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Growth in Local Government Spending on Public Water and Wastewater – *But How Much Progress Can American Households Afford?*



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Growth in Local Government Spending on Public Water and Wastewater - But How Much Progress Can American Households Afford?

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INTRODUCTION

Local government spending for public water (water supply and wastewater management) reached a new annual high of \$111.4 billion in 2010.



Local government spending for public water (water supply and wastewater management) reached a new annual high of \$111.4 billion in 2010, (1). That amount caps off the \$864 billion spent over the last decade (2001-2010) on public water (Table 1); and several decades (1956-2010) of nearly uninterrupted annual increases in public spending on water and wastewater exceeding \$1.7 trillion. The rate of growth and the magnitude of spending are impressive; but future local government spending faces several challenges that are likely to result in slower growth. This paper describes the rate and magnitude of local spending for public water, with a focus on the last decade (2001-2010); and identifies important challenges local government faces in future spending. These factors are important because water is essential to sustaining life; it plays a critical role in the ecology of watersheds; and it supports a \$16 trillion US economy. A pressing future concern is not whether local spending on public water will continue, but what level of investment is affordable given the current cost allocation practices.

Table 1

Local Government Public Water and Wastewater Investment, 2001-2010

A pressing future concern is not whether local spending on public water will continue, but what level of investment is affordable given the current cost allocation practices.

Year	Water Supply (\$ thou)	Wastewater Systems (\$ thou)	Combined Water and Wastewater (\$ thou)
2001	36,410,259	27,074,500	63,484,759
2002	40,169,307	30,207,393	70,376,700
2003	42,907,605	31,536,919	74,444,524
2004	44,275,003	33,966,273	78,241,276
2005	45,636,724	35,254,120	80,890,844
2006	47,414,872	37,954,564	85,369,436
2007	53,811,547	42,739,939	96,551,486
2008	54,595,577	45,468,332	100,063,909
2009	57,023,222	46,430,261	103,453,483
2010	60,620,732	50,778,201	111,398,933

LOCAL GOVERNMENT INVESTMENT IN WATER AND WASTEWATER: A HISTORY OF ROBUST GROWTH

The historical spending record clearly establishes local government as the dominant investor in public water, and by virtue of the investment also establishes local government as a critical water environment steward. Combined public water and wastewater investment is estimated to be \$1.77 trillion from 1972 (adoption of the Clean Water Act (CWA)) to 2010: \$981.4 billion for water supply; and, \$796.4 billion for wastewater systems. Federal construction grants for wastewater facilities accounted for roughly \$60 to \$80 billion of the total investment in the 1970s and 80s. The grant program was succeeded by a Congressional capitalization grant program to the states for distribution to local government in the form of State Revolving Fund (SRF) loans (CWSRF and for the Safe Drinking Water Act - SDWSRF). Given the longstanding relative decline in constant value of state and federal financial assistance to public water investment local government has had to raise rates and increase long-term borrowing to operate and sustain public water infrastructure and comply with regulatory mandates.

The Magnitude and Rate of Growth in Local Public Water Spending

Local investment in 1972 for water supply was \$3.7 billion, and \$3.2 billion for wastewater: a combined investment of nearly \$7 billion in capital construction, equipment, and Operations and Maintenance (O&M). The magnitude of local spending has grown considerably since then. The Census recently reported that 2010 local government expenditures for combined water and wastewater were \$111.4 billion: \$60.6 billion for water supply; and, \$50.8 billion for wastewater systems.

Combined public water spending from 1972 to 2010 (39 years) increased by 7.66 percent annually on average. Increased spending during this period generally ranged between 2.65 and 12.67 percent*. There were 5 instances where year over year spending fell below 2.65 percent (1982, 1984, 1994, 1998, 2001); and 7 instances where spending exceeded 12.67 percent (1974, 1975, 1979, 1980, 1981, 1986, 2007).

Public water investments grew through the recent Great Recession period (2008-2010), even though local government revenues declined sharply. Several exceptions to positive increases in year over year spending occurred, (Table 2), but for the most part these declining investments were negligible. Two exceptions to this trend where declines were more than negligible occurred for wastewater investments between 1981 and 82 (-3.05 percent decline), and again in 1993 and 94, (-6.37 percent decline).

Public per capita spending on local public water in the US has increased: \$284 in 1995; \$443 in 2005; and \$539 in 2010.

Table 2

**Successive Year Public Water Investment Increases
And Exceptions, 1972-2010**

Investment Category	Water Supply	Wastewater
No. Years of Increased Public Investment	38	35
EXCEPTIONS		
Year and %	1992-1993 -0.78%	1981-1982 -3.05%
		1993-1994 -6.37%
		1997-1998 -0.22%
		2000-2001 -0.09%

The rate of growth in public water spending far outpaced growth in non-military GDP with few exceptions during the last decade, (Table 3). Public water investments grew by 60 percent, while overall non-military GDP grew by 37 percent.

Local water spending outstrips growth in GDP

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Table 3

Growth in Local Public Spending Compared to GDP

	Water Supply (%)	Wastewater Systems (%)	Combined Water and Wastewater (%)	Non-Defense GDP Growth (%)
2001	2.75	-0.09	1.52	2.38
2002	10.32	11.57	10.85	3.39
2003	6.82	4.40	5.78	4.60
2004	3.19	7.70	5.10	6.36
2005	3.08	3.79	3.38	6.47
2006	3.90	7.66	5.53	5.99
2007	13.49	12.61	13.09	4.86
2008	1.46	6.38	3.63	1.76
2009	4.45	2.12	3.38	-2.64
2010	6.31	9.36	7.68	4.21

Local water Capital and O&M Spending outstrips inflation

Inflation erodes local government purchasing power, and over time, larger investments are needed to keep pace with investment needs. The rate of growth in public water spending was greater than inflation. For example, a \$1 million capital investment in wastewater in 2001 would cost \$1.45 million in 2010 according to inflation factors published by the Bureau of Economic Analysis (BEA) (3), (Table 4). In 2001 total local government spending on wastewater capital was \$8.8 billion. Using the BEA capital inflation factors would suggest a 45 percent increase in capital spending on this sector, or an expected \$12.8 billion investment in 2010, just to keep up with inflation. Actual wastewater capital investment in 2010 was \$20.6 billion.

Public water investment is not only growing faster than several benchmark economic indicators, it continues to garner widespread support from the public and local government officials. These investments produce enormous public and environmental benefits.

Table 4

Inflation Effects on Public Expenditures in Water and Wastewater (2001 = 100)

Investment Category	Capital Investment Water (\$)	Capital Investment Wastewater (\$)	O&M Investment Water/Wastewater (\$)
Year			
2001	1,000,000	1,000,000	500,000
2002	1,039,612	1,029,574	510,903.92
2003	1,070,512	1,044,805	535,507.04
2004	1,158,163	1,115,771	556,359.54
2005	1,232,089	1,185,326	589,720.00
2006	1,284,144	1,235,015	619,483.17
2007	1,353,351	1,303,349	651,098.06
2008	1,464,485	1,408,179	690,851.08
2009	1,463,807	1,408,463	680,955.58
2010	1,508,865	1,450,744	700,899.91

O&M investments are also subject to inflation. A 2001 O&M budget of \$500,000 would cost \$700,899, (or 42 percent more) in 2010 (Table 4) according to BEA inflation factors for this category. In 2001 all local government spent \$18.2 billion on wastewater O&M. Using the BEA capital inflation factors would suggest a 42 percent increase in O&M spending on this sector, or an expected additional \$7.6 billion, or \$25.9 billion investment in 2010. Actual wastewater O&M spending in 2010 was \$30.2 billion.

KEY PUBLIC WATER INVESTMENT HEADWINDS

Public water investment is not only growing faster than several benchmark economic indicators, it continues to garner widespread support from the public and local government officials. These investments produce enormous public and environmental benefits. Several factors that affect the level of public water investment are briefly identified below.

It can be noted that the rate of increased annual expenditures in this sector averaged 7.6 percent year over year since 1972, but spending just over the last decade decreased slightly to an annual average of 5.9 percent.

Population Growth

More new and rebuilt public water infrastructure is needed to serve a growing, and increasingly more urban population. The U.S. population was roughly 210 million in 1972 when the Clean Water Act was adopted, and grew 47 percent to 310 million in 2010. More users require safe drinking water and wastewater services both in cities experiencing growth, and as land development continues to expand. Indeed, more than 80 percent of the US population is now served by municipal wastewater systems. Global Insight estimates 32 percent growth in U.S. Metro populations, (an estimated 85 million people) over the next 30 years (2012-2042), (4). This population increase will also require additional public water infrastructure and services.

Inflation

As stated earlier, the rate of increase in local spending on public water generally exceeds inflation despite the downturn in the economy and local government revenues. It can be noted that the rate of increased annual expenditures in this sector averaged 7.6 percent year over year since 1972, but spending just over the last decade decreased slightly to an annual average of 5.9 percent.

Replacing an Aging Public Water Infrastructure

There is much uncertainty over how much it will cost to rebuild an aging water infrastructure, but the general sentiment is that it will be very costly. EPA estimates drinking water infrastructure investment needs at 334.8 billion between 2007 and 2027, (5), and \$298.1 billion for wastewater and stormwater management between 2008 and 2028, (6), for a total exceeding \$632 billion. Other organizations estimate a trillion dollar investment need for new and replacement physical plant, with special attention emphasizing pipe replacement, (7). Most of these estimates focus on capital needs. Local government, as the financier with the primary service delivery responsibility places emphasis on “all-in” capital and O&M costs. And that is why the Conference of Mayors (USCM) estimated that investment needs over the 20 year horizon (2008-2028) is likely in the range of \$2.8 to \$4.8 trillion, (8).

The Cost of Regulatory Compliance

Regulatory standards developed under the CWA and SDWA over the last 40 years have a direct influence on the design, technology choices, operation of treatment facilities, and overall cost of service, long term borrowing and user rates. The cost of compliance with standards is “baked” into the capital investments because you choose your treatment technology based on its demonstrated ability to meet specified contaminant concentration removal or reduction. All capital investments have O&M budgetary requirements that are annually recurring costs. Together, the cost for capital and O&M has mounted over time. The cost of service includes the cost of regulatory compliance.

Indicators of ratepayer affordability limits are becoming more clearly recognized, and this is an issue of real fiscal concern.

In the early stages of large public water treatment, filtration was considered a satisfactory treatment technology. When death rates of 300 or more per 100,000 populations were attributed to waterborne microbes chlorination was added to filtration with an amazing overnight reduction of typhoid and cholera mortality. This stark reversal of a major public health threat is now an artifact of a past era. The new normal is an expanded life expectancy and what can be done to improve the situation, and cost to comply with expanded regulations is a major local concern.

A growing number of local elected officials are wary of the rate and magnitude of compliance cost growth, in addition to growing cost to provide services, and question whether or not the marginal benefits of additional investments have already reached the region of diminishing public clean water benefits. They are also concerned that state and federal regulators are directing local investments away from local environmental and public infrastructure priorities, (9). For example, the combined and sanitary sewer overflow (CSO/SSO) enforcement campaign that EPA is implementing is forcing communities to make relatively large long term investments in reducing overflows, but the resulting benefits may not outweigh the costs. In this current era of limited resources, many local officials want to target investments with a higher local priority. Modernizing outdated, existing water and wastewater systems in some communities is a higher priority investment than investing in CSO/SSO controls because water and wastewater systems demonstrate tangible public health benefits achieved over the last several decades.

A serious concern for local government is the disproportionate financial impact on households at or below the poverty level, or with low, moderate and fixed income at the lower end of the income distribution because user fees command a greater percentage of their annual incomes.



AFFORDABILITY LIMITATIONS

While some argue that not enough is being invested to protect and improve water quality, others argue that not enough is being invested to rehabilitate an aging water infrastructure inventory in the US. Local elected officials are more concerned with better understanding the financial burdens that can reasonably be placed on ratepayers to afford sustained future public water investment. Cumulative costs of providing public water services have mounted over time, and investments triggered by compliance enforcement requirements introduce uncertainty in local capital planning, increases the need for more long term borrowing, and consequently, increases user rates. Although annual public water investment has outstripped inflation, purchasing power continues to erode and increased spending is nearly inevitable, but a majority of the residential user class has not realized increased income at levels proportionate to increased public water spending.

Local government long term debt has steadily increased over the last decade and has reached a decade high.

The ability of local government to indefinitely continue making annual investment increases should not be taken for granted. Indicators of ratepayer affordability limits are becoming more clearly recognized, and this is an issue of real fiscal concern. Two limiting factors are of critical importance: the cost of service and rate structures, especially their impact on economically vulnerable households; and, the implications of growing local government long term debt and financing high cost public water infrastructure. These are discussed below.

Rate Structures and User Fees: Stress on Poor and Middle Class Households

Rate structures are commonly, but not exclusively, designed to support cost of service including O&M and debt retirement, and to generate capital reserves. The current cost allocation method applied in most communities is to set rates at “fair and proportionate” levels (10). This practice, an artifact of the Clean Water Act and condition of past federal financial assistance, employs uniform unit pricing within residential and non-residential user categories. Common practice allows for differential rates between classes of users, but not within user classes, (with some exceptions for tiered rates to promote conservation, etc.). The rate schedule defines user fees, and depending on how a particular community implements their cost allocation scheme, users are billed monthly or less often for “water and sewer”. Residential users can be further categorized into owners and renters, (an important distinction because most owners are billed directly by the local water agency, while renters may be billed indirectly through rent payments).

Public water user fees have been increasing, albeit irregularly, over the last 2 decades, the net result of which is the cumulative cost to consumers has increased. It is more common to find large urban centers adjusting rates upwards every year. When capital investments are involved double-digit rate increases usually follow.

A serious concern for local government is the disproportionate financial impact on households at or below the poverty level, or with low, moderate and fixed income at the lower end of the income distribution because user fees command a greater percentage of their annual incomes. This disparate financial impact is regressive. Current public water cost allocation schemes that rely on uniform user class pricing place a tremendous financial burden on the lower median income households in a community. The financial burden is both substantial, and sometimes, widespread in a community

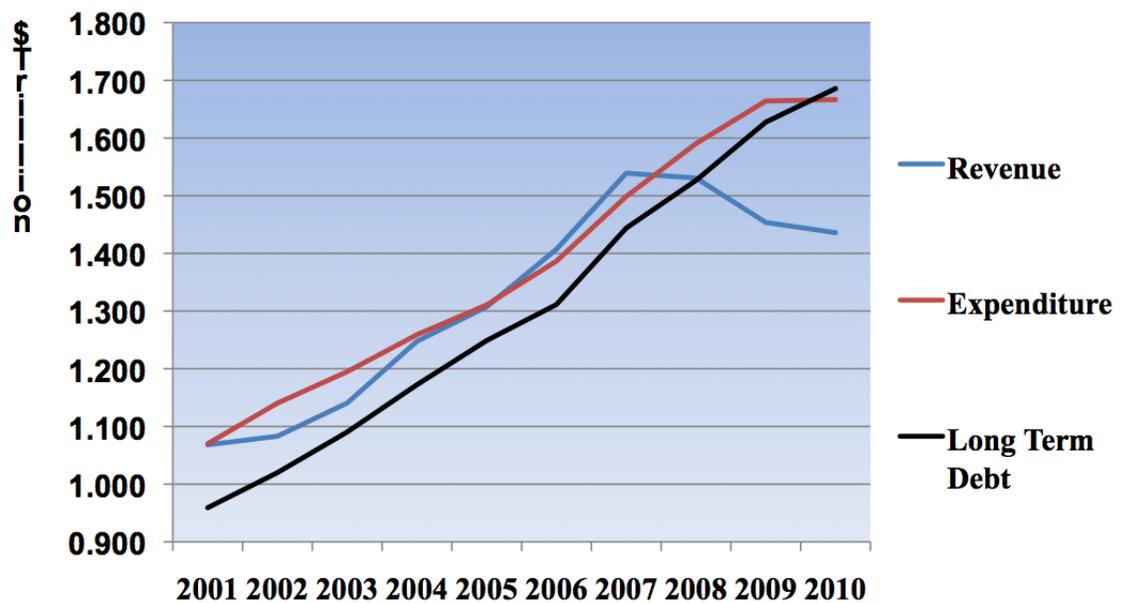
Another trend that signals potential for financial distress and limits on public infrastructure financing is the dual impact of increasing annual local government expenditures with declining revenues (deficits), along with substantial growth in long term debt.

Financing Public Water: Long Term Debt and Community Creditworthiness

Providing public water infrastructure requires large capital investments typically financed with tax exempt municipal bonds (revenue and general obligation bonds), low interest loans and other forms of loan guarantees augmented infrequently by state or federal grants. Public water capital financing shares a crowded field comprised of many non-water public infrastructure interests seeking resources in the tax exempt bond market. Local government is the node where balancing the capital investments and coordinating long term borrowing takes place, and herein lies their ability to manage financial risk and cultivate strong credit ratings to get favorable interest rates. Community creditworthiness is important because it influences the availability and interest rates of borrowing, thus local officials try to plan for the right combination of long term borrowing, the level of long term debt, the need to periodically re-access bond financing for public purposes, and the level of local revenues required to service debt repayment and provide adequate budget for O&M and capital reserves.

Local government long term debt has steadily increased over the last decade and has reached a decade high, (Chart 1). This trend predates the recent recession but may have accelerated faster toward the end of the decade because of it. Local government long term debt grew from \$959 billion in 2001 to \$1.68 trillion in 2010, an annual average increase of 6.5 percent.

Local Government Revenues, Expenditures and Long-Term Debt: 2001-2010, (\$nominal)



Tax exempt bond financing for public water infrastructure between 2003 and 2012 was \$258 billion. A total of \$1.65 trillion in tax exempt bonds were issued for public purposes during that period, (11). The availability of tax exempt bonds for public water investment, over time, is subject to influences from political and economic forces beyond the control of local government. For example, present day policy proposals would limit or eliminate the tax exempt interest income from municipal bonds as a way to close tax advantages and gain more federal tax revenue. A review of Thomson-Reuters bond database commissioned by 3 local government advocacy groups indicates that capping tax exempt interest at the 28 percent tax rate would have raised the interest cost of municipal bonds to states and cities by \$173 billion over the period 2003 to 2012, (11).

Local government long term debt exceeded annual revenues in 2008 for the first time in recent history. By 2010 the gap between long term debt and annual revenues widened considerably. This is a noteworthy new high, and trend, in the ratio of debt to revenues for local government as a broad category of borrowers. While in and of itself a debt to revenue ratio of 1.0 or greater does not induce fiscal panic, it does signal concerns over level of debt and mounting debt service burdens on community households, and the perception of credit risk in the municipal bond market.

Another trend that signals potential for financial distress and limits on public infrastructure financing is the dual impact of increasing annual local government expenditures with declining revenues (deficits), along with substantial growth in long term debt, (Chart 1). While revenues declined from 2007 to 2010 local government expenditures and long term debt continued to increase by 55 percent and 75 percent, respectively, from 2001 to 2010. This trend suggests declining local government income and higher debt repayment burden, both factors that influence community creditworthiness.

DISCUSSION

Local elected officials, and the public, strongly support the goals of fishable, swimmable waters; and for government to provide access to safe drinking water. Cities developed across the US in the last 200 years are rich in the history of providing water resources. The many complexities of urbanization and community development have now resulted in local government commonly providing these essential public water services by establishing government enterprise. The enterprise arrangement respects the widely held view by Americans that water is a common good owned by everyone, and government should retain the authority to deliver it locally/regionally, or oversee critical aspects of how it is delivered by alternative arrangement. Public input at community meetings to discuss public water rate increases often reveals resentment over increases. The public continues to register skepticism over suspicion of profiting from public water services, and stating fear that rates are heading toward exclusionary pricing.

Looking carefully at the factors that influence public water user rates some local officials have suggested that their communities cannot keep financial pace with investments spurred by unfunded federal and state mandates, and the time has come to prioritize investments to maximize public benefits and target investments to sustain existing public water systems and where public benefits are greatest, (8).

In order to achieve progress toward clean water goals and simultaneously sustain the existing water infrastructure, user rates will have to continue to increase. Yet, the fundamental reliance on households and the non-residential user classes to afford the increased rates to sustain existing infrastructure and expand local responsibility to achieve progress on clean water goals is in question. Furthermore, the trend in local deficit spending and use of long term debt instruments may be reaching its limit in some communities. A growing number of households in communities across the US that are experiencing unemployment or declining income are also experiencing public water affordability challenges. A fresh look at local affordability and national water policy is timely.

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* Based on the arithmetic average 7.66% over 39 years, one standard deviation around the average indicates a range between 2.65 and 12.67%.

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The Mayors Water Council (MWC) provides a forum for Mayors to discuss issues impacting how they provide safe, adequate and affordable water and wastewater services and infrastructure in America's Principal Cities in the 21st Century. It is open to all Mayors, focusing on water resource issues, including: watershed management; water supply planning; surface and sub-surface water infrastructure financing and rehabilitation; water conservation, Public-Private Partnerships; and asset management.

The MWC helps Mayors develop local government policy objectives and facilitates dissemination of information on innovative technology, and cost-effective best practices. The MWC acts through the USCM Environment Committee by proposing and reviewing policies on water related matters that benefits the nation's cities.



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