

America's Pathway

To Sustainable Water and Wastewater Services

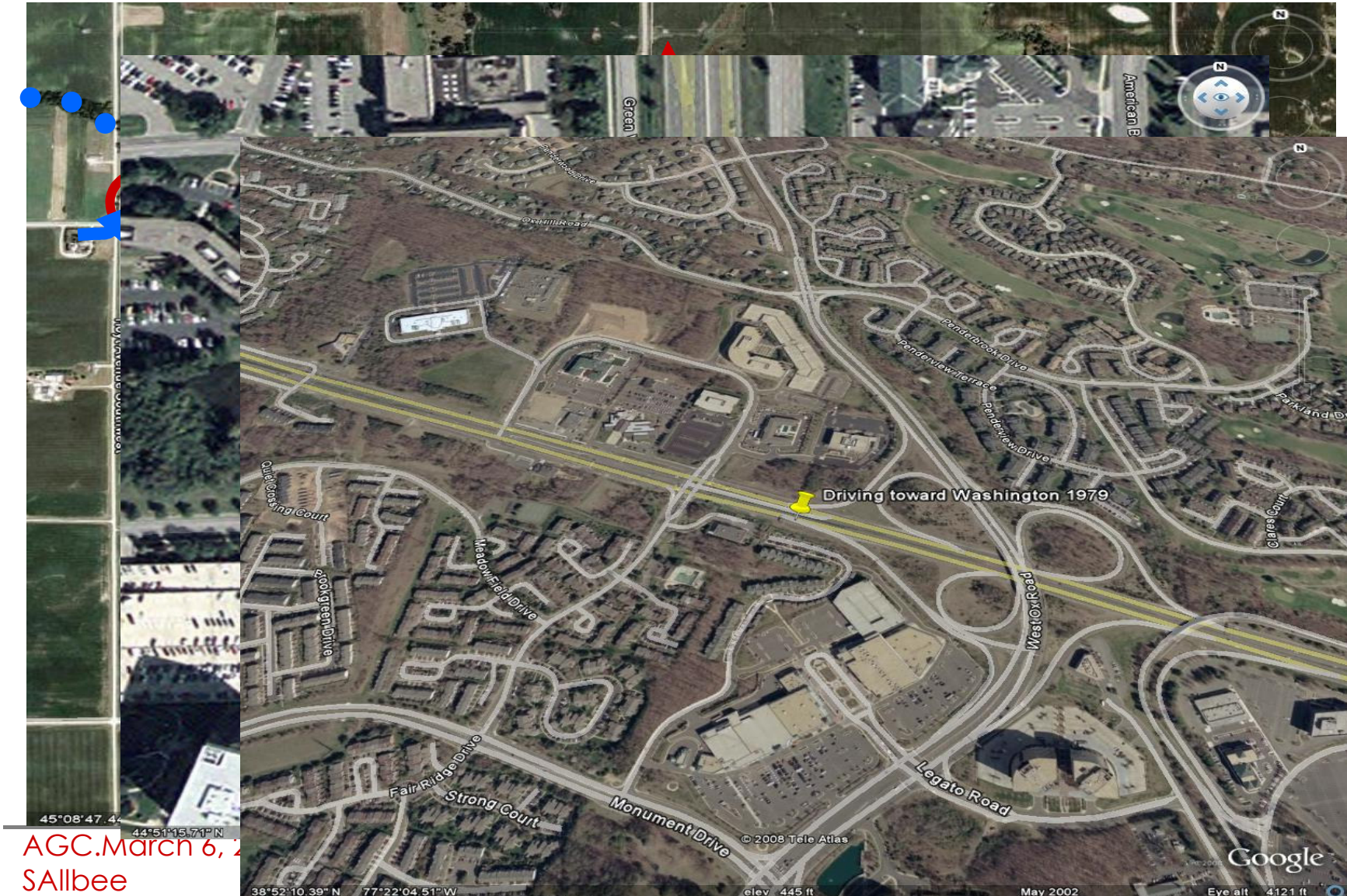


AGC.March 6, 2009
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This Presentation.

- Introduction.
- Principal Stressors.
- A National “Gap Analysis”.
- An Introduction to A New Way of Thinking “Advance Asset Management”.
- Challenges and Opportunities.
- The American Recovery and Reinvestment Act.
- FY2010 Budget Proposal.

All of us bring along a personal legacy - - it informs our perspective.

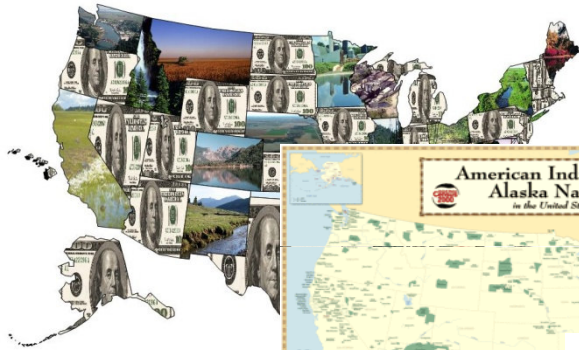


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Since arriving at EPA in 1979, most of my work has been about managing and establishing financial assistance program for wastewater.

Construction Grants (CG)

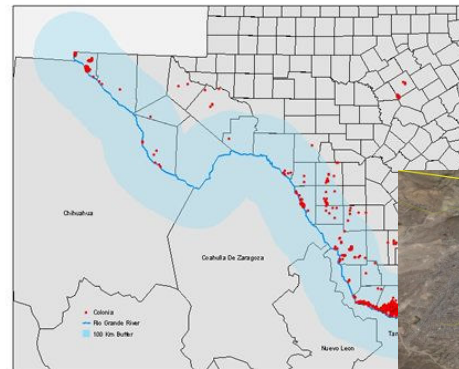
The State Revolving Fund Program



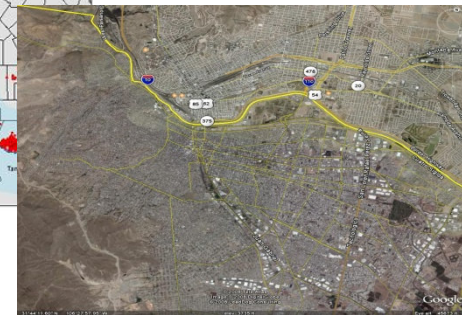
Tribal and Alaskan Native Programs



Colonia Programs



Border Programs

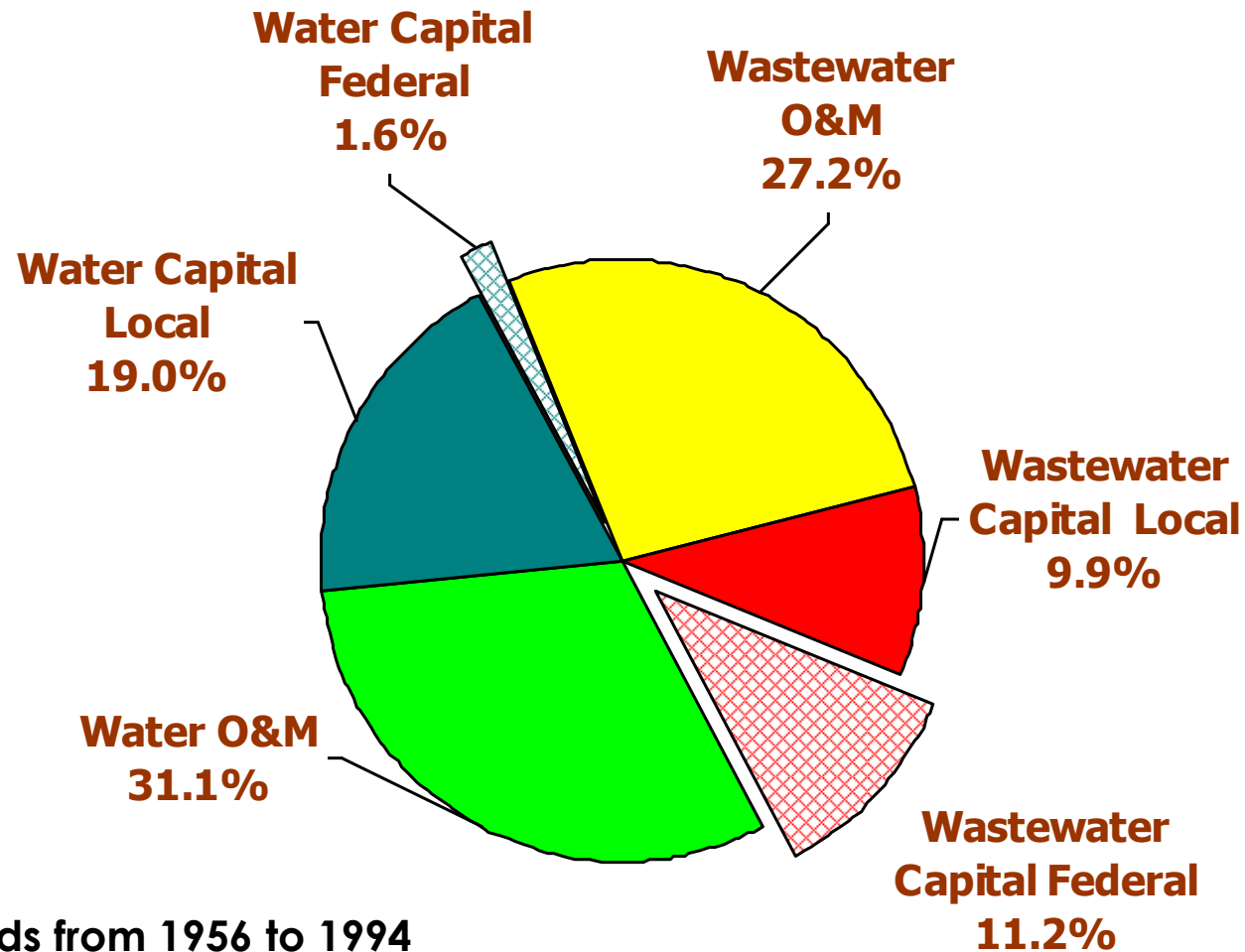


The challenge was to create federal programs that were responsive and effective in responding to particular needs

What I Have Concluded

Federal financial assistance was extremely helpful in bringing about measurable benefits, but a sustainable approach demands coming to terms with changes that reach beyond Federal funding strategies or mechanisms.

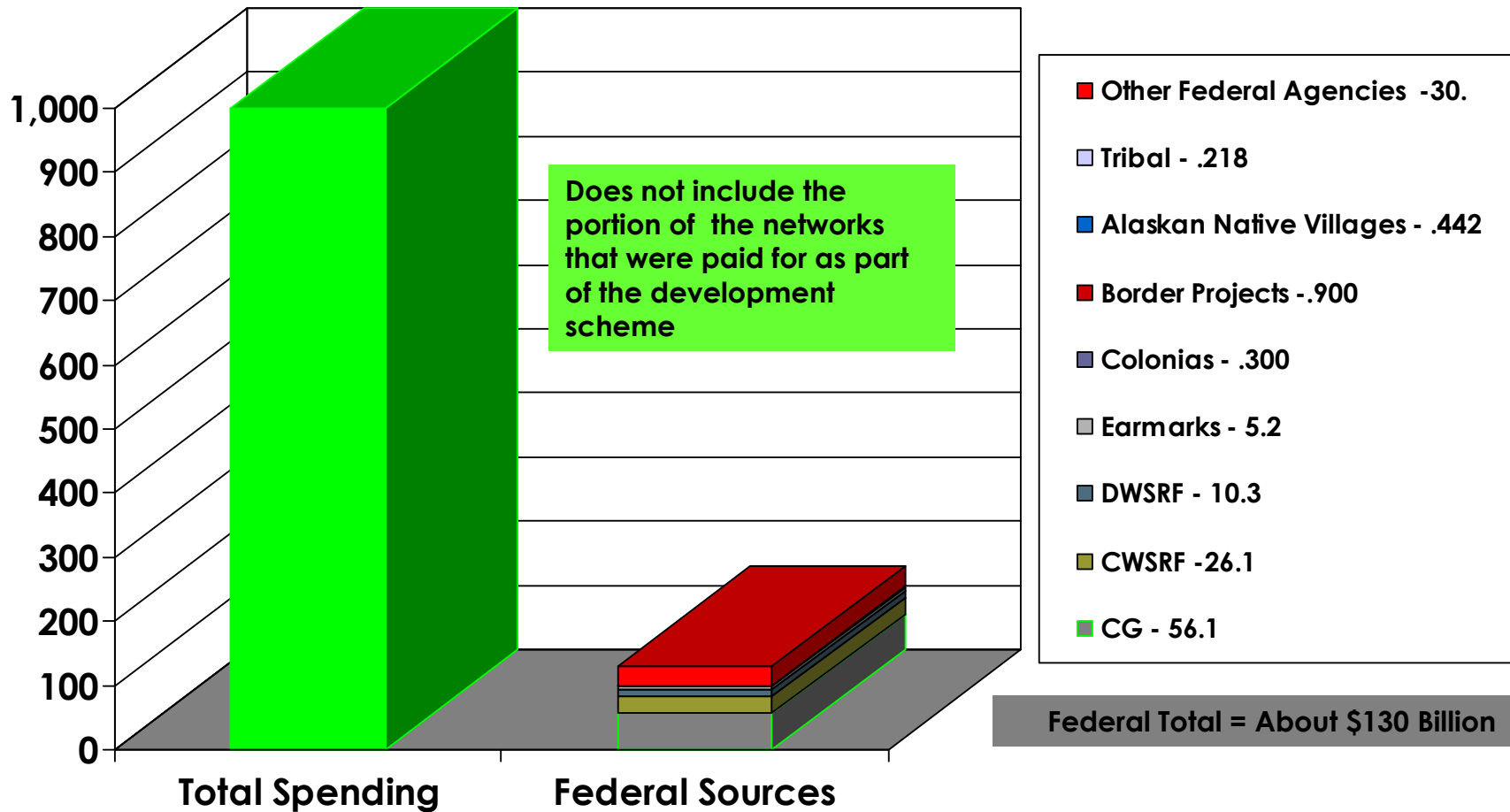
The vast majority of resources have always been local and will continue to be local



Sources of funds from 1956 to 1994

Where is the opportunity?

\$ In Billions Since 1972



The chart represents approximate values

America's Pathway

Principal Stressors



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Global Strategic Context

Sustainable water is an issue on the same order of magnitude as energy and climate change

**These are
societal changing issues!**

Local Strategic Context

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

LGAC Video

The leadership challenge is far from easy!

- 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 constantly compete with long term views regarding best value and intergenerational equity.
- Especially in regard to long life assets - - 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 and business skills (Assets and People).
- This is about people just as much as the physical stuff.

The history of urbanization, environmental degradation, and a generation of investments in expansion and upgrade partially defines 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.

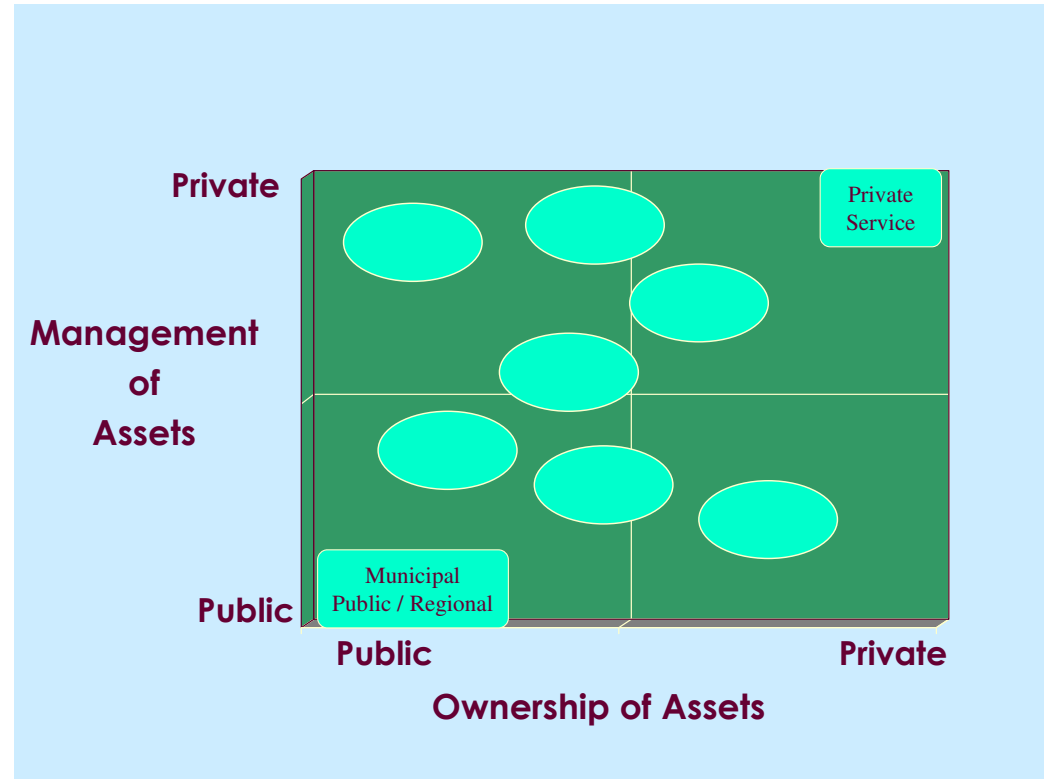
Highly decentralize management



- 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

Within the water sector, we have every model of ownership and management

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



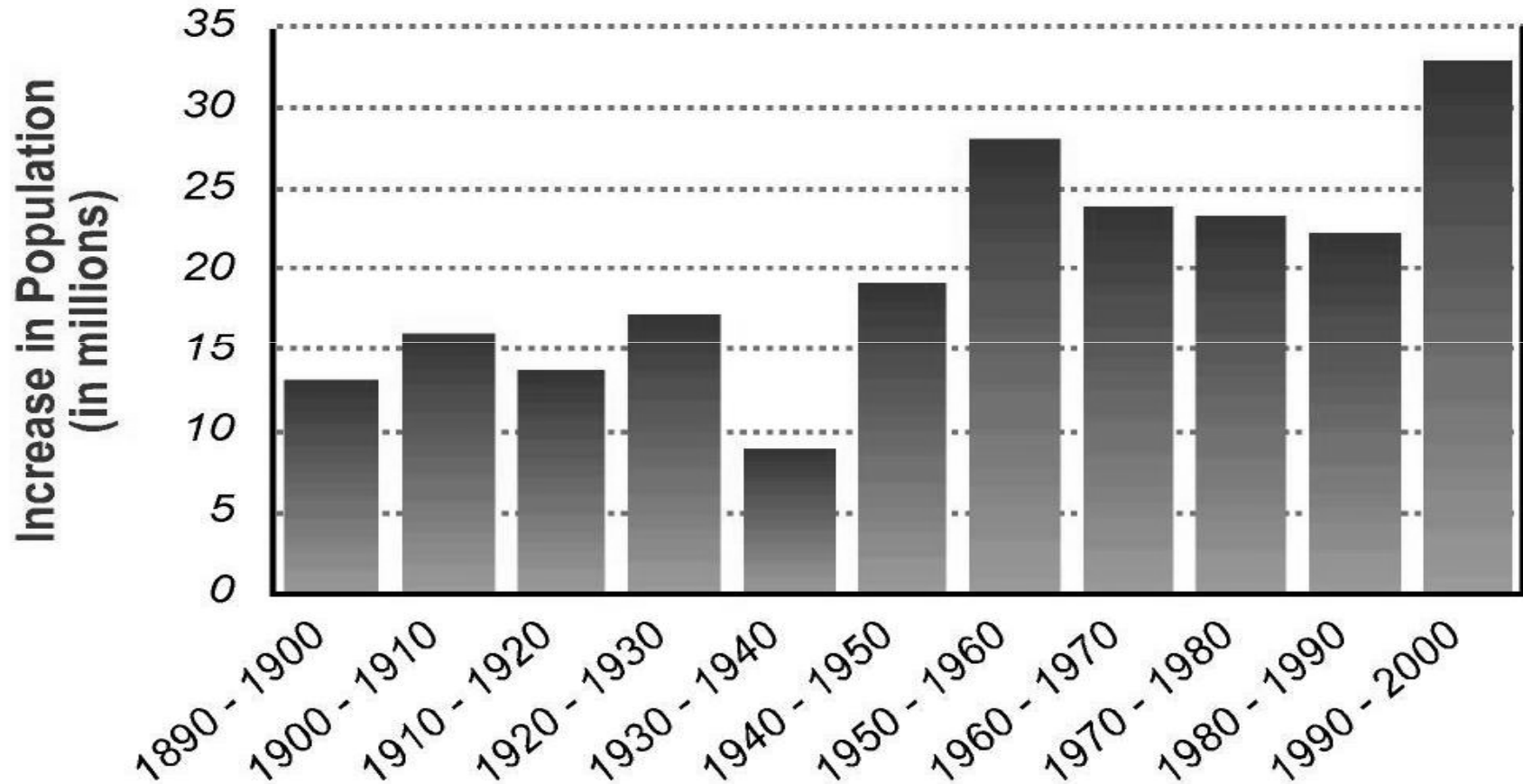
Emerging trends In ownership and management

- Institutional arrangements are trending more holistic. The organization's focus is broader (on the full water cycle). Decisions involve thinking from the point of source acquisition through initial treatment, distribution, collection, treatment and reuse or discharge. The broader framework affords opportunity to capture additional efficiencies and reduce adverse impacts..
- Asset management at the strategic and tactical levels forms the underpinnings for making better investment decisions.
- In the leading edge, asset management practices are trending toward a multi-sector platform where key decisions and priorities are set in the broader context of multiple infrastructure requirements across several municipal service areas.

The Demographics of People and Systems Are Important!

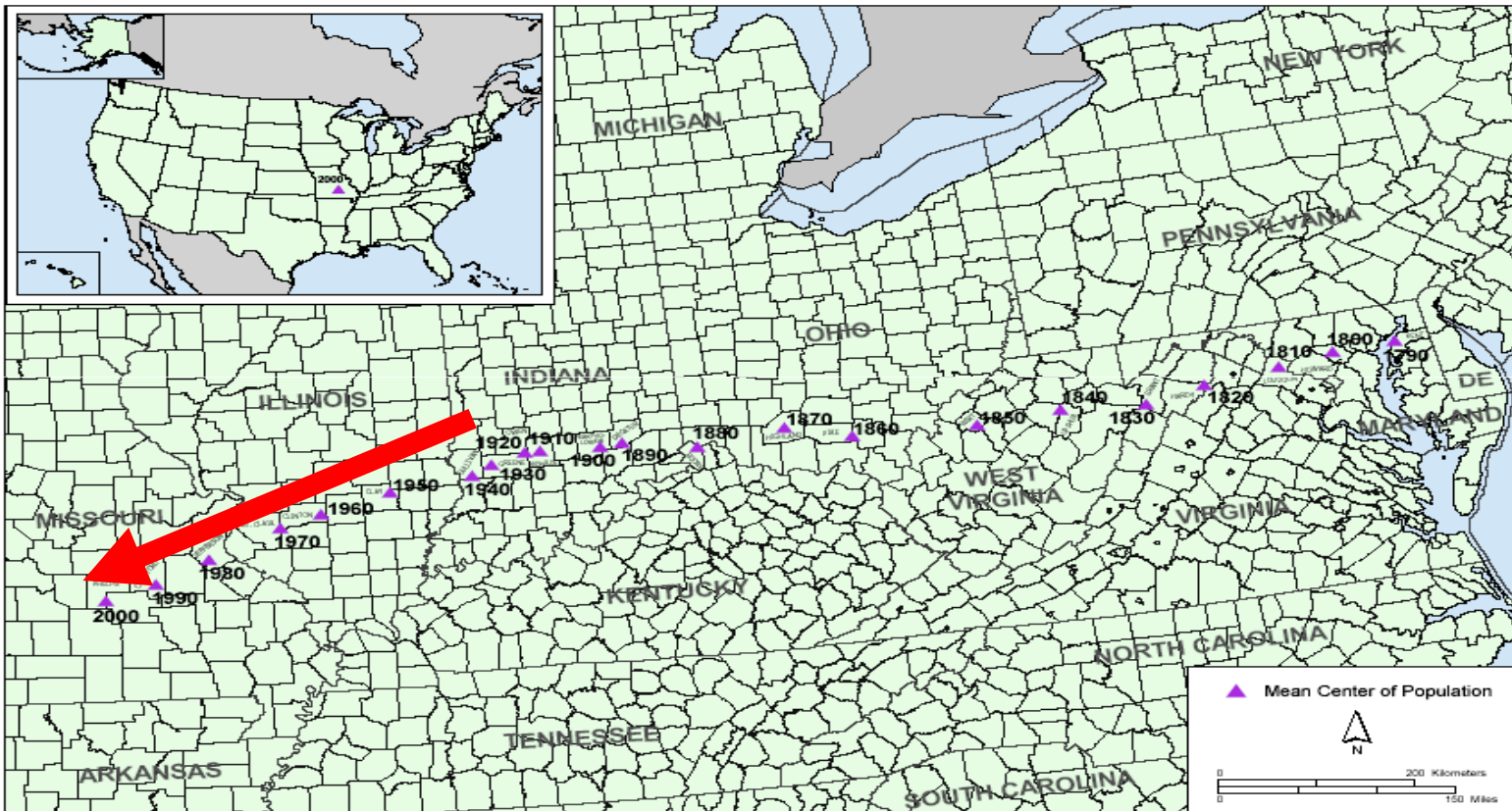
Long Life Assets (Water Infrastructure) Are Highly Impacted By Growth Patterns and Long Term Demographic Shifts.

The nation's demographic pattern



Population shifts

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

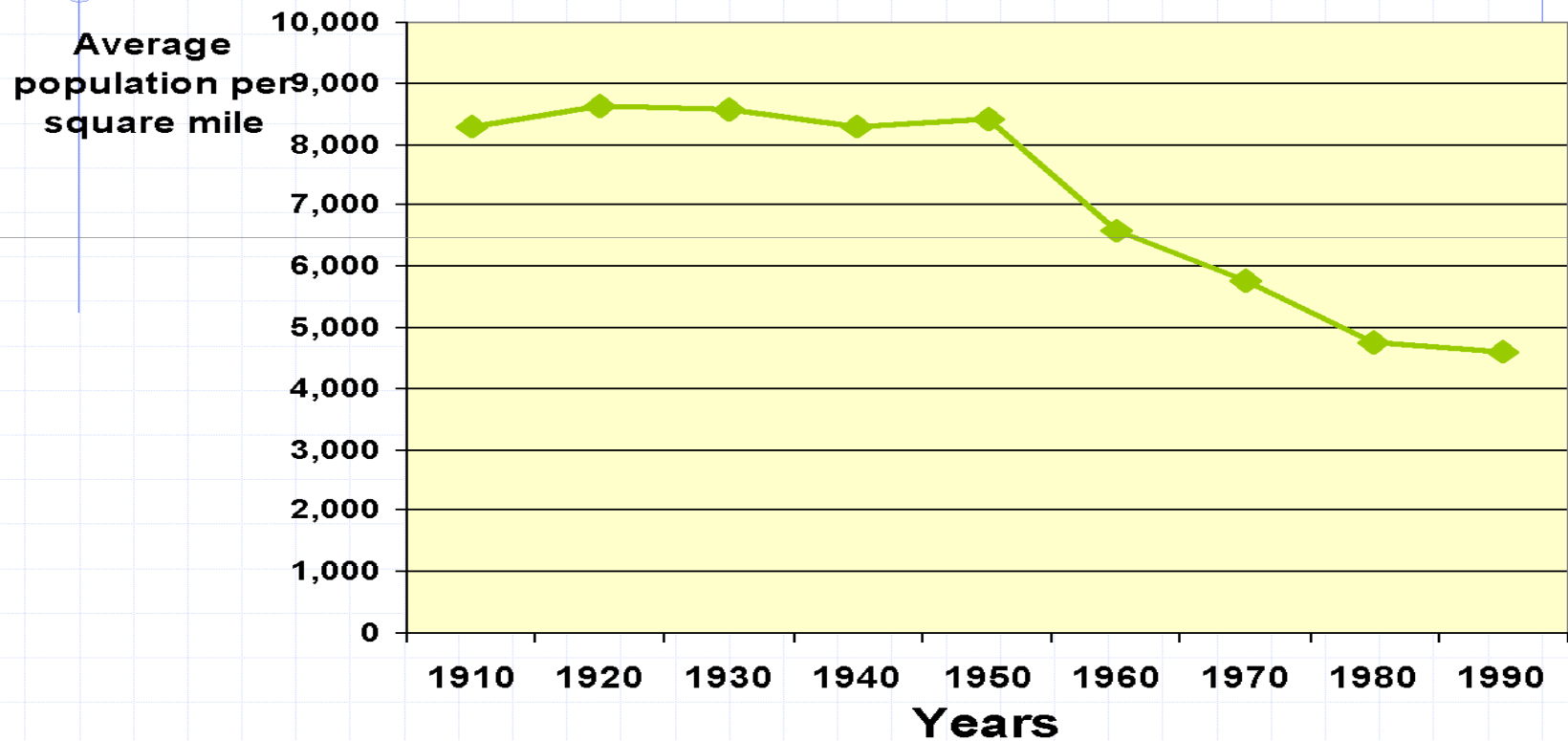


U.S. Department of Commerce Economics and Statistics Administration U.S. Census Bureau

Prepared by the Geography Division

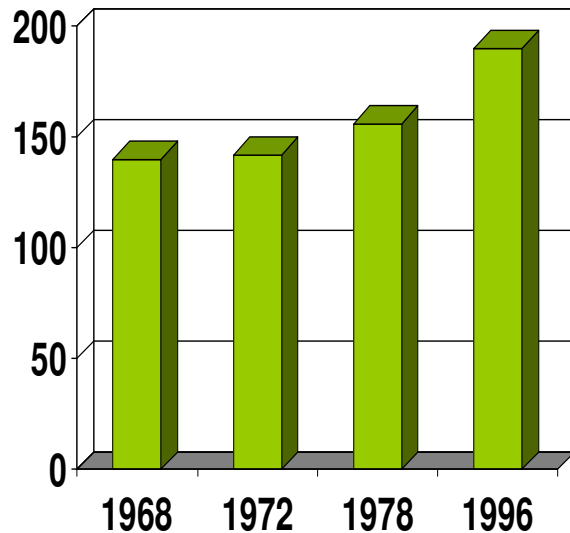
Changing patterns in land use density

**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

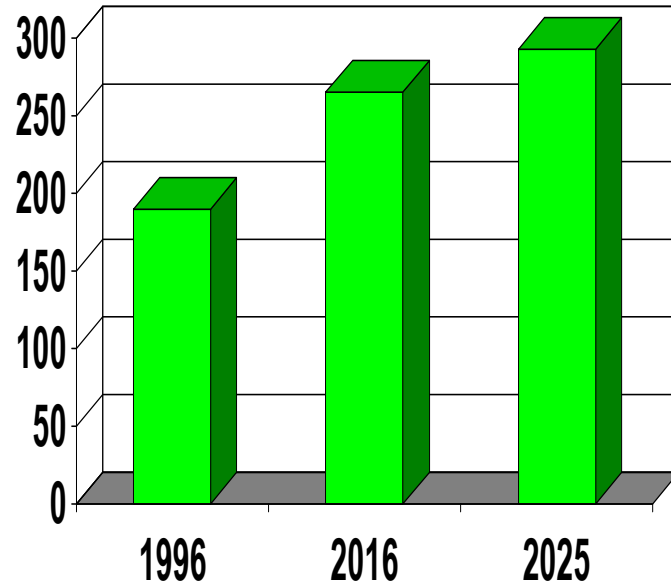


Source: USEPA, Progress in Water Quality. An Evaluation of the National Investment in Municipal Wastewater Treatment, June 2000.

<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%

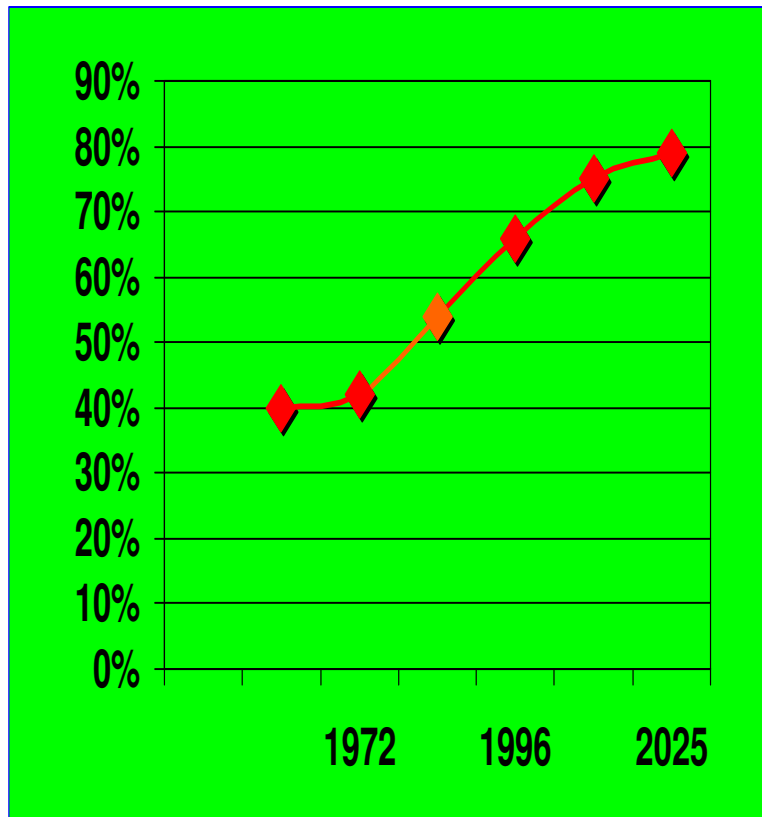
The emerging challenge

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

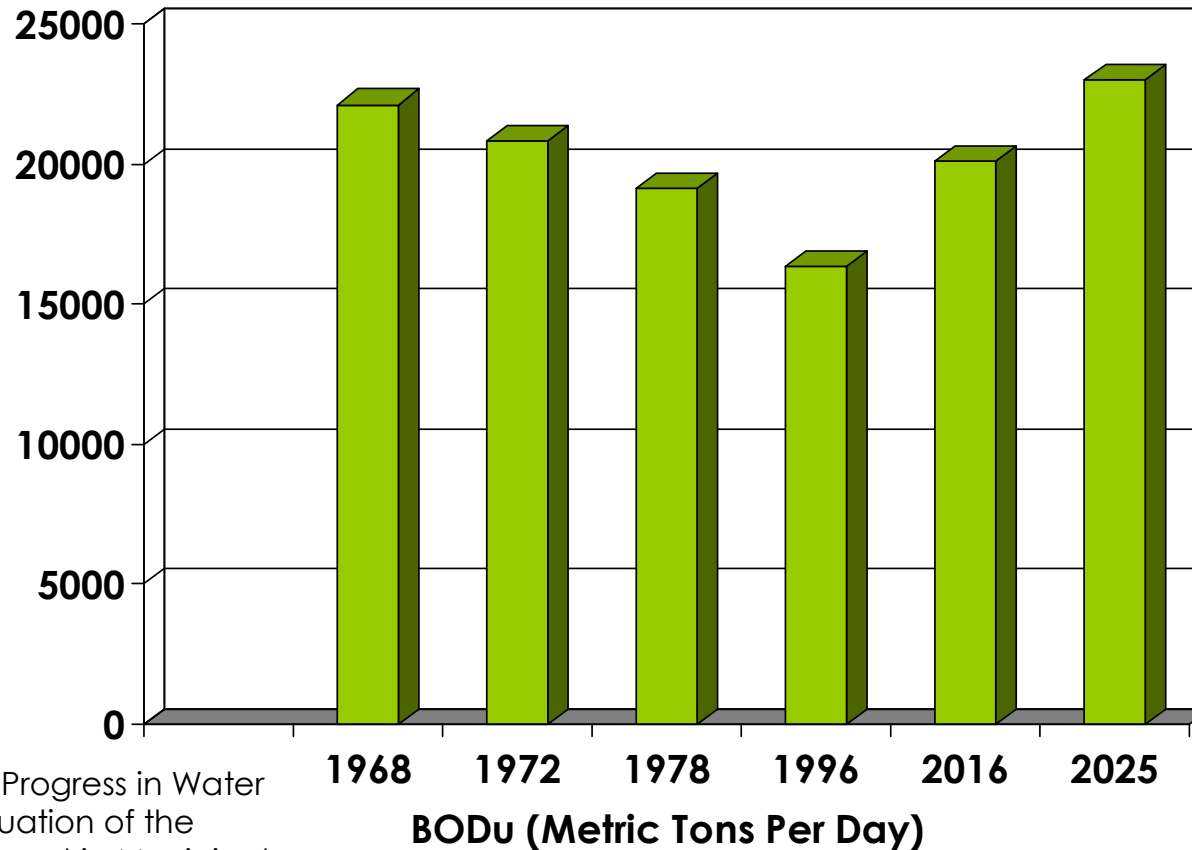


Source: USEPA, Progress in Water Quality: An Evaluation of the National Investment in Municipal Wastewater Treatment, June 2000.

**Leveling Off of BOD_U
Removal Efficiencies**



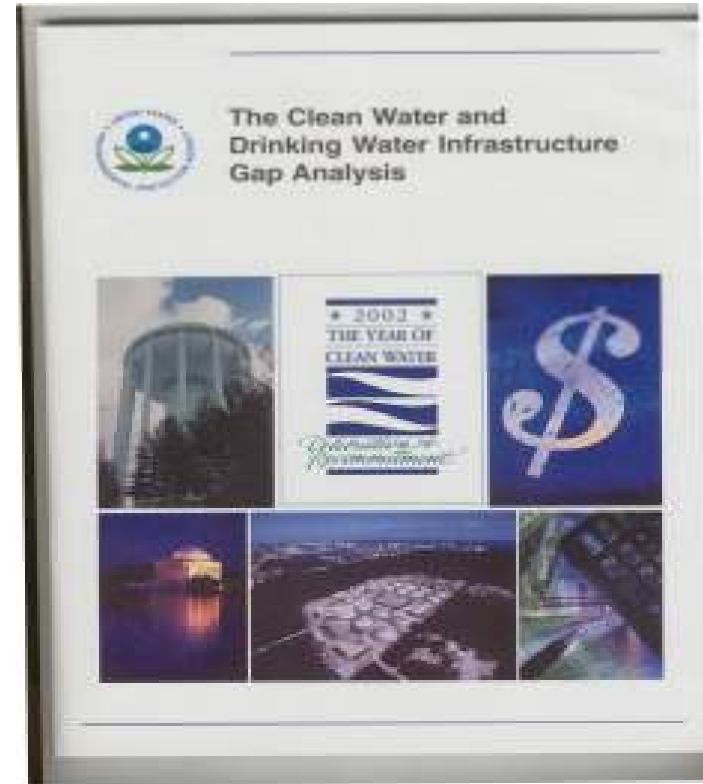
The projected growth alone, could produce BOD_u loadings similar to the mid-1970s



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

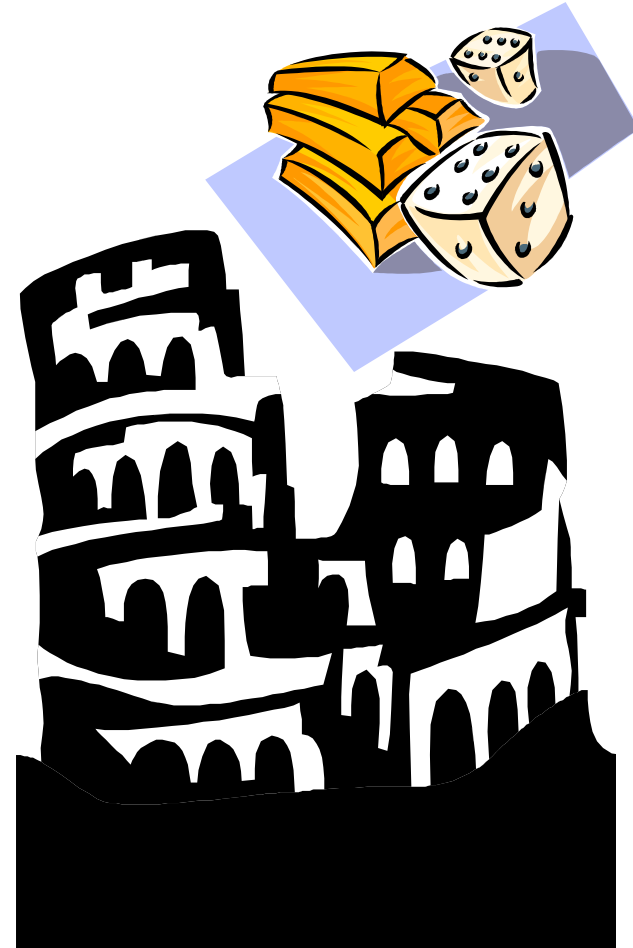
(Annual Rate of Increase - 3% Real)

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.

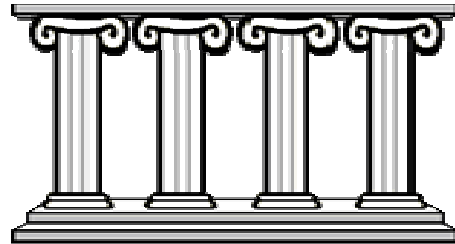


We can document that placing an emphasis on tackling the problems produced results, however !

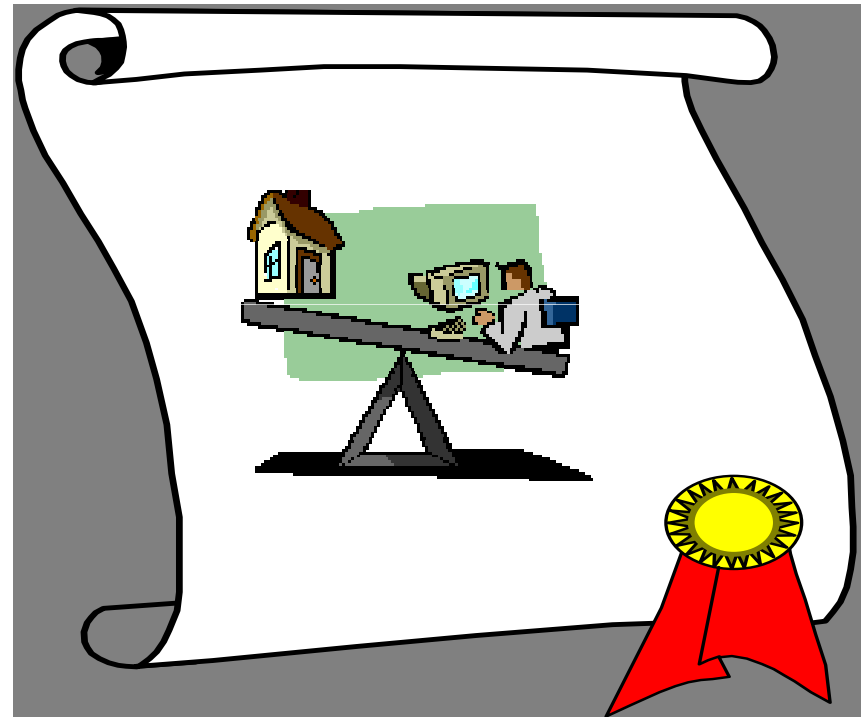
- Infrastructure challenges are not addressed through a one time fix, but rather a sustained commitment.
- The emerging focus is on taking the steps necessary to retain the gains achieved from the major investments of the last forty years.
- The largest aspect of meeting the emerging challenge is that 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



- **New investments in research**
- **New strategies for education and knowledge mgt.**

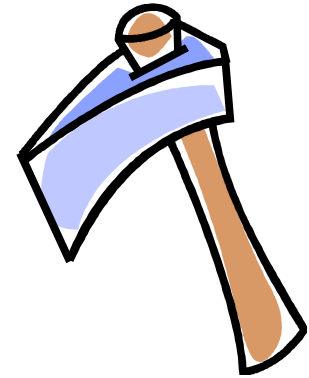
The most important consideration in pursuing a sustainable strategy?

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



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.



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!*

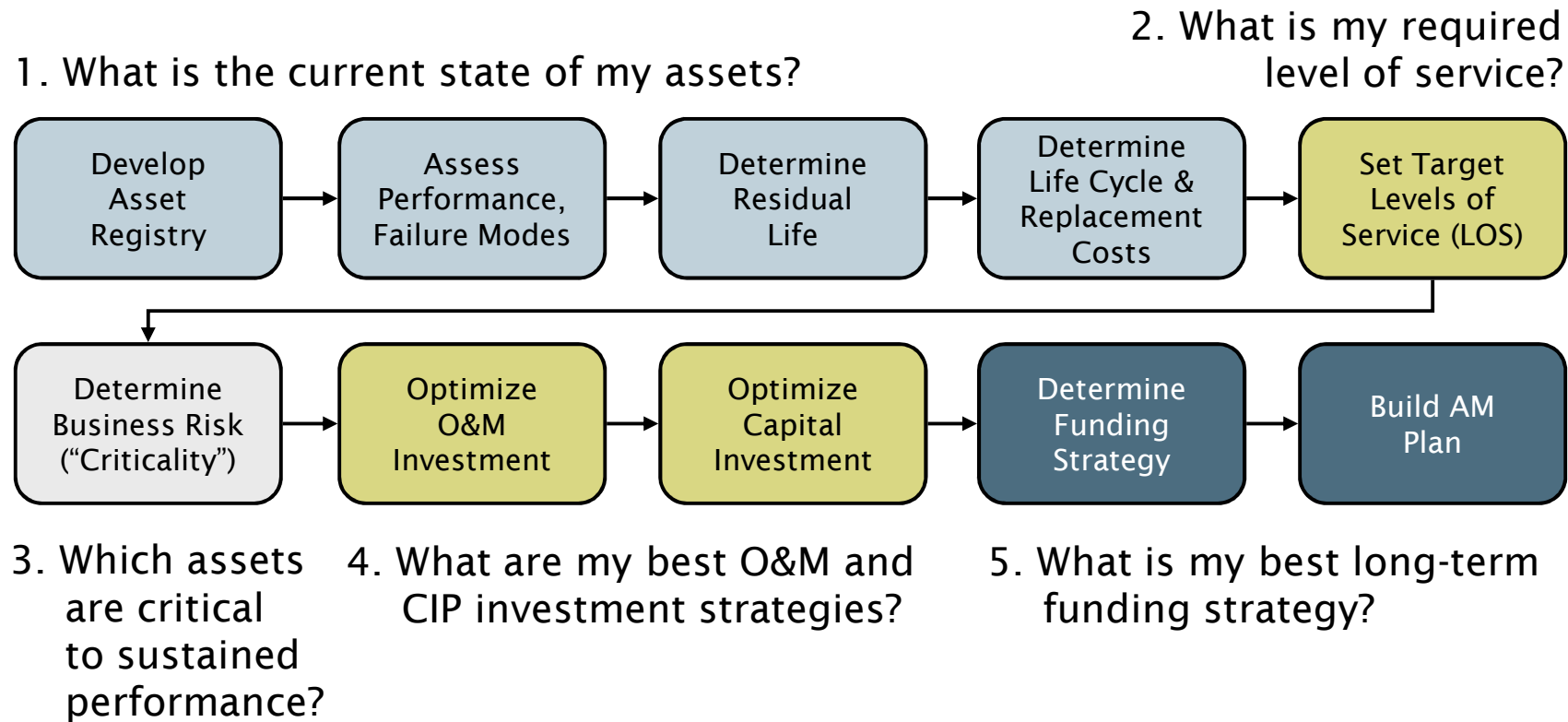
The Relationship of Asset Management to Sustainability.

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.



The Basic Concept and Process.



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
Think “*liquid Assets*”

Summary Industry Profile

- Increasing aggregate demand – water and wastewater
- Diminishing available water resources
- Leveling of “production efficiencies”
- Increasing output restrictions
- Aging infrastructure
- **Result: Increasingly expensive treatment options**

- Aging customer base – more and more on fixed income
- Diminishing technical labor pool running larger and more sophisticated plants and facilities
- Outflow of knowledge with retiring labor base
- Increasing resistance to rate increases
- **Result: Increasingly complex management environment**

Managing service is about becoming expert at....



Acquisition

Maintenance

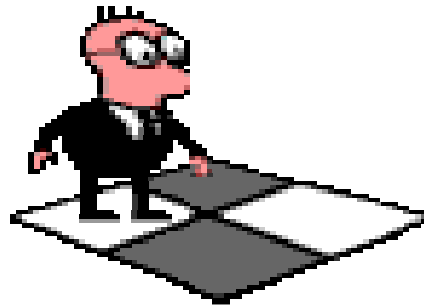
Repair

Renewal

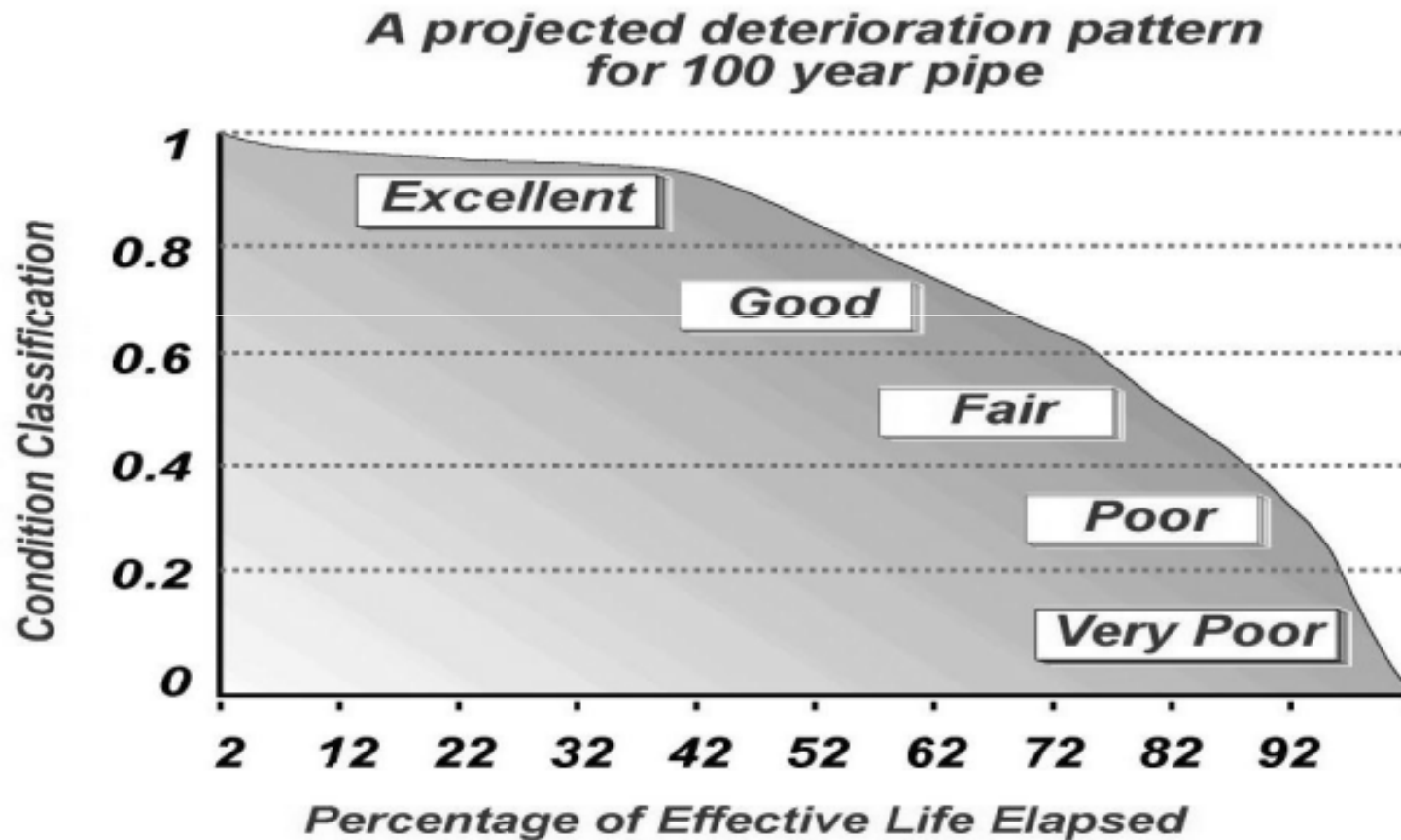
Replacement

Decision Making

There Are Some Critical Understandings



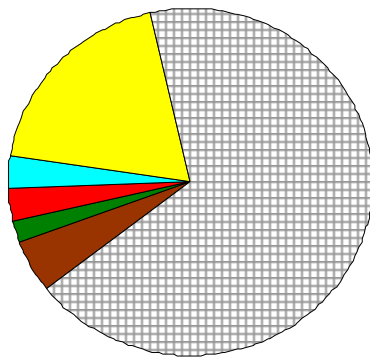
Some asset deteriorate quickly,
others over generations



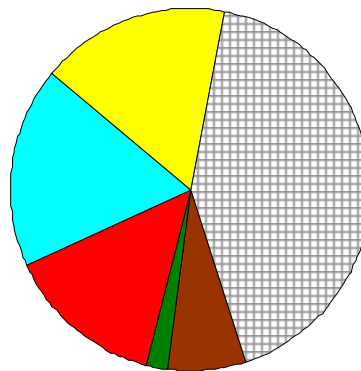
More pipe in lower condition levels will impact costs and performance



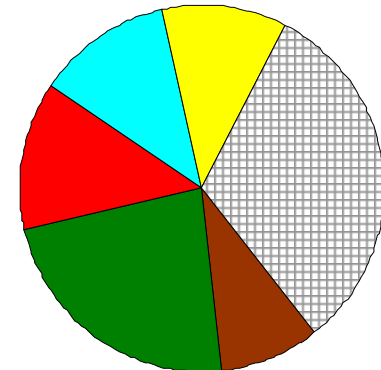
1980



2000

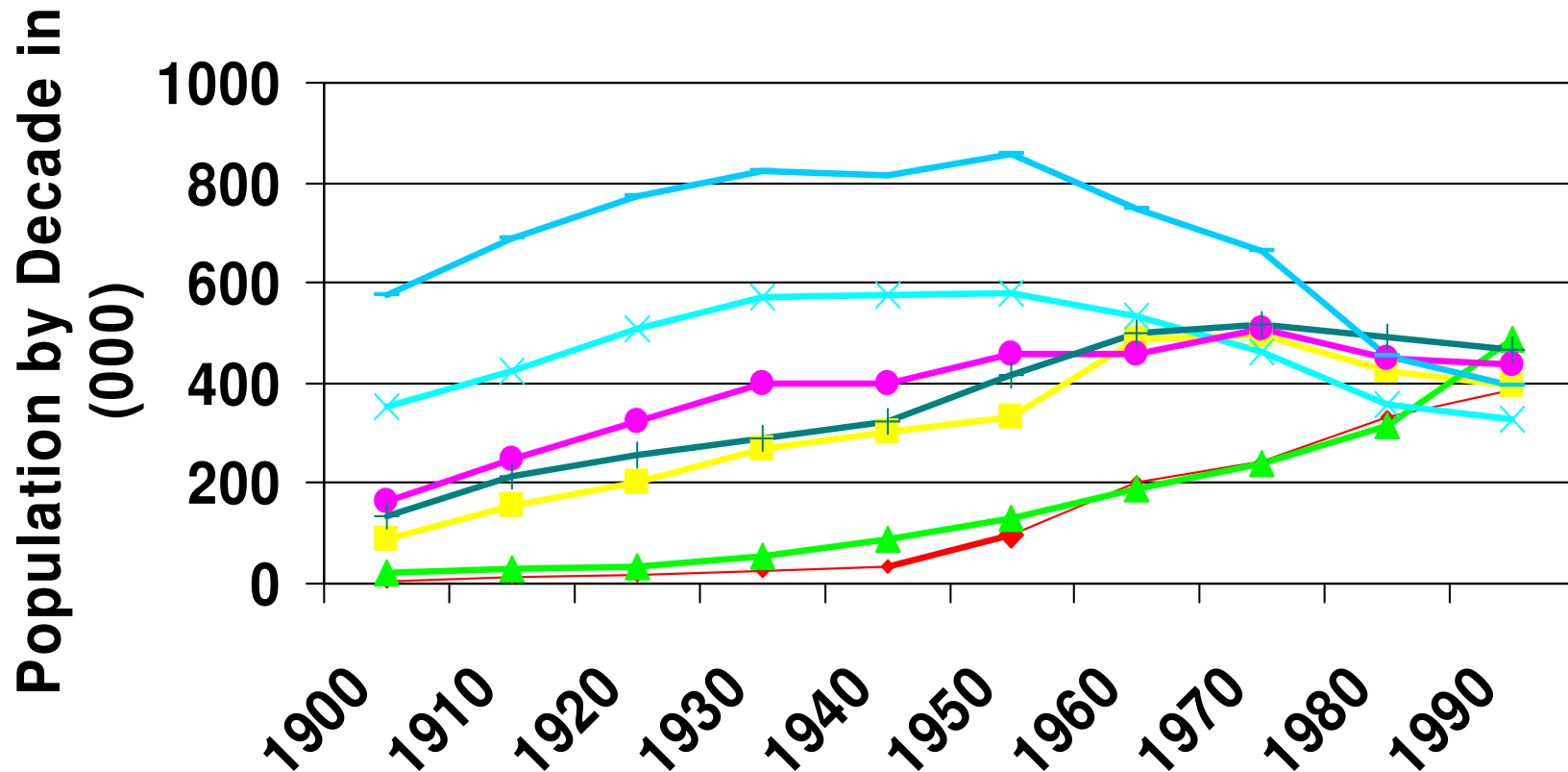


2020



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

Seven Metropolitan Regions That Currently Have Similiar Service Populations



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

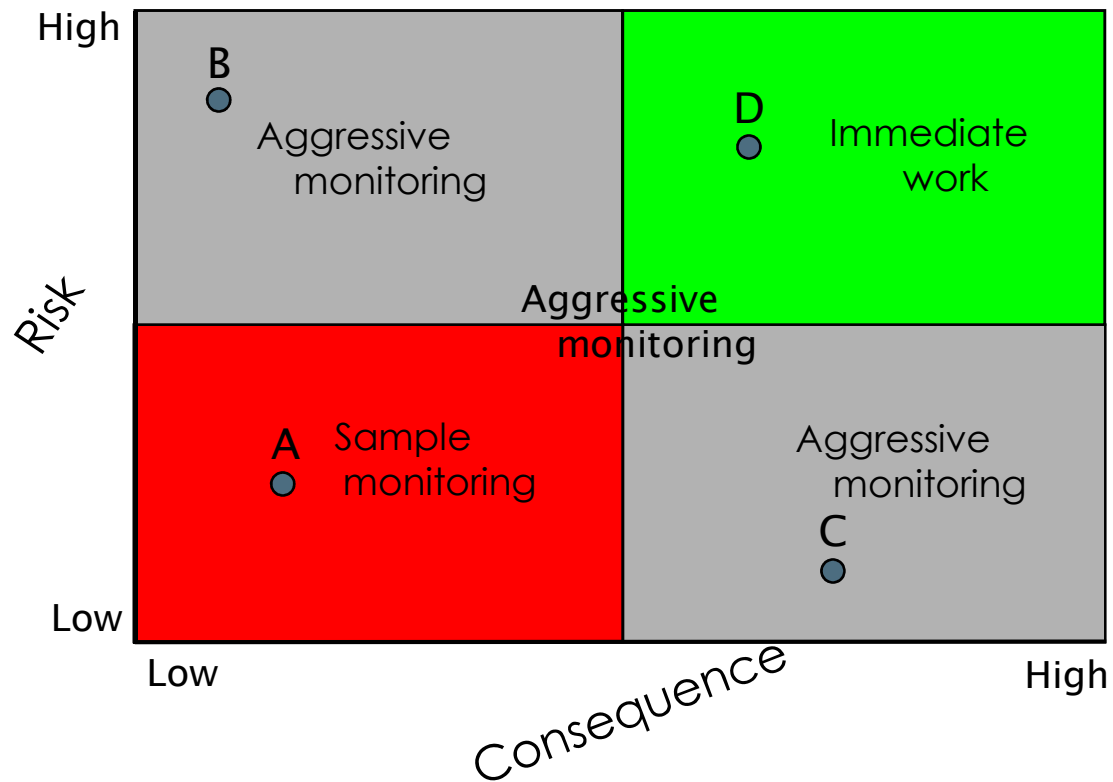
All assets are not created equal!

- (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!

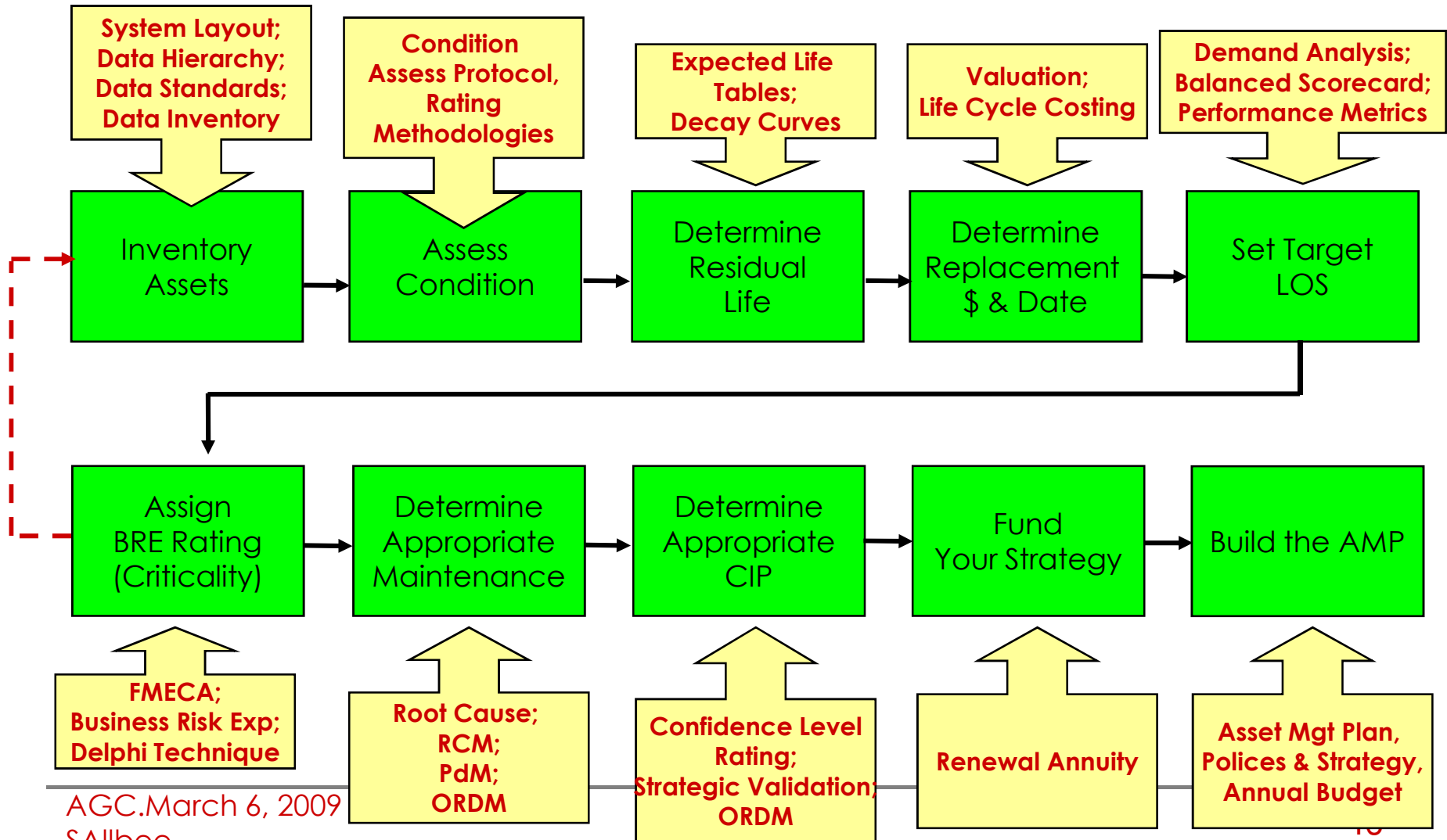
Best
Appropriate
Process + Quality of
Data Used = Confidence
That the
Course Is the
Right One!

Capital, Operations, Maintenance,
Repair, Renewal, Replacement

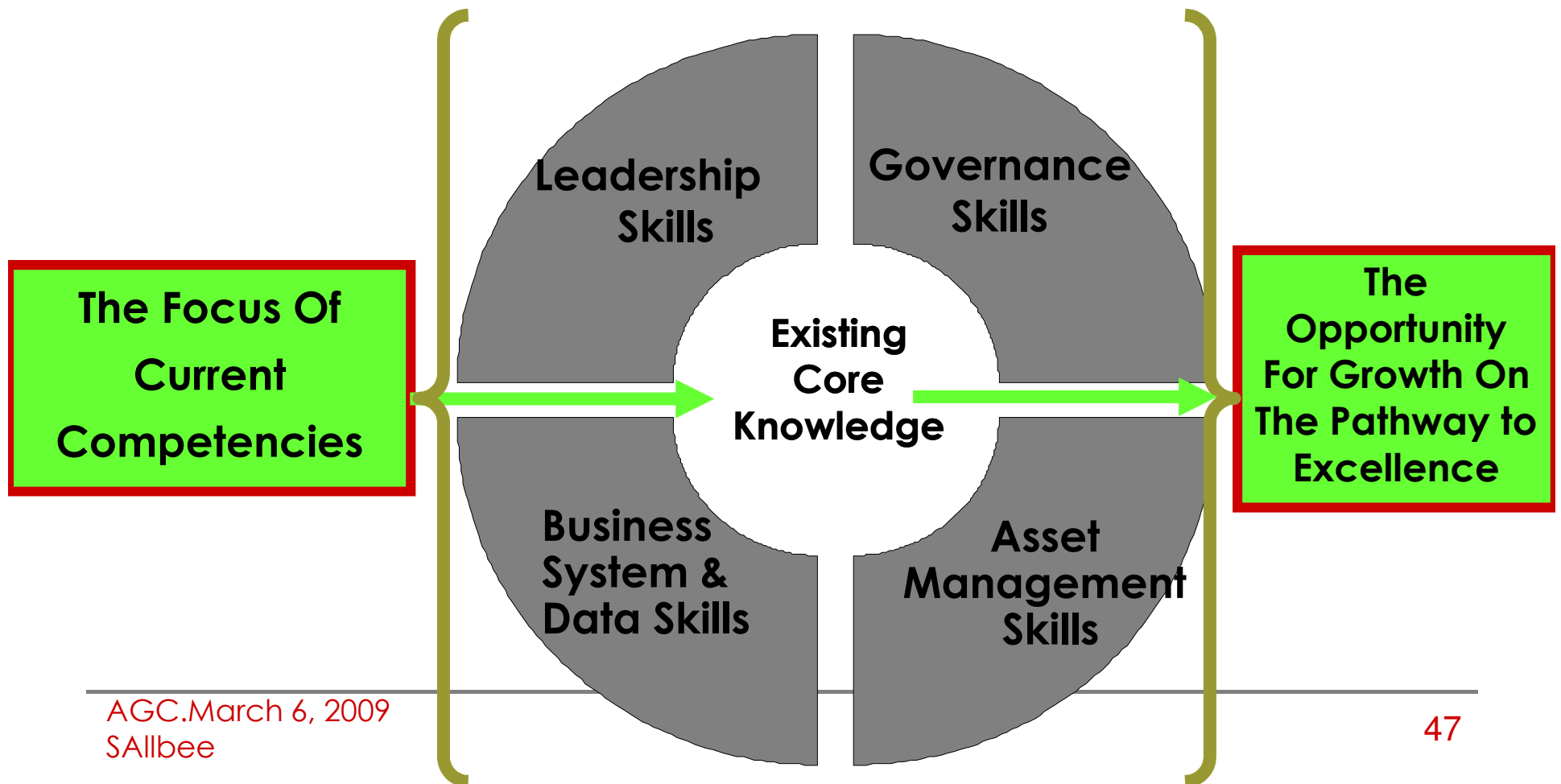
It's all investment!

The analytic practices and tools are important.

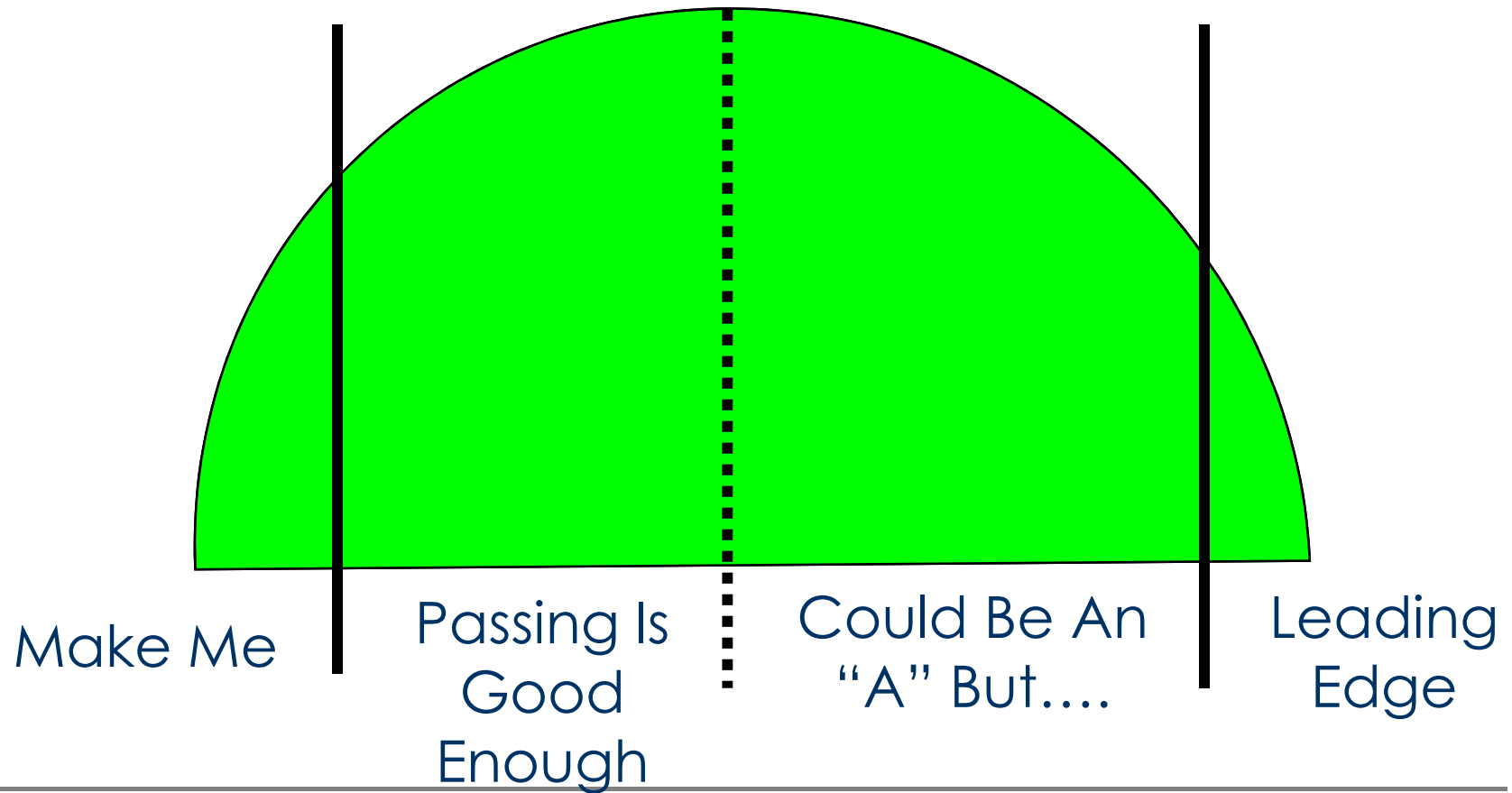
The “How To” is the yellow boxes



Additional skills will be added to become a sustainable business



Attitude is a big deal in establishing a sustainable situation



The most recent subject matter -
-Integrating Climate Adaptation
Into Lifecycle Costing and
Planning

Climate ready utilities!

Adaptation requires risk exposure management applied to:

- *Probability* or likelihood of event
- *Consequence* or impact of event
- “*Risk mitigation*” or risk reduction and avoidance

From an asset standpoint - - two key questions...

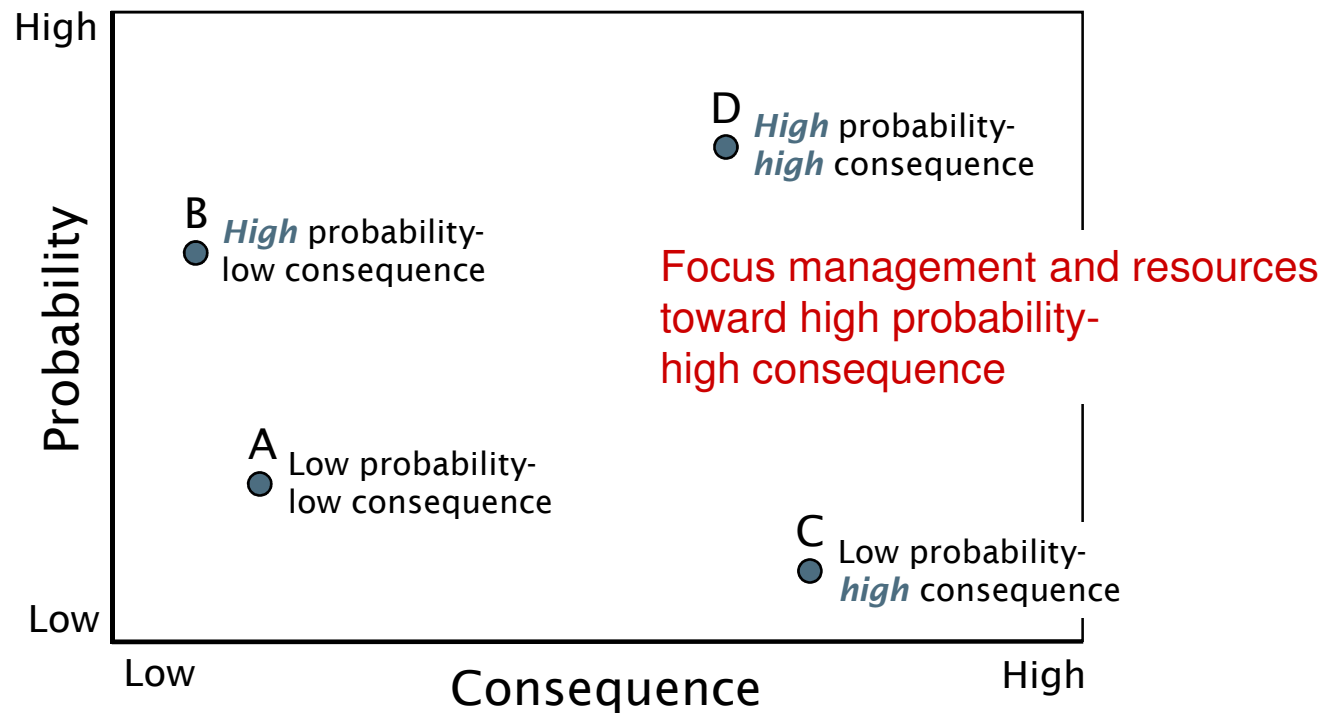
1. Is the impact reasonably *predictable*?
2. Is it cost-effectively *preventable*?

At a tactical level which facilities?

- How *are they affected*?
- What is the *likelihood* of the affect?
- What does it *cost* to mitigate?
- What are the *consequences* of not mitigating?

A strategic and tactical response requires integrating the assessment into your asset management paradigm.

What is the probability? What is the consequence?



It is not just about utilities: Six strategic Impediments -- opportunities on the pathway toward sustainability

- Intergovernmental relationships.
- Knowledgeable valuation and pricing.
- Restructuring institutional arrangements.
- Understanding affordability.
- The approaches to setting service levels.
- A strategic and tactical commitment to engaging in an aggressive international collaboration on water sustainability.

At a tactical level which facilities?

- How *are they affected*?
- What is the *likelihood* of the affect?
- What does it *cost* to mitigate?
- What are the *consequences* of not mitigating?

America's Pathway

A new dimension
-- “The American
Recovery and
Reinvestment Act
of 2009”

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ARRA funding for Clean Water and Drinking Water

- \$4 Clean Water
- \$2 Drinking Water
- \$1.38 B USDA for rural assistances

Several More Categories of Funding.

**Guidance to States issued
March 2, 2009 and published
on EPA Website**

ARRA objectives

- “To preserve and create jobs and promote economic recovery.”
- “To assist those most impacted by the recession.”
- “To provide investments needed to increase economic efficiency by spurring technological advances in science and health.”
- “To invest inInfrastructure that will provide long-term economic benefits.”
- “To stabilize State and local government budgets, in order to minimize and avoid reductions in essential services and counterproductive State and local tax increases.”

ARRA key features

- Allotment formula - - same as current program.
- Projects must be on State Intended Use Plans.
- Funds available until September 30, 2010, -- funds not under contract or construction within one year, reallocated.
- State match requirements are waived.
- At least 50% of the funding in the form of additional subsidies (grants or grant equivalent mechanisms).
- Not less than 20% is targeted for green infrastructure and energy conservation.

ARRA additional requirements

- Guidance or regulations previously issued to manage CWSRF and DWSRF remain in effect.
- New requirements:
 - ❖ Prevailing Wages.
 - ❖ Buy American - - applied to Iron, steel and manufactured goods. Waiver provisions outlined.
 - ❖ Reporting - - no less than weekly on key project characteristics, milestones, etc. Use of funds published at recovery.gov

2010 Budget Proposal

- Funds CWSRF at 2.4B for foreseeable future.
- Funds CWSRF at 1.5 B for foreseeable future.
- USDA funds for rural systems for foreseeable future.

This is a huge change in policy.

Amendments to the Clean Water Act

are under draft in House of Representatives



Thank you for
your time!

Have a great day.
