



Waterways

City of Madison Engineering Division • Annual Stormwater and Sewer Utilities Newsletter

cityofmadison.com/engineering/stormwater

FALL, 2025

Impressive to the Eye, Innovative to our City: John Nolen Drive Stormwater Design

The John Nolen Drive reconstruction is a generational project, years in the making. The City is about to see the transformation of the roadways, bridges and open space right next to the beautiful lakes we've all come to love. While the road and bridge construction project and the Madison Lakeway will be impressive to the eye, another element of the construction that you may not notice, but which will have a significant impact, is the innovative stormwater treatment system that underpins the design.

The JND stormwater treatment system is a combination of three proven technologies; catch basins, bioretention systems and a tree soil support system. These technologies work in concert to filter pollution and maximize tree health. The catch basins are oversized underground concrete structures with extra space in the bottom where sediment will be trapped. Twice a year this sediment can be easily sucked out by the City's Vactor trucks. Catch basins are effective at capturing sand and road grit but don't do a great job at capturing the smaller particles like silt or clay.

Downstream of the catch basins, water flows into a bioretention area that has a mix of sand and compost. The bioretention area is planted with deep rooted native plants which maintain the soils drainage and adds habitat for pollinators. The sand and compost mix is great at filtering out the finer pollutants from the road that catch basins miss (tire particles and brake dust and silt).

Next to the bioretention area is a special tree support system. This system consists of heavy-duty plastic supports that look similar to mix between Lego and milk crates. These plastic supports extend under the bike path and are filled with soil designed to maximize tree health. The plastic supports prevent the weight of the bike path from squishing all the air and moisture out of the soil under the path and allow the tree roots to extend under the path. Together, the system will treat runoff from John Nolen Drive to a baseline level and provide enhanced treatment for a few stretches of the road, all while giving the trees extra room to grow, extra water and improved drainage.

The last design feature in the system is a valve to bypass the winter snow melt around the bioretention and tree support area. While the City has implemented practices to minimize the amount of salt used on roads, snowmelt from major streets will inevitably contain salt which can damage trees and plants in the bioretention area. The only way to remove dissolved salt is through reverse osmosis, which is not a practical stormwater treatment system. Without a treatment option, the next best thing was to allow most of the salt laden runoff to by-pass the bioretention and trees in the winter and then reroute the water during the growing season.

While running, biking or driving past the stormwater treatment area, most users will only notice that there is a small low spot between the path and the road and a small metal dome. However, now that you've read this article you know there is a lot going on below the surface.



A Message from Your City Engineer, Jim Wolfe

The City of Madison Engineering Division is busier than ever designing, constructing and maintaining our City's our underground sanitary and storm sewer infrastructure as well as more visible above ground stormwater greenways and ponds and transportation system. It's an exciting time to be a part of the City of Madison, and we're so proud of the part we play in making Madison such a great place to live and work.

Our goal is to design and build infrastructure with a focus on sustainability and equity. Our stormwater system is a critical element of this infrastructure. If you haven't already, take a look at our cover story about the deep thought that went into the storm infrastructure under the upcoming John Nolen Drive project. Check out inside the newsletter on Page 2 to learn how you can join in and get involved in Stormwater Week 2025. We're really proud of the progress we've made in stormwater with our new Historic Street Flooding Map which helps our community understand flash flooding areas. We've decided to highlight the Pheasant Branch Enhancement Project that greatly improved the Old Sauk Trails Business Park after the 2018 floods (p. 2). On page 3, we hear directly from our City forester on if planting trees in private property actually helps with flooding mitigation (hint: it does!). While we have so many things going on in Engineering here at the City of Madison, we continue to focus on the community who we work for and always strive to improve on ways to connect and engage with (backpage). We are committed to continuing to provide a high level of service and your input is critical. Please continue to engage with us before, during and after construction, no matter the project. Working together we can work toward making the City of Madison a great place to live and work for future generations.

- Jim Wolfe

Statewide Call to Action for WI Residents: Stormwater Week 2025

Join the City of Madison and the rest of the state for the third annual Wisconsin Stormwater Week! WI Stormwater Week is a collaborative effort of organizations throughout the state that work to raise awareness about the sources of stormwater pollution. WI Governor Tony Evers signed a proclamation establishing September 20 – 28, as the 2025 WI Stormwater Week. This year, we have a statewide Call to Action for WI residents to get involved with a local cleanup or adopt a neighborhood storm drain. Additionally, residents can find a cleanup through the Alliance of the Great Lakes or host their own.

The week-long effort focuses on daily topics and webinars on Monday, Sept. 22 – Friday, Sept. 26 that promote stormwater pollution prevention and provide regional resources for residents to get involved. WI Land and Water will host and promote the four webinars:

- » **Monday, Sept. 22** (12 – 1 PM): Cleanup 101
- » **Tuesday, Sept. 23** (12 – 1 PM): What are the benefits of shoreline restoration?
- » **Wednesday, Sept. 24** (12 – 1 PM): What's an illicit discharge?
- » **Thursday, Sept. 25** (12 – 1 PM): How to engage the community in stormwater education
- » **Friday, Sept. 26** (12 – 1 PM): National Stormwater Awareness & Estuaries Week Resources

Watch the webinar recordings after the date on www.wistormwater.com

Engineering Provides New Historic Street Flooding Map

A new map is available for the community to see areas known to historically experience street flooding during intense thunderstorm type events in the City of Madison.

The City of Madison Engineering Division created the new map to be a simplified tool to help residents understand the locations of street areas that are more likely to flash flood and should be avoided when driving and parking during extreme storm events. This map compliments the more detailed watershed flood risk maps.

View the City of Madison Engineering Division Historical Street Flooding Map

The City of Madison Engineering Division has a number of resources on its [Flooding website](#) to help the community understand flooding that happens in Madison. **Flash flooding** can occur anywhere throughout the City when the stormwater infrastructure cannot convey the amount of water that is falling. **Lake level flooding** occurs when the entire Yahara chain of lakes system has more water flowing into it than can be moved through it.

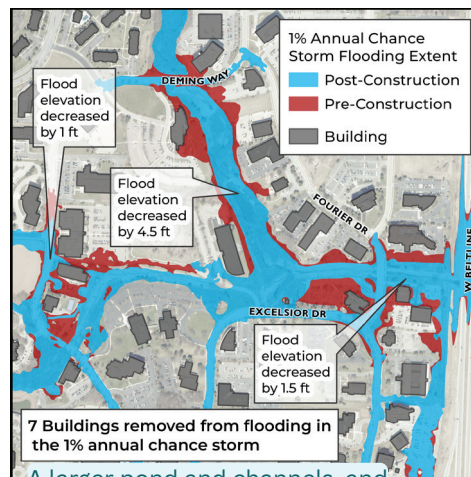
Lake levels are defined by DNR and implemented by Dane County.



Pheasant Branch Enhancement Majorly Improves Old Sauk Trails Business Park

The Pheasant Branch Enhancement reconstruction began in 2025 to maximize the ponds, greenways, and culverts in the Old Sauk Trails Business Park to mitigate future flooding with the funding assistance of a FEMA Building Resilient Infrastructure and Communities (BRIC) grant. The project also creates a multi-use path on the east side of the pond from Excelsior to Deming Way with a spur to Fourier Drive. The project will be completed in 2026.

Pheasant Branch Enhancement Flood Mitigation and Restoration - Project in Progress



A larger pond and channels, and larger pipes will help mitigate future flooding



Learn more at:
www.cityofmadison.com/PBE



Restoration is underway! Native wildflowers and grass seed will be planted in 2025, and trees and shrubs in 2026. Native species improve the functionality of the stormwater system, increase biodiversity, and provide wildlife habitat.

The project will decrease the flood elevation around the pond by 4.5 ft and mitigate the flooding of many buildings during the 1% annual chance storm. Prior to this project, the City contracted with an ecological firm to relocate herptiles (frogs and turtles) from the ponds and greenways to avoid impacts during the construction. The pond and greenway system will be revegetated with native wildflowers, grasses, trees and shrubs which will improve the functionality of the stormwater system, increase biodiversity and provide wildlife habitat.

Take Charge of Your Water Hardness With Blending Valves

By Emily Jones, Madison Metropolitan Sewerage District

Our drinking water in Madison is naturally high in minerals, or hardness. Most of us have water softeners to remove minerals to prevent hardness buildup in appliances and fixtures. While water softeners reduce impacts of hard water, they have the downside of contributing salt pollution to downstream freshwater.

Water softener blending valves are a way for you to find a sustainable balance between soft water and salt use. These valves work by diverting some hard water away from your softener and blending it with softened water, resulting in a mixture of hard and soft water used in your home. Blending valves reduce the amount of water you soften, so your softener needs to recharge less frequently and uses less salt.

Saving salt isn't the only benefit of blending valves. They also allow you to adjust water hardness to your preferred level. In a typical water softener setup, the water leaving the softener is completely soft, containing 0 grains per gallon of hardness. Some people don't like the feeling of completely soft water, so blending valves give them an option to customize the water quality in their home.

Hard water is defined as a hardness level above 7 grains per gallon. In Madison, our average water hardness is about 20 grains per gallon, so our water is very hard. If the water serving your house starts out at 20 grains per gallon, and you have a blending valve that diverts 20% of water away from your softener, you'll end up with water with 4 grains per gallon of hardness – much softer than the source water and with a 20% reduction in salt.

Blending valves are already taking off in our area. Local homebuilder Tim O'Brien Homes is installing blending valves as a standard feature on the water softeners in their new homes. Because blending valves are compatible with several brands of softeners, plumbers can also add the valves to existing softeners in a quick service appointment.

Historically, we've used water softeners to achieve the softest possible water, which uses the highest amount of salt. But the benefits of water softening are still present when water is softer, not softest. Learn more here: madsewer.org/blending-valves.



A blending valve is a small component added to the back of a water softener, which allows greater control over home water quality, and environmental benefits.

Plant a Tree on Private Property, It Helps Stormwater Management

Urban trees are quiet contributors to numerous environmental benefits including stormwater management. Trees intercept and hold incoming rain via surface tension on the leaves, branches, and trunk. This decreases the initial pulse of water that flows into the traditional stormwater management infrastructure. Intuitively we experience this any time we seek shelter under a tree during a rainstorm. Tree canopy overhanging impervious surfaces, like pavement and buildings, helps to intercept and redirect rain that would otherwise go directly into the storm sewer. Further, trees grow within pervious spaces, and their roots provide for infiltration channels into the soil where runoff water can be stored throughout the community.

Tree canopy benefits are maximized by mature large stature trees. Recent Urban Forest Inventory and Analysis (UFIA) found that 10% of the trees within Madison are 15" diameter or greater. Those relatively few large trees provide 53% of the community's leaf area. Many ecosystem services are driven by leaf area. Larger trees hold more carbon, remove more air pollution, and reduce more stormwater than smaller trees. Maximizing canopy across Madison comes from both supporting/protecting mature trees and also creating productive planting conditions for new trees to grow and thrive. Canopy benefits are delivered across all property boundaries and are considered a public good. In Madison, the largest land ownership classes are private property (56%), road right-of-way (17%), and municipal land (12%). The City is committed to modeling responsible tree management on public lands. Ultimately, the community will realize the greatest canopy benefit when these practices are exercised on all properties.

With the majority of lands in the City of Madison being under private control, and with the ability of mature trees to open pore spaces in the soil for infiltration, if you are looking for a method to provide cooling, increase infiltration and sequester carbon an easy big win is to plant a hardwood species on land you own.

Reduced or eliminated street flooding to improve safe access to emergency vehicles, motor vehicles, pedestrians, bicyclists, and buses.

Reduced or eliminated economic impacts that will help keep businesses undamaged, which will allow them to remain open to the public and employees.

Learn how Your Rain Garden Can Absorb the 'First Flush'

Written by Clean Lakes Alliance Mike Smale (Watersheds Program Specialist) and Paul Dearlove (Deputy Director & Chief Science Officer)

Would you ever think to eat your dinner off the road? Of course not! Roads and other paved surfaces accumulate some unsavory materials, like oils, dirt, and other debris. As a rainstorm begins, these pollutants quickly wash off the pavement and flow into storm sewers – and eventually into our lakes. This initial pulse of stormwater, also called the "first flush", can contain higher concentrations of pollutants compared to stormwater runoff generated later in the rainstorm. During summer events, First-flush runoff is also very warm, threatening aquatic organisms that are sensitive to sudden fluctuations in water temperature.

Enter the common rain garden. While rain gardens are not intended to contain all the runoff occurring during a big storm, these lushly vegetated depressions are particularly good at absorbing the first flush, keeping it from being sent untreated into nearby storm sewers. They also help to naturally clean and cool the water of the first flush by allowing it to percolate into the ground.

Watershed stewardship begins at home with little more than a shovel and some of your favorite plants. Rain gardens are relatively easy to build and provide benefits beyond cleaner storm waters (pollinator habitat, anyone?). So, until our streets are as clean as dinner plates, we can thank every neighborhood rain garden for working to handle that first flush and protecting our lakes.

Tree Leaves have Many Benefits [if Used Properly]

We've all removed leaves in the fall, but leaving some in place has several benefits. Birds, pollinators, and other creatures rely on fallen leaves for food and shelter over the winter. Keeping leaves helps yards retain moisture, reduces carbon emissions, and provides free fertilizer in your garden, lawn, and compost bin. Here are some DOs to leaving your leaves:

DO: use leaves as mulch and fertilizer

Leaves that fall naturally around flowers, trees and shrubs can be left as a mulch, and you can add more leaves to form a layer of at least 2 inches. Whole leaves will decay naturally over time as they do in forests, and they enrich the soil to feed nearby trees and other plant life.

DO: leave some leaves on your lawn

Some leaves left on a lawn will break down and fertilize the soil. If leaves cover about 20% of the grass, leave them where they fell. If only 50% of your grass is showing, you can mow over these areas if you want to help the leaves break down.

DO: remove leaves from the street

Removing leaves from the street, sidewalks, and driveways before rainfall is important for clean lakes. When it rains, wet leaves in the street form a nutrient-rich "leaf tea" that flows into stormwater sewers that connect to our lakes and other waters, feeding harmful algae growth.

DO: compost your leaves

If you have a lot of extra leaves, add them to a compost pile along with other plant matter and kitchen scraps and use the finished compost to improve garden soil.



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Discover how to keep up with construction projects near you.



Check Your Mailbox!

The City sends postcards with details about Public Information Meetings (PIMS) when construction is planned in your neighborhood.

Explore Project Pages Online

Visit cityofmadison.com/engineering/projects to find:

- Meeting dates
- Project design
- Schedule
- Contacts
- Recordings of virtual meetings



Get Email Alerts

Stay informed by signing up for email notifications on specific projects. Get updates on construction and meeting dates - right in your inbox.



Follow Us for Real-Time Updates

Follow Madison Engineering on social media for videos, photos and reminders. Check out our podcast, Everyday Engineering, too.



Watershed Study Progress By the Numbers

22 Watershed Studies in Total

13 Completed Studies (5 more anticipated by end of 2025)

48.9 sq. mi. of areas with completed existing conditions flash flood mapping

32.0 sq. mi. of city in "active" studies

67.9 miles (and growing) of storm sewer pipes improvements identified



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