risks these trees can pose. Inspection for hazards is conducted by the City's professional arborists and tree risk assessors. 💧



Bank repair



*Clean Water Connections is published by the City of Eugene Public Works Department to enhance awareness of stormwater and related surface water management issues.*

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happyivers.org

# Testing the waters

Amazon Creek receives about 60 percent of the City's stormwater before flowing north-westerly to the Long Tom and the Willamette River.

The Long Tom Watershed Council, Oregon Department of Agriculture, Department of Environmental Quality, and City of Eugene have worked together for five years to monitor and analyze pesticides in Amazon Creek. Staff take samples from multiple locations which differentiate between residential, commercial, industrial, and agricultural areas. Combined, the samples are tested for over 180 chemicals and in 2015, 31 pesticides were detected in the creek.

What can we do with this information? To reduce pesticide use, residential and commercial alike can follow the City's example of using integrated pest management practices that minimize (and in some cases eliminate) the use of pesticides by focusing on building healthy soils, planting the right plant in the right place, and only using pesticides as a last resort, starting with the least toxic, and following application instructions. Stormwater management such as rain gardens can greatly reduce all types of pollutants.

The Long Tom Watershed Council's Urban Waters and Wildlife Program specifically addresses the unique practices and needs associated with reducing site pollutants, and managing stormwater from developed urban commercial and industrial properties. They are well versed in helping all types of businesses achieve functional and aesthetic goals. To learn more about these voluntary efforts, contact Sarah Whitney with the Long Tom Watershed Council at 541-654-8965 or [urbanwaters@longtom.org](mailto:urbanwaters@longtom.org). Eugene residents with questions or concerns about water quality may call Kathy Eva at 541-682-2739 or visit [happyrivers.org](http://happyrivers.org).



## Explore Amazon Creek *continued from page 1*

wood chips. Look closely and you may discover a young native tree. Eugene Outdoors volunteers planted 190 trees along the creek this winter. Seasonal rains help to water these young plants and prepare them for summer heat. Wood chips protect them from drought and weeds, giving them room to grow. As the young trees mature, their canopies will spread wider, increasing their ability to capture rain and process carbon dioxide.

Another important plant you'll see a lot of is the willow. Their dense grey, green and yellow twigs line the creek edge, hiding the creek from our view and from the sun. Shading the creek and working with other plants to hold the banks are vital jobs for the willow. The hotter the water, the less oxygen for fish and bugs living in the creek. The more sediment, the greater the disruption to the food chain and transport of nutrients. However, too much of a good thing—like dense stands of willows—interfere with the flow of water. On a summer day, you may see Parks and Open Space staff wading in the water to prune the willows, which helps to keep the creek open during heavy rains. This activity, called green piping, is important for water movement and flow in this urban habitat.

Look for openings in the willows that offer views of water. The creek is often dotted with waterfowl. Male mallard ducks are commonly seen because of their vibrant green heads and grey bodies, followed closely by the females who are camouflaged by their mottled brown feathers. Open bank edges and shallow waters host great blue herons and egrets eagerly await food to swim, hop or float by. Swallows dive-bomb the surface of the creek on the hunt for insects. Chewed willow branches are a sign that a beaver has been gathering material to eat or to build with.

If you'd like to volunteer to help us care for Amazon Creek, please contact Eugene Outdoors (formerly Eugene Park Stewards) by emailing [carrie.l.karl@ci.eugene.or.us](mailto:carrie.l.karl@ci.eugene.or.us) or calling 541-682-4850.

## Make it an adventure!

**If you are exploring with children, encourage them to use all of their senses. Find a quiet spot together and close your eyes. Do you hear the buzz of insects, the call of birds or the croak of frogs? Do you smell the sweet scent of flowers, the spicy buds of the cottonwood trees or the scent of rain? Do you feel the breeze or the sun on your face?**

**Exploring nature is a great way to help a young person understand how complex the environment is and why it is important to all of us!**



Mallard duck (male)



Stormwater monitoring



Thanks to my friend David, a scientist at EWEB, for help with this article  
—Lily

## What's in your river?

You may think of things like fish or plants or rocks in your river because those are the things you can see. But have you ever thought about what might be in the river that you can't see?

Many cities (including Eugene) have scientists who collect samples and check the rivers for things that are very, very tiny. By studying these materials that take microscopes and other special tools to see, we learn what is normal for the river, if it is healthy, and if conditions are changing over time.

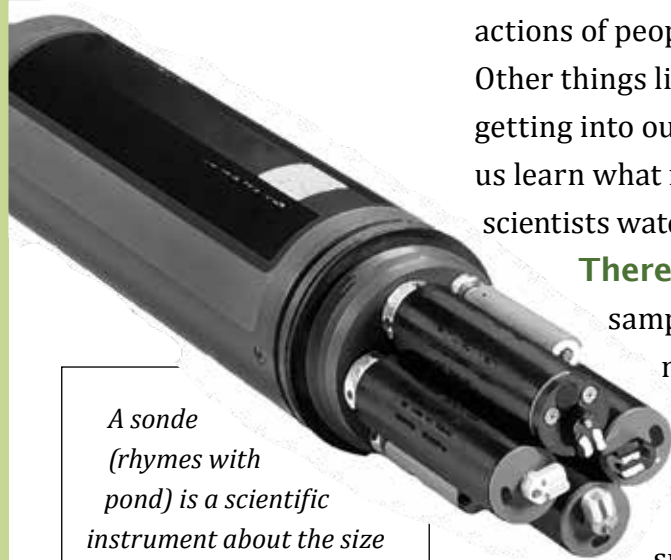
Water contains many things we cannot see. Some are natural parts of the water, such as minerals, metals and bacteria that come from sources like soil. However, even natural elements can reach unhealthy levels through the actions of people, especially from businesses and neighborhoods near the river. Other things like pesticides and medicines do not occur naturally, but they end up getting into our rivers and streams. Samples collected during rainy weather can help us learn what is being carried into the river during a storm. During the summer, scientists watch for things that might make the river unsafe for swimming or fishing.

**There are different ways** to collect this information. We can collect a sample of river water and send it to a laboratory, or use a sonde (at left) to measure the physical and chemical properties of water, such as temperature, pH and turbidity (cloudiness of the water). A sonde can be mounted in the river far from the office and send information directly to the scientist's smart phone. If there is a problem (for example a spill) it can be identified quickly so a worker can go to the location and track the pollution back to the source.

**By reporting what they find** and figuring out where it comes from, the scientists help workers in charge of water treatment know the best way to clean the water. They can also help people who live near the river learn more about things to do to



*If you have ever looked at a drop of pond water through a microscope, you know there are many things there that we can't see without special tools.*



*A sonde (rhymes with pond) is a scientific instrument about the size of a big rolling pin that is dipped or mounted in water to measure specific aspects of water quality.*

## It's Free! It's Fun! It's the Annual Public Works Day Open House!

Take a behind-the-scenes look at the many ways public works serves our community. Learn more about parks, the airport, wastewater, engineering, maintenance and more! Special guests include the Eugene Police and Fire Departments.

**Thursday, May 19 from 8:30 a.m. to 3 p.m.  
1820 Roosevelt Boulevard**

- Climb aboard and explore the big trucks
- Take part in hands-on activities geared for kids of all ages
- Meet stormwater ambassador Lily the frog
- Watch staff demonstrate really cool specialized equipment

Convenient bus, van and bicycle parking is available. LTD also has a bus stop right across from the yard's main entrance.



Let's go! For more information, visit [eugene-or.gov/pwday](http://eugene-or.gov/pwday) or call 541-682-4800.

keep rivers healthy for everyone. All of us need clean water—without any bad chemicals or bacteria. Each of us can help by not littering, picking up poop when we walk the dog, and sweeping dirt off the driveway or sidewalk and back on to the lawn or flower bed. Our river flows many more miles to other towns that like clean water too! Let's be good neighbors and help keep water clean. 💧