
America's Pathway

To Sustainable
Water and
Wastewater
Services



This presentation

- The Context Of The Current Service Challenge in the United States.
 - The Character of Water Assets
 - Where The Resources Come From.
 - The Organizational Structure of Service Providers.
 - The Demographic Underpinnings.
 - A Generation of Expansion and Upgrade.
- The Gap Analysis
 - Upcoming Growth in the Economy and Population.
 - The Implications of Aging Assets.
- A Period of Change - - Recognizing and Pursuing Opportunities.

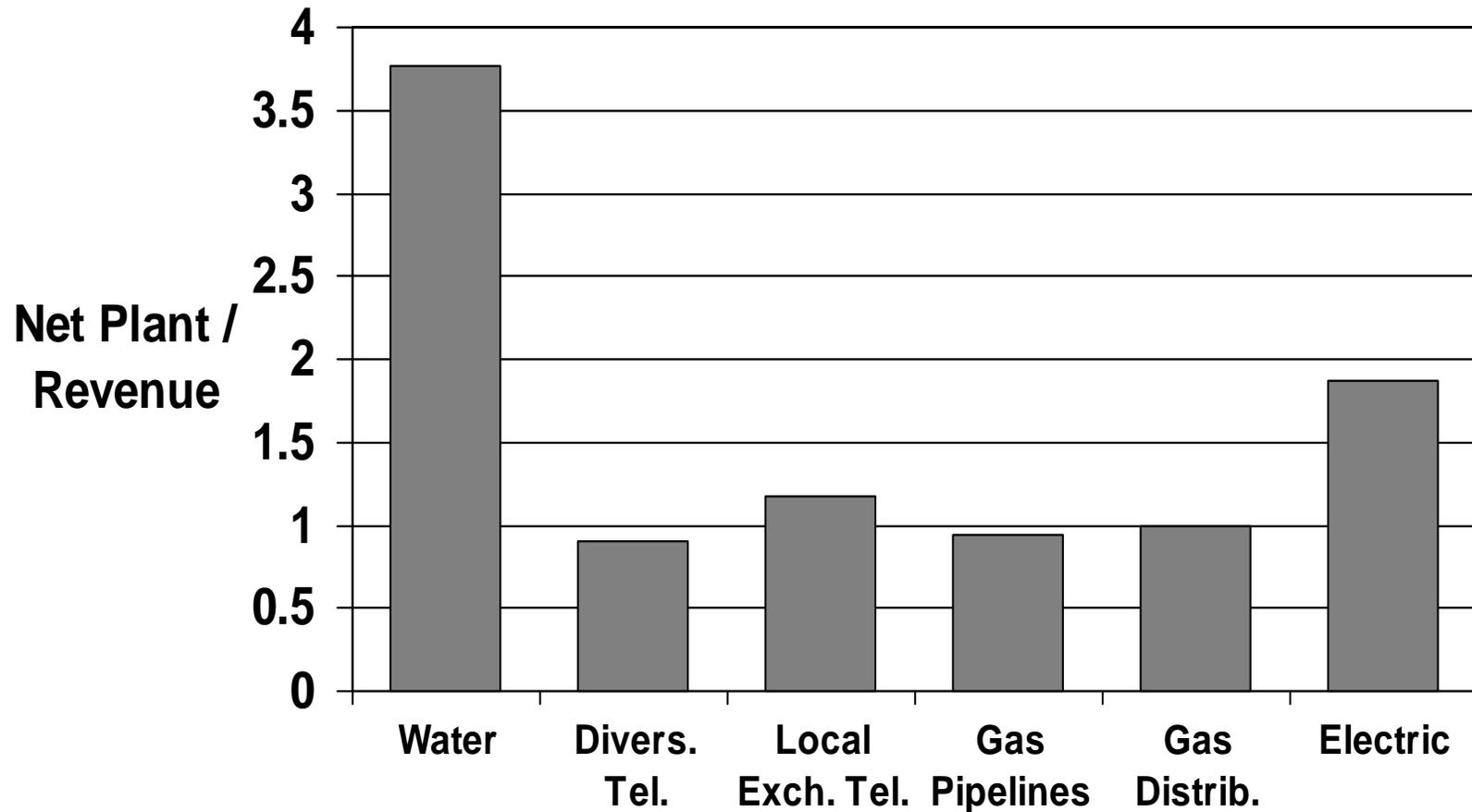
Strategic Context - -

“It’s very, very difficult to run a first class country or city on second rate infrastructure” LGAC Video

Water related infrastructure

- Generally very large.
- The costs are usually “sunk”.
- Asset lives are long.
- The services are often major inputs into a wide range of other industries and activities.
- Frequently substantially impacted by other types of infrastructure decisions, especially choices about land use and the density of urban development.

Water and wastewater systems are capital intensive



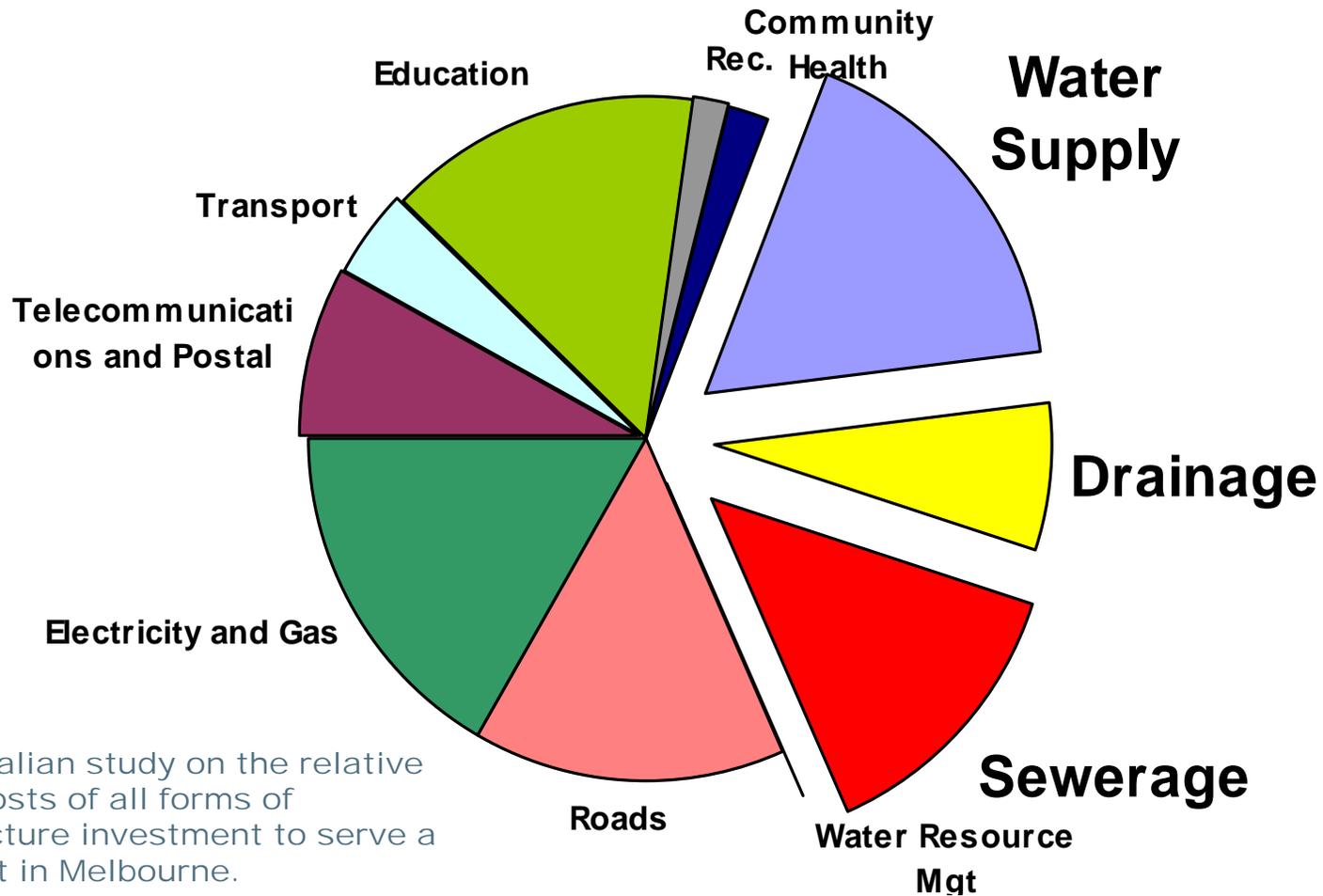
Purvenas, T.J., "Infrastructure Replacement - Credit Quality Concerns,"
Water, Spring 1998, National Association of Water Companies, Washington, D.C.

The characteristics of water infrastructure assets

- The systems are maintained in perpetuity (Grandfather's axe).
- Large networks are made up of components that are replaced, but network service potential remains constant.
- Don't actually (physically) depreciate on a straight line basis - that is, loss of service potential is not evenly distributed across time.

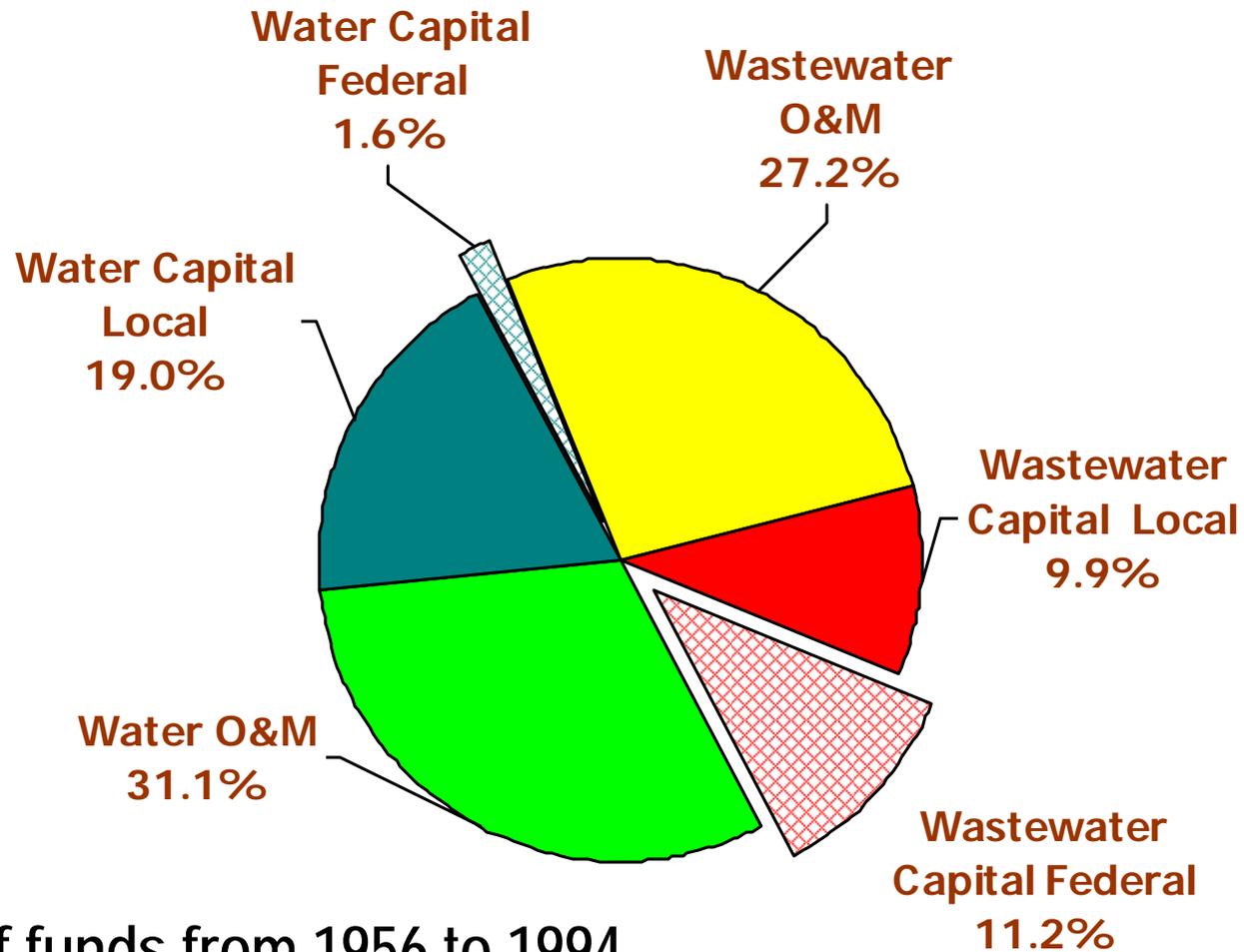


Water, sewerage and drainage (30 to 35%) of All Capital Investment in an urban lot



An Australian study on the relative capital costs of all forms of infrastructure investment to serve a typical lot in Melbourne.

The vast majority of the resources are from local sources



Sources of funds from 1956 to 1994

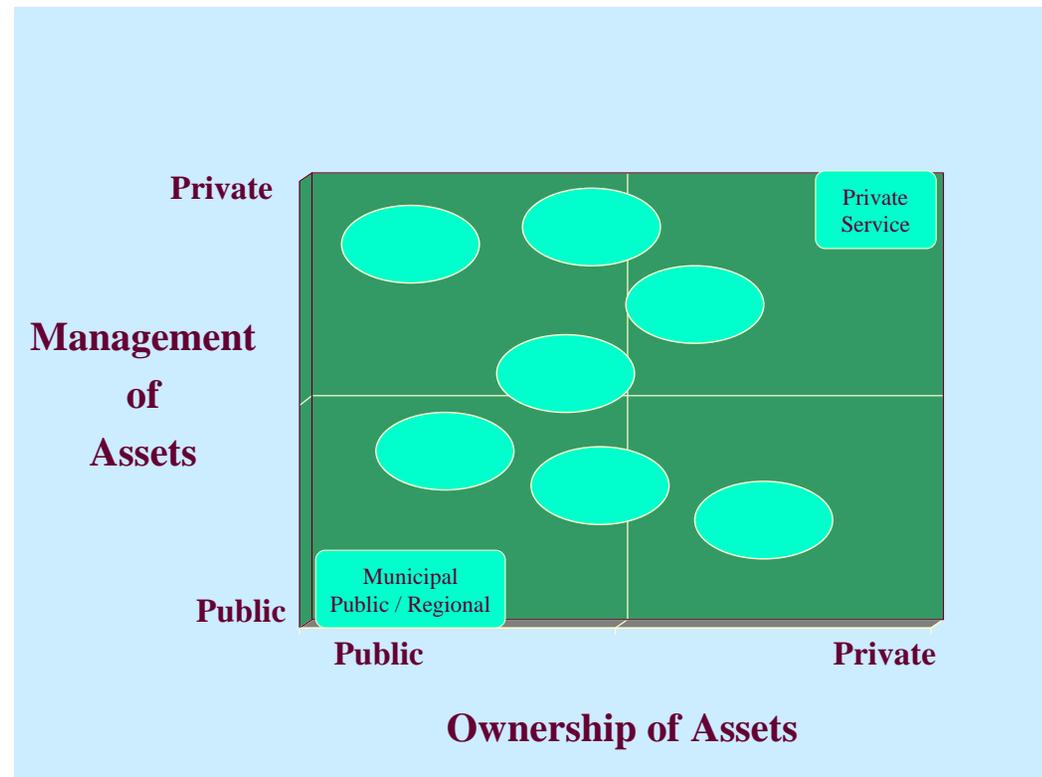
Highly decentralize management



- There are 16,000 public owned wastewater systems serving 75% of the population through centralized systems
- There are 54,000 community based water systems serving about 94% of the population through centralized systems
- The remainder of the population is served by on-site systems and private wells
- Most of the systems are small or very small
- However, most of the population is served by a relatively few large systems

Every model of ownership and management

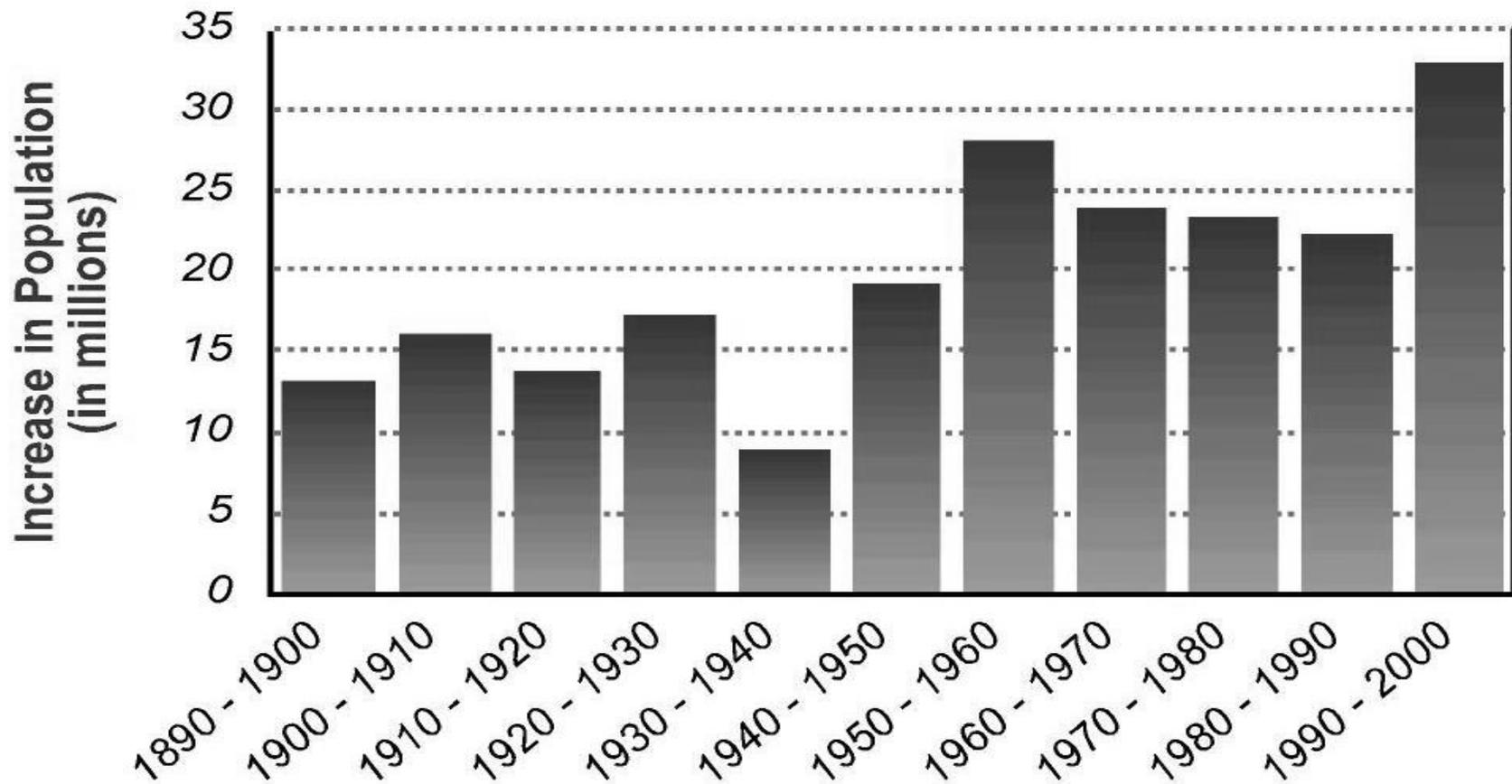
- Public Services
- Corporate
- Service and Leasing Contracts
- Concession Models
- Fully Private



The Demographics of People and Systems Are Important!

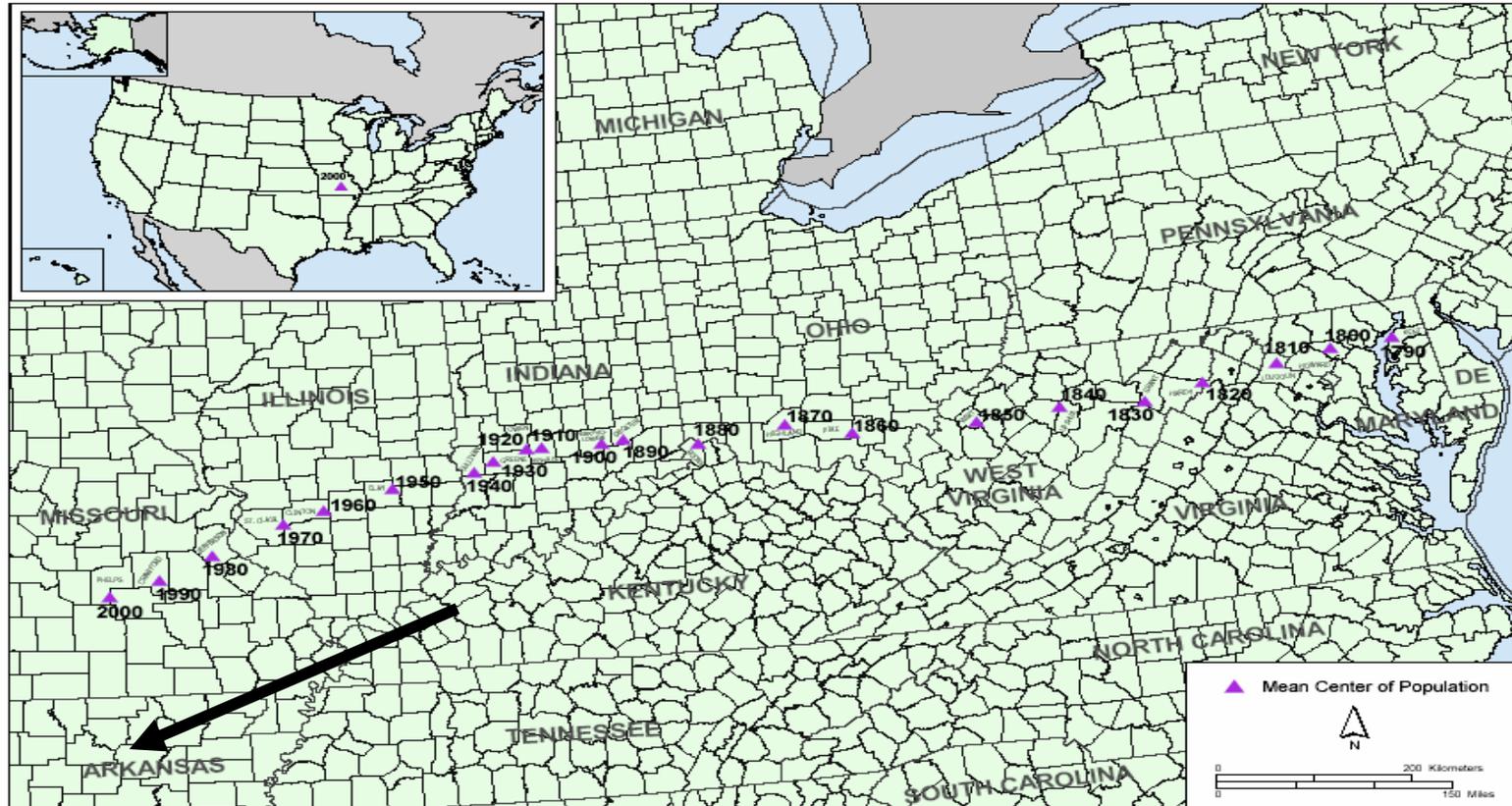
Long Life Assets (Water Infrastructure) Are Highly Impacted By Growth Patterns and Long Term Demographic Shifts.

The nation's demographic pattern



Population shifts

Mean Center of Population for the United States: 1790 to 2000

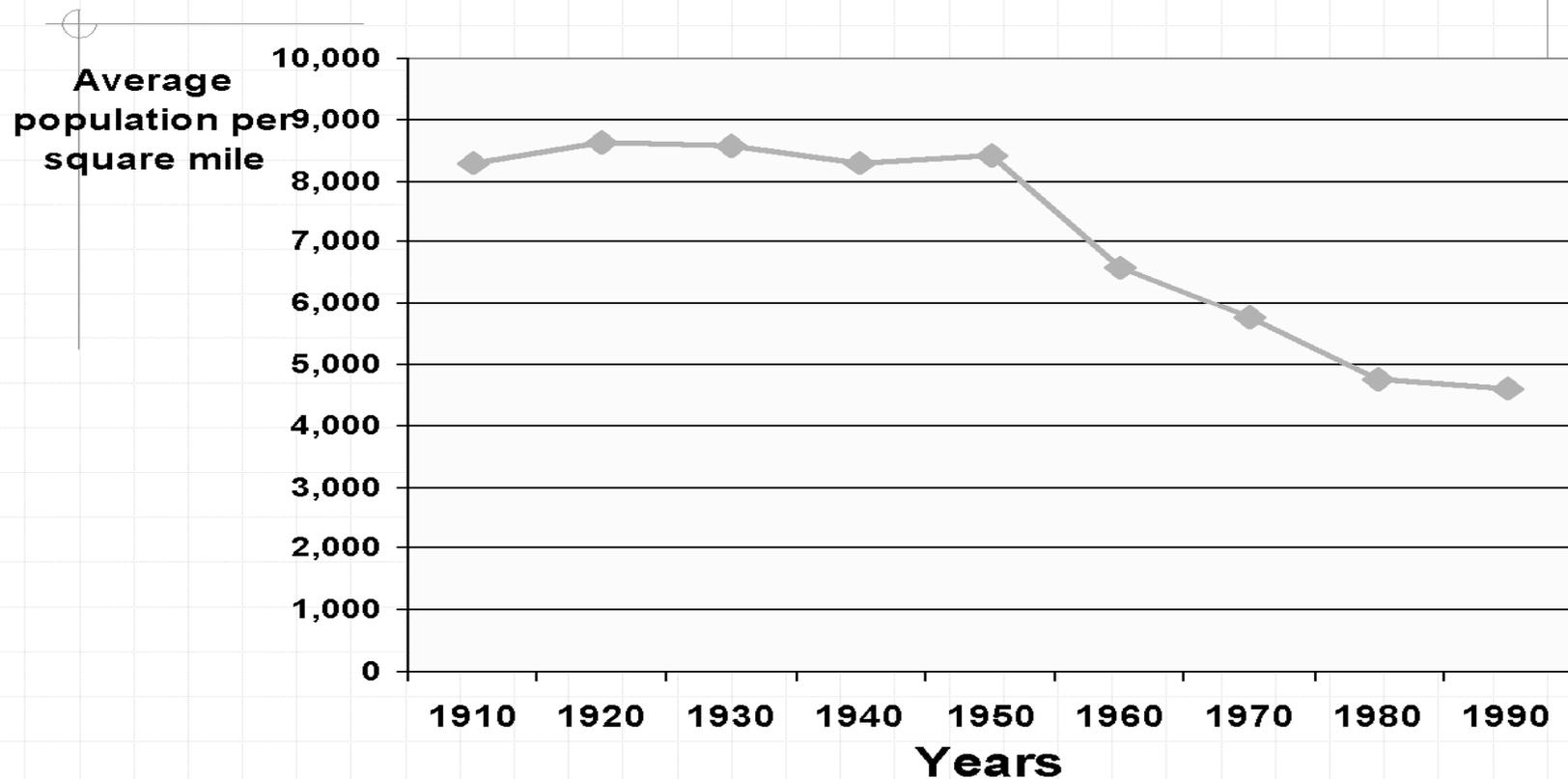


U.S. Department of Commerce Economics and Statistics Administration U.S. Census Bureau

Prepared by the Geography Division

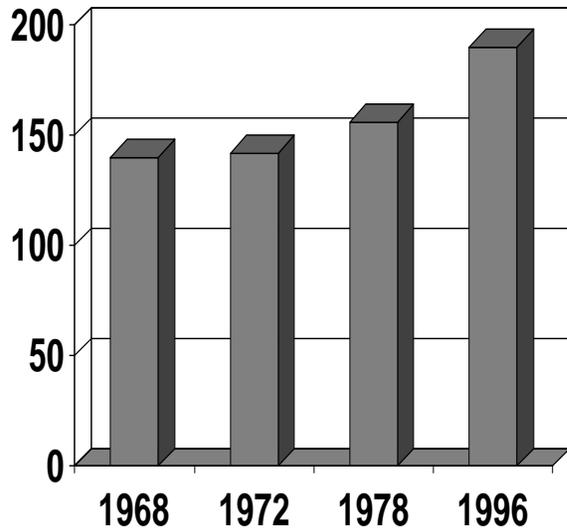
Changing patterns in land use density

**The average density of the urban population started a dramatic decline after 1950
(The 100 largest cities)**



Over the last several decades investments in expansion and upgrade

50 Million More Served

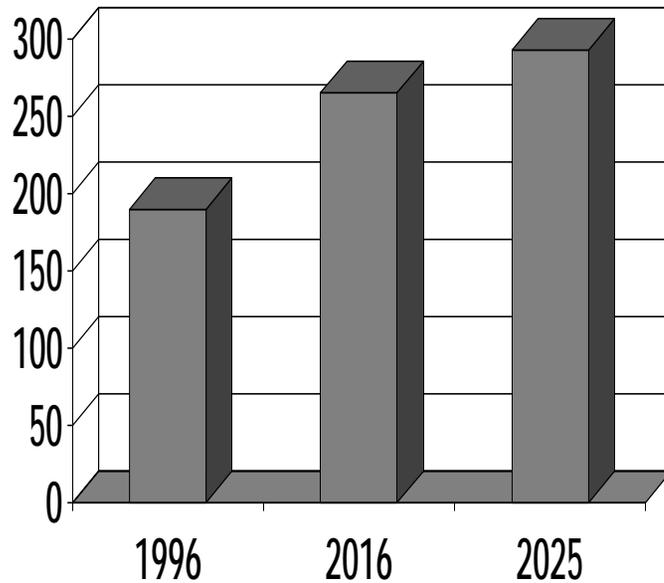


Source: USEPA, Progress in Water Quality. An Evaluation of the National Investment in Municipal Wastewater Treatment, June 2000.

<u>Higher levels of treatment</u>				
	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%

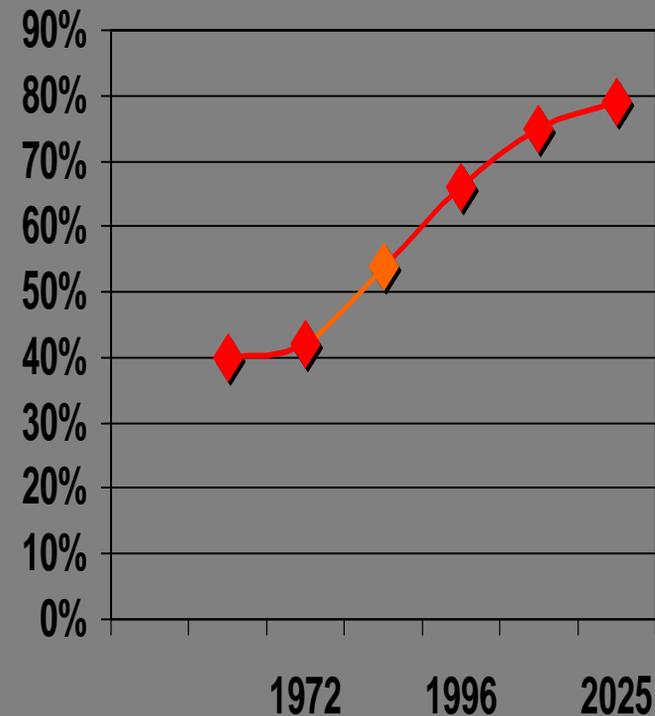
The emerging challenge

**Additional Served
Population 1996 to 2025
(In Millions)**

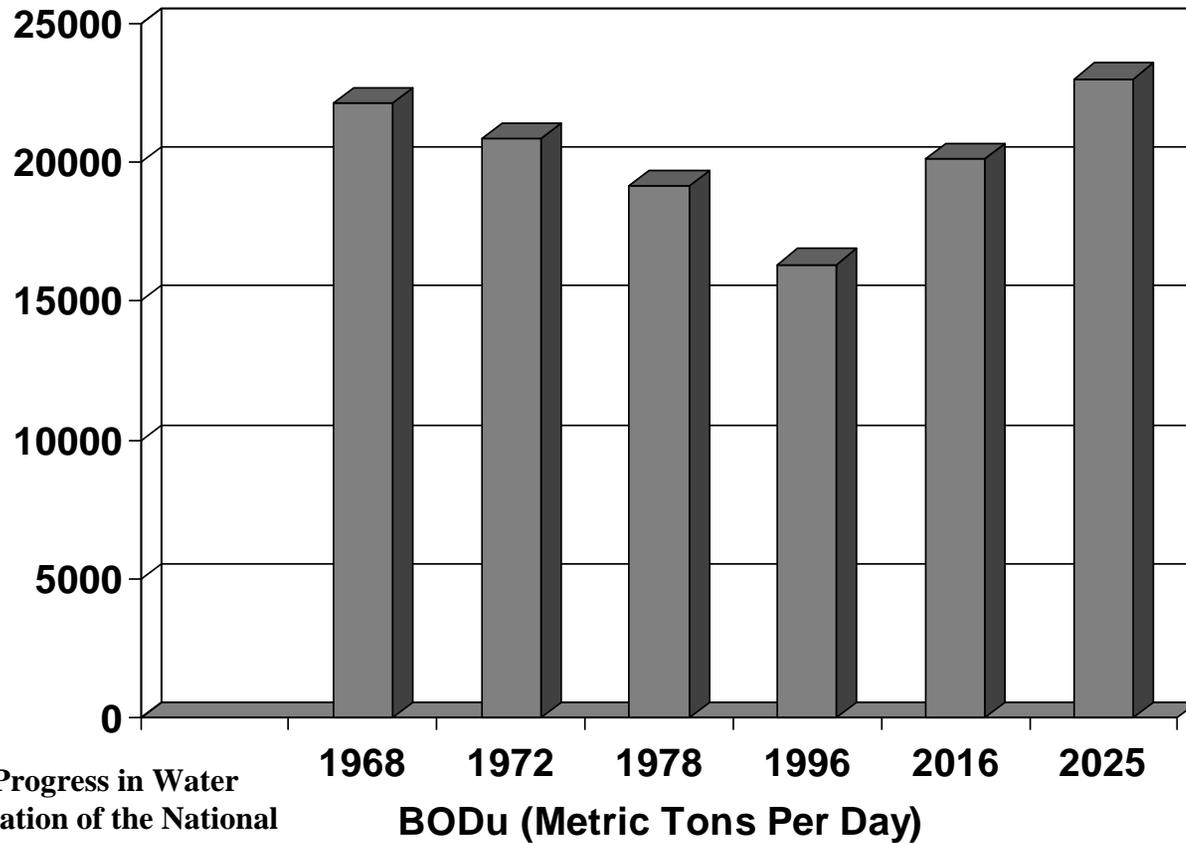


Source: USEPA, Progress in Water Quality: An Evaluation of the National Investment in Municipal Wastewater Treatment, June 2000.

**Leveling Off of BOD_U
Removal Efficiencies**



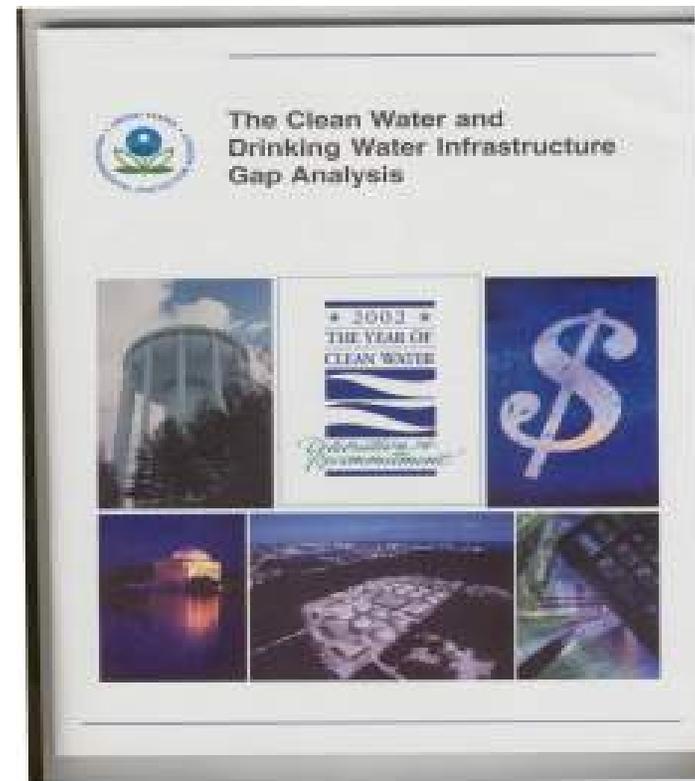
The projected growth alone, could produce BOD_u loadings similar to the mid-1970s



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

A Gap Report provided a transparent starting point - -

- 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>

The Findings (2000-2019)

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 Analysis

- Does not predict fate - - it identifies the challenge.
- Once the situation is understood, steps can be taken to do something about getting somewhere else.
- Identifying the elements of the challenge allows resources to be used where it counts most.
- Early understanding provides time to take steps to mitigate adverse outcomes and reach consensus on a pathway forward.

This is not a “ *All Broke Crisis*” but, on the way to 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.

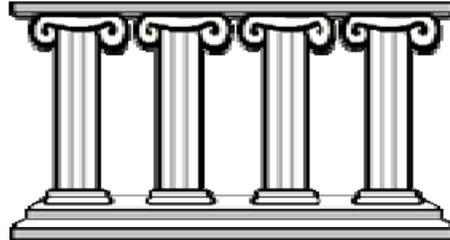


Placing an emphasis on tackling the problems produced results, however !

- Infrastructure challenges are not addressed through a one time fix, but rather a sustained commitment.
- The emerging focus is on taking the steps necessary to retain the gains achieved from the major investments of the last thirty years.
- The largest aspect of meeting the emerging challenge is that for the first time, in addition to making new investments, repair, renewal and replacement of existing systems is projected to become a large and growing aspect of the managerial and financial requirements.

EPA's agenda

- SRF Plus



- ✓ Better management
- ✓ Water efficiency
- ✓ Full cost pricing
- ✓ Watershed approach



The most important consideration in pursuing a sustainable strategy?

That Utilities Are Able to Do Their Work Expertly On Into The Future



A paradigm shift...

- Transition from *building and operating* to *managing* assets
 - Extending asset life
 - Optimizing maintenance and renewal
 - Developing accurate long-term funding strategies
- *Sustain long term performance!*

Managing service is about becoming expert at....



Acquisition

Maintenance

Repair

Renewal

Replacement

Decision Making

Two Things To Think About:

How Do We Deploy
Our Human
Resources?

&

How Do We Optimize
The Value Of Our
Physical Resources?



Preconditions for a utility to gain community support for a sustainable pathway

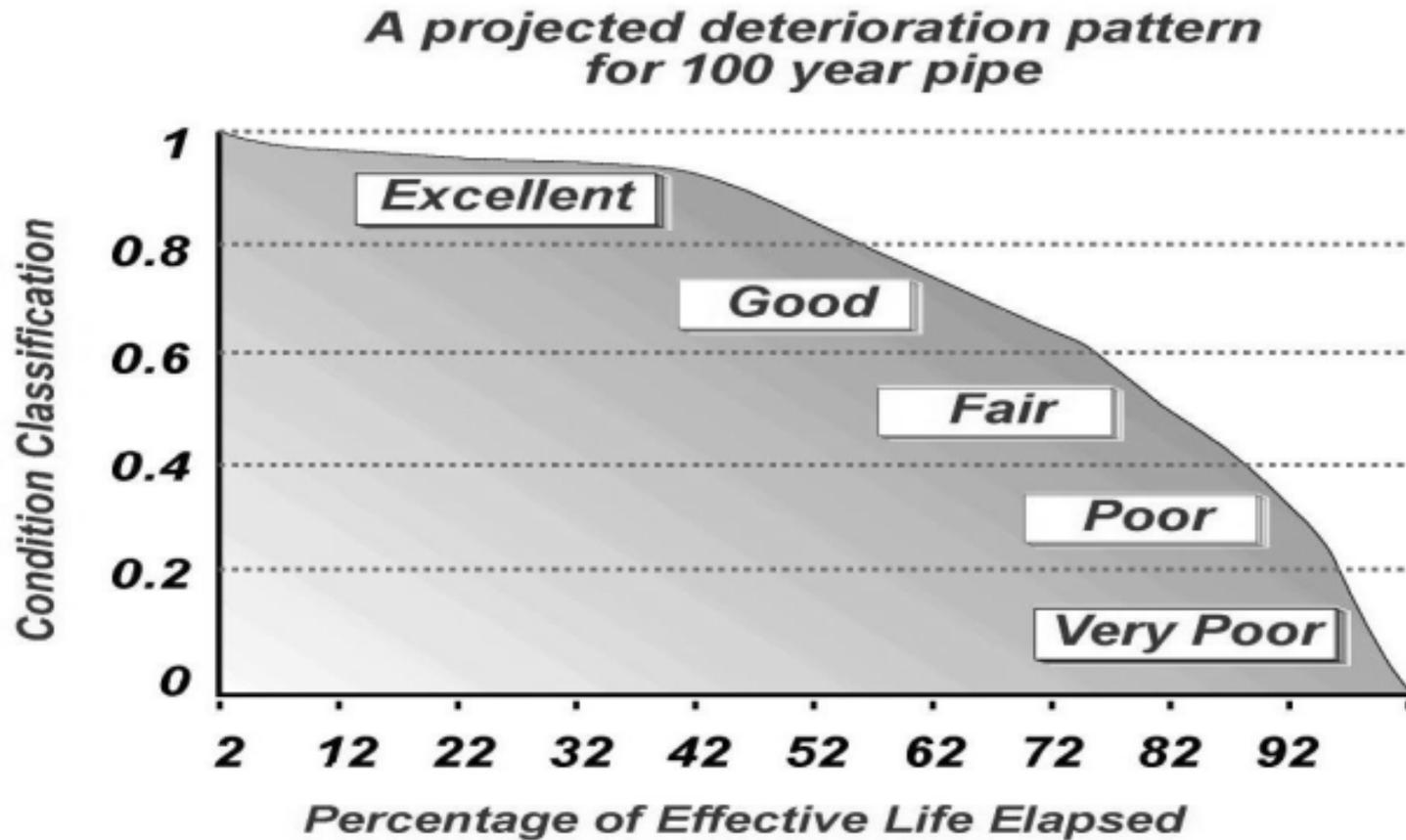
- Customers need to understand what a utility does!
- They need to believe that it has value!
- They need to be able to accept as true that the way the work is done (The Practices) are competent, if not exceptional!

The Need To Be Good
The Need To Be Transparent.

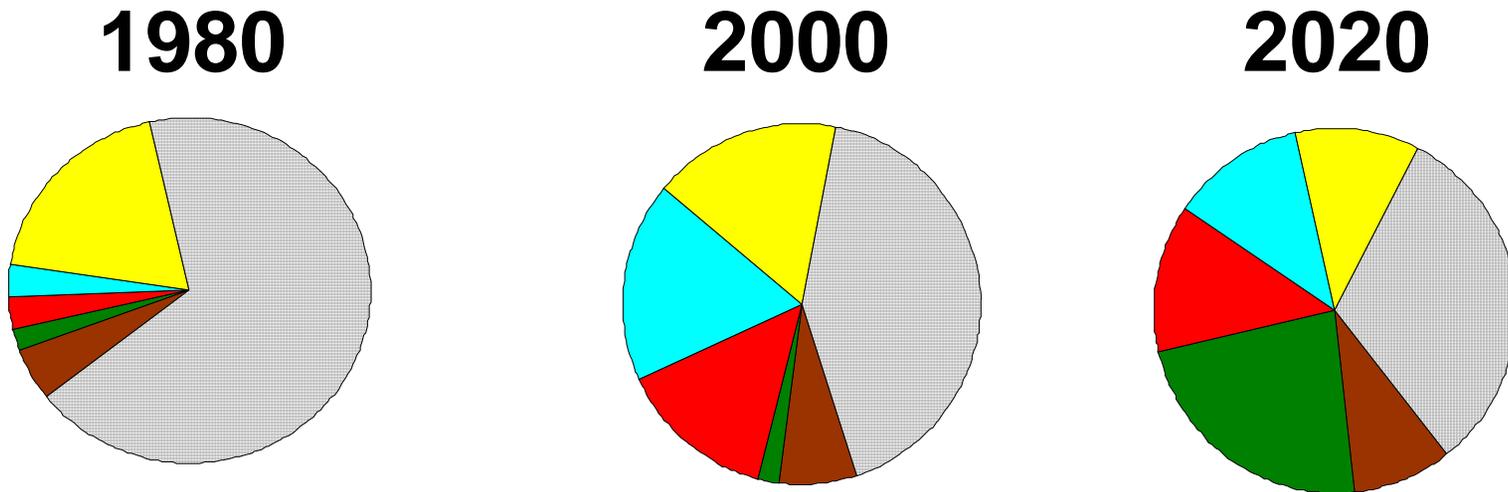
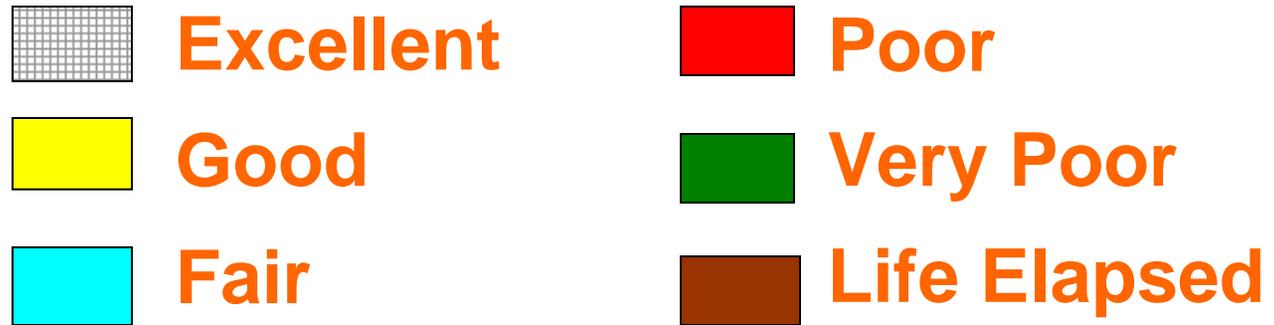
There Are Some Critical Understandings



Some asset deteriorate quickly, others over generations



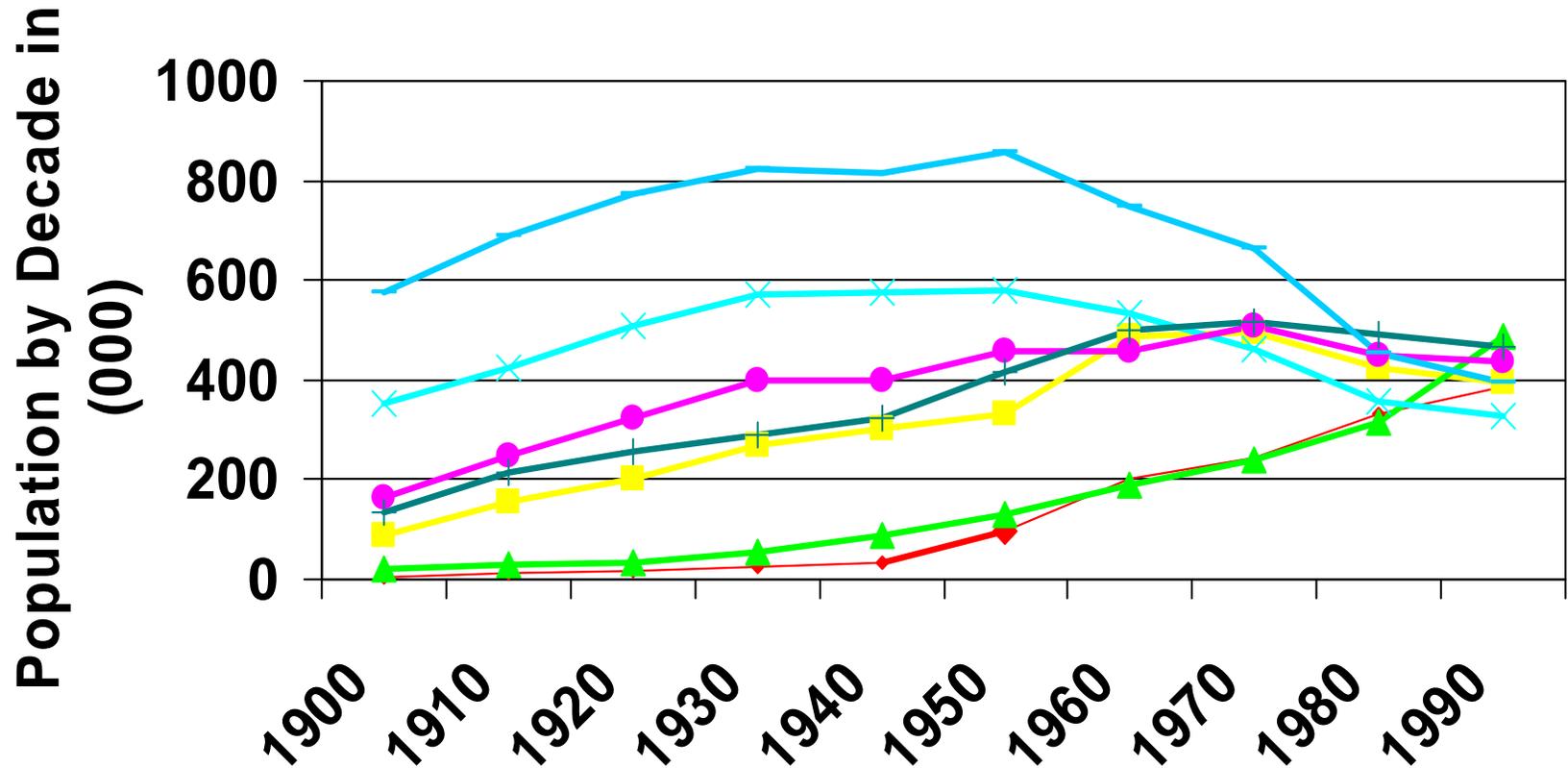
More pipe in lower condition levels will impact costs and performance



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

A particular situation is a reflection of the demographic patterns of the specific region.

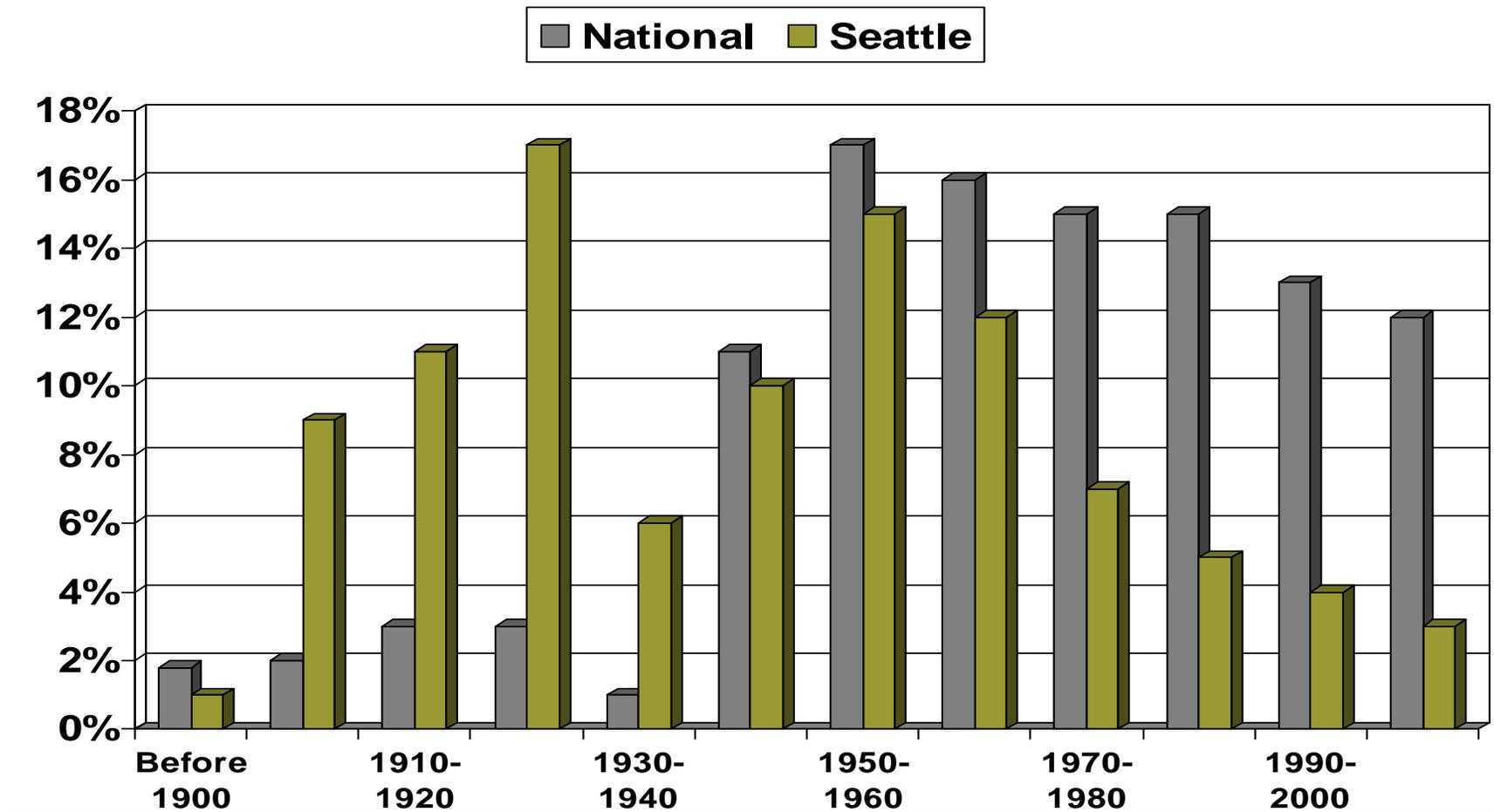
Seven Metropolitan Regions That Currently Have Simliar Service Populations



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

Your asset pattern is unique

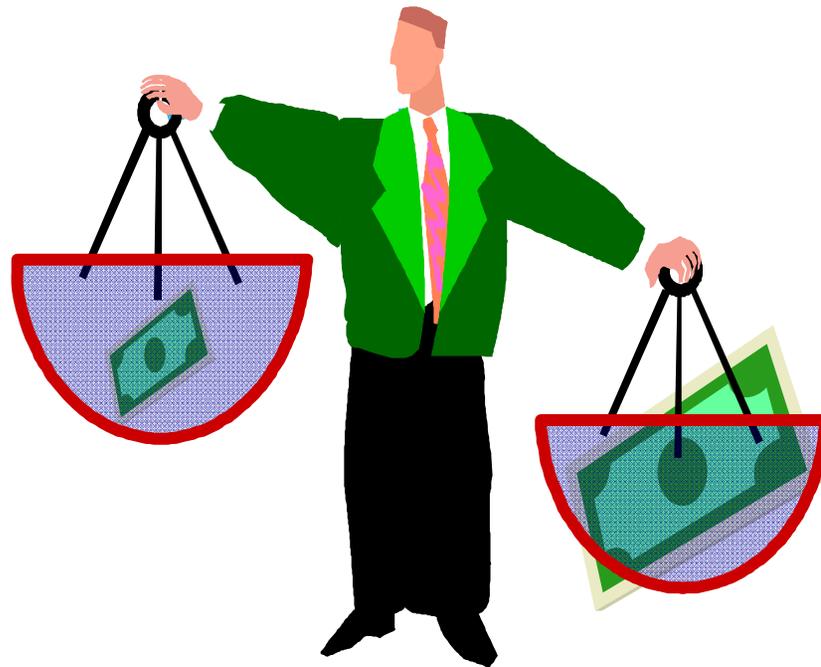
The % of The Distribution Network Installed By Decade



Generalized Data

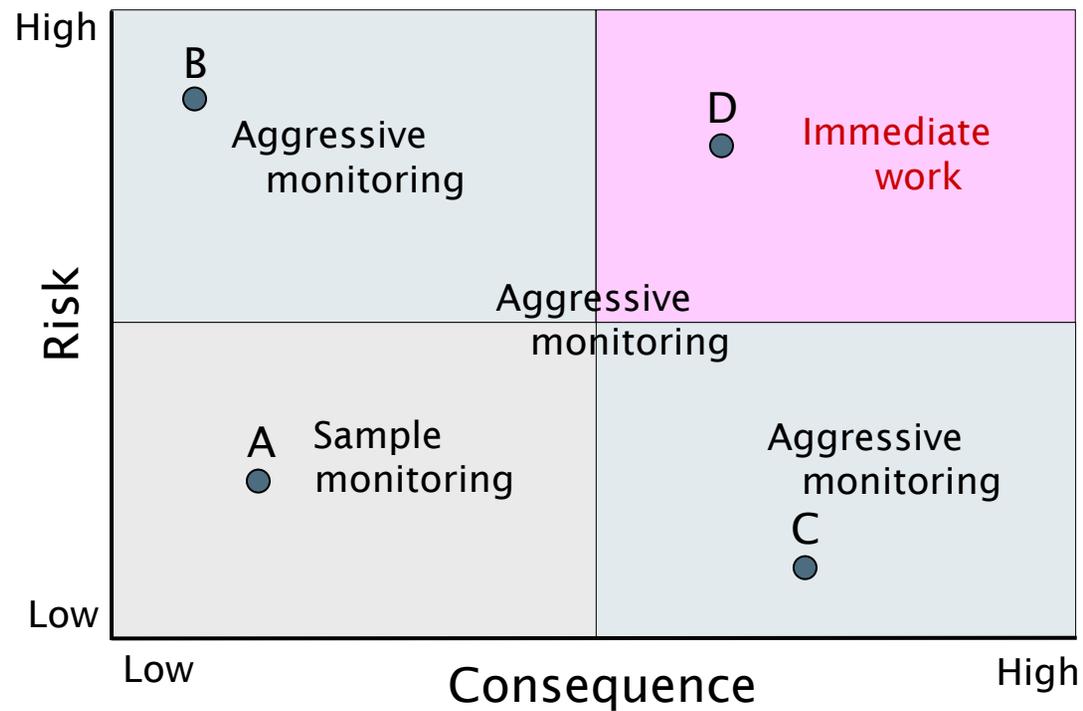
All assets are not created equal!

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



Business risk exposure drives work program

Work program response



Condition assessment

- Condition assessment is not an end in itself, but is a *means* to an end
- The *end* is to determine *remaining useful life*
- *Good-Fair-Poor*-type ratings have little utility *unless* they lead to an effective estimate of remaining useful life

The remaining useful life of an asset is *what we have left to try to manage*

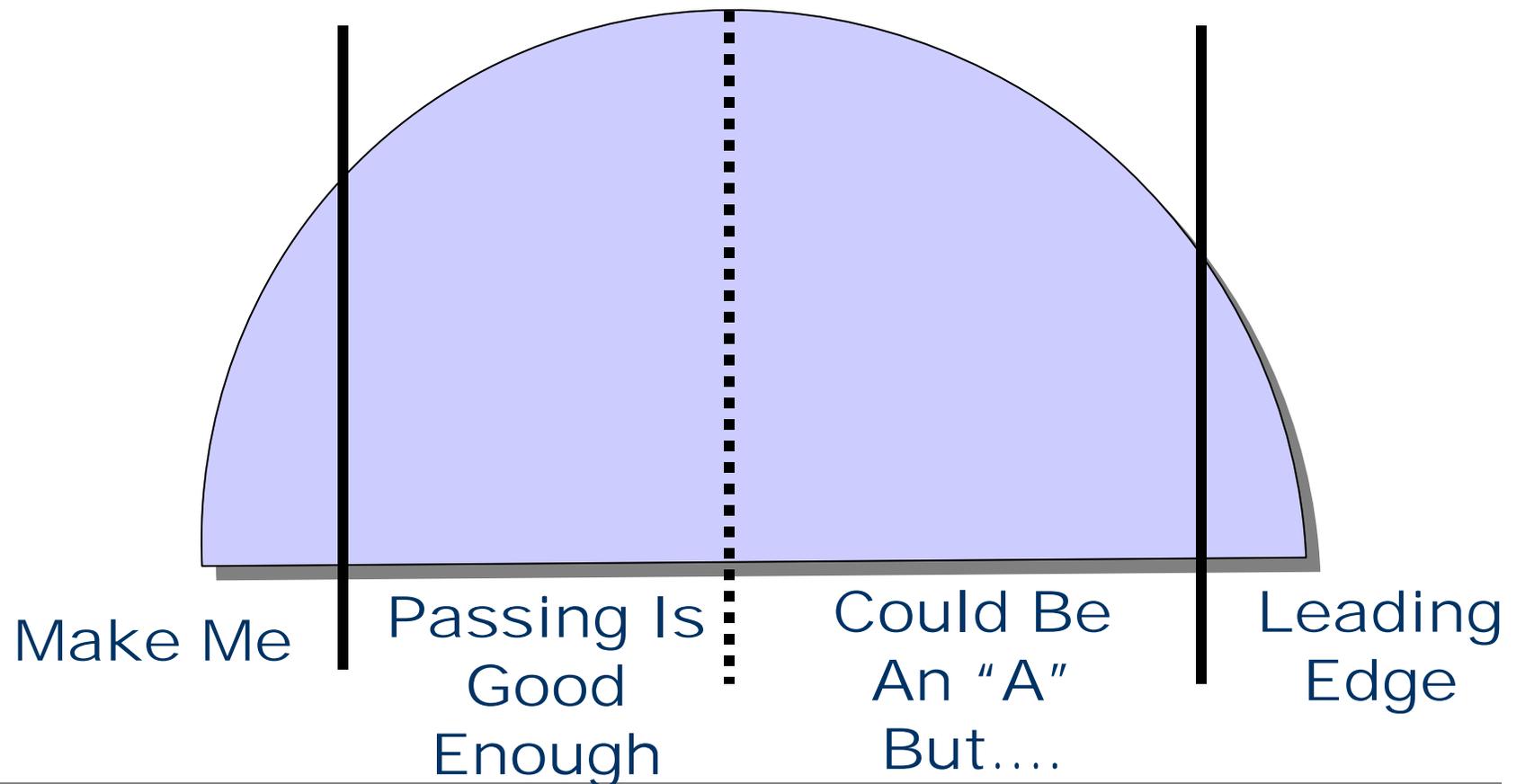
Respect the value of quality information!

**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!

Attitude Is A Big Deal In Establishing A Sustainable Situation





Have A Great Day!