



UTILITIES



*“As much as possible, we need to **redirect development** to existing communities and infrastructure. Otherwise, we’re just eating up more land and natural resources.”*

– Kaid Benfield





VISION FOR SUCCESS

VISION OF SUCCESS

This plan envisions that the City and its partners provide readily available and well-maintained utilities throughout the city that ensure a high quality of life for residents and to support economic expansion within the region.

The vision of success for Utilities includes:

Coordinated Planning

Utility infrastructure and regional land use planning will be coordinated to accommodate changing economic development needs. The City will coordinate utility planning with its partners to best ensure longevity and efficiency of infrastructure. Infrastructure will not be extended to support or promote decentralized land use or sprawl.

Achievement of Standards

Utilities will meet or exceed government standards, such as stormwater and clean air requirements, while being proactive on non-mandated goals, such as reduction of fossil fuel consumption.

Sustainable Funding

Utilities will continue to pursue federal and state grants and loans to finance utility improvements consistent with appropriate replacement cycles.

OVERVIEW AND INTRODUCTION

Well managed and planned utilities are a foundation for economic development and essential for business retention and attraction. Utilities are typically core services provided by the City of Milwaukee in cooperation with its partners such as Milwaukee Metropolitan Sewerage District (MMSD), WeEnergies for electricity and gas, American Transmission Company (ATC), and telecommunications providers. All of these organizations must coordinate efforts to provide utilities that meet current and future needs, and adapt to projected development.

Utilities tend to reach beyond the municipal boundaries of Milwaukee. For example, Milwaukee's drinking water is sold to 15 nearby suburbs, the Milwaukee Metropolitan Sewerage District system spans 28 communities, and the City of Milwaukee owns, constructs and manages the water main network in the neighboring City of St. Francis. These partnerships require planning and coordination to support reliable, well-managed utilities across the greater Milwaukee area.

The City of Milwaukee encourages utilities to pursue more sustainable approaches to providing services. These approaches may include an increased reliance on renewable energy and biofuels; using more green infrastructure to supplement grey infrastructure; and reuse of waste as a resource, such as fly-ash used as backfill or storage of rainwater for irrigation. Sustainable techniques not only provide environmental gains, but offer long-term savings and often create additional job opportunities.

WATER SUPPLY

Milwaukee's drinking water quality meets or exceeds all state and federal standards. The Milwaukee Water Works (MWW) is owned by the City of Milwaukee and is a national leader in providing high quality drinking water and monitoring water quality. MWW practices environmental stewardship in conserving water and energy resources. Milwaukee Water Works serves over 865,000 people from Milwaukee and 15 other communities via both wholesale and retail services. Wholesale clients operate their own water utilities, billing customers and maintaining the distribution systems in their communities. Retail clients receive full water service from MWW, including customer billing and distribution system maintenance.



Water treatment occurs at two plants, passing the water through multiple treatment process barriers. Since 1998, MWW has invested over \$227 million in treatment and distribution systems to ensure high quality water and reliable supply. Water treatment involves multiple processes including ozone gas, which is a primary disinfectant to destroy microorganisms that cause disease. MWW services and maintains approximately 1,965 miles of water mains.

SANITARY SEWER

Milwaukee Metropolitan Sewage District (MMSD) is the regional government agency that provides water reclamation and flood management services covering 28 communities, including Milwaukee, 411 square miles, and six watersheds. The District was established by state law and is governed by eleven commissioners with taxing authority. MMSD also undertakes lake and river water quality research, household hazardous waste collection, pharmaceutical collection, industrial waste monitoring, and planning and engineering services. MMSD also produces and sells Milorganite, an organic fertilizer, and methane which is used as an alternative energy source.

MMSD owns and operates about 3,000 miles of wastewater sewers in the region. Each community owns and operates their own sewers. Of the 2,446 miles of sewers in service within the City of Milwaukee, approximately two-thirds of the city is served by separated sewers and the remaining third is served by combined sewers. Separated sewers have two pipes – one that transports household wastewater to the treatment plant and another pipe that transports stormwater from streets and roofs directly to the nearest river or lake. Combined sewers have one pipe to collect both household wastewater and stormwater runoff. Concerns with separated sewers arise from the introduction of non-point source pollution into rivers and lakes, while concerns with the combined sewer system arise from occasional system overflows during major storm events. MMSD and the City of Milwaukee are partnering to address these concerns.

STORMWATER

The City has a strong commitment to improving the quality and reducing the quantity of stormwater runoff as demonstrated by several recently completed projects and initiatives. Two major bio-retention facilities along Canal Street in the Menomonee Valley, which

also serve as park-like green space, remove contaminants from stormwater before the flows are discharged into the Menomonee River.

Installation of green roofs on several public buildings is another way the City reduces stormwater runoff. Public buildings with green roofs include the Milwaukee Public Library, the Department of City Development, and the Housing Authority of the City of Milwaukee (HACM) developments. The new Public Works facility near 35th Street and Capitol Drive manages its stormwater onsite in an attractive pond.

Additional projects to reduce the flow of stormwater into the sewer system include downspout disconnections in targeted neighborhoods, foundation drain disconnections in public housing, promoting rain barrels, adding inlet restrictors on selected streets, and installing more native plants in city boulevards and public green spaces

The City has also designed and installed bio-retention facilities into street right of ways to treat stormwater runoff on North 27th Street between Capitol and Roosevelt Drives. These facilities are the first of their kind in the City of



LOCAL ACHIEVEMENT

Milwaukee single family through four-family homes recycle over 50 million pounds of material a year. This benefits the environment by reducing the amount of waste in landfills, but it also saves the City of Milwaukee money. The City earns revenue from the sale of recyclables, with recent revenue at \$1.5 million per year which goes into the City's general fund to pay for city services benefitting Milwaukee residents and businesses. (Source: <http://www.milwaukeecycles.com/>) Recycling creates more jobs than simply putting waste in a landfill, so recycling also helps boost employment.

In just one month, the City recycled nearly 1.8 million pounds of aluminum cans, which is over 60 million cans. If these cans were lined up, they would reach over 2,380 miles or the equivalent of Milwaukee to Seattle. As a result of this effort, the City won an award for the US Conference of Mayors' Cans for Cash – City Recycling Challenge. (Source: DPW data) This is the sixth time Milwaukee has taken first place in this challenge.

The Milwaukee Water Works has been recognized by the US Environmental Protection Agency as having the highest quality drinking water in the US. Milwaukee Water Works has invested over \$227 million since 1998 in treatment and distribution systems, resulting in high quality and reliable drinking water.

Milwaukee was one of the first cities to test its water for emerging contaminants. None have been found in Milwaukee's treated drinking water. Milwaukee was the first U.S. city to post the results on the Internet, demonstrating a commitment to water quality.

In Milwaukee, Lake Michigan water is used and returned to the lake. As a steward of this resource, the Milwaukee Water Works uses sustainable practices such as water supply side conservation, prevention of water loss, and energy and resource conservation. The utility received two American Water Works Association awards for water efficiency in 2008.

WeEnergies recycles 98% of its coal combustion products reducing the overall amount of waste. Fly ash and bottom ash can be used in cement, as sand/gravel/crushed stone, for soil stabilization, and for the solidification of sewage sludge. http://www.powerthefuture.com/qa/genqa_environment.htm; http://www.we-energies.com/environmental/recycle_coalash.htm

Since Milwaukee inaugurated its first Office of Environmental Sustainability in 2006, green momentum in the city has picked up steam. Milwaukee has invested in New Urbanist redevelopment, consciously folding sustainability into its planning and design (one green public housing development nabbed a Sierra Club honor in 2005). It has also taken great care to manage stormwater and reduce runoff into the lake and area rivers. In 2006, 5% of its fleet vehicles ran on alternative energy and one year later it was more than 40%. A 2006 energy audit of the City Hall complex led to power-saving measures that reduced energy use there by 9%. The city also has public outreach campaigns for recycling, composting, and water conservation. The city's updated bike plan may help get the near-75% of car commuters heading out to work...riding their bikes instead!" (sustainlane.com August 2006)

Milwaukee to use bioretention, a best management practice using native plants and engineered soils to trap pollutants from stormwater runoff, which reduces pollutants in runoff which reaches streams, rivers and lakes. Private land owners are also beginning to incorporate bio-retention techniques within new developments.

SOLID WASTE DISPOSAL AND RECYCLING

The City of Milwaukee Department of Public Works – Sanitation Services manages the collection of household refuse and yard waste for the city. Sanitation Services is responsible for the collection and disposal for residential solid waste for approximately 190,000 single-family through four-family residential households in the city. Sanitation Services also collects solid waste from over half of the multi-family and commercial buildings in Milwaukee.

The City's curbside recycling program serves residents of single family through four-unit residential households. Larger multi-family buildings and commercial buildings contract with private collection firms for recycling. Solid waste is hauled to two transfer sites before it is sent to two privately-owned landfills.

The City also operates two self-help stations for residents to recycle or safely dispose of a wide variety of items. Both locations accept material for recycling, brush and yard debris for composting, as well as garbage for landfill. The City is currently exploring new fixed collection

dates for recycling. Yard waste is collected seasonally in the fall for leaf pick up and materials are composted. The City encourages residents to compost yard waste, and throughout the year residents may take yard waste to the self-help centers for composting.

COMMUNICATION FACILITIES

Telecommunication, cable, and wireless internet facilities are privately constructed and maintained throughout the city. As these private companies modify and expand networks, it is coordinated with the City of Milwaukee. Private landowners are required to coordinate the extension of service to new developments. Although privately controlled, the placement of these facilities is often within the public right-of-way which obligates companies to obtain permission to access communication facilities. Care should be taken with the design of these facilities, especially in highly visible locations.

The City of Milwaukee owns and operates its own fiber optic system to serve Milwaukee Fire and Police Departments. This independent system ensures safe and reliable communications to protect the city and its residents.

The City is also exploring the opportunity of implementing a citywide wireless internet system.

POWER PLANTS AND TRANSMISSION LINES

Power and transmission lines are privately constructed and maintained,

however the City of Milwaukee controls placement. WeEnergies provides electric and gas service to the City of Milwaukee and American Transmission Company manages the electrical transmission lines.

Electricity is generated by a regional coal-fired power plant located in Oak Creek and a coal-fired co-generation power plant located in the Menomonee Valley. The Valley Plant generates both electricity and steam which heats many buildings in the downtown area.

FUTURE UTILITY NEEDS

Milwaukee is a highly urbanized area with a fully developed utility infrastructure network. New development and redevelopment can be constructed within Milwaukee and be served by the existing network of streets, water and sewer lines, drainage facilities and electrical grid. However, when planning for new development or reconstructing existing streets, the comprehensive coordination of utilities with regional transportation, economic development, housing, and land use planning should be a priority to ensure that current and future needs are met efficiently. Regionally decentralized or sprawling patterns of development should not be readily supported by costly infrastructure development. Instead, compact and low impact development patterns should be emphasized in the region. In addition, as utilities are upgraded, planning should be mindful of the aesthetic appearance of the utilities and the benefits of an uncluttered streetscape. Some developments choose underground utilities for this reason.

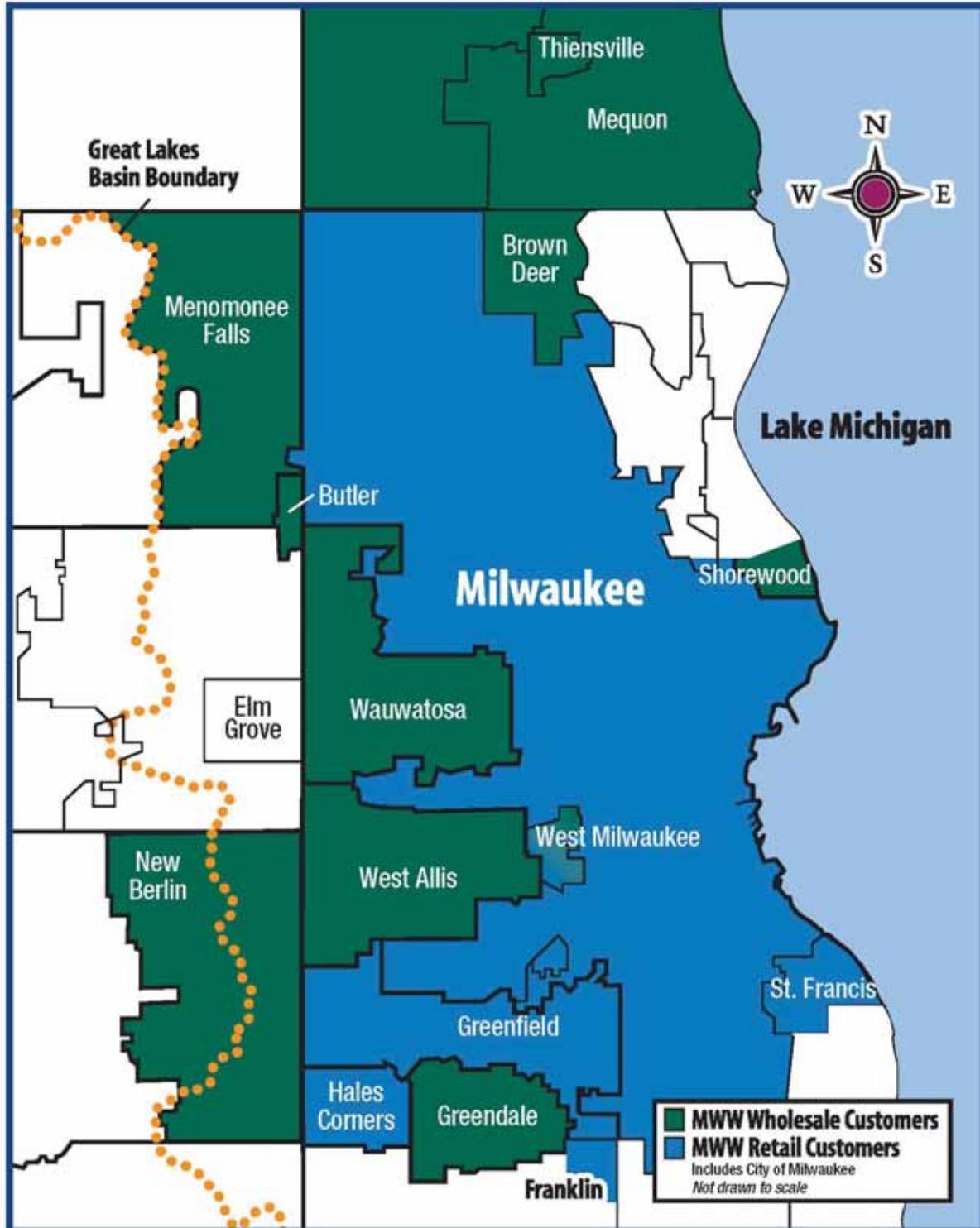




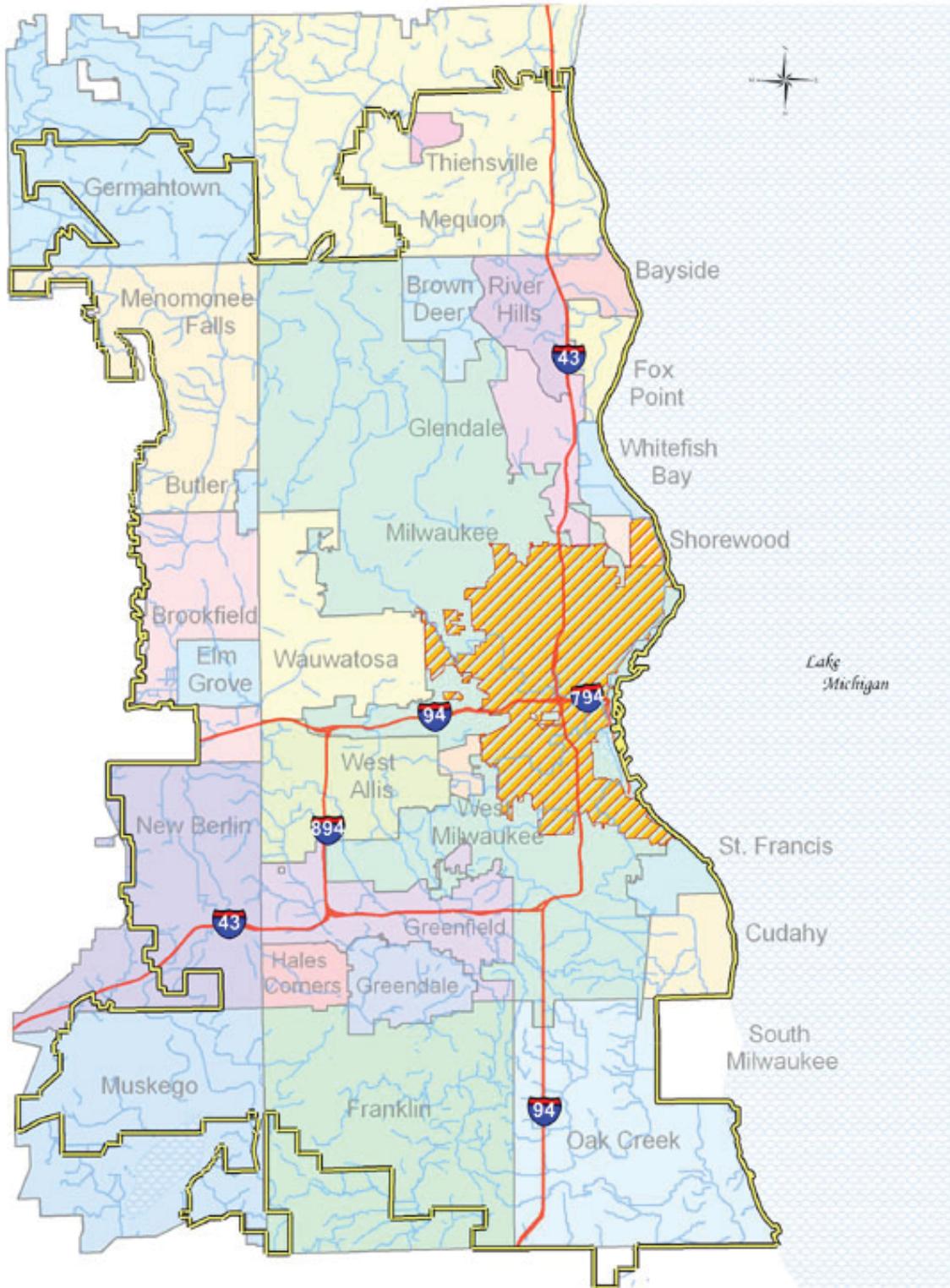
Milwaukee Water Works

Safe, Abundant Drinking Water.

Service Area



MMSD Service Area with Combined Sewer Zone

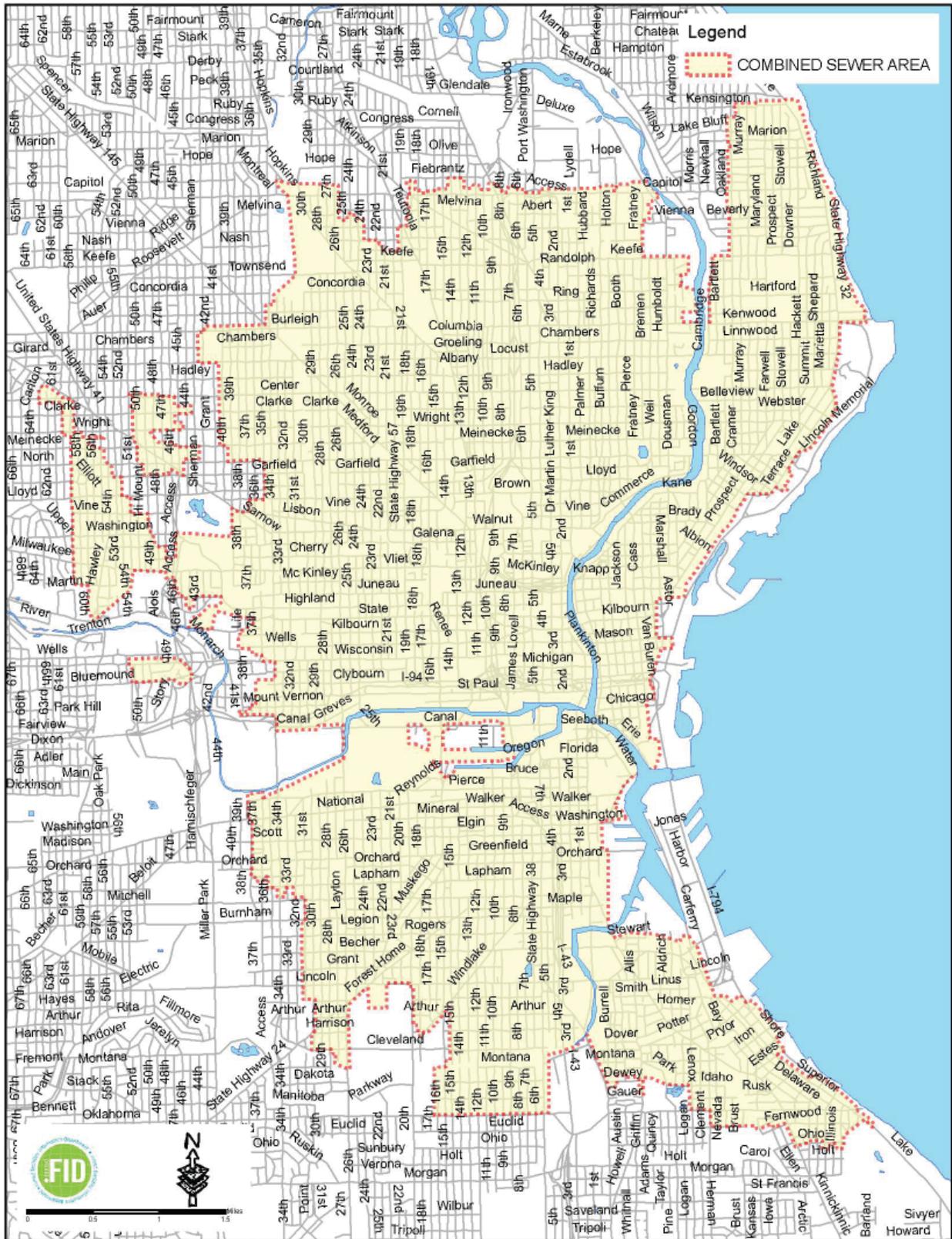


Legend

-  Current MMSD Service Area
-  Interstates
-  Combined Sewer Zone
-  Water

0 1 2 Miles





OPPORTUNITIES

1. **The City of Milwaukee utilizes the expertise and resources of private and public partnerships to increase the quality and efficiency of utility service.**

The City of Milwaukee collaborates with partners like WeEnergies, MMSD, and others to ensure the ability to meet current and future utility demands. For example, The City of Milwaukee has partnered with private sector companies to achieve energy and cost-savings. Milwaukee Water Works uses supply side conservation, which focuses on the utility itself saving water and energy used to treat and pump it. Using supply side conservation, the utility has saved over one billion gallons in the two-year period from 2006 to 2008. It could take decades of conservation by the utility's customers to equal this amount of water savings. Johnson Controls proposed the conversion of incandescent bulbs in traffic signals to Light Emitting Diodes (LED) technology which reduce maintenance costs and increase safety. Installing LEDs at all 730 intersections has the potential to reduce traffic signal energy consumption by 9%.

Private utilities that provide service to Milwaukee also strive to increase

quality and efficiency, resulting in a benefit to Milwaukee residents. For example, in 2000, WeEnergies announced Power the Future (PTF) plan, which includes investing in advanced power generation, adding renewable energy resources and improving existing power plants. Additionally, WeEnergies has a long standing commitment to environmental performance as evidenced by the reduction in sulfur dioxide, nitrogen oxide and particulates in power plant emissions.

2. **Milwaukee recycles over 50 million pounds annually from residential homes, (four family or less) significantly reducing solid waste and making recycling a critical industry.**

The City has established manageable goals and new strategies related to recycling, which increases opportunities for job creation in the recycling industry.

In 2008, the City of Milwaukee announced a new recycling public education and outreach campaign called "Recycle for Good." The goal is to increase the tonnage of recyclables collected in Milwaukee by 15%. The campaign aims to increase recycling efforts in neighborhoods where

recycling rates are low, as well as motivating current recyclers to do even more. Electronics recycling has proven to be very successful and associated costs are reducing.

The City of Milwaukee government promotes recycling in government operations. For instance as streets are reconstructed, concrete is recycled into new streets. Forestry trimmings can be used to generate energy. These efforts help the City to save money or comply with mandates.

Recycling will become even more valuable due to the 2009-2011 State of Wisconsin biennial budget which increased state taxes on garbage disposal by over 120%, raising the City of Milwaukee tipping rates over 35%. If the amount sent to the landfill remains the same as 2008, this would result in an additional \$2 million per year in taxes paid to the State of Wisconsin by the City of Milwaukee.

Other recycling initiatives include the nonprofit "Keep Greater Milwaukee Beautiful," a partner of the City of Milwaukee, which offers volunteer opportunities and internships related to recycling and environmental stewardship. The Be Smart statewide coalition, part of Associated Recyclers of WI, focuses on collaboration, knowledge, and education related to recycling.





3. Milwaukee has embraced new technological advancements to gain efficiencies in utility infrastructure.

Technological advances have been used to limit infiltration and inflow to the city's sewer system. In 2009, the city began to line lateral sewers, which are frequently a source of major infiltration and inflow. The lining technique has proven to be a very efficient and cost effective solution to lateral repairs resulting in a less intrusive repair process. In addition, the use of stormceptors slows stormwater flow into the sewer system during a major rain and also helps reduce the suspended solids that enter the system.

4. Milwaukee provides excess utility capacity for future demand.

When planning for utilities, the City routinely makes excess capacity available for the existing and future utilities. Providing for future utility needs minimizes the necessity of repeatedly disrupting streets to install additional utility capacity.

Milwaukee was among the first cities in the United States to provide wireless Internet access in public spaces. Pere Marquette Park and Cathedral Square Park have been freespots, or wireless access

points for public use since June 2003.

5. Milwaukee has an abundance of fresh water and the Milwaukee Water Works is known for exceptionally high quality drinking water.

Fresh and abundant water provides Milwaukee with economic development opportunities to attract and retain businesses, in addition to contributing to a high quality of life. MWW offers water-intensive industry and research an abundant and reliable source of high quality water at a low price. Water is Milwaukee's competitive advantage. Of the 50 largest cities in the US, Milwaukee ranks in the bottom third as having the least expensive water, according to a Badger Meter, Inc. survey in 2009.

6. The City of Milwaukee, together with its partners, continues to reduce reliance on fossil-fuel energy, while improving the environment through new and innovative measures.

Milwaukee has implemented many measures that directly or indirectly aid in the development of a greener city. The Milwaukee Office of Environmental Sustainability is working to position Milwaukee as a leader in environmental sustainability and energy performance in the 21st century. The office is charged with coordinating efforts to improve Milwaukee's lake and river water quality, reduce energy consumption, and stimulate economic development in the green technology sector. The Office of Environmental Sustainability emerged as a result of community input received from the Milwaukee Green Team, commissioned by Mayor Barrett in 2004.

Another outcome from the Green Team report has been an increase in more hybrid vehicles in the City fleet. The City has added 12 hybrid cars with a payback period of less than 10 years, 16 hybrid SUVs with a payback period of less than six years and two hybrid aerial lifts which are 14% more efficient than traditional diesel powered lifts. The City has even added bicycles to its fleet for use by employees for off-site meetings.

RE-USE OF GREYWATER

The capture and re-use of rainwater is already widely known and fairly popular, while the re-use of greywater may be less familiar. Greywater is washwater that has been used in the home; typically 50-80% of greywater comes from dish, shower, sink and laundry water. This can be reused for other purposes, especially landscape irrigation. Greywater excludes water from toilets and garbage disposals. Milwaukee's Urban Ecology Center is reusing greywater for toilet flushing. This was particularly challenging due to building codes. Greywater systems are gaining acceptance. The City of Tucson has a regulation that all new homes must include plumbing to enable greywater systems starting in 2010.

Sources: <http://www.oasisdesign.net/greywater/>
<http://www.governing.com/article/shades-greywater>



LET'S MAKE MILWAUKEE CLEAN & GREEN.

CHALLENGES

1. Funding for Milwaukee utility infrastructure maintenance is strained and limited.

Milwaukee's utility infrastructure systems are critical to the economic vitality of the area, and must be adequately or properly maintained. Even with state and federal financial assistance, continued funding for maintenance remains a challenge

Current replacement cycles for infrastructure systems, particularly streets and sidewalks, are not sufficient to maintain these systems at an adequate level. At the same time, the fiscal conditions facing the city make it difficult to

increase funding for infrastructure replacement. It is important to note that while 100% of properties in Milwaukee use or benefit from the City's infrastructure, as a result of property tax exemptions, far less actually provide the revenue stream of property taxes to pay for the City's infrastructure.

The current water main replacement cycle is well over 100 years. By 2015, approximately 70% of the mains will have reached their expected useful life. Similarly, the city's sewer system is currently on a replacement cycle of over 140 years, which exceeds the 90 year useful life of sewer mains.

2. Better coordination between City departments and with the City's partners is needed to minimize damage to newly installed utility and street infrastructure.

Lack of coordination can cause the disruption of recently completed work for new utility or street infrastructure projects. Each disruption in the flow of people, goods or services reduces economic productivity. For example, when streets are inaccessible in to businesses, customers often make other shopping choices, resulting in a significant challenge for local small businesses. Additionally, each time new pavement is disturbed to





accommodate underground utility needs, the patching that occurs compromises the integrity of the roadbed, and can lead to increased maintenance costs.

3. The rising cost of fossil fuels impacts Milwaukee's ability to provide core services in a cost effective manner, while addressing environmental concerns.

Even in the midst of budget challenges, the City must continue to prepare for sustainable growth and expansion, as well as new technologies. As the City anticipates continued economic growth,

it should continue to consider environmentally sustainable methods to provide essential city services in a cost effective manner. New technologies should be considered when efficiencies can be demonstrated. While initial start-up costs of new technologies tend to be high, they are not insurmountable and may demonstrate acceptable returns on investment.

4. Compliance with water management regulations is often costly.

Compliance with mandates from other levels of government, such as MMSD and DNR, often require Milwaukee

to make costly adaptations to its sewer system and stormwater runoff practices. For example, the State of Wisconsin Department of Natural Resources mandates a 40% reduction in total suspended solids that enter waterways by 2013. One challenge is to retrofit the established infrastructure to comply with the new standards. Although the City has embraced new technologies and methods for the efficient maintenance and repair of the sewer system, funding the retrofit of sewers is costly and funds are limited. In a dense, developed urban community, the physical space available for stormwater runoff facilities is an additional challenge.



POLICIES

I. THE CITY OF MILWAUKEE WILL MAINTAIN, IMPROVE AND EXPAND UTILITIES AND INFRASTRUCTURE, AS WELL AS PARTNER WITH OTHER UTILITIES, AGENCIES AND ADVOCACY GROUPS TO PROVIDE COST EFFECTIVE AND EFFICIENT SERVICES FOR ITS RESIDENTS AND BUSINESSES.

A. Support economic development in the greater Milwaukee region

1. Facilitate the movement of goods and services through well-designed, high quality public streets, sidewalks, internet, waterways and other networks
2. Continue to offer high quality fresh water while supporting the Milwaukee 7 Water Council marketing efforts to attract and retain fresh water business, industry, and research
3. Provide utilities and infrastructure to support business expansion and retention

B. Provide an enhanced quality of life for residents

1. Continue to provide reliable utility service and improvements with predictable and sustainable cost structures
2. Continue to promote recycling efforts
3. Continue to provide a clean and sanitary environment for the community
4. Continue efforts which improve water quality in Lake Michigan and the area's rivers

C. Continue capital improvements through a comprehensive and collaborative financial plan

1. Continue to work with partners to prioritize capital improvement plans that result in predictable rates and high-quality service for users
2. Work with partners to obtain additional city, state, and federal financial support, especially for infrastructure with regional impact
3. Continue the Capital Improvements Committee's work to prioritize and fund necessary capital improvements





II. MAINTAIN A HIGH QUALITY AND EFFICIENT UTILITY INFRASTRUCTURE THAT ALLOWS FOR GROWTH, WHILE RESPECTFUL OF THE ENVIRONMENT

A. Improve river and lake water quality

1. Continue education related to the safe disposal of waste, especially harmful pharmaceuticals, cleaning agents, and other hazardous products
2. Promote continued investments in stormwater and sewage treatment systems to ensure that the best possible quality effluent returns to Lake Michigan, the source of drinking water for people in the region
3. Continue and expand stormwater best management practices (BMPs)
4. Consider green infrastructure techniques to supplement grey infrastructure redevelopment or maintenance where appropriate
5. Update City codes, for example, parking lot landscape design to minimize stormwater run-off, add tree canopy, and increase the total permeable surface area

B. *Promote efficient water usage practices*

1. Continue to implement more sustainable boulevards to manage stormwater, and reduce irrigation water demand
2. Encourage the use of low flow water fixtures such as toilets, showers, faucets and advocate for identification and repair of water leaks
3. Identify more ways the City can harvest rainwater for landscape irrigation including rain barrels or cisterns on City housing developments and other municipal buildings where appropriate
4. Lead by example, encourage City employees and residents to find ways to efficiently use water at home and work
5. Maintain and promote Milwaukee's Water Works program which has shaped a demand-side conservation program to emphasize "Use Water Wisely – Control Water Costs" advocating efficient use of water, fixing leaks, helping consumers get the best value for their water usage, and reducing wasted water due to illegally opened hydrants

C. *Coordinate utility infrastructure and economic development planning*

1. Focus planning and coordination on major corridors where streets are critical to local economic development interests
2. Utilize the most efficient and durable materials for street resurfacing to increase durability and minimize maintenance
3. Coordinate sewer and other utility improvements with street resurfacing improvements to minimize the unnecessary deconstruction of recent street improvements





D. Explore and promote new utility infrastructure technologies and practices

1. Promote exploration and pilot demonstrations of new technologies with our partners
2. Consider allocating adequate funds to support exploration of new technologies
3. Continue to lead by example and seek efficiencies and sustainable practices in City fleet and buildings, such as green roofs and renewable energy sources
4. Promote urban design guidelines that maximize energy conservation
5. Promote greater awareness of rebate or incentive programs for energy efficient practices
6. Explore the development of green roof guidelines that encourage the use of green roofs for new development and redevelopment
7. Explore options for greater efficiencies in waste collection through increased separation, recycling and reuse of waste materials
8. Consider the use of wood biomass from tree trimmings or heat exchange energy from sewer pipes as alternative energy sources