

January 15, 2022

The Honorable Rick Hansen  
Chair, House Environment & Natural Resources  
Policy and Finance Division  
407 State Office Building  
100 Rev. Dr. Martin Luther King Jr. Blvd.  
Saint Paul, MN 55155

The Honorable Patricia Torres Ray  
Ranking Minority Member, Environment and  
Natural Resources Finance Committee  
95 University Avenue W.  
2225 Minnesota Senate Bldg.  
Saint Paul, MN 55155

The Honorable Josh Heintzeman  
Republican Lead, House Environment & Natural  
Resources Finance and Policy Committee  
353 State Office Building  
100 Rev. Dr. Martin Luther King Jr. Blvd.  
Saint Paul, MN 55155

The Honorable Carrie Ruud  
Chair, Senate Environment and Natural  
Resources Policy and Legacy Finance Committee  
95 University Avenue W.  
3233 Minnesota Senate Bldg.  
Saint Paul, MN 55155

The Honorable Bill Ingebrigtsen  
Chair, Senate Environment and Natural  
Resources Finance Committee  
95 University Avenue W.  
3207 Minnesota Senate Bldg.  
Saint Paul, MN 55155

The Honorable Foug Hawj  
Ranking Minority Member, Senate Environment  
and Natural Resources Policy and Legacy  
Finance Committee  
95 University Avenue W.  
2201 Minnesota Senate Bldg.  
Saint Paul, MN 55155

RE: Legislative Report on Future Wastewater Infrastructure Needs and Capital Costs as Required by  
Minn. Stat. § 115.03, subd. 9.

Dear Committee Chairs and Ranking Minority Members:

In keeping with the provisions of Minn. Stat. § 115.03, subd. 9, the enclosed report identifies and describes wastewater treatment facilities and sewer system upgrades and construction projects necessary to rehabilitate, expand, and improve wastewater infrastructure to meet existing and proposed water quality standards. The report includes appendices with detailed information on individual projects and communities.

Committee Chairs and Ranking Minority Members

Page Two

January 15, 2022

If you have any questions regarding this report, please contact me at [alexis.donath@state.mn.us](mailto:alexis.donath@state.mn.us).

Sincerely,

A handwritten signature in black ink that reads "Alexis Donath". The signature is written in a cursive style with a long, sweeping tail on the letter "h".

Alexis Donath  
Legislative Coordinator  
Commissioner's Office

AD:CO:cbg



REPORT TO THE  
LEGISLATURE

JANUARY 2022



# Future wastewater infrastructure needs and capital cost

FISCAL YEAR 2022

Understanding future needs for Minnesota's wastewater systems

# Minnesota's water infrastructure: Prepared for climate change?

## By the numbers



### There's lots of infrastructure.

Minnesota has approximately **800** publicly-owned wastewater treatment and sewer systems.



### Few have a climate plan.

Only **31** communities said they had completed a climate resiliency plan or a vulnerability assessment.



### Many communities say they need one.

**65** said they were interested in completing a climate resiliency plan.



### Some are at high risk.

**50** wastewater treatment plants are at severe risk of significant flooding over the next 30 years.



### There are now frequent overflows.

There are an average of **150** wastewater releases into our lakes and streams each year because of wet weather.

Source: 2022 Wastewater Infrastructure Needs Survey (WINS)

## Extreme weather threatens Minnesota's water infrastructure

### Our water is at risk now, and in the future.

In Minnesota, there have been over 550 incidents of wastewater overflowing into our environment as a result of wet weather since 2018. More than 50 wastewater treatment plants in Minnesota are at major to severe risk of significant flooding over the next 30 years.



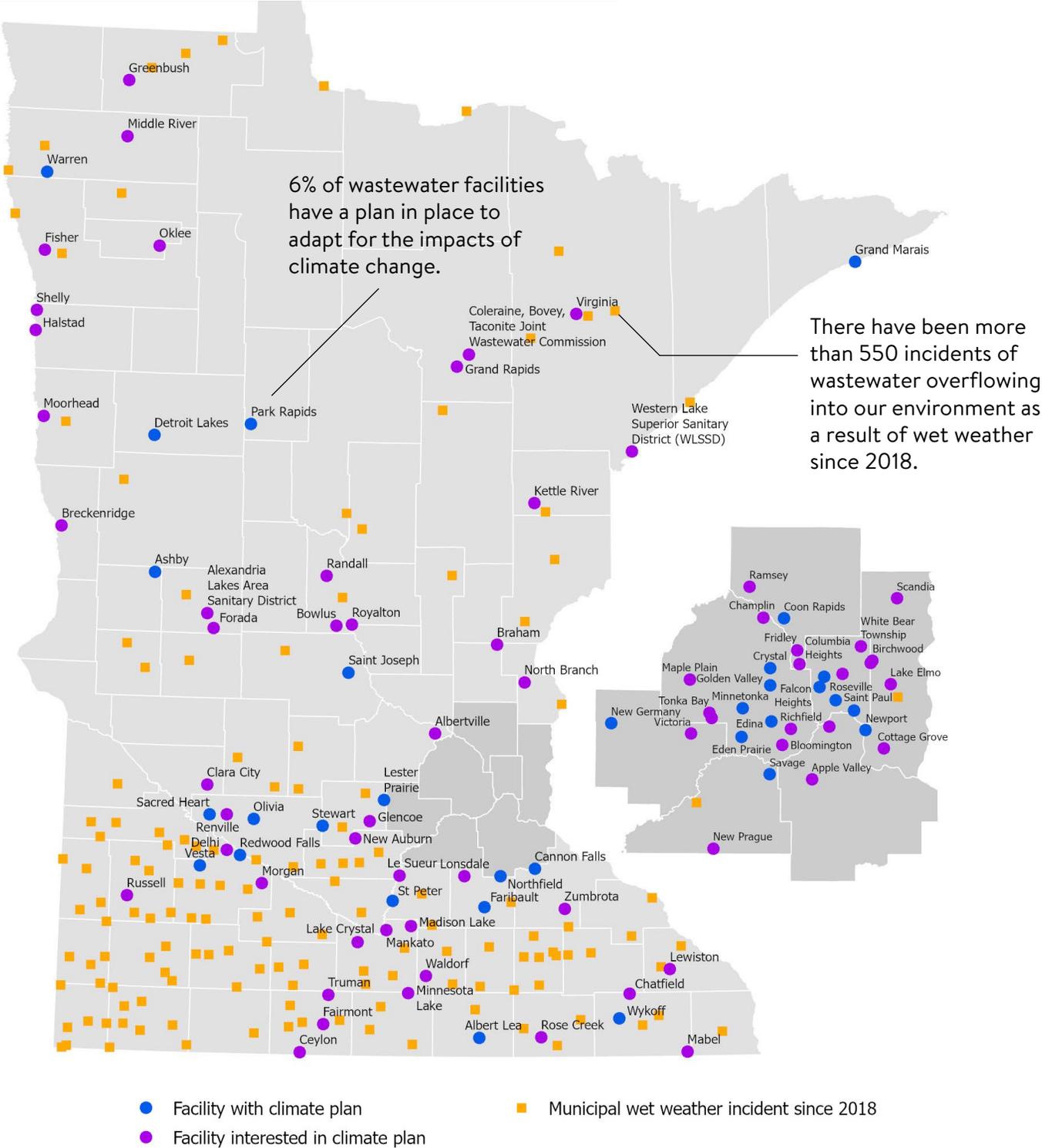
**Bigger burden for small communities.** Individuals pay for the cost of operating and upgrading local wastewater infrastructure through municipal fees. As a result, smaller communities struggle to make needed improvements to their systems, because they lack the population base that keeps maintenance and construction costs down in larger cities.

### We must partner with communities to prepare now.

State lawmakers should prioritize policy that will equip communities with the tools they need to prepare for climate change. Statewide funding for local infrastructure planning and upgrades will protect Minnesotans and our environment from future infrastructure failures caused by warmer, wetter conditions.

**State support is crucial.** The 2022 WINS responses indicate a critical need for support from the state of Minnesota to help local governments prepare their infrastructure for the impacts of climate change.

# Cities need support to prepare for extreme weather caused by climate change



**Contact** Alexis Donath  
 Legislative Coordinator  
 651-373-9277 alexis.donath@state.mn.us



www.pca.state.mn.us

## Climate planning in our communities

### Albert Lea: Ahead of the curve on climate planning

For the city of Albert Lea, extreme weather planning has always been a critical component of city infrastructure. Situated on low land, some properties in the city were built on swamps and lakes; streets regularly flooded after a rainfall of more than five inches. To address the issue, sump pump programs, drain tile inspections, sewer upgrades, and other projects were implemented rapidly.

Steve Jakne, Director of Public Works, described this as a long-term strategy. “We’ve made significant progress, but it’s not something you can fix over five to 10 years – it’s a 50-year process.”



Planning remains a top priority for the city. Projects such as storm-source systems and roadwork are often coupled together for efficiency’s sake. These updates can be three-times as expensive, but the urgency outweighs the cost. And while additional funding is critical for larger projects, cost-benefit analysis and guidance is also greatly needed.

#### Albert Lea’s future climate

+3-5 F warmer average annual temp than now



+5% higher average annual rainfall than now



+15% more heavy precipitation events annually



### Mankato: More opportunities to plan ahead

Mankato is implementing changes to wastewater infrastructure in direct response to Minnesota’s changing climate. Top priorities for the city include flood protection (riverbank stabilization, inflow and infiltration reduction efforts, etc.) and drought protection. Unprecedented rain events, wetter fall periods, and mid-winter thawing periods are of most concern to the city.

While there is support on a municipal level for climate planning, large-scale coordination is needed between city and regional organizations outside of Mankato. Mankato Wastewater Superintendent Josh Gad explained that project scopes often extend beyond hard infrastructure of wastewater treatment plants. Resources such as funding and employee bandwidth are needed to coordinate such integrated efforts, which Mankato does not currently have.

Gad explained, “We have several county tiles (tile drainage lines) that come into the city, and various creeks that flow into agriculture land. Given that climate resiliency needs vary depending on the entity, one decision can have compounding impacts on other stakeholders.”



Unprecedented rain events, wetter fall periods, and mid-winter thawing periods are of most concern for Mankato.

**Contact** Alexis Donath  
Legislative Coordinator  
651-373-9277 alexis.donath@state.mn.us

**MINNESOTA POLLUTION CONTROL AGENCY**

[www.pca.state.mn.us](http://www.pca.state.mn.us)

## Legislative charge

Minnesota Stat. § 115.03, subd. 9. Future costs of wastewater treatment; report.

The commissioner shall, by January 15, 1998, and each even-numbered year thereafter, provide the chairs of the house and senate committees with primary jurisdiction over the agency's budget with the following information:

- (1) an updated list of all wastewater treatment upgrade and construction projects the agency has identified to meet existing and proposed water quality standards and regulations;
- (2) an estimate of the total costs associated with the projects listed in clause (1), and the projects' priority ranking under Minnesota R. ch. 7077. The costs of projects necessary to meet existing standards must be identified separately from the costs of projects necessary to meet proposed standards;
- (3) the commissioner's best estimate, developed in consultation with the commissioner of employment and economic development and affected permittees, of the increase in sewer service rates to the residents in the municipalities required to construct the projects listed in clause (1) resulting from the cost of these projects; and
- (4) a list of existing and proposed state water quality standards which are more stringent than is necessary to comply with federal law, either because the standard has no applicable federal water quality criteria, or because the standard is more stringent than the applicable federal water quality criteria.

HIST: 1945 c 395 s 3; 1969 c 9 s 21; 1969 c 931 s 6; 1973 c 374 s 7-9; 1973 c 412 s 12; 1976 c 76 s 1; 1979 c 147 s 1; 1984 c 597 s 41; 1985 c 248 s 70; 1Sp1985 c 13 s 229; 1986 c 444; 1987 c 186 s 15; 1989 c 335 art 1 s 127; art 4 s 33; 1992 c 601 s 2; 1993 c 87 s 1; 1993 c 186 s 8; 1996 c 437 s 9,10; 1996 c 462 s 38; 1997 c 216 s 93; 2000 c 370 s 1; 1Sp2001 c 2 s 120; 2003 c 128 art 1 s 120,121; 1Sp2003 c 4 s 1

## Authors

Cara Omana, Municipal Division

Randy Thorson, Municipal Division

## Estimated cost of preparing this report (as required by Minn. Stat. § 3.197)

## Contributors/acknowledgements

Quinn Carr, Data Analysis Unit

Bill Dunn, Municipal Division

Total staff time: 234 hrs.	\$8,283.20
Production/duplication	\$31.48
Total	<u>\$8,314.68</u>

The staff team that compiled this legislative report gratefully acknowledges the time and effort that local elected officials, municipal engineers, staff contacts, and consulting engineers dedicated to completing the 2021 Wastewater Infrastructure Needs Survey (WINS).

## Minnesota Pollution Control Agency

520 Lafayette Road North | Saint Paul, MN 55155-4194 |

651-296-6300 | 800-657-3864 | Or use your preferred relay service. | [Info.pca@state.mn.us](mailto:Info.pca@state.mn.us)

This report is available in alternative formats upon request, and online at [www.pca.state.mn.us](http://www.pca.state.mn.us).

Document number: lrwq-wwtp-1sy22

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# Executive summary

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This report was prepared as required by Minn. Stat. § 115.03, subd. 9 to biennially document all identified wastewater treatment upgrade and construction projects and associated costs, project priority rankings, and residential sewer services charges for each community. This report also discusses whether any state water quality standards are more stringent than necessary to comply with federal law.

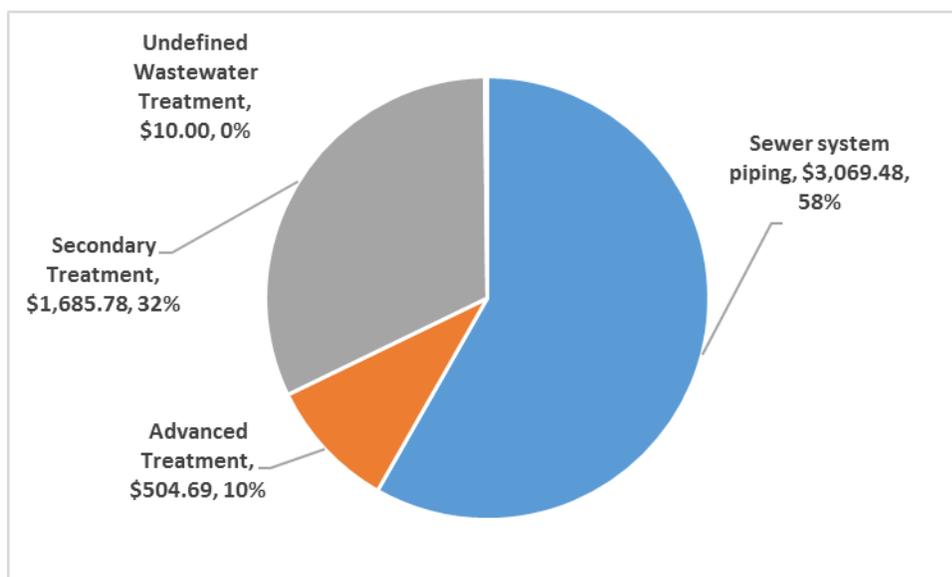
The Wastewater Infrastructure Needs Survey (WINS) was conducted electronically using Snap Survey. Data collected from the WINS was used in this report. While this procedure did generate issues with communities receiving the survey, we believe it was a success in terms of resource saving, better data quality, and number of responses received in comparison to past years.

It should be noted that observed trends could be impacted by the understanding and comfort level of communities completing the electronic survey rather than actual changes in “needs.” Over the coming years, we will monitor these trends to gain better understanding in what they mean.

## Statewide future infrastructure needs

Responding to the Minnesota Pollution Control Agency (MPCA) 2021 WINS of future wastewater treatment and sewer system needs, Minnesota’s communities identified **822 wastewater infrastructure projects** at a cost of **\$5.3 billion dollars**. These projects are necessary to rehabilitate, expand, and improve wastewater sewer systems and treatment facilities and to extend sewer systems to newly developed or existing areas that have wastewater improvement needs. The distribution of costs by type of project can be found in Chart 1.

**Chart 1: Statewide wastewater infrastructure needs by project type (millions)**



## WINS data summary

Some observations in the data submitted in 2021 include:

- Total projected statewide 20-year future infrastructure need increased by 22% from 2019 to 2021.
- The need for sewer system rehabilitation and upgrade (\$3,069.48 million) is significantly higher than wastewater treatment infrastructure work (\$2,200.47 million).
- Reported need for sewer system work increased by 28% from the 2020 WINS report.
- There was a 22% reduction in the reported number of infrastructure projects completed during this period in comparison to the data from the 2020 WINS report.
- Small communities more frequently struggle with affordability of infrastructure improvements.
- The age of sewer and wastewater treatment infrastructure continues to be a significant issue. A high percentage of sewer and wastewater treatment systems are near the limit of their expected useful life.
- Of the 539 communities that submitted WINS, 237 (44%) reported that they have an Asset Management Plan.
- Of the 539 communities that submitted WINS only 6% reported that they had completed a climate resiliency plan or a climate vulnerability assessment. Of the communities that responded that they did not have a plan, 15% said they were interested in completing one.

## Introduction

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### The purpose and scope of this report

In accordance with Minn. Stat. § 115.03, subd.9 the MPCA has prepared this report on:

- Future infrastructure needs and capital costs of rehabilitating, improving, and expanding publicly owned wastewater treatment and sewer systems estimated over the next 20 years.
- The affordability of wastewater infrastructure needs and residential costs.

Minnesota's publicly owned wastewater treatment systems are operated according to National Pollution Discharge Elimination System (NPDES)/State Disposal System (SDS) permits issued by the MPCA. The ownership and operation of publicly owned wastewater treatment and sewer systems is the work of approximately 800 Minnesota cities and sanitary districts. Of the latter, Metropolitan Council Environmental Services (MCES) and Western Lake Superior Sanitary District are the most prominent in the extent of services provided.

The information included in this report includes data from Minnesota cities and sanitary districts that own or operate wastewater treatment and collection systems that are covered by an NPDES/SDS Permit and that responded to the MPCA's 2021 WINS.

### Electronic survey format

WINS was conducted electronically using Snap Survey for a third survey cycle. Six hundred ninety-nine (699) communities and sanitary districts were emailed links to complete the survey on June 2, 2021, and 77% of these communities submitted a completed survey by September 1, 2021. The electronic format of the survey significantly reduced cost and staff time needed to print, mail, and manually manage data.

A significantly lower number of communities responded to the 2021 WINS than the 2019 WINS (685 in 2019, 539 in 2021). The survey was left open longer than in previous years and communities were contacted multiple times in an attempt to increase the rate of response.

## Data sources

The data in this report have been acquired from sources including:

### The 2021 Wastewater Infrastructure Needs Survey (WINS)

The 2021 WINS was emailed to communities and sanitary districts in June 2021 and 539 communities completed the survey. Six hundred sixty-three (663) projects were identified by those communities that completed the survey. The list of all projects reported in the 2021 WINS are provided in Appendix 1.

### The State Fiscal Year 2022 Project Priority List September 2021

The Clean Water Project Priority List (PPL) consists of project proposals submitted to the MPCA by communities and sanitary districts seeking financial assistance, generally within the next five years, for sewer and wastewater treatment construction projects, as well as stormwater projects. The MPCA prepares the PPL annually by ranking project proposals according to environmental criteria defined by Minn. R. ch. 7077. The PPL is then used by the Public Facilities Authority (PFA) to award grants and low-interest loans and supplemental affordability or pollutant-based grants. The State Fiscal Year (SFY) 2022 PPL is included as Appendix 2 of this Report. For information regarding PFA grants and loans, see <https://mn.gov/deed/pfa/>.

It should be noted that 173 projects were identified on the 2022 PPL that did not appear to be reported in the 2021 WINS. The majority of these projects were for communities that do not have a NPDES/SDS permit and were not sent WINS, or communities that did not complete their WINS. The PPL projects used for this report can be found in Appendix 1.

## State water quality standards

Minnesota Stat. § 115.03, subd. 9(4) requires the listing of “...existing and proposed state water quality standards which are more stringent than is necessary to comply with federal law, either because the standard has no applicable federal water quality criteria, or because the standard is more stringent than the applicable federal water quality criteria.” The federal Clean Water Act (CWA) establishes the requirements for delegated states to develop and implement standards and the procedures for doing so. Minnesota adopts standards to protect state waters consistent with these processes. There are no water quality standards that are more stringent than the applicable federal criteria.

## Basics of wastewater and wastewater treatment

Wastewater treatment processes range from relatively simple (stabilization ponds) to very complex (activated sludge treatment facilities), but all require careful operation and management to ensure the protection of the receiving water. The wastewater treatment process screens out debris and separates suspended solids and greases from the wastewater. One or more biological treatment processes are then used to remove dissolved organic matter from wastewater. Together this series of processes is referred to as *secondary treatment*. Depending on the need to address specific pollutants or improve conditions in receiving waters, *advanced treatment* may also be required. Advanced treatment typically focuses on one pollutant, such as phosphorous.

For more information on wastewater treatment basics, see any previous WINS Reports or visit the MPCA website on Wastewater: <https://www.pca.state.mn.us/water/wastewater>.

## **Types of infrastructure costs: capital costs, operation, and maintenance costs**

While this report focuses on future capital costs, publicly owned wastewater treatment and sewer systems are subject to both capital costs and operation and maintenance costs.

Capital cost increases result from one or more of the following factors:

- Infrastructure rehabilitation and replacement
- Community growth requiring infrastructure expansion
- Development of new systems to address wastewater collection and treatment in small communities with wastewater treatment needs
- Treatment facility upgrades to meet more restrictive wastewater discharge standards

Operation and maintenance cost increases are attributable to:

- Changes in operation and maintenance procedures resulting from capital changes
- Expansion of treatment facility systems and processes
- Sewer system expansion
- Increases in costs for personnel, chemicals, and supplies
- Changes in operation and maintenance to achieve more restrictive discharge standards

Capital projects are identified in the report as follows:

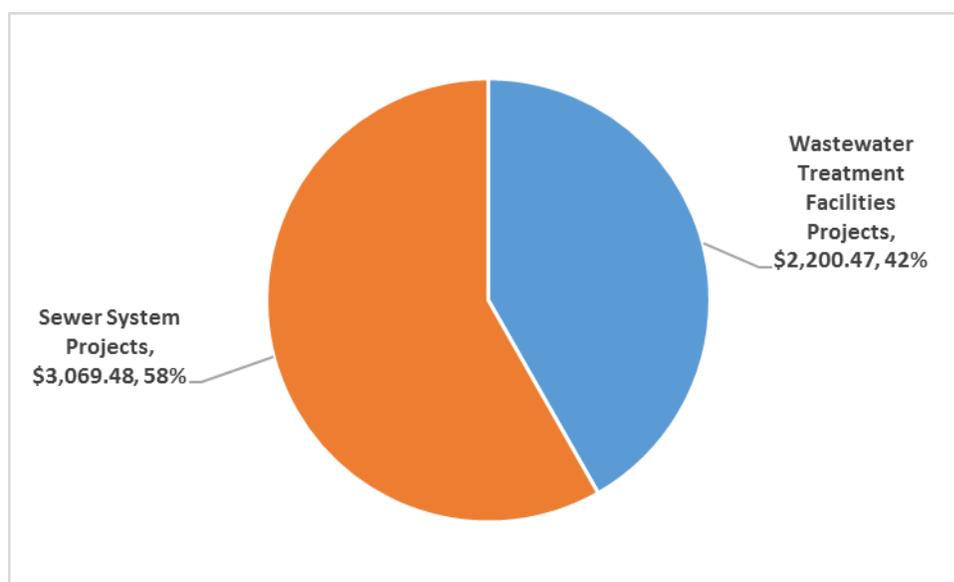
- Sewer System Projects – Projects involving the rehabilitation, construction and/or expansion of existing sewer and interceptor systems and projects to correct infiltration and inflow and/or combined sewer overflows. Infiltration and Inflow (I&I) is stormwater and groundwater that enters sanitary sewers through leaks or through illegal connections. Combined Sewer Overflows (CSOs) are discharge points in a sewer system that are utilized to release untreated wastewater to surface waters when the combination of wastewater and stormwater exceeds the capacity of wastewater treatment facilities.
- Wastewater Treatment Projects – The construction, improvement, and expansion of treatment facilities for the secondary and advanced treatment of wastewater to meet water quality standards.

# Wastewater infrastructure needs and capital costs

This section provides summary information on future wastewater infrastructure needs and capital costs facing Minnesota communities and sanitary districts, in accordance with Minn. Stat. § 115.03, subd. 9(1) and (2). The summary data is based on 822 wastewater infrastructure projects identified as future needs in the 2021 WINS survey and/or listed on the 2022 PPL, the combined list and community specific information is included in Appendix 1. Summaries are provided statewide according to project type. Minnesota communities identified 822 wastewater infrastructure projects at a cost of \$5.3 billion dollars. The following charts and tables provide a basic overview of the projected \$5.3 billion<sup>1</sup> in wastewater infrastructure needs.

The \$5.3 billion dollars in project costs are distributed between wastewater treatment and sewer system projects as indicated in Chart 2:

**Chart 2: Statewide wastewater infrastructure needs by project type (millions)**



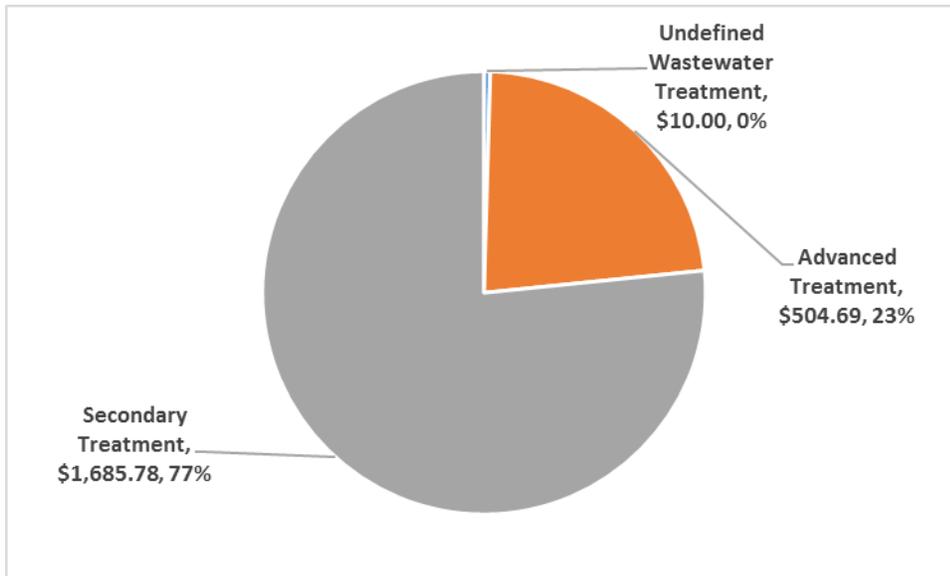
The \$2,200.47 million dollars in wastewater treatment project costs, which include rehabilitation, improvement, and expansion of wastewater treatment facilities, are distributed between secondary and advanced treatment<sup>2</sup> as indicated in Chart 3:

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<sup>1</sup> The reported \$5.3 billion (\$5,259.65 million) of overall need of the 2022 Report compares to reported needs of previous years (in millions) as follows: 2020 - \$4,124.69; 2018 - \$4,990.00; 2016 - \$4,207.66; 2014 - \$3,986.77; 2012 - \$3,658; 2010 - \$4,340; 2008 - \$4,526.57; 2006 - \$3,483.59 and 2004 - \$2,539.28. The large increase in cost from 2004 to 2008 is thought to have been caused by an increase in the number of communities completing WINS and higher quality data.

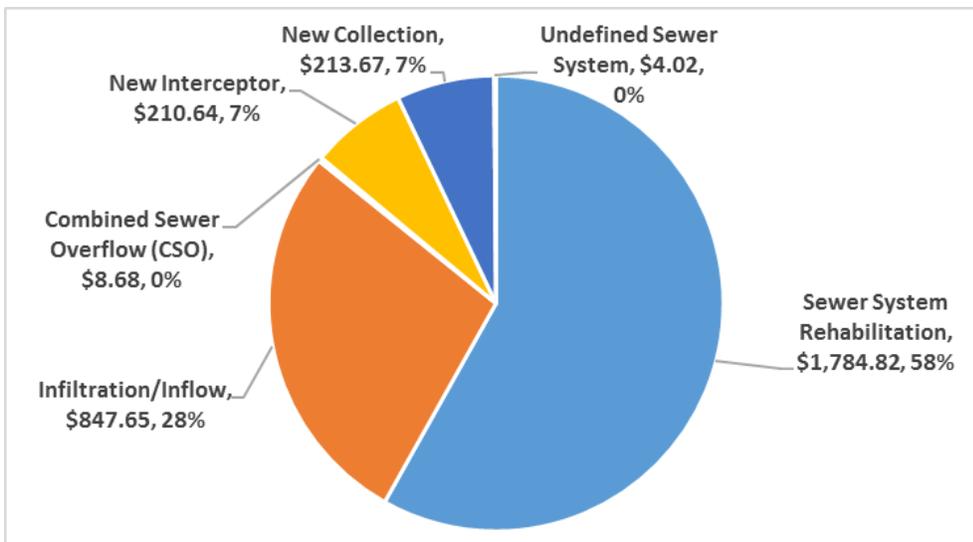
<sup>2</sup> For descriptions of secondary and advanced treatment, please see pages 3 and 4.

**Chart 3: Statewide distribution of wastewater treatment facility needs according to secondary and advanced treatment (millions)**



Of the \$3,069.48 million dollars of sewer system projects to rehabilitate, improve, and expand sewer and interceptor systems, costs are distributed as indicated in Chart 4:

**Chart 4: Statewide distribution of sewer system needs by type of sewer project (millions)<sup>3</sup>**



<sup>3</sup> In the 2021 WINS, a new category was added to gather data on private service lateral work, however no projects of this type were reported.

# Residential sewer charges

Minnesota Stat. § 115.03, subd. 9(3) requires an estimate of the increase in sewer service rates to the residents in the municipalities required to construct wastewater treatment upgrade and construction projects to meet existing and proposed water quality standards and regulations. This cannot be directly estimated based on the information available or gathered in the survey. To determine if sewer rates were potentially impacted by wastewater treatment upgrade and construction projects completed to meet existing and proposed water quality standards, MPCA compared sewer rates reported in 2019 to those reported in 2021 for communities that reported completing a wastewater treatment plant project in 2021. There were four communities that reported user rates with an increase of \$10 or more per month: Waldorf, Monticello, Waubun, and Babbitt. For Waldorf and Babbitt, reported household costs are greater than 1.4% of median household income (MHI) in these communities.

Responding to the 2021 WINS, 508 communities identified what they charged for sewer service for an average or typical residential connection at an assumed volume of 5,000 gallons per month. Table 1 provides various statistical parameters for average monthly residential sewer charges in Greater Minnesota and in the MCES Service Area. Greater Minnesota charges are reported by a series of population ranges. The sewer charges of individual communities as reported in response to WINS and used to create Table 1 are listed in Appendix 3.

It should be noted that some sewer service charges were reported as remarkably high or low in the 2021 WINS, and the reported value was likely a quarterly or annual rate, or a typing error. There were five communities that reported a charge of \$150 per month or greater and eight that reported a charge of less than \$10. Three communities that reported data were sanitary sewer districts in Greater Minnesota with no population data. These values were not used to create the following table.

**Table 1: Average monthly residential sewer charges for Greater Minnesota and the MCES Service Area, based on 5000 gal/day usage**

<b>Greater Minnesota</b>					
<b>Community Population</b>	<b>Average</b>	<b>Median</b>	<b>High</b>	<b>Low</b>	<b>Range</b>
<b>Under 500</b>	\$41.88	\$38.00	\$144.00	\$13.00	\$131.00
<b>500 to 999</b>	\$38.46	\$35.50	\$96.00	\$11.00	\$85.00
<b>1,000 to 2,499</b>	\$43.80	\$40.00	\$100.00	\$12.00	\$88.00
<b>2,500 to 4,999</b>	\$40.74	\$40.50	\$84.00	\$12.00	\$72.00
<b>5,000 to 9,999</b>	\$50.84	\$47.00	\$150.00	\$14.00	\$136.00
<b>10,000 to 24,999</b>	\$41.76	\$38.00	\$119.00	\$20.00	\$99.00
<b>25,000 and over</b>	\$34.57	\$32.00	\$50.00	\$22.00	\$28.00
<b>MCES Service Area (all communities)</b>					
	<b>Average</b>	<b>Median</b>	<b>High</b>	<b>Low</b>	<b>Range</b>
	\$41.40	\$31.00	\$150.00	\$17.00	\$133.00

## Variability of residential sewer charges

The overall range of sewer charges collected by Minnesota communities is considerable. White Bear Township, Morris, and Orono, which had the highest reported residential sewer charges in the state (as reported in 2021 WINS) collected \$150 monthly as compared to several communities that charge \$10 or

less monthly. For a discussion on the factors that help to account for the variability of charges, please see pages 18-19 of the 2020 WINS report: <https://www.pca.state.mn.us/sites/default/files/lrwq-wwtp-1sy20.pdf>

Appendices to 2022 Future Wastewater Infrastructure Needs and Capital Costs are bound as a separate document available upon request. The table of contents above briefly describes the Appendices. The report and the appendices will also be available early 2022 at the following location on the MPCA website: <https://www.pca.state.mn.us/about-mPCA/legislative-resources>

## **Wastewater infrastructure needs, household costs, and affordability**

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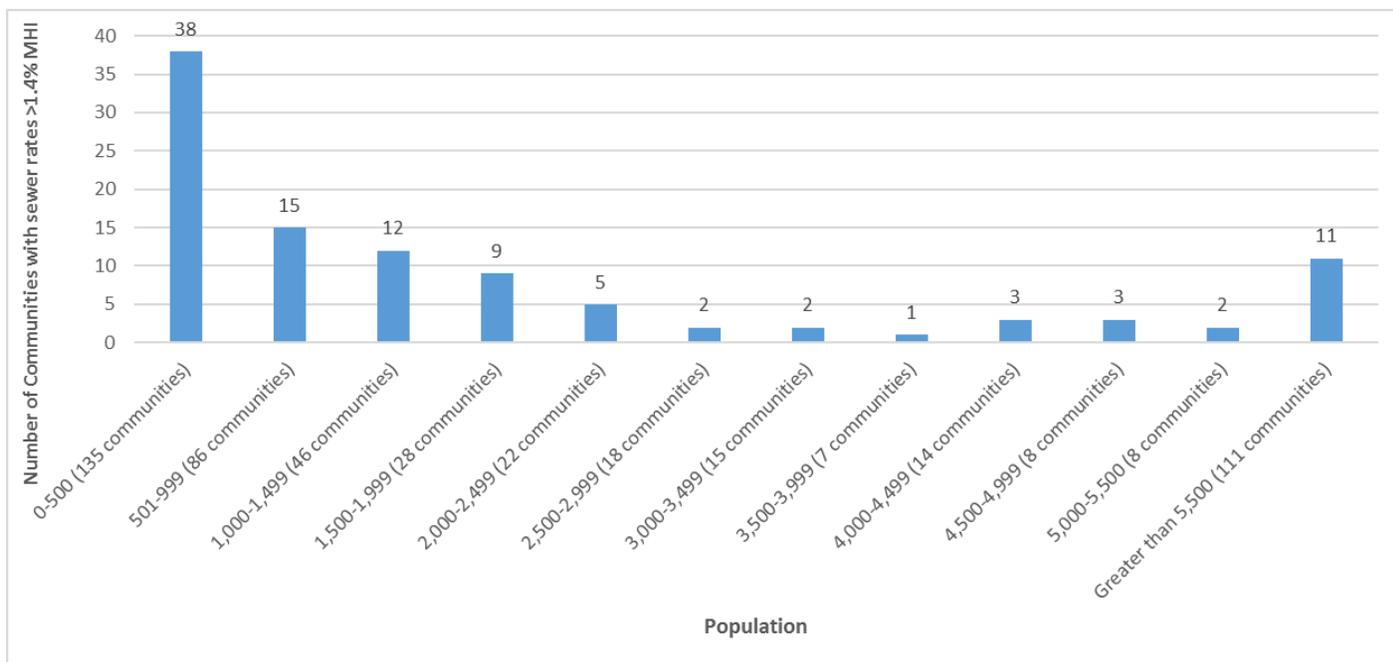
This section provides summary information on household costs and a comparative measure of affordability of wastewater infrastructure projects, in accordance with Minn. Stat. § 115.03, subd. 9(3).

Currently paying for the construction cost of infrastructure upgrades and the ongoing annual operation and maintenance costs are the responsibility of the communities and their rate payers. As a result, less populous communities frequently struggle with the affordability of wastewater infrastructure and treatment – they lack the economies of scale that help keep costs down in cities with large populations. The PFA uses 1.4% of MHI as a wastewater costs affordability index for Minnesota communities.

Chart 5 shows the number of communities in each population group that reported household costs greater than 1.4% of MHI. Costs are based on annual average residential sewer services charges, which encompass a community's infrastructure project costs and annual operation and maintenance costs. Household costs are presented as a percentage of annual MHI (2015 American Community Survey [ACS]). Sanitary sewer districts and other communities not listed in the 2015 ACS were not included in this analysis.

As indicated, a greater number of smaller communities reported being above the affordability index. Of the 498 communities that provided usable sewer rate data, 24% (92 out of 387) of communities with populations less than 1,500 reported rates above the affordability index in comparison to 10% (11 out of 111) being above the affordability index for communities with populations greater than 1,500. The sewer charges of individual communities as reported in response to WINS and used to create Chart 5 are listed in Appendix 3.

**Chart 5: Number of communities with wastewater costs greater than 1.4% of MHI, according to population**



## Asset Management Plans and climate resiliency

Asset management planning is one means of better recognizing and managing future needs. Asset management planning involves carefully maintaining and monitoring system components to gain the efficiencies of maximum useful life, as well as systematic replacement. Smaller communities are less likely to have the resources required to have a robust Asset Management Plan. Of the 539 communities that submitted WINS, 237 (44%) reported that they have an Asset Management Plan.

New questions were added to the 2021 WINS to help assess the measures Minnesota communities have implemented to prepare their infrastructure for climate change and increased wet weather events. Only 6% of communities that responded said they had completed a climate resiliency plan or a climate vulnerability assessment. Of the communities that responded that they did not have a plan, 15% said they were interested in completing one. Figure 1 shows the location of Minnesota communities that experience wet weather related releases in comparison to who has a completed climate resiliency plan. There are a significant number of communities that experience wet weather related releases and do not have a climate resilience plan completed. This indicates a large need to support future community efforts in developing climate resilience assessments, planning, and implementation.

Figure 1: Communities with climate resiliency plans and wet weather releases since 2018

