Section 6 • Utilities Element

6.1 Introduction

This chapter describes best management practices and infrastructure improvements related to public and private utility systems serving property in Bloomington. Public utilities consist of facilities related to the water system, surface water management, sanitary sewers, and solid waste while private utilities consist of the electric, gas, and communications systems.

Plans for the City's primary utility systems were updated concurrent with this comprehensive plan update, including: Water Supply Plan (WSP), Wastewater and Comprehensive Sewer Plan (WWCSP), and Local Surface Water Management Plan (LSWMP). Each of these plans provides detailed analysis and recommendations on infrastructure improvements to serve existing and forecast future development through 2040. These plans are attached to the comprehensive plan by reference and are available on the City's website (see sidebar).

Utility systems often go unnoticed in our daily life, in part because they are mostly located underground. We don't consider how critical they are to everyday activities until they do not function properly. As a fully developed city, Bloomington's utility systems are essentially complete. While utility systems have a relatively long life-span, large portions of the systems were built in the 1960s and 70s, and components are beginning to reach the end of their useful life. The current infrastructure functions well to serve today's population and businesses, but shifts in land use, population, and climate all impact the ability to meet the needs of Bloomington residents and businesses in the future.

History of Public Utility Systems

Before 1960, there were no public water or sanitary sewer systems in Bloomington. During the City's initial building boom between 1950 and 1960, many new homes relied on wells for potable water and septic tanks/cesspool systems for waste disposal. In 1959, voters approved the installation of public water and sanitary sewer systems to ensure the safety of the water supply and provide for sanitary waste disposal. Approximately 100 miles of water and sanitary sewer piping were installed in 1960.

Originally, water for the system was purchased from the City of Minneapolis and pumped during off-peak hours to reservoirs at West 82nd Street and Penn Avenue. To diversify its supply, the City constructed four deep wells and a water treatment plant, which began operating in 1974. In 2002, the City added two additional wells and increased the capacity of its water treatment plant.

Sewage was originally pumped north through Richfield and Minneapolis to be treated on a contract basis by the Minneapolis-St. Paul Sanitary District. Treatment in the

Associated Utility Plans

- The *Water Supply Plan* and *Wastewater and Comprehensive Sewer Plan* can be found under the Reports, Plans, and Info tab on the Bloomington Utilities Division website here: https://www.BLM.MN/Utilities-Division
- The *Local Surface Water Management Plan* can be found on the Bloomington Water Resources Division website here: https://www.BLM.MN/ENG/Water-Resources

metropolitan area was later handled by the Metropolitan Waste Control Commission, now referred to as the Metropolitan Council Environmental Services (MCES). Bloomington's sewage now flows southeast, under the Minnesota River near TH 77 to the Seneca Wastewater Treatment Plant in Eagan. The Seneca Plant, which also serves seven other communities, was built in 1972, then expanded and upgraded in 1992.

As the City developed so did its surface water management and drainage system. To reduce flood potential and improve water quality the City incrementally developed a surface water management system that relies on open drainage ways, drainage pipes, lift station pumps, private and publicly constructed retention and detention ponds, and natural and manmade wetlands and water bodies.

The City routinely evaluates, maintains, and upgrades utilities to ensure they continue to support a high quality of life and remain dependable and affordable. The City also strives to ensure utility functions do not negatively impact the natural environment. Looking forward, improvements will be needed to accommodate future redevelopment. This will involve asset renewal; working with MCES to meet long-term treatment capacity needs; continuing efforts to identify potential issues; and performing preventative system maintenance.

6.2 Existing Conditions

Water System

Supply - Bloomington's current public water supply is derived from two sources: groundwater and surface water. Groundwater is provided by six deep wells located near Normandale Boulevard, Poplar Bridge Road, and Collegeview Road. All except well #3, obtain water from the Prairie du Chien-Jordan aquifer. Well #3 obtains water from the Hinckley aquifer. While the water is high in quality, it is relatively hard so it is pumped directly to a nearby water treatment plant to be lime softened. The firm capacity of the wells is 15.1 million gallons daily (MGD), which is slightly higher than the designed treatment plant capacity of 14 MGD. All wells are actively used. City treatment plant staff operate all the wells and rotate their use to balance run time hours on an annual basis.

The surface water portion of the supply is purchased off-peak and wholesale from the City of Minneapolis, and is also lime-softened. Bloomington's agreement with Minneapolis allows the City to draw up to 20 MGD until the year 2037. The Minneapolis portion of the supply is stored in two reservoirs located at West 82nd Street and Penn Avenue in Bloomington. The water is pumped from the "82nd Street Reservoir" into the Bloomington distribution system primarily to meet peak demands.

The vast majority of Bloomington's water needs are met by the public water supply from these two finished potable water sources. The yearly average water demand is provided 75% via Bloomington treated water 25% via water purchased from Minneapolis. However, some private wells still exist. Private groundwater use is regulated by the Minnesota Department of Natural Resources. The largest private groundwater users in Bloomington are industrial users who avoid using treated water due to cost or chemical considerations. Private groundwater use raises several issues, such as aquifer recharge, proper metering and billing when discharged into the sanitary sewer system, and impact on surface water bodies when discharged into the storm sewer system.

Treatment - Bloomington's water treatment plant and wellfield was expanded in 2002 to meet essential demands, increase reliability, increase flexibility (providing a true dual source of treated water), reduce reliance on purchased water from Minneapolis, and gain greater control in meeting water quality goals. The facility capacity is sufficient to meet the City's projected needs through 2040 based on forecast growth in population and employment. The system also allows the City to meet essential demands (defined as average daily usage on an annual basis) if the City is no longer able to draw water from Minneapolis.

Bloomington's treatment process includes conventional lime softening through a contact solids basin (mixing, flocculation, and sedimentation), recarbonation, chlorination, filtration, and fluoridation. The plant has the capacity to supply 14 MGD of high-quality, softened water that meets the requirements of the Safe Drinking Water Act. The water treatment facility is staffed 24 hours a day by a fully trained staff of certified operators. The plant includes a certified laboratory staffed by two chemists who monitor raw and finished water quality, perform microbiological testing, analyze storm water runoff, and monitor municipal lake and stream water quality. Staff also ensures Minneapolis water is properly reconciled with Bloomington's well supplied water.

Lime softening residuals are a major by-product of the City's water treatment process. Lime is used as the principal softening agent to precipitate out calcium and magnesium ions. Disposal of lime softening residuals is an important consideration in the efficient operation of the plant. Although lime softening residuals are inert, their disposal is economically costly. The by-product is currently transported by truck to the City's seven storage lagoons in the Western Industrial Area, each of which has a storage capacity of two years. At appropriate intervals, the lagoons are excavated and the lime softening residuals are transported to farm fields. There the residuals are incorporated into the earth as a United States Department of Agriculture approved liming material. The City will continue to evaluate other water softening treatment processes that may potentially reduce lime softening residuals.

Distribution system - Bloomington's water distribution system delivers treated drinking water from the City's wells and water treatment system as well as two connections from the Minneapolis distribution system. The water from Bloomington's treatment plant is stored in a 4 million gallon treated water reservoir and pumped to the distribution system. The water from Minneapolis is delivered to two 10 million gallon storage reservoirs located at West 82nd Street and Penn Avenue, then pumped to the distribution system on demand.

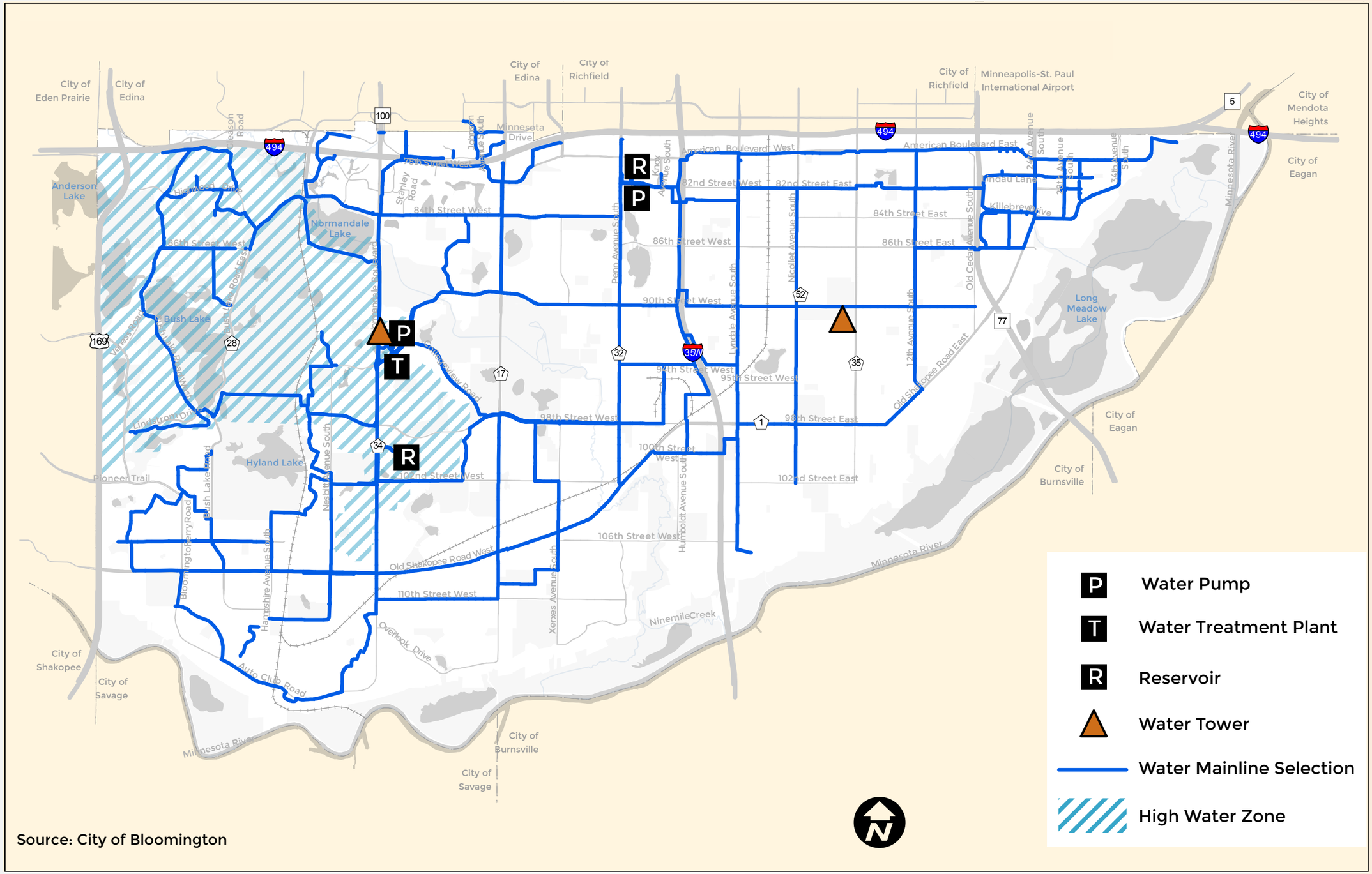
To achieve the pressure necessary to supply water throughout the City, the distribution system is divided into two pressure zones labeled as the "Normal Zone" and the "High Zone." The High Zone is supplied by pumping from the Normal Zone. In addition to water mains of various sizes, distribution infrastructure in the Normal Zone includes the 1.5 million gallon Valley View water tower located at 401 East 90th Street and the 3 million gallon Western Reservoir located at 9921 Rich Road. The High Zone includes the 1.5 million gallon northwest water tower located at 7201 West 83rd Street. Figure 6.1 depicts Bloomington's water distribution system.

Bloomington's water distribution system is essentially fully developed, providing service throughout the City. In 2008, Bloomington's *Water System Master Plan* (WSP) recommended several areas in the distribution system be upgraded to address water pressure deficiencies. By the end of 2018, roughly 85% of these recommended upgrades have been completed. The remaining system upgrades will be completed in conjunction with scheduled road rehabilitation projects.

Best in Glass

The City has been recognized for providing high quality drinking water; winning the "Best in Glass" award in 2015 followed by the national "Best of the Best" award in 2016. A second Best in Glass award was won in 2017.

Figure 6.1: Existing Water Distribution System



Source: City of Bloomington

Water systems are typically designed to meet peak period demands. In Minnesota, water usage varies dramatically throughout the year, with peaks during the hotter and drier months of the summer. One way the City attempts to defer or eliminate the need for water system capital improvements is to increase local water conservation efforts. Bloomington's WSP identifies several water conservation measures that are discussed in the Opportunities and Challenges section of this element.

Future water needs are modeled using the City's 2040 forecast data to ensure adequate service is provided and timed to coordinate with projected development. The WSP also outlines prioritization procedures to be used in emergency situations. The City will continue to review trends in billing data to better understand usage and demand. Water from the City of Minneapolis provides a second source of water to help during periods of peak demand. Additionally, City wells are monitored regularly to ensure they are recharging at an adequate rate.

Wastewater System

Collection Network - Almost 100 percent of Bloomington properties are connected to the City's sanitary sewer collection system, which is divided into 8 primary subsystem areas, shown in Figure 6.2. Within each subsystem, sewage flows through local collection pipes to larger trunk sewers that connect to the MCES regional interceptor line that carries it to the Seneca Wastewater Treatment Facility located in Eagan. Sewage is conveyed through the system mostly by gravity and 28 lift stations that pump sewage to a higher elevation to keep it flowing. Bloomington's sewer lines range in diameter from six to forty-two inches. Forecast sewage flows associated with the subsystem areas are shown on Figure 6.2. Figure 6.3 depicts the existing sanitary sewer infrastructure.

MCES Interceptors - The Metropolitan Council Environmental Services (MCES) regional collection system, (interceptor 3-BN-499), located in Bloomington, consists of 13 miles of pipe ranging from fifteen to sixty inches in diameter. Interceptor 3-BN-499 enters Bloomington near the intersection of I-494 and TH 100 and extends east to the intersection of East 90th Street and 18th Avenue in east Bloomington. The City expects the 3-BN-499 interceptor to remain under MCES operation given its regional role in serving portions of two cities and because it does not meet the criteria for removal from the regional system as outlined in the Metropolitan Council's *2040 Water Resources Management Policy Plan*. Current flows in portions of the 3-BN-499 interceptor, along with MCES lift station L-55, are reaching system capacity. The cities of Bloomington and Edina are currently of working with MCES to resolve capacity concerns.

Inflow and Infiltration – Addressing inflow and infiltration will be a continual challenge as components of Bloomington's wastewater collection system age. Inflow refers to clear water entering the sanitary sewer system from a single point such as a sump pump, foundation drain, or sewer access covers. Infiltration is the seepage of groundwater into sewer pipes through cracks or joints. Unlike sewage wastewater, water from inflow and infiltration is clean and does not require treatment. Minimizing the volume of inflow and infiltration preserves pipe capacity for sewage conveyance, reducing treatment costs and potentially guards against premature infrastructure improvements.

As described in the sidebar, the City performs numerous activities to reduce inflow and infiltration. The City makes an extra effort to upgrade manholes and mains to address inflow and infiltration in its annual street construction projects. This costs about $300,000 annually. Historic sewer flow records show that Bloomington's annual

sewer flows have reduced from just over 4 billion gallons per year (in 1993) to just under 3 billion gallons per year (in 2017); a 27% decline. This significant reduction in annual sewer flow represents over $2.5M in annual wastewater treatment cost savings at current MCES rates. While some of the reduction in sewer flow may be attributed to system wide conversion to low flow plumbing fixtures, it's believed that a significant portion of the reduction is the result of system wide I/I remediation work.

Blockage -Another continual challenge for the City's Public Works Department is addressing the issue of sewer blockages. Blockages occur when pipes are clogged or obstructed by solids or tree roots. City maintenance crews perform pipe cleaning to remove solids and mechanical treatment to control tree root intrusion. This maintenance is strategically scheduled based upon the results of televised inspection, and historic performance records. Blockages must clearly be avoided for the system to work effectively.

Subsurface Sewage Treatment Systems (SSTS) - In 2018, 37 Bloomington properties continue to utilize on-site subsurface sewage treatment systems (SSTS), as shown on Figure 6.4. Properties producing domestic or industrial wastes are required by City Code Section 11.26 to connect to the public sewer system within two years of sewer availability. Since 2008, the City has connected 10 properties to the public sewer system. The majority of the remaining properties are located in somewhat remote locations where City sewer service is not available within a reasonable distance and/or elevations are such that pumping would be required to obtain service. Past proposals to expand the City sewer system to several of these properties has been met with opposition by property owners as the physical constraints would drive estimated assessment costs to unreasonably high levels.

The City and Hennepin County mutually agreed that the County would administer permitting and inspection of SSTS within the City starting in 2015. Hennepin County's individual sewage treatment system program operates in accordance with Minnesota Pollution Control Agency regulations. Minnesota Rules Chapters 7080, 7081, 7082 and 7083 require that the County implement a comprehensive SSTS management program. The management program requires SSTS owners to have their tanks inspected at least every three years. Septic systems that are declared as failing must be repaired or replaced within three years. Systems that pose an imminent threat to public health and safety must be upgraded or replaced within ten months.

The program consists of a computerized notification and tracking database along with enforcement procedures. The database provides information on: dates of new system installation; pumping/inspection dates; the generalized SSTS condition; the volume of contents pumped; and whether the system is failing.

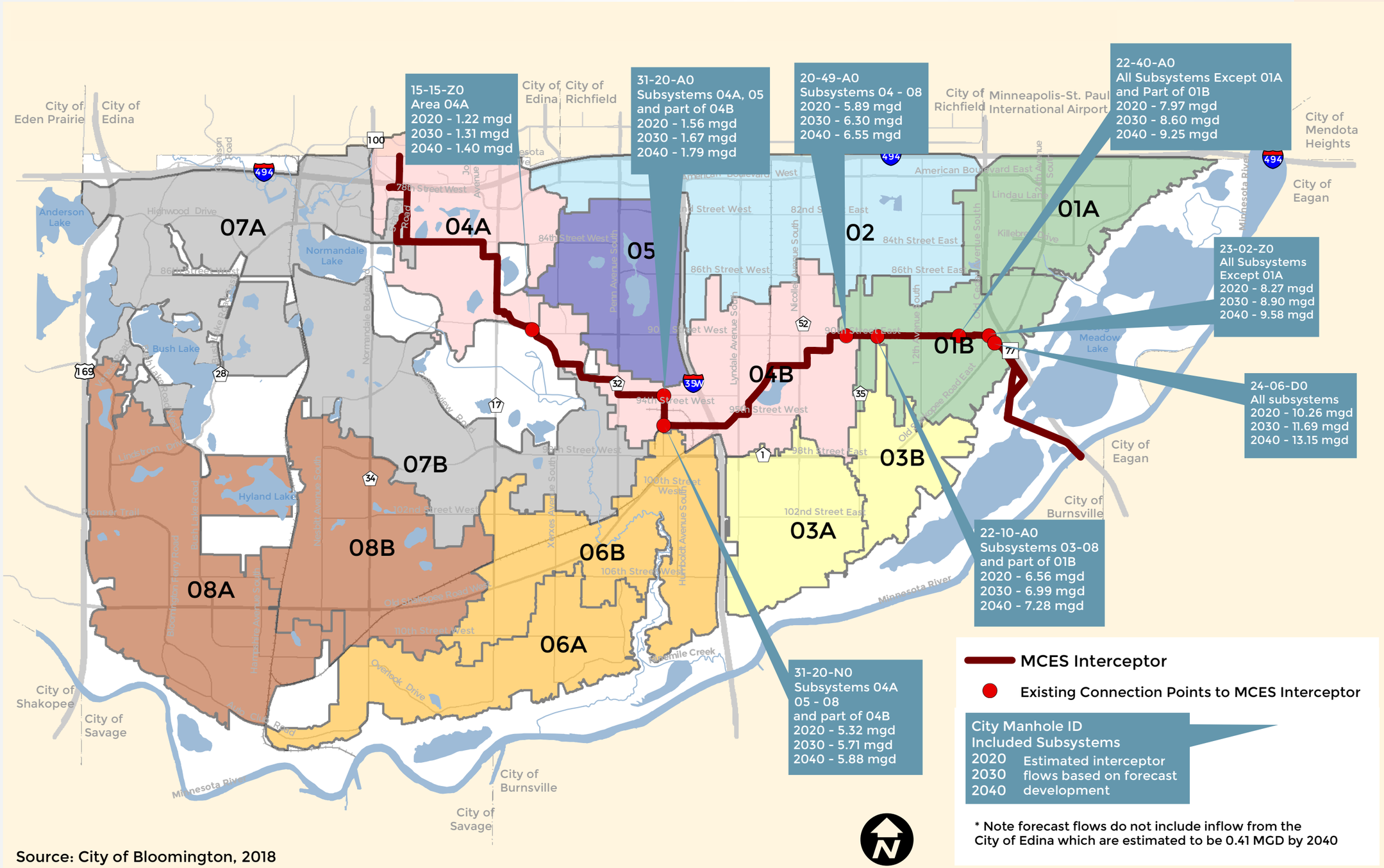
Addressing Inflow and Infiltration

While the percentage of Bloomington's sewer flow attributable to inflow and infiltration has historically been very low, Bloomington remains committed to further reductions, by prohibiting the discharge of storm water, ground water, roof runoff, surface water, unpolluted drainage, unpolluted industrial cooling water or unpolluted industrial process water to any public sanitary sewer *(City Code section 11.31(b)(3))*. In addition, the City requires properties on private sewer systems that produce domestic or industrial wastes to connect to the municipal sewer system within two years after such service becomes available *(City Code section 11.26(c))*.

The City's Public Works Department performs on-going preventative maintenance to proactively reduce inflow and infiltration, including:

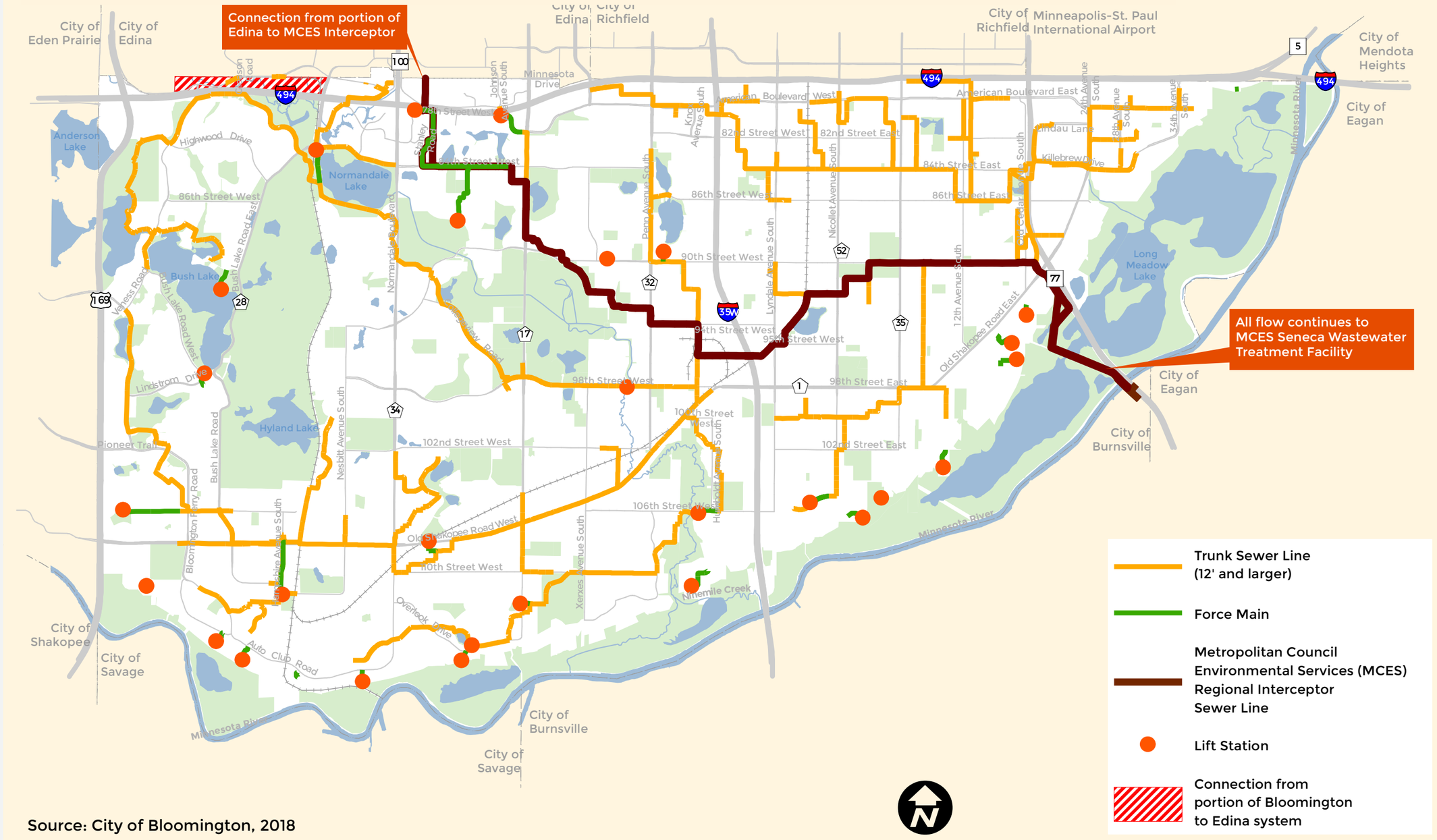
- Sewer main line television inspection and asset management evaluation for replacement or repairs
- Sewer manhole inspection and asset management evaluation for upgrades, repairs, or replacement
- Lift station asset management evaluation for needed upgrades, repairs, or replacement
- Sewer service line repairs
- Time of sale inspection to eliminate sump pump connections
- Public education about I/I reduction via internet and mailings
- Sewer system modeling and evaluation of monitored flow versus billed consumption

Figure 6.2 Sanitary Sewer Subsystems and Modeled Max Daily Flows



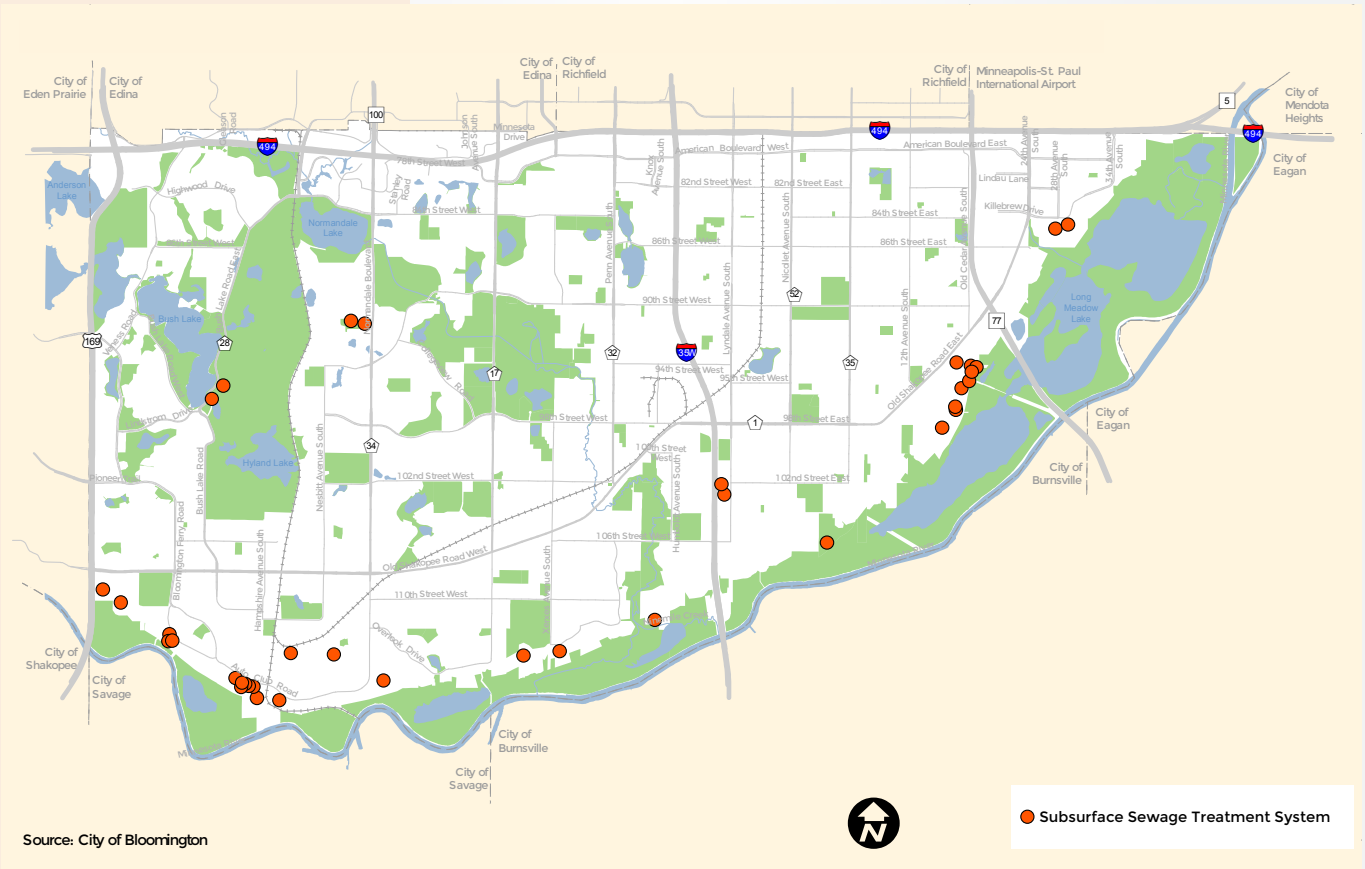
Source: City of Bloomington, 2018

Figure 6.3 Sanitary Sewer System



Source: City of Bloomington, 2018

Figure 6.4: Location of Subsurface Sewage Treatment Systems



Source: City of Bloomington

Surface Water Management System

Urbanization typically involves replacing natural, vegetated surfaces with pavement and buildings. This significantly alters the natural drainage patterns of rainfall and melting snow. Impervious surfaces restrict water from entering the soil, resulting in increased water draining from a site faster than when it was vegetated. If not properly managed, the cumulative effect of this phenomenon leads to increased flooding. Water draining off pavement and rooftops can contain pollutants (e.g., oils, sediment, salt) that negatively impact the quality of downstream water bodies and related habitat.

To reduce flooding potential and improve water quality, the City has constructed a comprehensive surface water management system as development has occurred. This system relies on open drainage ways; drainage pipes; lift station pumps; private and publicly constructed retention and detention ponds; and natural and manmade wetlands and water bodies. When possible and appropriate to the situation, the City has used natural drainage ways and wetlands within this system. Using natural systems benefits the City by lowering costs, improving water quality in lakes and streams, protecting wildlife habitat, and retaining the beauty of the natural environment.

The City recognizes that the type of drainage system and stormwater management used can affect development intensity and water quality. Bloomington will continue to pursue a context sensitive approach to stormwater management that focuses on

resource preservation and enhancement. The City's *Local Surface Water Management Plan* (LSWMP) and *Wetland Protection and Management Plan* describe local methods to advance mutual goals and policies regarding surface water management while assessing problems and proposing corrective actions. Best practices and proposed improvements to stormwater facilities are described in the City's LSWMP summarized below.

The City operates a permitted municipal separate storm sewer system (MS4) under the National Pollution Discharge Elimination System (NPDES) Phase II Program. The permit is administered by the Minnesota Pollution Control Agency and addresses six minimum control measures aimed at reducing pollutant loading to surface water through implementation of a storm water pollution prevention program. Additionally, the City has a completed non-degradation report to further satisfy the requirements of the NPDES addressing new or expanded storm water discharges as defined in State Rules.

Local Surface Water Management Plan (LSWMP)-Executive Summary

The LSWMP meets the local watershed management planning requirements of the Metropolitan Surface Water Management Act (Chapter 103B) and Board of Water and Soil Resources Rules 8410. It conforms to the requirements of local Watershed Management Organizations and Districts, Metropolitan Council requirements, Hennepin County goals and applicable state and federal laws. The document and its referenced literature are intended to provide a comprehensive inventory of pertinent water resource related information that affects the City and management of those resources. The updated LSWMP (2018) is attached as an appendix. Highlights include:

- An inventory of land and water resources within the City.
- Water resource management related goals and policies concerning water quantity, water quality, recreation, fish and wildlife management, enhancement of public participation, information and education, public ditch system, ground water, wetlands, and erosion and sediment control.
- An assessment of the existing and potential water resource related concerns within the City.
- Identified priorities and implementation program.
- Financial considerations regarding proposed regulatory controls, programs and improvements.

The updated LSWMP, adopted in May 2018, is intended to be in effect through the year 2027. Amendments may occur in the interim period as needed. Guiding principles used to develop goals and policies in the LSWMP include:

- **Water Quantity and Flooding** - Mitigate flood risk in a proactive and cost-effective way to foster a sustainable and resilient community by managing runoff volume and rate and effectively communicating risk.
- **Water Quality** - Maintain or improve water quality to meet or exceed state standards in lakes, streams, and rivers within or immediately downstream of the City.
- **Erosion and Sedimentation** - Prevent erosion and sedimentation and correct existing erosion and sedimentation problems.

Stormwater Management

All new development must meet adopted standards for stormwater discharge rates and volume retention. Calculations must be prepared describing potential stormwater generated by the 50-percent, 10-percent, and 1-percent annual chance event using Atlas 14 precipitation data shown in Table 4-1 of the LSWMP. Calculations must be submitted and approved as part of any development application prior to City issuance of any building or grading permits.

Any significant changes to the LSWMP must be approved by the affected watershed management organization. Additionally, proposed amendments to the LSWMP must be made known to the City Manager, Bloomington Public Works Department and Community Development Department and their directors, and the Metropolitan Council. A public hearing is required as part of the LSWMP amendment process. Chapter 8 of the LSWMP describes the amendment process in detail.

Rain Gardens

Rain gardens are shallow depressions designed to capture runoff from rainwater and snow melt onsite and allow it to infiltrate into the ground rather than entering the storm sewer system. During street reconstruction the City works to identify interested parties to coordinate construction. Since 2009 there have been over 80 rain gardens installed in Bloomington.

- **Groundwater -** Protect the quality and quantity of groundwater resources.
- **Wetlands -** Maintain the quantity of wetlands and preserve or improve their quality.
- **Recreation, Habitat, and Natural Areas -** Protect and enhance fish and wildlife habitat and maintain access to recreational areas.
- **Enhance Public Participation, Information, and Education -** Increase public understanding and awareness of pertinent water resource management issues and increase public participation in water management activities.

Physical Environment and Land Use - The LSWMP describes the inter-relationship of the major components of the physical environment and how they affect surface water management. These components include: land use, topography, soils, and geology/ groundwater resources.

Regulations to manage land use and development to minimize negative impacts on the natural environment are administered and enforced at various levels of government.

The Wetland Conservation Act is enforced locally by the City and prevents draining or filling of wetlands unless the wetland is either replaced or is exempted pursuant to State Statute. Wetlands are an important part of the City's natural drainage system so it is important that any potential disruptions to their function be properly reviewed and mitigated.

The City adopted and enforces regulations to reduce the risk of new structures flooding, mitigate risk to existing structures that may flood, and prevent water pollution. Minimum standards must be met when development occurs in these specified areas:

- **Flood Overlay Zoning District.** These standards are consistent with the National Flood Insurance Program
- **Shore Areas Regulations.** These regulations are consistent with Minnesota Statutes

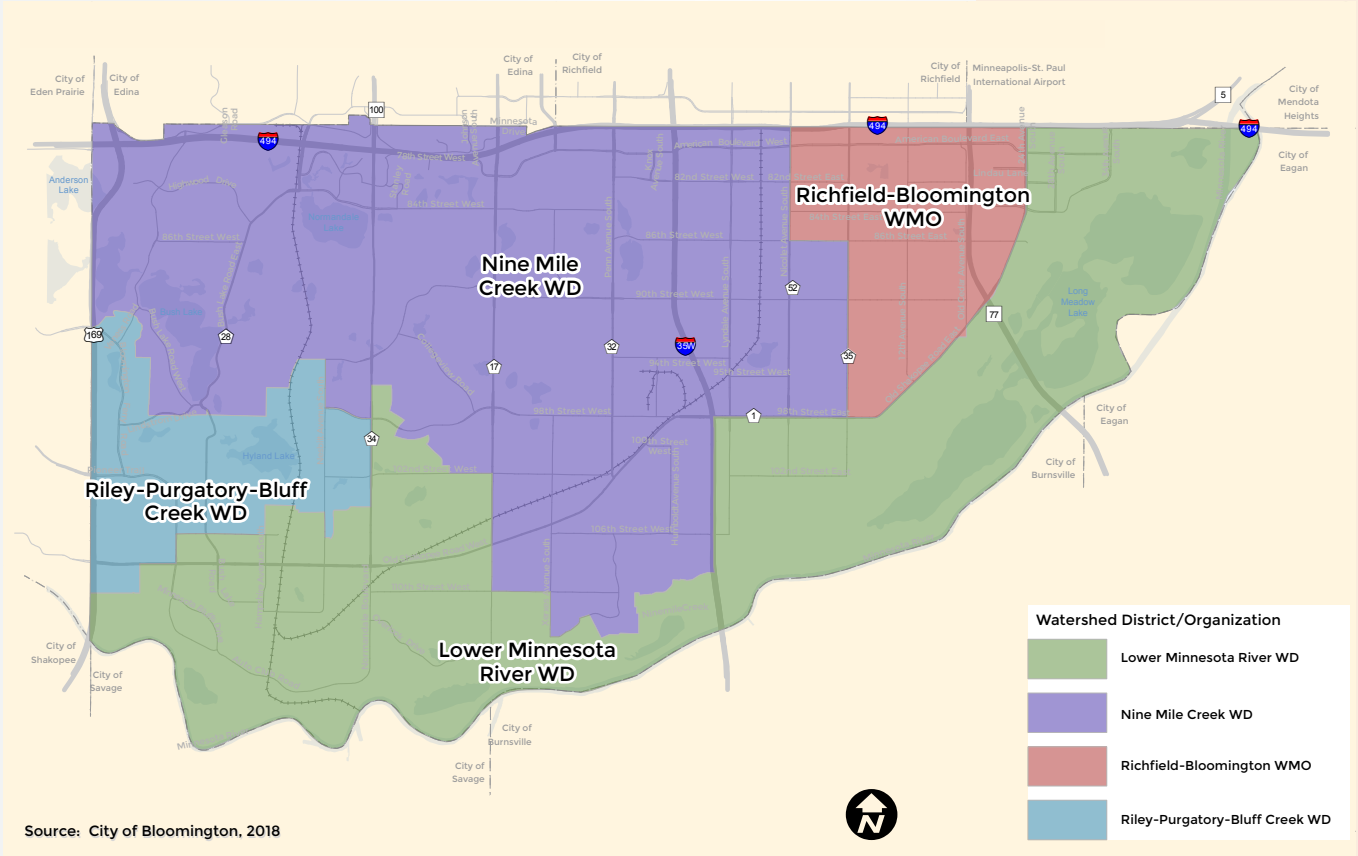
Watershed Districts - In 1956, Minnesota state law created and empowered watershed districts to work with cities and property owners to improve flood storage capacity and to protect water quality. As depicted in Figure 6.5, the City shares land area with three watershed districts and one watershed management organization. These entities each have their own watershed management plans. Bloomington's LSWMP complies with the requirements of the individual watershed plans and each organization approves the LSWMP. Any significant changes to the LSWMP must be approved by the affected watershed management organization.

Chapter 2.4 of the LWSMP outlines the various water resource related agreements between the City and other agencies. These agreements include joint study of water resources, maintenance agreements, infrastructure construction agreements, and joint powers agreements between jurisdictions. Bloomington has entered into agreements with:

- City of Edina
- City of Richfield
- City of Eden Prairie
- Nine Mile Creek Watershed District
- Hennepin County
- Minnesota Department of Natural Resources
- United States Fish and Wildlife Service
- Minnesota Department of Transportation

Watersheds and Drainage Areas - Underlying the watershed districts in Bloomington are 22 primary subwatersheds and a few thousands secondary drainage basins. Stormwater modeling was updated with Atlas 14 data using these drainage basins. Detailed data on volume, infiltration rates, and land cover relative to the watersheds is provided in Appendix B of the LSWMP.

Figure 6.5: Watershed Districts and Organization



Impaired Waterways

The Minnesota Pollution Control Agency (MPCA) is responsible for monitoring and assessing waterways to ensure compliance with the requirements of the federal Clean Water Act. One outcome of this process is a list identifying impaired waterways statewide (the 303 (d) list). Impaired water ways on the 303 (d) list located in Bloomington are listed in Table 6.1.

Table 6.1 Impaired Waterways

Watershed	Water body	Reach	Pollutant/ Stressor	Year Listed	Target Start Date	Target Completion	Required Bloomington Action
Nine Mile Creek	Nine Mile Creek	Headwaters to Minnesota River	Chloride	2009	2005	2009	Waste load allocation (WLA) for all MS4 permit holders of combined 5.164 tons/day
			Fish bioassessments	2004	2014	2029	Pending
		Marsh Lake to Minnesota River	Turbidity	TMDL delisted in 2010			N/A
			Fecal coliform	2018	2018	2019	Pending
	Bush Lake		Mercury	1998	1999	2011	Statewide initiative (No reduction required)
	Penn Lake		Nutrients	2018	2018	2019	Pending
Purgatory Creek	Hyland Lake		Nutrients	2008	2014	2018	Pending

Source: Minnesota Pollution Control Agency

Section 5.2 of the LSWMP provides a detailed list of corrective actions to address impaired waters. The City will work with partners such as Three Rivers Park District, Hennepin County, MnDNR, and U.S. Army Corps of Engineers to implement recommendations from various Use Attainability Analysis and Total Maximum Daily Load studies. Some corrective actions to be taken include:

- Treatments targeting invasive plant species
- Utilize cutting edge technology (road temperature monitors, improved brine mix, etc.) for winter road treatment
- Enforcement of sedimentation and erosion control standards

Solid Waste

The City of Bloomington coordinates collection of solid waste. Haulers are assigned collection days and areas. Organized collection helps reduce the number of trucks operating in residential neighborhoods, which reduces neighborhood noise and traffic, saves on road wear, and reduces emissions. Recycling is collected every two weeks and residents can select the size cart they feel is appropriate for their household. Billing is conducted through the City's utility billing process.

Private Utilities

Services related to electricity, natural gas, and communications are provided by private utility companies. These services are developed by private companies under various authorities granted by State and local authorities. While the City does not directly control these utilities, they are critical to the everyday activities of residents and businesses and are essential to the local economy.

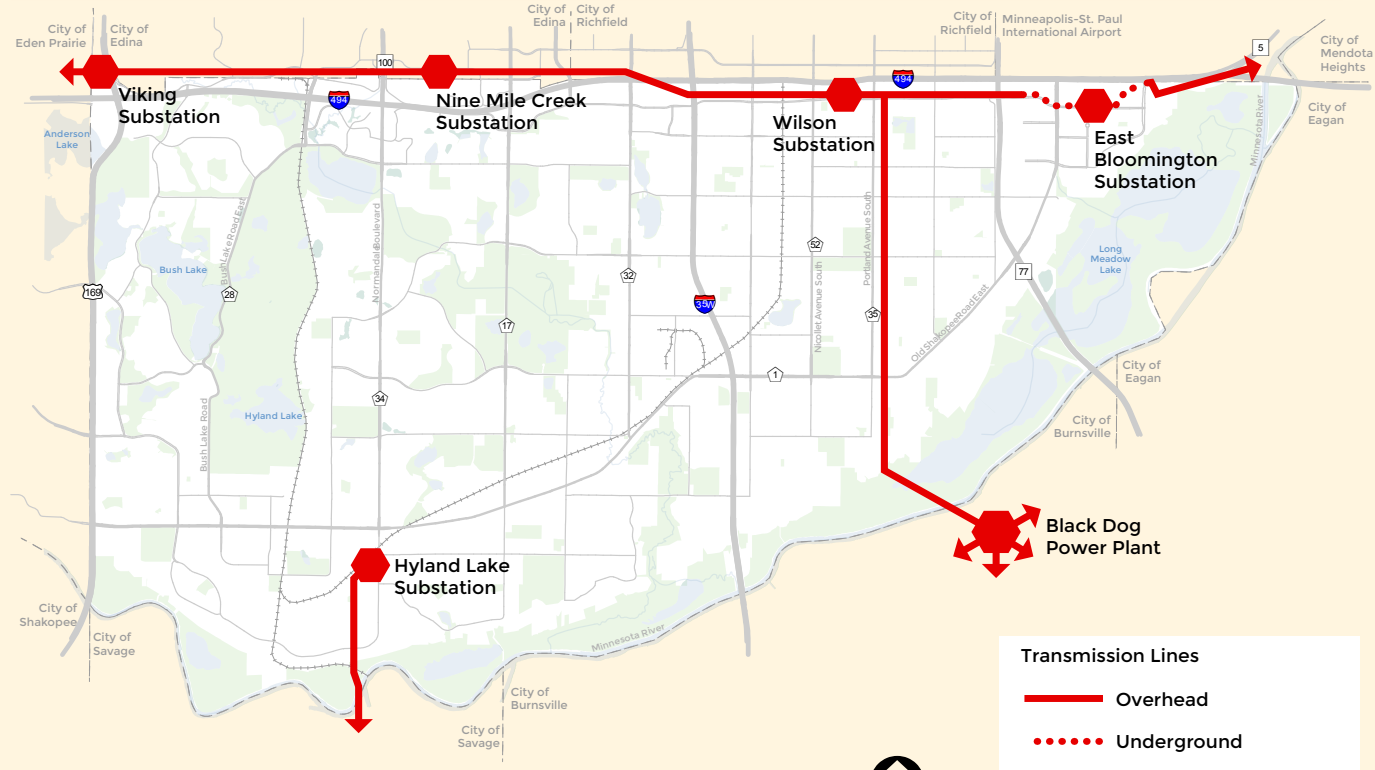
Electricity -Electrical service in the Bloomington is provided by Xcel Energy through a complex network of facilities. Figure 6.6 depicts the most visible facilities, including major transmission lines along the I-494 corridor and Park Avenue, five substations, and the Black Dog power plant located directly across the Minnesota River in Burnsville, which was recently converted from coal to natural gas burning. There are currently 38,493 residential and 3,823 commercial customers in Bloomington that rely on dependable electricity that is affordable and reduces greenhouse gases. Bloomington residents and businesses spent over $131 million on electricity in 2016. The average households spent $923 ($77 per month) and commercial customers spent $24,972 ($2,081 per month). By investing in a diverse mix of energy generation Xcel helps to keep energy costs relatively stable.

To improve reliable distribution of electricity the City has advocated for locating (or relocating) distribution lines underground. Locating distribution lines underground may not be appropriate in all situations and is often very expensive. Exploring opportunities for burying lines is an ongoing process the City will continue to pursue by working with Xcel and developers.

Energy Action Plan

In 2018, the City Council adopted an Energy Action Plan that defines energy goals, near-term priorities, and action strategies to reduce energy consumption and energy-related greenhouse gas emissions by 2035. The overall community goal is to achieve a 75% reduction in energy-related greenhouse gas reductions.

Figure 6.6: Major Electric Facilities



Source: City of Bloomington, 2018

Tree cleanup after a high wind storm.

The City is committed to reduce energy consumption and energy-related greenhouse gas emissions. To achieve that, the City is collaborating with Xcel Energy through its Partners in Energy (PiE) program. One of the program outcomes was development of an Energy Action Plan that identifies a number of tools and strategies to reduce energy consumption and promote alternative energy generation within the City.

Natural Gas - CenterPoint Energy provides natural gas service to customers located in Bloomington. There are currently 27,781 residential and 2,514 commercial metered customers who are serviced via a network of about 400 miles of gas lines. With the exception of control valves, CenterPoint Energy's natural gas network in Bloomington is underground. Bloomington is served by CenterPoint Energy's Belt Line high pressure transmission line. This line serves the western metropolitan area and generally runs north and south through Bloomington, roughly along Penn Avenue, Nicollet Avenue, Old Shakopee/Portland Avenue, and Old Cedar Avenue. Large segments of the Belt Line transmission line are in the process of being replaced with pipes that are more reliable and easier to inspect. There are no other known significant changes planned to the natural gas infrastructure in Bloomington.

Communications - Communications technology has advanced considerably in the last 10 years. With the proliferation of smart phones, social media, and e-commerce it is increasingly important to ensure access to reliable communications networks. The City of Bloomington is served by both wireless and broadband providers. The wireless and broadband networks complement each other. The City is currently entered in franchise agreements with CenturyLink and Comcast. Wireless carriers are not required to enter into franchise agreements.

The City strives to encourage and facilitate the continued development of high quality communications services while minimizing associated adverse impacts on the community and the reliability of existing services that are often delivered via the public rights-of-way. Bloomington continues to seek to expand the range of broadband choices available to residents and business while encouraging the existing Internet service providers to increase connection speed through investments in their infrastructure.

6.3 Opportunities and Challenges

Aging Infrastructure

The City of Bloomington boomed in population during the 1950's growing by over 40,000 residents. Most of the City's utilities were installed at that time and are now meeting the end of their useful life. While incremental improvements have been made, portions of the utility system will require upgrades in the near future. Upgrades may involve simple rehabilitation or full replacement with either equivalent or higher capacity facilities, depending on projected future demand. Every utility system and every situation is unique. Strategic prioritization will ensure each utility system is upgraded appropriately.

To assist with prioritization, the City is creating an asset management program for utilities modelled after the City's Pavement Management Program (PMP). This approach will involve developing condition assessment ratings, defining target conditions, and establishing a stable investment program.

Climate Shifts

While the City has little ability to immediately affect climate shifts, it is critical that we understand the implications these shifts have on our utility system functions. In 2016, staff from the City participated in a resiliency planning workshop coordinated by Nine Mile Creek Watershed District, Riley Purgatory Bluff Creek Watershed District, Minnesota Pollution Control Agency, Metropolitan Council, Freshwater Society and Barr Engineering. During the workshop four primary climate threats were identified that could impact utilities and other City infrastructure. These include:

- Drought
- Extreme Heat
- Ice Storms
- Extreme Precipitation

These events can negatively impact the City's ability to deliver utilities and ensure the safety of residents and businesses. Extreme heat increases demand for air conditioning, which requires more electricity. Drought can result in water supply shortages. Increased intensity of rainfall may over tax the storm sewer system resulting in increased flooding or potentially become a source of inflow to the sanitary sewer system.

Being able to adapt to these changes is important to ensure adequate and dependable service. Understanding changing climate patterns can help the City understand how existing utility systems should be adapted and identify opportunity to mitigate future impacts. Being resilient and flexible to respond to unforeseen changes is key to remaining affordable, dependable, and can help improve the environment. The City's utility system plans and Energy Action Plan go into details about how systems are being adapted to be more resilient.

Sustainability

Utility infrastructure and functions can directly influence natural processes and impact the natural environment. Negative impacts can be minimized and mitigated through education and implementation of best practices that protect natural resources

Enhancing sustainability and resilience.

Through responsible management and strategic investments, we preserve our capacity to maintain, enhance, and support our environment, people, and economy. This will enable the City to prosper and maximize its potential for future generations.

Curbside cleanup event.

Recycling bins in a City park.

and improve resilience, such as: conserving water and energy use, improving energy efficiency, and addressing the effects of climate change. Specific strategies related to sustainability are discussed in more detail in the City's individual utility system plans.

Conservation – Conservation techniques that reduce per capita use can be used to meet higher demands for services such as water and energy and offset the need for costly system capacity expansion. Some examples of water conservation techniques include: water audits to determine where leaks exist; metering to provide data on use (timing, volume, etc.); rate structure modifications to influence use (i.e., higher rates during peak use times). Local ordinances and regulations can be implemented that influence use, such as lawn watering restrictions or requirements for plumbing fixtures that use less water.

Reuse - New technologies and increased convenience and awareness are making reuse of stormwater, wastewater, and material goods increasingly viable options. Some examples include:

- Stormwater and waste "gray" water can be captured, reclaimed and reused for irrigation or as non-potable water. This approach has been used successfully in parks to water ball fields or flush toilets. Benefits include a reduction in potable water demand, reduction in stormwater runoff rates, reduced needs for sewer capacity upgrades, and decreased pollutant loads associate with stormwater runoff.

- Reuse or "up-cycling" of furniture, clothes and other durable goods can reduce the amount of waste sent to landfills. Residents can donate items that still have useful life but are no longer needed. Efforts to encourage this behavior should continue and can be an important tool in solid waste reduction.

Continual study of the feasibility and efficiency of these approaches is need to ensure they are cost-effective.

Recycling and Organics Collection - The City's Coordinated Solid Waste program currently provides curbside recycling every two weeks. While the City does not provide curbside organics pickup, residents can bring their food scraps and non-recyclable paper items to two City sponsored organics drop-off sites located that are open daily at:

- Valley View Park - 201 E 90th St

- West Bush Lake Park - 95th St and W Bush Lake Rd

Hennepin County also hosts an organics drop-off site at the South Hennepin Recycling and Problem Waste Drop-off Center at 1400 W 96th St. Organics collected at drop-off locations are turned into compost.

Communications Technology Accessibility

Access to communications technology is increasingly essential to today's lifestyle. Schoolwork, purchases, appointments, and more are being conducted through computers, smartphones, and tablets. While broadband and wireless services are available throughout most of the City, it is not always affordable. The City will continue to work to broaden choice of service options to ensure access to this critical infrastructure.

Wireless technology advancements - Wireless technologies are in a state of transition, which provides both opportunities and challenges. Small cell transmitters

are replacing large scale towers. However, clear standards for locating small cell transmitters lag behind standards for wireless towers. Legislation is rapidly changing and the City will continue to advocate for state and federal laws that support local control over where transmitters can be placed in rights-of-way, especially on City owned facilities. Maintenance costs and visual impacts are also issues that must be addressed. City supports continued advancements in wireless service in ways that enhance livability and minimize costs.

6.4 Future Utility Needs

Forecasts were completed for future water, sewer, and surface water demand taking into account past usage data in combination with projected development and known usage rates. Forecast models are used in each of the utility master plan updates to identify infrastructure needs to accommodate forecast population and development. These plans describe specific infrastructure improvements needed to serve forecast future development through 2040. A summary of major utility improvements scheduled to be implemented in the next 10-years is provided in Chapter 8: Implementation (see Table 8.2).

Water Demand and Improvements

Future water demand is based on forecast population and development derived through the City's parcel-specific forecasting methodology. Forecasts take into account development entitlements, discussions with developers and landowners, and development potential based on land use guide and zoning. Assumptions about potential future development on specific sites consider land use, year redevelopment is anticipated, location, and building size. The projected future total per capita water demand is calculated by first adding together water demand generated by projected residential, commercial, industrial, institutional developed through 2040. The forecasted water demand from forecast new development is added onto the base of existing water use values, which were 2,324 MG (residential and commercial) and 1,437 MG (industrial and institutional.) Water projections to 2040 are shown in Table 6.2.

Table 6.2 Water Use Projections

Year	Projected Total Population	Projected Total Per Capita Water Demand (GPCD)	Projected Average Daily Demand (MGD)	Projected Maximum Daily Demand (MGD)
2016	88,299	117.3	10.36	19.98
2017	88,459	125.8	11.13	27.05
2018	88,619	128.9	11.42	27.75
2019	88,779	130.6	11.59	28.18
2020	88,939	130.0	11.60	28.18
2025	90,940	137.6	12.51	30.40
2030	92,940	137.4	12.77	31.03
2040	95,862	140.5	13.51	32.82

Source: City of Bloomington, Water Supply Plan, 2017

Cross Jurisdictional Service

Since the early 1960s, the City of Bloomington has worked cooperatively, via formal agreements, with abutting jurisdictions to ensure properties along common boundaries are adequately served by public utilities. Copies of these agreements are included in an appendix of the Wastewater and Comprehensive Sewer Plan, which is attached as Appendix B of this comprehensive plan.

- **Bloomington-Edina Joint Powers Agreement** – Staff from Bloomington and Edina are currently working to update the expired Joint Powers Agreement that will address ownership and maintenance issues for joint water and wastewater service and infrastructure that cross the city boundaries. The updated Joint Powers Agreement is anticipated to be completed by the end of 2019 or early 2020.
- **Eden Prairie Wastewater Service** – A few customers located in the far northwest corner of Bloomington are served by the City of Eden Prairie (see Figure 2 in the Wastewater and Comprehensive Sewer Plan). While the City of Bloomington does not maintain a formal inter-community service agreement with the City of Eden Prairie for wastewater, the City of Eden Prairie charges those properties directly for wastewater service.

Sewer Demand and Improvements

In 2017 the City contracted with Barr Engineering to update the City's Wastewater and Comprehensive Sewer Plan (WWCSP). A copy of the updated plan is provided in Appendix B. The work included updating the City's computer model of the sanitary sewer system. A detailed description of the model is provided in Chapter 5 of the WWCSP. The updated model was developed in Innovyze's InfoSWMM format. The calibrated hydraulic model was used to evaluate the sewer system for 2020, 2030, and 2040 development conditions. The model allows City staff to examine modeled flow conditions of any pipe within the public system.

Sewer flow inputs for the model include existing consumption plus additional Max Daily Flow from forecast development. The Max Daily Flows were determined by multiplying forecast development parameters times the unit flow rates derived from the base parameters used in MCES SAC procedures. While this methodology evaluates pipe capacity under the worst case flow scenario (which is consistent with industry standards) it results in higher total flow inputs than just applying population based average daily flow calculations as displayed in Table 6.3. Figure 6.2 shows the sewer subsystems (used to monitor flow and calibrate the model) along with the subtotals of the modeled Max Day Flow inputs at 8 points along the MCES interceptor for 2020, 2030, and 2040 development conditions.

Bloomington's current and forecast Average Daily Wastewater Flows are listed in Table 6.3. Bloomington currently generates wastewater flow at an average level of about 8 mgd (million gallons per day). Commercial/industrial users generate approximately 41% of that flow, while residential users generate about 59% of the flow. Future wastewater flows were calculated by applying average daily residential and commercial/industrial flow rates to forecast population and employment. It is noted that the City's flow projections are higher than those made by the Metropolitan Council Environmental Services (MCES). Bloomington projects a 14% increase in total flows between 2020 and 2040, while the MCES projects a 10% increase in total flows for the same time period. The most significant difference between these flow forecasts is due to the City's use of a higher commercial/industrial (employment) flow rate.

Bloomington's method of estimating future flows utilizes the historical ten year average residential and commercial/industrial flow rates. The MCES forecasts were prepared in accordance with the methods outlined in the Council's 2040 Water Resources Policy Plan. While residential flow rates used by the City and MCES are similar (56.2 versus 60 gallons per capita per day), the City used a significantly higher commercial/industrial flow rate (37.3 versus 15 gallons per employee per day). This higher flow rate is warranted given Bloomington's strong hospitality and manufacturing industries compared to other communities in the Metropolitan Council's service area.

Table 6.3: Current and Projected Average Daily Wastewater Flow

Year	Residential (mgd)	Commercial /Industrial (mgd)	Bloomington Forecast Total Avg Daily Flow (mgd)	MCES Forecast Total Avg Daily Flow (mgd)
2016	4.69	3.30	8.00	8.00
2020	5.00	3.60	8.59	8.48
2030	5.22	4.03	9.25	8.56
2040	5.38	4.29	9.68	8.63

Source: City of Bloomington – WWCSP, 2018. Note Forecasts do not include proposed increased flows from the City of Edina which are expected to reach about 0.410 additional mgd by 2040.

Table 6.4 summarizes forecast households and employment within each of the sewer subsystems for 2020, 2030, and 2040.

Table 6.4: Forecast Households and Employment by Sewer Subsystem, 2016 – 2040

Sewer Subsystem	Type	2016-2020	2020-2030	2030-2040	Total Growth
01A	Households	494	906	571	1,971
	Employment	2,819	6,684	4,317	13,821
01B	Households	0	159	96	255
	Employment	(33)	(24)	(13)	(70)
02	Households	240	335	288	863
	Employment	(12)	1,233	837	2,057
03A	Households	9	53	144	205
	Employment	(17)	(12)	(7)	(36)
03B	Households	0	21	0	21
	Employment	(4)	(3)	(2)	(8)
04A	Households	0	96	335	431
	Employment	320	1,831	803	2,955
04B	Households	0	(49)	24	(25)
	Employment	38	188	805	1,031
05	Households	5	0	102	107
	Employment	(64)	(47)	(374)	(485)
06A	Households	13	0	19	32
	Employment	(4)	(3)	(2)	(8)
06B	Households	6	288	0	294
	Employment	27	(24)	(13)	(11)
07A	Households	172	0	19	191
	Employment	(72)	722	(60)	590
07B	Households	0	10	39	49
	Employment	(29)	(23)	(12)	(64)
08A	Households	15	128	0	143
	Employment	176	31	49	256
08B	Households	0	340	0	340
	Employment	(35)	(26)	(14)	(76)
Edina	Households	0	0	0	0
	Employment	261	(27)	(15)	220
TOTAL	**Households**	**954**	**2,288**	**1,637**	**4,877**
	Employment	**3,372**	**10,500**	**6,300**	**20,172**

Source: City of Bloomington

The updated sewer model was used to identify improvements needed to accommodate anticipated growth and redevelopment to the year 2040. Sewer modeling indicates the City's sanitary sewer system can accommodate forecast development through 2040 provided necessary improvements are made in conjunction with new development. Detailed descriptions of system improvements are provided in the WWCSP under the Wastewater System Capital Improvement Plan section (CIP). Anticipated system improvements are also summarized in Tables 6.5 and 6.6 and Figure 6.7.

Table 6.5: Summary of Planned Sewer System Improvements 2020, 2030, and 2040

Project ID#	Ownership	Priority	Year	Length (ft)
CIP_05A	MCES	High	2020	4,312
LS_10	MCES	High	2020	NA (lift station)
LS_14	City	High	2020	NA (lift station)
CIP_05D	MCES	Medium	2030	368
CIP_11C	City	Medium	2030	4,345
CIP_02B	City	Low	2040	483
CIP_05C	MCES	Low	2040	941
CIP_07B	City	Low	2040	3,750
CIP_11B	City	Low	2040	3,701

Source: City of Bloomington – WWCSP, 2018

Table 6.6: Summary of Watch List Improvement Projects through 2040

Project ID#	Ownership	Length (ft)
CIP_01A	City	1,305
CIP_02A	City	826
CIP_03A	City	1,559
CIP_4A	MCES	276
CIP_05B	MCES	4,557
CIP_06A	City	5,011
CIP_007A	City	4,387
CIP_08A	City	327
CIP_09A	City	2,330
CIP_10A	City	2,668
CIP_11Ac	City	1,927
CIP_11Ap	Private	76
CIP_12A	City	509

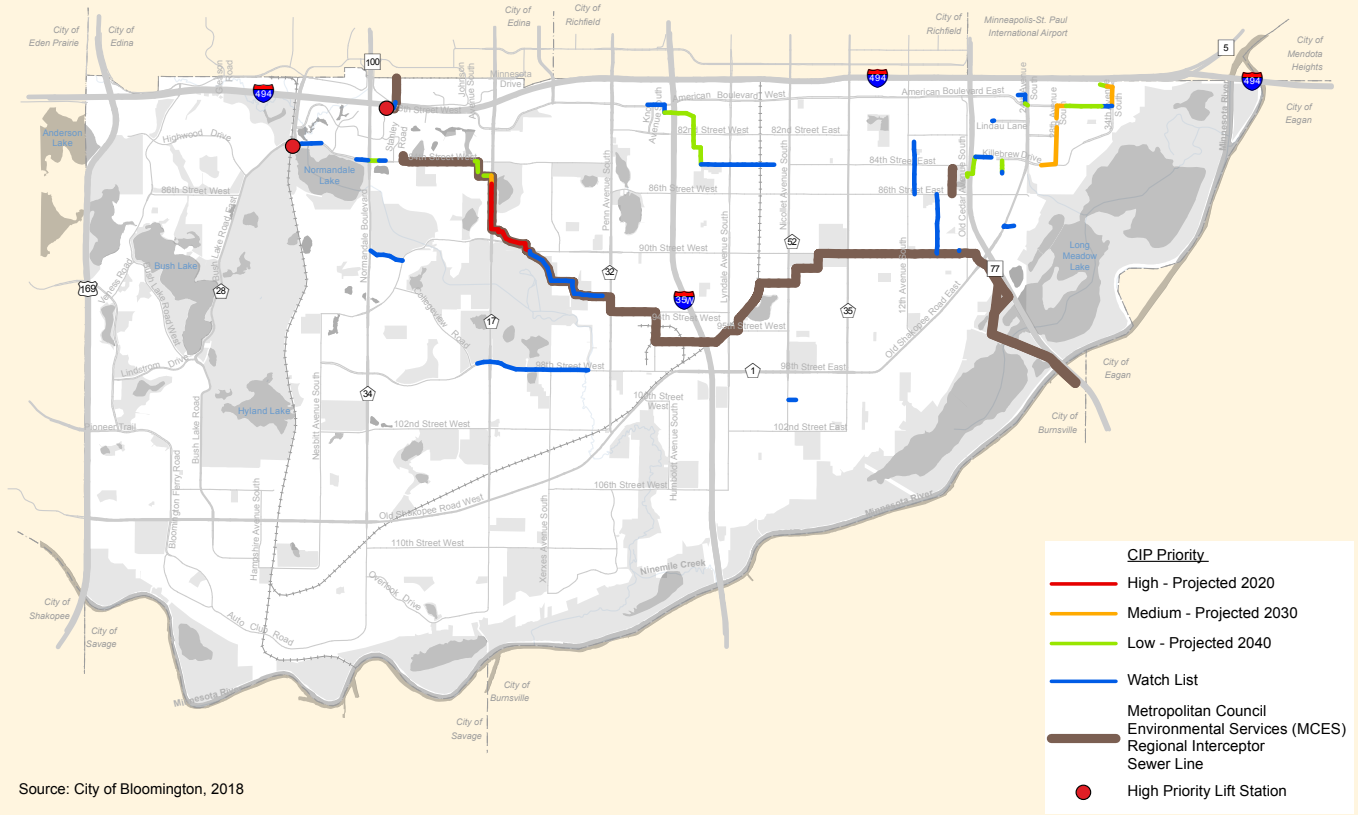
Source: City of Bloomington – WWCSP, 2018

The general scope of these CIP improvements include increasing system capacity by replacing existing pipes with larger pipes or by installing new parallel pipes to build up capacity in areas affected by forecast redevelopment. The CIP also recommends making improvements at two existing sewer lift stations. Work at one of the lift stations (which is owned by the MCES) is expected to begin in late 2018 or early 2019. Three of the project areas involve the MCES owned regional interceptor 3-BN-499. As previously mentioned, the City is working with MCES and the City of Edina on capacity upgrades to that regional interceptor. The City is also in the process of developing and implementing an Asset Management Program which is designed to evaluate the condition, performance, and reliability of the existing wastewater system in an effort to proactively identify and prioritize needed system improvements as well as identify necessary additional preventative system maintenance.

In the summer of 2018 Bloomington and Edina staff started to work on an update to the expired Joint Powers Agreement which will address ownership and maintenance issues for joint water and wastewater service and infrastructure that cross over the City boundaries. It is anticipated that the revised Joint Powers Agreement will be completed in early 2019.

The City will continue to work cooperatively with the MCES to assure that Bloomington's daily and peak sewer flow rates meet the MCES flow threshold and capacity requirements delivered to the MCES Seneca wastewater treatment plant.

Figure 6.7: Sanitary Sewer System CIP Priorities



Source: City of Bloomington, 2018

Surface Water Management Improvements

To better understand surface water infrastructure capacity needs the City recently started using Atlas 14 precipitation data provided by the National Oceanic and Atmospheric Administration (NOAA) to model storm events. Data indicate that rain events are becoming stronger and bring more water. This has led to a shift in the City's underlying assumptions around storm events. Whereas the basic assumption had been that there was a 1 percent chance of a 6 inch rainfall occurring within a 24 hour period, new data indicate there is now a 1 percent chance of a 7.5 inch rainfall event within a 24 hour period. This extra 1.5 inches represents a very large increase of rainfall. Extrapolating data from the last ten years, suggests future increases in the total volume of a 1 percent chance rainfall are likely.

The LSWMP describes detailed corrective actions to address surface water issues. It also includes a prioritized list of projects, cost estimates, funding sources, and implementation timing of corrective actions. Corrective actions include programmatic, non-structural, and structural projects. Some examples non-structural and programmatic projects include the City's street sweeping program, invasive species management, and enforcing the City's phosphorus fertilizer ordinance. An example of a structural project would be installing storm sewers and other hard infrastructure designed to manage storm water. More detailed description of corrective actions, projects, and financial considerations are located in Chapters 5, 6, and 7 of the LSWMP.

6.5 Implementation:

Some tools to implement the goals and strategies related to utilities systems are described below.

Modeling – The City's three utility system plans (WWCSP, WSP, the LSWMP) all utilize modeling to identify future infrastructure needs to accommodate forecast growth and development. The Utilities Division and the Planning Division work in close coordination to ensure utility systems have adequate capacity to serve future development identified using the City's forecast tracker tool. While the utility system plans reflect anticipated future needs, unanticipated development can alter utility needs. Routine updating of models helps ensure capacity is sufficient to meet demand.

District Plans - Utility models are often updated in conjunction with preparation or updating of district or special area plans. The City has three development districts (South Loop, Penn American, and Normandale Lake) and adopted plans for each that describe future development potential and address related infrastructure needs. These plans are updated periodically to remain current or when significant deviations from the original plan occur.

Special Studies - The City prepares special studies to address areas of specific concern or in response to unforeseen opportunities or challenges. Examples include the recently adopted Energy Action Plan and the 98th Street Station Area Plan that was initiated at the request of Metro Transit. Special studies outline specific strategies, tools, and infrastructure needs to achieve the goals outlined in the study.

Asset Management - Routine review and evaluation of system conditions and performance is key to protecting the value and effective lifespan of the City's utility infrastructure. The City is developing and implementing an asset management program for utilities modelled after the successful pavement management program. This program assigns condition ratings to infrastructure components, which can identify potential issues before they affect service and assists in setting priority and timing for infrastructure improvements. This program is also used to coordinate utility improvements with other infrastructure improvements (e.g., roads) which can reduce costs and disruption to residents and businesses. Needed improvements identified through the asset management program are incorporated into the City's Capital Improvement Plan (CIP), which is updated annually.

Coordination with Partners - The City routinely coordinates and partners with other utilities operating within the City, including: Hennepin County, Xcel Energy, CenterPoint Energy, and telecommunications companies. Coordination and partnerships help reduce costs, lessen impacts, and ensure routine maintenance is being conducted. Common areas of partnership include:

- Coordinating infrastructure construction projects to minimize disruption and reduce costs.
- Working cooperatively on policies and regulations to minimize potential conflicts and maximize mutual benefits.
- Data sharing to assist with infrastructure and service planning and delivery.

6.6 Goals, Strategies, Actions

Goal 1: Dependably and affordably provide a high quality public water supply.

Strategy 1.1: Protect the quality and quantity of the groundwater supply.

- Encourage continued development of a metropolitan groundwater model, as a tool to define aquifers and aquifer recharge areas and as a basis for aquifer protection and management.
- Replace wells as they reach the end of their useful life in accordance with Minnesota Department of Health wellhead protection requirements.
- Continue active enforcement of the State Well Code through the City's Environmental Services Division.
- Continue to require that unused wells be sealed at the time of property transfer.
- Continue to track data on underground storage tanks and hazardous material spills within the City.
- Continue existing and proactively research new security practices to protect against vulnerabilities to the quality of the City water supply.
- Continue to ensure infiltration practices are in accordance with guidance outlined in the Local Surface Water Management Plan and Wellhead and Source Water Protection – Wellhead Protection Plan.
- Collaborate with state and regional agencies on groundwater monitoring, inventorying, or permitting programs.

Strategy 1.2: Maintain a secondary water supply to meet peak period demands and improve system reliability and flexibility.

- Continue to purchase water from other jurisdictions.

Strategy 1.3: Reduce the need for disposal and storage of water treatment by-products.

- Consider changes to the water treatment process to reduce the production of lime softening residuals.
- Continue recycling of lime softening residuals for agricultural and/or industrial uses and review additional lime softening residuals disposal alternatives.

Strategy 1.4: Construct improvements to the water distribution system as necessary to meet area demands and to address any fire flow or pressure deficiencies.

- Implement the water distribution system improvements recommended in the Water Supply Plan.

- Provide for critical maintenance of existing deficiencies in City utility capital facilities.
- Coordinate City utility capital expenditure planning with capital investment planning by other Divisions.

Strategy 1.5: Reduce individual and household water consumption.

- Implement water conservation measures outlined in the City's Water Supply Plan. Conservation measures include: metering; water audit, leak detection and repair programs; rate structures; regulations for plumbing fixtures; retrofitting programs; local ordinances; educational programs; and pressure reduction.

Goal 2: Dependably and affordably convey sanitary sewage into the regional treatment system.

Strategy 2.1: Make strategic improvements to the sanitary sewer collection system to ensure efficiency and effectiveness and to meet the increased demand resulting from continued growth and redevelopment.

- Implement the CIP recommendations of the updated Wastewater and Comprehensive Sewer Plan.
- Continue the sanitary sewer preventative maintenance program.
- Complete and implement the wastewater component of the Utilities Asset Management Program to address infrastructure rehabilitation and replacement.

Strategy 2.2: Reduce per capita/per employee sanitary sewage generation rates.

- Continue proactive efforts to reduce inflow and infiltration.
- Implement water conservation measures outlined in the City's Water Supply Plan.
- Study the feasibility to treat sanitary sewage and reuse for non-potable water sources.

Strategy 2.3: Reduce the number of on-site sewage disposal systems while ensuring that existing on-site systems are properly maintained.

- Enforce City ordinances requiring connection to the public wastewater collection system within two years of availability. (City Code Section 11.26(c)).
- Limit the establishment of new subsurface sewage treatment systems.
- The County will continue to manage Bloomington's subsurface sewage treatment systems in accordance with Minnesota Pollution Control Agency and the Minnesota State Department of Health Rules.

Strategy 2.4: Work with Metropolitan Council Environmental Services (MCES) to ensure coordinated local and regional sanitary sewage conveyance and treatment.

- Periodically review and evaluate sewer collection network capacity and treatment capacity in conjunction with MCES to ensure long-term viability of the system.
- Encourage proactive regional capital improvements planning to schedule long-term expansions to treatment facilities as necessary.
- Continue to work with the Metropolitan Council on the coordination of regional interceptor sewer line upgrades or replacements.
- Work with City of Edina staff in 2019 to complete the update of the Joint Powers Agreement which will address ownership and maintenance issues for joint water and wastewater service and infrastructure that cross over the City boundaries.

Goal 3: Ensure that the public and private surface water management system meets community needs in an effective and economically prudent manner.

Strategy 3.1: Mitigate flood risk.

- Hold new development runoff to pre-development runoff rates.
- Utilize existing natural ponding areas for impoundment and treatment of surface water runoff as outlined in the Local Surface Water Management Plan.
- Work with property owners to identify and implement cost-effective solutions to minimize flood risks and mitigate damage to existing structures in flood prone areas.
- Design new storm sewer systems to accommodate level of protection for the 100-year event using the most recent NOAA published precipitation data.
- Continue to enforce the Flood Hazard Overlay District.
- Utilize natural ponding areas, such as wetlands and lakes, naturally occurring low areas and constructed low areas when necessary for the purposes of flood and rate control.
- Consider the impacts of future precipitation and climate trends when developing and implementing City water resource management projects and programs.
- Utilize a Nested Atlas 14 distribution for design storm events as outlined in the Local Surface Water Management Plan.
- Study the feasibility to treat and reuse stormwater for non-potable water sources.

Strategy 3.2: Maintain or improve the quality of water in area lakes, streams, and rivers.

- Continue to enforce the requirements in Bloomington's Shore Area Protection Ordinance and Bluff Protection Overlay District.

- Continue implementing a comprehensive street sweeping program.
- Continue to enforce the surface water management requirements in the Bloomington's Storm Water Pollution Prevention Program and Local Surface Water Management Plan.
- Partner with Watershed Management Organizations to provide educational opportunities, inform the public on pertinent water resource management issues, and increase public participation in water management activities.
- Implement the Local Surface Water Management Plan.
- Continue to implement Bloomington's zero phosphorus fertilizer ordinance restricting the sale of fertilizers containing phosphorus.
- Encourage implementation of low impact development practices and green infrastructure techniques in new development and redevelopment to reduce pollutant loading to surface waters.
- Continue to implement stormwater best management practices that improve runoff water quality and reduce pollutant loading to surface waters from the storm sewer system.
- Continue to maintain existing regional storm water treatment facilities.
- Continue to implement an erosion and sediment control permitting program consistent with the requirements of its MS4 SWPPP and the NPDES Construction Stormwater General Permit.

Strategy 3.3: Preserve and improve the quality and quantity of wetlands.

- Continue to implement the policies, programs, capital improvements, and ordinances detailed in the Wetland Protection and Management Plan.
- Continue to act as the Local Government Unit responsible for administering the Wetland Conservation Act.
- Educate and work with property owners to establish native vegetative buffers around wetlands and water bodies consistent with the Wetland Protection and Management Plan.

Goal 4: Minimize the impact of private utility infrastructure on surrounding areas.

Strategy 4.1: Minimize the impact of private utility infrastructure on surrounding areas.

- Require new or expanded substations to be extensively screened and landscaped.
- Minimize the impact of electric infrastructure on redevelopment by working with landowners and Xcel Energy to relocate transmission lines that bisect redevelopment sites.
- Continue to enforce City Code requirements related to Towers and wireless telecommunication that reduce impacts especially on residential neighborhoods.

Strategy 4.2: Improve private utility service reliability.

- Work with Xcel, developers, and private property owners to bury overhead distribution lines when feasible.
- Require new electric lines to be placed underground.
- Monitor and review changes in high pressure natural gas transmission lines.
- Require natural gas control valves to be placed underground when technically feasible.
- Collaborate with CenterPoint Energy and other partners to review redevelopment and construction plans.
- Encourage new communications infrastructure to be placed underground when technically feasible.

Strategy 4.3: Support conservation efforts.

- Continue to implement cost effective energy use education programs.
- Implement the recommendations in the Bloomington Energy Action Plan.

Strategy 4.4: Foster use of renewable energy.

- Research the potential applicability of renewable energy sources and technologies.
- Encourage the development of geothermal, wind, solar, microgrids, district heating/cooling, and other renewable energy infrastructure to generate energy for adjacent uses or for transmission to the electrical grid.
- Amend the City Code to remove barriers to renewable energy.

Strategy 4.5: Coordinate placement of private utilities and communication infrastructure in public rights-of-way..

- Charge appropriate fees to providers seeking to place utilities and communication infrastructure in public rights-of-way.
- Encourage coordination and communication between public and private utilities when placing utilities underground to identify colocation opportunities.
- Require utilities and communication providers to coordinate construction projects to minimize obstruction of motorized and non-motorized travelways.

Strategy 4.6: Recognize federal and state imposed limits on the regulation of communications infrastructure while working to keep those limits fair and equitable.

- Lobby the State, FCC and Congress to retain local zoning control over communications infrastructure such as local control over communication tower standards.

Strategy 4.7: Increase broadband access and affordability for Bloomington residents.

- Support the entry of additional broadband providers into the Bloomington market.
- Explore opportunities to form public-private partnerships to increase wired or wireless broadband service.
- Encourage broadband providers to improve infrastructure to support high speed access for all Bloomington households and businesses.

Goal 5: Provide a high quality and efficient solid waste program.

Strategy 5.1: Ensure the City's recycling and refuse collection programs are cost effective and meet needs.

- Develop performance standards to evaluate the quality of services provided by recycling and refuse collection contractors.
- Collect data on per capita recycling rates verse solid waste from providers to evaluate annual performance.
- Evaluate and explore implementation of new technology and other tools to enhance program efficiency and effectiveness.

Strategy 5.2: Work to increase recycling and reduce waste.

- Work with Hennepin County and other partners offer programs to educate residents and businesses on approaches and opportunities to reduce, reuse, and recycle.
- Explore the feasibility and cost-effectivenss of a curbside organics collection program.