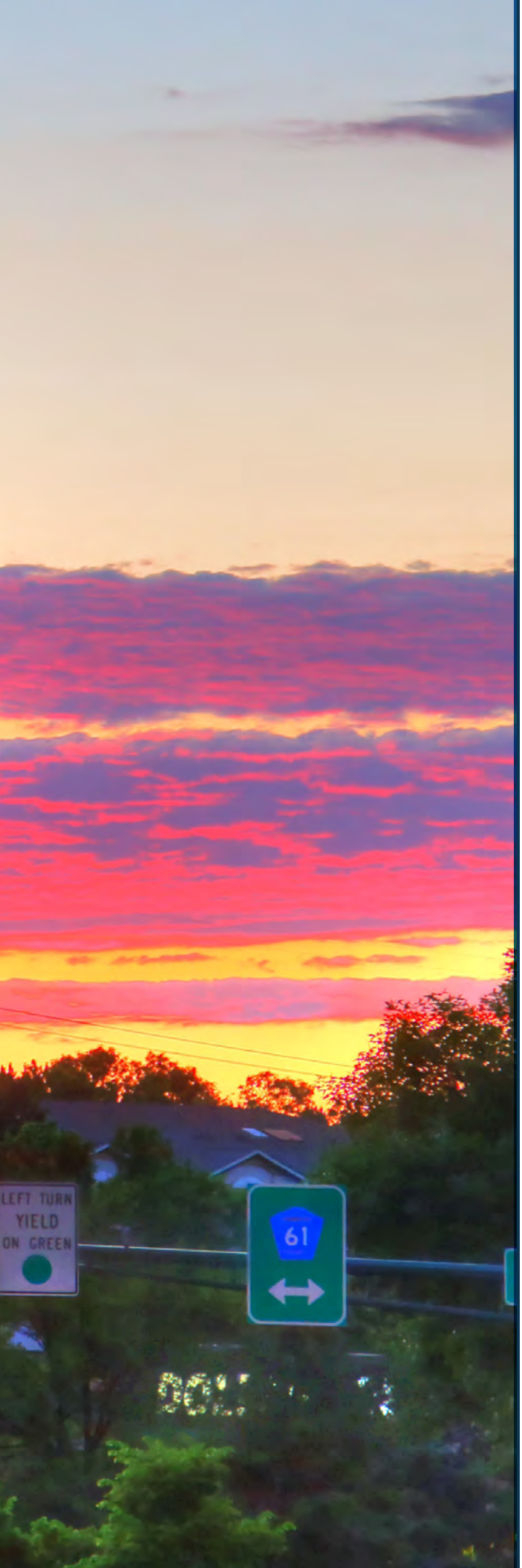


Chapter 9

Water Resources & Infrastructure Plan

The quality and quantity of the City's water resources, along with the infrastructure that supports them, directly impact the prosperity, quality of life and continued development of the City of Eden Prairie. From surface waters to aquifers and finally into homes, the sustainability of these water resources sets the foundation for vitality in the City. The City is dedicated to responsibly managing the use of aquifers for water supply, surface waters for their ecological and development functions, and land use patterns for their potential impacts to these resources. This chapter will summarize the issues, goals, and implementation strategies identified related to surface water, wastewater, and water supply within the City.

"[It is important to provide] education on water issues in the City including lakes, streams, parking lot runoff, etc."

Participant, Aspire Eden Prairie 2040 DIY Workshop

Goals, Objectives & Strategies

The water resources and infrastructure goal and objectives outlined below were developed based on the City's 2008 Comprehensive Plan, community engagement efforts, and other applicable documents. In addition, specific strategies on how to achieve these goals and objectives are listed below:

Goal 1: *Provide current and future generations of Eden Prairie residents and businesses with a safe, high-quality, sustainable drinking water supply, the sanitary and efficient removal of wastewater, and the reliance of having clean and environmentally safe surface waters within the City's boundaries.*

Objective 1a

Prioritize water resource planning as Eden Prairie continues to grow to ensure equitable and adequate access by all residents.

Strategies

1. Evaluate future growth opportunities against the City's wellhead protection plan to ensure land-use decisions are consistent with safeguarding the drinking water supply from contamination.
2. Minimize the use of salt on roadways to reduce chloride contamination in surface waters and to minimize the potential for elevating chloride levels in groundwater.
3. Work to achieve water quality standards in lakes, streams, and wetlands consistent with intended use and classification and State of Minnesota water quality standards.

Objective 1b

Educate the public about the importance of water conservation and available opportunities.

Strategies

1. Maintain the crucial public health function of providing for the safe and reliable collection and removal of wastewater in accordance with state health and environmental standards and regulations.
2. Continue to provide incentives to both residential and commercial water customers to install water-conserving equipment, appliances, and irrigation systems.
3. Continue educating the public on reducing water consumption to ensure the availability of a sustainable water supply for future generations.
4. Promote the use of Best Management Practices (BMPs) and Low Impact Development (LID) to protect and restore water quality and reduce the quantity of stormwater run-off throughout the City.

Surface Water

The City of Eden Prairie, having regulatory and land-use control for all territories within the City must develop a Local Water Management Plan (LWMP), capital improvement program, and official controls as necessary to conform to Minnesota Statutes 103B and Minnesota Rules 8410. The City's LWMP was adopted by City Council in September 2016, updated in July 2017 and is adopted by reference into this Comprehensive Plan. In August of 2017, the Metropolitan Council reviewed and approved the adopted LWMP for inclusion into the Comprehensive plan.

The LWMP is intended to provide the City of Eden Prairie with information and direction in the administration and implementation of surface water resource management activities within the City during the period of 2017-2027. It serves as a guide to projects, provides for effective allocation of resources, and sets forth a funding plan for projects and programs over the next five to 10 years. As the LWMP is being adopted by reference, occasional updates to the LWMP are expected in response to City operations, budget planning, work requirements and public requests. The following is a summary of the adopted plan.

Issues

Prior to and during development of the LWMP, the City solicited input on water resources-related problems, issues, and requirements to be addressed in the plan. The stakeholders identified consisted of City Council, commissions, and staff, as well as various regulatory bodies, lake associations and the public. The issues identified during this process include the following:

- Some of the lakes and streams in the City do not meet the state's water quality standards for recreation and aquatic life.
- The reissuance of the State of Minnesota's National Pollutant Discharge Elimination System (NPDES) General Stormwater Permit requires local governments such as Eden Prairie to adopt and enforce standards for development and redevelopment which limits stormwater runoff from sites over one acre in size.
- New or expanded management and administrative responsibilities are required in the NPDES permit to control runoff and protect and improve water quality from municipal facilities.
- New invasive aquatic vegetation and aquatic invasive species have been identified in the City and in adjoining municipalities which will require new or expanded monitoring or maintenance.
- New and updated Watershed District Rules and Standards have been implemented that require City ordinance updates.

Goals

The LWMP updates the City's goals and related policies to address the problems and issues that were identified. The goals are as follows:

- **Goal 1.** Work to achieve water quality standards in lakes, streams, and wetlands consistent with intended use and classification and State of Minnesota water quality standards.
- **Goal 2.** Protect downstream water resources, reduce the potential for flooding, and minimize related public capital and maintenance expenditure necessary to control excessive volumes and rates of runoff and to mitigate erosion.
- **Goal 3.** Protect and/or restore wetlands to improve or maintain their functions and values in accordance with the Minnesota Wetland Conservation Act and the City's Wetland Protection ordinance.
- **Goal 4.** Work to prevent contamination of the aquifers, promote groundwater recharge, and encourage water conservation practices.
- **Goal 5.** Control or manage sediment discharge into surface water resources and drainage ways.
- **Goal 6.** Support water recreation activities and fish and wildlife habitat by implementation of programs to maintain or improve water quality.
- **Goal 7.** Increase public involvement and knowledge in management and protection of water resources.

Implementation

The adopted LWMP includes an Implementation Plan to help achieve those goals through capital projects, management programs, maintenance activities, and special studies. Specific surface water capital improvements are outlined in the Water Resources & Infrastructure CIP Matrix at the end of this Chapter.

Capital Projects

The Riley-Purgatory-Bluff Creek, Nine Mile Creek and Lower Minnesota River Watershed Districts have completed Use Attainability Assessments (UAAs) and have partnered in Total Maximum Daily Load (TMDL) studies for many of the key waterbodies in Eden Prairie. These studies have identified potential strategies to help protect or improve the water quality and the use of those waterbodies. The City continuously evaluates partnership opportunities with the Districts to undertake priority projects. The City also has been systematically surveying the condition of storm drainage system features as well as water quality, which has identified a number of potential improve-ment projects and priority actions. These projects and actions are presented in the Implementation Plan.

The Implementation Plan also includes projects to install water quality Best Management Practices (BMPs) with street or other infrastructure construction, and projects to reduce lake internal loading, such as alum treatments, rough fish management, and invasive aquatic vegetation management. Stream inventories have been updated and will be used to prioritize streambank stabilization and restoration projects.

Maintenance Activities

The City undertakes a variety of maintenance actions, including actions required by its NPDES MS4 Permit. These include ongoing water body inventory and condition assessments, erosion control monitoring, street sweeping, stormwater system inspections and repairs, and a general education and outreach program.

Special Studies

The City has and will continue to participate in TMDL studies and UAA assessments, in partnership with the watershed districts and the MPCA. Other studies are undertaken as necessary, such as assessment of areas for regional treatment opportunities and the recent "Eden Prairie Town Center Stormwater Management Guide" that identified opportunities for stormwater treatment as the area redevelops.

Management Programs

The City operates several programs that directly or indirectly affect water resources, including a Public Education and Outreach program. A variety of social and traditional media are used to inform and educate citizens. City events, workshops and festivals provide additional opportunities for education.

The City has developed an Environmental Learning Center (ELC) to educate local residents about water quality, water conservation, sustainability, waste reduction, and environmental stewardship. The ELC includes an interactive activity center and laboratory for use by local school groups. Volunteers monitor water quality though the Citizen Assisted Lake Monitoring Program (CAMP) and the Wetland Health Evaluation Program (WHEP). Volunteers also work with the City on programs such as Adopt-A-Street and storm drain labeling.

The City implements other programs, including goose and invasive species management; lake monitoring and watercraft inspections. Stream water quality is also monitored at a Watershed Outlet Monitoring Program (WOMP) station at the outlet of Riley Creek through a partnership with the Met Council. The RPBCWD operates two additional WOMP stations on Purgatory Creek, one at Valley View Road and one at Pioneer Trail.

Plan Updates

Section 8 of the LWMP sets forth a process to update the plan in response to city operations, budget planning, work requirements, or public requests. The Implementation Plan and Capital Improvement Program (CIP) will be reviewed and updated periodically by the City as needed based on new information or as new opportunities and requirements arise. At a minimum, the CIP will be updated biannually. The LWMP amendment process will follow the applicable Minnesota Rules and Statutes for administering and updating a Local Water Management Plan.

Community Health

Fountains for All

Public drinking fountains offer f ree a ccess t o healthy drinking water to all residents. They serve as an alternative to bottled water and sugary drinks and help promote healthy drinking habits. By including water fountains in public parks and along public trails, Eden Prairie can support the health of its residents and the environment.

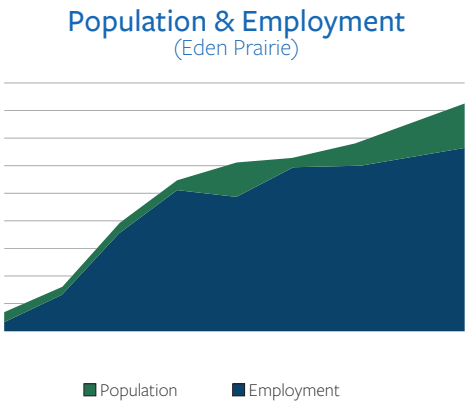
Water Supply

The City routinely updates the water supply plan, capital improvements plan, and water rate studies, treating all three planning documents as mutually supportive and synchronized, to ensure the plans remain effective and continue serving the needs of the community. Few areas remain to be developed in Eden Prairie, but the City will continue to experience growth through higher density redevelopment.

Population & Employment Forecasts (2040)

The City's 2040 Comprehensive Plan proposes a population growth of approximately 20,000 people by adding higher density residential neighborhoods in two key areas: the Major Center Area and the Golden Triangle Area. The Southwest Light Rail Project is anticipated to spur High Density Residential and additional Commercial growth along the corridor through the City. As a result of this plan revision, the population in 2040 is projected to be 82,400 with an employment base of 66,600. Figure 1 shows the historical as well as the projected population and employment forecast.

Figure 1

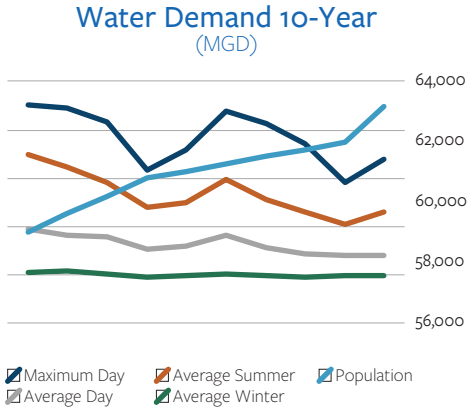


Water Use

Historical Water Use

The City of Eden Prairie began pumping water from municipal wells to residents in 1971 when the City's population was approximately 7,000 people. In 1974, the first phase of the water treatment facility was constructed. Over the past 45 years, there have been three additional expansions of the water treatment facility to accommodate growth.

Figure 2



There has been an overall reduction in water consumption over the last 10 years. Figure 2 above depicts this general downward trend in water use. There has been a slight reduction in the winter quarter demand from 2007 to 2016, even with a population growth of approximately 4,000 people during that 10-year period. Since winter usage is not impacted by irrigation, this reduction indicates that wider use of water efficient plumbing fixtures is playing a significant role in demand reduction. The City of Eden Prairie's recent five-year ratio of average maximum day demand to average day demand is 2.41. This ratio is a measurement of daily water use, comparing the general amount of water used to the maximum amount of water used. The total average daily per capita water demand has ranged from 165 gallons per capita per day (GPCD) in 2007, to 112 GPCD in 2016.

Correspondingly, the residential per capita water demand has significantly decreased over the last five years, and appears to have reached the goal set by the DNR of less than 75 GPCD for residential water use. In 2015 and 2016, the residential per capita water demand was either at or just below the goal of 75 gallons.

Water Demand Projections

The projected annual water demand through 2040 is summarized in Table 1, with projected populations for the years 2020, 2030, and 2040 provided by the Metropolitan Council. The total per capita water usage for 2016 was 112.3 GPCD. The target for the year 2022 and thereafter is set at 110 GPCD, based upon a conservative engineering analysis of the City's diminishing base water use and community conservation goals of 70 GPCD for residential users within the next five years. The projected Maximum Daily Demand was estimated by reviewing historical data and trends, and multiplying the average daily demand by a calculated peaking factor.

Table 1. Projected Annual Water Demand

Year	Population Served	Projected Total Per Capita Water Demand (GPCD)	Projected Average Daily Demand (MGD)	Projected Maximum Daily Demand (MGD)
2020	67,900	111	7.54	18.16
2030	75,200	110	8.27	19.94
2040	82,400	110	9.06	21.84

Existing System

Water Treatment

The City of Eden Prairie operates a lime softening water treatment facility (WTF) that was constructed in four phases starting in 1974, with the last expansion completed in 1997. The capacity of the water treatment facility is 28 million gallons per day (MGD). There is approximately 2.5 million gallons (MG) of available clearwell storage at the treatment facility. Currently, the water treatment facility, clearwell storage, and high service pumping are all adequate for the City's needs through the year 2040, provided no major water emergencies or system failures occur that tax the ability of the system to keep up with the anticipated daily demand cycles.

Distribution Storage Facilities

Eden Prairie has five million gallons (MG) of finished water stored within the City's distribution system. This stored water is intended to help meet heightened system demands, provide emergency and fire flow storage, and help maintain uniform pressure in the distribution system during peak hourly demands. The City's existing distribution storage facilities include a two MG elevated ground standpipe reservoir on Baker Road, a one MG elevated water tower at Hidden Ponds Park, and a two MG elevated water tower at Eden Prairie's Town Center. Plans are currently being developed for an expandable ground storage reservoir facility of 2.5 MG capacity to provide better system reliability and improved operational flexibility. This additional facility would aid the City in meeting its emergency storage goals as outlined in the Eden Prairie Master Utility Plan, which is nearing completion at adoption of this Plan. The facility's construction has been included in the City's CIP and the latest utility rate study to ensure sufficient water sales revenue is being collected to build and sustain the facility.

Water Sources

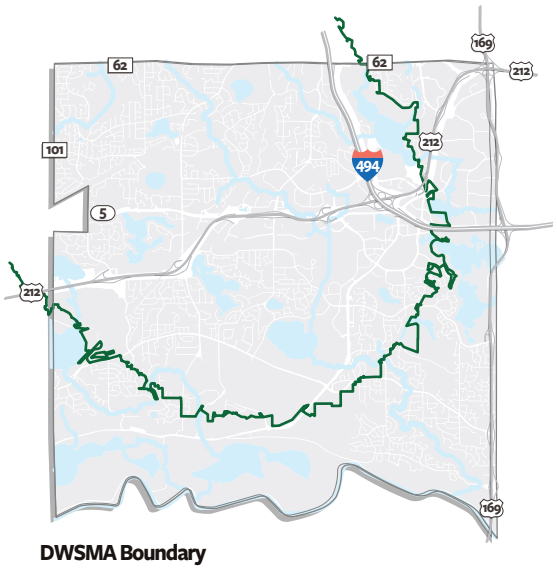
Groundwater Wells

The City of Eden Prairie has a total of 15 groundwater wells located in the Jordan and Prairie Du Chein Aquifers, with only one well constructed since the 2006 Comprehensive Plan Update. The City's Well No. 1 was previously abandoned due to its location in the US Highway 212 right-of-way. The total rated capacity of all wells in Eden Prairie is approximately 32.8 MGD. Regional seasonal groundwater influence and local well field interference during periods of peak demand results in an overall capacity reduction of approximately 10 MGD from the rated value. The total current capacity of the well field is approximately 22.75 MGD for all 15 wells based upon estimated aquifer pumping levels. The existing firm capacity, assuming the largest two wells are taken out of service, is approximately 19.3 MGD for 13 wells.

The construction of four additional wells have been planned to meet future demands. The wells would provide additional capacity to meet the city's water emergency needs and will distribute the pumping pressure on the aquifer from its present linear orientation to a lateral position, creating less hydraulic interference on other wells and on the aquifer as a whole. These wells have been programmed in the CIP and funding for the construction and sustainment of these wells has been included in the City's periodic utility rate studies to ensure sufficient revenue is generated for these improvements.

Emergency Interconnections

Eden Prairie has interconnections with four adjacent City distribution systems, which can be used for emergency or auxiliary water supply. Currently, a total emergency supply capacity of approximately 10 MGD is available to the City. However, consideration must be given to water quality and pressure differ-ences between distribution systems when evaluating interconnections. Eden Prairie chemically softens its well water to reduce the total hardness of the treated water, while three of the four adjacent communities do not utilize a softening process. Therefore, the instability of the mixed water, should either



DWSMA Boundary

community need drinking water from its neighbor, may result in precipitation of calcium carbonate in the piping in the vicinity of the interconnections. Other water quality problems such as cloudiness, taste differences, and color may occur as a result of mixing potable water produced using different treatment processes. These interconnections are periodically exercised in coordination with the adjoining community water utility.

Water Source Alternatives

The City of Eden Prairie does not have an existing plan for using surface water, such as from lakes or rivers, for emergency supply and does not consider such sources practical for emergency purposes. The City could consider utilizing surface water as a long term regional water supply solution, however, this would require considerable transmission line improvements, an additional water treatment facility, and most likely joint partnerships or water sales contracts with adjoining communities to provide wholesale water to neighboring municipalities. Information presented by the Metropolitan Council in "The Effects of Low Flow on the Water Quality in the Metropolitan Area–Working Paper No. 6" indicates that the City's only potential surface emergency water supply is the Minnesota River, which would be a poor source due to high algal growth, significant organic loading, and seasonal flow reductions. Such feasibility of the Minnesota River as a potential surface water source should be evaluated at the regional level for water supply.

Emergency Response Plan

If water pressure and available water in the municipal water system were to reach levels that could endanger public health, the City Manager or his designee may declare a state of water emergency. Section 3.30 of the City Code covers official control and provisions to limit water use and enforce restrictions during such an emergency. Eden Prairie's city council has scheduled for January 8, 2019 an ammendment to the Ordinance and City Code adding the Governor's Declaration of Water Emergency as a trigger to implement water emergency procedures. The City's emergency response focuses on prioritizing water use and reducing demand. Additionally, the City would turn to utilizing water source alternatives to help mitigate water deficiency.

If a water emergency were to arise, in which the City's water treatment plant becomes unavailable for a short period of time, Wells No. 6 and 7 would pump directly into the City's distribution system to provide short-term, temporary drinking water. Water quality issues would initially occur from this change, as mentioned in the Emergency Interconnections section, as unsoftened water from Wells No. 6 and 7 containing significant quantities of iron and magnesium would blend with the softened water already in the distribution system.

In extreme cases, other wells, if available, could be pumped to the City's water treatment plant even if the plant is not operational. Provided the high service pumping station is functional, well water could potentially be delivered to the distribution system without treatment. This emergency response option is highly undesirable, however, due to the resulting poor water quality and subsequent impact of sediment accumulation in the distribution system from precipitation of iron and manganese.

Source Water Protection

Water Supply Improvements/Maintenance

Eden Prairie annually conducts leak detection surveys on one-third of the City's water distribution system and repairs all leaks identified. Water distribution system leaks that occur due to system failures are normally repaired immediately. Periodically, minor leaks in distribution valves of lesser severity and consequence are deferred a short time until multiple repairs can be performed at lower cost by a single contractor on the same mobilization trip.

Although it is difficult to quantify unmetered water (e.g., firefighting) The City intentionally tracks water consumed during annual water-main flushing operations and most other maintenance activities. Eden Prairie's unmetered water remains well below 10 percent and annually ranges from six to seven percent.

Wellhead Protection

In 2004, the City completed a Wellhead Protection Plan (WHPP) Part Two in accordance with Minnesota Rules Chapter 4720.5200. The area from which City wells draw water is identified as the Wellhead Protection Area (WHPA). The area around it, which is to be protected and managed, is defined as the Drinking Water Supply Management Area (DWSMA). The locations of these areas were approved by the Minnesota Department of Health on March 18, 2003 and are delineated in the WHPP.

The WHPP was subsequently updated in 2013 to include expansions to the DWSMA and all new wells installed since the original plan. City planning staff have been diligent in referring to the DWSMA GIS map overlay and including well head protection analysis in the review process for new developments. The most recent WHPP Part Two includes collaboration with other communities within Eden Prairie's DWSMA to safeguard the community water supply against potentially unsafe development practices in other jurisdictions.

Sustainable Resilience

Recycle Water

Reusing greywater is an important tool for sustainability, resiliency, and affordability. Through the use of greywater, all buildings can help to minimize the amount of water that is discharged in the sewer system and is ultimately treated. The City will continue to promote the benefits of reusing greywater through project review to encourage the safe reuse of greywater.

Water Conservation Plan

Since the last Water Supply Plan, the City has stressed water conservation through the following key tactics:

- Regularly conduct water rate study updates with emphasis on conservation pricing.
- Undergo water supply system improvements such as leak repairs and valve replacements.
- Educate the public about water conservation.
- Form water conservation ordinances.
- Establish a water conservation rebate or retrofitting program.
- Consistently enforce water restrictions.
- Demonstrate water conservation projects.
- Continue annual leak detection.
- Encourage Sustainable Eden Prairie program participation.

Eden Prairie is proud to be a leader in water conservation efforts among communities in the metro area and beyond. Since 1998, when the first water conservation rebates were offered to local residents, the commu-nity set the stage for individual water stewardship. The City's programs for water sustainability efforts also became the model for the Metropolitan Council's water efficiency grant program in 2016.

Eden Prairie has educated hundreds of school children and adults annually from inside and outside the City since the establishment of the Environmental Education Center at the local water treatment plant in 1998. The education center contains numerous self-guided exhibits of water conservation and awareness displays, all of which are periodically modernized to keep pace with society's changing demographics and technological growth. City staff also provides a water conservation training program and water treatment plant tour. Eden Prairie has experienced a generational change in water conservation awareness, which is considered to be greatly influenced by this program. Families in which both parents and children are educated on water conservation have significantly contributed to water use reduction in the community as a whole.

Eden Prairie has established internal objectives for water conservation that exceed the published community goals in order to be more successful than the expectations of the Department of Natural Resources and the Metropolitan Council.

The water utility annually budgets thousands of dollars for the purpose of constructing water conservation landscapes, water reuse projects, and rain gardens. This is with the aim to show residents and commercial customers how to take on water-conserving projects independently and protect Eden Prairie's water supply for generations to come. Since 2011, the utility has been replacing lawns with native landscapes at various utility properties, and beginning in 2016, the utility has funded annual conversions of lawn-spaces throughout the entirety of city-owned properties. Wherever native landscapes are practical, they are constructed as demonstration projects of low-water use options to traditional urban lawns. Signs and various forms of educational materials, both printed and online, are provided to residents to guide them through the process.

Additionally, Eden Prairie completed in 2018 its first water-reuse demonstration project created in partnership through a joint grant with the Metropolitan Council and Riley Purgatory Bluff Creek Watershed District. This project collects rainwater from the large roof surface of Fire Station No. 2, treats the water to the appropriate public health standard of safety, and makes the water available for onsite irrigation and the washing of fire trucks. Aside from the actual savings of metered, treated drinking water, a primary goal of this project is to educate the public about the practicality of implementing similar systems at their homes. Accordingly, the site has been designed to guide visitors through each step of the process, including an example of low-water-use vegetation and yard design. The project is meant to promote the idea that water conservation is a community ethic and an achievable goal for everyone.

Social Equity & Diversity

Water Justice

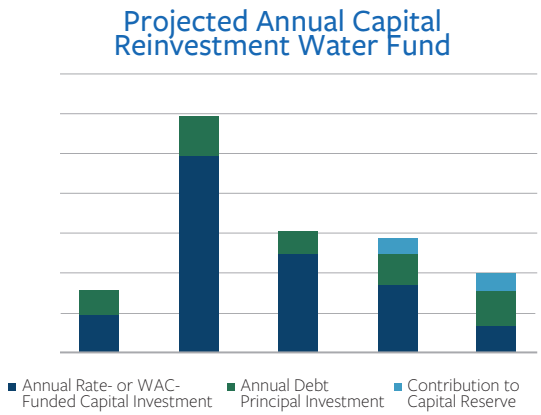
Water quality impacts community members all on a daily basis, through the water people drink and use for food preparation and the water people use for showering and recreating. Water justice means provision of clean and safe water access for everyone regardless of factors such as location or income level.

Capital Improvement Plan & Operating Budgets

The City of Eden Prairie is committed to capital reinvestment of the Water Utility to achieve the goals and policies set forth and maintain the long-term sustainability of the Utility. In addition to specific CIP projects outlined in the Water Resources & Infrastructure CIP Matrix, the following programs will continue to be included in the City's annual operating budgets:

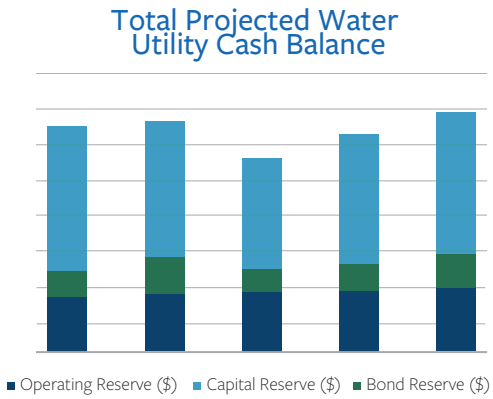
- Distribution system interconnections.
- Water meter installation, repair, and upgrade program.
- Water auditing and accounting of water usage.
- System leak detection and repair program.
- Enforcement of regulations regarding water efficient plumbing fixtures.
- Environmental learning center and public education efforts.
- Water conservation rebate and grant program.
- Incentivizing commercial and large residential area irrigation system upgrades.

Figure 3



Recognizing that infrastructure continues to age, the City developed a reinvestment strategy designed to support the rehabilitation and replacement of public water systems in consideration of the age of these systems and the anticipated life cycle of various assets. The strategy targets an annual capital reinvestment of approximately $2 million to support future rehabilitation projects and capital replacement or new construction.

Figure 4



Wastewater

The wastewater plan component of Eden Prairie's comprehensive plan conforms with the 2040 Water Resources Policy Plan and Thrive MSP 2040, thereby providing the Metropolitan Council with sufficient information from the community to ensure the regional wastewater system has adequate capacity to serve the future needs of the region. This section of the water resources chapter summarizes Eden Prairie's comprehensive wastewater plan and provides specific planning information about system size and capacity, major system components, historical and estimated future flow data, population and employment predictions, and land-use implications. The impact of Individual Sewage Treatment Systems (ISTS), inflow and infiltration (I/I) and mitigation efforts to reduce I/I, and capital improvement planning considerations are also discussed.

Existing Sanitary Sewer System

Eden Prairie's first comprehensive trunk sewer plan was adopted in 1969. The City is currently following its Comprehensive Sewer Policy Plan that was prepared in 1985. The City's system includes five MCES interceptor sewers, 12 trunk systems, and 22 lift stations. Eden Prairie expanded its urban service area in 1997 to include an additional 850 acres of developable residential land in the southwest portion of the City, which is the extent the City expects the Municipal Urban Service Area (MUSA) to reach.

Historically, there has been development of homes outside of the MUSA boundary through the use of Individual Sewage Treatment Systems (ISTS). At the time of home construction, primary and secondary sites for the ISTS were identified within the property. As these properties age, experience malfunctions of the existing ISTS systems, or utilize both the primary and secondary sites, a connection to municipal services may be the solution necessary to prevent damaging environmental impacts.

The Metropolitan Council review process for the connection to municipal services under these circumstances should be expedited in order to reduce the potential for environmental impacts. Evidence of a failing system and lack of a viable alternative site would need to be demonstrated to install a system from a licensed inspector. Connection to municipal services in these cases would not be intended to provide for increased development potential but rather to service existing properties; therefore, the land use designation would remain Rural.

Gravity Sewers

The City of Eden Prairie's gravity sanitary sewer system consists of six-inch to 36-inch diameter piping that is polyvinyl chloride (PVC) pipe, ductile iron pipe (DIP), or reinforced concrete pipe (RCP). Sanitary sewer construction started in the 1960s, with the majority of the system constructed in the 1970s and 1980s. The existing gravity sanitary sewer system appears to be in good overall condition based upon televising and inspection efforts to date. The trunk system consists of gravity lines primarily ten inches in diameter and greater, lift stations, and forcemains. The City's trunk system has been completely built out, which is shown together with the interceptor system in Figure 4. The gravity sewers are directed to approx-imately 15 miles of MCES interceptor sewers within Eden Prairie.

Lift Stations

The City of Eden Prairie's sanitary sewer system consists of 22 lift stations ranging in size from a small 30 gallons per minute (gpm) grinder station to a large 940 gpm lift station. The lift stations have been sized to handle buildout of their service areas. Table 2 summarizes the capacity information for each of the lift stations.

Table 2. Lift Station Capacities

No.	Lift Station Name	Pumping Capacity (gpm)	Existing Peak Flow (gpm)	Remaining Capacity (gpm)
1	Topview	132	53	79
2	Super Valu	151	40	111
3	Duck Lake Road	235	71	164
4	Purgatory Creek Park	30	18	12
5	Washington Avenue	302	145	157
6	Red Rock	141	34	107
7	Bluffs West	55	33	22
9	Pioneer Trail	791	324	467
10	Bluestem	132	58	74
11	Red Oak	164	9	155
12	Bell Oaks	211	56	155
13	Riley Creek Ridge	538	231	307
14	Riverview Heights	178	34	144
15	Summerfield	324	123	201
16	Bearpath	138	100	38
17	Highview	528	248	280
18	Cedar Forest	606	130	476
19	Eden Prairie Road	799	175	624
20	Spring Road	940	479	461
21	Riley Lake Park Barn	50	20	30
22	Staring Lake Outdoor Center	50	15	35

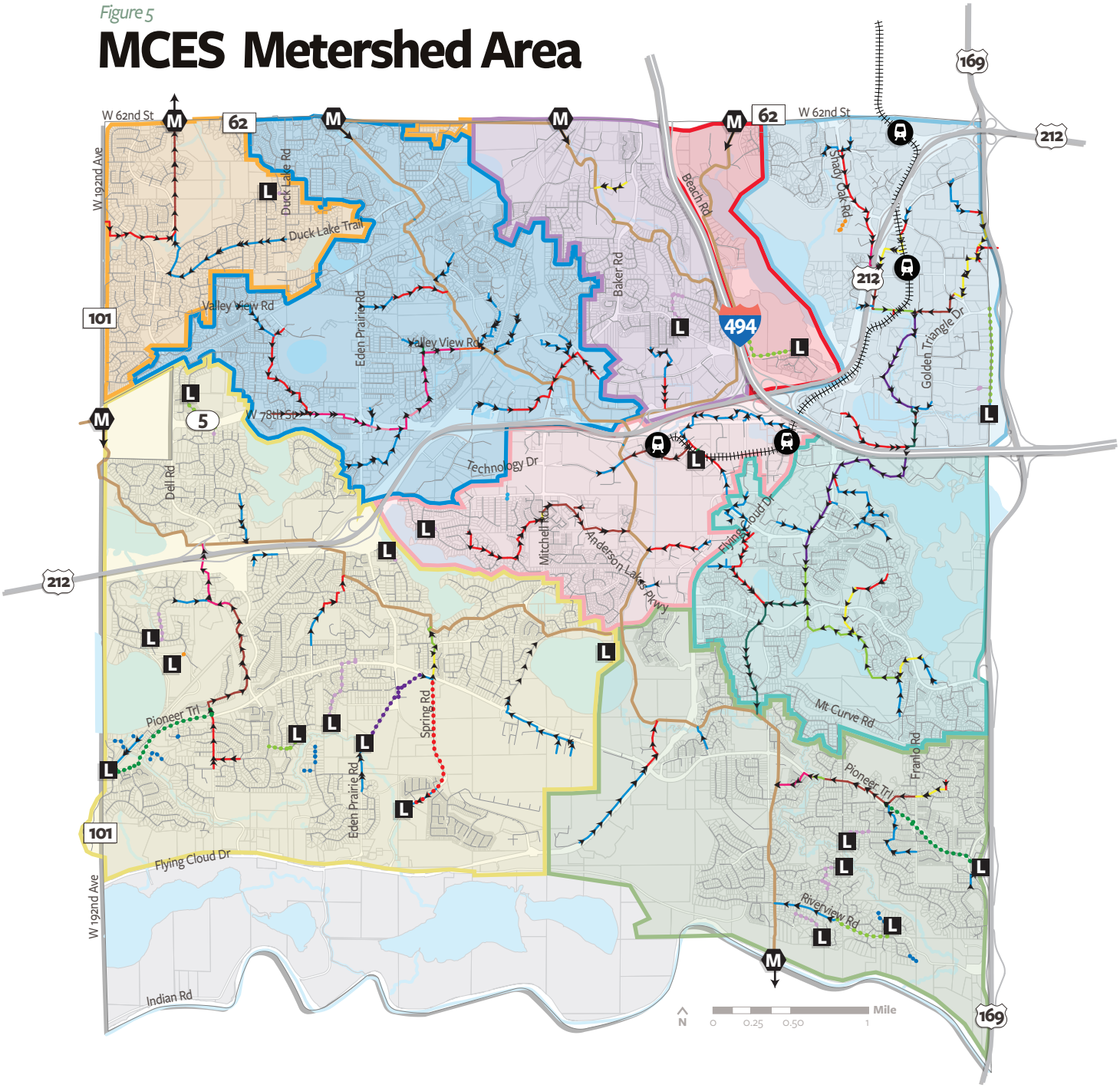
MCES Interceptors & Intercommunity Connections

The MCES interceptors, which also serve southwest Hennepin County and portions of Carver County, enter Eden Prairie at three locations in the north along the Minnetonka border and one location to the west along the Chanhassen border where they eventually combine and exit Eden Prairie in the south at the Minnesota River. All of Eden Prairie, is served by the MCES Blue Lake wastewater treatment plant (WWTP) located along the Minnesota River in Shakopee. Conveyance to the Blue Lake plant is provided though MCES Interceptors 8253-329 (Red Rock), 6-SS-670 (Purgatory Creek), 7118 (Nine Mile One Trunk), 6801 (Nine Mile Creek), and 6903 (North). The majority of Eden Prairie's sanitary sewer system flows south directly through MCES Metershed 409. Three areas in the northwest quadrant of the City flow north to Minnetonka into Metersheds 414, 412, and 411, which then flow back into Eden Prairie and Metershed 409 through the Purgatory Creek and Nine Mile One Trunk Interceptors. The areas served by Metersheds 411 and 412 are unmetered into Minnetonka. Metershed 414 includes an area of Chanhassen that flows unmetered into Eden Prairie.

Wastewater from approximately 250 acres along the northeastern edge of Eden Prairie had for years been served by the MCES Metro WWTP located in St. Paul. Conveyance to the Metro plant was provided through MCES Metershed 129 in the City of Edina. However this metershed was changed when the Bryant Lake Trunk was extended into this area, at which time the City of Eden Prairie truncated the sewer main leading to Edina and redirected most of the flows from this area southward into the Bryant Lake Trunk, and into Metershed 409. Presently only one, possibly two commercial properties on the border with Edina still contribute flow to Edina's system which flows to Metershed 129. Figure 5 depicts the Metropolitan Council's Map showing the MCES interceptors, metershed areas, and subsequent intercommunity connections.

Figure 5

MCES Metershed Area



Sewershed Districts

- (MO) Minnetonka Outler District
- (PC) Puragtory Creek District
- (NCW) Nine Mile Creek West District
- (NCE) Nine Mile Creek East District
- (BL) Bryant Lake District
- (RR) Red Rock District
- (C) Central District
- (AL) ANderson Lakes District
- (PT) Pioneed Trail District

Gravity Trunk Sewer

- Gravity Sewer
- MCES Interceptor Sewer
- 9 - Inch
- 10 - Inch
- 12 - Inch
- 15 - Inch
- 18 - Inch
- 20 - Inch
- 21 - Inch
- 24 - Inch
- 27 - Inch
- 30 - Inch
- 33 - Inch
- 36 - Inch
- M MCES Meter / Connection

Forcemain

- 2 - Inch
- 2.5 - Inch
- 3 - Inch
- 4 - Inch
- 6 - Inch
- 8 - Inch
- 10 - Inch
- 12 - Inch
- L Lift Station

Large Sewer Users

When planning for wastewater systems both significant industrial users (SIU) and categorical industrial users (CIU) are often looked at because of their potential to impact both the sanitary sewer and treatment systems. At the present time there are no major industries in Eden Prairie whose average daily wastewater flow exceeds 25,000 gallons and no industries in the City require pretreatment of their wastewater before discharging into the City's system.

Existing Wastewater Flows

Existing wastewater flows are not measured for individual users and therefore not characterized by land use type. The total flows are only measured by MCES at two meter locations leaving the City. Annual, monthly, and hourly flow data is available for the MCES meters. Peak month and peak hourly flow data help determine infiltration and inflow contributions. Table 3 summarizes the average wastewater flows from the last 10 years for the City of Eden Prairie.

The 10-year average annual per capita wastewater flow is approximately 79 gallons per day (GPD) and the average dry weather (winter quarter, December-February) per capita wastewater flow is approximately 76 GPD. Because the wastewater flow is not tracked by customer type, these per capita rates include the total flow from residential, commercial, and industrial properties. However, water-use data is available by customer type and can be used to estimate the wastewater flow collected from residential and other land uses. Water-use data indicates that residential water use averaged 74 percent of the total water metered over the last 10 years. Thus the residential portion of the average per capita wastewater flow is approximately 60 GPD. The average per capita commercial/industrial wastewater contribution is then approximately 20 GPD

When comparing 10-year average dry weather flows to the same winter quarter water usage, the wastewater flow is approximately 93 percent of the water use. The metered dry weather wastewater flow correlates quite well with the metered water use for the same time period, which indicates some validity to the existing flow data. The difference is relatively minor considering metering accuracies and the fact that a small portion of the water usage is not captured as metered wastewater where it flows out of Eden Prairie's metershed areas.

Table 3. Historical Wastewater Flow

Year	Population	Average Annual Flow (MGD)	Average Dry Weather Flow (MGD)	Peak Month Flow (MGD)	Average Annual Per Capita Flow (GPD)	Average Dry Weather Per Capita Flow (GPD)
2007	59,028	4.93	5.16	5.23	83.56	87.4
2008	59,618	4.97	4.84	5.88	83.44	81.18
2009	60,207	4.82	4.56	5.15	80.07	75.72
2010	60,797	5.23	4.69	6.2	85.99	77.12
2011	61,191	5.45	5.16	7.19	89.12	84.36
2012	61,586	4.59	4.4	5.76	74.49	71.46
2013	61,980	4.66	4.1	5.54	75.19	66.22
2014	62,374	4.61	4.33	5.35	73.95	69.49
2015	62,769	4.5	4.44	4.77	71.72	70.75
2016	63,163	4.82	4.78	5.06	76.3	75.73
Average					**79.39**	**75.94**

Population & Employment Projections

The comprehensive wastewater plan is developed in part to portray the condition of the Eden Prairie wastewater collection system under future flow conditions, assuming that the population and employment forecasts are achieved. The purpose in developing the plan is to anticipate future changes to the system that may be required and to allow for the development of a sustainable capital improvement program for the wastewater collection system. The Thrive MSP 2040 population, household, and employment forecasts in 10-year increments through 2040 will be used to generate wastewater flow projections and maintain the required consistency with all parts of the comprehensive planning effort.

Table 4 presents the projections differentiated by sewered and unsewered components within the City. It should be noted that the existing and projected unsewered population for the City has been overestimated by MCES; however, in recent communications with MCES, their planning staff will adjust the numbers to reflect the projections provided by the City.

Projections of sewered population, households, and employees for the remaining two commercial buildings served by the Metro wastewater treatment plant are not provided, as this contribution is insignificant. Table 5 presents projections of sewered population, households, and employees for the area in Eden Prairie served by the Blue Lake wastewater treatment plant.

Table 4. Sewered Projections

Year	Component	Population	Households	Employment
2010	MCES Sewered	60,197	23,730	48,775
2010	Unsewered	600	200	-
2020	MCES Sewered	67,360	27,220	64,000
2020	Unsewered	540	180	-
2030	MCES Sewered	74,900	30,300	68,000
2030	Unsewered	300	100	-
2040	MCES Sewered	82,340	33,280	72,500
2040	Unsewered	60	20	-

Table 5. Blue Lake WWTP

Year	Population	Households	Employment
2020	67,360	27,220	64,000
2025*	71,130	28,760	66,000
2030	74,900	30,300	68,000
2035*	78,620	3,179	70,250
2040	82,340	33,280	72,500

Wastewater Flow Projections

General

To forecast flows from future growth, the land use plan will be utilized, and unit flow rates will be established for each land use category based upon the anticipated density in housing units and persons per acre. These flow rates can be applied to specific undeveloped parcels or redevelopment areas.

To forecast future flow from existing areas historic flow data, industry standards, and current MCES data need to be examined. The regional data collected by MCES suggests the current overall average annual flow is 85 gallons per capita per day (gpcd), which is lower than the traditional default for sewer design of 100 gpcd. Furthermore, MCES has prepared future average flow projections for the metropolitan interceptor and treatment system based upon 60 gpcd for residents, 15 gallons per day (gpd) per employee from new development, and a gradual reduction of wastewater flow from existing development. Use of these planning assumptions reflects an increase in water conservation and a reduction in inflow and infiltration. It is important to note that these flow rates will vary as systems become larger and are likely to increase as the wastewater collection system ages. It is therefore prudent to use traditional design values when looking at the design of new lateral sewer or trunk systems.

Please note that Eden Prairie has been developing a GIS-based, discreet sanitary sewer system model which captures actual winter-quarter water meter data from each account as the assumed base sewer flow, and projects that use throughout the system to provide a very realistic accumulation of flows for every trunk system. This model is in development and is expected to be completed by third quarter of 2021. The results of this model will be used to replace the TAZ based estimates provided in this report, and will serve to update the City's Comprehensive Plan following completion.

Land Use

The 2040 land use plan for the City of Eden Prairie served as the basis for the development of the sanitary sewer flow projections and modeling of specific parts of the trunk system in redevelopment areas (see the Land Use Change Development Areas map in the Land Use Chapter). Detailed descriptions of the various land uses are found in the Land Use chapter.

Using Land Use Guide in the Land Use Chapter, the acreage of each land use type was determined for each sewer subdistrict. For purposes of sewer modeling, certain land uses were combined. Commercial, Industrial, Flex Service, and Mixed Use were combined into a single category of Commercial/ Industrial. The land use data was then checked with respect to the 2040 population and employment projection for each traffic area zone (TAZ). Table 6 summarizes the wastewater flow generation rates in gallons per acre per day for each land use type. With most of the City already built out, these per-acre flow generation rates are beneficial for estimating flows from the few remaining undeveloped parcels or potential redevel-opment areas. The per-acre estimated flows from undeveloped parcels can then be used to determine if the existing lateral sewers in those areas are adequate to convey the future flows to the trunk system.

Table 6. Wastewater Flow Generation by Land Use

	Gallons/ Acre/Day
	Acres
Residential	
Rural	274
Low Density	822
Medium Density	1,918
High Density	3,288
Mixed Use	800
Commercial	
Commercial	800
Office/Light Industrial	
Light Industrial/Business Park	800
Office	800
Industrial	
Industrial	800
Other Land Uses	
Parks & Open Space	100
Public/Semi-Public	800
Total	

Peak Flow Factors

The sanitary sewer system must be capable of handling the anticipated peak wastewater flow rate including any infiltration and inflow (I/I). The design peak flow rate can be expressed as a variable ratio to the average flow rate. Curves used to describe this ratio, called the Peak Flow Factor (PFF), indicate a decreasing ratio of peak flow to average flow with increasing average flow.

Peak Flow Factor (PFF) curves have been developed to depict this ratio and the Metropolitan Council has analyzed the extensive flow data within their system to correlate actual peaking factors with the formulated curves. A summary of the design peak flow factors based upon current MCES data is used by this report for estimating future peak flows from development areas.

MCES has recognized that these peaking factors reflect that sanitary sewers (local and regional) have been designed for an average combined flow for residential, commercial, and industrial contributions of 100 gallons per capita per day. Since the current actual average is approximately 85 gallons per capita per day they have adjusted the peak flow factors upward (divided by 0.85) for determining infiltration and inflow mitigation. This adjustment essentially reflects the available capacity for any additional infiltration and inflow in the system. These values are then used to set the peak flow metershed goals for each community. Table 7 summarizes the peaking factors for MCES design and metershed goals.

Table 7. MCES Flow Variation Factor for Sewer Design

Average Flow (MGD)	Peak Hourly Flow Factor
0.00 - 0.11	4.0
0.12 - 0.18	3.9
0.19 - 0.23	3.8
0.24 - 0.29	3.7
0.30 - 0.39	3.6
0.40 - 0.49	3.5
0.50 - 0.64	3.4
0.65 - 0.79	3.3
0.80 - 0.99	3.2
1.00 - 1.19	3.1
1.20 - 1.49	3.0
1.50 - 1.89	2.9
1.90 - 2.29	2.8
2.30 - 2.89	2.7
2.90 - 3.49	2.6
3.50 - 4.19	2.5
4.20 - 5.09	2.4
5.10 - 6.39	2.3
6.40 - 7.99	2.2
8.00 - 10.39	2.1
10.40 - 13.49	2.0
13.50 - 17.99	1.9
18.00 - 29.99	1.8
Over 30	1.7

MCES Metershed Goal Peaking

Average Flow (MGD)	Peak Hourly Flow Factor
0.10 or Less	4.5
0.11 - 0.20	4.4
0.21 - 0.30	4.3
0.31 - 0.40	4.2
0.41 - 0.50	4.1
0.51 - 0.60	4.0
0.61 - 0.70	3.9
0.71 - 0.80	3.8
0.81 - 1.00	3.7
1.01 - 1.20	3.6
1.21 - 1.50	3.5
1.51 - 2.00	3.4
2.00 - 2.50	3.3
2.51 - 3.00	3.2
3.01 - 3.50	3.1
3.51 - 4.00	3.0
4.01 - 4.50	2.9
4.51 - 5.00	2.8
5.01 - 6.00	2.7
6.01 - 8.00	2.6
8.01 - 10.00	2.5
10.01 - 12.00	2.4
12.01 - 16.00	2.3
16.01 - 20.00	2.2
20.01 - 30.00	2.1
Over 30	2.0

Wastewater Flow Projections

When forecasting flows for communities that have already been mostly developed, historical data is often examined to determine total flow projections for the community. The 10-year annual average per capita flow rate from Eden Prairie is approximately 80 gallons per day (gpd), which is slightly lower than the current overall MCES system average of 85 gpd. This is perhaps an indication of the general trend in water conservation the City has seen with the water system, but it could also be an indication that the overall average inflow and infiltration in Eden Prairie's system is below the metro area system average. While water conservation within existing households is expected to continue to improve, the existing sanitary sewer system will continue to age and become more likely to leak. Thus for planning purposes, the City will continue to use an overall per capita average of 90 gpd for future flow projections.

This is a slightly more conservative average value than historical data would determine, but it is close to the current metershed goals set by MCES for the City of Eden Prairie. City staff believes it is prudent to plan conservatively for long-lived infrastructure such as sewer systems. Table 8 indicates the current MCES Metershed goals for annual average flow which equates to an average of 89 gpcd.

Annual average wastewater flow projections through 2040 are summarized below in Table 9. These estimates are based upon an overall system average of 90 gallons per capita per day (gpcd). The projections for Metershed 414 remain the same as existing values since that area is already fully developed and not anticipated to have any changes due to redevelopment.

Table 8. Current MCES Metershed Goals

Year	Projected Total Average Annual Flow (MGD)	Projected Average Annual Flow M409 (MGD)	Projected Average Annual Flow M414 (MGD)
2016	5.68*	5.13	0.55

**Equates to approximately 89 gpcd based upon estimated 2016 population*

Table 9. Average Annual Waste Flow Projections

Year	Projected Total Average Annual Flow (MGD)	Projected Average Annual Flow M409 (MGD)	Projected Average Annual Flow M414 (MGD)
2020	6.11	5.77	0.34
2025	6.44	6.10	0.34
2030	6.77	6.42	0.35
2035	7.09	6.74	0.35
2040	7.42	7.07	0.35

Sanitary Sewer Trunk System Analysis

The trunk sanitary sewer system layout for the City of Eden Prairie is presented on Figure 4. This map shows sanitary sewer districts, existing trunk sanitary sewers, MCES interceptors, lift stations, and force mains. In addition, sizes of all trunk sewers are shown with reference points along each pipe. The trunk sewer system is completely built out at this time, and modeling of specific redevelopment areas indicate that existing trunk sewers have adequate capacity to meet the 2040 projections. Individual sanitary sewer districts are discussed below.

Sanitary Sewer Districts

The City is divided into 10 major sewer districts. The major sewer districts coincide with either major trunk areas within the City of Eden Prairie and/or MCES interceptor segment areas. A summary of characteristics and special issues within each district is provided in the following sections. There are over 100 connections to the MCES interceptor system within the City of Eden Prairie.

Minnetonka Outlet District

The Minnetonka Outlet District is located in the northwest corner of the City and consists of mostly residential properties. This district is completely built out. The flow from this district flows out of Eden Prairie and into the City of Minnetonka and comprises the majority of MCES Metershed 414. There are also two small areas on the northern edge that flow into Minnetonka and MCES Metersheds 411 and 412.

Table 10. Minnetonka

Sewer District	Projection	2017	2020	2030	2040
Minnetonka Outlet District (MO)	Flow (mgd)	0.38	0.38	0.39	0.39
	Population	5,655	5,655	5,684	5,684
	Households	1,800	1,800	1,809	1,809
	Employment	150	150	157	157

Sustainable Resilience

Water Conservation for Growth

"Protection and management of Eden Prairie's groundwater supply is vital to the health and survival of our community. Water conservation reduces the demand on groundwater, surface water and municipal water systems, and delays or completely eliminates the need for expensive infrastructure expansion projects. Preservation of our water resources will ensure our community's water supply is sustainable for future generations. Since 2000, the Eden Prairie has offered rebates to residents and businesses to promote water conservation. Potential ideas for new City-led conservation initiatives for residents include:

- ***Continue to update water conservation rebate programs to follow modern trends and technologies***
- ***Incentivize residents to reduce their water usage by creating a community wide challenge.***
- ***Work with local organizations to host workshops on rainwater harvesting, rain garden installations and turf alternatives.***
- ***Develop a webpage on the City website to provide resources on understanding utility bills, checking for leaks, and water consumption."***

Sustainable Resilience

Rainwater Reduction Program

Sanitary sewers were designed to carry wastewater, such as that from sinks, washing machines, and toilets. Wastewater is collected from homes and businesses and treated at a facility before it is discharged. When it rains, rainwater and groundwater can enter the sanitary sewer system through defects. As the system ages, excess rainwater flowing into the pipes can become substantial. Additionally, many people do not realize that connecting their basement sump pump discharge to a floor drain or laundry tub creates a significant community sanitary sewer capacity problem, and is, in fact, illegal. A single sump pump can easily exceed the capacity of a home's normal sewer flow many times over.

A sanitary sewer system is not designed to transport or treat an excessive amount of rainwater. Excess water from sump pumps and leaks can easily overwhelm the sewer system and cause very unpleasant and expensive sanitary sewer backups. The long-term solution to this issue is to add additional treatment capacity and repair the defects that allow the water to enter the system. However, these solutions are costly and can take several years to complete. Through the identification and repair of areas of the system that are susceptible to leaks, and the removal of excess rainwater from all forms of inflow, the expansion of current facility's treatment capacity can be delayed or even eliminated.

Purgatory Creek District

The Purgatory Creek District includes areas that flow to MCES Interceptor 6-SS-670 located in the northern half of the City running north to south generally following Purgatory Creek. There are three trunk sewers within this district which contribute flow to the MCES interceptor: Highway 5 Trunk, Duck Lake Trunk, and Baker Road Trunk. The Highway 5 Trunk serves the old Highway 5 corridor west of Highway 212 as well as the Round Lake area. The Duck Lake trunk serves the area between Purgatory Creek and the eastern portion of Duck Lake. The Baker Road trunk serves areas north and south of Purgatory Creek and east of Highway 212.

Table 11. Purgatory Creek

Sewer District	Projection	2017	2020	2030	2040
Purgatory District (PC)	Flow (mgd)	0.88	0.91	0.99	1.06
	Population	10,699	10,997	11,991	12,939
	Households	4,233	4,347	4,727	5,090
	Employment	7,024	7,039	7,090	7,139

Nine Mile Creek West District

The Nine Mile Creek West District includes areas that flow to MCES Interceptor 7118 located in the northern half of the City and just west of Highway 494. There are no major trunk sewers that serve this area, however there are a number of lateral sewers that are connected directly to the MCES interceptor.

Table 12. Nine Mile Creek West

Sewer District	Projection	2017	2020	2030	2040
Nine Mile Creek West District (NCW)	Flow (mgd)	0.37	0.38	0.41	0.43
	Population	4,044	4,088	4,233	4,349
	Households	1,691	1,695	1,706	1,716
	Employment	4,287	4,433	4,919	5,308

Nine Mile Creek East District

The Nine Mile Creek East District includes areas that flow to MCES Interceptor 6801 located in the northern half of the City and just east of Highway 494. There are no major trunk sewers that serve this area and the contributing area is small in comparison to the other districts.

Table 13. Nine Mile Creek East

Sewer District	Projection	2017	2020	2030	2040
Nine Mile Creek East District (NCE)	Flow (mgd)	0.06	0.07	0.08	0.09
	Population	324	325	326	328
	Households	97	97	98	98
	Employment	1,653	1,796	2,273	2,654

Anderson Lakes District

The Anderson Lakes District is located in the middle of the eastern side of the City. The district includes both residential and commercial areas. The 36-inch and 33-inch Anderson Lake Trunk serves a major portion of this area, which also includes flow from the 24-inch Neill Lake Sub-Trunk and the flow from the entire Bryant Lake District. The district flows to MCES Interceptor 6903.

Table 14. Anderson Lakes

Sewer District	Projection	2017	2020	2030	2040
Anderson Lakes District (AL)	Flow (mgd)	0.74	0.79	0.86	0.92
	Population	8,637	9,170	10,050	10,796
	Households	3,999	4,152	509	4,778
	Employment	6,270	6,574	7,075	7,500

Bryant Lake District

The Bryan Lake District is located in the northeast corner of the City and includes both residential and commercial areas. The Bryant Lake Trunk serves this area which then flows into the Anderson Lake District and eventually into MCES Interceptor 6903. A portion of this district along the eastern border used to flow to the City of Edina and to MCES Metershed 129, however, when the Bryan Lake Trunk was extended up into that area, the flow was redirected from the Edina connection to the Bryant Lake Trunk, which ultimately flows into MCES Intercepter 6903. Currently only a couple of commercial buildings that are located within Eden Prairie are on still on the line that goes to Edina.

Table 15. Bryant Lake

Sewer District	Projection	2017	2020	2030	2040
Bryant Lake District (BL)	Flow (mgd)	0.88	1.00	1.17	1.34
	Population	2,030	3,241	5,239	6,934
	Households	962	1,557	2,538	3,371
	Employment	28,929	30,457	32,049	34,250

Red Rock District

The Red Rock District encompasses the southwestern portion of the City and extends to the border with Chanhassen. The district includes areas that flow to MCES Interceptor 8253-325 including two trunk sewers: Riley Road Trunk and Spring Road Trunk. The Riley Trunk Sewer is constructed of 21-inch and 18-inch piping, and the Spring Road Trunk Sewer consists of a 12-inch trunk line.

Table 16. Red Rock

Sewer District	Projection	2017	2020	2030	2040
Red Rock District (RR)	Flow (mgd)	1.04	1.06	1.12	1.18
	Population	14,695	14,922	15,678	16,390
	Households	5,425	5,481	5,666	5,840
	Employment	2,248	2,322	2,567	2,798

Central District

The Central District is located in the middle portion of the City and includes areas that flow to MCES Interceptor 6903 between the Purgatory Creek and Red Rock Districts. There are three separate smaller 12-inch trunk lines, including the West 78th Street Trunk that serve this area.

Table 17. Central

Sewer District	Projection	2017	2020	2030	2040
Central District (C)	Flow (mgd)	0.73	0.86	1.01	1.20
	Population	7,784	9,390	11,264	13,658
	Households	3,785	4,496	5,325	6,383
	Employment	8,797	9,323	9,938	10,722

Pioneer Trail District

The Pioneer Trail District is located in the southeastern corner of the City and includes areas that flow to MCES Interceptor 6903. The district includes mostly residential and a small amount of commercial area. There is one small trunk line (Pioneer Trail Trunk) which serves a large portion of the district.

Sewer District	Projection	2017	2020	2030	2040
Pioneer Trail District (PT)	Flow (mgd)	0.71	0.73	0.77	0.81
	Population	9,837	10,113	10,734	11,322
	Households	3,722	3,777	4,022	4,215
	Employment	1,860	1,888	1,933	1,972

Flow Allocation Summary

A static model of the sanitary sewer system was created to allocate projected 2040 flows across the system. The modeling is based upon a variety of parameters, including land use, population density, standard wastewater generation rates, topography, and future land use plans. The City has provided population and employment forecasts for each traffic analysis zone (TAZ) within the City. These TAZ areas were correlated with the individual sewer subdistricts to provide the basis for allocating flow across the system. The TAZ area population and employment projections were assigned residential and non-residential flow rates to calculate the projected wastewater flow from each area. In general, the model delineates the existing sewer system into design segments. Each end of a design segment has a node assigned to it. The nodes were established wherever one of the following conditions was encountered:

- Flow from a subdistrict enters the pipe network.
- Significant grade change has occurred.
- Change in pipe size.
- Two or more trunks connect.
- Manmade elements affect the location and installation costs for the trunk system or lateral service of the subdistricts.

Each subdistrict contains at least one collection point where the subdistrict's sewage enters the pipe network. Upstream of that collection point, a lateral network of 8 inch gravity lines can serve areas that are currently not connected to the system.

Table 19. Average Annual Wasterwater Flow Projects by MCES Interceptor Segment or Metershed Area

MCES Interceptor (Sewer Districts)	Projection	2017	2020	2030	2040
MCES Metershed 414 (Minnetonka Outlet)	Flow (mgd)	0.36	0.36	0.37	0.37
	Population	5,382	5,382	5,411	5,411
	Households	1,709	1,709	1,718	1,718
	Employment	150	150	157	157
MCES Metershed 411(Minnetonka Outlet)	Flow (mgd)	0.01	0.01	0.01	0.01
	Population	120	120	120	120
	Households	40	40	40	40
	Employment	-	-	-	-
MCES Metershed 412 (Minnetonka Outlet)	Flow (mgd)	0.01	0.01	0.01	0.01
	Population	153	153	153	153
	Households	51	51	51	51
	Employment	-	-	-	-
MCES Interceptor 6-SS-670 (Purgatory Creek)	Flow (mgd)	0.88	0.91	0.99	1.06
	Population	10,699	10,997	11,991	12,939
	Households	4,233	4,347	4,727	5,090
	Employment	7,024	7,039	7,090	7,139
MCES Interceptor 6801 (Nine Mile Creek East)	Flow (mgd)	0.06	0.07	0.08	0.09
	Population	324	325	326	328
	Households	97	97	98	98
	Employment	1,653	1,796	2,273	2,654
MCES Interceptor 7118 (Nine Mile Creek West)	Flow (mgd)	0.37	0.38	0.41	0.43
	Population	4,044	4,088	4,233	4,349
	Households	1,697	1,695	1,706	1,716
	Employment	4,287	4,433	4,919	5,308
MCES Interceptor 6903 North (Central)	Flow (mgd)	0.73	0.86	1.01	1.20
	Population	7,784	9,390	11,264	13,657
	Households	3,785	4,496	5,325	6,383
	Employment	8,797	9,323	9,938	10,722
MCES Interceptor 8253-325 (Red Rock)	Flow (mgd)	1.04	1.06	1.12	1.18
	Population	14,695	14,922	15,678	16,390
	Households	5,425	5,481	5,666	5,840
	Employment	2,248	2,322	2,567	2,798
MCES Interceptor 6903 South (Bryant Lake, Anderson Lakes, Pioneer Trail)	Flow (mgd)	2.26	2.46	2.79	3.07
	Population	20,504	21,983	25,723	28,993
	Households	8,683	9,305	10,969	12,344
	Employment	37,059	38,937	41,056	43,722
Total	Flow (mgd)	5.73	6.11	6.78	7.42
	Population	63,705	67,360	74,900	82,340
	Households	25,714	27,220	30,300	33,280
	Employment	61,218	64,000	68,000	72,500

Individual Sewage Treatment Systems

A map showing the locations of each SSTS within Eden Prairie is contained in Figure 6. Chapter 10 of the city code details how the City has managed the permitting, construction, inspection, and supervision of individual subsurface treatment systems in the community in compliance with MPCA regulations (Minnesota Rules Chapters 7080-7083). The City no longer allows new septic systems to be constructed unless it is technically infeasible to connect the property to the public sanitary sewer system. Therefore, these systems are declining in number, because the owners are not permitted to construct a new SSTS unless it is technically infeasible to provide public sanitary sewer service to the property. In 2019 the Eden Prairie City Council adopted Resolution 2009-19 which transferred jurisdiction for the permitting and enforcement of SSTS within the City's geographic boundary to Hennepin County. Presently, there are less than 200 single-family residences that utilize individual on-site facilities for the disposal of their wastewater.

There are no public or private community SSTS within the city limits of Eden Prairie. It is anticipated that the number of on-site systems in Eden Prairie will be reduced as municipal sewer service is extended throughout the City and that only a few on-site systems will remain in operation by the year 2040. The only remaining septic systems will likely be those in the southeast portion of the City along River View Road, and the properties in the south portion of the City on Dell Road. Service by gravity sewer in those locations is currently technically infeasible to connect. Individual in-home grinder pump stations discharging into a low pressure forcemain system may be the only technically feasible option. At this time, no plans exist to bring these properties into the sanitary sewer service area. Table 20 shows the estimated number of remaining SSTS at key intervals between 2017 and 2040.

Figure 6

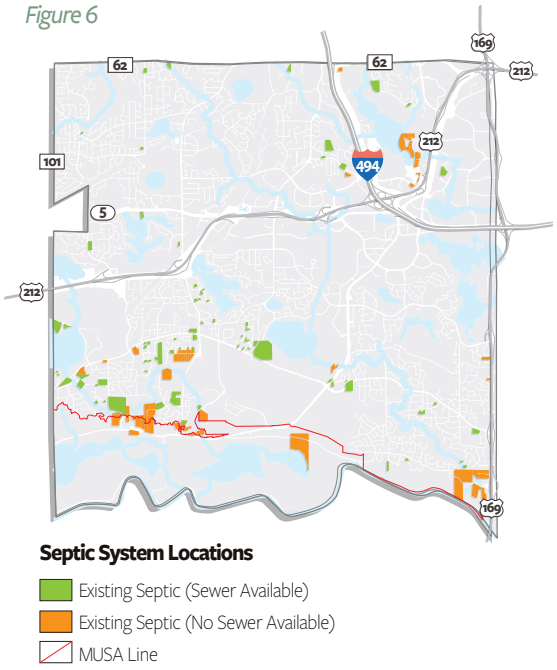


Table 20. Projected Number of SSTS Over Time

	2017	2020	2025	2030	2035	2040
Known or Estimated Number of SSTS	160	140	125	50	40	20

Inflow & Infiltration

The Metropolitan Council appointed a task force that met in 2003 and 2004 to address the impacts of excess inflow and infiltration (I/I) on the regional system. I/I refers to when groundwater and stormwater improperly enters the sanitary sewer system, such as through cracks or roof leaders, causing dilution of sewage water and inefficiency in treatment I/I can also result in the sewer system exceeding its capacity. It was determined that the cost for source removal was much more cost effective than the cost to store, convey, and treat excess I/I. Thus the current program focuses on source removal within the communities and the regional system. In 2009 and 2010, the Metropolitan Council Demand Charge Task Force reviewed goals of the ongoing program including a possible demand charge. The concluding recommendation was to implement a similar ongoing program rather than implement a mandatory demand charge. However, discretion was left to institute a demand charge if a community is not working towards meeting its I/I Goal.

Included within the 2040 Water Resources Policy, adopted in May of 2015 and more recently amended, is the establishment of I/I goals for all communities discharging wastewater to the regional system. Communities with excessive I/I will still be required to eliminate it within a reasonable time period. The Council has established I/I goals for each metershed, which is the maximum allowable discharge to the regional wastewater system expressed as a peak hourly flow rate measured in million gallons per day (mgd). The I/I Goal is equal to the adjusted average dry weather flow (ADF) multiplied by the respective peak hourly factor. The ADF is based upon a 10-year rolling average of meter flow data and is adjusted upward by population growth for future forecasting. As part of the ongoing I/I efforts a procedure manual has been updated by the Metropolitan Council for the subsequent program year. The 2019 Program Year Manual lists all of the requirements, roles, and responsibilities of both the Council and the local communities.

This plan requires Eden Prairie to be responsible for the following efforts:

- Identify existing and continued maintenance programs for the collection system.
- Create an I/I Mitigation Plan that addresses both public and private infrastructure and includes goals, policies, and strategies for preventing and reducing excessive I/I.
- A description of the requirements and standards of the community including ordinances related to the prohibition and disconnection of sump pumps, foundation drains, and roof leaders from the sanitary sewer system.
- Determining the sources, extent, amount, and significance of existing I/I in both municipal and private sewer systems.
- Providing a cost summary for remediating the I/I sources identified in the community and the results of any previous mitigation work.
- Establishing an implementation plan for preventing and eliminating excess I/I including the strategy and prioritization for I/I mitigation projects based upon flow reduction, budget, schedule, or other criteria.
- Working cooperatively with nearby communities to develop a mitigation plan for flow entering from another community.
- Working with the Metropolitan Council to identify sources of I/I that enters the regional system within the community or geographical area.
- Managing local I/I reduction programs to meet the community's I/I Goals.
- Responsibility for eliminating excess I/I and completing I/I mitigation work.

Existing I/I

When looking at average infiltration/inflow in a system over the course of a year the average dry weather (winter) flows can be compared to annual average and peak month flows to determine the amount of I/I entering the system. To understand whether or not groundwater plays a role during dry weather periods, the average dry weather flows can be compared to the water use for that same period as they should closely correlate since no wet weather rainfall events or lawn sprinkling occurs in the winter time. For Eden Prairie, the dry weather flow averages about 93 percent of the water use for the same period indicating that there is no base infiltration in the winter time. Table 21 summarizes average annual, average dry weather, and peak month flows for the City of Eden Prairie for the last 10 years as well as compares the various flows to help quantify the amount of I/I entering the system on an average basis.

Comparing annual average (AA) to average dry weather (AD), the average flow attributable to I/I is approximately 0.21 mgd or four gallons per capita per day, which could be considered the base infiltration and inflow. The average peak month to annual average ratio is 1.15, which is not overly excessive when looking at typical peaking factors. This equates to an average I/I contribution of approximately 0.75 mgd of clearwater flow from a combination of private sewer systems and public wastewater infrastructure during wet weather periods. Further wastewater flow monitoring during periods of wet weather is expected to help the City identify additional sources of I/I not yet discovered.

Table 21. Average Annual Wastewater Projections for MCES Interceptor

Year	Population	Average Annual Flow : AA (MGD)	Average Dry Weather Flow : AD (MGD)	Peak Month Flow : PM (MGD)	Base I/I AA - AD (MGD)	Average Wet Weather I/I PM - AA (MGD	Peak Month to Annual Average Ratio
2007	59,028	4.93	5.16	5.23	-0.23	0.3	1.06
2008	59,618	4.97	4.84	5.88	0.13	0.91	1.18
2009	60,207	4.82	4.56	5.15	0.26	0.33	1.07
2010	60,797	5.23	4.69	6.2	0.54	0.97	1.19
2011	61,191	5.45	5.16	7.19	0.29	1.74	1.32
2012	61,586	4.59	4.4	5.76	0.19	1.17	1.26
2013	61,980	4.66	4.1	5.54	0.56	0.88	1.19
2014	62,374	4.61	4.33	5.35	0.28	0.73	1.16
2015	62,769	4.5	4.44	4.77	0.06	0.27	1.06
2016	63,163	4.82	4.78	5.06	0.04	0.24	1.05
Average I/I Flow (MGD)					**0.21**	**0.75**	
Average I/I Per Capita (GPCD)					**4.17**	**13.04**	
Average I/I %					**5.23**	**16.2**	

Social Equity & Diversity

A Local Approach to Water Equity

The City's water resources must be carefully managed to meet the needs of its citizens and its commercial and industrial users, to protect local habitats and ecosystems, and to provide aesthetic beauty and recreational opportunities for both current and future generations.

I/I on an average basis can be quantified by looking at flows over the course of a year, however, it is much more difficult to determine peak instantaneous or peak hour events that are mostly associated with inflow. A one-inch rainfall event could have a large impact on the system or minimal impact depending upon the duration and intensity, as well as other factors for each particular event. Typically, no two events are the same, and at best, patterns can be extrapolated for general rainfall amounts. To pinpoint peak hour events, it requires a significant amount of flow monitoring at many locations in a large system. There has been only limited data collected during previous mitigation efforts which makes it is difficult to accurately quantify for the entire system.

Eden Prairie recognizes that additional future sewer flow monitoring will be necessary to quantify wastewater flows and any associated I/I in both the public and private segments of the wastewater system. Funding is planned for future annual wastewater flow monitoring beginning in 2020 for the next decade, and as the City's discrete wastewater system model evolves, we are hopeful it's I/I predictive flow capabilities will help further quantify potential future I/I contributions based upon actual data captured for specific private property developments.

Previous Mitigation Efforts

In 2005, Eden Prairie, along with the entire metro area, experienced a very significant rainfall event which resulted in the Metropolitan Council imposing Inflow and Infiltration (I/I) penalties to all communities who had peak flows more than their allowed daily maximum. Eden Prairie was one of those communities. The City was assessed a surcharge of $2.78 million, which equated to the cost of treatment for Eden Prairie's 8 million gallon excess I/I peak flow from the 2005 storm event. The surcharge was distributed across 5 years, allowing the City to perform $556,000 per year in projects that mitigated I/I. The City did exactly that. Records of sewer districts, maps, reports of progress, and correspondence that discusses these improvements are available for review.

Eden Prairie began its I/I mitigation program with the creation and adoption of an I/I ordinance (attached in the Appendix). The Ordinance and it's accompanying City Code update outlined the requirements for property owners, clarified the purpose and justification for the elimination of I/I, and gave the City the authority to perform property inspections and enforce the terms of the ordinance.

Among the projects performed to reduce I/I, the City satisfactorily completed work that included inspecting 14,000 homes individually for improperly connected sump pumps, the televising of 200 residential and commercial sanitary sewer laterals, and smoke testing of all private property connections for developments and commercial property within the system. It was determined that all sewer laterals were tight based on the 200 that were inspected, therefore effort and cost were no longer expended in televising the remainder of the private laterals.

Social Equity & Diversity

The Centrality of Water Resources

Water as a resource has critical importance in guaranteeing a high quality of life and in supporting economic growth and competitiveness. Coordination regarding decisions about supply, surface water management, handling of wastewater, and related issues in land use, transportation, and housing necessitate a holistic approach to water management.

Sustainable Resilience

Integrated Water Resources Management

Integrated Water Resources Management (IWRM) is an increasingly embraced process that promotes coordination in the development and management of water, land and related resources so as to maximize economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems and the environment. IWRM is based on the understanding that water resources are an integral component of the ecosystem, a vital natural resource, and an economic and social good.

It should be pointed-out that Eden Prairie has 1,172 homes constructed prior to 1970, which pre-dates the existence of a public sewer system. These homes were all served by privately owned SSTS. However, when the City's public sewer system was started in the mid-1970s, previously constructed homes which had their own SSTS began to connect to the public system. All sewer laterals were constructed of PVC pipe, and any clay-tile that may have been previously used in the septic system was abandoned. Over time, nearly all of these pre-public sewer system homes were eventually connected to the public system, thus eliminating past potential sources of I/I through old, inferior pipe systems.

The smoke testing program showed many opportunities for direct connection repairs, leaking clean-out connections, etc., which the City aggressively corrected in partnership with the private property owners. Wastewater O&M budgets include annual funding for smoke testing to ensure private system I/I doesn't increase due to lack of attention. Of the 14,000 homes identified in areas that had the appropriate soil conditions or other factors that would make them most probable to have sumpwater to eliminate, 600 were found with problems and all but approximately 15 have been corrected. The 15 remaining belong to residents who will not allow the City to enter their home to verify whether there is a problem or not. Those residents have been faced with paying fines of $100 per month since the program began rather than allow the City into their home. About two or three of these accounts per year ultimately decide to let the City in to perform an inspection and removed them from the list.

The City provides a winter-time sump pump discharge permit for only those homes which have continuously pumping dewatering systems that either create a public nuisance by their freezing discharge water or have no practical means of eliminating the water. These permits allow the sump pumps to discharge into the sanitary sewer, are only available October through May, and the City must visit the home to seasonally change the discharge location. Only one homeowner has requested this permit at the time of this publication.

The City has also made repairs to hundreds of sanitary sewer manholes in the streets every year by excavating the top portions of the manhole assembly above the cast-concrete base, and the cracked and broken concrete spacers that contractors used to bring the manhole up to the grade of the street when the system was built (most of them from the 1980s and early 1990s) have been replaced. The City has found this to be its most productive I/I effort within the public wastewater system. The historic average number of structures repaired by excavation and replacement is 332 per year, a rate of repair that has been fairly steadily maintained each year since 2006. The City is budgeted to continue this pace perpetually; however, manholes that have been previously repaired have been identified as still intact and not in need of rehabilitation when reviewed again for upgrades. As the number of remaining defective manholes are reduced, this will free up time and budget dollars for other I/I projects.

Eden Prairie participated in a Metropolitan Council inflow and infiltration grant program between 2014 and 2016 and received a fair-share portion of the total allocation of the state's grant pool. The City's share totaled $48,000, which was based on the amount of work that was completed. The City applied for and received approval of a subsequent grant for years 2017 to 2019, and the City is tracking expenses in the I/I mitigation program which will be reimbursed up to the fair-share available. Priority of effort for the I/I work the City has planned for 2019 as outlined in the City's grant application includes:

- Pipe Joint Sealing & Chimney Seals
- Cross Connection Elimination
- Manhole Sealing Joints, Castings, Covers

Mitigation Plan

Every year the City either inspects or jets every manhole in the community and one-third of the City's sewer mains are cleaned with a vacuum jetting system. The City also cleans and services each of the 21 sanitary sewer lift stations by removing and inspecting the pumps and components, and servicing the pumps, motors, piping, and controls annually. The City completely rehabilitates one lift station each year, which effectively gives the City a brand-new lift station every 22 years.

The City's goal in I/I is to continue to maintain and repair the public system to eliminate leaks, perform periodic smoke testing of the private systems to verify private sewer integrity, and to work with private developments to make sure their privately owned sanitary systems are managed, maintained, and repaired to minimize or eliminate I/I. Items 62, 67, and 70 in the Wastewater CIP shown at the end of this chapter specifically apply to I/I mitigation. Additional I/I work is included in each annual Operations & Management budget that does not appear in the CIP matrix.

The City will continue the practice of inspecting every manhole in the subsequent year's street repair program and fixing the manholes that may be leaking before the street is overlayed or seal coated. The City also will continue to replace the older style cast-iron manhole covers with new, gasketed, non-pickhole manhole lids that do not permit surface water to enter through the cover.

Capital Improvement Program

Capital Improvements

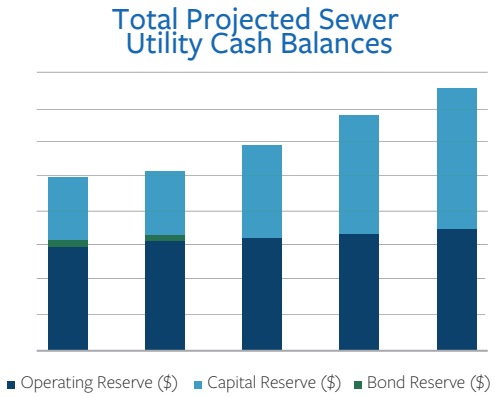
At this time, most of the City's trunk system has been fully constructed. It is anticipated that the remaining growth of the sewer system will be minor to serve the few remaining undeveloped parcels and/or redevelopment areas.

As the City of Eden Prairie continues to grow, annual demand for wastewater services will increase. To accommodate the community's projected growth, the City has budgeted for capital improvement projects through 2026. Over the ten-year planning period, the Capital Improvement Plan (CIP) budgets include $2,492,000 for sewer utility projects. Major projects include lift station rehabilitation, manhole rehabilitation, sewer rehabilitation or lining, and small diameter sewer extensions. A detailed description of the wastewater CIP items is outlined in the Water Resources & Infrastructure CIP Matrix at the end of this Chapter. Items 62, 67, and 70 in the Wastewater CIP Matrix specifically address I/I mitigation work activities, repairs, and construction.

User Rates

The City of Eden Prairie has commissioned three utility rate studies since 2009 and revised sewer rates subsequent to each study. The City's utility rates are adjusted annually, and the designed long-term rate plan ensures the utility grows and sustains the necessary capital reserve to ensure funds to properly and proactively maintain and expand the wastewater system to keep pace with aging infrastructure needs, community growth, and mitigation of infiltration and inflow. The current 2017 Rate Study Update includes this approach and recommendations to continue to provide long term sustainability for the sewer utility.

Figure 7



Water Resources & Infrastructure CIP Matrix

#	Project Description	Funding Source	Estimated Budget	Timeline
WATER SYSTEM				
1	High Service Pump System	Bond	$3,600,000	10 years
2	Old Plant 480 MCC	Revenue	$369,000	10 years
3	Chemical Tanks	Revenue	$138,000	10 years
4	Lime Slaker Replacement	Revenue	$-	10 years
5	Filter Press Replacement	Bond	$2,493,000	10 years
6	Filtration Optimization	Revenue	$-	10 years
7	Basin Optimization	Revenue	$-	10 years
8	Office / Green HVAC	Bond	$1,780,000	10 years
9	Garage Addition	Revenue	$-	10 years
10	East Chemical Access Area	Revenue	$146,000	10 years
11	Parking Lot Expansion South Side	Revenue	$-	10 years
12	Parking Lot Expansion West Side	Revenue	$347,000	10 years
13	Side 4 Basin Recoating	Revenue	$740,000	10 years
14	Well 17 Construction	Water Access Charge	$505,000	10 years
15	Well 17 Pump and Facilities	Water Access Charge	$683,000	10 years
16	Well 17 Transmission Pipeline	Water Access Charge	$297,000	10 years
17	Well 18 Construction	Water Access Charge	$541,000	10 years
18	Well 18 Pump and Facilities	Water Access Charge	$1,012,000	10 years
19	Well 18 Generator	Water Access Charge	$211,000	10 years
20	Well 18 Transmission Pipeline	Water Access Charge	$630,000	10 years
21	Well 19 Construction	Water Access Charge	$579,000	10 years
22	Well 19 Pump and Facilities	Water Access Charge	$1,084,000	10 years
23	Well 19 Transmission Pipeline	Water Access Charge	$550,000	10 years
24	Well 20 Construction	Water Access Charge	$621,000	10 years
25	Well 20 Pump and Facilities	Water Access Charge	$1,160,676	10 years
26	Well 20 Generator	Water Access Charge	$240,895	10 years
27	Well 20 Transmission Pipeline	Water Access Charge	$613,187	10 years
28	Well and Tower Radio System	Revenue	$220,000	10 years
29	Wells Major Rehabilitation - Well No. 5	Revenue	$620,000	10 years
30	Wells Major Rehabilitation - Well No. 10	Revenue	$628,000	10 years
31	Dell Road [Crestwood Terrace to FCD (CSAH 61)]	Revenue	$200,000	10 years
32	Beach Road Water Main	Revenue	$580,000	10 years
33	CSAH 61 (Charlson Rd. to Carver County)	Revenue	$175,000	10 years
34	Eden Prairie Road Connection to FCD	Revenue	$360,000	10 years

#	Project Description	Funding Source	Estimated Budget	Timeline
35	Water Cons. Landscaping	Revenue	$292,500	10 years
36	City Property Smart Irrigation Control Upgrade	Revenue	$270,000	10 years
37	Well Rehabilitation, Annual O&M Project	Revenue	$3,020,392	10 years
38	Ground Storage Reservoir (GSR) & Pump Station	Revenue	$300,000	10 years
39	Flying Cloud Dr. (Shady Oak Rd to Washington Ave)	Revenue	$50,000	10 years
40	Anderson Lakes Parkway (Preserve to Franio)	Revenue	$250,000	10 years
41	Prairie Center Dr. / Preserve Blvd. Intersection	Revenue	$25,000	10 years
42	Anderson Lakes Parkway (Amsden Way to Franio)	Revenue	$50,000	10 years
43	W. 78th Street (Prairie Ctr Dr to Washington Ave)	Revenue	$100,000	10 years
44	Willow Creek Road	Revenue	$550,000	10 years
45	West 70th St - East Segment	Revenue	$25,000	10 years
46	LRT Project Improvements	Revenue	$100,000	10 years
47	CSAH 4 (Spring Road) Watermain	Revenue	$400,000	10 years
48	N-S Road in TownCenter (Singletree to LRT Station)	Revenue	$50,000	10 years
49	Watermain - PCCP Piping Evaluation	Revenue	$158,000	10 years
50	Water Tower Recoating (Dell Road - Hidden Ponds)	Bond	$1,700,000	10 years
51	Ground Storage Reservoir (GSR) & Pump Station	Water Access Charge	$4,500,000	10 years
52	Ground Storage Reservoir (GSR) & Pump Station	Bond	$4,500,000	10 years
53	AMR System	Bond	$5,800,000	10 years
54	Water System Master Plan	Revenue	$70,317	10 years
55	Comprehensive Plan and Rate Study Update	Revenue	$31,643	10 years
56	General I&C Updates	Revenue	$264,000	10 years
WASTEWATER SYSTEM				
57	CSAH 61 (Charlson Road to Carver County)	Revenue	$206,000	10 years
58	Eden Prairie Road Connection to FCD	Sewer Access Charge	$566,000	10 years
59	Lift Station Rehabilitation Program	Revenue	$2,267,000	10 years
60	Comprehensive Plan Update and Rate Study Consulting	Revenue	$13,000	10 years
61	Water and Wastewater System Master Plan	Revenue	$45,000	10 years
62	Televising Sanitary Sewer Citywide	Revenue	$260,000	10 years
63	Compact Excavator	Revenue	$105,000	10 years
64	Flying Cloud Drive (Shady Oak Road to Washington Ave.)	Revenue	$50,000	10 years
65	Prairie Center Drive / Preserve Blvd. Intersection	Revenue	$25,000	10 years
66	Willow Creek Road	Sewer Access Charge	$550,000	10 years
67	Sump Pump Collection Program	Revenue	$250,000	10 years
68	LRT Project Improvements	Revenue	$400,000	10 years
69	N-S Road in TownCenter (Singletree to LRT Station)	Revenue	$50,000	10 years
70	I/I Project	Revenue	$100,000	10 years

#	Project Description	Funding Source	Estimated Budget	Timeline
STORMWATER SYSTEM				
71	Preserve Blvd (Westwind to ALP) and ALP Intersect	Revenue	$575,000	10 years
72	Pioneer Trail (City Street) (CSAH 1 to CSAH 1)	Revenue	$100,000	10 years
73	Dell Road (Crestwood Terrace to FCD (CSAH 61))	Revenue	$200,000	10 years
74	CSAH 61 (Charlson Rd. to Carver County)	Revenue	$30,000	10 years
75	Eden Prairie Road Connection to FCD	Revenue	$130,000	10 years
76	TH 101 (Pleasant View Rd. to TH5)	Revenue	$200,000	10 years
77	Birch Island Road	Revenue	$100,000	10 years
78	Riley Lake Road (Riley Creek to Chanhassen)	Revenue	$100,000	10 years
79	Flying Cloud Drive (Shady Oak Rd. to Washington Ave.)	Revenue	$250,000	10 years
80	Anderson Lakes Parkway (Preserve to Franlo)	Revenue	$250,000	10 years
81	Prairie Center Drive / Preserve Blvd. Intersection	Revenue	$50,000	10 years
82	Anderson Lakes Parkway (Amsden Way to Franlo Rd.)	Revenue	$100,000	10 years
83	W. 78th Street (Prairie Court Drive to Washington Avenue	Revenue	$150,000	10 years
84	Duck Lake Road (Duck Lk Trail to South Shore Lane)	Revenue	$300,000	10 years
85	Creek Knoll Road	Revenue	$150,000	10 years
86	Willow Creek Road	Revenue	$100,000	10 years
87	West 70th St - East Segment	Revenue	$75,000	10 years
88	Sump Pump Collection Program	Revenue	$550,000	10 years
89	LRT Project Improvements	Revenue	$75,000	10 years
90	Singletree Lane Streetscape/Water Quality	Revenue	$-	10 years
91	N-S Road in TownCenter (Singletree to LRT Station)	Revenue	$250,000	10 years
92	Storm Water Quality Improvement Projects	Revenue	$3,700,000	10 years
93	Creek and River Corridor Restoration Projects	Revenue	$2,830,000	10 years
94	General Storm Water Repairs and Maintenance	Revenue	$2,225,000	10 years
95	General Road Drainange Improvements	Revenue	$2,925,000	10 years
96	City Facility Stormwater Projects	Revenue	$455,000	10 years
97	Street Sweeper Replacements	Revenue	$285,000	10 years
98	Bobcat Compact Track Loader	Revenue	$55,000	10 years