Funding Crumbling Infrastructure

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Presentation Outline

1. State of Infrastructure
   - Funding needs
2. Decreasing Demands
   - Reduced Revenue
3. Building Support For Funding
   - Communications
   - Community Involvement
   - Brooklyn Park Example
   - Mankato Example

Design Life of Drinking Water Systems

- The water supply infrastructure includes: pipes, ground water wells, surface-water intakes, reservoirs, storage tanks, treatment plants, pumping stations, etc.

Components	Years of Design Life
Reservoirs and Dams	50 - 80
Treatment Plants – Concrete Structure	60 - 70
Treatment Plants – Mechanical and Electrical	15 - 25
Trunk Mains	65 - 95
Pumping Stations – Concrete Structures	60 - 70
Pumping Stations – Mechanical and Electrical	25
Distribution	60 - 95

Dawn of Replacement Era

- The nation's drinking water systems face staggering public investment needs over the next 20 years.
  - A large part of the U.S. water system dates back to the years shortly after World War II therefore, a significant amount of buried infrastructure - the underground pipes - is at or very near to the end of its useful life.

Poor Condition, Aging and Leaky Pipes

Nationally →

Over 6 billion gallons, about 14% of daily water use.

City, State	Population	Avg. Main Breaks *Annually*
Baltimore, MD	619,493	1,190

Midwest →

For largest utilities main breaks increased from 250 to 2,220 in last 19 years

City, State	Population	Avg. Main Breaks *Annually*
Duluth, MN	86,300	140
Hibbing, MN	16,350	60-70
St. Paul, MN	285,068	140

Headline →

St. Paul, MN

20” main break caused 1.75 million gallon water loss in February 2013

- $ 42,000 water cost + labor for repair

Needs for Investment in Water Mains Is Staggering

2011-2035 Totals			
(2010 $M)	Replacement	Growth	Total
Northeast	$92,218	$16,525	$108,744
Midwest	$146,997	$25,222	$172,219
South	$204,357	$302,782	$507,139
West	$82,866	$153,756	$236,622
Total	**$526,438**	**$498,285**	**$1,024,724**

2011-2050 Totals			
(2010 $M)	Replacement	Growth	Total
Northeast	$155,101	$23,200	$178,301
Midwest	$242,487	$36,755	$279,242
South	$394,219	$492,493	$886,712
West	$159,476	$249,794	$409,270
Total	**$951,283**	**$802,242**	**$1,753,525**

- Based on the 2008 America's Infrastructure Report Card for MN, the drinking water infrastructure needs a $5.46 billion investment over the next 20 years.

Water System Rating

- The nation's drinking water system received a grade of D minus by the American Society of Civil Engineers in its 2009 Report Card of America's Infrastructure.
- Ten years ago, EPA estimated that by 2020 the condition of nearly half the water and sewer pipes in the United States would be considered "poor", "very poor", or "life elapsed".

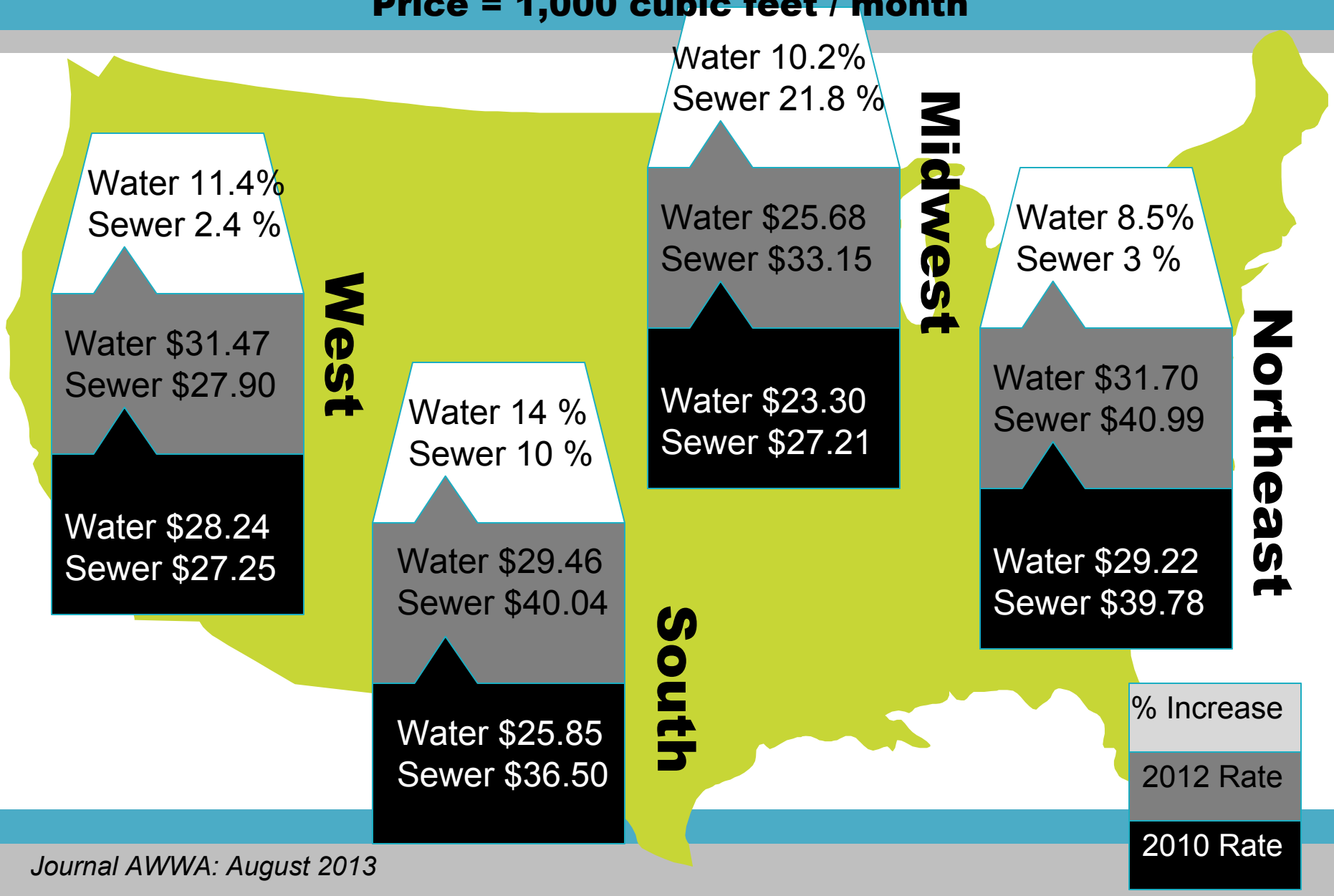
Funding Deficit - 2010

$91.2 Billion	Water and Wastewater Needs
$36.4 Billion	Spending
$54.8 Billion	**Deficit**

ASCE 2010 Report

Increasing Water and Sewer Rates

Price = 1,000 cubic feet / month



Journal AWWA: August 2013

Investment On Infrastructure

- United States 2.4%
- Europe 5%
- China 9%

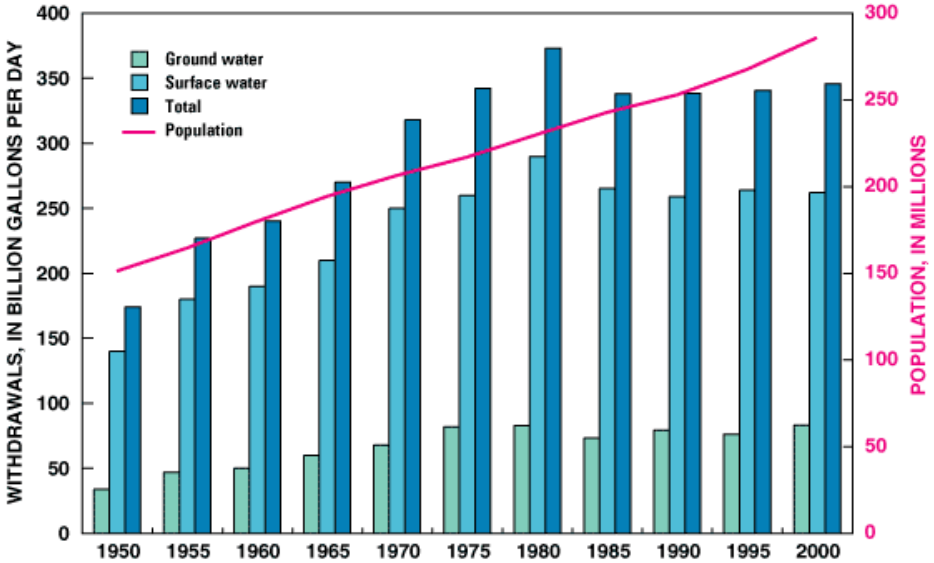
American City and County, July 2012

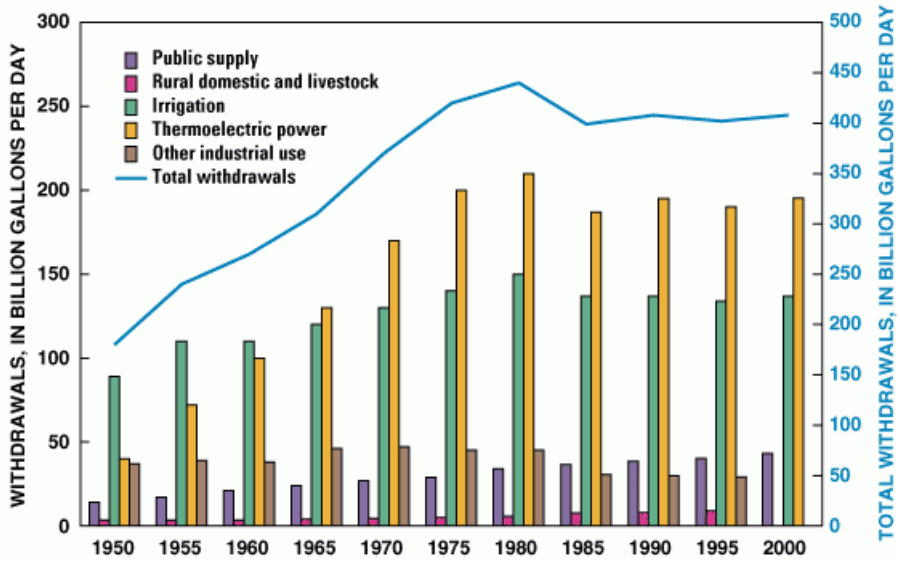
- Water and Sewer bills are lowest among developed nations as percent of household income.

Water World, January 2013, Vol. 29, No. 1

Trends in Water Use

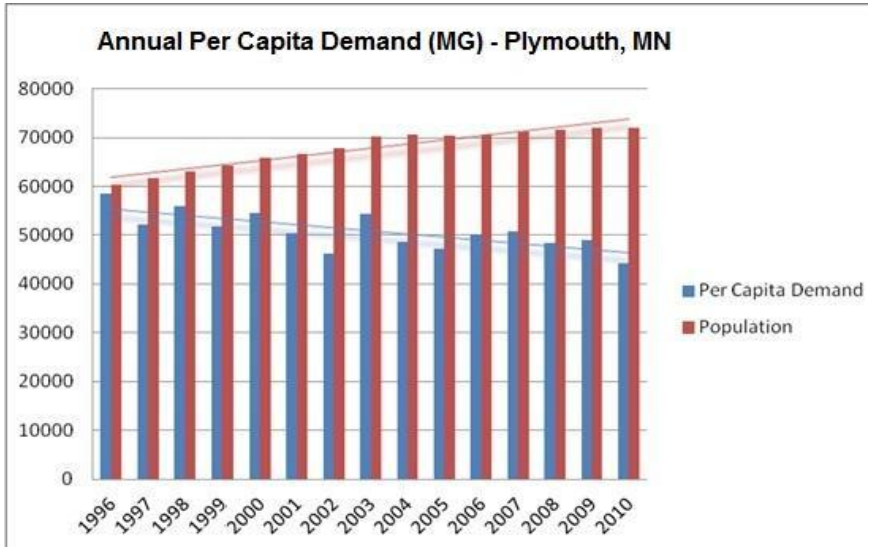
- Water utilities across North America are experiencing declining water sales.
- The declining demand, mostly in residential customers is due to the decline in the number of individuals per household and the increased use of low-flow appliances.





Water Demand over Time for Various Cities of Minnesota

- Emphasizing water conservation to reduce the growing water shortage in many parts of the United States.
- The economic climate has decreased new developments and people are moving either to rental property or smaller houses.
- The result of this trend is lower water usage and per capita water demand and consequently lower revenues.



Per Capita Demand For Residential Customers

- Cities in Minnesota that experienced a decrease or stable water usage over the last decade.

- Water utilities are experiencing a similar pattern of water usage in almost every part of this Country.

Dilemma Of Water Supplier

- Due to the age of the infrastructure the cost of running the system is increasing and the revenue from sales is decreasing.

- The utilities are using more chemicals and enhanced treatment methods to meet national standards for drinking water, thus increasing the cost of running the system. Inflation is also taking a toll.

- The dilemma for water utilities is that they already have the infrastructure in place which needs to be maintained and upgraded irrespective of the amount of water sold to their customers.

Dilemma Of Water Supplier (cont.)

- With the decrease in demand and revenue, there is large burden on the water utilities to increase water rates.

- Rate increases are not popular and due to the economic conditions of cities, it is difficult to get support for the water supplier to increase the water rates.

Forecasting, Scenario Building, and Planning

- Water and wastewater utilities can encompass practices like asset management.
- Maintaining an accurate inventory of infrastructure assets and quantifying renewal needs can help a utility justify large capital expenditures to its:
  - Governing boards
  - Schedule renewal programs over a practical period of time
  - Decrease costs by improving its bond rating
- According to one EPA report: over one quarter of municipalities charge water rates that do not cover their costs.

Forecasting, Scenario Building, and Planning (cont.)

- Develop assistance programs for low-income and disadvantaged groups such as senior citizens.
- Frequent rate adjustments, implementing forward looking rates, and making demand-repression adjustments to programs and prices.
- Many utilities face declining rate bases as customers move from neighborhoods served by the existing system to outlying areas.
- Utilities should charge service expansion fees to customers or developers in the new neighborhoods to pay for all the expansion cost.

Other Measures Utilities Can Implement To Address This Issue

- Utilities and local government should develop a comprehensive local strategy that includes:
  - Assessing the condition of the drinking water system infrastructure.
  - Strengthening research and development.
  - Working with the public to increase awareness of the challenge ahead, assess local rate structures, and adjust rates where necessary.
  - Building managerial capacity.

Communication

- Effectively communicate the needs for infrastructure improvements is vital to provide funding.
- Provide information in an easy to understand format to elected officials on a regular basis such as:
  - Number of water main breaks and how much it costs to repair the breaks.
  - Age of infrastructure and remaining useful life.
  - Value of water system displayed graphically.
    - The total value of water system is decreasing when depreciation is more than the capital investment.
    - Depletion of the value of the system over the years.

Rate Study

- Conduct a rate study to show the real cost of water.
  - Complete a rate study by an outside consultant to develop realistic multi-year projections of the revenues and expenditures including infrastructure improvement needs.

  - Rates should fund depreciation.

Citizens' Advisory Committee

- Customers are normally willing to pay for the water system infrastructure improvements when they understand why it is needed.
- Set a Rate Committee or Citizens' Advisory Committee to help communicate the needs to elected officials.
  - The committee representing members from industry, city council, ordinary citizens and commercial interest should be formed to provide a broad support to rate adjustment.

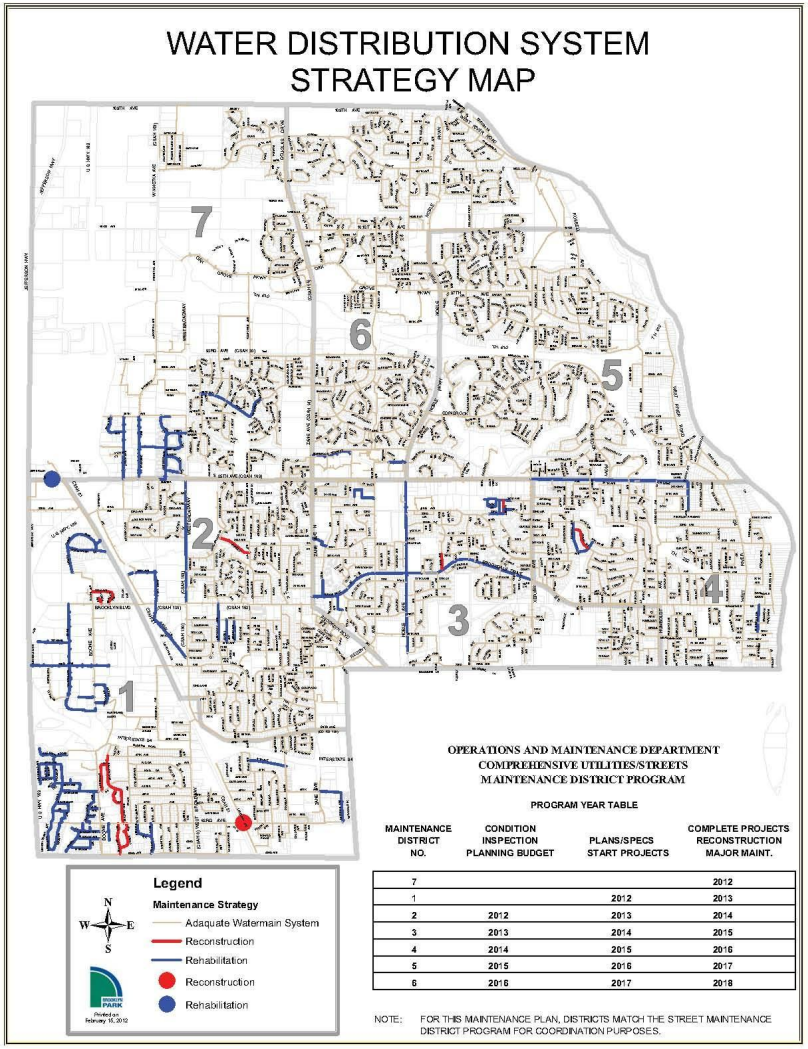
Community Involvement

- Treat communities served as partners.
- Engage stakeholders in the decision-making processes.
- Partnering with them to give them enough confidence that their money is being well-spent.
- External stakeholders must be a part of the process using a thoughtful public outreach approach.

Public Outreach Program

- Setting up conferences, workshops and retreats to educate people on specific policy issues, plans or projects.
- Setting up a Citizen Advisory Committee.
- Media strategies.
- Evaluate community impact assessment by determining the impact of certain projects on the communities and their quality of life.

Long Term Strategy Map



Brooklyn Park, MN:
Developed a Long Term Water Distribution System Strategy Map

Condition Report

Brooklyn Park, MN:
Condition Report helps convey water system status

Water Quality Comparison

City of Brooklyn Park
Water Quality

12/31/2011

Adequate = Green

Problem = Red

Problem Type	Raw Water (Before Treatment Plant)	Finished Water (After Treatment Plant)
Iron & Manganese	Red	Green
Hardness (Dissolved Solids)	Red	Red
Organics	Green	Green
Lead & Copper	Green	Green
Other Metals	Green	Green
Disinfection	Red	Green

Brooklyn Park, MN:
Water Quality Report compares raw water to finished water

Documenting Activities Shows Staffing Needs

Water System Staffing Needs
City of Brooklyn Park, MN

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Hours	Adj Hours	FTE
Meters	50	63	47	18	40	34	29	27	50	44	26	40	468	3744	4500	2.16
Meter Shop	40	24	20	8	0	10	9	10	18	9	8	28	184	1472	1500	0.72
Reads	2	2	2	2	2	2	2	2	2	3	2	3	26	208	225	0.11
Meter/SO Group													0	0		**2.99**
VM Repairs	8	2	12	15	36	6	5	4	5	8	5	0	106	848	1500	0.72
Water Service Work	28	12	15	7	14	5	5	2	5	10	10	2	115	920	2000	0.96
Valve Work	0	0	1	1	1	0	0	2	2	2	11	2	22	176	200	0.1
Water Repair Group															3700	**1.78**
Hydrant Work	20	5	3	100	14	13	26	26	18	10	3	1	239	1912	2280	1.1
Hydrant Cleaning	20	20	20										60	480	600	0.29
Hydrant Group															2880	**1.38**
Support to Others															499.2	0.25
													1252	10016	13304.2	6.4
Total	186	135	127	151	107	70	76	73	100	86	65	76	1252			
Snowplow	18	7	7										32	256	0	0.12

Comprehensive Maintenance District Program Document Infrastructure Condition Rating

City of Brooklyn Park
Operations Maintenance Department
Public Utilities Comprehensive Maintenance District Program

Adequate = Green (4.0 - 3.1)
Marginal = Blue (3.0 - 2.1)
Problem = Red (2.0 - 1.1)

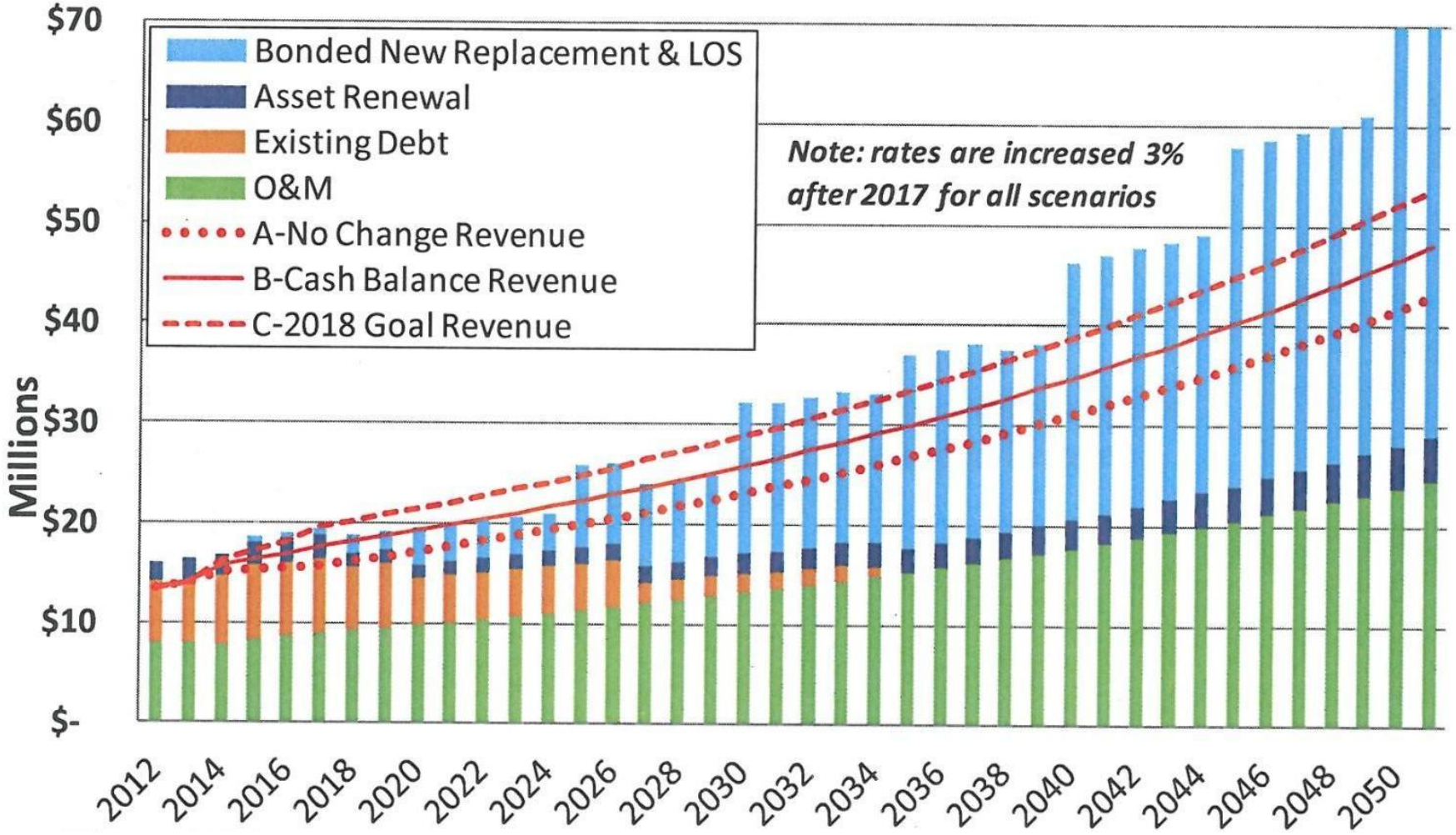
Maintenance District	Watermain (miles)	Water Valves (No.)	Fire Hydrants (No.)	Water Services (No.)	Water Meters (No.)		Sewermain (miles)	Manholes (No.)	Sewer Services (No.)
District 1	43	906	361	2073	2223		33	704	2073
District 2	48	1051	424	3700	4430		39	886	3690
District 3	41	776	341	2310	3147		37	828	2300
District 4	39	736	342	2390	3101		33	689	2420
District 5	47	960	481	4000	3320		40	993	4255
District 6	54	1137	519	3218	3754		40	1084	3411
District 7	36	873	353	2016	1875		27	725	1085
Utility System Totals	308	6439	2821	19703	21850		249	5909	20385
Overall Facility Rating	3.0	3.0	3.2	3.4	3.5		3	3.6	3.1

Comprehensive Maintenance District Program Document Infrastructure Condition Rating

Water Supply Facility	Overall Average Rating	Site	Structural	Process Equipment	Aeration	Contact Basins/Filters	Sump Pits	Plate Settlers	Controls SCADA	Metering System	Security	Coatings	Pumps	Electrical	HVAC
1988 Water	3.4	X	3.5	4	3	3	4	X	3.5	4	3.5	4	3	3	2
Plant		X						X							
1998 Water	3.7	X	3.5	4	3.5	3.8	X	X	3.5	4	3.5	4	3.5	3.5	4
Plant		X						X							
2010 Water	3.9	3.8	4	4	4	4	4	4	3.5	4	3.5	4	4	4	3.5
Plant															
Reservoirs	3.5	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Ground	3.5				X	X	X	X		X			X		X
Elevated	3.5				X	X	X	X		X			X		
Wells	3.5		X		X	X	X	X							
Well Houses	3				X	X	X	X					X		
Lift Stations	3				X	X	X	X		X					X

Adequate	(8.0 - 4.0)	Green
Marginal	(1.9 - 2.9)	Blue
Problem	(0 - 1.8)	Red

Mankato: Long Range Approach



Funding Approach

1. Revenue for infrastructure replacement will primarily come from higher rates.
2. Leadership and effectively conveying needs is critical.
3. In the past, 73% of infrastructure improvement referendums have been approved.
4. Water professionals have done a poor job of conveying infrastructure needs.

Conclusion

- Many water systems throughout the country face maintenance backlog and significant replacement costs.
- Older pipes and their joints leak more than newer ones, and all the pipes should be replaced at the end of their useful lives.
- The demand for a new water system in developing areas may lead communities to lay new pipes rather than repair old ones.
- As leakage and breaks in older system grow, the cost of operating an increasingly inefficient system grows with them.

Conclusion (cont.)

- Replacing obsolete infrastructure simply to maintain existing service will require utilities to find new revenue, either from rate increases or public subsidies.
- EPA estimated that even if utilities could increase their revenue by 3 percent per year (above inflation), they still would be $45 billion short of what they will need to replace deteriorated pipes over the next 20 years.
- Without revenue growth, utilities will fall $102 billion short of their replacement needs and $161 billion short of their operations and maintenance needs.

Questions

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