



# **U.S. Infrastructure Finance Needs for Water and Wastewater**

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## **Executive Summary**

Much of the existing drinking water and wastewater infrastructure in the United States is at or near the end of its useful life. When such infrastructure is not replaced, public health and the environment are at risk. As a nation, however, we are under-funding water and wastewater infrastructure by \$20 billion annually. The federal government share of wastewater infrastructure spending has shrunk from 78 percent in 1978 to just 3 percent today. In the last four years alone, combined funding for the four largest federal programs that support water and wastewater infrastructure has declined more than 17 percent, not adjusted for inflation. Steep increases in project costs during the same period have magnified the effect of the funding cuts.

For small, rural water and sewer systems, these challenges are exacerbated by diseconomies of scale that result in higher user rates, per capita construction costs, and staff turnover than their urban and suburban counterparts. In addition, more than a million rural Americans still live without adequate service. The communities that operate these systems struggle to secure financing to make needed improvements.

Federal programs are subject to cyclical and political budget pressures that reduce available domestic discretionary spending. Establishing trust funds for water and wastewater infrastructure, similar to the highway and aviation trust funds, would remove budget pressures and provide a dedicated, deficit-neutral, stable source of financing.

## **About RCAP**

Founded in 1972, the Rural Community Assistance Partnership (RCAP) is a 501(c)(3) nonprofit national service delivery network that provides direct technical assistance, training, and financial resources to water and wastewater systems in more than 2,000 small rural communities each year throughout the U.S., Puerto Rico, the U.S. Virgin Islands, and the Pacific Trust Territories. Most of the communities we assist are economically disadvantaged and have a population under 2,500.

# U.S. Infrastructure Finance Needs for Water and Wastewater

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## BACKGROUND

In the U.S., we often take for granted our drinking water and wastewater infrastructure. Water lines lie buried beneath our rural roads and city streets, out of sight and out of mind. Much of our national investment in these water utilities occurred many decades ago during economic and demographic expansions. This early infrastructure of century-old cast-iron pipes and post-World War II era pipes now needs to be replaced.<sup>1</sup> So do the systems installed and financed during the heyday of federal construction grant and loan programs in the 1960s and 1970s. Replacement needs are further complicated by the additional need to upgrade infrastructure to modern environmental standards.

Drinking water and clean water standards are crucial to public and environmental health. The Rural Community Assistance Partnership (RCAP) strongly advocates that safe, affordable drinking water and clean lakes, rivers and seashores should extend to all communities. We've seen dramatic benefits of past national investments, through the provision safe drinking water to the vast majority of the U.S. population and in reduced pollution of our nation's waterways.

To ensure sustainability, however, infrastructure investments require effective management and fiscal responsibility, by both local utility management and state and federal infrastructure finance and regulatory programs. If any party in this local-state-federal partnership fails to meet its full responsibility, the system can break down and our parents, children and grandchildren in our own homes and neighborhoods are at increased risk of endangered public health through failure of basic drinking water or sewage infrastructure.

Water and wastewater are fundamentally local services, provided by the most local levels of government—cities and towns, rural water supply cooperatives, and even some homeowner's associations. Nationwide 53,000 community water systems provide basic drinking water services for 282 million Americans.<sup>2</sup> The U.S. Environmental Protection Agency (EPA) defines a "community water system" (CWS) as a public water system that supplies water to the same population year-round.<sup>3</sup> Some 17,000 publicly owned treatment works also process wastewater to our higher "secondary" effluent standards adopted in the 1970s.<sup>4</sup> For most of these utilities, the physical infrastructure has served for many decades, and has now reached the time for rehabilitation and replacement.

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<sup>1</sup> AWWA, Dawn of the Replacement Era: Reinvesting in Drinking Water Infrastructure, May 2001.

<sup>2</sup> EPA Factoids, 2005. (The remainder of the population is served by private wells, and in some areas still by hauling water from remote sources.)

<sup>3</sup> Public Drinking Water Systems: Facts and Figures, <http://www.epa.gov/safewater/pws/factoids.html>, accessed February 2007.

<sup>4</sup> EPA. Clean Water and Drinking Water Infrastructure Gap Analysis. Sept. 2002., p. 7.

## SMALL WATER SYSTEM NEEDS

The RCAP regional partners have worked for three decades alongside rural communities throughout the U.S. As a result, RCAP carries an important advocacy role to ensure that the voices of rural and underserved communities are adequately represented in national discussions about securing investments in basic services. While aging physical infrastructure and increasing regulation affect communities of all sizes, the factors are especially acute for the majority of water utilities in the U.S.—the small water systems.

“Large” and “very large” water systems may serve 81 percent of the population, but the great majority of water systems (92 percent) serve communities under 10,000 population.<sup>5</sup>

**Community Water System Demographics**

System Size	# of Systems	Pop. Served	% of Systems	% of Pop.
Very Small 25-500	29,666	4,925,748	56%	2%
Small 501-3,300	14,389	20,851,292	27%	7%
Medium 3,301-10,000	4,748	27,514,714	9%	10%
Large 10,001-100,000	3,648	102,747,558	7%	36%
Very Large >100,000	386	126,304,807	1%	45%
Total	52,837	282,344,119	100.00%	100.00%

Source: EPA Factoids: Drinking Water and Ground Water Statistics for 2005.

**Smaller & Medium-sized Community Water Systems**

All Systems	# of Systems	Pop. Served	% of Systems	% of Pop.
< 3,300 Pop.	44,055	25,777,040	83%	9%
< 10,000 Pop.	48,803	53,291,754	92%	19%

Small utilities typically charge higher water and sewer rates for service simply because investment, operations, and maintenance costs are shared across a smaller number of customers. Effects of these “diseconomies of scale” are evidenced at many levels, from volunteer or part-time staffing of the smallest systems to a reduced ability to finance and service loans for major infrastructure upgrades.

An additional factor that contributes to higher residential user rates in small water systems is that much smaller percentages of income are earned from “non-residential” commercial or wholesale

<sup>5</sup> EPA. Factoids: Drinking Water and Ground Water Statistics for 2005.

customers.<sup>6</sup> As seen in the table below, the largest water systems, on average, receive 50 percent of their revenue from commercial and wholesale accounts. For small water systems, the non-residential customers that do exist are often small businesses with relatively low water usage and not large industrial customers.

**Community Water System Revenues**

<b>System Size</b>	<b>Number of Community Water Systems</b>	<b>Avg. Total Revenue</b>	<b>% of Revenue from Residential Customers</b>
Very Small 25-500	29,666	\$22,000	89%
Small 501-3,300	14,389	\$185,000	84%
Medium 3,301-10,000	4,748	\$760,000	74%
Large 10,001-100,000	3,648	\$3,600,000	67%
Very Large >100,000	386	\$41,000,000	50%

EPA Community Water System Survey 2000

With lower population densities in rural areas, small utilities also serve fewer customers per mile of distribution pipe, as evidenced in the table below. As a result, both construction and maintenance costs per connection can be greater than in larger urban utilities.

<b>Population served</b>	<b>Customers per mile</b>
101 - 500	75
501 - 3,300	115
3,301 - 10,000	168
10,001 - 50,000	196
50,001 - 100,000	221
100,001 - 500,000	275
> 500,000	315

For Publicly Owned Community Water Systems.  
EPA Community Water System Survey 2000, p. 26.

Just as a home is often the largest asset for most U.S. households, drinking water and sewer infrastructure is usually the most expensive asset owned by a local community. Likewise, whereas mortgage lending is commonly used to finance home purchases, most utility infrastructure will be similarly financed with loans over the life of the assets. This “pay-as-you-use” financing means that future users will also pay for infrastructure investments through their monthly water and sewer rates.

<sup>6</sup> EPA. 2000 Community Water Survey, and Bagi, p. 44.

### Average Annual Revenue and Capital Improvement Expenditures

System Size	Average Total Revenue	Average Annual Capital Improvement Expenditures
		Publicly Owned Systems
Very Small 25-500	\$22,000	\$34,000
Small 501-3,300	\$185,000	\$48,000
Medium 3,301-10,000	\$760,000	\$199,000
Large 10,001-100,000	\$3,600,000	\$1,114,000
Very Large >100,000	\$41,000,000	\$12,606,000

EPA Community Water System Survey 2000

The vast differences in scale of annual revenue seen above help illustrate why small utilities may require different infrastructure lending programs and finance mechanisms.

### Average Percentage of Capital Improvement Funded by Source

System Type	Source	Very Small 25-500	Small 501-3,300	Medium 3,301- 10,000	Large 10,001- 100,000	Very Large >100,000	Total All Systems
Publicly Owned Systems	Current Revenue	45%	53%	50%	56%	65%	51%
	DWSRF & Other Gov't Loans	11%	19%	14%	12%	6%	15%
	Govt Grants or Prin. Forgiveness	30%	15%	16%	6%	2%	17%
	Private Sector Borrowing	9%	11%	17%	25%	27%	14%
	Other	6%	3%	2%	0%	1%	3%

From EPA Community Water System Survey 2000, pp. 31, 34.

Larger water systems tend to pay for a greater percentage of capital investments through current revenue, have credit ratings, and are more likely to borrow from private capital markets. Small utilities have more difficulty with project affordability due to small customer bases and will more often access state and federal loans and grant programs in order to fund capital projects. These fundamental differences may be misunderstood by some policy makers as an “entitlement mentality.” In reality there are significant issues of affordability and lack of access to capital for small utilities that indicate legitimate roles for federal and state loan and loan-grant funding. It is important to note that the “average annual capital improvement expenditure” of \$48,000 for small publicly owned water systems does not adequately demonstrate the impact of a major

infrastructure project on a small community. A water utility will have regular, ongoing annual infrastructure improvement expenses, but a “major” water infrastructure project may occur only once every 20-40 years. Construction costs to replace a significant portion of a small drinking water or wastewater system are regularly several million dollars.

As an example, a recent cost estimate to replace failing sewer collection lines in a small central Texas town with a population of 500 is \$2.4 million. In such a situation, even with significant grant funding, debt service would easily equal or exceed the “average” capital expenditure budget of the average small community.

## REVIEW OF INFRASTRUCTURE FINANCE NEEDS & GAP ESTIMATES

Over the past decade, studies by both industry and government have documented the national scale of total infrastructure investment needs. Some of the major studies estimating water infrastructure needs are summarized in the tables below. As the studies have been repeated, the estimates have often increased. One example is the EPA Drinking Water Needs Survey (DWNS) conducted in 1995, 1999, and 2003. With efforts to improve the accuracy of the needs survey, the 20-year needs estimate increased by 60 percent from \$167 billion reported in the 1999 survey, to \$276.8 billion in the 2003 survey.<sup>7</sup>

### *Estimate of Current Annual Capital Spending*

Source	Drinking Water	Wastewater	Total
2000 WIN <sup>8</sup>	\$12B	\$10B	\$22B

### *Estimates of Annual Capital Investment Needs*

Source	Drinking Water	Wastewater	Total
2000 WIN	\$24B	\$23B	\$47B
2001 AWWA <sup>9</sup>	\$8.3 B (pipes only)	n/a	n/a
2002 EPA <sup>10</sup>	\$7-22B	\$16-22B	\$23-44B
2002 CBO <sup>11</sup>	\$12-20B	\$15-22B	\$27-42B
2003 DWNS <sup>12</sup>	\$13.8B	n/a	n/a

<sup>7</sup> EPA, 2003 DWNS, p. 5. Note: 1995, 1999 estimates are in 2003 dollars as reported in the EPA 2003 DWNS.

<sup>8</sup> “Clean and Safe Water for the 21st Century,” Water Infrastructure Network. April 2000.

<sup>9</sup> AWWA. Dawn of the Replacement Era: Reinvesting in Drinking Water Infrastructure, May 2001.

<sup>10</sup> EPA. The Clean Water and Drinking Water Infrastructure Gap Analysis. Sept. 2002.

<sup>11</sup> Congressional Budget Office. Future Investment in Drinking Water and Wastewater Infrastructure. November 2002.

<sup>12</sup> EPA, 2003 Drinking Water Needs Survey.

### **Summary of Estimated Annual Gap Between Current Spending and Investment Needs**

<b>Source</b>	<b>DW Gap</b>	<b>WW Gap</b>	<b>Annual Gap</b>	<b>20-Year Total</b>
2000 WIN	\$11B	\$12B	\$23B	\$460B
2002 EPA*	\$0-13.5B	\$0-8.9B	\$0-\$22.4B	\$0 - 448B
2002 CBO	\$0-8.3B	\$3.2-11.1B	\$3.2-19.4B	\$60B - 388B

### **RESPONSE IS NEEDED TO GAP ESTIMATES**

Sophisticated studies by advocacy and industry groups and government agencies have analyzed and attempted forecasts of these important needs. A strong concern arises from the fact that over the past decade, there has been almost no response to the repeated studies.

The Water Infrastructure Network Study in 2000 and EPA Gap Analysis in 2002 each forecast needs over the period from 2000-2019. We are now one-third through that time period and presidential budgets have been repeatedly proposed to reduce federal infrastructure funding, rather than respond to the well-documented needs.

If extensive studies and the complexity of estimates tend to obscure real needs rather than inform policy decisions, then we've experienced an "intelligence failure." Continued failure to provide adequate access to capital financing for basic infrastructure leaves us guilty at a "top-down" level of the "*deferred maintenance*" that we advocate against at the local utility level.

### **INFRASTRUCTURE FINANCE SOURCES AND FUTURE OPTIONS**

There is a clear federal role in protecting basic public health by regulating drinking water quality, and also in ensuring that America's water bodies support their uses as drinking water sources, fishing or contact recreation areas. A federal role of ensuring adequate access to infrastructure financing, through direct loan and grant allocations—by the U.S. Department of Agriculture Rural Development (USDA RD), EPA-capitalized State Revolving Loan Funds (SRFs), or the proposed Clean Water Trust Fund—is appropriate due to the scale of investment lending required. While private capital and municipal bond markets can provide much of the lending for domestic infrastructure, there are major areas—especially lending to small systems—that are often underserved by private lenders.

#### USDA Rural Development, Water Environment Program

From its origin in 1937 and first loans in 1940 to the present, the former Farmers Home Administration program financed many of our rural and small city water and wastewater systems throughout the U.S.

USDA RD now makes direct loans, with some partial grants, based on community income levels and user affordability. Because outstanding loan payments are repaid each year to the U.S.

Treasury, the program requires a relatively small annual appropriation for loan funds. In recent years, grant allocations have declined sharply, impacting the affordability of loans offered to communities.

**USDA WEP Grant funding as Percentage of Total Loan-Grant Allocations**

<b>Fiscal Year</b>	2001	2002	2003	2004	2005	2006
<b>Percent</b>	39%	42%	39%	33%	28%	26%

Communities that, due to poverty level incomes, are eligible for “up to 75 percent” grant funding commonly receive only 20 to 25 percent grant funding. While this can be a reasonable loan-to-grant ratio for medium-sized communities with a sufficient customer base, it dramatically reduces the ability of small rural systems to make needed infrastructure upgrades. Applications to USDA RD for funding can further take several years to be awarded loan and grant funding due to the enormous backlog of funding applications.

**USDA RD Water Environment Program (WEP)  
Loan and Grant Applications Funded and Annual Backlog**

<b>Fiscal Year</b>	<b>Applications Funded (millions)</b>	<b>Application Backlog (millions)</b>	<b>Application Backlog (number)</b>
2001	\$1,211	\$3,300	1,500
2002	\$1,969	\$2,100	800
2003	\$1,260	\$2,100	850
2004	\$1,327	\$2,000	971
2005	\$1,272	\$1,400	763
2006	\$1,363	\$2,300	985

While USDA RD staff work to target the diminishing grant funds to the communities with greatest need, there is a clear need for a greater level of both annual loan and grant funding. Small communities often find needed distribution and collection line replacement projects unaffordable, and end up “phasing-out” construction—deferring needed but unaffordable borrowing and construction into the future. Meanwhile, construction and project costs continue to rise and affordable lending resources decrease.

Clean Water State Revolving Fund, EPA and States

The Clean Water State Revolving Fund (CWSRF) originated after the 1987 Clean Water Act amendments as a successor to the Federal Construction Grants Program.

The CWSRF is funded with federal grants through EPA to the states to capitalize state revolving loan funds. States provide 20 percent matching funds, and a number of states have leveraged their programs by borrowing additional funds in the bond market.

**EPA Clean Water SRF Appropriations**

<b>Fiscal Year</b>	2001	2002	2003	2004	2005	2006
<b>Federal Capitalization Grant (millions)</b>	\$1,314	\$1,343	\$1,294	\$1,313	\$1,054	\$873

Recent federal budgets have reduced capitalization grants, rather than acknowledging the documented need to increase available capital investment funds for wastewater infrastructure rehabilitation and replacement.

While the CWSRF allows below market interest rates, it does not provide grant funding or loan forgiveness, which are vital to finance replacement or upgrades to some of the smallest community wastewater systems.

A 2005 survey by the Council of Infrastructure Financing Authorities identified over 2,000 projects seeking \$9 billion in funding.<sup>13</sup>

A frequent concern with the SRF funding are the “cross-cutting” federal requirements that, while well-intentioned, often have limited impact other than slowing application and financing processes. CWSRFs currently only lend to “public entities.” Opening the lending to “private” entities will also include member-owned and managed non-profit associations, such as are eligible for the DWSRF. In short, the more flexibility given to these programs, the better. State programs are encouraged to follow the leveraging model to bring more capital lending to the table. This leveraging is often referred to as the “next generation” of SRFs or as Water/Wastewater Infrastructure Financing Authorities.

Drinking Water State Revolving Fund, EPA and States

The Drinking Water State Revolving Fund (DWSRF), modeled after the CWSRF, was authorized with the 1996 Safe Drinking Water Act Amendments in recognition that, in order to meet increased federal regulations, drinking water systems would require access to additional funding resources. The DWSRF program also provides federal capitalization grants through EPA to the states, requires state matching funds, and also are increasingly “leveraged” with through additional state bond issues. DWSRF appropriations are regularly below the originally authorized amounts, and in recent budgets have been singled out for marked decreases.

**EPA Drinking Water SRF Appropriations**

<b>Fiscal Year</b>	2001	2002	2003	2004	2005	2006
<b>Federal Capitalization Grant</b> (millions)	\$918	\$723	\$613	\$757	\$820	\$768

Community Development Block Grants, HUD

The Community Development Block Grant (CDBG) program administered by the U.S. Department of Housing and Urban Development (HUD) annually provides nearly \$5 billion for local community development needs that range from affordable housing programs to economic development, public health services, and public facilities. While most CDBG funds are granted to metropolitan areas, about 25 percent of the national funds, or \$1.2 billion in FY 06, constitute “non-entitlement” CDBG funds that are passed to state governments to allocate for smaller population and rural needs. Another sign of the great need for affordable water and wastewater financing for small and rural communities is that about 30 percent of the “non-entitlement”

<sup>13</sup> Ward, CIFA Remarks Jan. 19, 2007.

CDBG funds each year finance water and sewer improvements for low-to-moderate income communities, as shown in the table below.

**Water/Sewer Improvements Funded with HUD CDBG Funds**

	<b>From all CDBG Funds</b>	<b>From State/Non-entitlement</b>
<b>FY01</b>	\$434,061,487	\$375,185,667
% of Total 2001	9.2%	30.9%
<b>FY02</b>	\$495,212,608	\$429,621,939
% of Total 2002	9.8%	34.0%
<b>FY03</b>	\$478,729,532	\$425,034,323
% of Total 2003	10.0%	32.3%
<b>FY04</b>	\$471,403,859	\$417,142,202
% of Total 2004	9.7%	30.4%
<b>FY05</b>	\$443,978,039	\$392,522,818
% of Total 2005	9.2%	29.9%
<b>FY06</b>	\$446,924,173	\$386,670,463
% of Total 2006	9.5%	31.4%

As an example of how CDBG grant funding is extended to rural needs, the State of Texas for FY 06 determined that 57 percent of the state/non-entitlement CDBG funds (\$42 million) would be allocated for community development/public facilities needs. (Other funds go to priorities such as colonia initiatives, rural health, economic development and disaster relief.) Of the public facilities allocation, local municipalities or counties applying on behalf of rural non-profit water supply corporations access most of these funds for water and sewer improvements. While the CDBG is a grant program, and communities must match only five to ten percent of the project cost (depending on community size) with local funds, most grant awards are for \$250,000, and often require a community to apply several times in sequential grant years before receiving funding.

In perhaps another sign of limited funds for affordable infrastructure financing, about three percent of the state funds in Texas are allocated to a “self-help” Small Towns Environment Program (STEP). If communities cannot obtain other affordable loans or financing, they may apply for grants for materials or other project costs and install water and sewer lines with local volunteer labor.

In the President’s 2006 budget, the CDBG program was recommended to be “zeroed-out”; however, Congress restored funding. While demand could be expected to be high for a program with 90 to 95 percent grant funding for local community needs, such funds are vital for some of the smallest communities to keep affordable water and sewer rates, and allow repair of failed or inadequate infrastructure.

Clean Water and Drinking Water Trust Funds

USDA RD, SRF, and CDBG appropriations are subject to cyclical and political budget pressures that reduce discretionary federal domestic spending. Establishing a trust fund similar to the

Highway and Aviation Trust Funds to finance water and wastewater infrastructure would remove these budget pressures and move toward stable and adequate financing for the needs of the next 20-50 years. Broad support exists for creating such a trust fund, as shown through the Clean Water America campaign with more than 157,000 petitioners and 170 supporting organizations.<sup>14</sup> For a trust fund to be a viable option, an adequate and equitable dedicated funding source must be identified. When a trust fund is established, it is important that it ensure access to affordable financing for the smallest and high cost water and sewer utilities.<sup>15</sup>

### Private Capital Markets

Given the projected \$30 billion additional needs for annual water and sewer infrastructure investment, it is clear that increased private capital lending is needed. Private capital markets are most accessible for utilities with a sufficient revenue/customer base and a good credit rating, and that seek to borrow larger amounts. Large water utilities obtain an average of 25 percent of capital funds from private borrowing. Private funding is generally more efficient in terms of reduced burdens of federal application processes, environmental reviews, and other “cross-cutting” requirements. The process also takes less time, because waiting on funding application backlogs or certification in Intended Use Plans is unnecessary.

Because federal infrastructure lending programs and appropriate subsidy and grant programs are vital to small utilities, the limited federal funds that are available should be well targeted. Private lenders should be encouraged to extend affordable financing downward to medium-sized communities that have not traditionally been served by private capital markets.

Fannie-Mae and Federal Home Loan Bank-type infrastructure financing entities that purchase existing utility infrastructure loans could also encourage increased lending from private markets. Specific tax incentives changes may also lead to some increased water infrastructure lending.

Most utilities are stable, low-risk investments. As long as the population remains stable or growing, the customer base will remain to service debt with monthly water and sewer bill payments. USDA RD has documented extremely low default rates over the 70-year life of its rural water system lending programs.

### Non-Profit Revolving Loan Funds

The RCAP regional partners have 15 years experience with lending for small system needs. These RLFs were developed to respond to the need for lending for small infrastructure projects for which local banks were not willing to extend financing, yet for which the urgency or small amount made them impractical for funding through state or federal programs. Community Resource Group, the Southern RCAP, regularly makes loans of \$10,000 to \$250,000 for up to 10-year terms at affordable and market interest rates to a number of small communities. Often, these loans have provided emergency financing to replace a failed sewer lift station, provide a new groundwater well or storage tank, provide interim financing for a USDA RD loan, or fund

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<sup>14</sup> See Clean Water America, <http://www.cleanwateramerica.org>.

<sup>15</sup> AWWA, p. 24. WIN 2002, p. 4.

cost overruns when a CDBG grant was not sufficient to complete a project. These small infrastructure loans also have extremely low default rates.

Just as the microcredit lending of the Grameen Bank founded by 2006 Nobel Peace Prize Winner Muhammad Yunus in Bangladesh pioneered extending credit to underserved poor populations where credit-risk information did not exist, RCAP and other small revolving loan funds have addressed the “asymmetric information” problem through years of utility management training experience and onsite field staff assessments.<sup>16</sup>

USDA RD has recognized the effectiveness of small revolving loan funds such as RCAP’s and, in each of the last several years, has made a grant award of approximately \$500,000 to capitalize small revolving loan funds. However, the needs remain greater than available funding for these important lending programs.

## **OTHER INNOVATIVE RESPONSES**

In response to the well-documented needs for water infrastructure finance in the coming decades, the EPA has encouraged best practices in utility management in order to secure existing investments and ensure that limited federal funding is put to the best possible use. These are important efforts, and RCAP technical assistance field staff use many of these EPA-developed tools in training local utility boards and management staff. It is important to recognize that improved management practices alone are not adequate to meet an investment needs gap of the magnitude documented by WIN (\$29.4 billion annually<sup>17</sup>) or the EPA 2003 Drinking Water Needs Survey (\$276.8 billion over the next 20 years). The solution will require all the best management practices, increased private market lending, and significant additional federal funding.

The EPA best practices have been organized in a framework of “Four Pillars for Sustainable Infrastructure” that include full cost pricing, better asset management, efficient water use, and watershed approaches. While each of these areas merits additional research and consideration, the following is a brief application of these factors to small systems needs.

### Full Cost Pricing

As acknowledged in the EPA literature, “full cost pricing” may have different implications across the diverse set and sizes of local utilities.

The 2002 EPA Gap Analysis recommended that one solution for meeting the impending infrastructure finance needs would be to increase real revenue by three percent each year (above inflation). This is unrealistic and based on a faulty assumption that aggregate increases will address individual utility needs. A small water utility serving a population of 500 with infrastructure that is 40-100 years old will not be able to affordably finance and service debt for \$1-2 million projects to replace distribution systems through moderate revenue increases alone.

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<sup>16</sup> Analogy attributed to National Drinking Water Advisory Council discussion in Ft. Worth, TX 2006.

<sup>17</sup> Adjusted to current dollars.

As system size increases, there is increased ability to fund capital improvements through current revenue and private borrowing. However, small, rural and high-cost systems will require federally subsidized lending in amounts greater than currently available.

Anecdotes of small utilities that charge \$10-12 per month for water service and do not adequately maintain rates do depict the needs for improved local management training, however such stories do not reflect the current situation of small and rural utility rates. At the March 2007 Paying for Sustainable Water Infrastructure Conference, USDA RD Water Environment Program Administrator Jim Maras noted that USDA RD borrowers are now charge average water rates of \$38, and \$39 average sewer rates. Many small community water systems now charge \$50-70 or higher water rates as the systems begin new debt service payments on a USDA RD loan to replace aged infrastructure, or must install high-cost treatment to meet new EPA regulations.

Full cost pricing for small utilities suggests annual adjustment of water and sewer rates to keep up with inflation, and that budgets need to fully account for operating and capital improvement reserve funds.

#### Better Management/Asset management

The core of asset management initiatives is long term planning and budgeting for future maintenance and capital replacement needs. Every utility should inventory existing infrastructure with an assessment of age, condition, projected life expectancy and replacement costs and incorporate this information into a multiple-year capital budget.

Depending on system size and resources, there will remain a threshold for capital expenses, below which a utility may efficiently set aside funds to self-finance improvements. Above this given cost threshold it will remain necessary and appropriate to finance the cost of long-term infrastructure over the life of the assets.

#### Efficient Water Use

Scarcity of water resources and costs of water production vary greatly among utilities. Communities dealing with drought, impaired resources, or higher costs of surface water or other treatment to remove contaminants, or that purchase treated water, are usually acutely aware of the need to conserve water resources and the cost of producing and selling additional water. For small systems, however, water sales provide the limited revenue that is available to meet budgets, and reducing water usage while reducing variable costs has only marginal impact on the large fixed costs of system infrastructure.

Reducing water loss due to deteriorated and leaking water distribution lines is probably one of the greatest areas for improved efficiency. Large utilities that afford staff or contractors to conduct leak detection can more efficiently identify water lines that need repair or replacement. Addressing water loss by repairing aged and failing distribution lines, however, returns to the need for adequate financing.

## Watershed Approach

Watershed approaches to source water protection, or managing water quality issues, are a good idea and may be important for identifying the most effective ways to address issues such as non-point source pollution; however, repairs to prevent sanitary sewer overflows and inadequate treatment plants, whether identified on a watershed basis or individually, again require access to affordable financing.

## Regionalization

If part of the high cost of service and affordability issues for small systems is due to their lack of economies of scale—it is appropriate to ask under what circumstances small utilities can achieve lower cost operations through merger or shared management with neighboring utilities. No one-size-fits-all answers exist, but opportunities for regionalization are important and receive separate treatment in a companion RCAP study.

## **TECHNICAL ASSISTANCE & CAPACITY DEVELOPMENT**

RCAP and other technical assistance providers have worked for years to extend best practices and needed training and assistance to many of the 40,000 small community water and sewer providers. Some of this technical assistance is funded through HHS Office of Community Services funding, USDA Rural Development contracts for technical assistance, and EPA Drinking Water and Wastewater programs. In addition, programs like the EPA DWSRF provide Capacity Development assistance to borrowers with improved management and compliance training and guidance.

Any reauthorization of the CWSRF, or implementation of a Clean Water Trust Fund, should include a technical assistance and capacity development component. The 40,000 smallest community water utilities often have the greatest compliance-related needs, as well as the need for financial and management training, while state and federal program staff are stretched thin and unable to provide the same level of cost-effective onsite assistance.

## **SUMMARY RECOMMENDATIONS**

From more than three decades of experience providing water and wastewater technical assistance in thousands of small rural communities each year, the Rural Community Assistance Partnership advocates the following steps to address the US water infrastructure finance shortfall:

1. Establish a Clean Water and a Drinking Water Trust Fund to provide dedicated, off-budget revenue sources to fund the large, needed increase in federal investment in infrastructure.
2. Reauthorize and adequately fund the existing infrastructure finance programs (USDA RD, EPA DWSRF and CWSRF, CDBG). Target these federal investments to communities with greatest need.

3. Define “affordability” commonly across state and federal infrastructure finance programs. Provide sufficient federal grant and loan assistance to achieve affordability among systems of all sizes.
4. Encourage increased lending from private capital markets where viable.
5. Capitalize efficient nonprofit small revolving loan funds.
6. Adequately fund capacity development and technical assistance programs.

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