Section 6

Utilities Element

6.1 Water System

This section summarizes in-depth water system plans, including:

- *Water System Master Plan.*
- Bloomington's *Water Emergency and Conservation Plan* (which satisfies the requirements of *Minnesota Statute 103G.291 Subd. 3,* and was reviewed by the Metropolitan Council and approved by the Minnesota Department of Natural Resources on September 28, 2007.)
- Bloomington's mandated *Wellhead Protection Plan.*

Water System History

Before 1960, there was no public water system in Bloomington. Users extracted water from private wells. The shallow water table in the eastern portion of Bloomington contributed to a building boom that saw the City's population jump from around 10,000 in 1950 to over 50,000 in 1960. The new, mass-produced homes relied on wells for potable water and septic tanks/cesspool systems for waste disposal. In most cases, the well consisted of a length of pipe with a well point attached, driven into the shallow aquifer about twelve to fifteen feet below the surface, not far from the waste disposal systems. Within a few years, wastewater began to seep into the shallow aquifer, causing its water to be unfit for drinking.

After careful study, a referendum was held in 1959 and voters approved the installation of public water and sanitary sewer systems. In the spring of 1960, a rapid construction program was initiated. Approximately 100 miles of water and sanitary sewer piping were installed in the first year. 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 went into operation in 1974. In 2002, the City of Bloomington completed a project which added two additional wells and increased the capacity of its water treatment plant.

Water Supply

Bloomington's current public water supply consists of two sources: groundwater and surface water. Groundwater is provided by six deep wells located near Normandale Boulevard, Poplar Bridge Road, and Collegeview

Valley View Water Tower

Utility Systems Introduction

Utility systems are a necessity for public health, safety, and welfare and play a direct role in physical development and environmental quality. Modern water treatment and distribution, sanitary sewage collection and treatment, surface water management, and gas, electric, and communication services have become so dependable and available as to often be overlooked. Bloomington is, for the most part, currently well served by public and private utilities. For Bloomington to continue to grow and prosper, however, the City must take steps to keep Bloomington's public and private utility infrastructure up-to-date and to ensure the future availability of additional utility capacity.

It is the City of Bloomington's intent to work with public agencies and private utilities to provide high quality, highly dependable utility services while minimizing utility costs and the visual impacts of utility infrastructure through efficient design and operation and coordinated planning.

Water Treatment

Bloomington's ground water treatment process includes conventional lime softening through a contact solids basin (mixing, flocculation, and sedimentation), recarbonation, chloritization, filtration, and fluoridation all done in a manner that makes the ground water compatible with surface water provided from the City of Minneapolis. 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 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.

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 costly in economic terms. 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 U.S. Department of Agriculture approved farm field enhancement.

Road. All of the wells, except Number Three, obtain water from the Prairie du Chien-Jordan aquifer. Well Number Three obtains water from the Hinckley aquifer. Water from the wells is pumped directly to a nearby water treatment plant. The well water, high in quality but relatively hard, is lime-softened. The capacity of the wells is 18.1 million gallons per day (MGD).

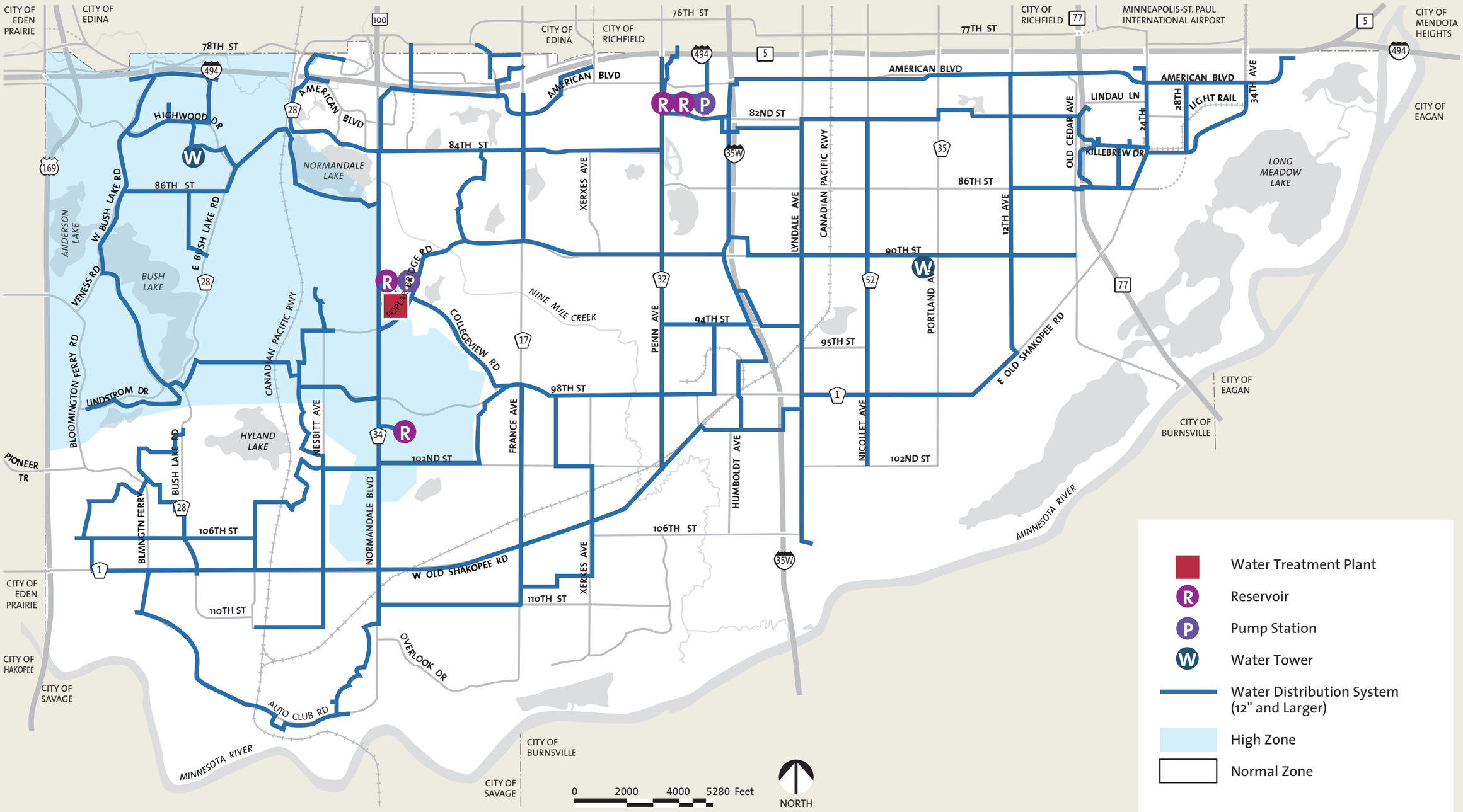
The firm capacity of the wells is 15.1 MGD, which is slightly higher than the designed treatment plant capacity of 14 MGD. All wells are actively used. City treatment plant staff operate all the wells and rotate their use to balance run time hours on an annual basis.

The surface water portion of the supply, purchased off-peak and wholesale from the City of Minneapolis, is also lime-softened water. Bloomington's current agreement with Minneapolis allows the City to draw up to 30 MGD until the year 2017. The Minneapolis portion of the supply is stored in two 10-million gallon reservoirs located at West 82nd Street and Penn Avenue in Bloomington. The water is pumped from the 20 MG "82nd Street Reservoir" into the Bloomington distribution system based upon system demand. The reservoir is used primarily as a peaking facility. Water in the distribution system is a blend of these two finished potable waters. The yearly average of Bloomington treated water versus the Minneapolis purchased water is 75% to 25%.

The expansion of Bloomington's water treatment plant and wellfield in 2002 was completed 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 improvement is consistent with the projected needs of the community based on growth in population and employment and allows the City to meet essential demands (defined as average daily usage on an annual basis) should Bloomington lose the ability to draw water from Minneapolis.

The vast majority of Bloomington's water needs are met from the public supply, although some private wells do exist. Private groundwater use is regulated by the Minnesota Department of Natural Resources. The largest private use of groundwater in Bloomington comes from those industrial users who avoid treated water due to cost or chemical reasons. 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.

Figure 6.1 Existing Water Distribution System



Source: Bloomington Utilities Division, 2008.

Water Distribution System

Bloomington's water distribution system is supplied from the City's wells and water treatment system as well as two connections to 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****, page 6.3,* depicts Bloomington's water distribution system. Total storage capacity is roughly 30 million gallons, slightly over twice the average daily demand.

As a developed community, Bloomington's water distribution system is essentially complete. In 1998, Bloomington's *Water System Master Plan* recommended several areas in which the distribution system should be upgraded to address water pressure deficiencies.

Table 6.1 Historical and Projected Water Demand

Year	Average Day (MGD)	Maximum Day (MGD)	Maximum Hour (MGD)
2007	13.3	36.2	61.5
2008	13.4	36.4	61.9
2009	13.5	36.6	62.2
2010	13.6	36.8	62.6
2011	13.6	36.9	62.7
2012	13.6	37.0	62.9
2013	13.7	37.1	63.1
2014	13.7	37.2	63.2
2015	13.8	37.4	63.6
2020	13.9	37.6	63.9
2025	14.1	38.1	64.8
2030	14.3	38.6	65.6

Source: Bloomington Utilities Division (historical data), Black and Veatch (projections), and Bloomington's Water Emergency and Conservation Plan.

Water Demand

A water utility must be able to supply water at highly fluctuating levels of demand. Demand levels most important to the design and operation of a water system are average day, maximum day, and maximum hour. Average day demand is the annual volume of water supplied divided by the number of days in the year. This number is used for projecting peak demands and for developing probable supply, treatment, and pumping costs and revenue. Maximum day demand is the maximum quantity of water used on any day of the year. This number is used to size water supply, treatment, and distribution facilities.

The greatest demands on a water system are generally experienced for short periods of time during the maximum demand day. These peak demands are referred to as maximum hour demands because they seldom extend over a period of more than a few hours. Pumping and storage requirements are usually determined on the basis of maximum hour demands.

Table 6.1, *left,* depicts recent water use rates as well as projected future demand. Construction of additional wells and expanded treatment capacity were completed in 2002 as recommended in Bloomington's Water System Master Plan to meet future essential demands and to increase system reliability, flexibility, and overall water quality while optimizing the service life of the water treatment plant.

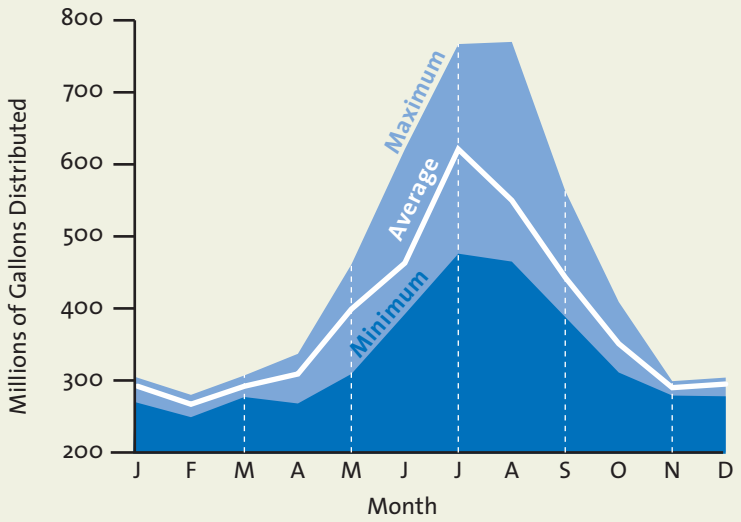
Sam H. Hobbs Water Treatment Plant

Beyond its use for drinking water and indoor household needs, Bloomington's water system is also vital for:

- **Fire Suppression** – Insurance rates are based in part on a city's water system;
- **Manufacturing Support** – Bloomington is home to several manufacturers that require a plentiful, consistent water supply; and
- **Landscaping Maintenance** – ***Figure 6.2****, above right,* illustrates that more than half of the City's water demand in summer months relates to maintaining landscaping.

Modifying water usage to more sustainable levels will require changes in the landscaping materials that are used and how those materials are maintained. Maintaining a water rate structure that promotes water conservation is vital to the City's sustainability efforts.

Figure 6.2 Water Distribution by Month, 1998 - 2007



Source: Bloomington Utilities Division.

By the end of 2008, roughly 85% of these recommended upgrades have been completed. The remaining system upgrades will be completed in conjunction with upcoming pavement rehabilitation projects.

Water systems are typically designed to meet peak period demands. In Minnesota, water usage varies dramatically throughout the year. Peak periods invariably occur during the hotter and drier months of the summer. ***Figure 6.2****, above,* shows the impact of the seasons on minimum, maximum, and average Bloomington water usage. One way the City attempts to defer or eliminate the need for capital improvements to the water system is to increase local water conservation efforts, especially the replacement of conventional landscaping with types that require less water.

In pursuit of an even more sustainable city, Bloomington's *Water Emergency and Conservation Plan* identifies several water conservation measures including: metering; water audit, leak detection, and repair programs; rate structures; regulations for plumbing fixtures; retrofitting programs; local ordinances; educational programs; and pressure reduction. Current measures include public education, metering upgrades, leak detection, and rate structures. Bloomington will also prepare a Utilities Asset Management Program, similar to the existing Pavement Management Program, to manage utility maintenance and replacement for the long term.

6.2 Sanitary Sewer System

This section summarizes the City's *Sanitary Sewer Policy Plan*. This section also includes updated information based upon water consumption histories and a new Comprehensive Sanitary Sewer System Model developed by Black and Veatch in 2007.

History

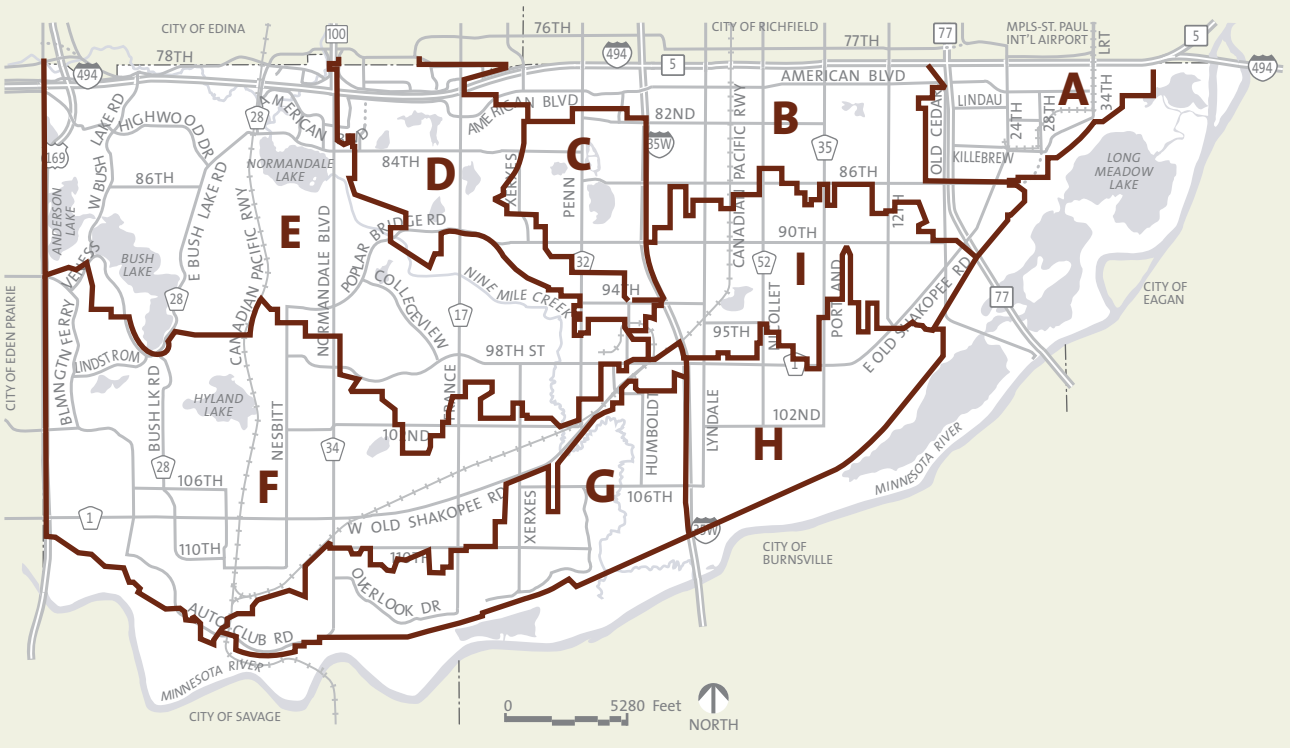
Before 1960, there was no public sanitary sewer system in Bloomington. Sewage treatment occurred on-site in septic tank cesspool systems. As the population and number of septic systems soared in the 1950s, wastewater began to seep into the shallow aquifer, causing its water to be unfit for drinking. After careful study, a referendum was held in 1959 and voters approved the installation of public water and sanitary sewer systems. In the spring of 1960, a rapid construction program was initiated. In the first year, approximately 100 miles of water and sanitary sewer piping were installed.

MCES owns and operates regional interceptor sewer lines and sewage treatment facilities while the City of Bloomington owns and maintains local sewer lines. The City maintains certain components of the regional interceptors as defined in a maintenance contract with 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 Burnsville, Eagan, Savage, and

Sewer pipe installation, 1960.

Originally, Bloomington's sewage was pumped north through Richfield and Minneapolis and then treated on a contract basis by the Minneapolis-St. Paul Sanitary District. Sewage treatment in the metropolitan area was later taken over by the Metropolitan Waste Control Commission, now referred to as the Metropolitan Council Environmental Services (MCES).

Figure 6.3 Sanitary Sewer Districts



Source: Bloomington Utilities Division.

small portions of Apple Valley and Lakeville, was built in 1972, then expanded and upgraded in 1992 to a capacity of 39 million gallons per day. The original interceptor and sewage lift station that directed flow north have now been abandoned.

Collection Network

Almost 100 percent of Bloomington's current population is connected to the sanitary sewer collection system. Once entering the system, sewage flows by virtue of gravity and with the help of 28 lift stations that pump sewage to a higher elevation to keep it flowing. Bloomington's sewer lines range in diameter from six to sixty inches. ***Figure 6.3**, page 6.7,* depicts the location of the sanitary sewer service districts, while ***Figure 6.4**, page 6.9,* depicts sanitary sewer infrastructure.

As a fully developed City, Bloomington's sanitary sewer system is essentially complete. The system is relatively new and is characterized by the latest engineering and construction techniques. Looking forward, major issues concerning the system include making improvements as necessary to accommodate future redevelopment; working with MCES to meet long-term treatment capacity needs; continuing efforts to identify the presence of inflow and infiltration; and performing preventative system maintenance.

Sewer lines serving a regional purpose are owned and operated by Metropolitan Council Environmental Services. As discussed in its *Water Resources Management Policy Plan*, the Metropolitan Council proposes requiring cities to acquire, through reconveyance, MCES interceptor lines which it feels no longer have a regional role. This proposal includes one MCES interceptor in Bloomington identified as 3-BN-499. This line serves portions of both Edina and Bloomington and runs across the City from its entrance point near the intersection of I-494/TH 100 to the intersection of East 90th Street and 18th Avenue. This interceptor currently meets the criteria for serving a regional role and projected sewage flow increases in Edina will strengthen that role. The City of Bloomington expects the 3-BN-499 line to remain under MCES operation due to its regional role in serving portions of two communities and the fact that it does not meet the criteria for removal from the regional system as outlined in the *Water Resources Management Policy Plan* (December 1996, p. 45). Current flows in the upstream reaches of the 3-BN-499 regional interceptor, along with MCES lift station L-55 are reaching system capacity. The Cities of Bloomington and Edina are in the process of working with MCES in an attempt to resolve the capacity concerns.

Inflow and Infiltration

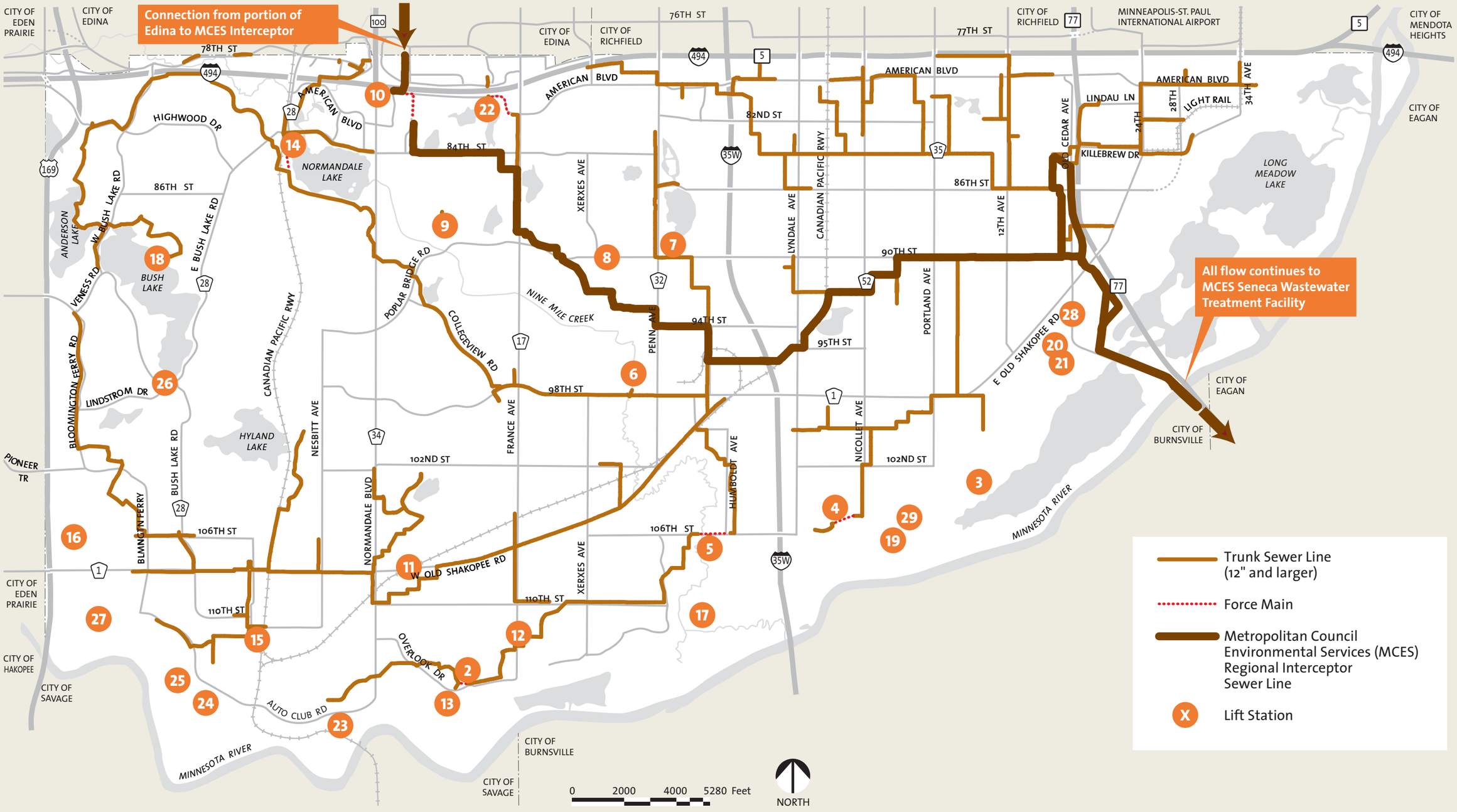
Of concern for any sanitary sewer system are infiltration, inflow, and blockage. Infiltration is the seepage of groundwater into sewer pipes through cracks or joints. Inflow is the entrance of clear water into the system from a single point such as a sump pump, foundation drain, or sewer access covers. Blockage occurs when pipes are clogged or obstructed by solids or tree roots. Infiltration and inflow increase the volume of sewage, thereby increasing treatment costs and potentially requiring premature infrastructure improvements. Blockage must clearly be avoided for the system to work effectively.

While the percentage of Bloomington's sewer flow attributable to inflow and infiltration has historically been very low, Bloomington remains committed to further reductions. To reduce inflow, Bloomington prohibits 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 their management of the sanitary sewer collection network, the City's Public Works Department has initiated many preventative maintenance efforts to proactively avoid infiltration, inflow, and blockage. Efforts that occur on an on-going basis include:

- Pipe cleaning.
- Chemical and mechanical treatment to control tree root intrusion.
- Sewer television inspection.
- Main line repairs.
- Installation of cured-in-place liners.
- Requiring manhole chimney seals on all new and reconstructed manholes.
- Service line repairs.
- Lift station maintenance and upgrades.
- Changing castings.
- Covers on manholes.
- Eliminating sump pump connections.

Figure 6.4 Sanitary Sewer System



Source: Bloomington Utilities Division, 2008.

Future Demand and Recommended Improvements

Bloomington currently generates sewage at an average level of just under 9 mgd (million gallons per day). Commercial/industrial users generate approximately 40% of that flow while residential users generate 60%.

***Table 6.2**, below,* depicts current and projected future sanitary sewer flows using two methodologies. The first method uses recent average flow rates times updated population and employment forecasts prepared by Bloomington Planning staff. The second method uses generation rates of 75 gallons per day per future resident and 25 gped (gallons per employee per day) as recommended in the *MCES 2030 Water Resources Management Policy Plan*. This methodology includes a graduated reduction in the existing baseline sewer flows ranging from 4 gpcd (gallons per capita per day) in 2010 to 10 gpcd in 2030. These reductions were developed by the MCES and presented to the City of Bloomington via correspondence in January of 2008. The first method projects a 27% increase in total flows between 2005 and 2030. The second method projects a 20% increase in total flows for the same time period. Note that these figures represent updated values that modify the values found in Bloomington's *1998 Sanitary Sewer Policy Plan*. ***Figure 6.5**, page 13*, depicts forecasted flows by year at various entry points to the MCES interceptor.

The *1998 Sanitary Sewer Policy Plan* also included hydraulic modeling analysis of about 10% of the sewer infrastructure at the subdistrict level. This was completed to identify improvements needed to accommodate anticipated growth and redevelopment. Based on that analysis, the plan made eleven recommendations to maintain the capacity and integrity of the existing system to the year 2020. To date, eight of the items have been completed, while work on the remaining three items (including installation of new pipe) was started in the spring of 2008.

Table 6.2
Current and Projected Average Daily Sanitary Sewer Flow

Year	Residential (MGD) [1]	Commercial/ Industrial (MGD) [1]	Total Average Daily (MGD) [1]	Total Average Daily (MGD) [2]
2005	5.51	3.55	9.06	9.06
2010	5.82	4.23	10.05	10.02
2015	5.95	4.55	10.50	10.24
2020	6.08	4.88	10.95	10.46
2025	6.14	5.08	11.22	10.53
2030	6.21	5.29	11.49	10.61

Source: Bloomington Utilities Division. [1] *Bloomington methodology (no declining base flow, future rates at recent averages: 67.1 gpcd for residential and 39.1 gped for commercial/industrial).* [2] *MCES methodology (see discussion above).*

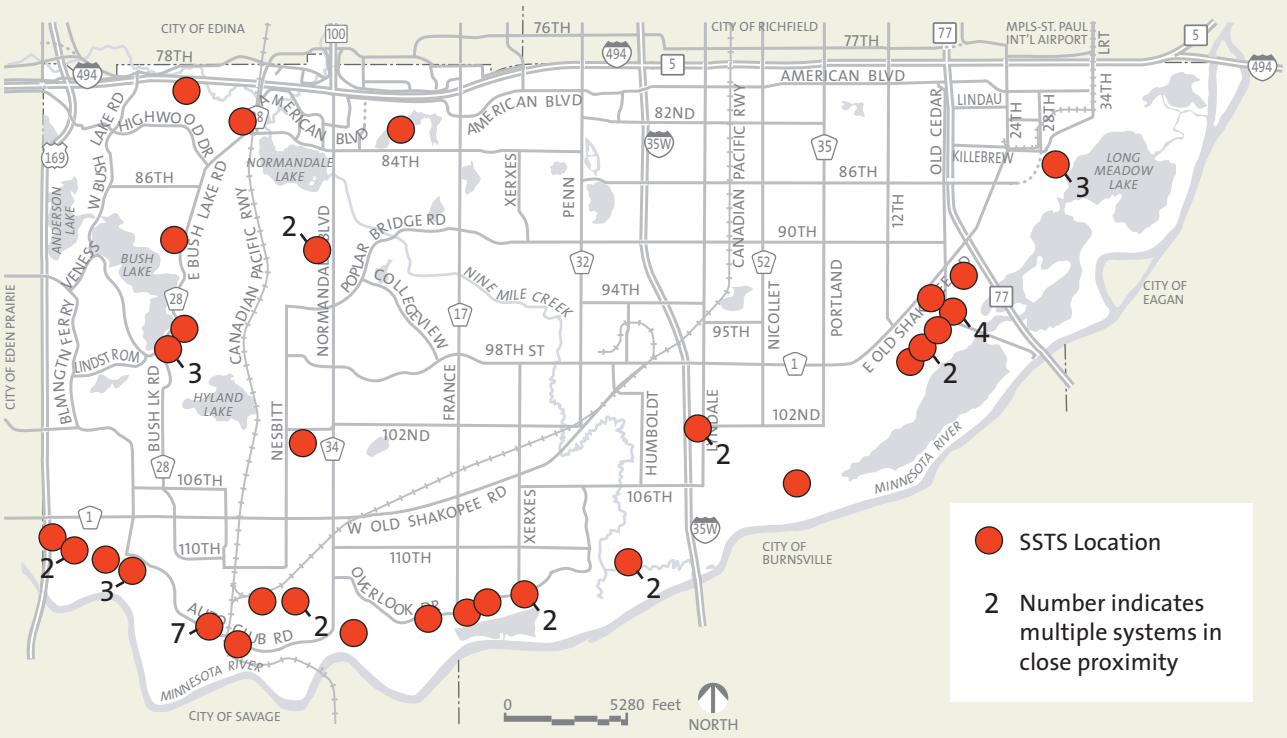
In 2006 the City contracted with Black and Veatch to build a Comprehensive Sanitary Sewer System Model and update the recommended improvements needed to accommodate anticipated growth and redevelopment up to the year 2030. The new model gives City staff the ability to examine modeled flow conditions of any pipe within the public system, at any time over a 24-hour period. The revised recommended improvements include sixteen CIP project areas, and seven lift station upgrades. Upgrades to two of the lift stations were recently completed. Construction in two of the project areas will begin in May of 2008. Five of the project areas and one of the lift stations involve MCES interceptor 3-BN-499, and as previously mentioned, the City is working with MCES on capacity upgrades to that interceptor.

Subsurface Sewage Treatment Systems (SSTS)

As of 2008, 50 Bloomington properties continue to utilize on site subsurface sewage treatment systems (SSTS). ***Figure 6.6****, below,* depicts the locations of active SSTS. Properties producing domestic or industrial wastes are required by *City Code Section 11.26 (c)* to connect to the public sewer system within two years of sewer availability. Since 2000, the City has connected 33 Bloomington properties to the public sewer system. The City regulates the operation of SSTS in accordance with Minnesota Pollution Control Agency regulations. The Bloomington Environmental Health Division is responsible for coordination and enforcement of SSTS ordinances.

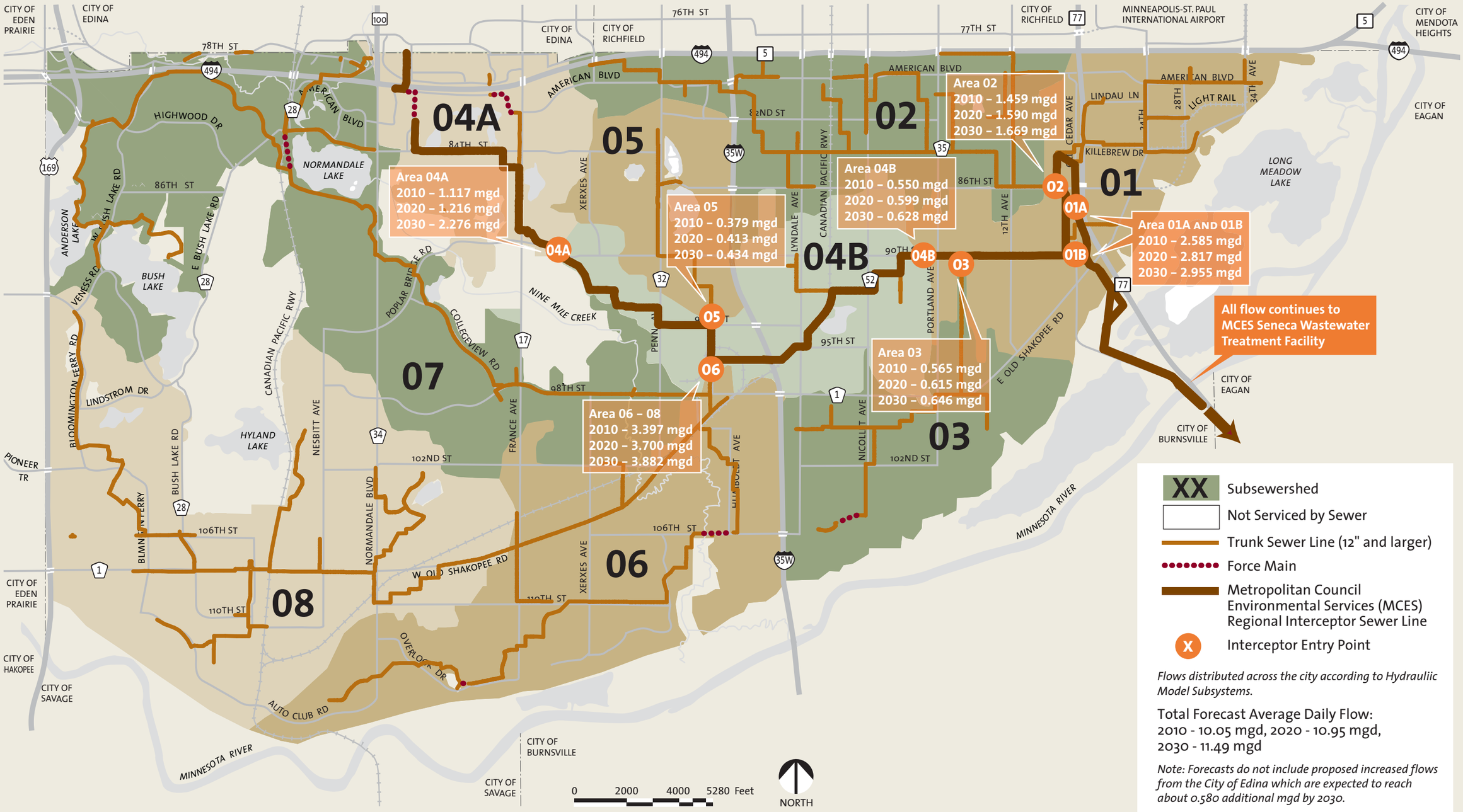
In accordance with *Minnesota Rules Chapters 7080, 7081, 7082 and 7083* the City will continue to implement a comprehensive SSTS management program. SSTS owners are required to have their systems inspected and pumped at least every three years under a City permit and repair or replace failing systems within five years. The program includes a computerized notification and tracking database along with enforcement procedures. The database is able to identify the dates of new system installations, the date of pumping/inspection, the generalized condition of the SSTS, the volume of contents pumped and whether the system was failing. The management program also requires upgrade or replacement of systems that pose an imminent threat to public health and safety within ten months.

Figure 6.6 Location of Active Subsurface Sewage Treatment Systems



Source: Bloomington Utilities Division.

Figure 6.5 Forecast Sanitary Sewer Flows 2010 - 2030



Flows distributed across the city according to Hydrauliic Model Subsystems.

Total Forecast Average Daily Flow:
2010 - 10.05 mgd, 2020 - 10.95 mgd,
2030 - 11.49 mgd

Note: Forecasts do not include proposed increased flows from the City of Edina which are expected to reach about 0.580 additional mgd by 2030.

Source: Bloomington Utilities Division, 2008.

6.3 Surface Water Drainage System

This section summarizes the City's most current *Comprehensive Surface Water Management Plan* (CSWMP) and *Wetland Protection and Management Plan*.

The Need for Management

Urbanization alters the natural drainage patterns of rainfall and melting snow. Increased impervious surface area restricts water from entering the soil, which causes more water to exit a site faster than when it was vegetated. If not properly managed, the cumulative effect of this phenomenon leads to increased flooding potential. Urbanization also adds pollutants to draining water that can have negative effects on our water bodies and the life forms that depend on them.

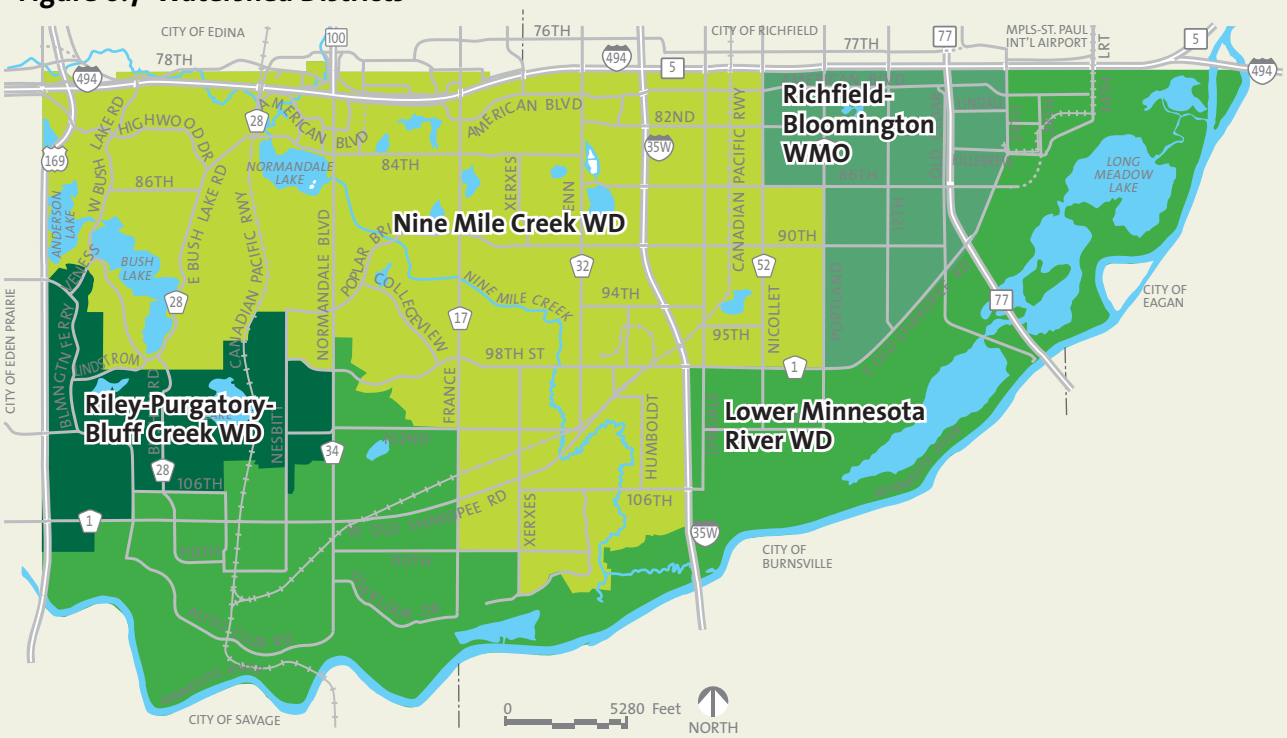
To reduce flooding potential and improve water quality, the City of Bloomington has constructed a comprehensive surface water management system as development has occurred. This system relies on open drainage ways; drainage pipe; lift station pumps; private and publicly constructed retention and detention 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, saving valuable wildlife habitat, and retaining the beauty of the natural environment.

The City recognizes that decisions on when to use natural or non-natural drainage systems and when to use on-site or off-site stormwater management create varying impacts on the sometimes competing interests of development intensity and water quality. Bloomington will pursue a balanced approach to stormwater management that is context sensitive and takes into account resource preservation and enhancement.

Regulatory agencies, as well as the Metropolitan Council, share Bloomington's view on the importance of surface water management. The City's CSWMP and Wetland Protection and Management Plan discuss local methods to further joint goals and policies regarding surface water management while assessing problems and proposing corrective actions.

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 Rule.

Figure 6.7 Watershed Districts



Source: Bloomington Utilities Division.

Watershed Districts

In 1956, 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 6.7**, above,* the City of Bloomington shares land area with three Watershed Districts and a Watershed Management Organization. These entities each have their own watershed management plans. Bloomington's surface water plan is in accordance with the requirements of the individual watershed plans for the Bloomington area.

Comprehensive Surface Water Management Plan Summary

The CSWMP 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 with 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 plan:

- Provides an inventory of land and water resources within the City.
- Outlines 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.
- Provides an assessment of the existing and potential water resource related concerns within the City.
- Outlines priorities and develops an implementation program.
- Discusses the financial considerations of implementing the proposed regulatory controls, programs and improvements.

The CSWMP is intended to be in effect through the year 2015, at which time it will be updated. Amendments may occur in the interim period as needed. Guiding principles used to develop goals and policies in the CSWMP include:

- Utilize appropriate, cost effective measures to control excessive volumes and rates of runoff.
- Improve water quality.
- Promote ground water recharge.
- Prevent erosion of soil into surface water systems.
- Protect and enhance fish and wildlife habitat and water recreational facilities.
- Secure the other benefits associated with the proper management of surface water.

A substation at 28th Avenue and American Boulevard.

6.4 Private Utility Systems

In addition to water, sanitary sewer, and storm sewer service, development relies upon the availability of private utilities, notably electricity, natural gas, and communications. While local governments do not control the provision of these services, they do have limited regulatory authority over the location and design of the conveyance infrastructure. The City will facilitate the continued development of these private utilities while minimizing associated adverse impacts.

Electricity

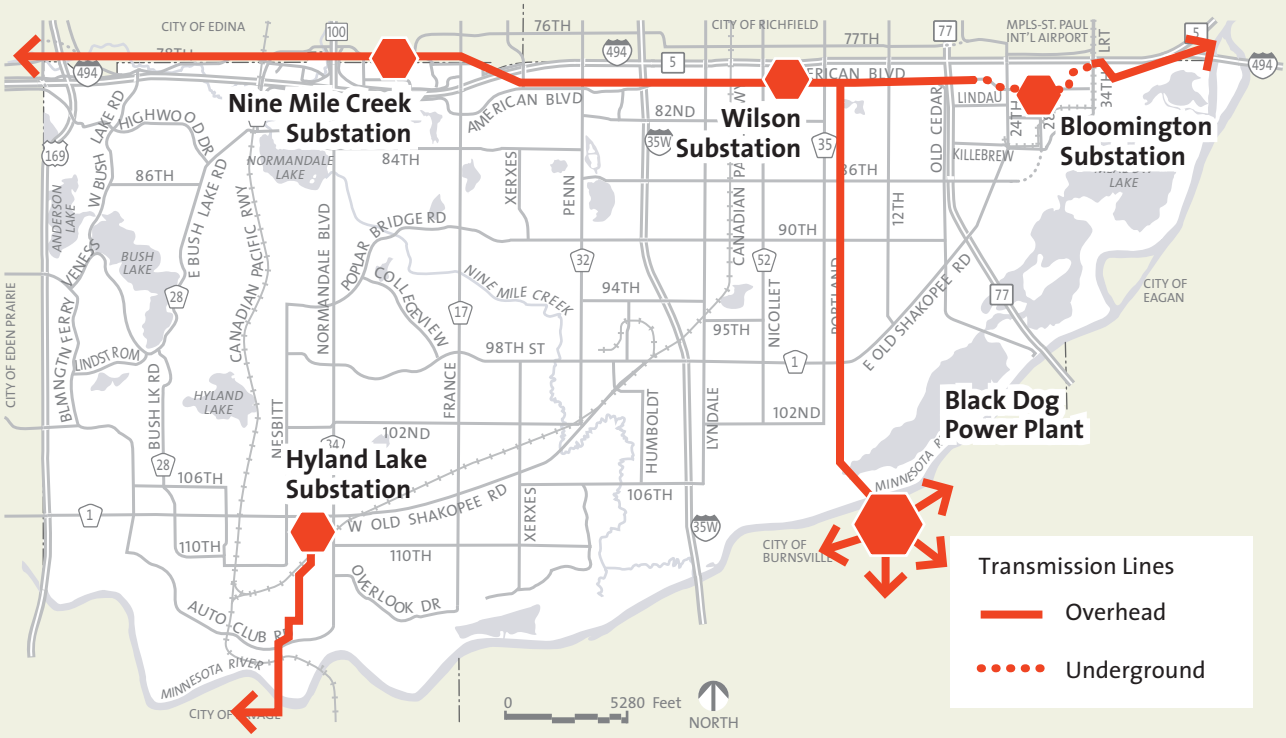
Electric service in Bloomington is provided by Xcel Energy through a complex network of facilities, the most visible of which include major transmission lines along the I-494 corridor and Park Avenue, four substations, and the coal and natural gas fired Black Dog power plant directly across the Minnesota River in Burnsville (*See **Figure 6.8** on page 6.18*). Over the last ten years, Xcel made the following improvements in Bloomington:

- The Bloomington Substation in the Airport South District was relocated to accommodate the new north-south runway at MSP and greatly expanded in anticipation of significant future development in the area;
- A mile length of the transmission line paralleling I-494 was placed underground to accommodate the new north-south runway; and
- The Wilson Substation was expanded and improved.

Looking forward, the following impacts of the electric system in Bloomington need to be minimized:

- Unreliability. Bloomington has been negatively impacted in recent years by frequent outages from storm damage. The outages are partially a function of the high number of distribution lines that run above ground, particularly in older portions of the community. Over time, Bloomington and Xcel Energy will need to work together to find measures to make the

Figure 6.8 Major Electric Facilities, 2008



Source: Bloomington Utilities Division.

system more reliable and to coordinate undergrounding of distribution lines.

- Land use impacts. Several potential redevelopment sites in Bloomington are bisected by overhead transmission lines. Bloomington and Xcel Energy will need to work with landowners to coordinate the realignment, especially during recircuiting projects, of the overhead transmission lines to facilitate redevelopment.

Natural Gas

CenterPoint Energy provides natural gas service to 25,660 metered homes and 2,467 metered businesses in Bloomington through a 391-mile underground network of gas lines. Bloomington is also home to high pressure transmission lines that convey natural gas from the south to customers throughout the western metropolitan area. With the exception of control valves, CenterPoint Energy's natural gas delivery infrastructure in Bloomington lies underground. As of 2008, no significant changes are planned to that infrastructure.

Communications

Bloomington is served by a number of private communication networks that supply telephone, television, internet and data services. Most of these networks provide multiple services. Distribution technologies range from copper wire networks to fiber optic networks to wireless antenna networks using various technologies and frequencies. Each of these communication networks requires its own infrastructure, such as communication towers, satellite dishes, or a network of above or below ground wires.

The provision of advanced communications technology is important to the City's residents and businesses and vital to the continued economic development of the City. One service becoming increasingly important is broadband internet availability. Bloomington's primary broadband choices are through the cable TV system or the telephone system (DSL service). While all households have the ability to purchase broadband through the cable system, Qwest Communications reports that approximately ten percent of Bloomington households do not have access to DSL service due to infrastructure limitations. Wireless cell phone providers also offer broadband internet service in Bloomington, although at a higher price point.

The City strives to encourage and facilitate the continued development of high quality communications services while minimizing any associated adverse impacts upon the community or upon the reliability of existing services that are often delivered via the public rights-of-way. Bloomington also seeks to expand the range of broadband choices available to residents and businesses while encouraging existing internet service providers to make investments in their infrastructure to increase speeds and availability.

6.5 Goals, Strategies, Actions

Goal 1 Dependably and affordably provide a high quality, sustainable 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 rech arge areas and as a basis for aquifer protection and management while retaining local control over water supply issues..
- Continue implementation of ongoing wellhead protection efforts.
- Construct new public water supply wells, if necessary, to meet Minnesota Department of Health wellhead protection requirements.
- Continue active enforcement of the State Well Code through the City's Environmental Health 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.
- Implement economically feasible water system recommendations of the *Asset Management Plan* via existing staff allocation approved by the City Council.

Strategy 1.2

Maintain a secondary water supply to meet peak period demands, improve system reliability and flexibility and protect underground supplies.

- Continue to implement the existing water purchase contract with the City of Minneapolis.

Strategy 1.3

Reduce the need for disposal and stor age of water treatment by-products.

- Change the water treatment process, when feasible, to reduce the production of lime softening residuals.
- Continue the implementation of lime softening residuals disposal alternatives including, but not limited to, the recycling of lime softening residuals for agricultural and/or industrial uses.

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.

- Continue implementation of the water distribution system improvements recommended in the *Water System Master Plan*. As of 2008, 85% of these improvements have been completed.

Strategy 1.5

Reduce per capita water demand.

- Explore water conservation measures outlined in the City's *Public Water Supply and Emergency Conservation Plan* to the extent deemed feasible and beneficial. 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.
- Promote alternative landscaping types that require less water to maintain.

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

Strategy 2.1

Construct cost-effective improvements to the sanitary sewer collection system as necessary to meet the increased demand resulting from continued growth and redevelopment.

- Finalize implementation of the three remaining recommendations from the *1998 Sanitary Sewer Policy Plan*.
- As warranted and in a cost effective manner, continue the implementation of improvements to the sanitary sewer collection system that are recommended in the *2006 Comprehensive Sanitary Sewer System Modeling Project*.

Strategy 2.2

Maintain an efficient and effective sanitary sewer collection system.

- Continue a phased sewer infrastructure replacement/rehabilitation program.
- Continue the sanitary sewer preventative maintenance program.
- Implement economically feasible sanitary sewer system recommendations of the *Asset Management Plan* via existing staff allocation approved by the City Council.

Strategy 2.3

Reduce per capita/per employee sanitary sewage generation rates.

- Continue proactive efforts to reduce and eliminate infiltration and inflow.
- Implement water conservation measures outlined in the City's *Public Water Supply and Emergency Conservation Plan* to the extent deemed feasible and beneficial.

Strategy 2.4

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 sanitary sewer system within two years of availability.
- Prevent the establishment of new on-site disposal systems unless other solutions are cost prohibitive..
- Continue implementation of the City's comprehensive management program for on-site disposal systems.

Strategy 2.5

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 and accommodate future flows.
- Encourage proactive regional capital improvements planning to schedule long-term expansions to treatment facilities and sewer interceptors, as necessary to support regional land use goals to accommodate an increasing percentage of the region's growth in fully developed areas.
- Due to its regional role as defined by the Metropolitan Council's *Water Resources Management Policy Plan* (December 1996, p. 45), request the MCES to remove the regional interceptor sewer line 3-BN-499 from its list of sewer lines to be reconveyed to local government.

Goal 3 Ensure that the public and private surface water management system is constructed to economically meet community needs as development occurs.

Strategy 3.1

Design a surface water system that reduces impacts on the built environment to 100+ year events.

- Hold new development runoff to pre-development runoff rates.
- Utilize existing natural ponding areas for the impoundment and treatment of surface water runoff as outlined in the *Comprehensive Surface Water Management Plan.*

- Work with property owners to identify and implement economical solutions to minimize damage risks to existing structures in flood prone areas.
- For new structures, require a minimum of two feet of freeboard between the lowest livable floor and the water elevation of the 1% chance event.

Strategy 3.2

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

- Using the provisions outlined in the *Comprehensive Surface Water Management Plan*, apply the guidelines of the Nationwide Urban Runoff Program (NURP) to the extent practicable for the design of new storm water management facilities for all new development and redevelopment in order to reduce pollutant loading to surface waters.
- Require applicants to receive permits from the appropriate watershed district when applicable.
- Continue to enforce Bloomington's *Shore Area Protection Ordinance*.
- Continue implementing a comprehensive street sweeping program.
- Ensure surface water management activities follow Bloomington's *Storm Water Pollution Prevention Program and Comprehensive Surface Water Management Plan*.
- Provide educational opportunities, inform the public on pertinent water resource management issues and increase public participation in water management activities.
- Implement the *Comprehensive Surface Water Management Plan* and *Wetland Protection and Management Plan's Capital Improvement Plan* as the Storm Water Utility budget allows.
- Continue to implement Bloomington's zero phosphorus fertilizer ordinance restricting the sale and use of fertilizers containing phosphorus.
- Protect wetlands in conformance with the requirements of the *Bloomington Wetland Protection and Management Plan* and all State and Federal requirements.
- Encourage the implementation of low impact development practices in new development and redevelopment to the extent practicable to reduce pollutant loading to surface waters.
- Implement best management practices identified in the approved Storm Water Pollution Prevention Program including those identified in the *Nondegradation Report* to reduce pollutant loadings to surface waters from the municipal separate storm sewer system.

Goal 4 Work with Xcel Energy to accommodate Bloomington's electricity needs while mitigating adverse impacts.

Strategy 4.1

Minimize the impact of electric infrastructure on surrounding land uses.

- Require new or expanded substations to be extensively screened and landscaped.
- Underground electric lines where feasible.

Strategy 4.2

Improve electric service reliability.

- Where appropriate, explore a program to fund the incremental undergrounding of Bloomington's overhead distribution lines.
- Require new electric lines to be placed underground, if feasible.

Strategy 4.3

Minimize the impact of electric infrastructure on redevelopment.

- Work with landowners and Xcel Energy to relocate transmission lines that bisect redevelopment sites.

Strategy 4.4

Support efforts to conserve electricity.

- Continue to implement cost effective energy use education programs.
- Encourage further use of alternative energy sources.

Goal 5 Work with CenterPoint Energy to accommodate the City's natural gas needs while mitigating adverse impacts.

Strategy 5.1

Monitor and review changes in high pressure natural gas transmission lines to manage fire protection and public safety issues..

Strategy 5.2

Support efforts to conserve natural gas.

- Continue to implement cost effective energy use education programs.

Strategy 5.3

Require natural gas control valves to be placed underground when technically feasible.

Goal 6

Encourage and facilitate the continued development of a high quality communications infrastructure while minimizing any associated adverse impacts upon the community or upon the reliability of existing services delivered via the public rights-of-way.

Strategy 6.1

Minimize the number of communication towers citywide.

- Require antennas to be colocated on existing towers or structures such as buildings, water towers, or power line support structures when it is technically feasible to do so.
- Require new towers to be designed to accommodate multiple users.

Strategy 6.2

Encourage communication towers to be designed and located to minimize adverse impacts on the surrounding area.

- Use zoning tools to encourage towers to locate first in industrial areas, then in commercial areas, and finally at public and quasi-public uses in residential areas.
- Regulate tower height based on the tower's proximity to residential property.
- Encourage the use of stealth and camouflage techniques to reduce the visual impact of communication towers, especially in residential areas.
- Encourage antenna colocation on existing structures.

Strategy 6.3

Transfer the costs associated with placing private utilities and communication infrastructure in the public rights-of-way away from the general taxpayer and onto the provider and user of the service.

- Charge appropriate fees to providers placing 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 plan construction to minimize obstruction of motorized and non-motorized travelways.

Strategy 6.4

Recognize federally imposed limits on the regulation of communications infrastructure while working to keep those limits fair and equitable.

- Lobby the FCC and Congress to retain local zoning control over communications infrastructure.

Strategy 6.5

Encourage new communications infrastructure to be placed underground when it is technically feasible.

Strategy 6.6

Increase broadband access for Bloomington residents.

- Support the entry of additional broadband providers into the Bloomington market.
- Stay abreast of models used by other cities to form public-private partnerships to increase wired or wireless broadband service.
- Encourage Qwest Communications to improve its infrastructure to support DSL access for all Bloomington households.