Legislative Water Commission- 2019 Legislative Recommendations
Issue: Wastewater and Storm water Infrastructure
Summary
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JRS- Draft

Minnesota's Wastewater Infrastructure: Well-maintained and properly functioning wastewater (wastewater and storm water) systems are important because they protect public health and encourage economic development. Many communities have difficulty keeping up with staffing, training, reporting, rules, required upgrades and new regulations. Others have problems with infiltration and inflow are the result of broken or cracked pipes, sump-pump connections, extreme rain events, and lack of overflow capacity. For still other communities, funding is a major problem. For a variety of reasons, small towns face particularly difficult problems in meeting wastewater treatment demands.

Wastewater treatment facilities (WWTFs) typically have a design life of 40 years. After that, replacement and repairs are required. In addition, older treatment systems are commonly located in rural areas with higher sewer bills and limited municipal funding for upgrades. Most WWTFs were built with the assistance of federal and state funding. Federal funds for Minnesota water infrastructure has tapered off significantly. Barr Engineering conducted a state-wide assessment of wastewater infrastructure costs resulting from new and changing water quality standards and infrastructure requirements. Total state costs were estimated to be in excess of $300 million dollars per year. Costs needed for wastewater and storm water treatment system upgrades also were made for six example cities (Albert Lea, Austin, Fairmont, Grand Rapids, Hibbing and Rochester). The costs for wastewater upgrades for these cities ranged from $200 to $800 per resident and from $600 to $800 per resident for storm water. For these cities future storm water treatment requirements have the potential to add significant cost to the cities' financial burdens for about $15 million combined cost (capital and operating) per year, on the average for each city.

Wastewater and storm water improvements in Minnesota can be financed by loans or grants from a variety of public funding programs. Loans typically provide more favorable repayment conditions than municipal bonds. Grants can be used to decrease the required loan amount making repayment of capital costs more affordable. Given the significant gap that exists between requested and available funding for storm water, it is expected that future storm water treatment requirements for cities will significantly exceed available funding.

This document contains a summary of the effort put into this topic last year as LWC recommendations to the Legislature. Some of the following recommendations were put forward with some success. All of the recommendations are include for consideration for 2019. Following are recommendations as they apply to the maintenance and operation of adequate wastewater and storm water infrastructure with the goal of sufficient and clean water for the future. This list is intended to cover the most important issues that need resolution. However, the list needs additional discussion by stakeholders.

1. **Independent, Qualified, cost-effectiveness review of best-management practices at wastewater facilities:** The societal benefits of cleaner water, resulting from improvements in wastewater treatment, are difficult to measure directly because they are qualitative. Therefore, we need to move toward infrastructure-improvement decisions that are based on cost-effectiveness reviews that examine feasible alternatives to meet required pollutant reduction relative to the cost.
2. **Recommend that wastewater facilities undergo an "alternatives review" process** that includes estimated pollutant reduction for various improvements to best-management practices. An LCCMR grant to the Minnesota Pollution Control Agency (MPCA) was included in the ML 2018 Environment and Natural Resources Trust Fund Bill (HF 3352/SF 2934). If funded, the

project proposes to determine how mechanical and pond wastewater treatments can be optimized to operate more effectively as well as meet new effluent limits (ENRTF ID: 035-B). As the grant proceeds, it should support these reviews. Reviews could assist Local Governmental Units (LGUs) identify options for achieving pollutant-load reductions as outlined in their Total Maximum Daily Load (TMDL) requirements, as well as effluent limits from permits where TMDL requirements have not yet been established. This process also would help permittees evaluate whether trading options are viable, compared to new, or improved, facilities. Storm-water quality credit trading could be examined through an LCCMR grant to the Shell Rock River Watershed District that also is included in the ML 2018 Environment and Natural Resources Trust Fund Bill. This could inform the trading evaluation process. Finally, reviews could help identify areas where water infiltration and inflow to sewer lines is excessive. In those areas, corrective actions could be made to reduce the treatment of infiltration and inflow.

3. **Independent peer review of wastewater standards:** Incorporate the Minnesota Pollution Control (MPCA) Commissioner's order into statute. This recommendation would support MPCA efforts to provide additional scientific and public review of new and revised water-quality standards, and would ensure that the process continues on under future administrations .Background: A Minnesota Pollution Control (MPCA) Commissioner's Order (Order) was issued in July 2017 to address ongoing confusion about MPCA's reliance on independent, scientific peer review in the development of water quality standards. The Order establishes a transparent process for peer review of the scientific basis for proposed water quality standards, and allows for public comment on both the scientific information and the peer review. The order applies to only new, or revised, numeric water-quality standards that differ from U.S. Environmental Protection Agency's (EPA) criteria that have been through peer review. The MPCA peer-review process identified in the order is based on the EPA's Peer Review Handbook (4th Edition, 2015). A technical-support document (TSD) is developed to document the scientific basis for a proposed standard and under the Order each TSD must undergo external, scientific peer review. A draft TSD is released for public comment prior to peer review. The MPCA takes public comments on questions to pose to the peer reviewers. The TSD is then revised in response to public comments, and peer review, and becomes the basis for the water-quality standard rulemaking effort. The MPCA's Web site identifies water-quality standards under development, the lead agency scientist for each development effort, and opportunities for public input. The full Commissioner's Order: (115.035) is available from the MPCA.
4. **Pilot watershed-scale trading program that involves stakeholders:** A pilot program is needed to develop an adaptive approach for pollutant trading or pollutant banking, at a watershed scale, possibly using a third-party broker to facilitate. The approach should include the agricultural community in planning, possibly using the Oregon model. A contractor could be used to facilitate planning because stakeholders would include many participants. Interested partners may include: MPCA, Minnesota Department of Health (MDH), Board of Water and Soil Resources (BWSR), Chambers of Commerce, League of Minnesota Cities, Minnesota Environmental Science and Economic Review Board, Minnesota Environmental Partnership, Metropolitan Council, and the Minnesota Storm water Coalition. Ideas for brokers include; BWSR, Minnesota Technical Assistance Program, the Environmental Initiative, or a new organization. The Minnesota River Basin may be ideal for a pilot because there is a wealth of phosphorus and chloride data. There also is an opportunity to incentivize more storage in the Minnesota River basin using non-point source trades. Consider funds for the MPCA to develop basin-wide data that shows where "potential to emit" conditions exist that would necessitate facility upgrades (they've already done this for phosphorus and chloride in the MN River Basin). Relate these data to impairments, possible trading areas, and to watershed boundaries, to determine where opportunities are greatest for successful point source to point source or point source to nonpoint-source trades.

5. **Identify efficiencies for regional wastewater administration, operation and maintenance**: Small towns and cities struggle with costs associated with maintaining and upgrading water supply and wastewater-treatment facilities. Alternative approaches are needed meet the needs of towns and cities that struggle to maintain, or grow, their population and economic bases. There is need to encourage, and provide funding for, stakeholders, including representatives from local governments, state agencies, state colleges and universities, and consulting engineers, to explore and identify alternative approaches and opportunities to address the challenges small cities and towns face in meeting their water supply and wastewater treatment needs. Consideration should be given to exploring ways to encourage regionalization, promote asset management, coordinate administrative and operational activities, recruit and share wastewater operators, and when appropriate, consider how decentralization of utility services might be accomplished.
6. **Change flushable wipes labels on personal care wipes**-- Prepare language for legislation to ban flushable wipes and modify, or advance, bills already introduced.
7. **Support the Public Facilities Authority (PFA) Bonding Request**--The PFA provides state matching funds for loans and grants to cities for wastewater, drinking water and storm water infrastructure projects. The Commission supported the 2018 PFA bonding target to of 167 million per biennium and has agreed to prepare a letter describing the need and timeframe for this commitment.
8. **Provide inflow and infiltration (I/I) funding for public and private sewer lines**-- Define the level of I/I that is considered excessive--above which corrective action should be funded. Amend MN Stat 473 to allow the Metropolitan Council to use revenues for this purpose. New funding source (such as the Chesapeake Bay model): Review the funding recommendations from the G16 and Minnesota Environmental Partnership report to see if there is majority interest in pursuing any of them.
9. **Streamline regulatory process--**The MPCA could assign permitting staff by watersheds, or by receiving water, so that communities within a watershed are getting the same direction. Additionally, they could issue permits within a watershed on the same timeframe so communities, related by receiving water restrictions, could work better together.

The LWC reached consensus on these recommendations in 2018

Supporting Discussion

Minnesota has a wastewater and storm water infrastructure problem. Well-maintained and properly functioning wastewater systems (wastewater and storm water) are important because they protect public health and economic development. However, wastewater systems are expensive to maintain, particularly for small cities and towns.

Wastewater systems include sewer connections, sewer mains that carry wastewater, pumps and lift stations to boost the wastewater stream, treatment plants that use various technologies to remove organic matter and other pollutants, and outfalls for returning treated effluent to a receiving water bodies. There are a variety of wastewater treatment technologies in place across the state. Some treatment technologies, such as stabilization ponds, require little maintenance, while others, such as sequential batch reactors, require daily attention. Regardless of the treatment technologies in use, all of the wastewater systems require leak-free pipes for optimal operation.

Municipal wastewater systems generally are designed to remove organics from sanitary wastewater. However, wastewater systems also can reduce concentrations and loads of several classes of chemical constituents. They remove total suspended solids (TSS) as well as nitrogen and phosphorus. Total suspended solids are the most visible indicators of water quality. Excessive solids cause cloudy water and can inhibit use by humans and aquatic life. Chloride gets into wastewater and storm water in several ways and can be toxic to aquatic life. Nutrients (phosphorus and nitrogen) cause algal blooms, which can decrease the aesthetic value of a water way and adversely affect aquatic life. Nitrate is a form of nitrogen and high levels of nitrate in drinking water are harmful to human and animal health. In some areas, nitrate contributes to freshwater algal blooms. Nitrate is also the primary cause of the dead zone in the Gulf of Mexico. Technology upgrades generally are needed to reduce sulfate and chloride and to meet lower limits for nitrogen and phosphorus.

Reducing pollutant loading to receiving waters by implementing wastewater and storm water treatment upgrades is more significant that simply decreasing solids and nutrient concentrations. The waters of the state also have designated beneficial uses which include domestic consumption, aquatic life maintenance, recreation, industrial consumption, agricultural and wildlife support, aesthetic enjoyment, and navigation.

While the treatment upgrades are important to all the waters of the state, they result in significant financial burdens to cities and towns. These systems are expensive and difficult for small communities to maintain and upgrade. Small communities in Minnesota (less than 5,000 residents) struggle with a changing regulations, aging infrastructure, inadequate state and Federal support. Many of these communities also have difficulty keeping up with staffing, training, mandatory reporting, rules and regulations. Other communities report problems with infiltration and inflow due to broken or cracked pipes, sump-pump connections, extreme rain events, rising water tables, and lack of overflow capacity. Many wastewater treatment plant operators find online reporting system challenging, and many also report having to invest in expensive upgrades or facility replacement due to recent permit changes. Systems generally have designed life spans of about 40 years and much of our infrastructure is older than 40 years. Many of the older systems are in small cites in rural areas of the state. Barr Engineering estimated that the financial needs across the state are in excess of 300 million dollars per year. They also estimate that, based on six example cities, wastewater treatment needs range from $200 to $800 per resident. Storm water needs were estimated to exceed $15 million dollars per year for these cities. Future infrastructure requirements exceed currently available funding.

The University of Minnesota at Morris recently conducted an analysis of water infrastructure needs for small cities. The study focused on whether small communities disproportionately burdened by wastewater system costs. The study assessed regulatory, structural, operational, and affordability challenges associated with municipal wastewater infrastructure. The sample of communities was based on by several factors, including population size, economic development region, and type of wastewater treatment systems, and included 681communities

The study found differences between smaller and larger communities regarding wastewater treatment system affordability. Economies of scale do not work in favor of small communities. On average, wastewater treatment system costs per household are higher in small communities, and there is often less capacity in smaller communities to absorb these greater costs. The study found that median household incomes of those in smaller communities are less than in larger communities and that the average age of residents is older in smaller communities. Consequently, sewer rates for those in smaller communities are a greater burden than in larger communities.

The "Morris study" also found that costs of infrastructure construction and upgrades generally had been provided by federal grants. However, these grant programs are being increasingly replaced by loan programs. When loan programs are short of funds, communities are forced to adsorb maintenance, repair, and replacement costs. Based on the analysis, there are about half as many people per mile of pipe in smaller communities compared to larger communities. Having to install and maintain comparable infrastructure with lower population densities while meeting wastewater regulations suggests that small communities are required to bear greater costs per capita.

The "Morris Study" also addressed sewer rates and found that costs to upgrade, replace, and maintain wastewater infrastructure are usually spread across households. Smaller communities generally pay more per household than is the case in larger communities. Annual sewer rates decrease with increasing community population. The study found that communities with older populations pay differentially greater sewer rates. In addition, older householders are much more likely to struggle with high or increasing wastewater rates due to fixed incomes. The study also assessed the affordability of sewer rates for lower-income populations in smaller communities. Sewer rates are generally unaffordable for any household earning less than $20,000.

In 2016, the legislative requested that Barr Engineering analyze the cost in complying with current and future water-quality regulations for communities, including storm water and municipal wastewater. The legislature required that the study include a diverse and representative sample of communities; estimate infrastructure costs to upgrade wastewater and storm-water systems to meet current and future water quality standards; and estimate the incremental change in water quality as a result of those upgrades. The existing pollutant loading and treatment needs to meet existing and future TMDLs, as well as associated costs to provide the additional treatment needs were estimated for municipal separate storm sewer system cities (MS4s) in the state. Six cities were evaluated in detail. These cites included Albert Lea, Austin, Fairmont, Grand Rapids, Hibbing, and Rochester. Based on this evaluations, assumptions related to future TMDL requirements were developed.

The Barr report is based on literature reviews to identify practical technologies to remove specific constituents from wastewater. The report includes descriptions of existing processes, descriptions of potential upgrades, and estimate of costs for upgrades most practical for specific WWTFs. The study found that existing sewer-use fees are approaching recognized limits for affordability. New water quality standards requiring upgrade of existing facilities would add to the operating city's financial burden. The study found that WWTF upgrades and operation for the municipalities in the study were expected to result in sewer fees ranging from 1.1 percent to 5.2 percent of household median income which would increase the gap between funding requested and available funding. This increase would

put additional pressure on the affordability of wastewater infrastructure

The Barr report also addressed storm-water treatment needs that are summarized by major river basin. Assuming a compliance period of 25 years, the statewide annualized cost to meet future TMDL requirements for all municipal MS4s exceed $317 million per year. The TMDLs identified was expected to establish the degree of storm-water treatment each MS4 required to provide in the future. Estimated costs to meet future TMDL requirements were conservatively high because they assume that the full cost of implementing the desired level of storm-water treatment would be completely borne by municipalities.

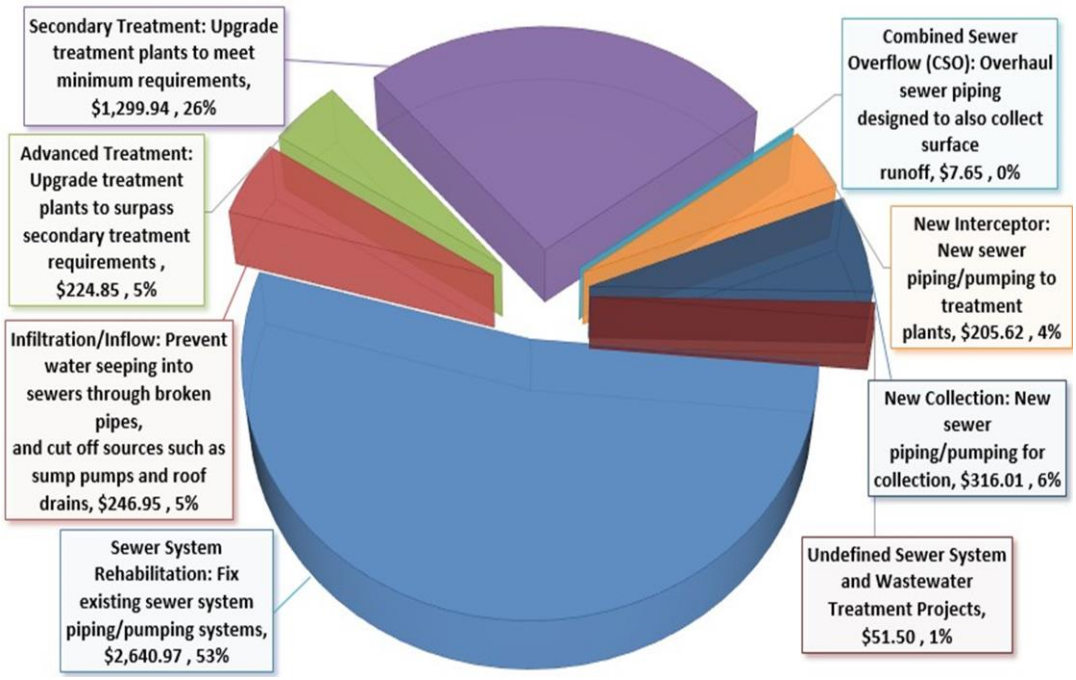
The report also summarized the state-wide needs and costs for meeting water quality standards for wastewater and for storm water. The total costs were estimated to be in excess of $300 million dollars per year. Costs needed for wastewater and storm water treatment system upgrades were made for six cities (Albert Lea, Austin, Fairmont, Grand Rapids, Hibbing and Rochester). The costs for wastewater upgrades ranged from $200 to $800 per resident. For storm water the estimates ranged from $600 to $800 per resident. These values can be used by other Minnesota municipalities to estimate the total costs associated with similar wastewater and storm-water treatment upgrades

For the six regulated MS4s included in this study, future storm-water treatment requirements have the potential to add significant cost to the city's financial burden of approximately $15 million combined cost (capital and operating) per year, per city. While a significant portion of the capital costs will likely be borne by future land development or redevelopment projects, the remaining capital and operational costs will be borne by the cities, further adding costs to the new wastewater costs. Given the significant gap that currently exists between requested and available Clean Water Funding for storm-water projects and given that other non-municipal storm-water projects are also competing for funding, it is expected that future storm-water treatment requirements for the, 164 cities with municipal separate storm sewer systems permits will significantly exceed current funding levels.

In 2018 the Minnesota Pollution Control Agency prepared a report for the Legislature titled: Future wastewater infrastructure needs and capital costs.
The report is summarized as follows: Effective wastewater infrastructure is crucial for economic growth and development. Much of Minnesota' wastewater infrastructure was built with federal grants during the 1970s-80s and is reaching the end of its effective design life. In response to MPCA's 2017 biennial survey, 715 communities (85% of those surveyed, identified nearly $5 billion in infrastructure needs over the next 20 years – a 15% increase in need from the 2015 survey. **Only 5% of this need is due to new water quality regulations and most of the need is for replacement of aging infrastructure.**

About 75% of the wastewater generated in Minnesota by households, businesses, and industries is collected in sanitary sewer systems and flows to municipal wastewater treatment facilities. Wastewater is treated to reduce or eliminate organic matter, nutrients, disease-causing organisms, and other pollutants before it is discharged to a river, lake, stream, wetland, or is land applied or reused. Wastewater treatment is necessary to protect public health and to improve, protect, and preserve Minnesota's water quality. Inadequate wastewater treatment capacity can hinder economic growth and development.

Key Points: Statewide future infrastructure needs



Minnesota's communities identified **more than 1,050 wastewater infrastructure projects at a cost of almost $5 billion dollars** (shown below in millions of dollars) in future wastewater treatment and collection systems system needs over the next 20 years.

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 un-sewered areas.

The MPCA's Project Priority List identifies municipal projects that seek state funding to be built over the next five years. These projects are ranked by the MPCA based on environmental and public health criteria. Stat loan and grant funds from the Minnesota Public Facilities Authority are based on these priorities so that financial resources are targeted to the highest priority projects. The current Project Priority List identifies 302 projects totaling $1.53 billion for construction over the next five years.

Challenges

Age of sewers: Sewers installed more than 50 years ago are frequently beyond their useful life, in part because they were typically constructed of vitrified clay tiles that are not as durable and do not perform at current standards. At this time, the percentage of sewer systems over 50 years old is 32% in Greater Minnesota and 20% in the Metropolitan Council Environmental Services area (excluding Minneapolis and St Paul).

Age of treatment facilities: Wastewater treatment facilities' major structural components have an expected useful life of 40 years. As these structures deteriorate, effectiveness declines, leading to additional operating and maintenance cost and a greater potential for permit violations and unintended discharges. At this time, 20% of Greater Minnesota's treatment facilities are more than 40 years old.

Project affordability: Wastewater systems are expensive for communities to build, operate, and maintain. Residential sewer charges can differ greatly from one community to another for a variety of reasons, many of which are beyond a community's control. These include different receiving water standards and discharge limits, advanced treatment requirements to meet specific waterbody protection and restoration goals, and economies of scale that generally lead to higher costs per household for small communities.

Funding Programs for Wastewater and Storm-Water Upgrades

Wastewater and storm-water improvement projects in Minnesota can be financed by loans or grants from a variety of public funding programs. Loans typically provide more favorable repayment conditions than municipal bonds. Grants are used to decrease the required loan amount making repayment of capital costs more affordable. Based on the difference between the requested funding and the available funding, it can be inferred that funding is limited. Existing wastewater infrastructure in many Minnesota cities is approaching the end of its useful design life, so many recent funding requests have been for rehabilitation projects of existing wastewater collection and treatment systems, to maintain performance, rather than meet new standards. Loan repayment are typically made from hook-up fees collected for new connections to the sewer system and fixed monthly fees for sewer access. Grant awardees do not need to pay back the funding agency. If grants do not cover the entire project cost, they can reduce the total loan amount needed to fund a project, which reduces the impact on user rates.

Public Facilities Authority (PFA) Loans and Grants (Multiple Programs) the PFA provides state funding for water infrastructure from the Clean Water Revolving Fund, the Wastewater Infrastructure Fund (WIF), and the Clean Water Legacy Fund. PFA also administers Small Community Grants for small communities to improve subsurface sanitary treatment systems and soil treatment systems and Point Source Implementation Grants to meet TMDL or WQBELs, especially for phosphorus and nitrogen limits. PFA funding accounts for about 75 percent of public wastewater funding in Minnesota. Clean Water Revolving Fund loans typically are used to fund wastewater improvement projects. Projects must have a facilities plan approved by the MPCA to request placement on the IUP. The 2017 PPL included 290 projects with a total estimated cost of $1.5 billion and an additional 17 projects without cost estimates. The projects include storm water collection and treatment, wastewater collection system improvements, wastewater treatment, and water treatment to remove chlorides. The 2017 IUP listed 84 projects totaling $347 million but only about 36 projects totaling $107 million in 2017were funded. The projects that the PFA plans to finance only account for seven percent of the estimated costs included in the MPCA 2017 PPL .The WIF provides supplemental grants to cities, counties, townships, or other governmental subdivisions responsible for wastewater treatment. MPCA.

Minnesota Board of Water and Soil Resources (BWSR) administers a Clean Water Fund (CWF) to support projects that protect or improve water quality in surface or groundwater. This includes storm- water treatment projects. In order to be eligible, cities in the seven-county metropolitan area must have a relevant water plan. For FY2017, 171 applicants totaling $34.41 million requested funds, but BWSR fully funded only a portion of those projects. Most of the funding was provided in grant categories that municipalities could be eligible to use to improve surface water quality. A significant portion of the available grant funding each year is spent to address nonpoint source runoff of pollutants from rural areas.

The US Department of Agriculture administers loans to small communities in order to reduce user costs of drinking water, wastewater, and storm-water treatment upgrades via the federally funded Water and Waste Disposal Program. Cities, towns, and rural areas with populations less than 10,000 are eligible.

Minnesota Department of Employment and Economic Development (MDEED) oversees federal funds for Small Community Development Grants. These grants are designed to reduce the financial burden of wastewater treatment for low to medium income households. Cities and towns with population's less than 50,000 and unincorporated townships with populations less than 2000 are eligible. Grants are provided for a maximum of $600,000 for single purpose projects.

Conclusions: Well-maintained and properly functioning wastewater systems (wastewater and storm water) are critical because they protect public health and make economic development possible. Many communities have difficulty keeping up with staffing, training, mandatory reporting, rules and regulations. Other communities report problems with infiltration and inflow due to broken or cracked pipes, sump pump connections, extreme rain events, and lack of overflow capacity. Others identify funding as the major problem. Many wastewater treatment facilities (WWTF) operators find the online reporting system challenging, and others report having to invest in expensive upgrades or facility replacement due to recent permit changes. Some note problems with cost and availability of hauling and disposal of solids. For a variety of reasons, small towns face particular difficult problems in meeting wastewater treatment demands. WWTFs typically have a design life of 40 years. After that time, replacement and repairs are required to maintain the existing levels of treatment. Mechanical equipment, such as pumps, has shorter design lives of 15-20 years. Sixteen percent of existing wastewater treatment systems in Minnesota are greater than 40 years old, and 30 percent are greater than 30 years old. In addition, older treatment systems are commonly located in rural areas with higher sewer bills and limited municipal funding for upgrades. Most of Minnesota's WWTFs were built with the assistance of federal and state funding. Federal funds for Minnesota water infrastructure has tapered off significantly since the 1990s. The state needs to address this growing fiscal disparity, particularly for small towns and cities.