Regional System Capacity Planning

Environment Committee: October 14, 2025

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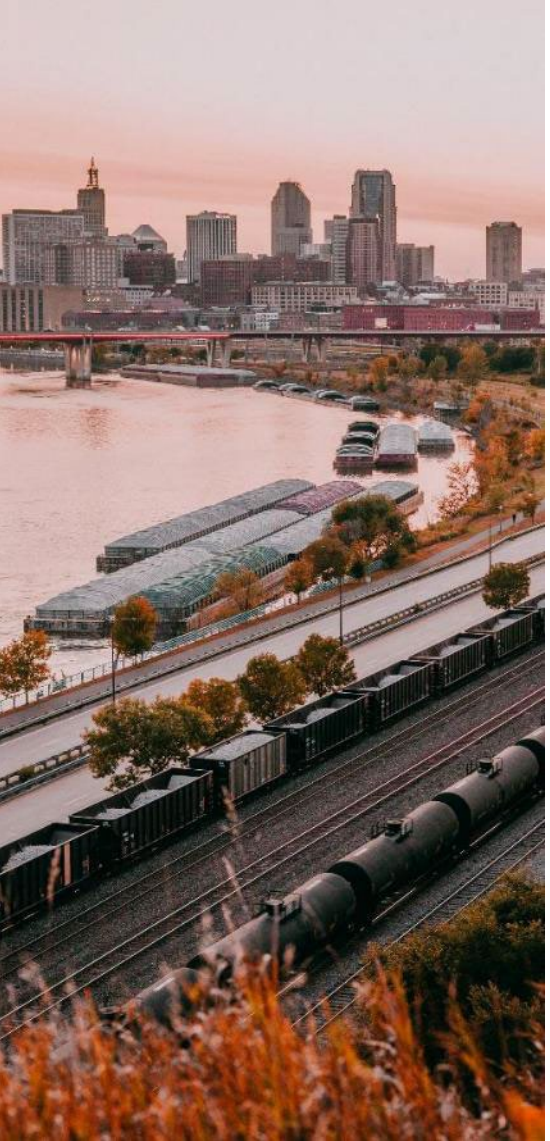
METROPOLITAN COUNCIL

MN Statutes – Obligation to Provide Regional Wastewater System Capacity



473.511, Subd. 1.

Sewer Service Function

a) Obligates the Council to implement its "Comprehensive Plan" (i.e., Wastewater System Plan) for the collection, treatment and disposal of sewage in the Metropolitan area, and shall construct, equip, operate and maintain all additional interceptors and treatment works needed to implement said Plan.

473.513

Municipal Plans and Programs

a) Requires each local government unit shall adopt a similar policy plan for the collection, treatment and disposal of sewage for which the local government unit is responsible, coordinated with the Council's Plan. Each such plan shall be submitted forthwith to the Council for review and shall be subject to the approval of the Council as to those features affecting the Council's responsibilities as determined by the Council.

2050 Water Policy Plan Service Capacity Provisions

Policy 9: Regional Wastewater Service Area Policy

Wastewater service will be extended as necessary to facilitate development in communities if the community's request for regional service is aligned with the regional Wastewater System Plan, the community's comprehensive plan, and comprehensive sewer plan, and adheres to other Met Council policies.

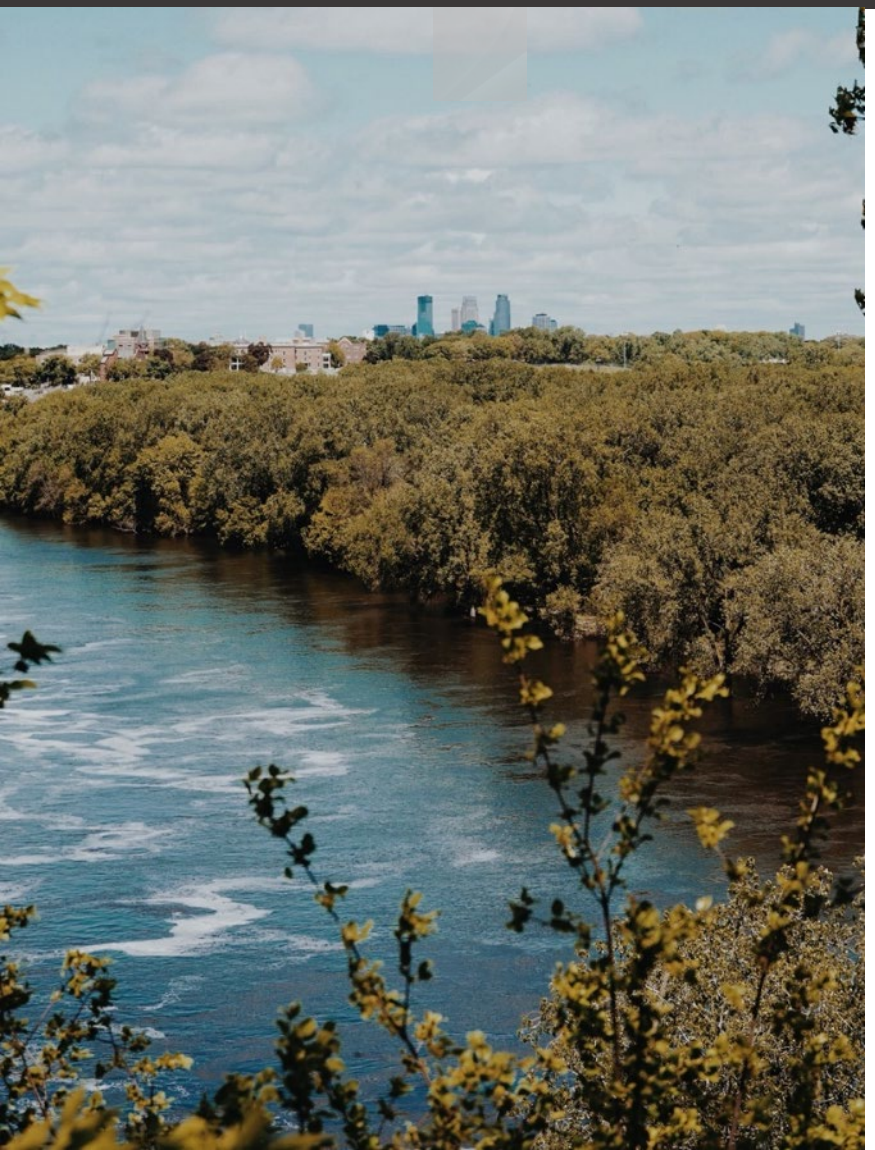
Plan:

- Requests for additional wastewater service must be submitted to the Met Council through the comprehensive plan and comprehensive sewer plan process.
- Regional wastewater system improvements will be staged, when feasible, to reduce the financial risks associated with inherent uncertainty in growth forecasts.

Provide:

- Provide wastewater service commensurate with the needs of the growing metro region in a sustainable manner.
- Provide sufficient capacity in the wastewater system to meet the growth projections and long-term service area needs identified in approved local comprehensive sewer plans.
- Extend wastewater service to suburban communities if the service area contains at least 1,000 developable acres and guides residential land use densities consistent with Met Council policy.

Terms and Definitions



Hydraulic Capacity

- Gravity Pipes: non-surcharge (pressurized flow) conditions. Generally considered full capacity at 80% depth of pipe diameter.
- Forcemains: pressurized flow where velocity of flow is between 7 and 8 feet per second.

Reserve Capacity

- Remaining capacity within pipe that isn't currently being utilized to provide service. Reserved for future growth.

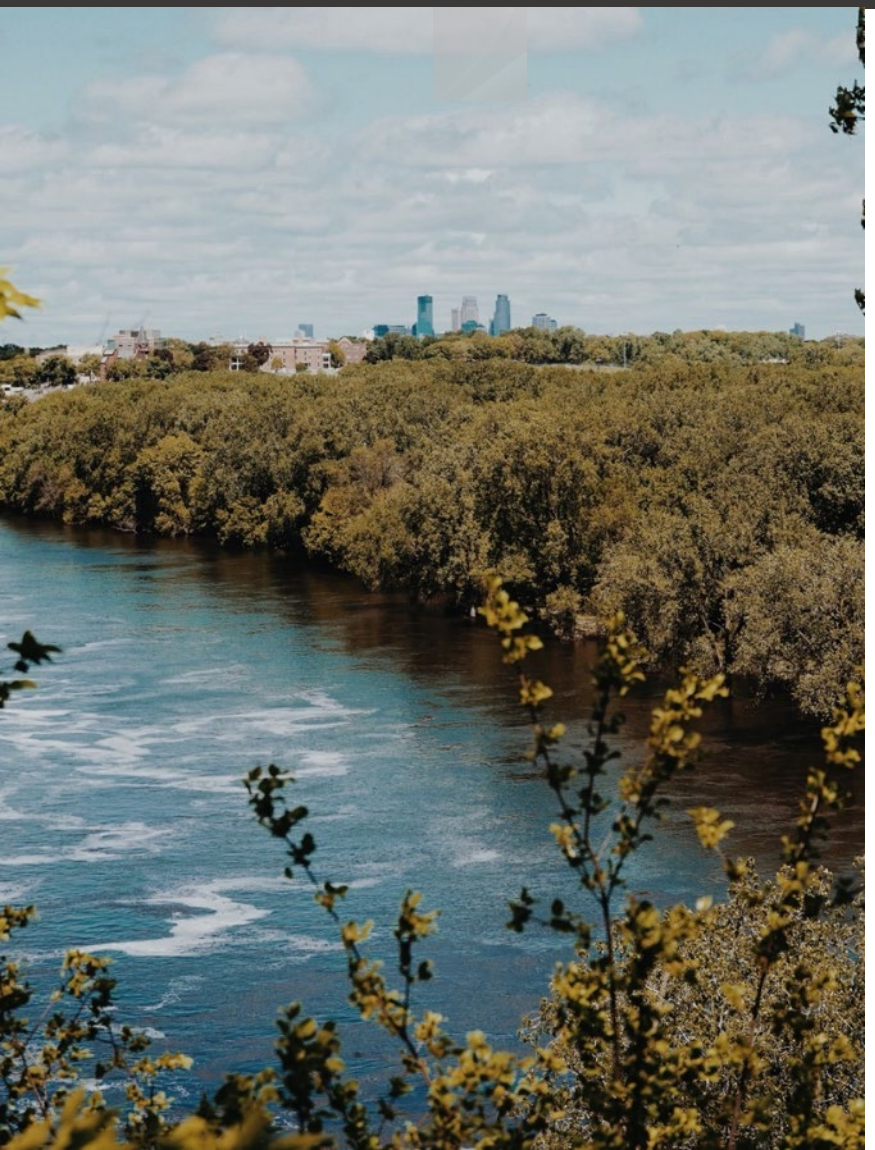
Inflow and Infiltration (I/I)

- Storm or ground water that enters the collection system and needs to be treated at a Water Resource Recovery Facility (WRRF).

Excessive I/I

- Peak hourly flow in response to wet weather occurrences that exceeds basis of the original maximum design capacity consideration for wastewater conveyance systems.

Terms and Definitions



Surcharged Flow Conditions

- Conditions when a gravity pipe is flowing full under pressure, with the water level at or above the crown of the pipe. Not desirable unless pipe is specifically designed to operate under pressure. Also depending on elevation of hydraulic grade line and surface elevation, enhanced risk of overflow or basement backups.

Source: MetroConnects, website, August 2025

Source: ServiceMaster Restore, website, August 2025

2050 Water Policy Plan Service Capacity Provisions

Policy 11: Inflow and Infiltration Policy

Inflow and infiltration is systematically addressed in the regional wastewater conveyance system to reclaim and ensure capacity, improve efficiency, and better utilize capital funds. Capacity enhancements are not made to accommodate excess inflow and infiltration.

Plan:

- Limit expansion of wastewater service within communities where excessive inflow and infiltration jeopardizes the Met Council's ability to convey wastewater without an overflow or backup occurring or limits the capacity in the system to the point where the Met Council can't provide additional wastewater services. The Met Council will work with those communities on a case-by-case basis, based on the applicable regulatory requirements.

Provide:

- Institute a demand charge for those communities that have not met their inflow and infiltration goal(s), if the community has not been implementing an effective inflow and infiltration reduction program as determined by the Met Council, or if regulations and/or regulatory permits require Met Council action to ensure regulatory compliance.
- Use the demand charge to cover the cost of wastewater storage facilities and/or other improvements necessary to avoid overloading Met Council conveyance and treatment facilities and for use of capacity beyond the allowable amount of inflow and infiltration.

2050 Wastewater System Plan – I/I Design Standard

Appendix F Wastewater Flow Variation Factors

Variation factors for Design

Average Flow (MGD)	Peak Hourly Flow Factor
0.00 – 0.11	4.0
0.12 – 0.18	3.9
0.19 – 0.23	3.8
0.24 – 0.29	3.7
0.30 – 0.39	3.6
0.40 – 0.49	3.5
0.50 – 0.64	3.4
0.65 – 0.79	3.3
0.80 – 0.99	3.2
1.00 – 1.19	3.1
1.20 – 1.49	3.0
1.50 – 1.89	2.9
1.90 – 2.29	2.8
2.30 – 2.89	2.7
2.90 – 3.49	2.6
3.50 – 4.19	2.5
4.20 – 5.09	2.4
5.10 – 6.39	2.3
6.40 – 7.99	2.2
8.00 – 10.39	2.1
10.40 – 13.49	2.0
13.50 – 17.99	1.9
18.00 – 29.99	1.8
over 30.00	1.7

Variation factors for I/I Program “goals”

Average Flow (MGD)	Peak Hourly Flow Factor
< 0.10	4.5
0.11 - 0.20	4.4
0.21 - 0.30	4.3
0.31 - 0.40	4.2
0.41 - 0.50	4.1
0.51 - 0.60	4.0
0.61 - 0.70	3.9
0.71 - 0.80	3.8
0.81 - 1.00	3.7
1.01 - 1.20	3.6
1.21 - 1.50	3.5
1.51 - 2.00	3.4
2.01 - 2.50	3.3
2.51 - 3.00	3.2
3.01 - 3.50	3.1
3.51 - 4.00	3.0
4.01 - 4.50	2.9
4.51 - 5.00	2.8
5.01 - 6.00	2.7
6.01 - 8.00	2.6
8.01 - 10.00	2.5
10.01 - 12.00	2.4
12.01 - 16.00	2.3
16.01 - 20.00	2.2
20.01 - 30.00	2.1
> 30.00	2.0

Key Wastewater Concepts

Regional Service Area (RSA)

Growth within the RSA is planned to be served by the regional wastewater system.

Growth outside the RSA is assumed to be served by ISTSs and local, rural WWTPs.

The amount of growth served in the RSA is assigned by the Council and confirmed by local comprehensive sewer plans.

Regional System Capacity

Capacity utilized is impacted by the amount of growth as well as where that growth is occurring.

Capital investments are tailored to regional system capacity needs.

Other Facilities

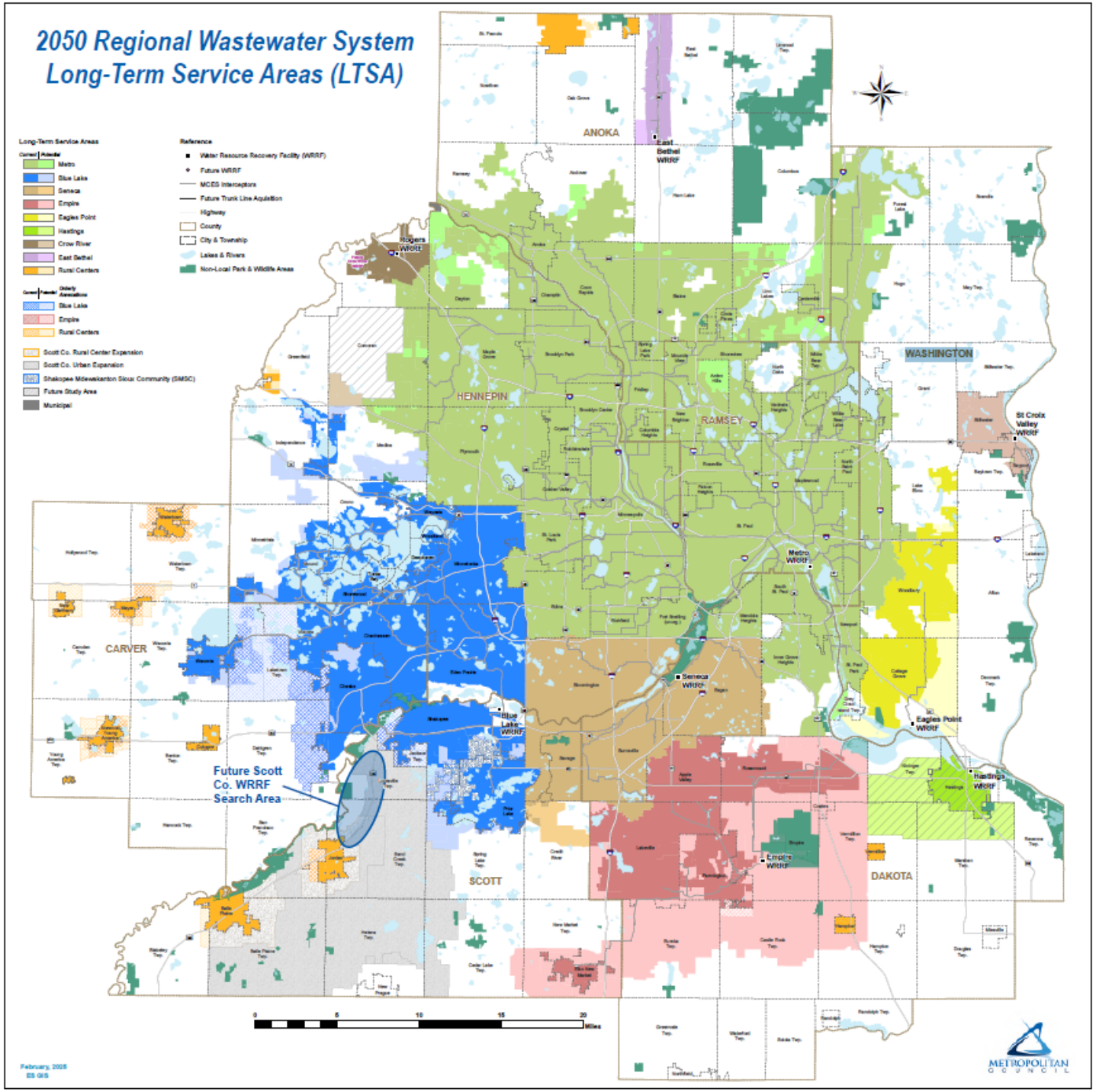
Demand for, location, and composition of regional facilities and services will change by approved growth forecasts.

- Liquid waste receiving facilities
- Vactor waste facilities
- Solids processing

Individual Sewage Treatment System (ISTS)
Wastewater Treatment Plant (WWTP)

2050 Regional Wastewater System Plan

- Reflects local community 2040 wastewater service areas.
- Council confirmed adequate land supply within 2040 service area (MUSA), to accommodate 2050 growth forecasts.
- Identifies Long-Term Service Areas (Post 2050) for long-term growth capacity based on Water Resource Recovery Facility (WRRF) build out capacities.



Existing Flow Data Collection

Permanent ES Billing Meters

Parshall Flume with suspended level “radar” sensor. Note stilling well.

Magnetic flow meter on 36-inch Ductile Iron Pipe (Inverted Siphon)

- Long-term data
- High confidence
- Fixed location

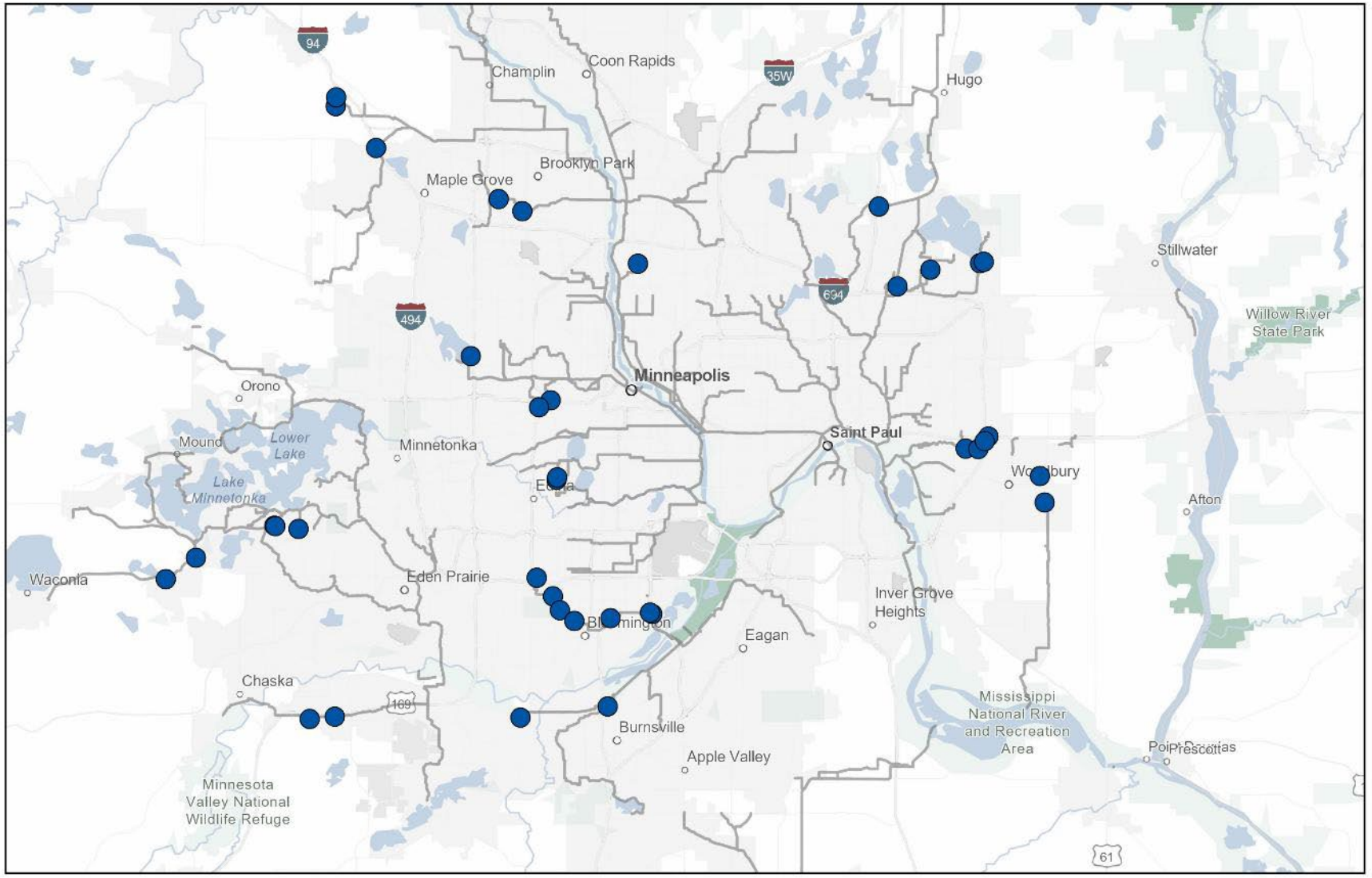
Temporary Meters

Source: Elscolab website June ’25

Source: GPM Environmental Solutions LLC website June ’25

- Short-term data
- Lesser degree of confidence
- Flexible location

Capacity Utilization – Temporary Flow Monitoring



Temporary Meters for System Capacity Analysis Since 2019

Temporary Meters

MCES Interceptors

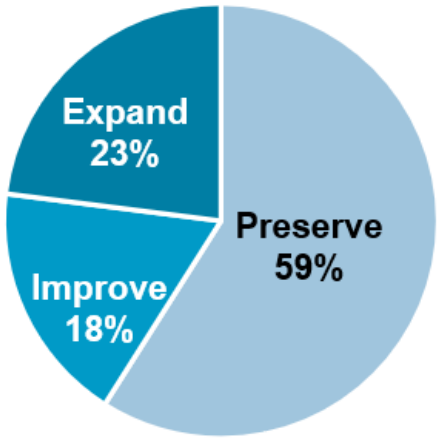
N

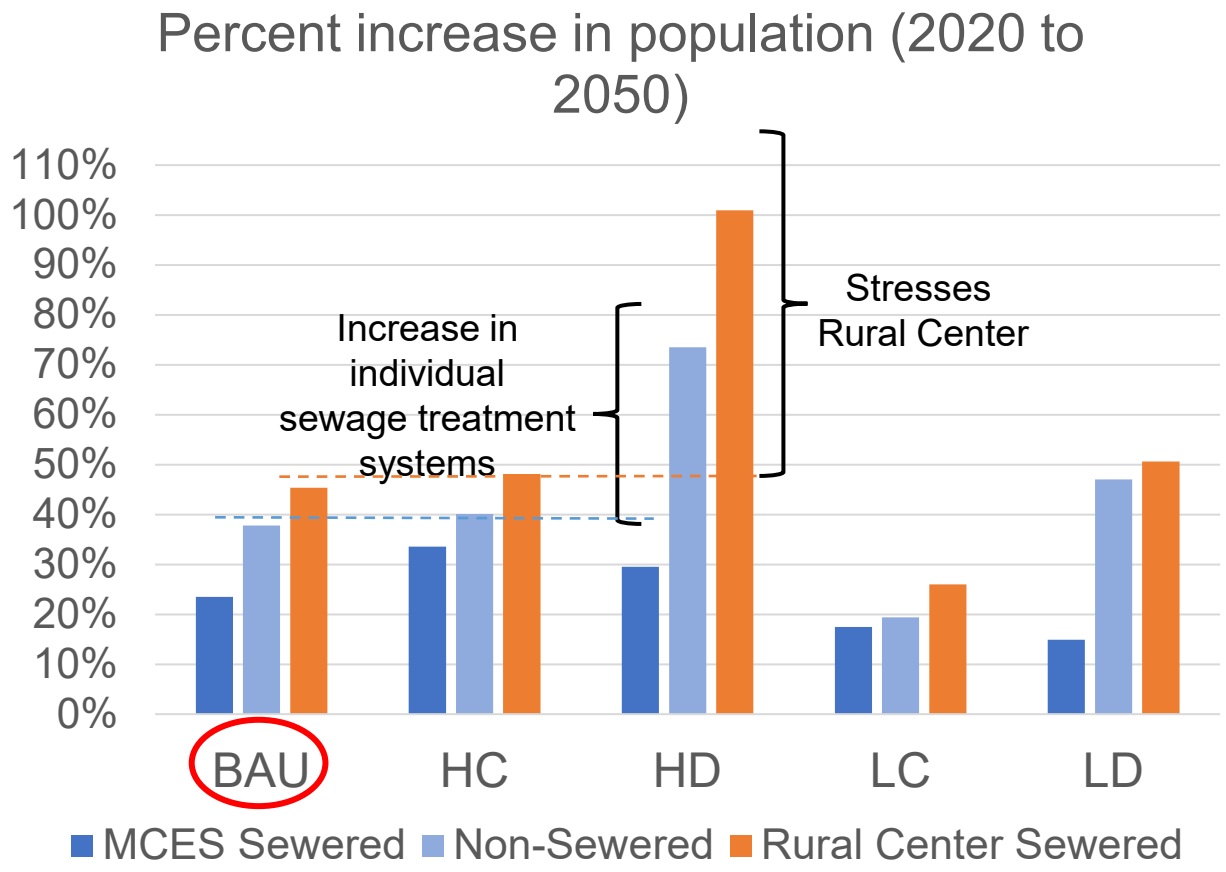
0 2.5 5 10 Miles

Regional Service Area Scenario Forecast Model

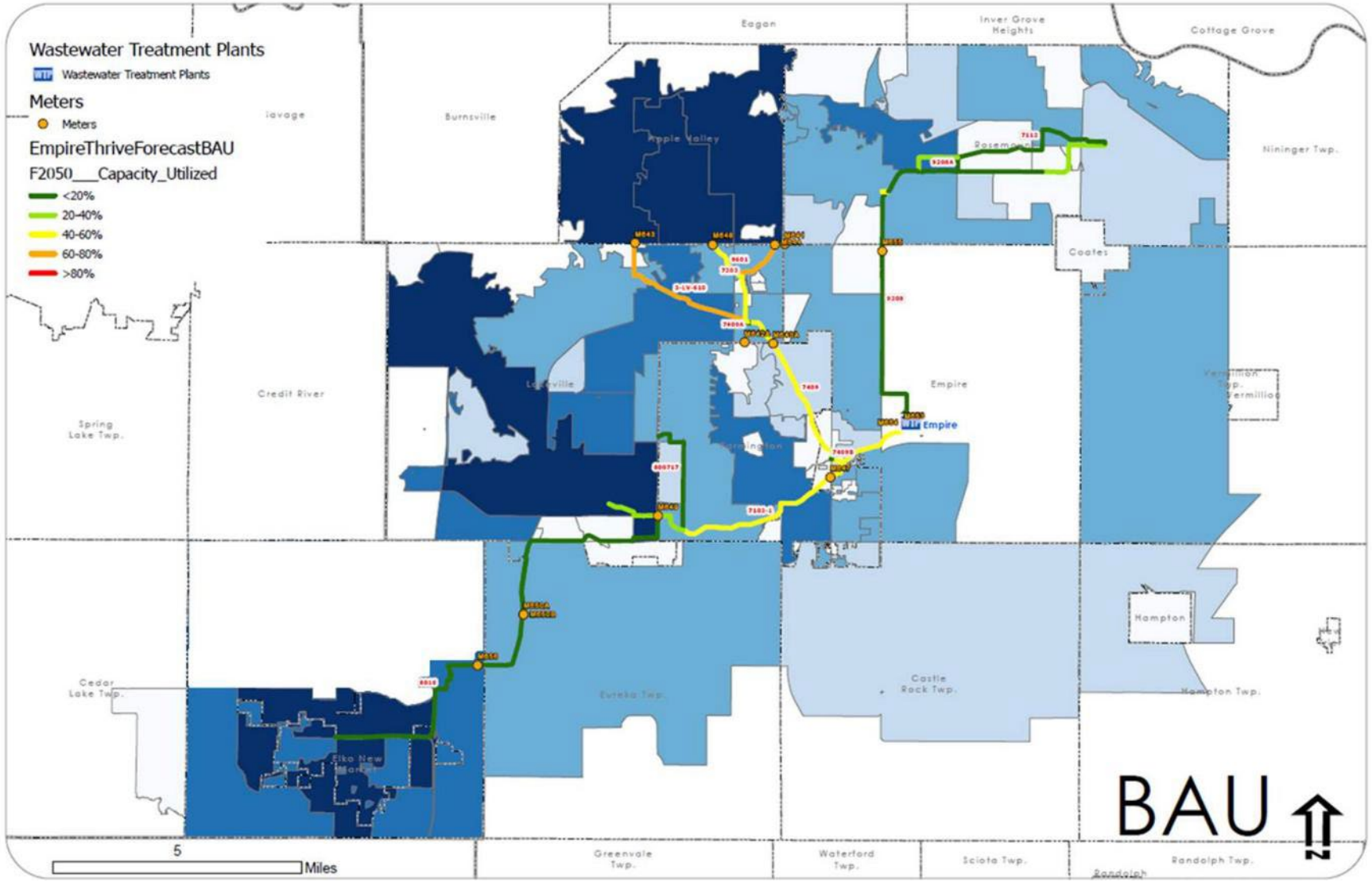
- 2050 Forecast growth scenario, included five assumptions.
- High compact/dispersed growth forecast scenarios were used to evaluate the impact to the regional system. Few new system capacity issues identified.
- Final adopted Imagine 2050 forecasts closely reflected a “Business as Usual” scenario (historical growth trend). No new capacity restricted areas identified.

Current (2025-2030) capital objective distribution



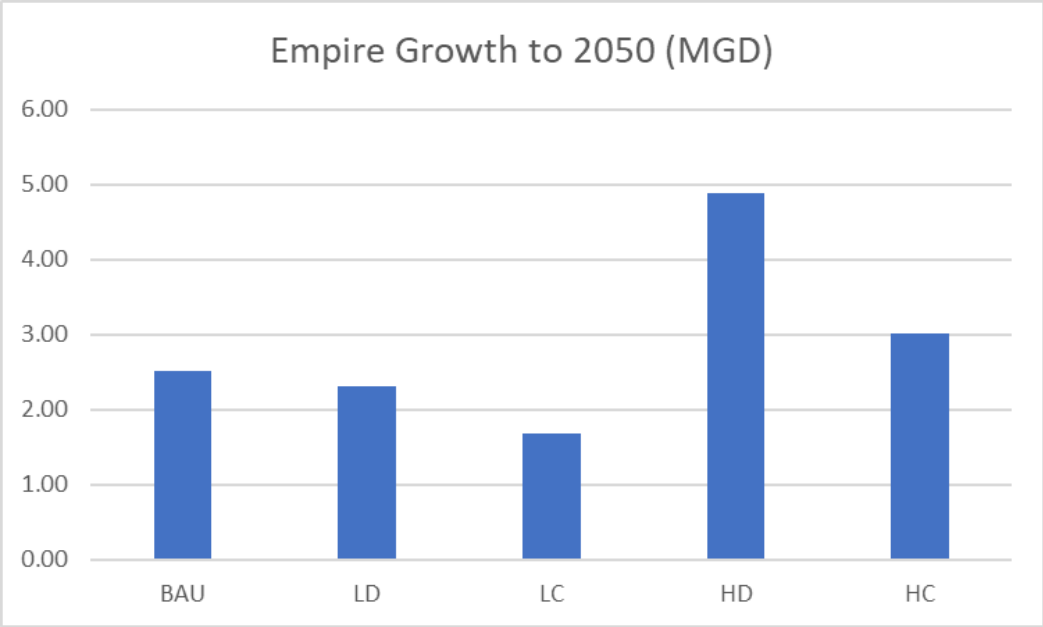


System Capacity Evaluation – Scenario Modeling



Scenario Modeling: Empire TP

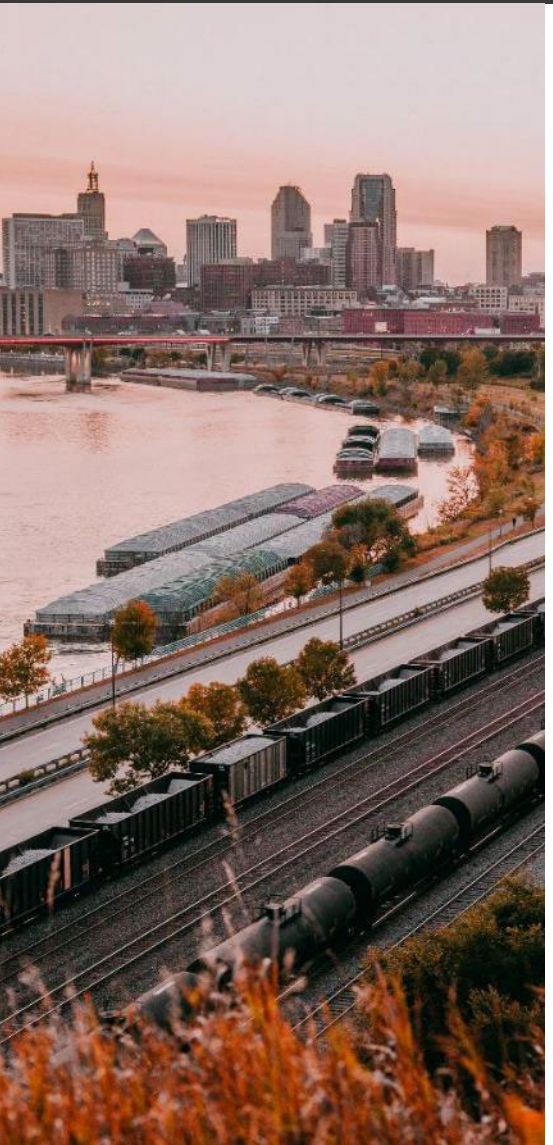
Graph and Table Discussion



	Length (miles)		Flow Growth (MGD)
	>80%	61-80%	
BAU	0.0	4.2	2.5
LD	0.0	4.2	2.3
LC	0.0	4.2	1.7
HD	1.7	2.5	4.9
HC	0.6	3.6	3.0

BAU – Business As Usual
LD – Low Growth, Dispersed Development
LC – Low Growth, Compact Development
HD – High Growth, Dispersed Development
HC – High Growth, Compact Development

Forecast Revisions – Reconfirmation of Capacity



Revisions to forecasts where Capacity Status is Reconfirmed

- Preliminary Scenario Forecast Distribution Modeling Results
    i. Image 2050 Development Guide “Business as Usual”
- Final Development Guide and Water Policy Plan (Sewered Forecasts)
- System Statement Forecasts
- Final Community 2028 Comprehensive Sewer Plan (CSP) Forecasts
- Subsequent major CSP amendment reflecting large forecasts changes or changes in service point connections to regional wastewater system
- Subsequent Comprehensive Plan Amendments (land use changes), AUAR’s, EAW, EIS that reflect major wastewater flow generators (Industrial, Data Centers, Manufacturing, etc.)

Existing and Future Wastewater Generation Rates

2050 Wastewater System Plan Assumptions

Existing Regional Average Generation Rates

- Determined through actual metered wastewater data (multi-year avg)
  a) 70 gallons per capita per day
  b) 180 gallons per residential equivalent connection (REC) per day
  c) 800 gallons per acre per day

Future Projected Generation Rates

- Considers actual local generation rate
- Reduction of base flow for I/I mitigation and water conservation efforts
  a) 60 gallons per capita per day
  b) 15 gallons per employee per day
  c) 150 to 160 gallons per REC per day
  d) 600 to 800 gallons per acre per day - Applied to long-term service areas

} Applied to Imagine 2050 Forecasts

Hydraulic Modeling Efforts

Completed or Ongoing Hydraulic Model Development and Analysis

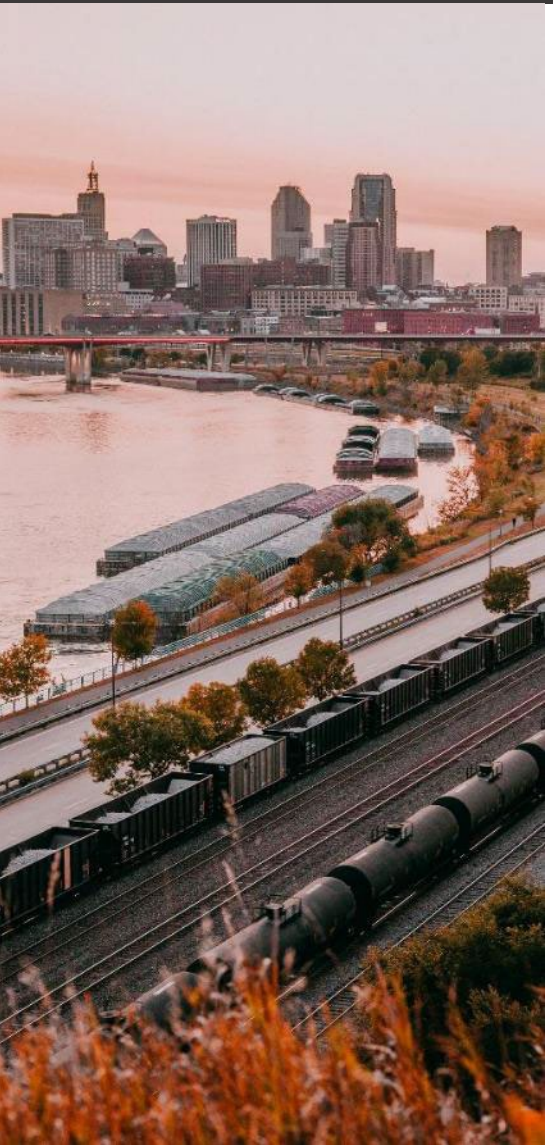
System Modeling

- Minneapolis System
- Saint Paul System
- Lake Minnetonka System
- NW Area System (Northern Hennepin + Anoka Counties)
- NE Area System (Forest Lake to Saint Paul)

Facility Flow Analysis (Modeled flow routing)

- 1-WO-500 (Woodbury)
- Riverview Siphon (Saint Paul, West St. Paul)

Current Capacity Related Projects (6-Year CIP)



Projects in various stages of Development

Interceptor Projects

- Blaine Relief Interceptor – Lino Lakes
- Savage Trunk Sewer & LS Acquisition – Credit River/Savage
- Interceptor 7031 – Bloomington
- Interceptor 7029 – Forest Lake
- L77 & Force Main Acquisition – Lake Elmo/Woodbury
- Interceptor Extension – SW Lake Elmo
- SE Area System – Hastings, SE Metro Area

Water Resource Recovery Facilities (WRRF)

- Crow River – Rogers, Corcoran, Dayton
- Blue Lake – Treatment + Solids
- Metro – Solids

Summary

- Both State Statute and Met Council policies require and support the delivery of regional wastewater conveyance and treatment infrastructure to provide system capacity to serve existing development and future growth as identified in the Regional Wastewater System Plan and local Comprehensive Sewer Plans.
- Communities must satisfy certain requirements to be served by the Regional Wastewater System. (Service area size, minimum density, local adoption of Met Council Waste Discharge Rules, etc.).
- Availability of regional system capacity is confirmed when Council releases regional development guide and wastewater system plan forecasts and again confirmed when communities submit their decennial comprehensive sewer plans, and major comprehensive plan amendments.
- Regional wastewater capacity will not be built to accommodate excessive inflow and infiltration (I/I). Those communities having excessive I/I are required to locate its sources and reduce I/I to identified limits.
- The Met Council includes system capacity enhancements in its Regional Wastewater System Capital Program to address capacity needs for accommodating growth and timing those investments when needed.

For more information

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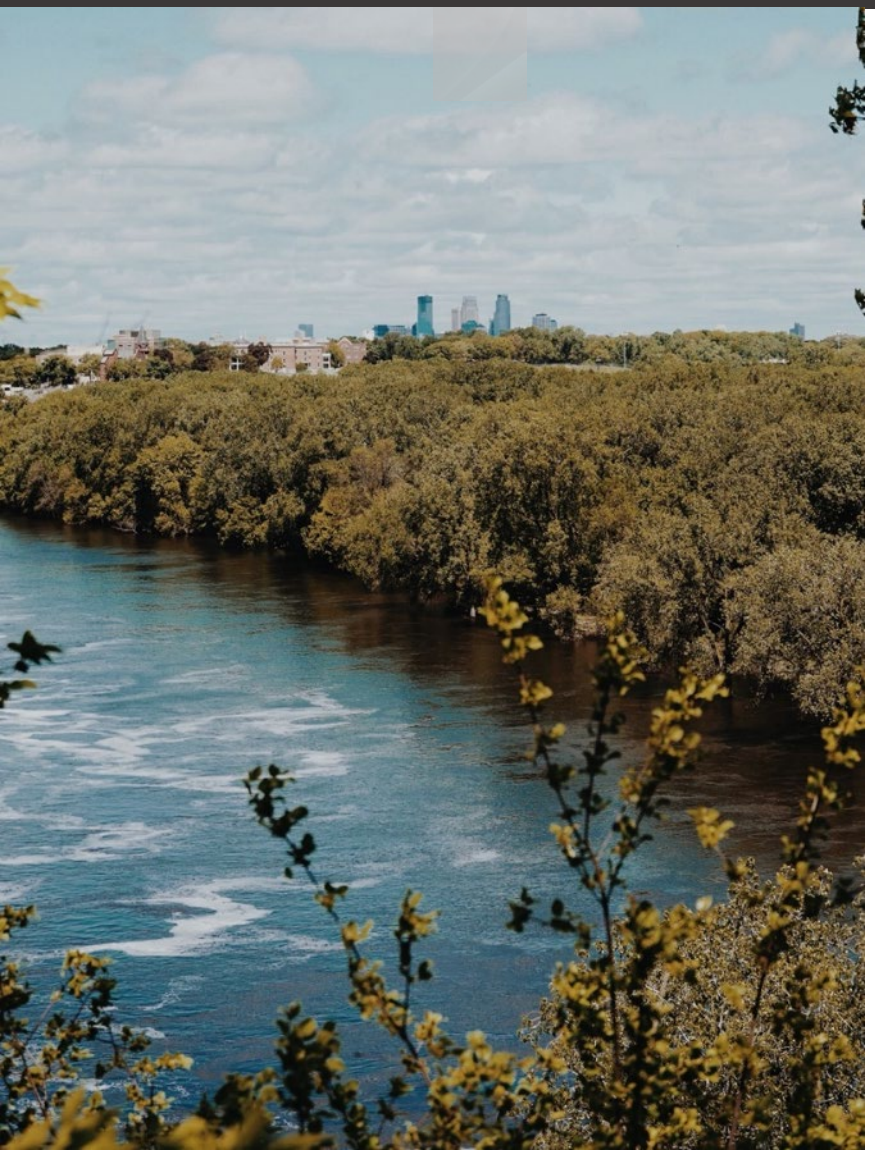
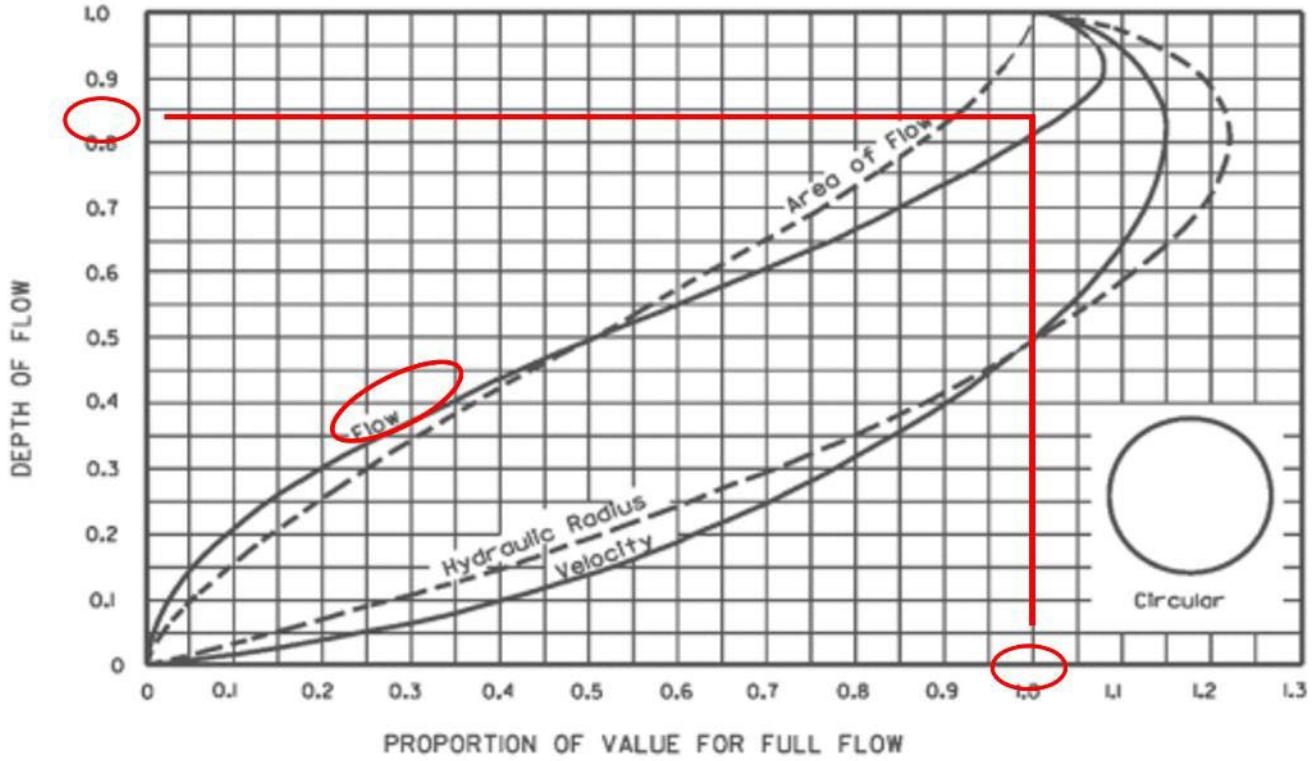
Hydraulic Pipe Capacity and Accepted Full Pipe Flow



Hydraulic Capacity: Full pipe capacity generally considered to be achieved at 80% of full pipe flow, i.e. depth of flow divided by pipe diameter.



Reference: American Concrete Pipe Association (1980).