

10 Utilities

Introduction

The City of Roseville provides a variety of public facilities and services. Utility services are essential to the health, safety, and welfare of its citizens. Sanitary sewer and water are absolutely necessary for the efficient functioning of the City. Since the physical infrastructure of Roseville is aging, the City recognizes the need to track and evaluate the condition of the City's infrastructure. The Capital Improvement Plan (CIP) is one tool that is used to plan for rehabilitation and/or replacement of facilities as appropriate.

The Utilities chapter of the Comprehensive Plan contains the following components:

- ◆ Goals and Policies
- ◆ Water Supply System
- ◆ Sanitary Sewer System
- ◆ Utilities Capital Improvement Plan (CIP)
- ◆ Other Utilities
- ◆ Implementation Strategies

Goals and Policies

The preservation and protection of the City's utilities is vital to the community's health and residents' quality of life. To accomplish this, the City of Roseville has identified the following goals and policies:

Goal 1: Provide efficient and high quality public facilities, services, and infrastructure.

Policy 1.1: Provide reliable and high-quality water and sanitary sewer facilities.

Policy 1.2: Work to provide efficient and cost-effective services through ongoing evaluation and intergovernmental coordination.

Policy 1.3: Maintain an up-to-date emergency preparedness plan.

Policy 1.4: Work to reduce inflow and infiltration into the City's sanitary sewer system.

Policy 1.5: Prepare long-term plans to identify, prioritize, and determine the costs to maintain and/or replace City water and sewer facilities.

Policy 1.6: Utilize the CIP and annual budgeting process for prioritizing major public expenditures.

Goal 2: Work with private utilities and other governmental entities to ensure that Roseville residents and businesses have high-quality and reliable electric, natural gas, telecommunications, and other services.

Policy 2.1: Encourage private utilities to replace outdated infrastructure and to provide new infrastructure that allows residents, businesses, and institutions to make effective use of current technologies.

Policy 2.2: Coordinate public improvement projects with private utilities to facilitate replacement or updating of existing utilities.

Policy 2.3: To improve aesthetics within the city, work with private utility providers to convert overhead utility lines to underground utility lines.

Policy 2.4: Communicate City land-use and development plans to private utilities to ensure that adequate services are available.

Policy 2.5: Monitor private utility maintenance and reliability statistics and consult with adjoining municipalities and other governmental entities regarding adequacy of services.

Goal 3: Coordinate the installation of communication technology infrastructure to be responsive to rapidly evolving systems.

Policy 3.1: Require installation of communication infrastructure in all development and redevelopment projects.

Policy 3.2: Require communication infrastructure installation on all street reconstruction projects.

Water Supply System

Roseville’s Water Supply Plan provides the City and its residents with assurance of adequate safe water to meet their needs and procedures for water system emergencies. It also discusses measures the City is implementing to conserve this precious resource.

The Water Supply Plan consists of four parts:

- ◆ Part I: Water supply system description and evaluation
- ◆ Part II: Emergency response procedures
- ◆ Part III: Water Conservation Plan
- ◆ Part IV: Metropolitan Land Planning Act Requirements

The City of Roseville purchases treated, potable water from Saint Paul Regional Water Services. The current wholesale water contract is for a 20-year period and is in place until 2025. Saint Paul Regional Water Services provides the required treatment processes before the water is introduced into the water distribution system in Roseville; no further treatment is required by the City. The City distributes the water to its retail customers. Roseville also provides wholesale water via its system to the City of Arden Hills. To accomplish this, there are three interconnection points with the City of Arden Hills:

City	Size	Location
Little Canada	8"	County Road C and Rice Street
Little Canada	12"	South of Woodlynn on Rice Street
Shoreview	8"	County Road D and Lexington
New Brighton	6"	Old Highway 8 and County Road D
St. Anthony	12"	West of Patton Road on County Road C
Lauderdale	6"	Roselawn and Lake Street
St. Paul	8"	Galtier Street and Larpenteur Avenue

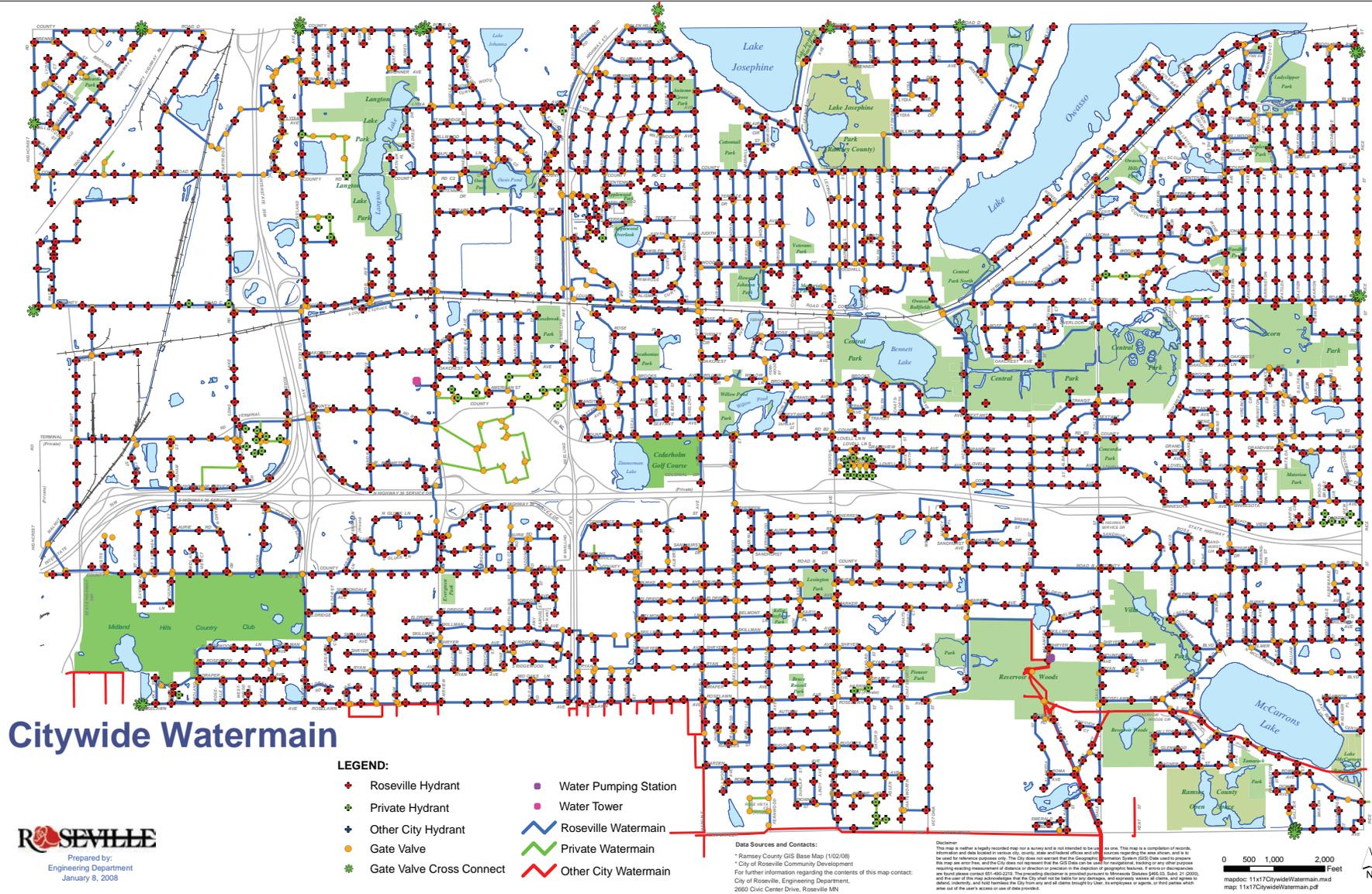
Community Cross Connections
Table 10.1

1. Cleveland Avenue and County Road D
2. Fairview Avenue and County Road D
3. Glenhill Road and Hamline Avenue

Historically, the water utility has been managed to be self-supporting, with future replacement needs financed from revenue generated from the fees paid by customers. The City periodically reviews the contract with Saint Paul Regional Water Services to ensure that the City is obtaining the most cost-effective services.

The water system consists of 160 miles of mainline, one water tower, and one booster station (water pumping facility) and has seven emergency connections with adjacent communities (see Figure 10.1).

These interconnections are normally closed but can be opened to meet Roseville’s emergency needs. Appropriate personnel are to be contacted before these



Citywide Watermain

ROSEVILLE
Prepared by:
Engineering Department
January 8, 2008

City Watermain
Figure 10.1

connections are opened so operational changes can be implemented in the source city, if necessary.

The interconnections with the cities of Little Canada, Lauderdale, and St. Paul are only of use in emergency situations related to the Roseville distribution system. The source water for these connections is from the City of St. Paul system and would be of little value during an emergency within the St. Paul Regional Water Services production and treatment systems.

The interconnections with Shoreview, St. Anthony, and New Brighton could be opened in a wider variety of emergencies as they produce their own water from wells within their system.

Sanitary Sewer System

The entire city of Roseville is within the Metropolitan Urban Service Area (MUSA). Therefore, sanitary sewer interceptor and treatment is provided to the City via the Metropolitan Council Environmental Services (MCES) system. Within the city, the system is under the jurisdiction of the City’s sanitary sewer utility. Historically, the sanitary sewer utility has been managed to be self-supporting, with future infrastructure replacement needs financed with revenues generated from the fees paid by users.

The Roseville sanitary sewer system consists of approximately 180 miles of sanitary sewer, 3,112 manholes, and 13 lift stations. The public sanitary sewer provides service to 17,258 households and businesses. The Citywide Sanitary Sewer map (Figure 10.2) shows the locations of these facilities and direction of flow.

Residential			Non-Residential		
	Number	Percent		Number	Percent
Single Family	9,114	55.7%	Commercial	484	31.4%
*Multi-Family	205	10.0%	Institutions	69	2.9%
<i>*includes one mobile home park</i>					

Sewage Connections

Table 10.2

City	Sewer flow TO Roseville	Sewer flow FROM Roseville	Drinking Water flow TO Roseville	Drinking Water flow FROM Roseville
Arden Hills	None	48 residences (County Road D)	107 residences (County Road D)	None
Falcon Heights	None	None	None	16 residences
Maplewood	None	None	6 units	Schroeder Milk- (Rice Street)
St. Anthony	2 residences	None	None	2 residences
St. Paul	9 residences 17 unit apt bldg	None	2 Shopping Ctrs, Taco Bell (Larpenteur Ave)	None
Shoreview	None	11 units (County Road D/ Lake Owasso)	None	None
Totals	28 units	59 units	113 units	18 units 1 commercial

Source: City of Roseville Research 6/2008

Intercommunity Utility Service Connections

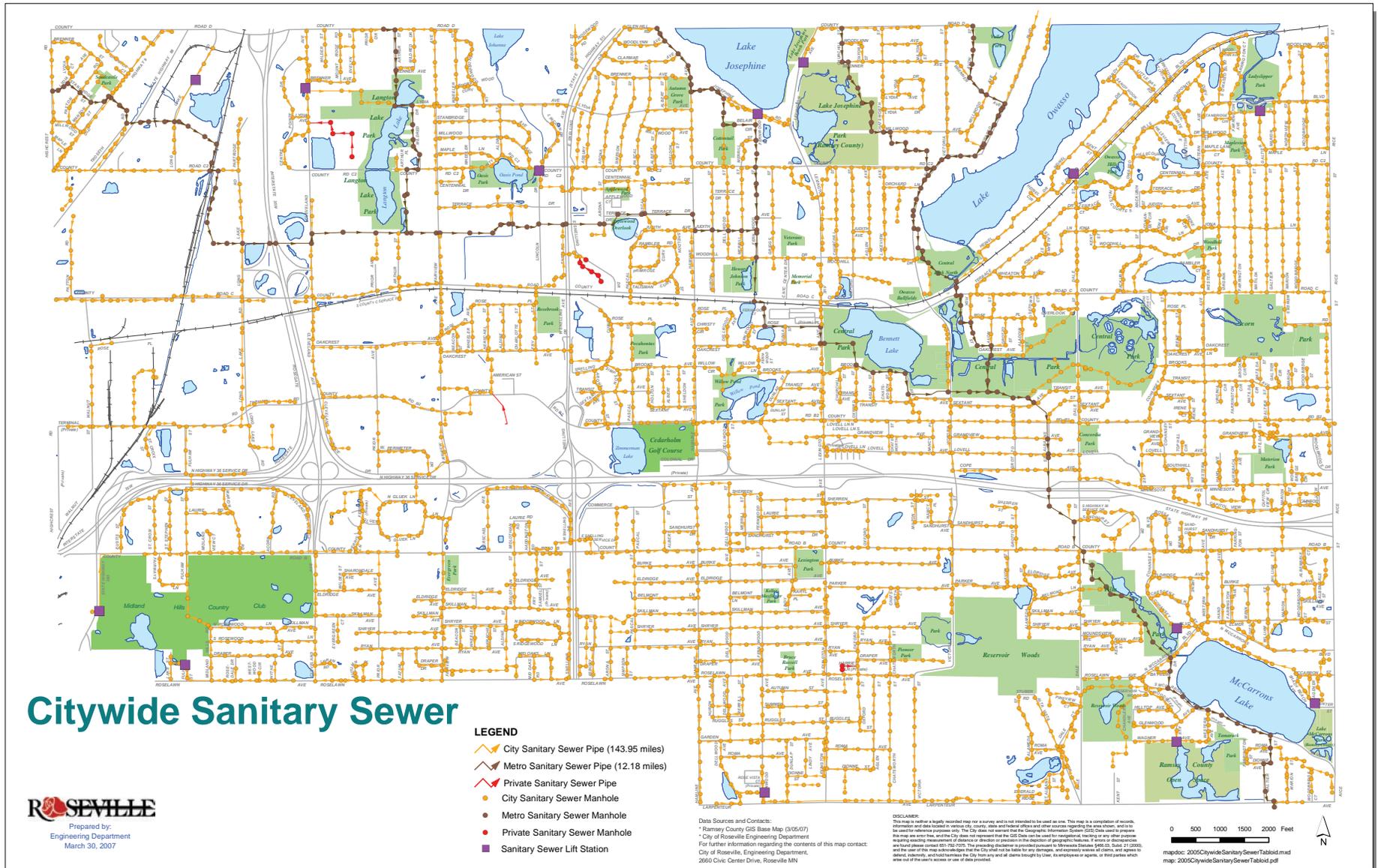
Table 10.3

Trunk sewers and the 13 lift stations collect wastewater and deliver it to the MCES interceptor sewers. The MCES interceptors serving the city of Roseville include RV-430, RV-431, RV-432, and RV-433. For interceptor locations and service areas see Figure 10.2 - Citywide Sanitary Sewer Map. All of the interceptors flow south and eastward where they connect to RV-430, which delivers the waste to the Pigs Eye Wastewater Treatment plant in St. Paul. Operated by the MCES,

this plant accepted an estimated 1.95 billion gallons of wastewater from Roseville in 2007. See Figure 10.3 for the Sanitary Sewer Service Areas map.

MCES owns and maintains the interceptor sewers. Public sanitary sewer trunk lines are in place and serve all 10,674 parcels in Roseville.

The City’s sanitary sewer lines and lift stations collect sewage from individual parcels or properties and route



Citywide Sanitary Sewer
Figure 10.2

the sewage to the MCES sewer interceptors. The City's system design and condition is reviewed and updated continuously to ensure adequacy. The 13 sanitary sewer lift stations are electronically monitored 24 hours a day.

On-Site Sewage Treatment

On-site septic systems are regulated by City code. The code requires that existing structures with on-site septic systems shall connect to the municipal sanitary sewer system within one year of sewer service being made available. Current records indicate all existing structures in the city of Roseville are connected to the sanitary sewer system.

Intercommunity Services

The City of Roseville provides utility service to properties in adjacent communities. In summary, sewage from 59 dwelling units flows from Roseville to an adjoining community, and 26 units send sewage into the Roseville system. Neighboring communities have not requested additional sanitary sewer extensions, and the City is not aware of any potential new requests.

Future Demand Forecast

Municipal sewer service is available to all properties within the City. Redevelopment and/or reuse of existing sites is the largest challenge for the City in the future. Developers are responsible for extending trunk or lateral mains to provide for sewer connections in development or redevelopment projects.

Presently over 98% of the property within the city has been developed. The City of Roseville's 2030 household and employment forecasts are shown in Table 10.4 and Table 10.5 projects annual sewer flow and hourly demand in 2010, 2020, and 2030. Table 10.6 projects annual sewer flow by land use by year in five-year increments until 2030.

Year	2010	2020	2030
Sewered Population	36,000	37,000	38,300
Sewered Households	15,500	16,000	16,500
Sewered Employment	42,450	44,700	46,100
Average Annual Wastewater Flow (MGD)	4.47	4.5	4.54
Allowable Peak Hourly Flow (MGD)	10.73	10.8	10.9

Projected Sewer Flow

Table 10.4

Interceptor	2010		2020		2030	
	Ave. Annual Wastewater Flow (MGD)	Peak Hourly Flow (MGD) (1)	Ave. Annual Wastewater Flow (MGD)	Peak Hourly Flow (MGD) (1)	Ave. Annual Wastewater Flow (MGD)	Peak Hourly Flow (MGD) (1)
1-RV-430 (2)	5.02	12.04	5.61	12.9	6.15	14.15
1-RV-431	0.20	0.77	0.33	1.17	0.33	1.20
1-RV-432	0.22	0.83	0.22	0.84	0.22	0.84
1-RV-433A	0.10	0.41	0.10	0.41	0.10	0.41
1-RV-433	0.19	0.72	0.19	0.72	0.19	0.72

Notes:

(1) Calculated using MCES peak flow factors

(2) Projections for 1-RV-430 include flows from 1-RV-431, 432, 433A, and 433.

Projected Sewer Flow by Interceptor by Year

Table 10.5

Land Use and Sewer Flow Analysis

Sewer Flow Analysis

Within Urban Service Area	Allowed Density Range Housing Units/Acre		Existing (2000)	2010	2015	2020	2025	2030	Change 2000-2030	Sewer Flow Assumptions (gallons/acre)	Existing (2000)	2010	2015	2020	2025	2030	Flow increase 2000-2030
	Minimum	Maximum	acres	acres	acres	acres	acres	acres	acres		mgd	mgd	mgd	mgd	mgd	mgd	mgd
Residential Land Uses			3403	3403	3465	3487	3547	3619	216								
Low Density Residential	1.5	4	2973	2965	2987	2978	3002	3037	64	550	1.635	1.631	1.643	1.638	1.651	1.670	0.035
Medium Density Residential	4	12	146	146	156	157	169	160	14	800	0.117	0.117	0.125	0.126	0.135	0.128	0.008
High Density Residential	12	30	284	292	322	352	376	422	138	6000	1.704	1.752	1.932	2.112	2.256	2.532	0.076
									0								
C/I Land Uses	Est. Employees/Acre		1539	1540	1552	1534	1524	1566	27								
Neighborhood Business	32		40	40	37	42	35	45	5	800	0.032	0.032	0.030	0.034	0.028	0.036	0.004
Community Business	32		216	217	214	220	230	206	-10	800	0.173	0.174	0.171	0.176	0.184	0.165	-0.008
Regional Business	32		220	220	254	254	279	259	59	800	0.176	0.176	0.203	0.203	0.203	0.223	0.047
Business Park	32		43	43	43	43	110	282	239	800	0.034	0.034	0.034	0.034	0.088	0.226	0.191
Office	32		163	163	150	140	125	79	-84	800	0.130	0.130	0.120	0.112	0.100	0.063	-0.067
Industrial	8.5		857	857	754	682	617	496	-361	500	0.429	0.429	0.377	0.341	0.309	0.248	-0.181
Community Mixed Use	Residential is 25 - 50% of total mix; 4.00 dwelling units - no max density		0	0	100	153	153	179	179	1900	0.000	0.000	0.190	0.291	0.291	0.340	0.340
Public/Semi Public Land Uses			3420	3420	3420	3417	3413	3334	-86								
Institutional			513	513	513	513	510	476	-37	600	0.308	0.308	0.308	0.308	0.306	0.286	-0.022
Parks and Recreation			834	834	834	831	830	845	11	250	0.209	0.209	0.209	0.208	0.208	0.211	0.003
Golf Course			181	181	181	181	181	157	-24	150	0.027	0.027	0.027	0.027	0.027	0.024	-0.004
Roadway Rights of Way			1796	1796	1796	1796	1796	1770	-26	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Railroad			96	96	96	96	96	86	-10	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Subtotal Sewered			8362	8363	8437	8438	8484	8519	157	Total	4.974	5.018	5.369	5.609	5.785	6.152	
Undeveloped																	
Vacant			171	170	95	95	48	48	-123								
Wetlands	--	--	271	271	271	271	271	271	0								
Open Water, Rivers and Streams	--	--	57	57	57	57	57	71	14								
Total			8690	8691	8765	8766	8812	8861	171								

* For Mixed Use categories include information regarding the estimated minimum and maximum housing density ranges and acres/percentage of residential use.

mgd=million gallons per day

Projected Sewer Flow by Land Use by Year
Table 10.6

Infiltration and Inflow (I/I)

The MCES Water Resources Management Plan includes policies for reducing inflow and infiltration (I/I). The MCES has projected significant growth in the metropolitan area by 2030. This increase, along with current levels of I/I in the system, would require significant, costly increases to expand the existing MCES treatment facilities to meet the future wastewater flows. As a result, the MCES has implemented an I/I surcharge program. Communities with excessive I/I will need to develop plans to reduce I/I. The City of Roseville has been identified as a community with I/I challenges. The MCES has imposed a surcharge on the City as a part of its I/I reduction program. Based on current readings that the MCES has taken from several monitoring points, Roseville's surcharge is estimated at \$82,538 a year for five years, beginning in 2007. The City is working to identify areas of the sanitary sewer system that are contributing to the City's I/I problem and to take the necessary measures to reduce and/or eliminate the surcharge. The following outlines the City's objectives, policies, strategies, and implementation plan to achieve reduction in I/I.

Problem: The City of Roseville is faced with an annual surcharge from the MCES due to I/I levels that exceed the MCES allowable peak flow rate for the community

Objective: The objective of the program is to identify and remove sufficient I/I to eliminate the current I/I surcharge and reduce the annual treatment cost paid to the MCES.

Approach: The approach will include an initial "big picture" review of the current situation, followed by more detailed investigations, data evaluation, rehabilitation

and then long-term follow-up. The Implementation Plan provides a basic guideline for I/I reduction efforts. It must be flexible to allow for a change in direction in response to the actual situations or defects that are identified during the course of the work. Rehabilitation is the step that actually removes sources of I/I and is considered an ongoing task.

Existing I/I Problems

In 2007, the City began to study its I/I problem in response to the MCES imposed surcharge. In 2008, the City will complete the initial study and develop and implement an I/I reduction plan, along with an analysis of costs for remediation. The following steps explain how the City identified the extent, source, and significance of I/I throughout the City's sanitary sewer system.

1. **Initial review:** This was completed through the compilation of MCES flow data, city maps, city investigation records, lift station data, connection data, and building type information.
2. **Analysis:** The data was reviewed with respect to other system information to develop a plan for additional investigation efforts. The data allowed staff to eliminate areas where monitoring demonstrated there was not an I/I issue, and focus efforts on areas with I/I peaks.
3. **Collection of additional flow data:** The areas with I/I peaks were outfitted with temporary flow meters to allow us to review "flow response" and the correlation to rainfall events. Lift station pumping records analysis.
4. **Identification of potential source(s):** Once the analysis was complete, various types of I/I within the system could be identified. The source of I/I

affects which actions the City will implement to reduce the excessive I/I.

I/I Implementation Plan

Once the potential sources of I/I are identified, the City will take the following actions to eliminate and prevent excessive I/I.

1. **Additional investigation:** Conduct additional investigation to pinpoint I/I sources. Methods used:
 - a. Smoke testing to reveal direct inflow sources such as low-lying manhole covers, roof drains, catch basins, and area drains
 - b. Physical survey of manholes to identify deficient adjusting rings, manhole barrel joints, or wall leakage, and pipe penetration joint leakage
 - c. Internal televising of sewer mains to view and videotape the condition of the existing underground pipe; this will identify structural pipe problems including open and leaking joints, collapsed pipes, poor-quality service connections, and broken pipes, in addition to I/I defects such as leaking joints and leaking or running service connections
 - d. Sump pump inspections to inspect individual properties for sump pumps that may be connected to the sanitary sewer; if the pump is illegally connected, the property owner must correct the situation and have the property re-inspected periodically to ensure that it remains disconnected
 - e. Foundation drain (or leaking service line) inspection of individual properties to identify directly connected foundation drains and

leaking service lines. Since this method is on private property and connections are typically underground, it is a difficult and potentially expensive task that is left as last choice in the investigation list

2. Rehabilitation of defects: Serious defects that are identified during the course of the investigation will be rehabilitated to eliminate I/I sources. Since the majority of the defects that are identified will be smaller, they will be compiled and evaluated before developing a rehabilitation project. This list of defects will be regularly reviewed and prioritized to provide the most benefit. A database of defects and projected rehabilitation methods will be maintained to prepare a priority listing of rehabilitation required to correct the problems.

Rehabilitation methods include:

- a. Catch basin disconnection: Disconnect catch basin leads from sanitary sewer and extend connection to storm sewers for clean water flows.
- b. Roof drain disconnection: Disconnect/reroute roof drains to ground, street surface, or storm sewer.
- c. Seal manholes: Raise cover to grade and seal cover or replace with non-vented cover, grout manhole barrel joints, install cast-in-place manhole liner, or replace deteriorated manhole as needed.
- d. Fix pipe defects: Test and seal joints, install cured-in-place pipe liner (CIPP), slip lining with new carrier pipe, or perform pipe bursting to replace pipe “in place.”

- e. Eliminate private property sources: Re-route sump pumps to discharge onto ground or street surfaces, provide alternative outlets for sump pump discharge water.
 - f. Follow-up inspections: Conduct regular, every two to three years, random re-inspections to assure that the outside surface discharge remains intact.
 - g. Foundation drain disconnection: Disconnect direct connections to the sanitary sewer and reroute the flow from the drain tile to a new sump pump installed to lift water from the foundation level and discharge it onto the ground surface away from the foundation.
 - h. Repair of leaking service lines: Either replace or install slip lining to correct the leakage.
3. Annual Report: An annual report will be prepared to summarize efforts and costs during the course of the preceding year. It will include a review of flow data, comparison of changes from previous years, and MCES allowable flow rates, and recommend work for the following year.

Utility Capital Improvement Plan

The Capital Improvement Plan (CIP) has been developed to identify needs to ensure proper, continuous operation of the water and sanitary sewer utilities. The CIP was developed to support the intent of the Imagine Roseville 2025 goals to replace infrastructure when appropriate to minimize potential for failure of these systems.

Water Utility

The City’s Water Utility provides for the operation, maintenance, and replacement of water utility infrastructure. The division also ensures compliance with a host of regulatory requirements in the operation and maintenance of this system.

The Water Utility’s long-range goals include:

- ♦ Provide for uninterrupted operation of the water system to ensure the health and welfare of Roseville residents and businesses.
- ♦ Meet the regulatory goals of Minnesota Department of Health and other regulatory agencies related to the provision of safe drinking water.
- ♦ Provide excellent customer service in the utility area.
- ♦ Plan and implement a long-term infrastructure replacement plan.

To support these goals, the existing complement of vehicles and equipment will need to be replaced when they reach the end of their useful life. Infrastructure will be evaluated for appropriate rehabilitation or replacement schedules.

The city has over 100 miles of cast iron water mains that were installed in the 1960s and early ‘70s. Cast iron is prone to breakage due to minor shifts in the ground. It is recommended the City plan for the replacement or rehabilitation of all cast iron main over the next 20 to 30 years. Total cost in today’s dollars could exceed \$30 million for these mains to be replaced or lined. Technological improvements in pipe lining will help to minimize disruption to street infrastructure and keep restoration costs reasonable on these projects.

Other regulatory agencies have an impact on operational needs due to required compliance at the local level. A long-term funding plan is necessary to meet infrastructure replacement needs. The city will see minimal growth that would affect this system. Capital needs are to support replacement of existing infrastructure and support existing operational equipment.

Sanitary Sewer

The City's Sanitary Sewer Utility provides for the operation, maintenance, and replacement of sanitary sewer infrastructure. The division also ensures compliance with many regulatory requirements in the operation and maintenance of this system.

The Sanitary Sewer Utility's long-range goals include:

- ◆ Provide for uninterrupted operation of the sanitary sewer system to ensure the health and welfare of Roseville residents and businesses.
- ◆ Meet the regulatory goals of MCES and other regulatory agencies related to I/I reduction and other regulation.
- ◆ Provide excellent customer service in the utility area.
- ◆ Plan and implement a long-term infrastructure replacement plan.

To support these goals, the existing complement of vehicles and equipment must be replaced when they reach the end of their useful life. Infrastructure will be evaluated for appropriate rehabilitation or replacement schedules.

Other regulatory agencies have an impact on operational needs due to required compliance at the local level.

A long-term funding plan is necessary to meet the infrastructure replacement needs. The city will see minimal growth that would affect this system. Capital needs are to support replacement of existing infrastructure and support existing operational equipment.

Other Utilities

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 continue to facilitate development of these private utilities, while minimizing associated adverse impacts.

In Roseville, electricity and natural gas are provided by Xcel Energy. Comcast provides a variety of services including cable television, telecommunication, and data services. Other companies provide communication services as well.

These private utilities use the public right-of-way for distribution of their services. The City has a right-of-way ordinance that requires any private company to get a permit for work within the public right-of-way. This ensures that the City is aware of work that may inconvenience the public and that these private utilities restore the public infrastructure, minimizing the long-term costs to the City.

Although water supply and sanitary sewer are the primary focus of this chapter, private utilities (electric, natural gas and telecommunications) are essential elements of Roseville's well-being and future vitality.

Reliable and high-quality service is required to attract and keep people and businesses in Roseville. As with municipal utilities, the ongoing replacement and upgrading of aging infrastructure is essential. In the coming years, technology infrastructure will be increasingly important. This technology connects Roseville to the global economy.

Implementation Strategies

In order to achieve the goals and policies discussed in this section, the City of Roseville should use the following strategies:

Ordinances

As a regulatory tool, ordinances can provide standards that define areas or features that need protection or preservation. They can also introduce regulations to assist in achieving a desired end.

Conservation and Education

One of the most cost-effective and efficient ways to promote water and energy conservation is through education. The City sponsors many programs and events on a local and regional level that focus on preserving and enhancing the environment. The City should focus on working with residents, businesses, and schools to identify ways that environmental awareness can promote conservation.

Power Outages

Document power outages and work with other governmental bodies and surrounding municipalities in developing appropriate responses.