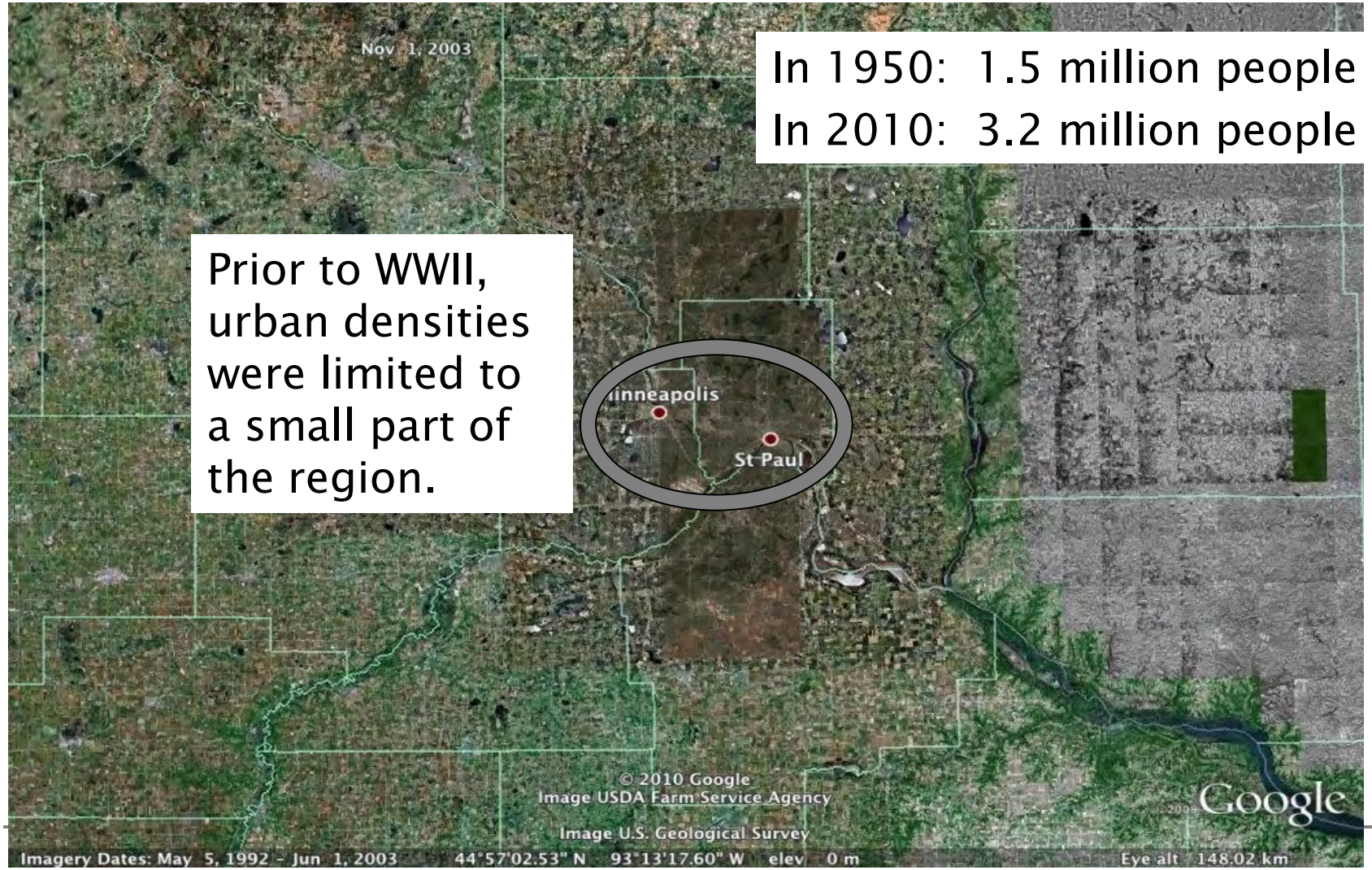
Asset Management:
The Strategic Context

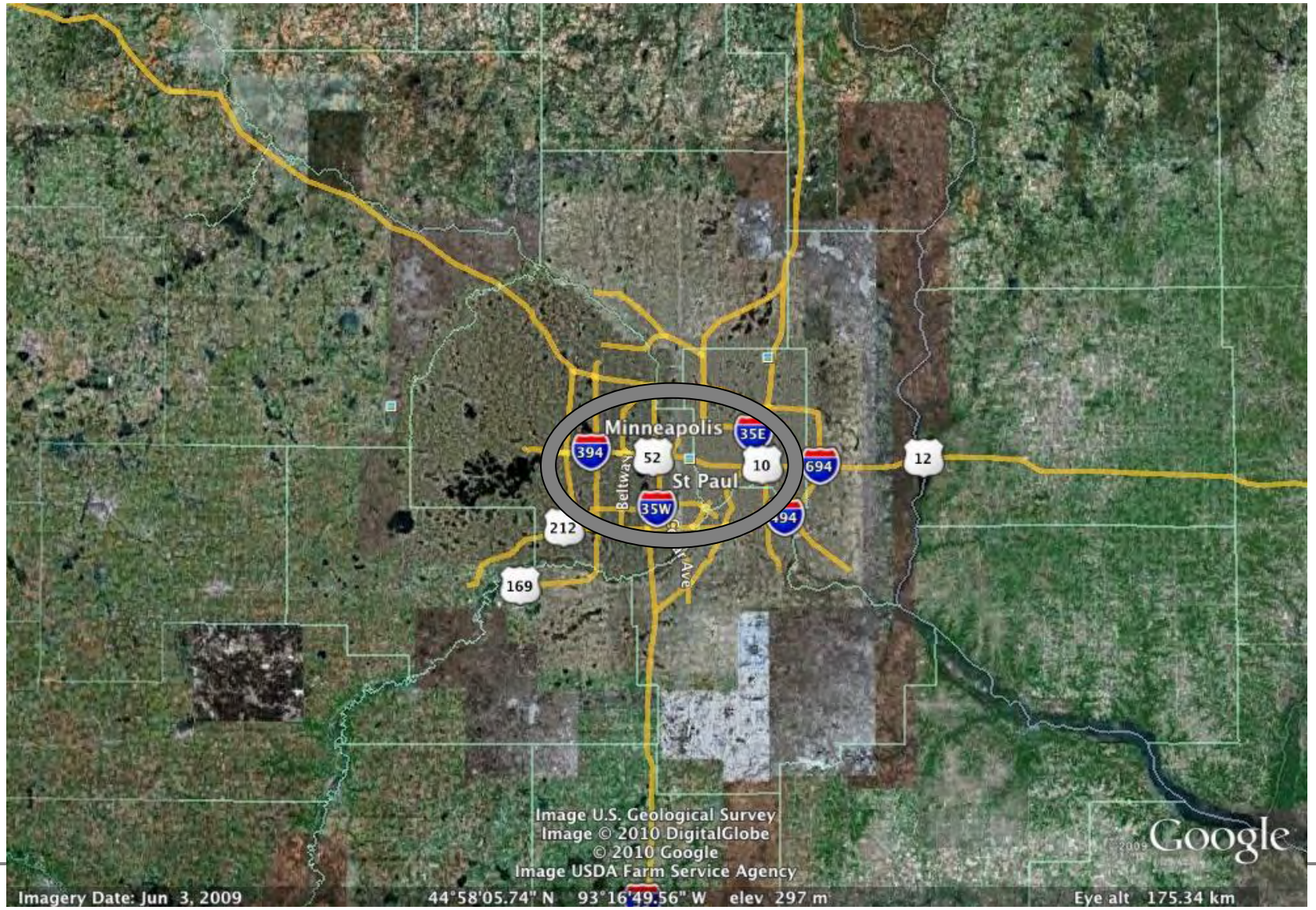
This Module

- The impact of environmental assets and urban systems on the quality of life.
- The multi-generational challenges of urbanization, system expansion and upgrade.
- The financial context and resource requirements associated with water and wastewater systems
- The public policy aspects of managing urban systems and the long term sustainable delivery of services.
- Introduce Asset Management as a process and practice integral to the sustainable deliver of water and wastewater services.

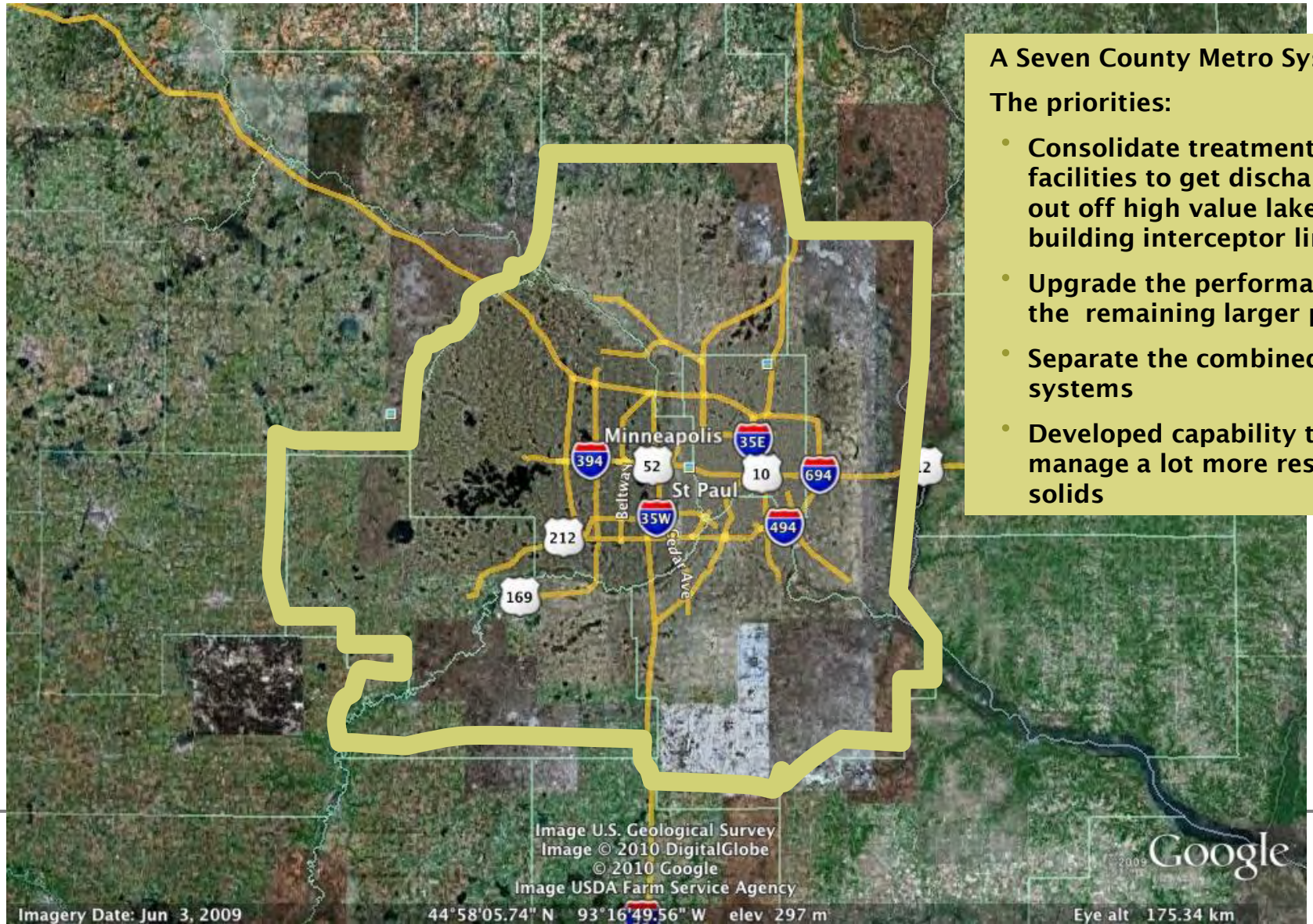
As an Example: The Minneapolis / St Paul Region Has a Relatively Common Growth Pattern Since The 1950s



Where and How We Lived Changed Dramatically.



By the 1960s the Impacts of Urbanization Brought About The Next Major Institutional Response.

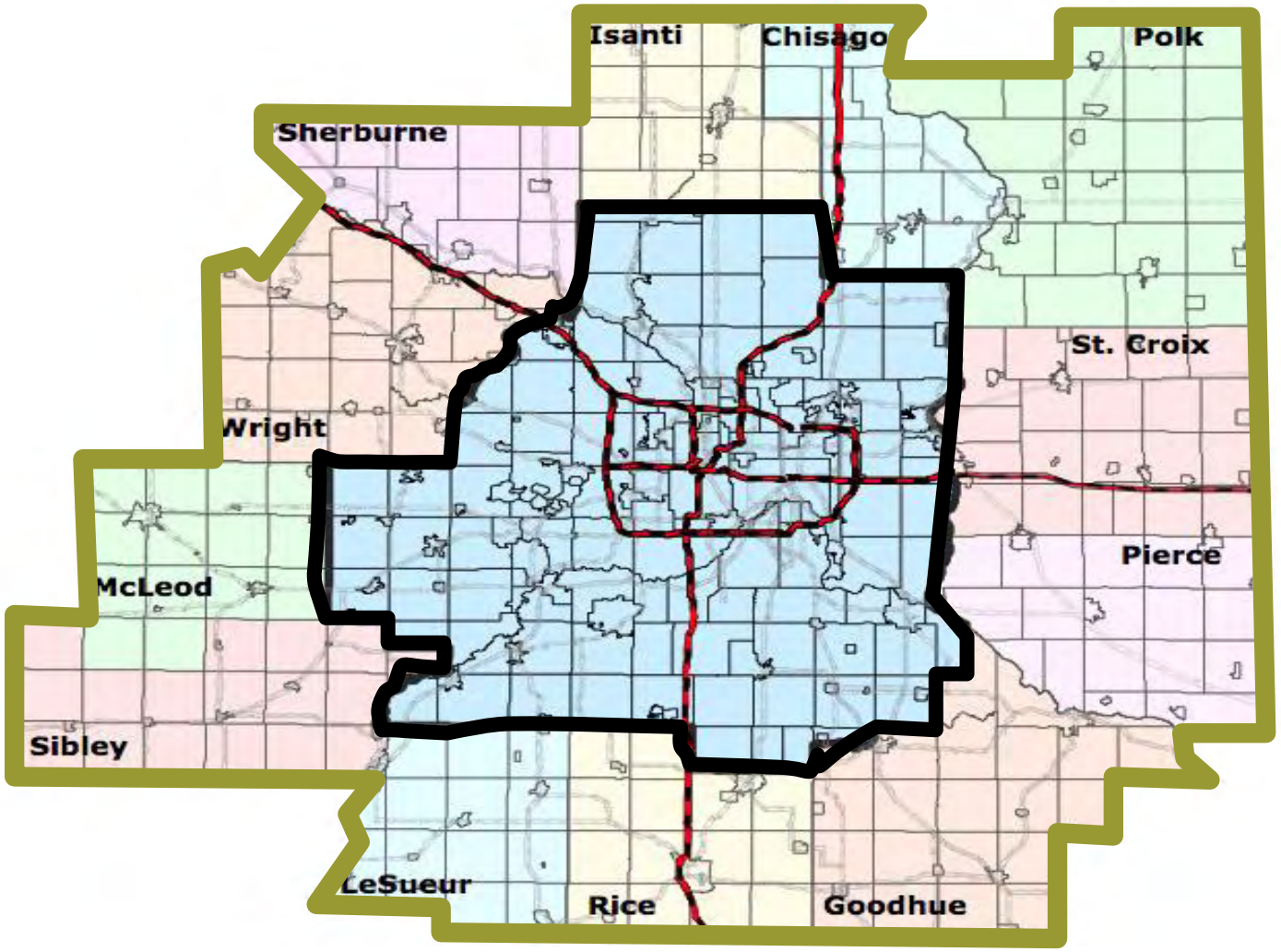


A Seven County Metro System

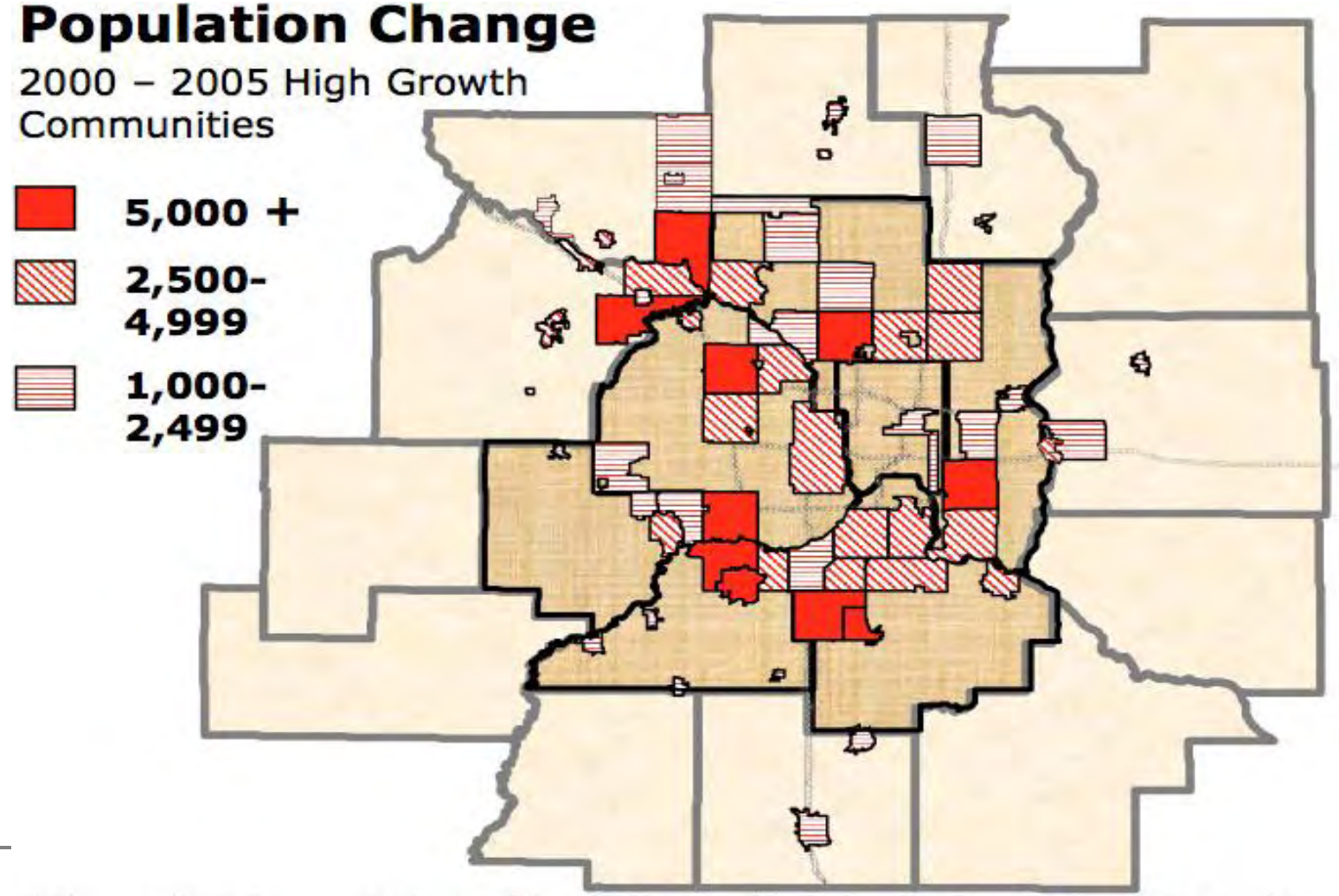
The priorities:

- **Consolidate treatment facilities to get discharges out off high value lakes by building interceptor lines**
- **Upgrade the performance of the remaining larger plants**
- **Separate the combined systems**
- **Developed capability to manage a lot more residual solids**

By the 1970/80s, the Impacts of Urbanization Began to Reach Into a Number of Adjacent Counties

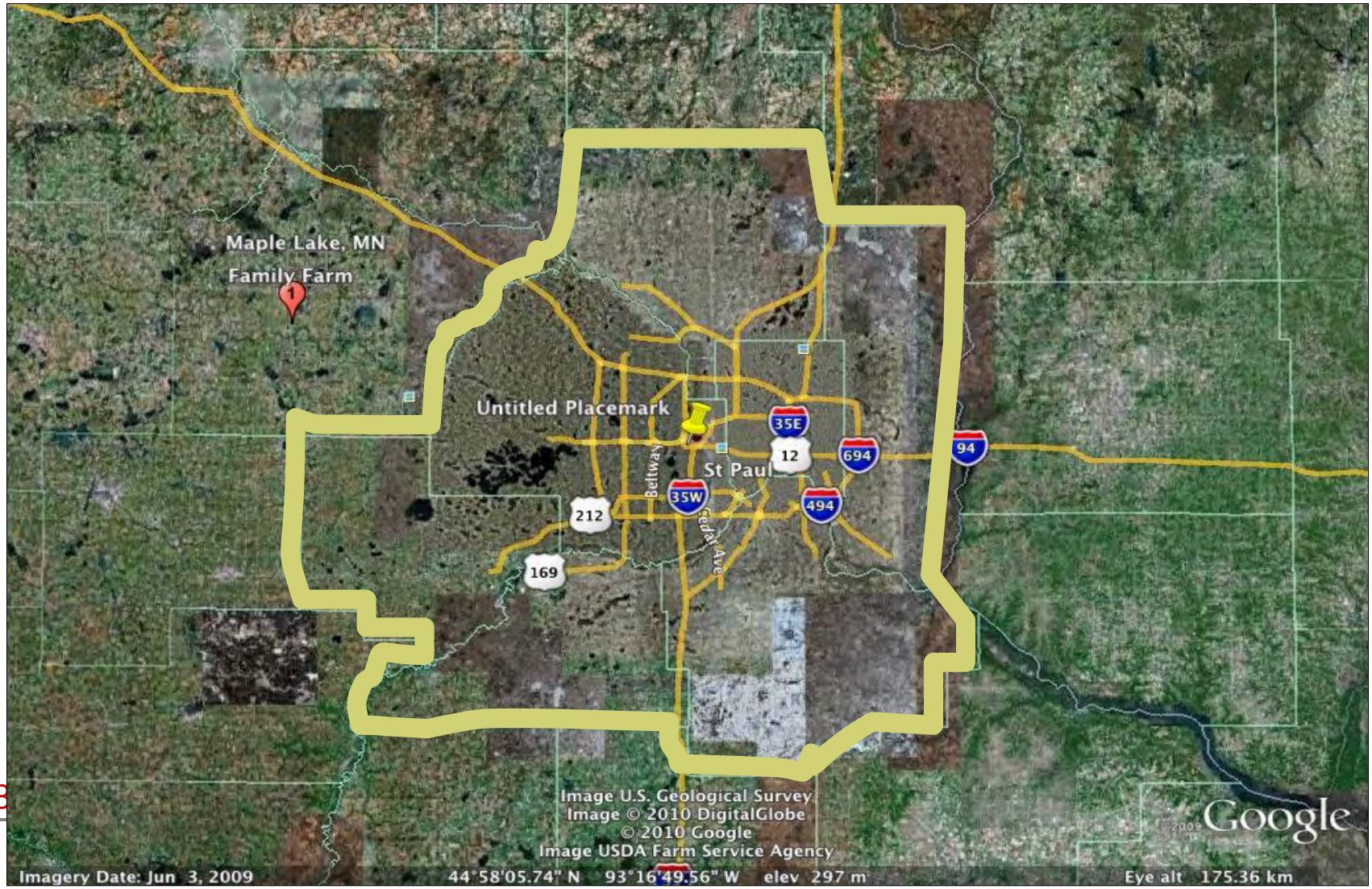


By 2000, Some of the Fastest Growth Was Occurring in Counties That Just a Few Decades Earlier, Were Not Thought To Be Part of the Urban Metropolitan Region

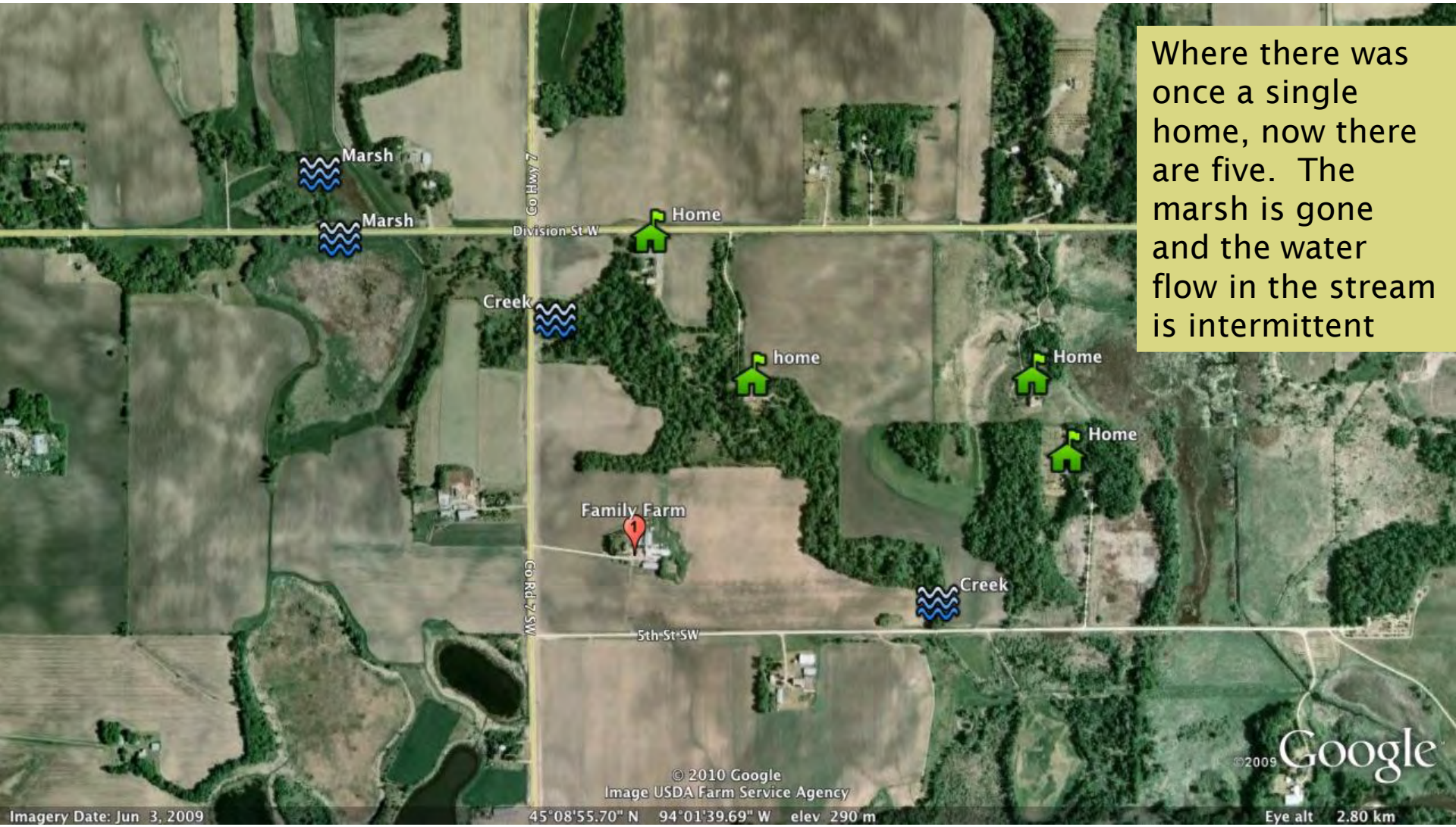


* Minnesota State Demographic Center; Wisconsin Demographic Services Center and Metropolitan Council

It Did Not Take Long, Until the Region Spread Into What, Until Recently, Were Very Rural Areas



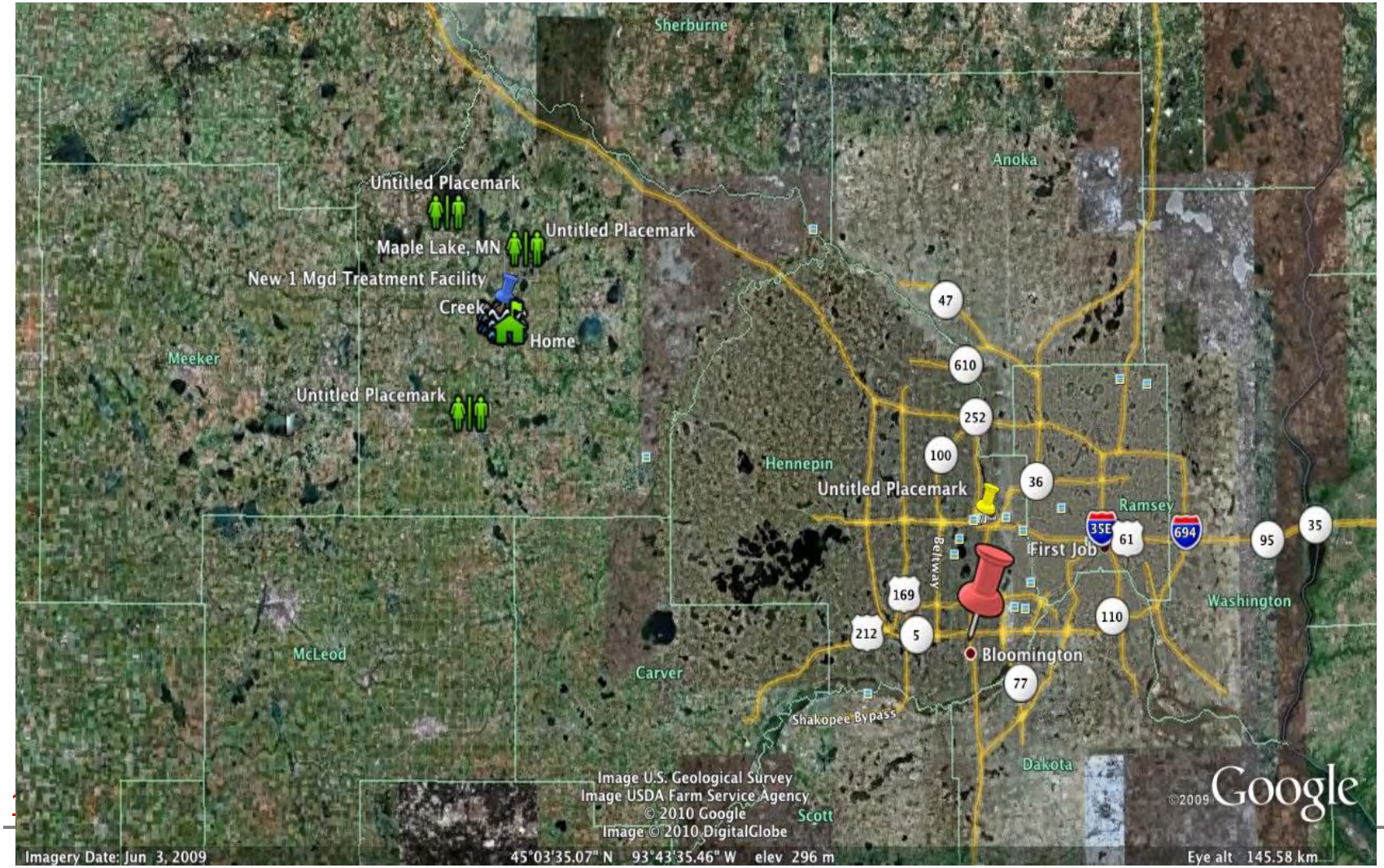
The Impact of Urbanization Even In The Far Reaches of the Urban Fringe Is Less Obvious, But Quite Dramatic.



Where there was once a single home, now there are five. The marsh is gone and the water flow in the stream is intermittent

Unlike the Farms, the Small Communities In These Exurban Reaches Have Extension and Upgrade In Play

The Water and Sewer Lines Below Were Installed in 1964 in Open Land In the Urban Fringe (The Red Marker).



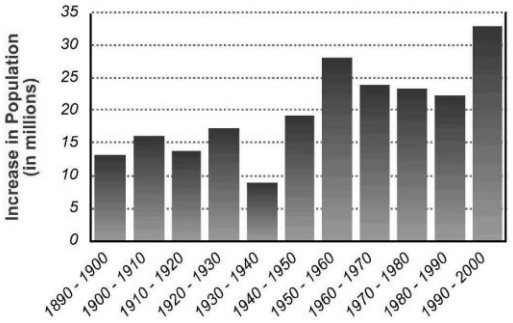
This is the Land Use, Today (the Pipe Network Installed In Virgin Land In 1964)

Understanding The Demographic and Legacy Aspects of Assets Within a Particular System Is Very Important.

It Is Also Important To Have Insight Into What the Situation Looks Across Systems: A High Level National Assessment.

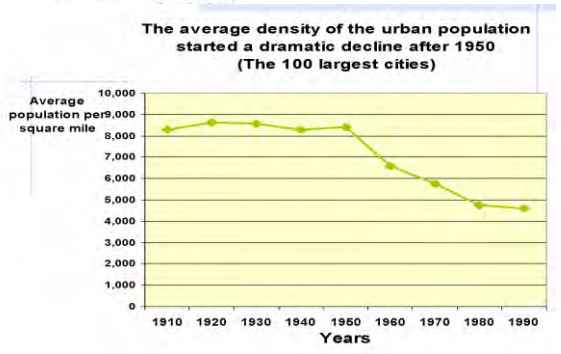
Long Life Assets (Example: Water Infrastructure) Are Impacted By Growth Patterns and Demographic Shifts.

We are adding population



We are relocating

For the Better Part of 50 Years
Our urban densities declined

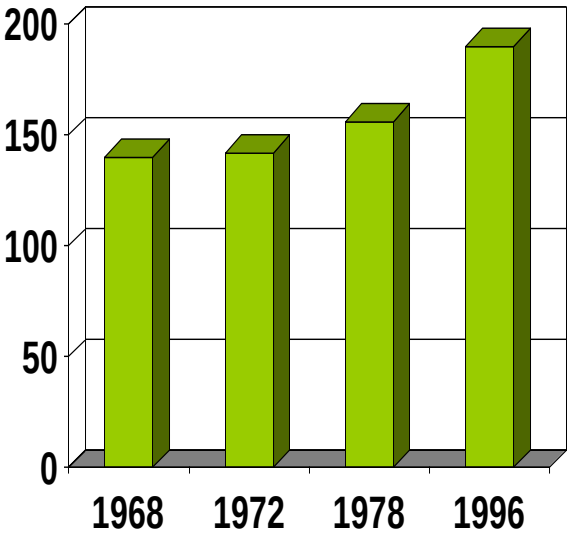


The History of Urbanization, Environmental Degradation, and a Generation of Expansion and Upgrade Substantially Defines Major Aspects of the Current Challenge

- In the 1970s, the country faced significant water quality problems and major policy and strategic changes resulted.
- The Federal government took on a larger role as a regulator and became a very significant source of funds for capital improvements.
- A new permit process was established to control discharges to the nation's waterways.
- Very large investments were made in the treatment of industrial waste and in the upgrading of the public wastewater systems.

The Last Several Decades Featured Large Investments in Expansion and Upgrade

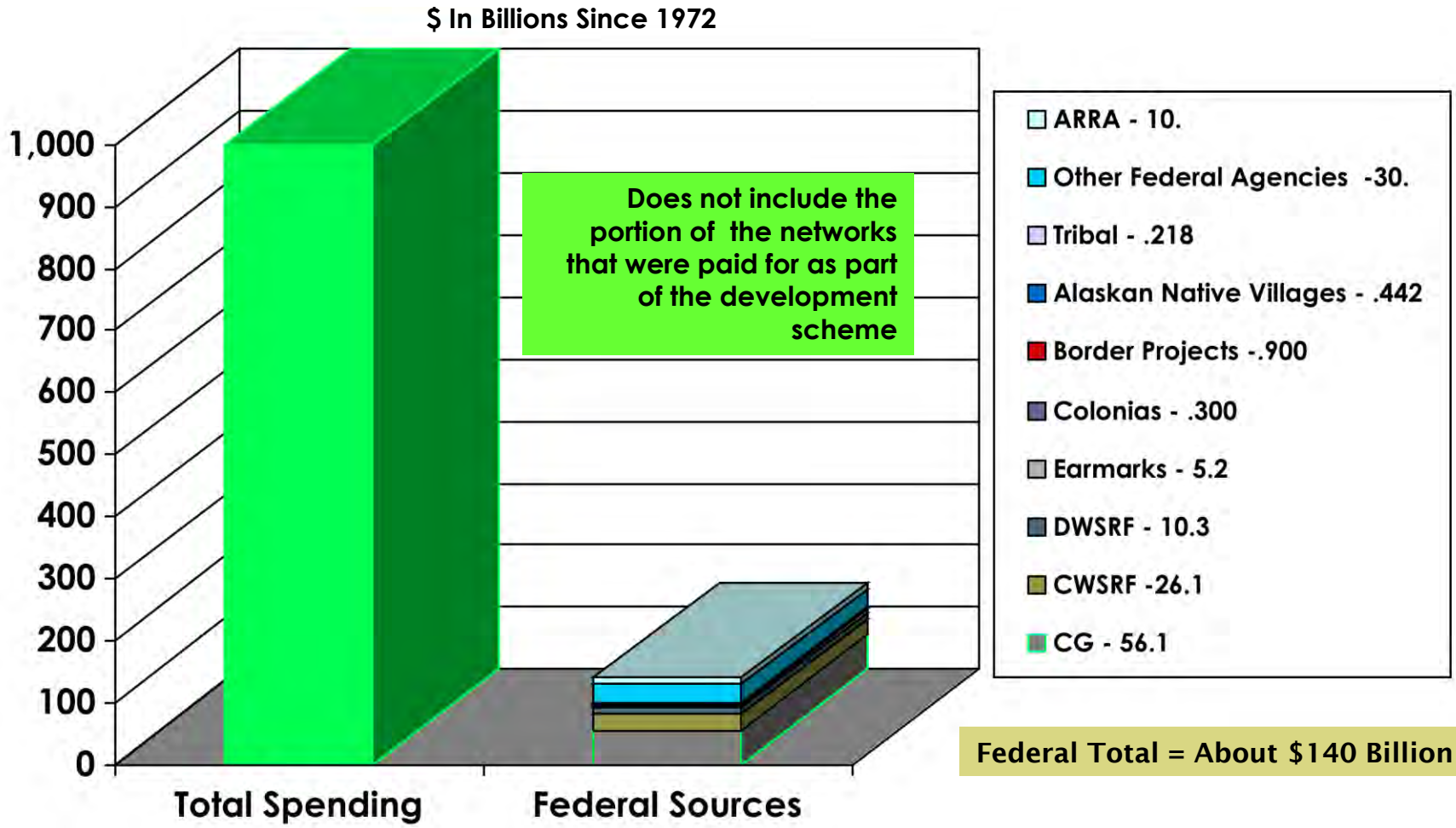
50 Million More People Served



Source: USEPA, Progress in Water Quality. An Evaluation of the National Investment in Municipal Wastewater Treatment, June 2000.

Higher levels of treatment				
	72	82	92	96
Total Plants	19,355	15,662	15,613	16,024
Less Than Secondary	13.4%	19.9%	5.6%	1.1%
Secondary	48.7%	50.7%	58.2%	58.6%
More Than Secondary	2.4%	17.6%	23.6%	27.6%
No Discharge	2.4%	10.2%	12.7%	12.7%

On a National Scale, The Expansion and Upgrade Required Huge Investment Over An Extended Period

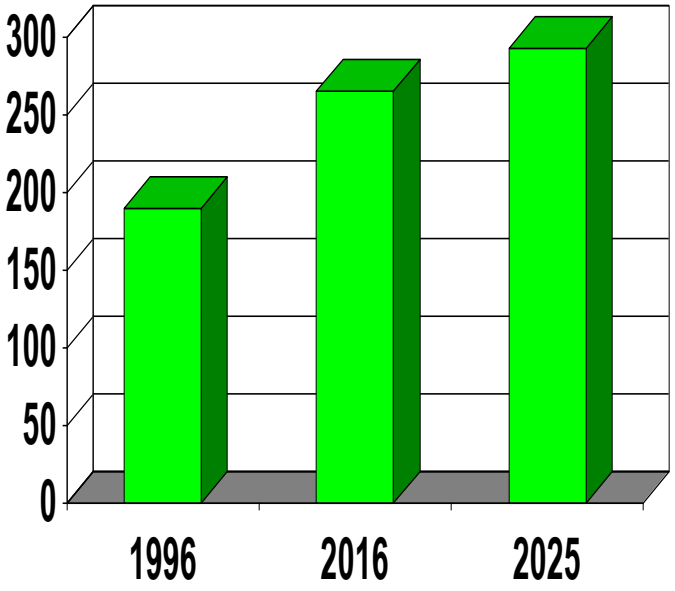


Federal Total = About $140 Billion

The chart represents approximate values

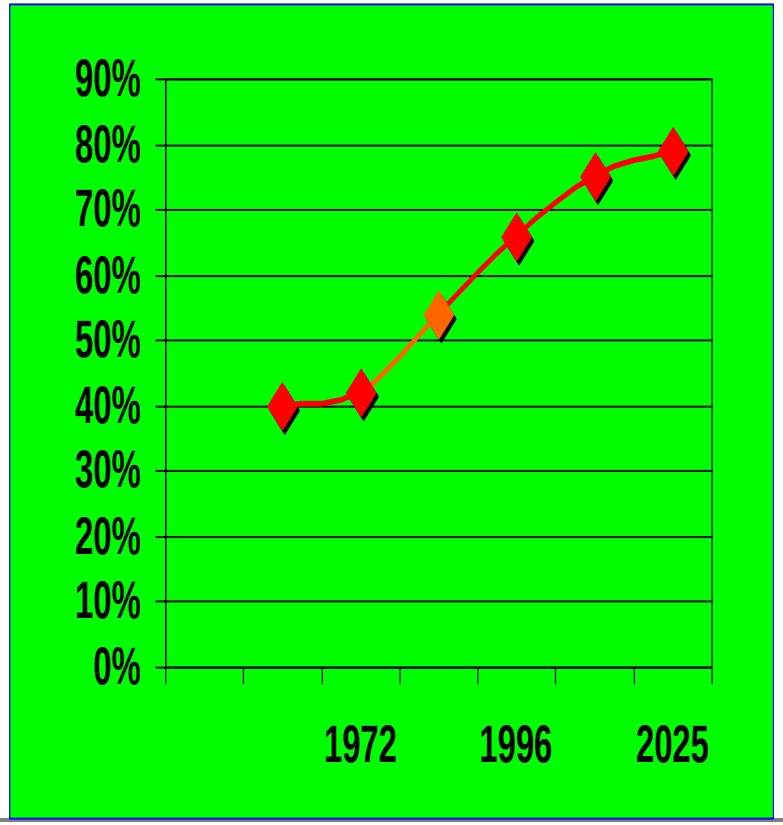
The Emerging Challenge

Additional Served Population1996 to 2025 (In Millions)

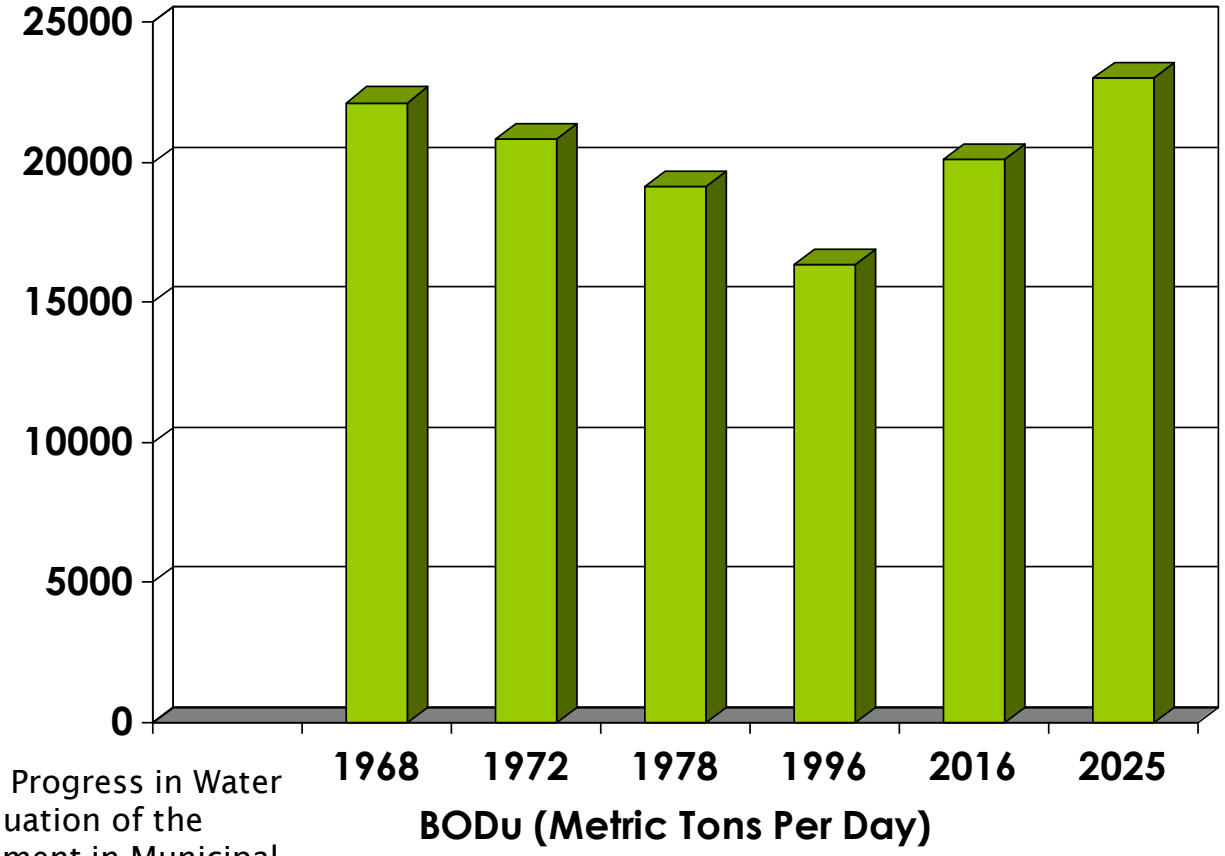


Source: USEPA, Progress in Water Quality: An Evaluation of the National Investment in Municipal Wastewater Treatment, June 2000.

Leveling Off of BOD_U Removal Efficiencies



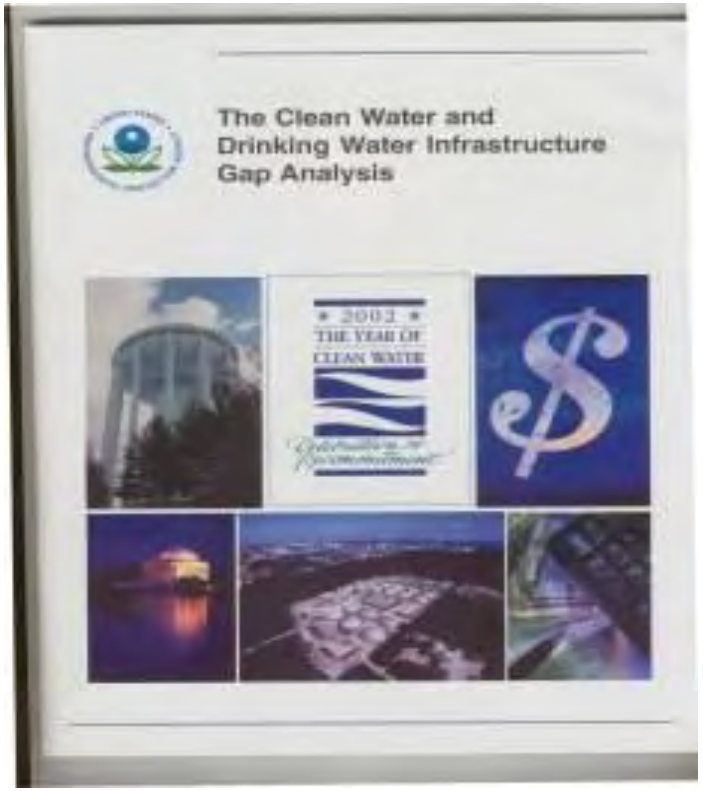
The Projected Growth (Alone), Could Produce BOD_U Loadings Similar to the Mid-1970s



Source: USEPA, Progress in Water Quality: An Evaluation of the National Investment in Municipal Wastewater Treatment, June 2000.

A Gap Report Was Used To Provide a Transparent Starting Point for Thinking About the Challenge Ahead

- The Gap Report Was Released - - WEFTEC 2002.
- The Purpose -- To reach a common quantitative understanding of the (Funding Gap) the potential magnitude of increase in investment needed to:
  - Address growing population and economic needs, and
  - Renew our existing aging infrastructure.



http://www.epa.gov/owm/gapreport.pdf

Asset Management Is a Natural Response to the Gap Analysis

No Revenue Growth Scenario

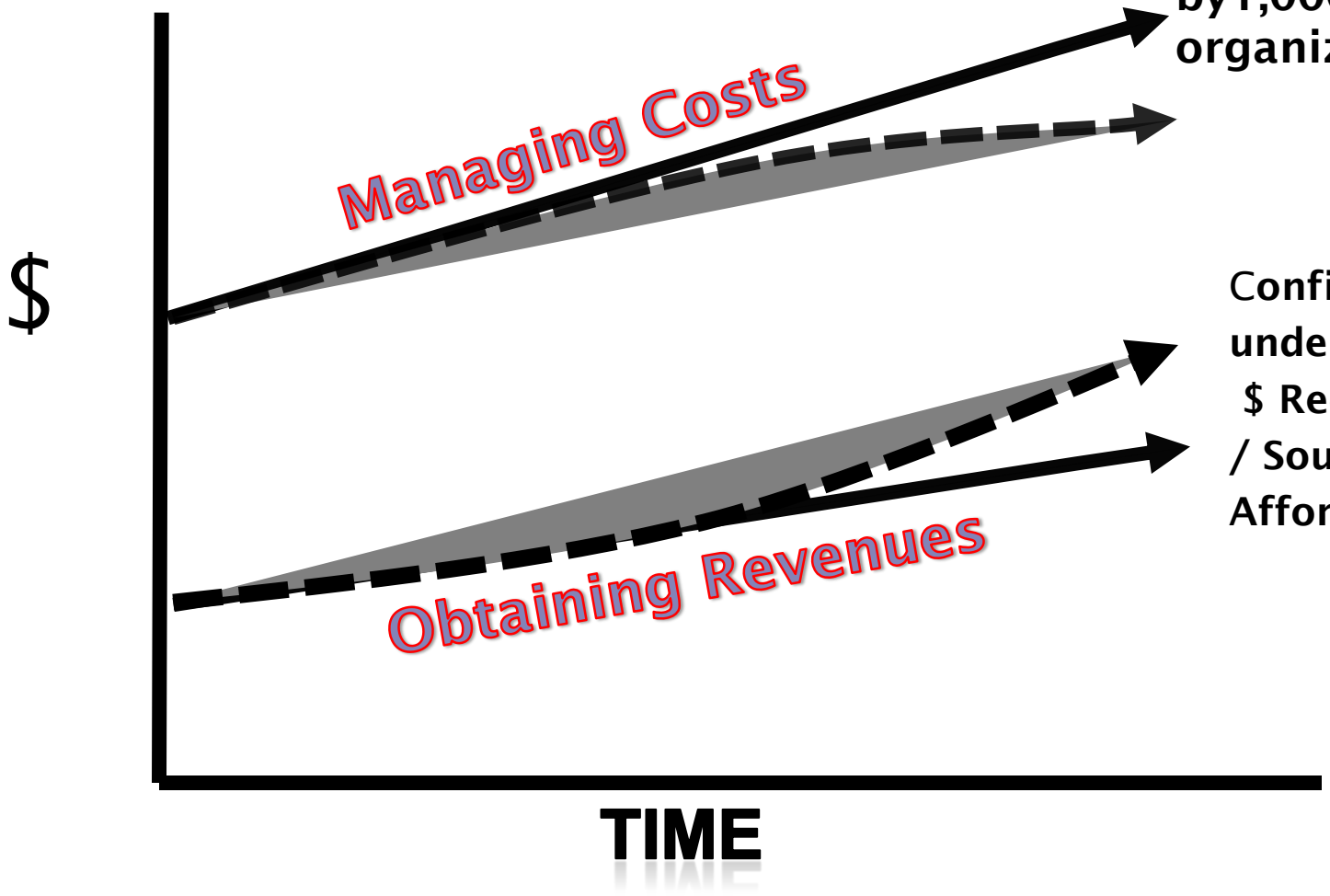
Total Payment Gap (20 Years) (Average in Billions of Dollars)		
	Clean Water	Drinking Water
Capital	$122	$102
O&M	$148	$161
Total	$271	$263

Revenue Growth Scenario

Total Payment Gap (20 Years) (Average in Billions of Dollars)		
	Clean Water	Drinking Water
Capital	$21	$45
O&M	$10	$0
Total	$31	$45

(Annual Rate of Increase - 3% Real)

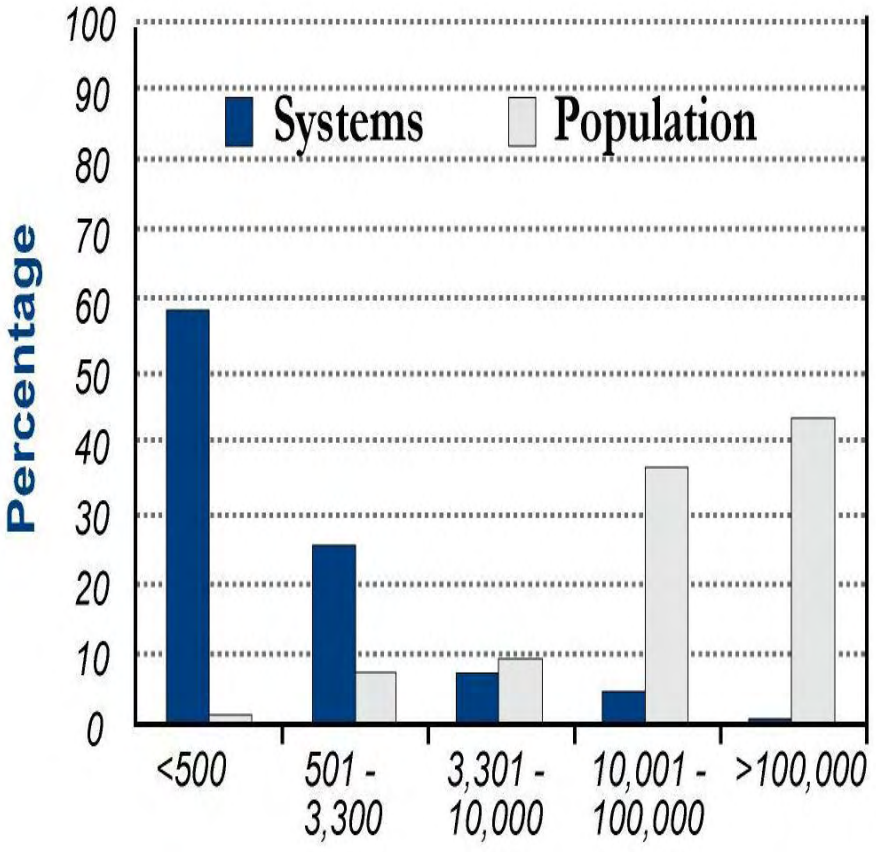
The Policy Thrust of Sustainably Closing the Gap Requires



The Single Most Important Measure of Success in Pursuing a Sustainable Strategy

Service Providers Are Able to Do Their Work Expertly and Carry Forward Advancements in Sustainable Practices

The Institutional Characteristics of the Water and Wastewater Industry Impact Management Strategies



- There are 16,000 public owned wastewater system that serving approximately 75% of the population
- There are 54,000 community based water systems serving about 94% of the population.
- As shown by the graph on the size classes of drinking water systems, we have a lot of small systems, but most the population is served by relatively few large system
- Note that EPA does not own or operate water or wastewater assets.

There Appear to Be Mega-Trends In Ownership and Management Within the Water Sector

- Institutional arrangements are trending more holistic. The focus of organizations is broader (on the full water cycle). The holistic framework affords opportunity to capture additional efficiencies and make least life cycle costs choices in investment strategies.
- Steps are taken toward managing both centralized and decentralized service options and in bring green and gray approaches into a common integrated platform. No one size fits all.
- Asset Management at a strategic and tactical levels forms the process and practice underpinnings for investment decisions.
- In the leading edge, Asset Management structures are becoming more multi-sector oriented where key decisions and priorities are set in the broader context of multiple infrastructure requirements across several service sectors.
- The service are successful being provided in both public or private organizations. In either case, the emphasis is on becoming more business-like, more efficient and more customer oriented in the delivery of services.

Local Strategic Context - -

"It's very, very difficult to run a first class country or city on second rate infrastructure" *LGAC Video*

From a Community Viewpoint

- Successfully leading requires a forward looking sustainable pathway for both community wealth (infrastructure) and natural assets.
- Infrastructure decisions necessitate significant financial commitments. Investment choices accrue benefits for generations.
- Short term constraints are contrasted with long term views regarding best value and intergenerational equity.
- Major decisions take place in a context of known unknowns and unknown unknowns.
- Conflicts arise between regulators and the providers and the ratepayers and the providers. Compulsion is sometimes required.
- Sustainability strategies demand a collaborative way of thinking and acting; the knowledge requirements encompasses scientific, engineering, public policy, business and HR skills.

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From a Systems Standpoint, Our Systems Do Not Represent An "*All Broke Crisis, Today*" But, Are On the Way to presenting a Persistent Systemic Problem

- Our systems are aging.
- The status quo will result in increased public health and environment risk.
- Failure to manage the assets based on least life cycle costs strategies will require more revenues over the long term to meet service objectives.
- We can do better!

A sustainable pathway requires the ability to make smart investments driven toward long term outcomes

- Customers need to understand what a utility does!
- They need to believe that it has value!
- They need to be able to accept as true that the way the work is done (The Practices) are competent, if not exceptional!

The need to be good

The need to be transparent

This about Process, practice, tools

and improved data for decision making

Asset Management relates to sustainability

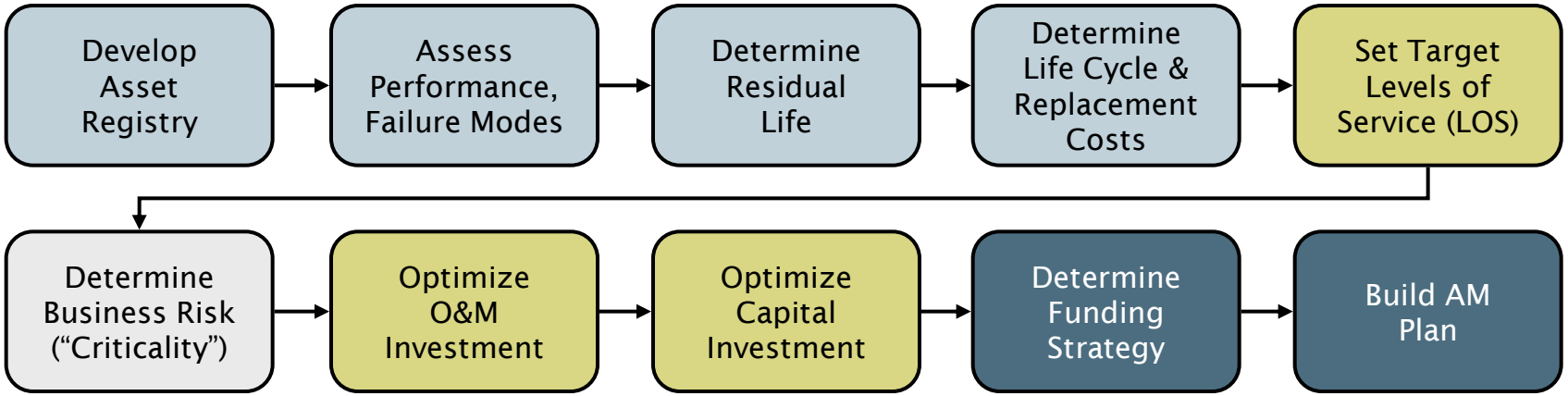
It's A Critical Building Block

- Better acquisition, operations, maintenance, and renewal and replacement DECISIONS makes a sustainable strategy more manageable.
- A focus on the "How to" aspects of making better choices helps achieve service objectives at least life cycle costs.

Our Asset Management Efforts Have Focused On Knowledge Transfer, Training and Collaboration

1. What is the current state of my assets?

2. What is my required level of service?

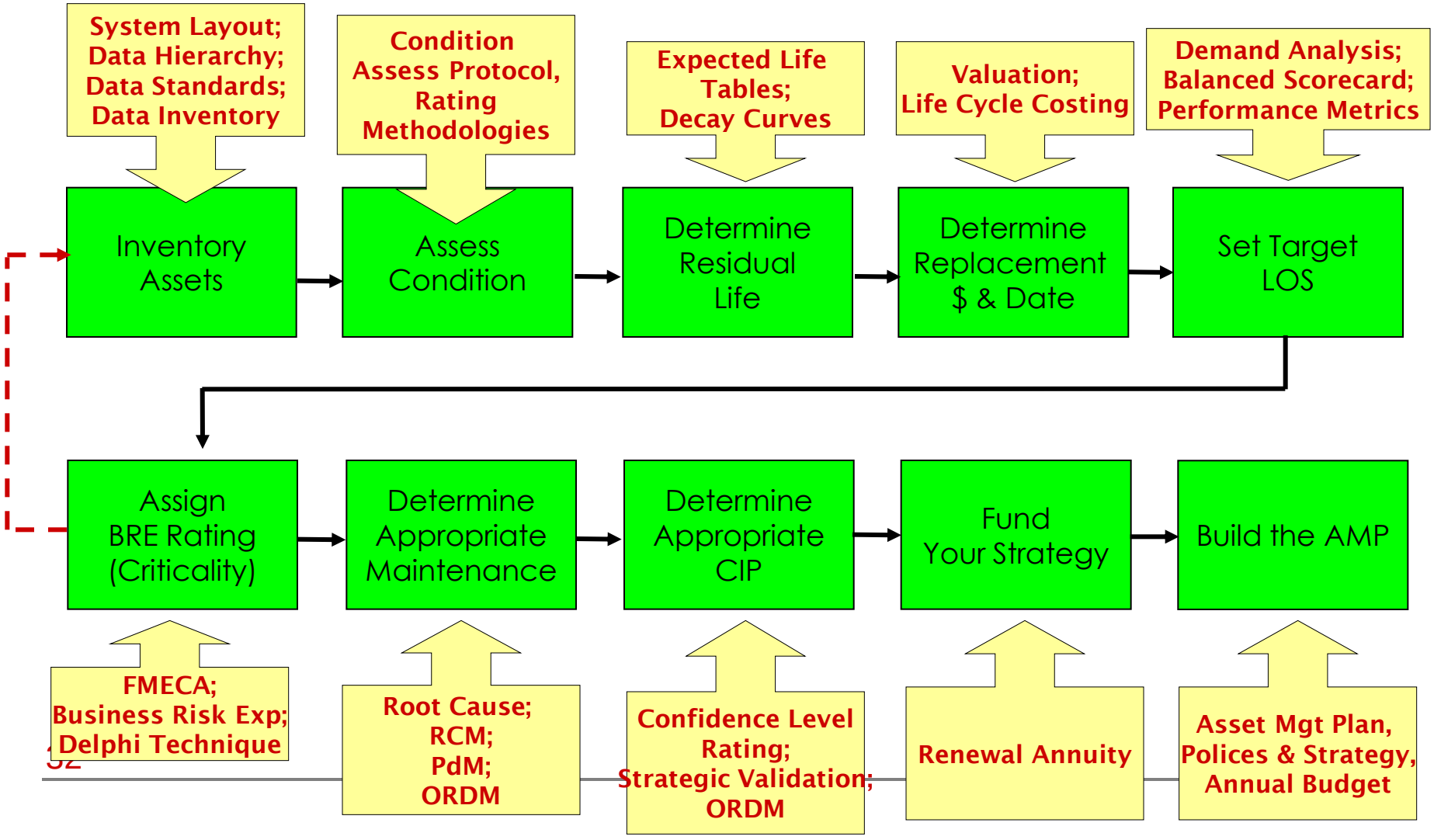


3. Which assets are critical to sustained performance?

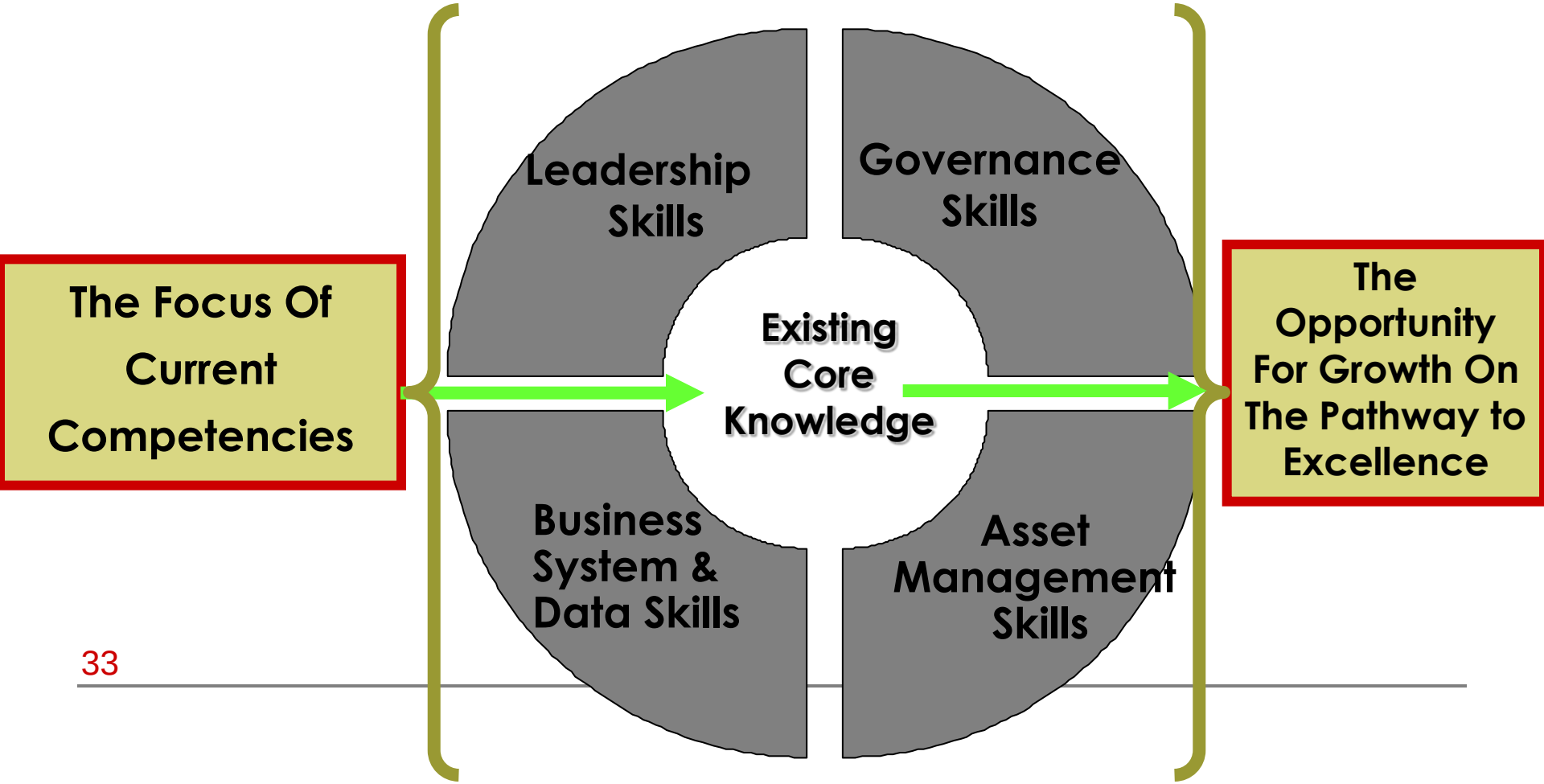
4. What are my best O&M and CIP investment strategies?

5. What is my best long-term funding strategy?

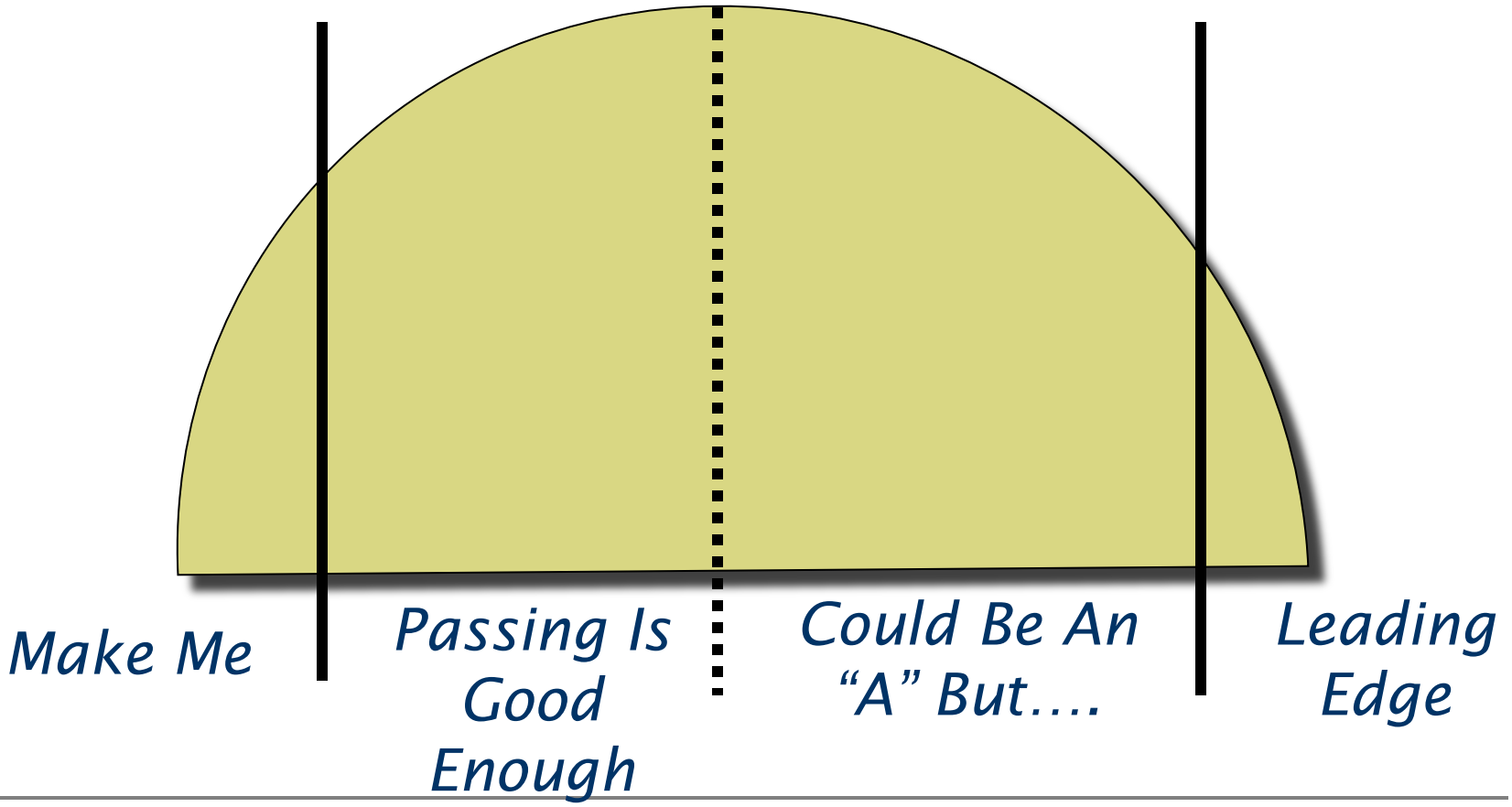
New Knowledge Is Mostly About The "How To" Requiring the Development, Mastery and Transfer of Tools and Technique



Harvesting the Analytic Value of Applying More Advanced Approaches Demands Additional Skills



Obviously, Attitude Plays a Major Role In Establishing a Sustainable Situation. Knowledge Transfer Efforts Are Focused on Early Adopters.



Improving Asset Management Practices Is a Foundation Issue. The Direction Is Relative Easy to Envision, But Difficult to Make It Happen. These Are the Elements:

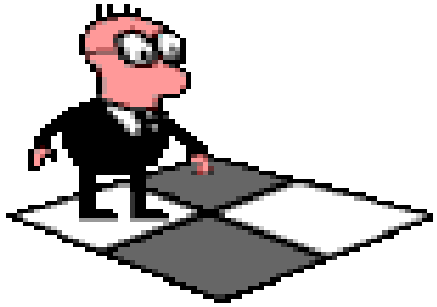
- Take actions that support and promote universal adoption of advanced asset practices and there are lots of approaches.
  - Sustain Communities. Assure investments are aligned with sustainable principles. Every dollar from every source for every purpose is an investment decision.
  - Think First. Focus on upfront planning - - invest dollars early to save long term.
  - Build Confidence that the choices are the right ones.
    - ✓ Invest in research and decision support (guidance, case studies, tools, etc).
    - ✓ Invest in knowledge transfer through training and education initiatives.

Improving Asset Management Practices - - Continue

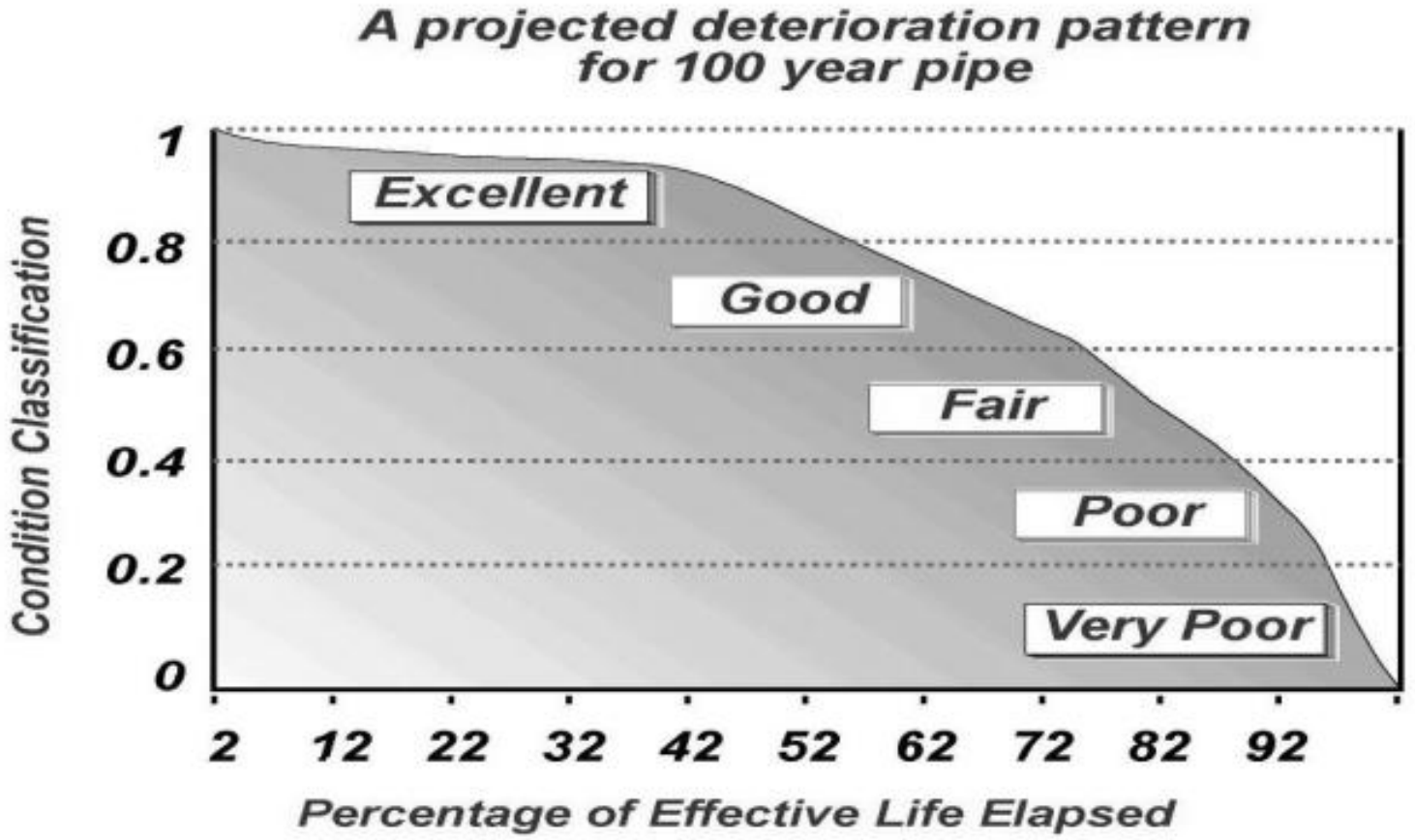
- Require Asset Management Plans as a platform for integrating base programs such as permitting, funding and enforcement activities with initiatives such as green investments, energy and water conservation, climate adaptation, and capacity development. Investments are made in the context of the asset plan. Improve the processes and data quality used in supporting decisions.
- Document Progress. Defined and track success against triple bottom line measures for social, economic and environmental objectives.

- Professionalize the practice. Bring about practice excellence through knowledge development and transfer initiatives. Facilitate opportunities and venues for education and training. Document the learning process through the certification and credentialing.
- Collaborate with other sectors. Encourage multi-sector AMPs & cross-sector partnering.
- Advance by taking small steps in the right direction. (continuous improvement)

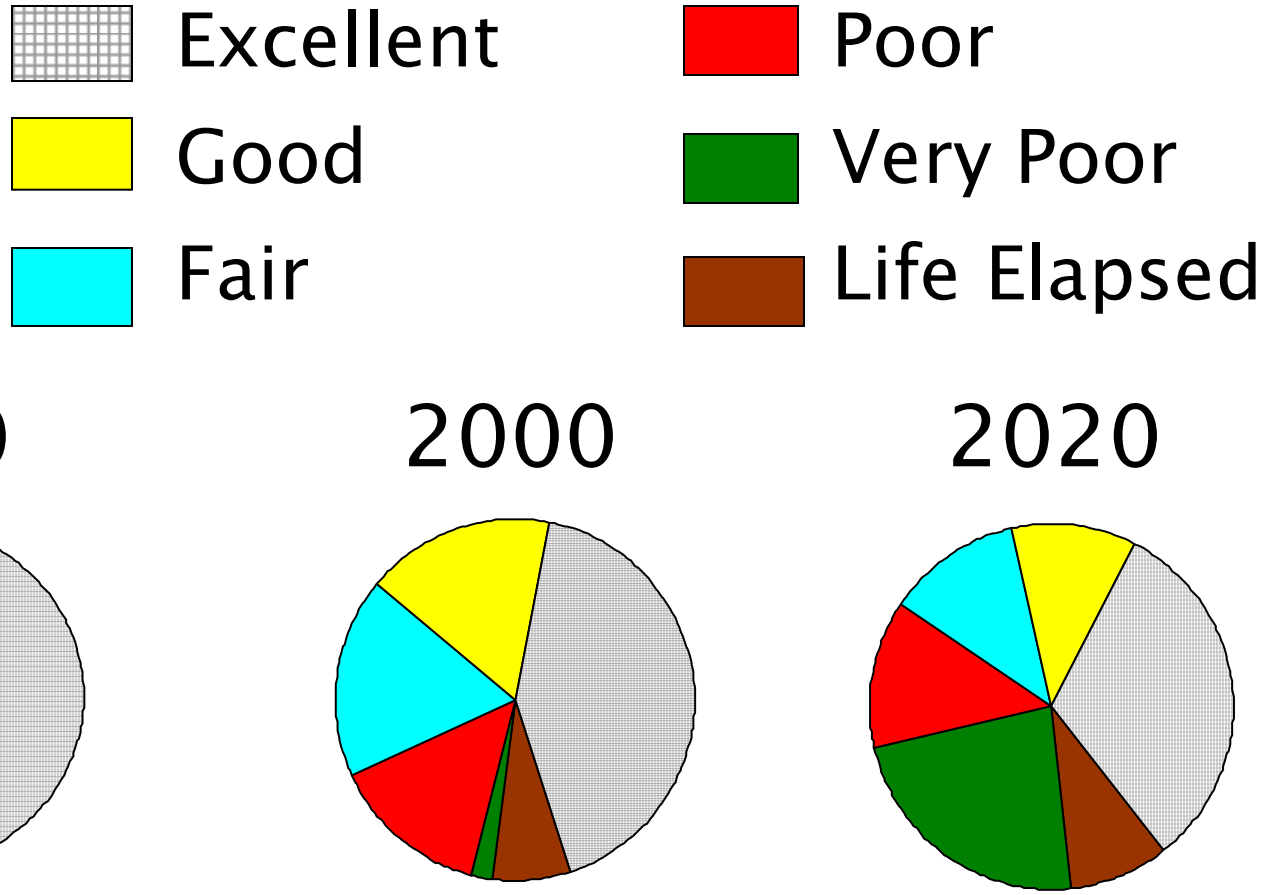
There Are Several Take Home Messages



Some Asset Deteriorate Quickly, Others Over Generations

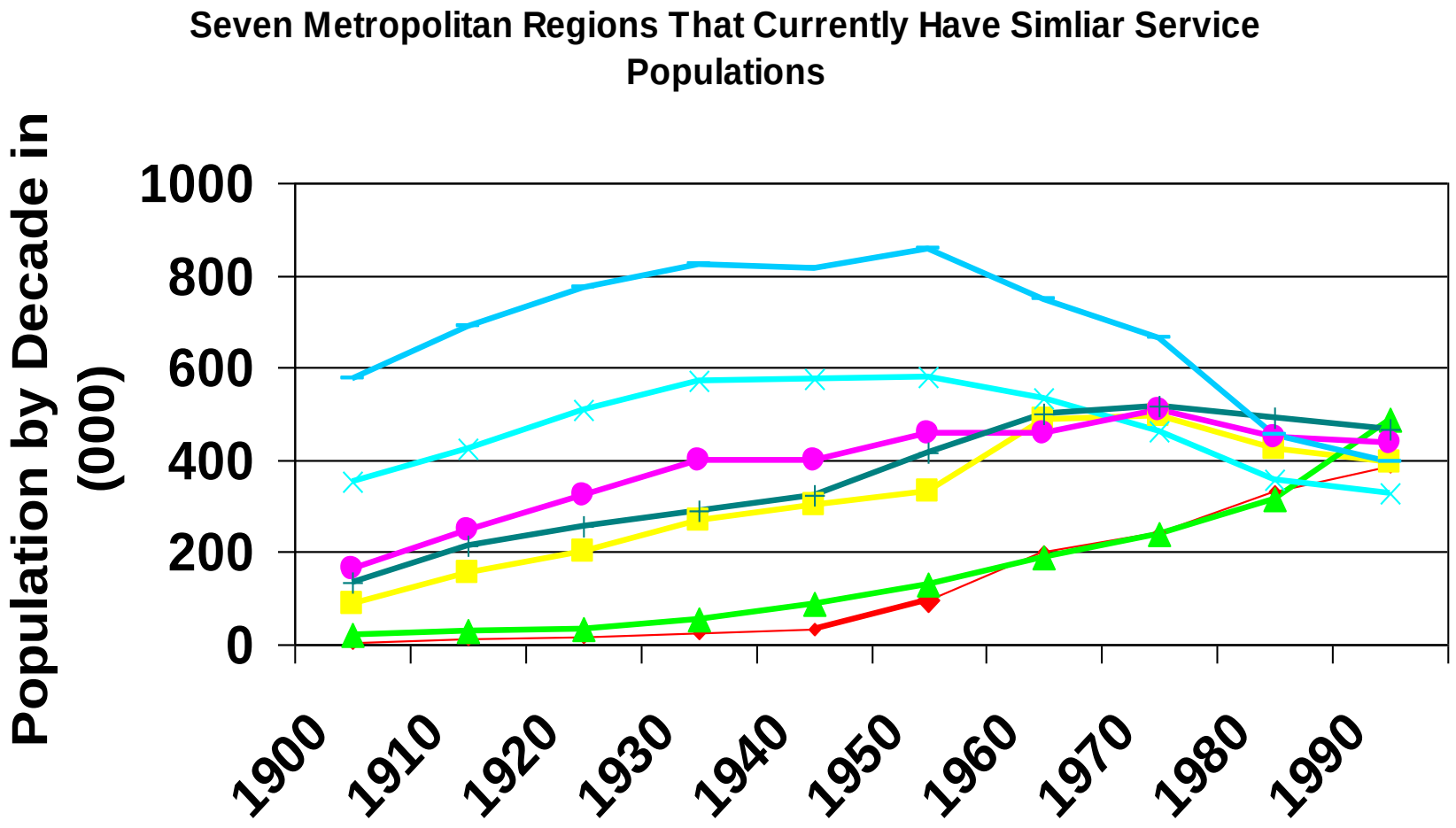


More Pipe In Lower Condition Levels Will Impact Costs and Performance



Approximately 2 - 2.5 Million Miles Water / Wastewater: Public / Private

A Particular Situation Is a Reflection of the Demographic Patterns of the Specific Region.



What services costs in Prosperville, may not provide valuable insight into the costs of services in Bommertown. Specific knowledge is required.

All Assets Are Not Equal!

- (Criticality) is a function of:
  - “Consequence” &
  - “Likelihood” of Failure

Respect the Value and Quality of Information!

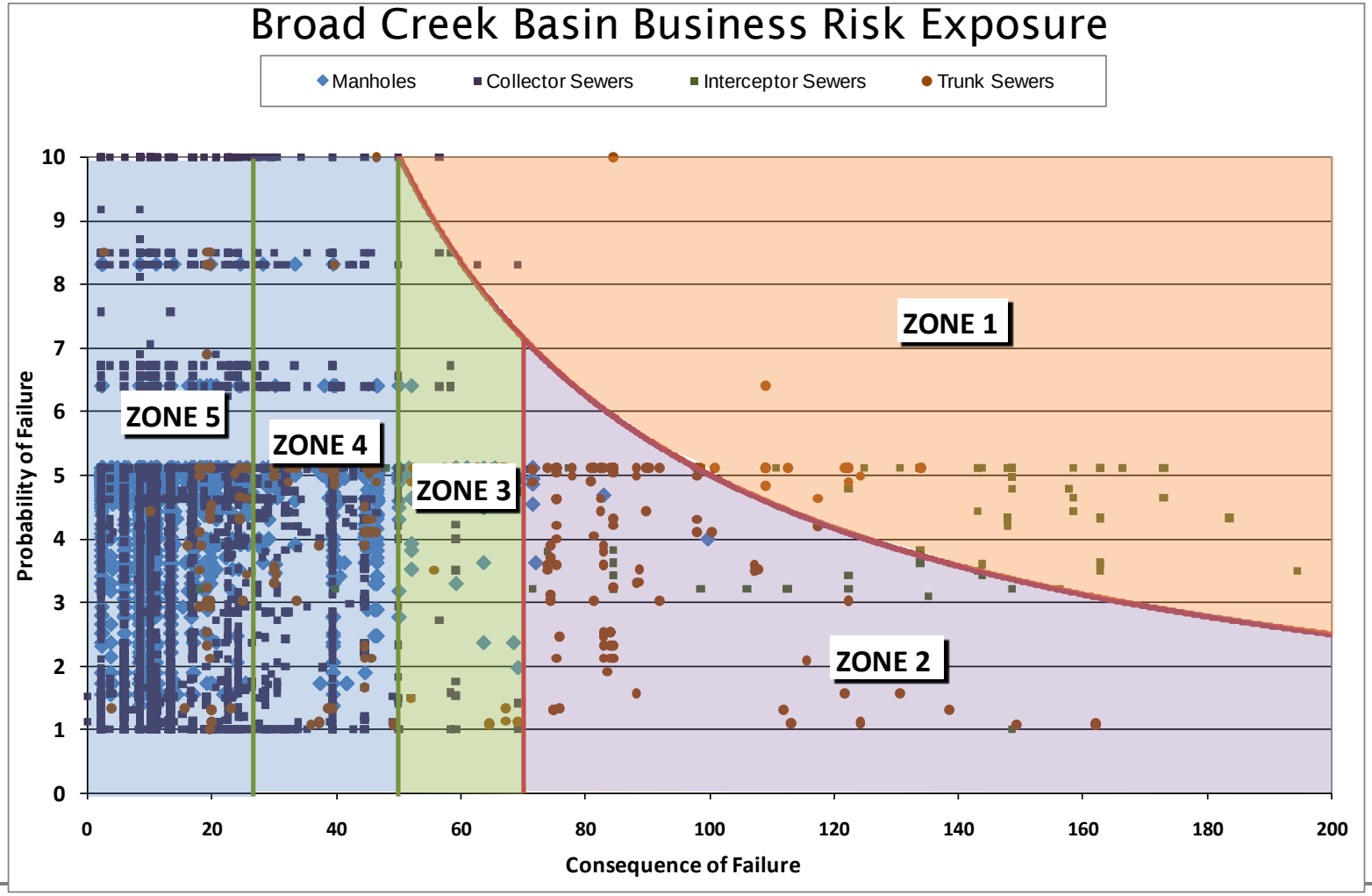
Best Appropriate Process + **Quality of Data Used** = **Confidence That the Course Is the Right One!**

Capital, Operations, Maintenance, Repair, Renewal, Replacement

It’s all investment!

What Does Mature Practice Look Like?

Assets Are Critical to Sustained Performance *Broad Creek Basin*



Start Simple: Grow the Practice

What do you need to know to have confidence that a course of action is the right thing to do, at the right time, at the right costs.

End of This Module Thank You for Your Time!

Websites & Video Sources

http://www.epa.gov/owm/assetmanage/index.htm

http://www.epa.gov/awi

https://courses.worldcampus.psu.edu/public/buried_assets/

http://www.epa.gov/waterinfrastructure/lgac_video/index.html

http://liquidassets.psu.edu/