



# Detroit Basement Backup & Flooding Handbook

How basements flood and  
action steps for residents



# TABLE OF CONTENTS

Welcome Letter From Mayor Mike Duggan .....	3.	What is a Backwater Valve? .....	22.
Why Protect Your Basement From Flooding .....	4.	Basement Backup Protection Program .....	24.
Reasons Why Basements Backup & Flood .....	5.	A Message From Director Gary Brown .....	29.
How Untreated Sewage is Collected in Detroit .....	11.	DWSD CIP One Page Overview .....	30.
Homeowner Responsibility .....	12.	A Message From GLWA Interim CEO Suzanne Coffey .....	31.
What Steps Can I Take .....	13.	GLWA CIP One Page Overview .....	32.
Disconnect Downspouts .....	15.	GLWA and DWSD Responsibilities .....	33.
Clean Sewer Line Every 1-2 Years .....	16.	Wayne County and State/MDOT Responsibility .....	35.
Inspect Sewer Line With Camera Every 3-5 Years .....	16.	Resources .....	36.
Water and Sewer Service Line Warranty Program .....	19.	Climate Change .....	40.
Reduce Flooding with New Equipment .....	20.	Customer Assistance Programs .....	41.

## English

This notice provides important information. Please have someone translate this notice for you if you are unable to read it.

## Spanish (Español)

Este aviso brinda información importante. Si no puede leer esta notificación, pídale a alguien que se la traduzca.

## Bengali (বাংলা)

এই বিজ্ঞপ্তিতে গুরুত্বপূর্ণ তথ্য রয়েছে। আপনি পড়তে না পারলে অনুগ্রহ করে কাউকে দিয়ে আপনার জন্য এই বিজ্ঞপ্তি অনুবাদ করিয়ে নিন।

(العربيةArabic)

يقدم هذا الإشعار معلومات مهمة. من فضلك اطلب من شخصي أن يترجم لك هذا الإشعار لو كنت غير قادر على قراءته.

The City of Detroit Basement Flooding Handbook provides homeowners and residents the information and resources to reduce flooding and sewer backups. The recommendations can help reduce flooding on your property, although not all flooding can be eliminated as outlined in this Handbook starting on Page 4. This publication will be updated periodically. Please check <http://www.detroitmi.gov> for the latest version.

Version 2023-1.0

## Did you know?

There are three parts to the sewer system that take away untreated sewage from your home and stormwater from your property and street. They are the following:

- The sewer and storm system starts on your property with your private drains, plumbing, sewer lateral service line coming from your house (some homes, very few in Detroit, have separate storm lines as well) and your gutters and downspouts;
- The local sewer system, operated by the Detroit Water and Sewerage Department (DWSD), collects the combined untreated sewage and stormwater from homes and businesses, whereby homes' and businesses' sewer lateral service line are tapped into a collection pipe typically under the alley; and
- The regional sewer system, operated by the Great Lakes Water Authority (GLWA), collects from the local sewer pipes and pumps or uses gravity to take it to the Combined Sewer Overflow facilities and the Water Resource Recovery Facility for storage, pre- treatment, when necessary, and complete wastewater treatment.

# WELCOME FROM MAYOR MIKE DUGGAN

After Summer 2021, it should now be clear to everyone in Detroit, Michigan and this country that climate change is real. In the past 80 years, three of the eight highest single-day rain events have occurred in the last seven years (see chart below). Rising temperatures over the recent decades lead to more precipitation or rain. And, in the summer of 2021, we had three rain events over two inches in a matter of hours. Our climate has changed, and we must prepare for more rain and snow.

Beginning the night of Friday, June 25, 2021, many Detroiters experienced historic flooding that overwhelmed the existing City sewer system. We quickly responded, with the Detroit Water and Sewerage Department (DWSD), Department of Public Works (DPW) and General Services Department (GSD) cleaning streets, removing flood debris, cleaning and sanitizing basements for our most vulnerable residents, and inspecting and cleaning city sewers. We also worked with Governor Gretchen Whitmer and her Administration to apply for and secure a Presidential Disaster Declaration within two weeks of the rainstorm, which activated more than \$100 million to help residents and businesses recover through FEMA.

This rainstorm was compounded by two more rain events on July 16 and August 13, 2021.

Together, we can take steps to be more climate resilient. I am committed that the City of Detroit through DWSD and the Great Lakes Water Authority (GLWA) will do our part, though it will take time to design, engineer and construct the improvements. It starts right away with ensuring we maximize the tremendous and historic financial resources from the Biden Administration and Congress, including the American Rescue Plan Act and the Infrastructure Investment & Jobs Act.

We must all do our part. As a City we have a responsibility, and as a property owner you do as well. This new Detroit Basement Backup & Flooding Handbook is intended to inform you of what causes basement flooding and sewer backups and the steps you can take.

I cannot say we will eliminate all flooding – it's just not possible to predict every situation and storm. We can do much better than in 2021 and build a more resilient sewer system (refer to Pages 31 and 33 for information on GLWA and DWSD plans).



**Michael E. Duggan**  
Mayor  
City of Detroit

## TOP 8 SINGLE-DAY RAIN EVENTS

Date	Inches	
6/26/2021	5.77	Presidential Major Disaster Declared
8/11/2014	4.57	Presidential Major Disaster Declared
7/07/1998	4.34	
9/11/2000	3.71	
8/11/1964	3.21	
7/12/1966	3.19	
7/11/1979	3.08	
7/31/2018	2.96	

Source: Currentresults.com

# WHY YOU SHOULD PROTECT YOUR HOME FROM BASEMENT FLOODING

The Detroit Basement Backup & Flooding Handbook is directed to homeowner-occupants, landlords and renters. Tenants should consult their landlords about the recommended steps in this Handbook.

Basement flooding can occur for many different reasons. It can impact your property and quality of life in the following ways:

- Damage to basement flooring and materials
- Loss of furniture and entertainment systems
- Damage to personal, irreplaceable items
- Food spoilage
- Damage to furnace, hot water tank, washer, dryer and the home's electrical system
- Structural damage to the home, including possible damage to the foundation

In most cases, basement flooding damages are not covered by insurance, unless you have overland flooding insurance and a sewage backup rider. If you are a designated floodplain, you may qualify for specialized insurance. If your private sewer lateral service line and/or plumbing causes the flooding or backup, it is often the case that insurance will not provide any relief. Additionally, if the City of Detroit's sewer system is overwhelmed by a rain event, and it determined that there was no failure in the system that caused at least 50% of the issue, the Sewer Backup Damage Claim will likely be denied. Talk with your insurance agent about your riders, as well as about flood insurance if you are on the lower eastside of Detroit in the designated FEMA floodplain area. You may also refer to the information on the Water Line and Sewer Line Warranty provide by a third-party that is shared in this Handbook.

In this Handbook, you will learn what causes basement flooding and steps to help protect your home. Also, included is information about the work the Detroit Water and Sewerage Department (DWSD) and the Great Lakes Water Authority (GLWA) are doing to maintain the existing combined sewer system as well as take steps to become more climate resilient.

If you take every measure possible, there is still no guarantee that you can avoid all basement backup and flooding. The actions in this Handbook will help reduce the potential for backups and flooding in your home.



# REASONS WHY BASEMENTS BACKUP & FLOOD

There are several reasons why basements back up or flood. It may be one or combination of the following primary reasons.

- Heavy rainstorms or snowmelt
  - *Flooding can also occur during light rain and dry days due to private plumbing or foundation issues*
- Basement foundation cracks or other structural issues
- Grading of dirt, mulch or other material away that declines toward the house rather than away from the house
- Drain tiles cracked or broken on the property
- Blocked, collapsed, offset or cracked private sewer lines
  - Your pipe may be blocked with roots, wipes, feminine products or other debris
  - An offset pipe means it's connected to the city sewer at a point where it will not allow your sewage to flow into the city sewer collection pipe
- Blocked or broken basement drains
- Plumbing leaks inside your home
- Blocked and/or damaged catch basins
- Location in a floodplain
- Blockage or failure in city sewer

## Cause of Basement Flooding

### Why a basement may flood

Flooding of basements can occur any time. It can happen to anyone who has a basement, even if it never flooded before. While most often flooding occurs during big rains or rapid snowmelts in the spring, it can occur even during dry weather.

- Basements are inherently prone to flooding – they are, by definition, the lowest level of a building, typically built partly or entirely below ground level.
- Groundwater is water that is naturally located below the ground's surface – the groundwater level can be, at times, above the level of the basement floor; in some locations, groundwater can be always above the level of the floor.
- Sewer pipes are also located in the ground. This includes all varieties – storm, sanitary, and combined (most Detroit neighborhoods have combined sewer); while in most cases, sewers are below the level of the basement, the water level in the sewers can be, at times, above the level of the basement floor.
- Gravity does its best to move water from high to low; if either the groundwater level or sewer level around your home is above the basement floor, gravity will try to move that water into your basement; a crack in the foundation floor, for example, provides gravity with a perfect path for water to be pushed into the basement.
- Sanitary sewers always have a path to the home, by design, and it is called the sanitary sewer lateral service line; while under normal conditions, the lateral pipe allows water to flow from your home to the sewer, there is the potential for water to move from the sewer toward your home.

These circumstances described are shown in Figures 2 and 3, which are discussed in more detail below.

To understand why a basement might flood, it is important to show the more common pathways, intentional or not, that allow water to flow into or around your basement. Figure 1 indicates a typical home, and how it is serviced during normal conditions. Not all homes have a storm sewer lateral pipe (as shown in the figure); most have a single sanitary sewer lateral.

**Figure 1** highlights common problems (in red) that all might contribute to a higher risk of flooding. Most are on private property or are within a homeowner's ability to change - whether by regular maintenance or by specific projects reduce potential flooding sources. Some of these problems include:

- Poor lot grading - the sloping of the land is promoting water flow toward the house instead of away from the house.
- Unmaintained foundation - cracks have developed that allow water to seep into the basement.
- Problems with pipes - both the weeping tile and sewer laterals have problems that cause backups into your basement drains of either clear water (rainwater) or gray water (water with untreated sewage).

**Figure 1**

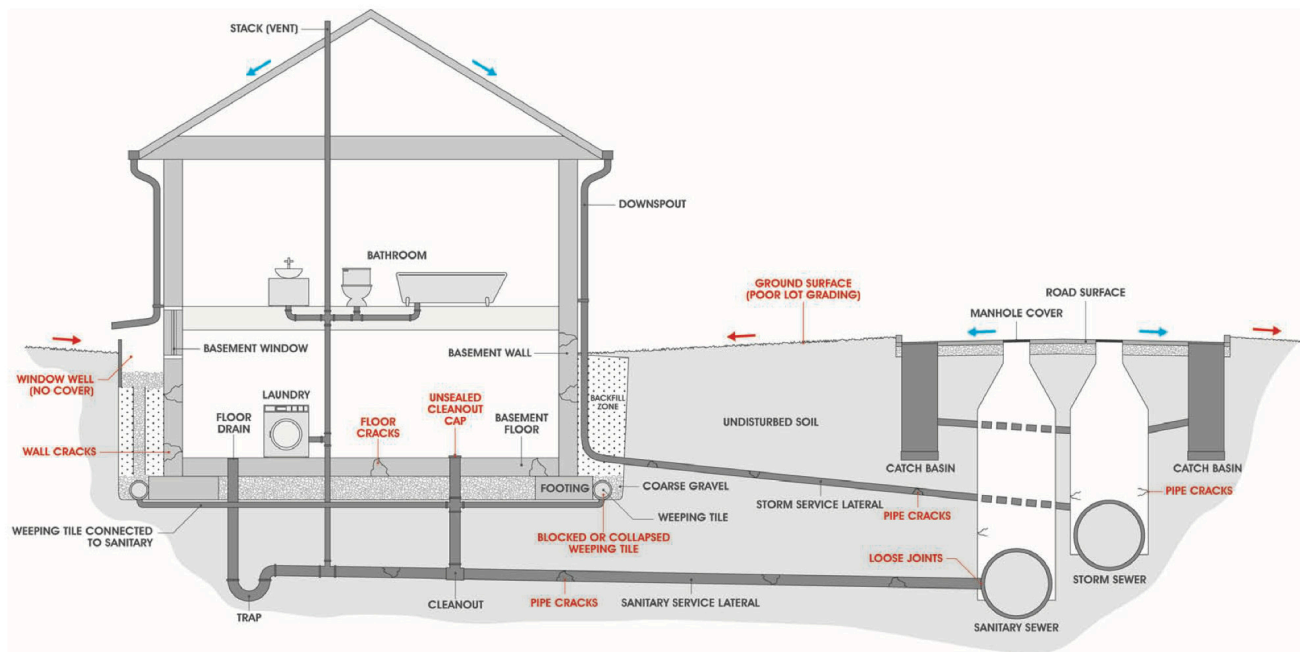


Figure 1: This image is for demonstration purposes only and not all Detroit houses have separate storm and sanitary sewer pipes.

# Flooding during dry weather

Most flood events do happen during wet weather, but it is quite possible for a flood to occur during dry weather, too. Three of the most common reasons are as follows:

1. A blocked or failed sanitary lateral. The sanitary sewer lateral service line, just like the shingles on your roof, or your paved driveway, is a feature that will degrade over time. As a lateral degrades, several things can happen. For example, tree roots might penetrate your pipe, and the lateral might collapse because of gradual deterioration. These scenarios can block the lateral, resulting in a sewage backup. And, the collapse or crack can not only result as backup into your home, but it can also create a sinkhole due to the shifting of the underground material.

In this case, it will be your own home's domestic wastewater that floods your basement. The only way for the wastewater to drain becomes the lowest fixture in the home – usually the floor drains or a basement level shower stall, sink or toilet. Your lateral, just like your roof, your driveway or windows, needs maintenance, and ultimately needs to be replaced or rehabilitated. Talk to a licensed plumber, who can carry out an assessment, and see the recommendations in this Handbook.

Another reason for blockage of a sanitary sewer is simply due to what is being flushed down the toilet. You should only flush the three P's: pee, poop and toilet paper. Flushing wipes of any kind, feminine products, toys, grease or other debris can cause a backup in your sewer lateral on your property, or even back up a neighborhood if the debris reaches the city sewer.

2. Foundation drainage failure. Some homes were constructed in lower-lying areas that are generally wetter than others. In such cases, the foundation drainage system, whether by gravity or by sump pump, must work continuously to keep the ground water level around the foundation lower than the basement floor.

Just as with sewer laterals, gravity foundation systems, often called weeping tiles, may degrade over time or get plugged by fine sediments. As a result, the ground around the foundation will cease to drain itself by gravity.

In other cases, sump holes in the foundation are constructed to accommodate a sump pump. These devices pump out the water around the foundation and either discharge it to the lawn or storm sewer. Discharging a sump pump to the sanitary sewer is illegal in the City of Detroit per the building code. It is possible for these pumps to fail, or simply be unable to keep up with the incoming water or get plugged. Refer to sump pump owner's manual.

This flood type will be discussed further in the wet weather section.

3. Water supply-line break or hot-water tank failure. Sometimes, a flood is due to a break in the home's internal water supply plumbing, including but not limited to the service line under the front yard, or failure of the hot-water tank. This can result from aging plumbing or equipment, a puncture of a pipe during construction, or freezing-induced splitting of a pipe.

# Flooding during wet weather

Flooding during wet weather is far more common than flooding during dry weather. Rain, ground-thaw and snowmelt put a heavy load on drainage systems, including the storm and sanitary sewers found underground. With the additional water on the surface and underground, there are several reasons why a basement might flood.

- Surface inflow, or overland flooding. During periods of heavy rain or rapid snowmelt, surface water may pool around the house, or accumulate in hard surface depressions such as driveways or roads adjacent to a home. During extreme weather events, this water can flow into the home. Proximity to the river or other waterways can also present a risk. Generally, proper grading on the property will reduce the risk of surface water getting into your home. This is illustrated in Figure 2.

One of the most common causes of water pooling up against a home is failure to maintain functioning gutters and downspouts. If those roof drainage systems fail, or freeze-up in the winter, they can cause all water from the roof to drain right beside the house and seep along the foundation wall and possibly into the basement. Refer to the disconnect downspout page in this Handbook if your downspouts are still connected to the drain tiles/underground storm system.

- Foundation drainage failure. Homes usually have some form of a drainage system built around them. This safeguard promotes the movement of water away from the basement and blocks the entry of water into the building.

For this reference, the waterproofing aspects of a foundation are considered part of the foundation drainage system. Within this category, there are four main causes for basement flooding (see next page), all generally a result of excessive groundwater around the foundation, as illustrated in Figure 2:

## Figure 2

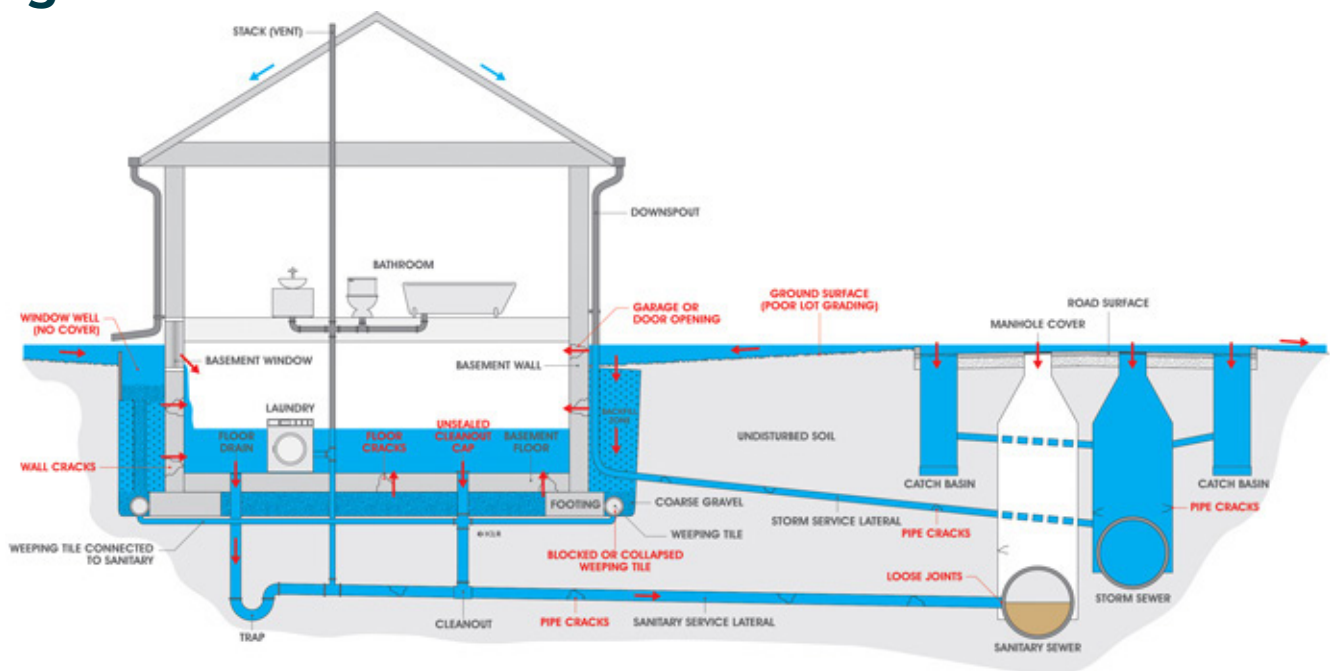


Figure 2: This image is for demonstration purposes only and not all Detroit houses have separate storm and sanitary sewer pipes.



1. **Seepage.** If the water table rises, water can enter the basement through cracks, holes and other unintended paths. This is generally considered to be part of the aging process of the home and the materials used to build it. Regardless of the condition of the drainage materials and pipe work around the foundation, if water can enter the foundation floor or walls via cracks and holes or other defects, it will likely occur during heavy rains, ground-thaw or snow-melt periods, when there's lots of water in the ground. Settlement of the lot grading around the building and downspouts discharging runoff water too close to the home can increase the amount of water around the foundation and increase the risk of water entering via cracks.
2. **Sump pump failure.** If your basement is equipped with a sump and sump pump(s), it can mean that the foundation drainage system of your home requires some assistance to keep up with the groundwater around it, or it simply cannot drain adequately by gravity to the surrounding ground or storm sewer. New homes are required to have sump pumps in these situations. Sump pumps, when working properly and adequately maintained, can safely pump excess water above the foundation and away from it. Ideally, this water should be routed to the lawn or storm sewer. If the pumps cannot keep up or fail to operate (perhaps due to a power failure, or malfunction), the groundwater level around the foundation can rise to the point that it flows up and out of the sump onto the basement floor. If you have a sump pump, you should have a backup power solution.
3. **Weeping tile failure.** Over time, the foundation drainage system can deteriorate. As a result, the weeping tile system can fail. This may be, due to a partially or fully collapsed pipe, or due to sediments plugging the pipes. If the weeping tile fails, the drainage of water around the foundation is either impeded or blocked altogether. As a result, the groundwater level around the foundation gets too high and it may spill into the basement via the sump, if one exists, or via leaks in the foundation. In situations where there are leaks in the sewer lateral or plumbing beneath the foundation, groundwater can inundate the sanitary lateral and restrict the flow of sanitary wastewater. This could result in both groundwater and/or wastewater entering the basement by way of the floor drain or lowest sanitary fixture.
4. **Sewer backup.** Most homes in Detroit only have one connection to the combined sewer system, and that is the sanitary sewer lateral coming from the back of the house. However, there are a few neighborhoods where homes have separate storm sewer laterals as well, for the purpose of foundation and downspout drainage, and these need to be maintained (See Figure 1).

These laterals form either one or two intentional direct connections to the city storm and/or sanitary collection systems. The city storm and sanitary systems operate well in most cases and are maintained through maintenance programs.

However, when a blockage occurs, or when the systems are overloaded during heavy rains, a sewage backup can occur into a house, as per Figure 3. Here are a few reasons why:

1. Sewers are full. When the sewers are full, this is called a “surcharged condition.” It means the pipe system is full and the water level in the manholes may rise well above the top of the pipe. If the sewage level in the system exceeds that of your basement, flows can be blocked, or worse, sewage can flow towards your home (see Figure 3). When this occurs, the wastewater may enter your basement by way of the lowest fixture, which is usually a floor drain, shower drain, sink, washtub or toilet.

The underlying cause of this is excess water in the sewer system, which ultimately overloads the sewer with more water than it was designed for. Excess water generally comes from leaks in the city collection pipes and private sewer laterals, inflow from surface features as well as illegally connected, private-side sources including foundation drains, sump pumps and downspouts. The technical term for this is “extraneous flow” or “inflow and infiltration.”

2. Flow restriction. Any situation that puts additional flow into the sewer lateral may make the problems of a partially or fully blocked sewer lateral worse. If flow is restricted, there is more chance a sewer backup can happen.

**Figure 3**

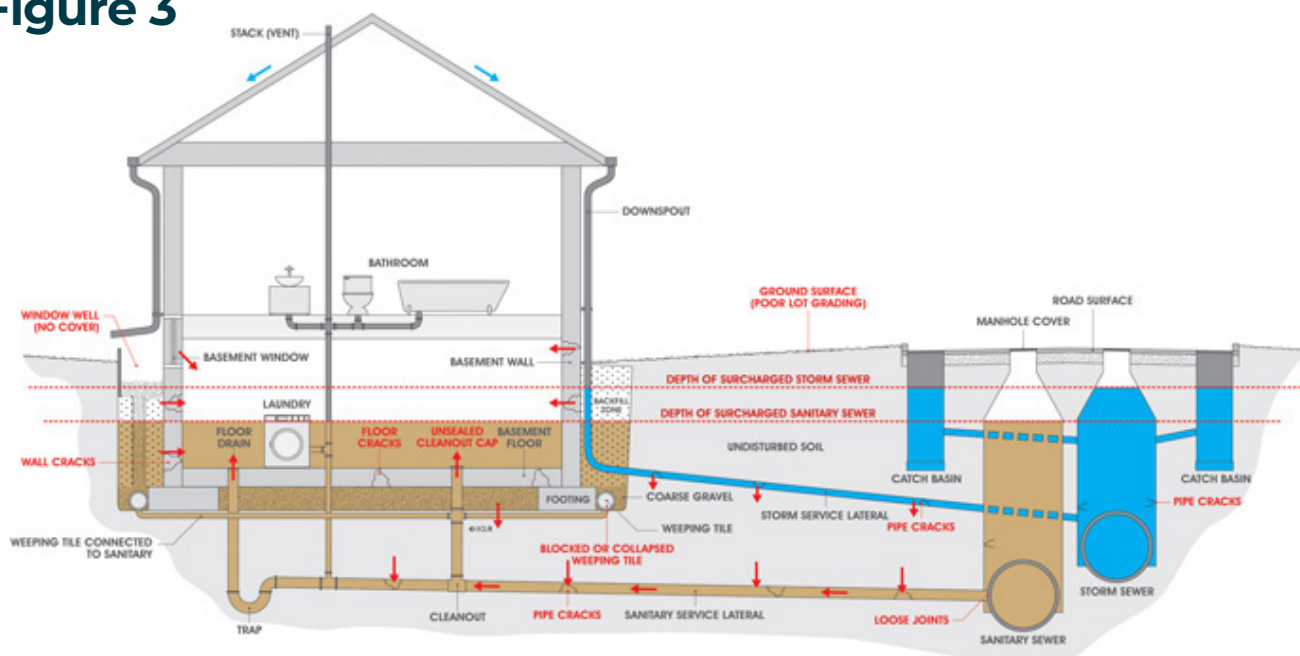
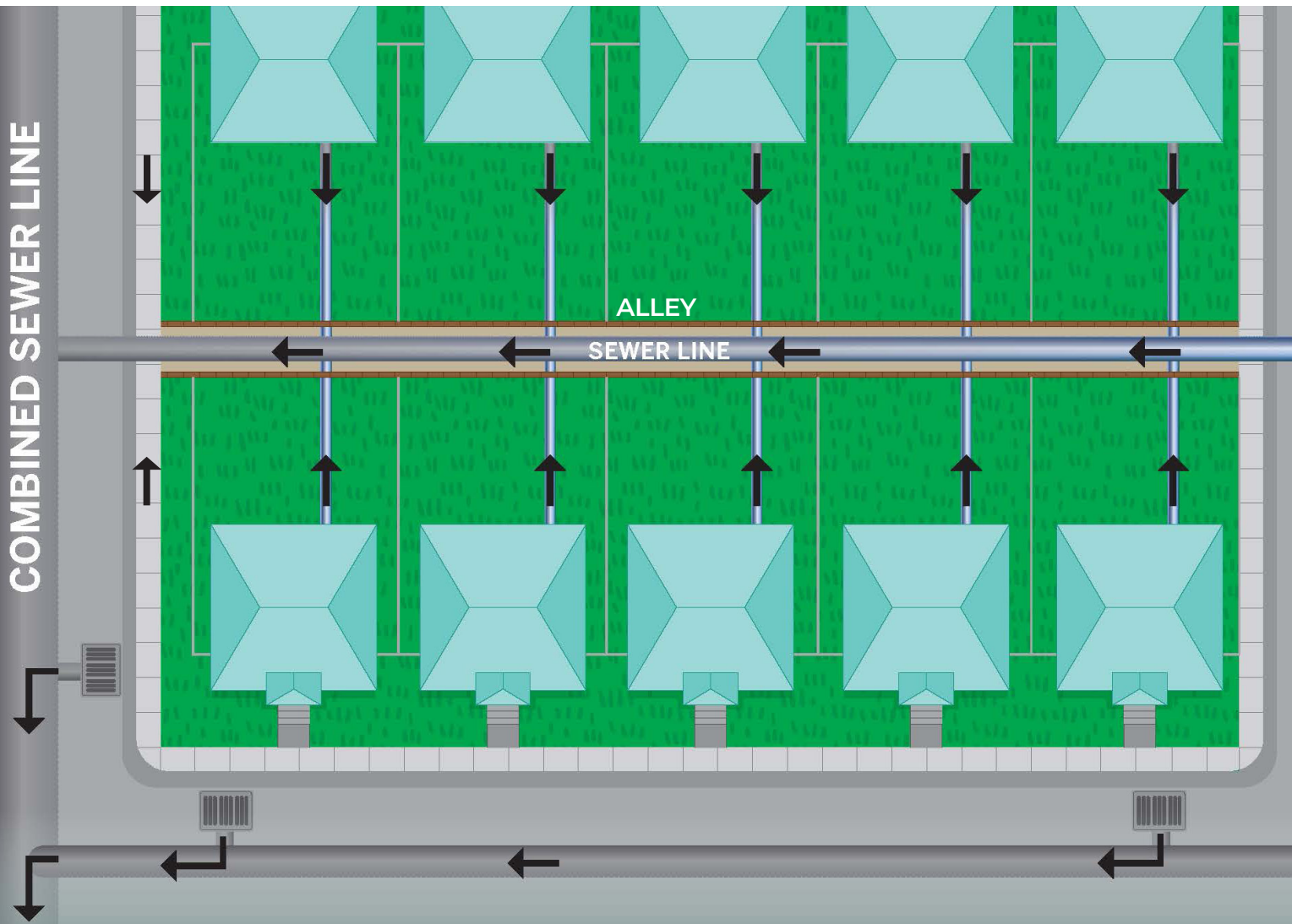


Figure 3: This image is for demonstration purposes only and not all Detroit houses have separate storm and sanitary sewer pipes.

**Flooding caused by sewer backup (Source: Handbook for Reducing Basement Flooding, ICLR, 2009)**

In summary, there are several different circumstances that can result in basement flooding. The following pages in this Handbook offer solutions to help reduce flooding.

# HOW UNTREATED SEWAGE AND STORMWATER ARE COLLECTED IN DETROIT (in most parts of the city)



To wet weather treatment facilities and Water Resource Recovery Facility

This diagram is intended for educational purposes and is not to scale.



# WHAT PART OF THE SEWER SYSTEM IS HOMEOWNER RESPONSIBILITY?

## WHERE'S YOUR LINE?

**Water:** Most of the city's water mains are in the front of a property. Mains are typically located in the street or the grass between the sidewalk and street.

**Sewer:** Most of the city's sewer pipes are located in the rear of the property; a few are located in the street. Sewers are typically in the alley or the city easement in your backyard.

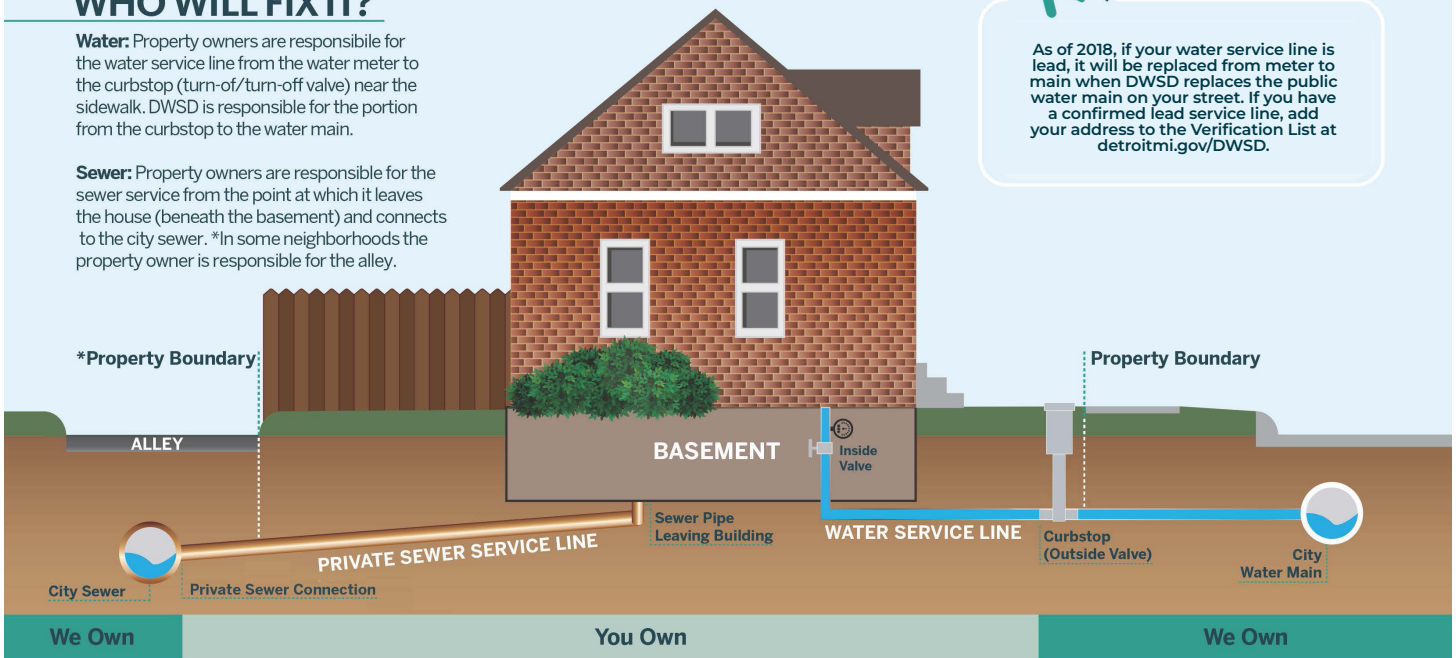
## WHO WILL FIX IT?

**Water:** Property owners are responsible for the water service line from the water meter to the curbstop (turn-of/turn-off valve) near the sidewalk. DWSD is responsible for the portion from the curbstop to the water main.

**Sewer:** Property owners are responsible for the sewer service from the point at which it leaves the house (beneath the basement) and connects to the city sewer. \*In some neighborhoods the property owner is responsible for the alley.



As of 2018, if your water service line is lead, it will be replaced from meter to main when DWSD replaces the public water main on your street. If you have a confirmed lead service line, add your address to the Verification List at [detroitmi.gov/DWSD](http://detroitmi.gov/DWSD).



# WHAT STEPS CAN I TAKE

There are actions homeowners can take to protect your property and steps all residents can do to help reduce the potential for flooding. Many are no or low-cost steps. Private sewer and foundation maintenance and preventative measures are recommended and do involve an expense.

- **Only flush the 3P's: pee, poop and toilet paper**
- Pour grease, fats and oils into containers instead of your drains
- Store items in basements on shelves and not on the floor; valuables should go as high as possible and be in waterproof containers
- Regularly clean gutters
- Frequently inspect floor drains and clean of any debris or blockage
- Maintain your sewer lateral service line and clean, repair as needed
- Clean above and around the catch basin(s) in front of your home
- Seal foundation cracks and repair other structural issues
- Regrade dirt, mulch and other material to slope away from the house
- Disconnect downspouts from the sewer system and redirect storm runoff onto your lawn
- Elevate utilities in your basement, including furnace and hot water tank
- Address plumbing leaks



Clean gutters regularly - clogs can lead to rainwater seeping down your wall and into your foundation



Identify and repair cracks in your basement wall



Clean above and around catch basins - reduce the potential for neighborhood flooding



**While we're doing the big stuff  
you can help with the small stuff  
and make a big difference.**



**Tip #1**

**Cleaning your catch basins of leaves, dirt and trash**

Periodically cleaning leaves and trash out of your catch basin will help reduce debris, better handle stormwater flows, and can help to reduce flooding. It's surprising what you'll find doing the small stuff.



**Tip #2**

**Dumping your fat, oil and grease in a disposable container**

Don't put fat, oil, or grease down your drain; eventually, it will build up and create blockages in your drains and may cause a backup into your home. Have your delicious cooking stick to your ribs and not to your pipes.



**Tip #3**

**Disconnecting your downspouts and rerouting the water**

Disconnecting your downspouts and directing stormwater runoff into lawns and away from the storm drains prevent it from flowing into streams or rivers. Who knew how much fun this could be.

**WORKING HARD FOR YOU.**

Learn more tips at [detroitmi.gov/watertips](http://detroitmi.gov/watertips)



**Water & Sewerage  
Department**

# HOW TO DISCONNECT DOWNSPOUTS

Disconnecting your downspouts from the underground drain tiles near your house can be a simple task that helps reduce basement flooding. The drain tiles due to age can be cracked and they connect to the sewer system. By disconnecting, where you can safely do so, you allow the

rain and snowmelt runoff into your lawn rather than into the sewer system. Every residential household receives a 25% green credit on the Drainage Charge part of your DWSD bill, assuming you already disconnected the downspouts.

## SUPPLIES NEEDED

- Work Gloves
- Eye Protection
- Dust mask
- Hacksaw
- Measuring Tape
- Marker
- Pliers
- Screwdriver
- Downspout elbow and extension

## SUPPLIES NEEDED IN STEP 4

- For straight pipe use
  - Rubber cap with hose clamp.

- For bell pipe use
  - Concrete
  - Chicken wire
  - Newspaper
  - Bucket
  - Putty Knife
  - Towel or clean rag

## STEP 1

Determine if the pipe where the downspout attaches is a bell shape or straight.



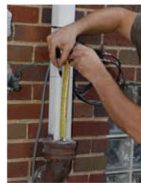
*Bell Pipe*



*Straight Pipe*

## STEP 2

Measure approximately 9" from where the downspout enters the storm drain pipe.



## STEP 3

Cut the downspout with a hacksaw where you measured and right above where the downspout enters the pipe. Remove that section of downspout.



## STEP 4

**NOTE:** Be sure to follow each part of this step in full, or there may be a sewage smell.

**Bell Shape Pipe:** Cut about 1 foot by 1 foot amount of chicken wire and form into cup shape. Place into the pipe just below the bell. Add crumpled newspaper on the top of the mesh (this will help ensure the concrete doesn't leak down into the sewer). Mix the concrete according to the direction (stiff mixture) and add concrete until it is flush with the top of the bell pipe.



**Straight Pipe:** Cap the sewer pipe. This prevents water from going in. In most cases, you should be able to use a rubber cap secured by a hose clamp. Use a screwdriver or ratchet to tighten the cap until it is secure.



## STEP 5

Insert the downspout into the elbow. You may need to crimp the end of the downspout with a pair of pliers to get a good fit. (You may want to secure the downspout with a screw or rivet).



## STEP 6

Attach a downspout extension to carry water away from the house and foundation. We recommend 5 feet in a direction away from foundations, sidewalks, and driveways. It is critical to make sure that disconnecting your downspout and redirecting the water does not cause a hazard or nuisance to you or your neighbors!



## **CLEAN SEWER LINE EVERY 1-2 YEARS**

Private sewer lateral service lines, coming from the house to the connection of the city sewer collection pipe can be as old or nearly as old as the city infrastructure. Add to this the fact that many Detroit neighborhoods have large trees where the roots can break into the sewer pipe to find water and other nutrients.

It's important in reducing flooding and home maintenance costs that most residents have their sewer service line cleaned at least every 2 years, every one year if you have large trees on or near your property. Having a licensed

plumber clean your entire sewer service line can help not only avoid backups but can reduce damage to your sewer pipe which can be much more costly than the \$75-\$150 sewer snaking (cleaning).

In some cases, you may want to consider hydro jetting your sewer service line if your plumber discovers large root balls.

Cleaning your sewer lateral regularly can help avoid bigger problems that can be much more costly. Repairing or replacing a private sewer lateral can cost between \$5,000 - \$20,000.

## **INSPECT SEWER LINE WITH CAMERA EVERY 3-5 YEARS**

Hiring a licensed plumber to place a camera in your sewer service line every 3-5 years can help detect failures including cracks, pipe collapses, etc. These could not only lead to backups into your home, but they can also lead to sinkholes behind or in front of your home (in most neighborhoods, the sewer lateral service line is behind the house). Defects or damages to your sewer lateral can result in a \$5,000 - \$20,000 repair or replacement.





## **BEFORE YOU HIRE, ASK THESE 4 QUESTIONS:**

**1**

### **ARE YOU LICENSED AND INSURED?**

Making sure your plumber is licensed and insured certifies they are qualified to perform and complete the work. Do not hire unlicensed or uninsured plumbers. In the event something goes wrong, you may be responsible and may need to hire a new contractor to make the proper repairs.

**2**

### **DO YOU HAVE A SPECIALTY?**

Some plumbers specialize in certain work. Make sure your plumber specializes in drain and sewer line cleaning. Also, they should have the ability to snake your pipe at least 75-feet, can place a camera in the pipe, and have a hydrojet option. You may need these additional measures depending on the severity.

**3**

### **DO YOU HAVE REFERENCES?**

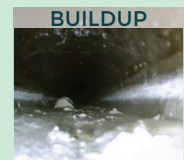
Most plumbers should be able to provide references upon request if you don't already have a recommendation from a trusted source.

**4**

### **HOW FAR DO YOU PLAN TO SNAKE?**

DWSD encourages residents to snake their sewer service line annually and most especially if you have large trees surrounding your home. Tree roots can cause damage to the pipe underground. Your plumber should identify the distance between your drain or cleanout and the city sewer collection pipe. Again, most houses are at least 75-feet from the city sewer pipe.

*Example images that might be seen when using a camera while snaking a sewer line.*



You can also watch our video by using the QR Code or going to [youtube.com](https://www.youtube.com) and searching "DWSD Tips for Homeowner Sewer Line Maintenance"



## **ONCE WORK BEGINS:**

- Watch the hired plumber perform the snaking.
- Make sure they are snaking your pipe all the way to where it connects to the city sewer system.
  - Using the camera connected to the snake, the plumber should also be checking for defects, especially if the snaking did not resolve the backup.

## **BEFORE THE PLUMBER LEAVES:**

- Request a clear and legible copy of the findings.
- Talk to the plumber and make sure that they took all the necessary steps to ensure the line is clear of defects.
- Get a copy of the video footage. If you cannot, take pictures of the potential issue using your smartphone for your records, as it may be needed for insurance and/or DWSD.

## How does DWSD clean city sewers?

DWSD uses sewer condition assessments, customer complaint records, risk factors (such as serving a hospital or school), and other data to determine where to inspect and clean city sewers. DWSD trained crews use Vactor trucks that can clean and vacuum the sewers more than 800 feet from the location of the manhole they are accessing.

At times, alleys need to be cleared and personal property moved to access the manholes for sewer inspection and cleaning.



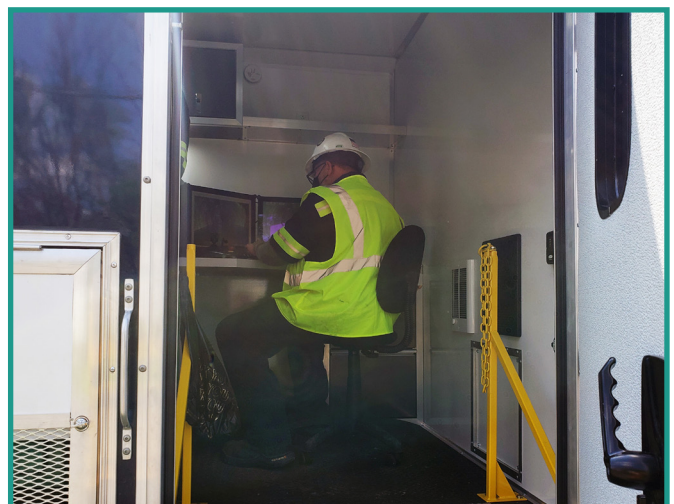
## What does DWSD do for televising?

When there is water in basement investigations or engineering evaluations for capital improvements, DWSD will clean and televise the city collection pipes. Based on the assessment, this may involve some later rehabilitation, either lining or pipe replacement, though in most cases the city sewer condition is functioning properly after cleaning and rodding.

During this televising, DWSD will also capture video of the condition of the private sewer lateral service line at the city sewer connection.

- If there is an apparent issue, DWSD will capture the video and send a photo of the issue to the resident in a “Fix It Letter.” The homeowner is responsible for making that repair stated in the letter.

- If a defect with the private sewer lateral service line is discovered, the homeowner will be advised to hire a licensed contractor, who will apply for a permit, and repair or replace the pipe.



# WATER SERVICE LINE AND SEWER SERVICE LINE WARRANTY



A Program for Detroit Homeowners

## Water Line and Sewer Line Protection Program

As a Detroit homeowner, you may be faced with the need to repair the water service line coming into your home or the sewer service line going out of your home.\* Many homeowners may be unprepared for the potentially high cost of repairs if a problem arises. The Detroit Water and Sewerage Department (DWSD) endorses American Water Resources (AWR) to offer Detroit homeowners a discount on the optional Water Line and Sewer Line Protection Program. For a low monthly fee, AWR will protect Detroit homeowners like you from unexpected repairs to the water and sewer lines that service your home.

- Unlimited protection for covered water line and sewer service line repairs.\*\*
- 24/7 support – Call AWR at 833-901-1888.
- Prompt repairs – Timely repairs to resolve your service line problems, performed by local, insured, independent contractors.
- 1-year warranty on all covered repairs to ensure quality of work.
- Convenient payment options – Choose from monthly and annual payments.
- **Discounted pricing – DWSD special pricing of \$7.98 per month for the Water Line and Sewer Line Protection Program. That's over a 60% discount from regular pricing.**

### About AWR's Water Line and Sewer Line Protection Program and Detroit's Basement Backup Protection Program:

AWR's optional Water Line and Sewer Line Protection Program is available to all Detroit homeowners and helps protect customers from unexpected repair costs associated with water and sewer line repairs. AWR's program is separate from and complementary to the City of Detroit's Basement Backup Protection Program, which is only available in select neighborhoods and to select residential homeowners for protecting their property during rainstorms. The Basement Backup Protection Program does not provide for the repair or replacement of water or sewer lines.

\*If you live in a dwelling like a condo, please contact your local homeowners association to determine your responsibilities.

\*\*Protection does not include a septic tank or the components thereof and other exclusions apply, see Terms and Conditions for details.

American Water Resources is a trademark of American Water and used under license. AWR's optional programs are not provided or guaranteed by American Water or its affiliates.

DET06



# REDUCE BACKUPS AND FLOODING WITH NEW EQUIPMENT

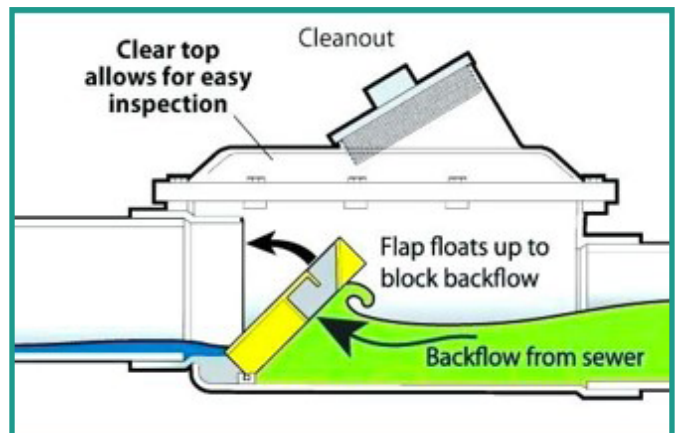
In areas or neighborhoods of Detroit with historic occurrences of basement backups and flooding during rain events, it is advised that you consult with a licensed plumber about your property and how to protect it. You may need to install a backwater valve to reduce basement backups in you home and/or a sump pump to reduce flooding in your basement. Please also refer to the City of Detroit Basement Backup Protection Program in this Handbook if you have a home in one of the target neighborhoods (see page 24).



Steps involving a backwater valve installation



Contractor removing a portion of the basement floor and digging underneath to expose the sewer service line in order to install the backwater valve



How a backwater valve works

Sump pumps move water from the lowest point of the basement out of the home. A plumber will carve out a hole in the floor of the basement and install the sump pump. The pump's valves sense escalating water levels and turn on when the water pressure threshold is met, pumping water away from the home through a discharge line. Not all homes in Detroit need a sump pump - the plumber's assessment will determine if a sump pump is needed.

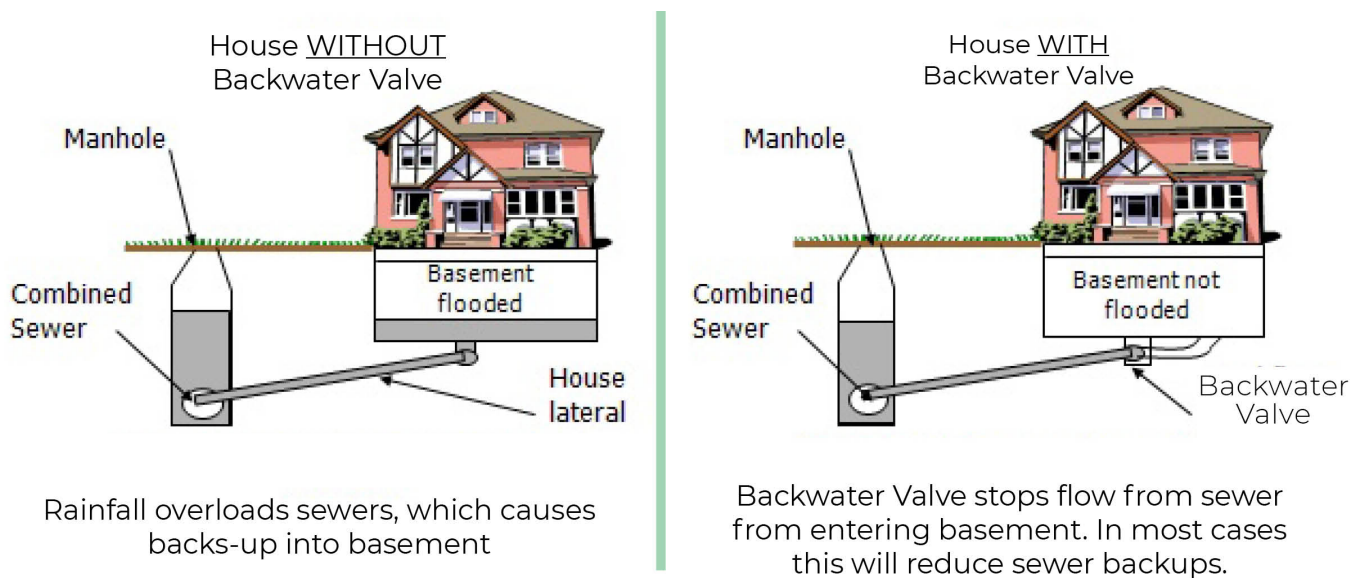


A sump pump attached to the drain tiles around a basement foundation

# WHAT IS A BACKWATER VALVE?

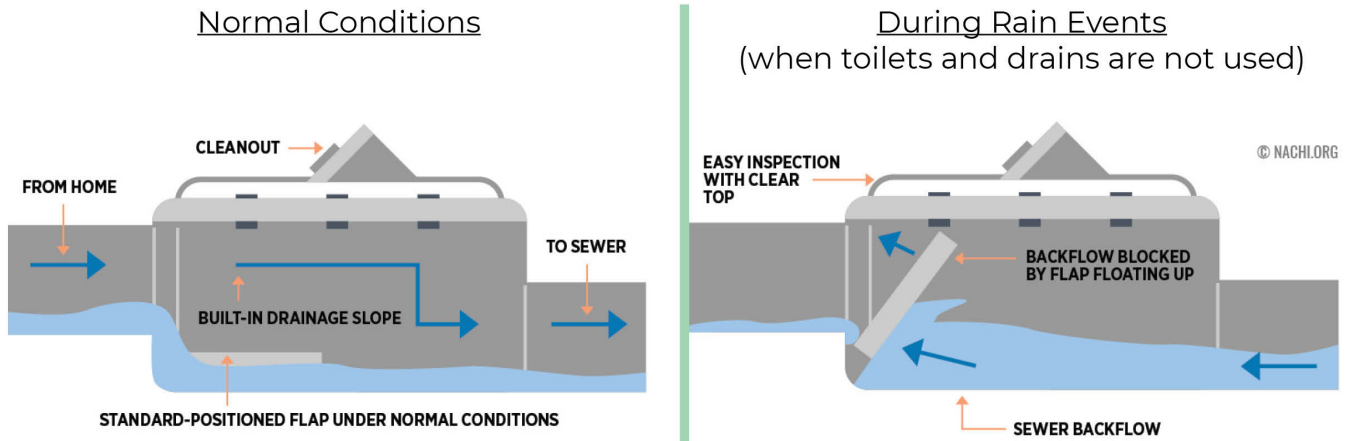
The valve, when properly maintained, helps protect your home and will push the sewage back out into the system and possibly into your street

During a rain storm or heavy snow melting, a sewer backwater valve can help reduce flooding into your basement. If kept clear of obstructions, a backwater valve allows water to flow freely from your house to the sewer, but is designed to close itself if water tries to come back from the sewer toward your basement. Installing a backwater valve, combined with disconnecting downspouts and drain tiles from the sewer, can effectively prevent basement flooding in most cases (see diagram below).



The backwater valve is installed underground on your private sewer lateral service line under your basement. A small area of your basement is dug up and restored to install the backwater valve. Licensed plumbers can do the installation. In order for the backwater valve to work properly, you must periodically make sure it's clear of debris. Also it is important that you do not use the toilets, your washer, dishwasher and drains during storm events. This flow could prevent the valve from being able to close in the event of a backflow (see next page for detailed diagram of how the backwater valve works.)

## Sewer Backwater Valve



*Detailed example of how a backwater valve works.*

Whereas a sump pump will help remove water from under and around your basement foundation, a backwater valve when used properly blocks sewage and stormwater from coming up into your basement floor drains. A closed valve will help protect your basement, though it will likely push the combined stormwater and sewage onto your street.





# **CITY OF DETROIT RESIDENTIAL BASEMENT BACKUP PROTECTION PROGRAM**

**What is the City of Detroit Basement Backup Protection Program?**  
Homeowners in 11 Detroit neighborhoods that have historically experienced basement backups during rain events are eligible to apply for this program.

With increasingly frequent and severe weather events, it is important for residents to take measures to protect your property. There are small steps you can take to reduce basement backups and flooding as outlined in the City of Detroit Basement Backup & Flooding Handbook.

Local, county and state government agencies are assessing implementation of climate resiliency plans.

Property owners should disconnect downspouts from the sewer system, and where necessary install a backwater valve and/or sump pump to help reduce the potential for basement backups at houses, especially for areas that experience a history of basement backups.

The City of Detroit is offering residential homeowners (owner/occupied and landlords of residential houses and duplexes) who have property within one of the 11 identified neighborhoods, a Basement Backup Protection Program. This is not offered to commercial property or nonprofits. The neighborhoods are based on historic basement backups and flooding reported to the Detroit Water & Sewerage Department (DWSD).

Phase 1 of the Basement Backup Protection Program is currently offered to homeowners in the Victoria Park and Aviation Sub neighborhoods, which were the hardest-hit areas during the June 25-26, 2021 rain event and have a history of basement backups during rainstorms. Phase 1 began in Spring 2022.

View the [map](#) for the neighborhoods that are eligible for Phase 2. This phase is scheduled to begin in 2023 and end by December 2024 or when funding is exhausted. These neighborhoods are based on a history of basement backups and funding availability.

The Detroit Basement Backup Protection Program is funded by the Detroit Future Fund, possible only due to funds approved by U.S. Congress and President Joe Biden for the American Rescue Plan Act. The Fund pays for most of the cost. No water and sewer rate dollars are used. Homeowners that have residential property in either phase can apply now.

## **Basement Backup Protection Program at a Glance:**

Eligible work is subject to available funding, provided on a first-come, first-served basis and must meet the requirements listed in the application and the property must be in one of the target neighborhoods. DWSD will manage the program.

- The maximum lifetime limit for this program per residential, non-commercial property is \$6,000. Services that are eligible include:
  1. Inspect sewer lateral service line with CCTV (\$400 maximum)
  2. Disconnect downspouts and install extensions at least three feet from foundation (\$400 maximum)
  3. Install backwater valve only if sewer lateral service line is in viable condition (\$2,000 maximum)
  4. Install sump pump on properties where diversion is possible (\$3,500 maximum)
  5. Install backwater valve and sump pump with sump pump overflow (\$5,300 maximum)

### **What this program does not cover:**

- No replacement or repair of a sewer lateral service line from the house to the city connection.
- No replacement or repair of other private plumbing.
- No repairs to basement foundation or floor, such as pre-existing cracks, gaps and failing seals.
- No reimbursement for additional or alternative power for sump pumps.
- No reimbursement for existing backwater valve and/or sump pump.
- No replacement of an existing backwater valve or sump pump.
- No addition of another sump pump and/or backwater valve.
- No plumbing repairs on the private property including inside the house and the water service line.
- No homeowners in neighborhoods outside of the target areas will be eligible due both to funding capacity and based on historic basement backup data.
- If you have a finished basement with flooring other than cement, this program will only cover repatching the cement floor – the City will not subsidize the cost for restoring any tile, wood, carpeting, other materials, and/or fixtures.

## Requirements

- This subsidy program is only for residential, non-commercial property (occupied houses and duplex homes).
- Funding must be available at time of application - check [detroitmi.gov/basementprotection](https://detroitmi.gov/basementprotection) to see if there is a notice that funding has been committed (exhausted).
- For Phase 1 eligibility, the homeowner must have an occupied house or duplex in Victoria Park or Aviation Sub neighborhoods.
- For Phase 2 eligibility, the homeowner must have an occupied house or duplex in one of the 9 targeted neighborhoods as defined in the map at [detroitmi.gov/basementprotection](https://detroitmi.gov/basementprotection).
- The homeowner will review and sign a waiver once initial approval of your application has been granted.
- After the signed waiver is received, the homeowner occupant or landlord will receive an invoice estimating the services.
  - Homeowner occupants can have a waiver for the deposit if enrolled in the DWSD Lifeline Plan; you can apply if you are low or moderate-income and become eligible for the waiver if you get approved and enrolled in the plan.
- DWSD will schedule an appointment for a pre-inspection by the City of Detroit Buildings, Safety Engineering & Environmental Department (BSEED), and must pass the inspection to be eligible to participate - depending on the phased schedule this occurs in 2022 or in 2022-2024.
- After the inspection is approved, a licensed plumber, assigned by DWSD, will visit the property to inspect the private sewer lateral that services your home. At this time, the plumbing contractor will review a list of eligible flood mitigation upgrades through the Basement Backup Protection Program.
- Based on BSEED initial inspection and the plumber's assessment and estimate, DWSD will deny or approve the work to be performed under this program.
- BSEED will issue a permit and inspect the final work.
- **All** eligible basement flooding protection work **must** be performed by a contractor/licensed plumber contracted and scheduled by DWSD.
- If the downspouts are disconnected, they must safely be routed onto grass or a flower bed, and not on cement or towards a neighboring house, which can be done under this program.
- Any work performed by the homeowner themselves **does not** qualify for subsidy.
- Disputes with respect to qualifying work will be resolved by the representative from DWSD.
- The contractor will use material/fittings that are approved by the Detroit Building Code, including the backwater valve and sump pump specifically approved for this program.
- DWSD will pay the authorized contractor upon completion of the work, including proper inspections.
- If water bill arrears exists, account holder must agree to enroll into a payment plan or low-income assistance plan.

## How do I Receive Approval?

Homeowner verifies their residential house or duplex is in the defined area based on the map on this page, then apply online. Tenants cannot apply. Once DWSD has provided pre-approval, the homeowner takes the follow steps:

- Homeowner must allow BSEED to perform an inspection inside and outside the home.
- Homeowner must sign a legal waiver before work begins, which starts with an estimate and a sewer inspection by the plumber authorized by DWSD.
- Plumber will share the estimate with homeowner and send to DWSD for approval.
- DWSD will pay the plumber directly for the cost of the approved invoice.
- Final inspection is required before the payment is approved and is provided directly to the plumber.

## Application

Apply for the program by submitting an online application form at <https://detroitmi.gov/basementprotection>.

If you have any questions, email us at [dwsd-publicaffairs@detroitmi.gov](mailto:dwsd-publicaffairs@detroitmi.gov).

# A MESSAGE FROM DWSD

## DIRECTOR GARY BROWN

### Message from the DWSD Director

We thank our customers for your patience as we continue to analyze the impact from the Summer 2021 flooding and determine our next steps in how to make our sewer system more climate resilient. Refer to the next page that provides an overview of our planned projects.

This Basement Backup & Flooding Handbook is designed as a resource for the community.

The action steps provided in this Handbook are necessary as there is not one single thing that can respond to a major rain event or disaster alone. We must do these actions together – property owners, city government and the regional authority.

While we work on the big stuff – like lining and replacing City of Detroit sewers, engineering and installing stormwater management projects, and cleaning the sewers and catch basins – there are small things that every resident and property owner can do in the city. And, for those in neighborhoods with a history of backups and flooding during rain events, we recommend installing a backwater valve and/or sump pump to reduce impact on your property.

Learn about the Basement Backup Protection Program in this Handbook offered to neighborhoods with historic backups and flooding during rain events.

This Handbook will share what we are doing to be more climate-resilient and will better educate you about the causes of basement flooding, which are not the sewer system alone.

As always, we are working hard for you.



**Gary A Brown, Director**  
**Detroit Water & Sewerage Department**

### Did you know?

Detroit has primarily a combined sewer system that collects both untreated sewage and stormwater runoff from homes and businesses and flows to the treatment plants in the same collection pipe.

# DWSD CAPITAL IMPROVEMENT PROGRAM (CIP) OVERVIEW

DWSD is investing approximately \$100 million per year in upgrading the water and sewer systems, including stormwater management.

More than half of the CIP funds are invested in Detroit's sewer system: Sewer cleaning, lining and replacement, and stormwater management. Lining a sewer that remains in good condition can extend the life of the pipe 50 more years and is less disruptive to the neighborhood than excavating and replacing the piping. There are some areas where the sewer collection pipe will be replaced based on assessments.

Since 2015, DWSD has installed 19 Green Stormwater Infrastructure (GSI) projects that manage 75 million gallons of stormwater annually.

To separate the entire local sewer system in Detroit, it will cost an estimated \$20 Billion. However, there are areas where it makes sense to redirect or separate the stormwater (see project listing).

DWSD uses condition assessments to determine upgrades by reviewing previous repair data, placing cameras in the city sewer pipe, and analyzing risk data in the neighborhood under survey.

## Upcoming projects to improve sewer capacity and stormwater management includes:

- Sewer cleaning on a weekly basis, including catch basins;
- Far West Detroit Neighborhood Improvement Project includes redirecting stormwater from 1.5 square miles neighborhood to two new detention basins Rouge Park - construction is in progress;
- Fenkell Stormwater Project to manage more than 110 million gallons - in lower eastside stormwater study pending grand funding design phase; and
- Several neighborhoods with sewer lining or replacement based on assessments.

## DWSD's goal is to improve service delivery and quality of life by:

- Reducing water main breaks;
- Reducing street flooding and sewer system failures;
- Reducing future investment in new CSO facilities (wet weather treatment);
- Increasing acres managed by green stormwater infrastructure;
- Coordinating with other public and private agencies to maximize dollars invested and minimize disruption from construction activity;
- Increasing job opportunities for Detroiters; and
- Upgrading and maintaining facilities, equipment and systems for effective operations.

See DWSD Capital Improvement Program updates at [www.detroit.gov/DWSD](http://www.detroit.gov/DWSD).

Total sewer assessed since 2018 when program launched: 300.75 miles  
Total sewer replaced or lined 2002-2022: 389.29 miles  
Sewer cleaned since 2021: 886 miles

# A MESSAGE FROM GLWA CEO SUZANNE COFFEY

The Great Lakes Water Authority (GLWA) is committed to working with our member partners, including the city of Detroit, regulators, fellow utilities, and other stakeholders to improve the overall resiliency of the regional water and wastewater system.

It is our goal to do everything within our power to provide reliable water and wastewater treatment services to the people of southeast Michigan.

While GLWA studies the impact on the regional system of the extreme weather events that occurred in the Summer of 2021, we are at the same time, developing strategies that we can implement as soon as possible, as well as those that have a longer timeline, to help us mitigate flooding risks throughout the system.

I say mitigate, because science shows us that these extreme weather events will continue to happen due to climate change.

We also continue to move forward with the hundreds of millions of dollars in capital investments that are either currently underway or planned in the City of Detroit. Please see the overview of our Capital Improvement Plan on page 33.



**Suzanne R. Coffey, P.E.**  
Chief Executive Officer

## Did you know?

Due to the lower eastside being a low-lying, flood-prone zone, the sewer system uses three pumping stations to move combined sewer and stormwater. On the westside of Detroit, only gravity sewers are used (no pumping stations).

# GLWA CAPITAL IMPROVEMENT PROGRAM (CIP) OVERVIEW

GLWA will invest more than \$1.7 billion in the region's water and wastewater infrastructure through its Capital Improvement Plan (CIP) over the next five years, with an expected average annual investment of \$345 million.

The projects and programs included in the CIP aim to improve the regional system's reliability, redundancy and operational efficiency, as well as protect health and safety.

One important CIP program is GLWA's linear system integrity program (LSIP). The goal of the LSIP is to proactively assess and renew the regional system's more than 800 miles of water transmission mains and more than 200 miles of wastewater collection pipes. This program creates a specific framework for the ongoing inspection and assessment work that GLWA has been conducting since its creation in 2016.

Of the 182 projects included the 2022-2027 CIP, there are 76 either underway or planned in the city of Detroit including:

- Rehabilitation of the Detroit River Interceptor
- Replacement of the Conners Creek Pump Station and upgrades to the Freud Pump Station
- GLWA will use its observations from the June 2021 rain event and its impact on the Freud and Conners Creek Pump Stations to review the proposed design for potential performance enhancements
- Condition assessment of all of GLWA's combined sewer overflow facilities.
- Adding a diversion connection to the Northwest Interceptor in order to direct flows to the Oakwood Combined Sewer Overflow Control Facility.

See GLWA Capital Improvement Program updates at [www.glwater.org](http://www.glwater.org).



# GLWA AND DWSD RESPONSIBILITIES



## Roles and Responsibilities

- Operates regional water and wastewater system for communities in eight southeast Michigan counties, including the city of Detroit
- Bills member municipalities for water and wastewater treatment services
- Creates a collaborative, regionally-focused water and wastewater system that ensures all communities served have a voice in the direction of the utility
- Utilizes a partnership approach to operating the system based on mutual trust, collaboration, respect and open and honest communication



### Responsibility

- Collaborates with 88 member partners to ensure water quality for local customers in 112 communities (nearly 3.8M served)
- Collaborates with 19 member partners to ensure safe and sanitary wastewater treatment services for local customers in 79 communities (nearly 2.8M served)



### Customers

- Leases infrastructure from the city of Detroit
- Operates and maintains five water treatment facilities, one water resource recovery facility, as well as associated facilities and infrastructure
- Provides funding for and implements capital improvements to the regional water and wastewater systems
- Utilizes its double AA credit rating to secure favorable financing/lower interest rates on existing debt to allow for increase ability to use cash on hand to fund future capital improvements



### How It Works

- Operates the city of Detroit's local water and wastewater systems
- Bills residential and commercial accounts within the city of Detroit limits
- Provides compassionate customer service to all customers
- Offers payment plans and coordinates water affordability programs to eligible customers

- More than 230,000 residential, commercial, and industrial accounts within the city of Detroit

- Retains ownership of the city of Detroit's water and wastewater system (2,700 miles of water main and 3,000 miles of sewer collection piping)
- Leases infrastructure and water and wastewater treatment facilities to GLWA for \$50M a year over 40 years
- Utilizes the \$50M annual lease payment to replace aging city of Detroit water, sewer and stormwater infrastructure, starting with a \$500 million, five-year Capital Improvement Program (CIP) launched in June 2019

# Roles and Responsibilities

- Publishes a five-year Capital Improvement Plan (CIP) in partnership with member partners which outlines intended infrastructure projects in the water and wastewater systems and is evaluated annually
- Adopts an annual budget which includes capital, operating and maintenance expenses and limits yearly increase to no more than 4% (absent extraordinary circumstances)

- Leverages regional resources for member partner benefit, including maximizing use of existing public investments, coordinating asset upgrades and repairs with projects underway in member communities
- Determines capital improvements to meet service-level requirements and ensure long-term sustainability of the system
- Commits a dedicated half-percent of revenues to WRAP, a sustainable assistance plan that provides financial assistance, conservation education, minor plumbing repairs (including for bathroom and kitchen fixtures that pre-date the 1986 lead-free plumbing code change)
- Provides for enhanced financial transparency

- Sue McCormick, CEO; appointed and approved by GLWA Board of Directors
- Oversight by a six-member board comprised of one representative each from Oakland, Macomb and Wayne counties, two representatives from the city of Detroit, and one appointed by the Michigan governor to represent member communities outside of the tri-county area



- Replace full lead service lines, mostly residential, in Detroit as part of the CIP and per new state law to replace them within 40 years



- Expansion of enhanced Customer Assistance Programs administered through third-party, qualified service providers
- Focus on Detroit and improve operational practices have led to vastly improved customer outreach, responsive and preventative maintenance of the systems, and innovation in program implementation
- Reduces the amount of stormwater entering the wastewater system through a Green Infrastructure Program with 17 projects that manage 61 million gallons annually



- Gary Brown, Director of DWSD, appointed by the Mayor of Detroit and approved by DWSD Board of Water Commissioners in January 2016
- The DWSD Board of Water Commissioners is comprised of seven board members that are Detroit residents appointed by the Mayor of Detroit

# WAYNE COUNTY AND STATE/ MDOT RESPONSIBILITY

The Wayne County Department of Public Services is responsible for the roadways and storm collection system on county roads, including Outer Drive. Visit [www.waynecounty.com](http://www.waynecounty.com) and select Public Services to see county road construction updates and report road issues specific to county-maintained roads. You may also contact your designated Wayne County Commissioner.

The Michigan Department of Transportation (MDOT) is responsible for the pavement and stormwater collection system for state and federal roads including freeways I-96, I-94, I-75, I-375 and I-275 and surface roads Grand River, Gratiot, Telegraph and Woodward.

To see MDOT construction projects or report an issue, go to [www.michigan.gov/mdot](http://www.michigan.gov/mdot) or contact your state legislator.

These government entities are working on collaborative efforts with GLWA and DWSD to improve stormwater management.

# RESOURCES

## Terms and definitions

See Page 37.

## Climate Change Simplified – Impact in Detroit

Meteorologist and Climate Specialist Chris Edwards, formerly with WJBK-FOX2 and WXYZ-TV, partnered with Climate Central to provide a fact-based presentation on Climate Change and its impact. On page 40 is a portion of his presentation. The entirety of his presentation can be provided to you or your group by contacting Chris via Twitter @ChrisEdwardsTV.

See Page 40.

## Assistance programs

See Page 41.

## Important phone numbers and websites

Detroit Water & Sewerage Department  
**313-267-8000** Customer Service  
Report issues on Improve Detroit  
mobile app  
**[detroitmi.gov/DWSD](http://detroitmi.gov/DWSD)**  
**[detroitmi.gov/watertips](http://detroitmi.gov/watertips)**

## Definitions

**Backwater valve** – A valve placed in the sewer lateral to prevent water from backing up into the basement; sometimes referred to as a backflow valve.

**Capital Improvement Program** – A program funded by water, sewer and drainage rates, grants or other sources (not property tax dollars) to rehabilitate and upgrade the pipes, valves, and facilities related to the water and sewer systems; also referred to as CIP.

**Catch basin** – Catch basins direct surface stormwater to the underground storm or combined sewer system. Catch basins can be seen in the diagram on page 13, third picture down.

**Cleanout** – A cleanout port allows for access to the home's sewer laterals for cleaning and maintenance purposes. Cleanout ports may be located either in the basement, close to where the sanitary sewer lateral enters the basement, or outside of the home, usually somewhere close to the foundation or between the home and the street. On most Detroit properties, the cleanout is only in the basement.

**Climate change** – A long-term change in the earth's climate, especially a change due to an increase in the average atmospheric temperature; Detroit and Michigan have seen an increase in temperature causing an increase in perception in all four seasons. Climate resilience – The ability to anticipate, prepare for, and respond to hazardous events, trends, or disturbances related to climate; improving climate resilience involves assessing how climate change will create new, or alter current, climate-related risks, and taking steps to better cope with these risks.

**Combined sewer** – A sewer that has been designed to convey both sanitary sewage and storm sewage. This type of sewer often services older Midwest and East Coast cities and areas of Canadian communities.

### **Combined sewer overflow (CSO)**

– Combined sewers are designed to automatically bypass treatment facilities and re-route excess, untreated sewage to local surface water bodies when they become overwhelmed with excess sanitary and storm sewage. This automatic bypassing is called a combined sewer overflow.

### **Detroit Water and Sewerage Department**

– Operates and maintains the local water and sewer systems; collects bill payments for services provided in Detroit; is a City of Detroit enterprise department; Board of Water Commissioners sets the rates and approves contracts; also referred to as DWSD.

**Exfiltrate** – Exfiltration occurs when high pressure water or sewage is forced out of sewer pipes or sewer laterals through cracks or loose joints in the pipes.

**Foundation drain** – See “Weeping tile.”

**Great Lakes Water Authority** – Leases and operates the regional water and sewer systems from the City of Detroit; on the sewer side, operates the larger collection pipes, sewer interceptors, pumping stations, its board sets wholesale rates during public meetings; also referred to as GLWA.

**Green Stormwater Infrastructure** – A practice to use engineered features and nature to capture rainwater and snowmelt and either retain it to slow down the flow or detain and filter it and discharge directly to a waterway; also referred to as GSI.

**Groundwater** – Water that is contained within soil and between rocks below the earth's surface.

**Infiltration and inflow** – Infiltration occurs when groundwater infiltrates into the sanitary sewer system (for example, through cracks in pipes and loose pipe joints). Inflow occurs when excess stormwater enters the sanitary system directly, for example, through downspout connections, leaky manholes, and cross-connections where parts of the storm sewer system have been accidentally or illegally connected into the sanitary sewer system.

**Infiltration flooding** - Flooding that enters the home through cracks in the basement floors and walls. This water “infiltrates” through the ground and into the basement.

**Michigan Department of Transportation** - The Michigan Department of Transportation maintains the freeway system and major roadways, including the catch basins and underground stormwater collection system in those areas that connect to the regional sewer system; it uses state and federal funding; also referred to as MDOT.

**One in one-hundred-year storm** - A storm that has a 1 in 100 chance of occurring in any given year.

**One in five-year storm** - A storm that has a 1 in 5 chance of occurring in any given year.

**One in two-year storm** - A storm that has a 1 in 2 chance of occurring in any given year.

**Overland flooding** - Water that flows over the surface of public and private property, and can enter homes and buildings through doors, windows, vents, and other above-ground openings.

**Overland flow route** - A pre-determined route that is designed to direct overland rainwater and snow-melt flow in a controlled manner. Overland flow routes may include streets with heightened curbs or ditches, and often direct flows to nearby lakes, streams or rivers or to underground storm sewer systems.

**Permeable and impermeable** - Permeable surfaces, including grassy yards, have the ability to absorb a limited amount of rainfall. Impermeable surfaces, including paved driveways and roofs, have no ability to absorb rainwater. Soil may also be permeable or impermeable. For example, the backfill area around a home may be composed of more pervious soils, and undisturbed soils may be less pervious.

**Sanitary sewage** - Sewage that is created by use of a building’s plumbing (for example, sinks, toilets, dishwashers, laundry machines) and is considered a highly contaminated health hazard.

**Sanitary sewer** - An underground sewer-pipe that is designed to convey only sanitary sewage.

**Sanitary sewer lateral** - An underground pipe that connects a home’s plumbing to the municipal sanitary or combined sewer system; in most cases the connection is under the alley in Detroit.

**Sewer backup** - Sewage that is forced back through storm and sanitary sewer laterals from sanitary, storm or combined sewers. Sewage flooding typically enters lower levels of a home through plumbing fixtures, including floor drains, sewer cleanouts and basement toilets, sinks and showers.

**Storm sewage** - Storm sewage is created directly by rainfall and snowmelt. This water is cleaner than sanitary sewage and appear clear but can be contaminated with chemicals and debris.

**Storm sewer** - An underground sewer pipe that is designed to convey only stormwater flows.

**Storm sewer lateral** - An underground pipe that connects a home to the underground, municipal storm sewer system, which is only in certain parts of the city.

**Stormwater management** - The practice of managing overland and underground water flows created by rainfall and snow-melt. Stormwater management is commonly the responsibility of the municipal government, and in this case for Detroit, the responsible utility is DWSD.

**Sump-pit** - A sump-pit collects water from the home’s weeping tiles.

**Sump pump** - A sump-pump is a device that is placed into the sump-pit to pump liquid or wastes from a sump (secure hole in the basement).

**Surcharge** - The technical term for water backup in a sewer pipe due to insufficient capacity from overloading or blockage. See “Sewer backup.”

**Urban flooding** - Urban flooding occurs in urban areas, where there is a high concentration of buildings and impermeable surfaces, such as roadways, parking lots and roofs. This type of flooding can result from heavy rainfall, snowmelt or surcharging sewer systems. Urban flooding can occur in areas that are not at risk of flooding from rivers or other natural surface water bodies.

**Wayne County Department of Public Services** - Maintains the county roadways including the catch basins and underground stormwater collection system that connects to the local sewer system.

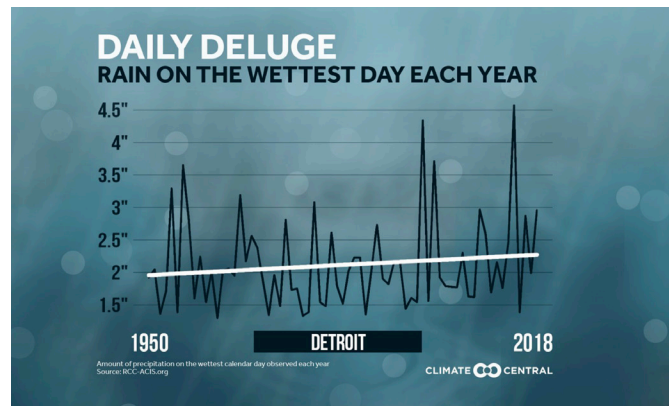
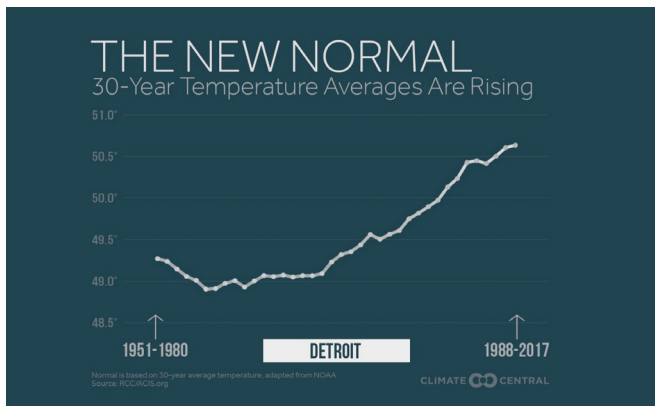
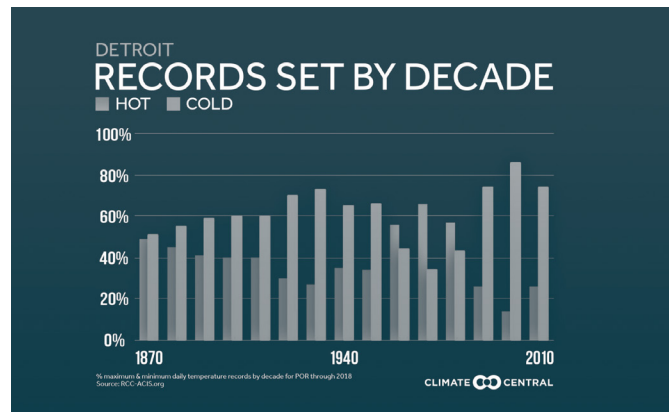
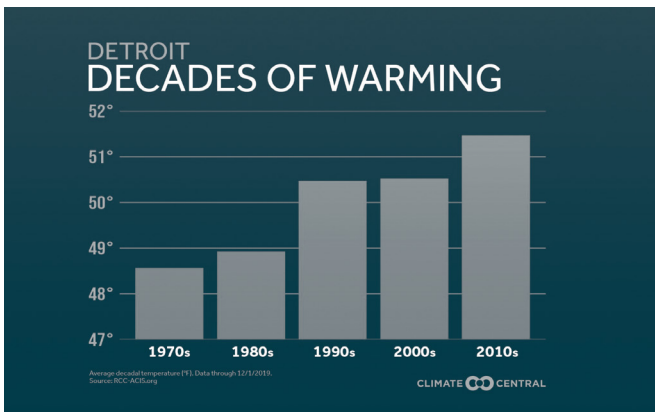
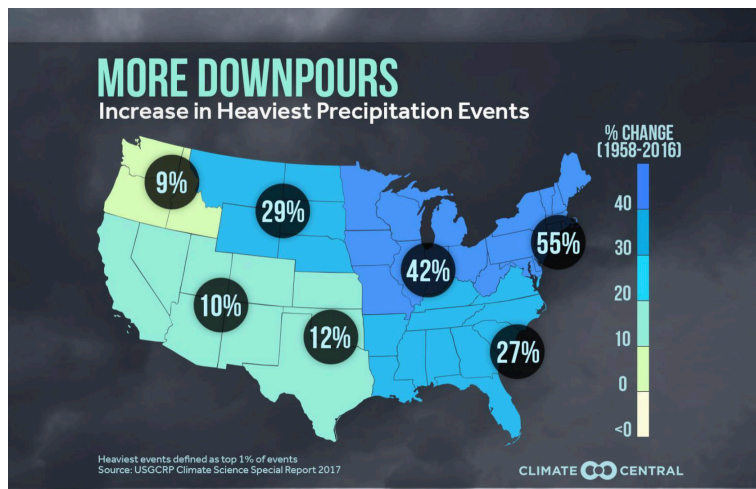
**Weeping tile** - A series of tiles or a perforated pipe located along the bottom of a building’s foundation that is used to collect and drain groundwater away from the building.

# CLIMATE CHANGE

According to the non-partisan organization, Climate Change Central, the temperature has risen in Detroit significantly over the decades, creating humidity that leads to more precipitation. The rain events that were experienced in Detroit in Summer 2021, leading to flooded basements, trend with this weather-based data. This trend is expected to continue - homeowners are encouraged to take steps to protect

their property, as well as government agencies implement strategies for climate resiliency.

Meteorologist and Climate Specialist Chris Edwards provided this content through Climate Change Central and has a full presentation available for community groups and others. Contact Chris via Twitter @ChrisEdwardsTV.





# DWSD IS HERE TO HELP

## No One Has To Lose Their Water Service In Detroit

The Detroit Water and Sewerage Department (DWSD) Lifeline Plan is Detroit's new water affordability program. Once enrolled, your benefits are:

- Get water **shutoff protection**
- Have your **past due balance erased** for good
- Receive an **affordable fixed bill** based on household income and size, and get up to **1,125 gallons of indoor water usage per household member per month**
- Eligible for **minor plumbing repairs** for high water usage



Call Wayne Metro at

**313-386-9727**



Complete online application at  
[waynemetrolife.org/DWSDlifeline](http://waynemetrolife.org/DWSDlifeline)

### TIER 1 135% FPL\*

\*Federal poverty level

You Pay Monthly

**\$18**

For water, sewer & drainage  
if your income is:

Number of People Living in the Household	Maximum Annual Household Income
1	\$18,075
2	\$24,352
3	\$30,630
4	\$36,908
5	\$43,185
6	\$49,463
7	\$55,740
8	\$62,018

### TIER 2 136% - 150% FPL\*

You Pay Monthly

**\$43**

For water, sewer & drainage  
if your income is:

Number of People Living in the Household	Maximum Annual Household Income
1	\$20,385
2	\$27,465
3	\$34,545
4	\$41,625
5	\$48,705
6	\$55,785
7	\$62,865
8	\$69,945

### TIER 3 151% - 200% FPL\*

You Pay Monthly

**\$56**

For water, sewer & drainage  
if your income is:

Number of People Living in the Household	Maximum Annual Household Income
1	\$27,180
2	\$36,620
3	\$46,060
4	\$55,500
5	\$64,940
6	\$74,380
7	\$83,820
8	\$93,260

DWSD has developed this water affordability program to keep everyone's rates low. This is also why water conservation is built into the program. Once your water debt is erased and you are enrolled, please pay your income-based monthly bill.

Updated: 2.2023

**TAKE PART:** Tap into the Lifeline Plan



Water & Sewerage  
Department

**WORKING HARD FOR YOU.**

FOR MORE INFORMATION, CALL

**313-267-8000**

[www.detroitmi.gov/DWSD](http://www.detroitmi.gov/DWSD)