$mart Investments For Water Resources Conservation

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Benefitting from $mart Water Resource Investments

Economic growth and community development often have the unwanted result of depleting or degrading natural resources, most notably water supplies. As populations expand and existing water supplies dwindle or are threatened, local governments must face additional costs trying to find, purchase or develop new water sources and treat existing supplies. In 1993, local governments spent a total of $24.2 billion, nearly 22 percent of their public works budgets, on water supply system construction, operation, and maintenance. After use, water is typically discharged to municipal sewage treatment systems, imposing additional costs. Local government sewerage expenses totaled $21.6 billion in 1993, almost 20 percent of their public works budgets. $mart Investments in water resources have the potential to yield substantial returns at both ends of the pipe.

Local governments spend $46 billion a year on water supply and waste water treatment systems—40% of public works expenditures.

Water resources management and conservation also yields environmental benefits. $mart Investment in water conservation can help preserve watersheds for healthy ecosystems and wildlife habitats. Conservation measures help to maintain adequate water levels in rivers and streams for aquatic ecosystems, and reduce the quantities of wastewater discharged to surface waters. Local governments can make $mart Investments to conserve water resources; many have found that such investments can bring high returns.

$mart Water Conservation Investments and Practices with High Returns

Short-term	Long-term
Adopt landscaping codes • Institute irrigation restrictions • Implement increasing block pricing	Conduct leak detection programs Subsidize plumbing fixture retrofits

$MART WATER CONSERVATION INVESTMENTS

EPA'S WATER ALLIANCE FOR VOLUNTARY EFFICIENCY PROGRAM

Program Overview

EPA's Water Alliance for Voluntary Efficiency (WAVE) Program promotes water conservation through voluntary partnerships with hotel chains to upgrade and improve plumbing fixtures, laundry facilities and other equipment. Signing a Memorandum of Understanding with EPA, partners promise to conduct water use audits, evaluate water conservation options, upgrade existing water systems and fixtures, and update EPA annually on the progress of implementation. They also agree to install water conserving fixtures and systems in all new facilities, and to provide information to customers and employees on the benefits of water conservation. Program partners receive EPA technical assistance, including a free "WAVE-Saver" software package for tracking water consumption, calculating marginal water costs and conservation budgets, and projecting the cost and performance of various water conservation options. EPA also provides education and outreach through training workshops for facility managers and engineers, and information on water conservation products and equipment suppliers.

EPA WAVE
Water Alliances For Voluntary Efficiency

Local Government Participation

The WAVE partnership program will soon be expanded to schools, hospitals, and other public facilities. EPA has been adapting the WAVE-Saver software for schools, with testing scheduled for late 1997. The agency also encourages municipalities, local and regional water resource boards, water districts and water utilities to join the WAVE program as supporters. In addition to upgrading their own water fixtures and systems, program supporters assist EPA in promoting water conservation, educating industry and the public about water conservation technology, and encouraging the development of new technologies. By mid-1997, WAVE supporters included ten city and county level water districts, water conservation departments, and water supply boards from around the country.

Benefits to Local Governments

EPA estimates that a hotel or motel can cut its water consumption by as much as 30 percent by installing water conserving fixtures and equipment, and that the payback period for installation costs is often three years or less. Some WAVE charter partners have reported reductions in annual water use ranging from 2.7 to 11 million gallons. That translates into annual water savings of 14 to 52 percent and corresponding cost reductions of $32,000 to $60,000 for water and sewer services.[1] Schools and hospitals, which use water in the same ways as

hotels, may be able to achieve similar cost savings once they are enrolled in the program. Until then, local governments can benefit from participation as WAVE supporters promoting water conservation. Because the marginal costs of developing additional water supplies are normally borne by municipally owned water utilities, local governments' promotion of water conservation can reduce their operating costs and help defer capital expenditures associated with the expansion and maintenance of water supply systems.

WAVE CHARTER PARTNERS SAVINGS FROM WATER CONSERVATION

- **Water use reductions:**
  - **2.7 to 11 millions gallons/year**
  - **14 to 52 percent of total use**
- **Water and sewer services savings:**
  - **$32,000 to $60,000**

$MART WATER CONSERVATION PRACTICES

There are a variety of proven water conservation investments and practices that can reduce water demand and save money. They range from water conservation ordinances and pricing policies to leak detection and voluntary conservation. For example, "increasing block price" programs charge more for each gallon of water if consumption increases beyond a specified threshold, creating an economic incentive for conservation.

- Nationwide, lawn watering accounts for about 32 percent of residential outdoor water use. Landscaping codes can promote significant water savings by restricting the time and amount of lawn and landscape irrigation. They can also require xeriscape landscaping, low-flow irrigation technologies and reuse of gray water.
- Use of *increasing block prices or time-of-day pricing* can also significantly reduce water demand. In Tucson, Arizona, increasing water prices produced a 33 percent drop in demand from 1974 to 1980.
- A combination of increasing block rates, irrigation restrictions, and plumbing code changes, in Tampa, Florida, reduced the community's water demand by more than 15 percent within the first nine months of the program.
- Many cities have found that a retrofit of plumbing fixtures yields substantial savings: in San Pablo, California, replacing conventional 4.5 gallon-per-flush toilets with low-flow 1.6 gallon-per-flush models in a 30 year-old apartment building cut average water use by 34 percent per household. At a replacement cost of $250 per fixture, the average annual savings of $46 resulted in a five and a half-year payback.
- Leak detection programs, both for water mains and for residential plumbing fixtures, can reduce costly water losses. The City of New York estimates that leakage accounts for as much as 10 percent of its total water demand. By surveying its water mains with computerized electronic leak detection equipment and completing repairs, the city contained the leaks and saved 89 million gallons per day. A separate program of residential leak detection by city inspectors reduced leakage by an additional four million gallons daily.

The local initiatives profiled on the following pages illustrate many of these practices.

Santa Monica, California

Highlights

- **Direct installation or rebates for ultra-low flow toilets in commercial and residential buildings.**
- **Restrictions on lawn and landscape watering, fountains and swimming pools.**
- **Implementation of increasing water rate structure.**
- **New development water supply costs paid in full by developers.**
- **Water use and wastewater flows reduced by14% and 21%, respectively, over five years.**
- **Five-year, $12.5 million reduction in city water supply and wastewater treatment costs.**

Santa Monica, California meets only about two-thirds of its water needs from local ground water supplies, purchasing the rest from the Metropolitan Water District of Southern California. The city also purchases wastewater treatment services from the City of Los Angeles at significant cost. In an effort to reduce both expenses, and avoid constructing its own wastewater treatment plant, Santa Monica initiated a comprehensive water conservation and management program in 1988, revising its plumbing code to require ultra low-flow (ULF) toilets in new buildings. The city also enacted a water conservation ordinance to regulate residential water use, including restrictions on lawn and landscape watering, fountains and swimming pools.

Santa Monica has also established economic incentives to encourage water conservation, including an inclining rate structure which charges higher unit costs as consumption grows, and a water-demand mitigation fee imposed on developers to cover the full water supply costs of new development. The city's Bay Saver Toilet Retrofit Program offers two options to encourage property owners to install ULF toilets: a $75 rebate for purchase and installation of a city-approved toilet, or a $35 payment to have the city provide and install one. The rebate and direct install options are financed with general water and wastewater revenues, credits given to the city by the Metropolitan Water District for conservation initiatives, and surcharges on water bills for property without upgraded fixtures. Having surpassed its original goal of retrofitting 25 percent of residential toilets in less than three years, the program was extended in 1992 to target an additional 25 percent of residential buildings and at least 25 percent of toilets in commercial buildings.

By late 1997 the Bay Saver Program had retrofitted 53 percent of toilets in residential buildings, but only 9.5 percent in commercial buildings. Commercial participation has been low since water costs constitute a smaller percentage of commercial budgets. Nonetheless, the program has reduced water demand and wastewater flows by 1.9 million gallons per day. Combined with other conservation measures, the city realized a 14 percent decrease in water use and a

21 percent drop in wastewater flows from 1990 to 1995, producing net savings of $12.5 million on water purchases and wastewater treatment services.[2]

Philadelphia Water Department

Highlights

- **Water conservation program to reduce non-payment of water bills.**
- **Average household water savings of 25%.**
- **48% return on investment to city's water department.**

The Philadelphia Water Department (PWD) serves a population of 1.74 million people, supplying the area with 349 million gallons of water per day. In 1986 PWD instituted the Conservation Assistance Program (CAP) to help low-income and "payment-troubled" residential customers manage their water use. The CAP educates consumers about water use and provides direct installation of low-flow toilets, shower heads and faucet aerators, in addition to minor leak repairs. Such assistance lowers customers' water use to levels they can afford. Because PWD has an abundant supply of water, the program was intended to serve only as a means to reduce non-payment of bills. However, it has also resulted in average household water savings of 25 percent. Through reduced bill arrearage and reduced water supply operating costs, PWD expects net savings of $97 per household over ten years, or $1.48 for every dollar invested in the program.[3]

Los Angeles

Highlights

- **Rebates for purchase and installation of low-flow toilets.**
- **Annual savings of $15 million in water supply and treatment costs.**
- **Two-thirds reduction in sewer hookup fees.**

Since 1988, the City of Los Angeles has required the use of low-flow water fixtures in all new construction. In 1990, to increase water conservation, the Los Angeles Department of Water and Power (DWP) began replacing toilets in existing buildings with low-flow models. Offering rebates of $75 to $100 for anyone purchasing a low-flow toilet, and distributing free toilets through local community organizations, the city replaced 620,000 toilets by 1996. The DWP has invested a total of $65 million in the rebate program, but now saves $15 million in water supply and treatment costs annually, for a payback period of less than five years. Residents also save on sewer charges, which are based on the amount of water piped into their homes. Reduced wastewater flows have enabled the city to cut costs for wastewater treatment, resulting in a two-thirds reduction in sewer hookup fees for new construction, the largest fee cut in the city's history.[4]

Atlanta's Public-Private Partnership for Water Conservation

Highlights

- **Retrofit 20,000 households in Empowerment Zone with low flow fixtures.**
- **Funding provided by corporate and non-profit partners.**
- **Projected savings of $2.7 million on water bills.**

EPA Region 4 has recently been involved in a public-private partnership with the City of Atlanta, Georgia Power Corp. and the Turner Foundation to distribute low-flow toilets, shower heads, and faucet adapters to low-income residents of the Atlanta Empowerment Zone, with funding provided by corporate and non-profit partners. The initial phase of the project, started with distribution of low-flow fixtures to 960 households, is expected to reduce annual water consumption by 25 million gallons, yielding savings of $87,000 on residents' water bills. The long-term project goal is to retrofit all 20,000 households in the Empowerment Zone with low-flow fixtures, with projected savings of $2.7 million on water bills.[5]

GETTING STARTED

TIPS FOR MAKING $MART INVESTMENTS FOR WATER RESOURCES CONSERVATION

- Design a water conservation program to address the specific needs of the community. This may require analyses of water metering or billing records to identify the largest water consumers.
- Target reductions in commercial and residential use through changes in water rate structures, or modifications to plumbing codes.
- Address non-payment of bills through in-home water audits, leak repairs, and subsidized retrofits with water conserving fixtures for low-income residents.

SOURCES OF ADDITIONAL INFORMATION

EPA WAVE PROGRAM

EPA Office of Water
Contact: John Flowers,
WAVE Program Director
Phone: (202) 260-7288
EPA's WAVE Technical Support Hotline
Phone: (800) 993-WAVE

The WAVE Program promotes voluntary water conservation. EPA provides program partners with technical assistance tools for plumbing upgrades, including free "WAVE-saver" software for tracking water use.

WATER CONSERVATION

City of Santa Monica
Environmental Programs Division
200 Santa Monica Pier
Santa Monica, CA 90401
Contact: Dean Kubani
Phone: (310) 458-2227
Fax: (310) 393-1279

Santa Monica's Environmental Programs Division tracks progress on a number of the environmental initiatives the city is undertaking as part of its Sustainable City Program.

City of San Jose
Environmental Services Department
777 N. First St., Suite 450
San Jose, CA 95112
Phone: (408) 277-5533
Fax: (408) 277-3606

The city is reducing wastewater flows by installing ultra low-flow toilets in new construction and providing incentives to local businesses to install water conserving fixtures. San Jose also plans to develop a Nonpotable Reclamation and Reuse Facility to provide water for irrigation, fire fighting, fountains, street sweeping and vehicle washing.[6]

GENERAL RESOURCES

International City/County Management Association (ICMA)
777 North Capitol Street, NE, Suite 500
Washington, DC 20002-4201
Phone: (202) 289-4262
Fax: (202) 962-3500
Internet Site: http://www.icma.org

ICMA is a professional and educational association for more than 8,000 local government administrators worldwide. ICMA provides training programs, technical assistance, data services and publications to improve the quality of local government management and administration.

ENDNOTES—CHAPTER 3

1. U.S. Environmental Protection Agency, Office of Water. Introducing WAVE - Water Alliances for Voluntary Efficiency: Hotel Water Management for the 21st Century. September 1994.
2. International Council for Local Environmental Initiatives, Project Summary Series, "Santa Monica, USA: Water Conservation," Project Summary #37, Internet Site, http://www.iclei.org/leicomm/lei-037.htm (accessed 5/13/97).
3. The Results Center, Division of IRT Environment, Inc. Philadelphia Water Department. Conservation Assistance Program. The Results Center Profile #109.
4. Wilgoren, Jodi. "Council Panel Agrees to Slash Sewer Hookup Fee," Los Angeles Times, April 10, 1996. p. B-1.
5. Perez, Ernesto A. "Atlanta Empowerment Zone - Water Conservation retrofit Kick-off results," Memorandum to John H. Hankinson, Jr., Regional Administrator, EPA Region 4, and Allison Wise, Special Assistant to Regional Administrator. June 3, 1996.
6. Renew America, Success Stories Series, "The Sustainable City Project," Internet Site, http://www.sustainable.doe.gov/ss/sustainable_city_project.htm (accessed 5/13/97).