

# **Overview of the Infrastructure Issue and Summary of NAWC's Proposed Solutions**

**Prepared for the  
Aspen Dialogue on Sustainable Water Infrastructure and Investment**

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This paper has been prepared to assist those participating in the Aspen Dialogue on Sustainable Water Infrastructure and Investment. Among other things, it provides information on:

- The infrastructure challenge the drinking water and wastewater industry is facing,
- The strategies to meet the infrastructure challenges that are being proposed by various parties,
- The related public policy and business questions that must be resolved,
- The consequences of a continuation of the lack of resolution on the infrastructure issues,
- What NAWC believes are the strategies we should pursue as a nation and industry to meet our infrastructure challenge, and
- What some of the sources of assistance may be to pay for the costs of addressing the infrastructure challenge.

Before addressing the details of infrastructure we must note that storm water management, including combined sewer overflows and storm water discharges, is not included in the discussions that follow. This is because those discussions ultimately make the case that the infrastructure investment gap should be closed by customers through full cost of service rates. This makes sense because it is easy to associate drinking water and sewer customers with the services they are receiving. However storm water management services are not provided to individual customers like traditional drinking water and sewer services. The benefits accrue to the entire community.

Because of the regional nature of storm water issues and their collective impact on all citizens in the region, as well as downstream regions, the optimal strategies for closing the storm water infrastructure investment gap differ from those for closing the gap associated with traditional water and sewer service. Because of the collective nature of the benefits received by all citizens from storm water management, various forms of taxation at the local and federal level may be the most equitable way to pay for storm water management. The tax levies received could be provided to wastewater utilities in the form of grants to help pay for the cost of storm water management.

One other note, the word "water" is frequently used in this document as a shorthand expression for both drinking water and wastewater.

## **Why so Much Infrastructure must be replaced?**

In their 2003 Drinking Water Needs Survey, EPA estimated that the drinking water needs for 20 years were \$276.8 Billion and that 2/3 was for transmission and distribution. About 19% was for treatment. A similar need survey for wastewater estimated a total need close to the drinking water need.

The main reason that an unprecedented amount of piping must be replaced or rehabilitated over the next 20 years is corrosion. In drinking water, pipes that were installed more than 100 years ago were made of cast iron and because cast iron is brittle the pipe walls had to be very thick to withstand the stresses they were exposed to. Pipes installed after World War II were made of steel which had great strength, allowing pipe walls to be much thinner. Unfortunately corrosion deteriorated the metal in the walls of these different pipes in a similar way. Consequently, thicker walled pipes took longer to corrode through than thinner walled pipes. Today the thicker walled pipes installed over 100 years ago are reaching the end of their useful lifespan at about the same time as the thinner walled pipes installed after World War II. Hence the unprecedented amount of piping that must be replaced over the next 20 years, which must inevitably increase costs.

## **Cost Consequences of this Massive Replacement**

The effect on water utilities is that their capital expenditures on pipe replacement will have to increase over this period to levels that far exceed what they have had to invest in the past. The most obvious place to get this capital is from customers by charging higher water and sewer rates. However rate increases are rarely accepted by the public without significant opposition, hence the attempts by some in our industry to get a significant amount of the infrastructure cost paid for by the federal government.

Of course there are other developments that will also significantly increase costs of providing safe and reliable water and proper sanitation services including new and more stringent drinking water standards, more stringent effluent limits, global warming which threatens and complicates the management of raw water sources among other things, and the need to enhance security at our utilities.

As with pipes, members of our water community are already petitioning the federal government to do more to cover the increased costs utilities will incur because of these developments. It seems that in the water and wastewater business, more than other businesses, there is a greater expectation that the federal government will protect the players from the financial consequences of operating in an uncertain and changing world.

## **Overview of Strategies for Meeting these Challenges**

There is a continuum of strategies to meet our infrastructure and other challenges that are being considered by the industry and Congress. The continuum can be defined by the following four strategies.

## Strategies

1. Have the federal government pay (e.g. through grants to communities) for most of the replacement infrastructure, thereby subsidizing everyone's water rates for the indefinite future.
2. Have the federal government pay for a significant portion of the replacement infrastructure. As with 1 above all customers would benefit from this subsidy. What government doesn't pay for would be made up by customers.
3. Have customers who can afford it pay for the replacement of infrastructure through full cost of service rates, with the federal government providing modest subsidies through low interest SRF loans, other loan programs, loan guarantees and insurance, and tax incentives. Economically disadvantaged customers, who cannot afford the full cost of service rates, would have their water and sewer bills subsidized with a combination of federal, state, local, and charitable assistance.
4. Have all customers pay for the infrastructure through a full cost of service rate regardless of affordability.

As explained in more detail in the paragraphs below, the optimum strategy(s) is likely to be different for utilities of different sizes. Strategies 1 and 4 represent the limits of the spectrum. Neither is being followed in its pure form today. Today utilities and the organizations that represent them are following or promoting a number of different strategies that are located along the continuum between the extremes. **Strategy 3 is a proposal that NAWC and others have made for how to proceed in the future to meet our infrastructure investment challenge.** Others have proposed strategies that call for much greater subsidy of all customers' water services, primarily through federal grants, which would be used to pay directly for infrastructure. This strategy is represented by Strategy 2.

### **The Industry Debate on Who Should Pay for Infrastructure**

These strategies reflect a fundamental disagreement in our industry about how much of the infrastructure should be paid for by the federal government versus utility customers, and how significant the affordability problem is and how it should be addressed. Some in our industry believe customers are already paying enough and argue that the federal government should step in and pay for a lot more infrastructure than they currently are. Lack of resolution on these issues has resulted in the deferral of a lot of infrastructure investment in our industry, causing an investment gap, as well as major inconsistencies in how the affordability issue is dealt with. The elements of this debate are detailed below along with NAWC's views on what we think are the best ways to proceed to meet our challenges.

### **How are other Utility Services paid for?**

I think it is instructive to first look at how other utility services are paid for in the U.S. Most customers of other utilities (electric, gas, telecommunication) pay full cost of service rates. There are no across the board subsidies of utility rates for all customers,

only very targeted subsidies to deal with the issue of affordability. These include the universal service program in telephone (paid for through rates) and the Low Income Home Energy Assistance Program (LIHEAP) in energy (paid with federal \$). The former subsidizes the cost of telephone service in remote areas that are inordinately expensive to serve and the latter directly subsidizes the energy bills of economically disadvantaged customers.

It is curious that services and products, other than water, that are also essential to life, like energy, food, shelter, clothing, and medical care are paid for by most customers at their full market prices, so why should water be different?

### **Drinking Water is still Relatively Cheap in the U. S.**

Before talking about affordability it is useful to look at U.S. average water prices compared to other developed countries. Water is relatively cheap in the U.S. compared to most developed nations. In an international survey done in 2000 by NUS a cubic meter of water in the U.S. cost about \$.50, while in Germany it costs \$1.80. In France and the U.K. the cost was just under \$1.20 while in Italy it was \$.73. Spain, Sweden, and Ireland had prices in the range of \$.55 to \$.63. Only Canada at about \$.40 was lower than the U.S. Many have said that drinking water in the U.S. has been historically under priced and that this continues today.

### **Costs, Affordability, and Utility Size**

In the water business because of high fixed costs, economies of scale are a very important factor in costs. Given similar treatment requirements, equipment and operating costs are always much lower on a per capita basis for medium and large systems than small systems. This means small systems, no matter how well they are run, must charge much more to their customers than larger systems for similar services. These significant cost differentials raise the issue of affordability of water and sewer services in small communities, especially if rates are raised to the levels needed to support the costs of replacing infrastructure. Affordability of water services can also be a problem among the urban poor, especially when a large portion of the commercial sector leaves an urban area, reducing the number of customers to spread the fixed costs over.

### **When is Federal Help Appropriate?**

As mentioned earlier, some in our industry argue that the infrastructure investment gap exists because most customers are “already paying enough” or “will not be able to afford” the water and sewer rate increases that will be needed to replace our aging infrastructure. Consequently, the federal government should step in to close the investment gap. However, the rationale for increased federal involvement because people are “already paying enough” needs to be carefully examined.

We must distinguish between “ability to pay” (i.e. whether a person can afford it) and “willingness to pay” (i.e. whether a person wants to pay). Most would agree that it is not

the responsibility of government, or charitable organizations for that matter, to subsidize a service cost just because customers don't want to pay the full cost of the service. Most would also agree that those that have the means should pay the full cost of a service if they expect to continue to get the service. However, a compelling social case can be made that government and charities do have a role in assisting those who cannot afford the full cost of vital, life giving services like water and sanitation. If one accepts this premise, then one is led to the conclusion that significant subsidies, federal or other, are appropriate to help customers that genuinely cannot afford a full cost of service rate, but significant subsidies are not appropriate to those who can.

This debate on access and affordability, especially in the international arena, is often couched by activist groups in terms of "water being a fundamental right of all people," implying that water should be provided free or at minimal cost and that making a profit on such a service is not acceptable. While we support the principle that all people should have access to safe and affordable water and sanitation, someone ultimately has to pay for the service or it won't happen. If those getting the water or sanitation services don't pay, it will have to be government or some charitable entity. Of course if it is government that pays, the money must ultimately come from taxes collected from citizens, including water customers.

Of course regardless of who pays, the solutions need to be tailored to physical and economic realities on the ground so that they are self sustaining over the long term. In the poorest communities in the developing world simple low capital cost systems maintained by the local communities are often the most successful approaches. These approaches are used by charitable organizations like Water for People. However, the economic and societal conditions we are facing in the U.S. are far better than in developing countries and the problems we are dealing with and the solutions that make sense here are very different.

### **Non-Targeted Federal Assistance has Many Problems**

If the federal government pays for a sizable proportion of our infrastructure (essentially subsidizing all customers) and the money comes from income taxes (or a tax or fee levied on all taxpayers), water customers are, in effect, still paying for the infrastructure because they all pay taxes. However, they will be paying for it indirectly, through a government system that will charge overhead and has multiple inefficiencies. The net effect is that only a fraction of what customers pay in taxes for infrastructure will actually be used to fund infrastructure in their communities.

Large across the board subsidies like grants to utilities often breed dependence, which works against economic self sufficiency. Large subsidies also distort economic price signals from customers, which can undermine conservation and efficiency improvements so essential for controlling actual costs.

On the other hand, if the subsidies provided by the federal government from income taxes are used to address the affordability problem (subsidies targeted to the economically

disadvantaged), then those receiving the subsidy are not indirectly paying those costs in full as in the above case because lower income taxpayers pay much lower taxes than others. Other, more well off taxpayers would be paying most of the subsidy instead. The targeted nature of this kind of subsidy also avoids the negative consequences associated with across the board subsidies.

In lieu of income taxes, the federal government could get the money to fund infrastructure through a special tax levied on some industry segment. Under this scenario, the industry segment being taxed would be providing a subsidy to water customers, some of which might be recovered from customers in the price of the products they bought from the industry segment paying the tax. This approach requires one party to pay for a service that someone else benefits from. It is not clear how one would convince the tax paying party to do this.

In these scenarios the federal government is essentially an agent that collects and transfers money from taxpayers or some industry sector, charges overhead, and gives it to utilities to buy infrastructure. It is much more efficient economically to have the utility collect directly from its customers the money needed for infrastructure. Water customers will then see what they are getting for the money they are spending and will be able to provide appropriate economic feedback to their utility, something that is impossible in a government managed subsidy program.

Some in our industry also believe, notwithstanding our significant national debt and the public's aversion to new taxes, that there is a real chance that the federal government will be able to provide all the money that will be needed to close the infrastructure investment gap. Those who believe this are reluctant to move forward to fund most of the infrastructure replacement on their own because it would require significant rate increases in most cases.

### **We have an Obligation to be Efficient Service Providers**

Getting our customers to pay the full cost of service will require significant marketing on our part including convincing our customers of the following:

- The management of the existing utility plant is efficient and effective;
- The infrastructure investments are essential to continue to meet standards and provide levels of service expected by customers; and
- For new investments and infrastructure replacement, the utility is pursuing a financing, design, construction, and management approach that assures the customers are getting very cost effective outcomes.

### **Political Disincentives to Addressing the Challenge at the Local Level**

If we expect decision makers at the local level to meet the infrastructure challenge on their own, which will require them to raise rates, we must find a way to generate the public support they need to withstand or mitigate the frequent public criticism that

accompanies even well justified rate increases. Even justifiable increases can undermine political careers. For municipally owned utilities these officials include utility managers, mayors, city counsels, and sometimes independent water boards, all of whom operate within the local political milieu. For privately owned utilities these officials include utility executives and state public utility commissioners, who approve investments, oversee service, and set rates. While these officials are not locally elected, they are not immune to local political forces. We must figure out how can we change the political equation or alternatively depoliticize the local decision making processes to reduce the political risks to all decision makers. Unfortunately, these risks are discouraging many officials (especially elected officials) from moving out on the infrastructure challenges on their own.

### **Small Utility Solutions – Strategy 2**

Approaching the problem as an affordability issue yields different optimal strategies for different sized utilities. The smaller utilities, because of their poor economies of scale and the likelihood that the communities they serve will not be wealthy, may find that full cost of service rates are not affordable by most, if not all of their customers. Some sort of rate subsidy or enhancement of economies of scale to lower rates is needed in most of these cases.

Before significant subsidies are provided officials should determine if the utility can be administratively or physically consolidated with a larger facility, which would allow a reduction in real costs through enhanced economies of scale. If that isn't feasible then some rate subsidization could be provided by the acquiring utility though use of uniform rates across all its service areas. If that can't be done then the only solution is to provide a direct subsidy from government to the existing utility that would lower all customers' rates to an affordable level. While this could be done by subsidizing individual customers' water bills directly, it can also be done by paying for at least some of the utility's capital investments. This reduces debt costs to all customers, allowing lower and hopefully affordable water rates. The latter approach may be easier and less costly than adjusting individual water bills, especially when most of the people cannot afford full cost of service rates. This subsidy could come from either state or federal government.

**Consequently, Strategy 2, which involves the federal government paying for significant amounts of infrastructure, might be the optimal strategy for these situations. While low interest SRF loans is another tool the federal government could use, the amount of subsidy possible with just an interest rate subsidy may not be enough to make rates affordable in these communities, so loan forgiveness (i.e. something like a grant, which is currently allowed under the SRF) may be needed as well.**

### **Large and Medium Utility Solutions – Strategy 3**

Affordability is not only an issue in small rural communities; it can also be a problem in big cities that have large economically disadvantaged sub-populations. This problem is

especially acute in cities that have seen businesses, professionals, and middle class families migrating out of the cities to the suburbs, leaving the urban poor to pay for the rehabilitation of aging infrastructure. In cases like this even a large system, because of a small and financially strapped customer base, will not be able to keep the per capital costs at an affordable level to many of its customers. Fortunately, in most cities there is still a majority that can afford full cost of service rates, so to assure scarce federal dollars are used efficiently (in lieu of grant payments to the utility, which would subsidize all customers) significant subsidies should be provided through water bill payment assistance only to those economically disadvantaged customers who can demonstrate they cannot afford a full cost of service rate.

As mentioned earlier a program like this called LIHEAP is already being used successfully in the energy sector to subsidize energy bills of the economically disadvantaged. Sources of funding for various possible water subsidy programs are discussed below. SRF loans with subsidized interest rates could also be provided to the communities, which would help to modestly reduce the rates of all customers. The approaches discussed in this paragraph are all included in Strategy 3.

### **Sources of Funding for Assistance**

Funding for the subsidies associated with addressing the affordability problem (or providing across the board subsidies to all customers) can come from many sources:

- the federal government,
- state governments,
- charitable sources, and
- the customers of the water utility
  - On a voluntary basis with charitable donations given through their bills, or
  - On a mandatory basis, through uniform rates, that apply to all customers regardless of actual costs in each service area, or through a special surcharge on bills.

The specific mix that is likely to be the most successful will depend in part on local circumstances and the amount of assistance available from the federal and state governments.

Some of the specific approaches for enhanced federal funding that have been proposed by various parties in our industry to implement their preferred strategies are listed below. Along with each are shown the strategies they would support and the actual source of funds needed to support the funding option.

- Increase the SRF appropriations and SRF grants to states (Strategies 2 & 3, income taxes)
  - More and bigger SRF loans
  - More forgiveness of interest and/or principle on SRF loans
  - More direct grants given from the SRF

- A federal grant program for utilities funded with appropriations (Strategy 1 & 2, income taxes)
- A trust fund that would issue grants (Strategy 1 & 2, income tax or a targeted tax)
- Eliminating the cap on private activity bonds making more low interest capital available (Strategy 3, reduces tax revenues going to Treasury)
- A water bill subsidy program like LIHEAP in the energy sector (Strategy 3, income taxes) combined with state and charitable giving
- Subsidizing a small poor community's rates by charging them a uniform rate charged to all customers of the utility that is designed to subsidize the small community's costs (Strategy 2 & 3, uniform rates)

Of course grant programs in the second and third bullets above are the kinds of massive across the board subsidies to all customers contemplated by Strategy 1 & 2. Under Strategy 3 grants would be limited primarily to small systems, with water bill subsidies used in larger systems that have an economically disadvantaged subpopulation. Federal financial obligations would be largest under Strategy 1.