



● Overview of Metropolitan's Efforts to Encourage Conservation

Summary

This report provides background on Metropolitan's historical approaches to encourage water conservation in its service area. This includes the incentive based regional conservation program, non-incentive based programs like the California Friendly landscape training program, legislative efforts and research.

Purpose

Informational

Attachments

Attachment 1 – August 8, 1988 Board Letter titled “Financial Incentives for Water Conservation”

Attachment 2 – May 29, 1990 Board Letter titled “Conservation Credits Program Financial Contribution”

Attachment 3 – December 13, 2005 Board Letter titled “Authorize implementation of conservation incentive level updates and program refinements from Metropolitan's Five-Year Conservation Strategy Plan”

Detailed Report

The Regional Benefits of Conservation

Metropolitan's regional conservation programs and approaches have a long history. Decades ago, it was recognized that demand management would be an important part of balancing regional supplies and demands. By reducing the demand for water, water conservation efforts were seen as a way to reduce the need to increase imported supplies and offset the need to transport or store additional water into or within the Metropolitan service area.

The actual conservation of water takes place at the retail consumer level. Regional conservation approaches have proven to be effective at reaching retail consumers throughout the service area and successfully implementing water saving devices, programs and practices. Regional investments in demand management programs, of which conservation is a key part along with local supply programs, benefit all member agencies regardless of project location. These programs help to increase regional water supply reliability, reduce demands for imported water supplies, decrease the burden on the district's infrastructure and reduce system costs, and free up conveyance capacity to the benefit of all system users. Thus, water conservation, as a demand management program, contributes to transportation infrastructure savings for all users of the regional water system.

Metropolitan's 1996 Integrated Water Resources Plan (IRP) included an analysis of future demand scenarios and their effect on infrastructure requirements. A comparison of capital infrastructure costs with and without demand management programs showed a difference of about \$2 billion. In other words, the ability to meet demand through local Demand Management Programs resulted in an anticipated \$2 billion in capital cost savings. A sensitivity analysis further showed that a 5 percent increase or decrease in demand had a correlative effect on when Metropolitan would need to incur capital infrastructure costs. Since then, Metropolitan has seen the benefits materialize. Metropolitan has been able to defer the need to build additional infrastructure such as the Central Pool Augmentation Project tunnel and pipeline, completion of San Diego Pipeline No. 6, the West Valley Interconnection and the completion of the State Water Project East Branch Expansion. Overall, the decrease in water demand, which is due in part to the effect of demand management programs, is estimated to have deferred the need for these projects between four and twenty five years at an estimated cost savings of \$2.7 billion (in 2015 dollars).

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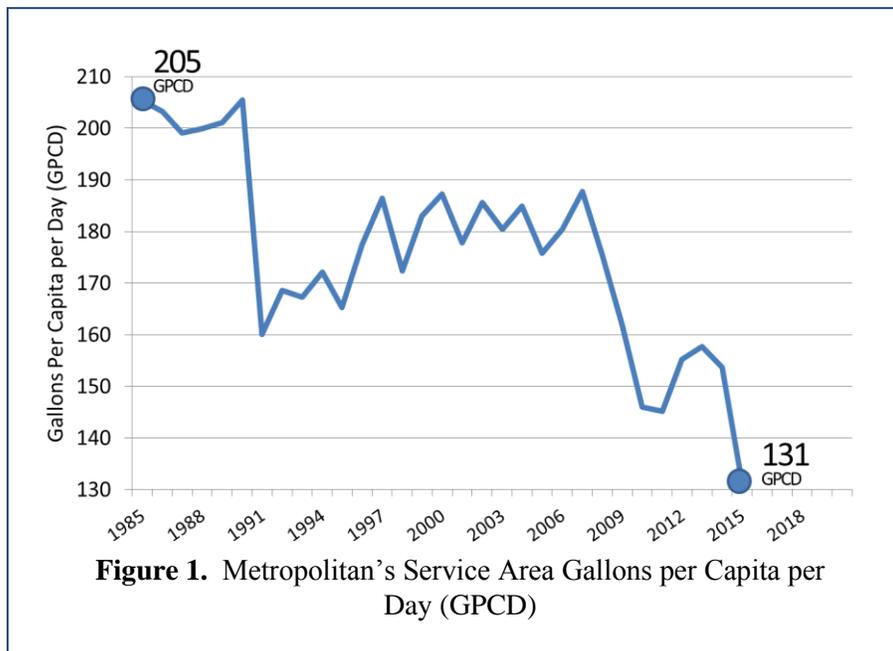
Since 1996, the IRP has been updated three times in 2004, 2010 and 2015. In each update, the importance and commitment to demand management programs including conservation has been a major component of the region’s resource development plan, reaffirming long-term sustainability of the region’s water supply through implementation of conservation and local resource development.

In 1999, the California Legislature and Governor recognized the regional benefit of conservation, as well as local supply development, by enacting Senate Bill 60 which directed Metropolitan to increase “sustainable, environmentally sound and cost-effective water conservation, recycling and groundwater storage and replenishment measures.”

Conservation Reduces Water Use

To date, Metropolitan has invested about \$731 million in conservation-related programs. Collectively, Metropolitan’s conservation programs along with local efforts have helped to reduce Southern California’s demand for water. Although the region’s population has increased by nearly 40 percent since 1985, conservation efforts have helped to maintain retail water demands at about the same level more than 30 years later.

Metropolitan’s efforts to increase the region’s water efficiency, along with the efforts of other agencies, have resulted in a drop in potable per capita water use of approximately 36 percent (Figure 1) over 30 years.



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Metropolitan's Early Conservation Efforts

The drought of 1976-1977 was one of the worst seen in the State of California. At the time, the State Water Project (SWP) allocation was very low. Metropolitan's Colorado River supplies were stable, but in order to help manage with low SWP supplies, Metropolitan requested its member agencies to reduce their deliveries by 10 percent. Additionally, Metropolitan started encouraging consumers region wide to conserve water through a highly visible water efficiency program (Figure 2). Metropolitan purchased 50,000 conservation kits (Figure 3) containing toilet displacement bags, shower flow restrictors, and dye tablets for detecting leaks. These kits were provided for member agencies to distribute to residents as a method to make an immediate impact in summer demand reduction. These drought response efforts were the beginning of the active conservation program at Metropolitan.

In the 1980s, it became evident that without a long-term conservation program, increasing demands could eventually outstrip the region's available supplies. Metropolitan began pursuing yearly efforts to encourage the public to use water more efficiently. One of the early efforts focused on an elementary school education program designed to create a greater awareness of the importance of water. The motive was to teach children the value of water at a young age with the hope that they would carry that value throughout their life. Metropolitan gradually expanded its educational conservation focus towards children by creating animated films and comic books (The Guzzler Gang) that they could relate to.



Figure 2. Billboard with conservation messaging in 1977



Figure 3. Water conservation kit

Financial Incentives for Encouraging Water Conservation

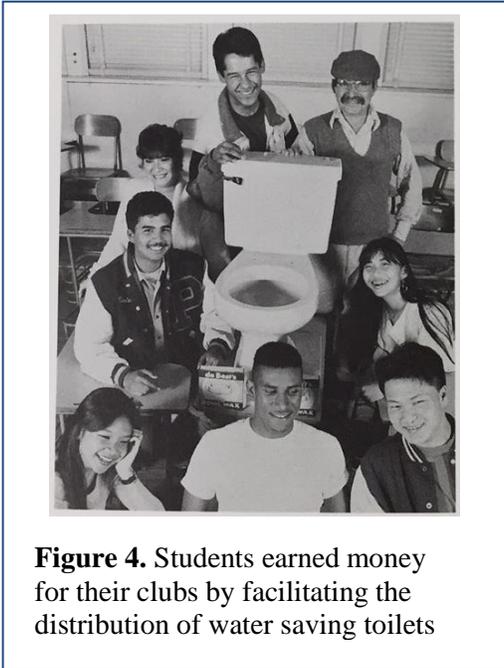


Figure 4. Students earned money for their clubs by facilitating the distribution of water saving toilets

In the 1980s Metropolitan began to develop an approach to fund conservation efforts within the region. Initially, the approach provided funding assistance to member agencies that could run their own local conservation programs. Metropolitan’s conservation rebate funding policy has evolved over time. Initially, it was established to provide up to 50 percent of a member agency’s program cost, as long as there was substantial projected water savings. In 1988, a maximum incentive of \$75 per acre-foot of estimated water savings (the estimated marginal cost of pumping SWP supplies) was established as a Base Conservation Rate. Over the next few years, Metropolitan funded several member agency conservation programs under this funding policy. In these early years, member agencies would apply to Metropolitan for funding assistance to help pay for their own local conservation rebate programs. Most of these programs involved replacing old 3.5 to 5.0 gallons per flush (gpf) toilets with ultra-low flow toilets (ULFT) that flushed at only 1.6 gpf. Metropolitan also initiated a program using a vendor, in which member agencies could sponsor ULFT giveaways in their service area (Figure 4). Metropolitan would pay the cost and then bill the member agency for half of the costs.

About 2.5 million residential toilets were replaced through this program. Other popular member agency conservation projects funded through this program consisted of residential audits and low flow showerhead and faucet aerator replacements. Metropolitan even partnered with McDonalds and the Broadway department stores to do large-scale giveaways of showerheads, distributing approximately 2 million showerheads through this program.

The Base Conservation Rate has been revisited by Metropolitan’s Board and revised twice since 1988, from \$75 to \$154 per acre-foot in 1990 and from \$154 to \$195 per acre-foot in 2005. [Attachments 1, 2 and 3](#) are the Board Letters describing the setting of the amounts of the Base Conservation Rate. The rebates that are associated with the different water saving devices are calculated based on the Base Conservation Rate. In general, rebates are calculated by multiplying the projected estimated lifetime savings (in acre-feet) of the device by the Base Conservation Rate. Device rebates are typically limited to half of the cost of the device or program in order to ensure the consumer has a financial stake in the successful use of the device.

The conservation devices and fixtures that are included in Metropolitan’s Conservation Credits Program have different costs, different savings rates and different useful lifetimes. When viewed on a per-device or per-fixture basis, the incentive rates appear to be different. However, with few exceptions, the rebate amounts are directly tied to the estimated acre-foot water savings over the useful life of the device limited by half of the estimated cost. Table 1 shows the current list of eligible devices and rebate amounts under the Conservation Credits Program.

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Table 1. Devices Available for Rebate through the Regional Conservation Program

| Conservation Items | Incentive |
|--|-----------------------------|
| Premium high efficiency toilets | \$40 each |
| High efficiency clothes washers | \$85 each |
| Residential smart irrigation controllers | \$80 each |
| Commercial smart irrigation controllers | \$35 per irrigation station |
| High efficiency urinals | \$200 each |
| Residential soil moisture sensors | \$80 each |
| Commercial soil moisture sensors | \$35 per irrigation station |
| Residential turf removal | \$2 per square foot |
| Commercial turf removal | \$1 per square foot |
| Connectionless food steamers | \$485 per compartment |
| Cooling tower conductivity controllers | \$625 each |
| pH cooling tower controllers | \$1,750 each |
| High efficiency sprinkler nozzles | \$2 each |
| Large high efficiency nozzles | \$13 per set |
| Dry vacuum pumps | \$125 per ½ hp |
| Plumbing flow control valves | \$5 per valve |
| Laminar flow restrictors | \$10 per restrictor |
| In-stem flow regulators | \$1 per regulator |
| Rain Barrels | \$75 each |
| Cisterns | \$250 - \$350 each |

Circumstances may occasionally prompt Metropolitan to offer rebate amounts that deviate from the direct relationship between the water savings and cost of the device and the Base Conservation Rate. This is typically done in two circumstances; as a pilot program for a new device or incentive that has not been used before, or when it appears the rebate amount needs to be adjusted to affect consumer demand for the product in question. Over the past several years, Metropolitan attempted to increase the interest and participation in outdoor water conservation through the Turf Removal Program. Initially, the Turf Removal Program rebate, based on the Base Incentive Rate, stood at \$0.30 per square foot of turf removed. In an effort to increase interest and participation in the program, the rebate was raised to \$1.00 per square foot of turf removed. Interest in the program did not increase appreciably. As the drought continued, a second modification was made increasing the rebate to \$2.00 per square foot of turf removed. Other member agencies also offered their own turf removal rebates in addition to Metropolitan’s incentive. The focus of these actions was meant to increase consumer interest in lower

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water-using landscapes and awareness of the drought conditions, while also helping to encourage landscape vendors to market California friendly vegetation and water saving supplies. At this increased incentive rate, interest and participation in the program increased greatly. In addition to the immediate water savings generated from this program, Metropolitan also sought to change the perception of the value of water within the region. More consumers are aware that attention to outdoor water use is an avenue towards larger amounts of water conservation in the future. The recent Turf Removal Program is a prime example of Metropolitan providing a rebate level that is higher than the Base Conservation Rate in order to spur activity in a given area.

Metropolitan may also seek to encourage interest in a certain device or program in order to increase the market awareness of that device. In recent years, Metropolitan has provided incentives for rain-barrels and cisterns. The rebates for these devices initially were set at a level higher than the Base Incentive Rate in order to gauge consumer response. The rebate levels have been adjusted later after analyzing how consumers responded to the initial rebate amount provided. As of the date of this report, the process for rain barrels and cisterns is ongoing, but it serves as an example of how Metropolitan may occasionally diverge from the Base Incentive Rate for the purposes of garnering additional information for the future conservation program.

To be effective, conservation rebates need to be high enough to encourage consumers to purchase more water efficient, and oftentimes, more costly, products. However, there are examples where the rebate level necessary to provide a real signal to consumers is too high to be supported by water savings projections. In these cases, Metropolitan may decide to not offer rebates for that class of item in order to spend the conservation incentive budget more effectively. Residential dishwashers are an example of this. The water saving difference between standard models and the high efficiency versions of dishwashers is so small that the calculated rebate would not be high enough to spur the purchase of the higher cost item.

Coordination Among Conservation Practitioners

Over the years, Metropolitan has successfully coordinated regional conservation efforts by regularly meeting with the practitioners among the member and retail water agencies in the region. The conservation and planning managers of these agencies convene at Metropolitan on a monthly basis to discuss Metropolitan's regional program and their local efforts. These meetings have provided valuable guidance and feedback from people that work in the field of water use efficiency. A subset of these conservation professionals has been established as a Program Advisory Committee (PAC), comprised of staff from member agencies, retail agencies, and Metropolitan. The PAC is convened annually to develop recommendations for updating Metropolitan's conservation program. The PAC performs the following functions:

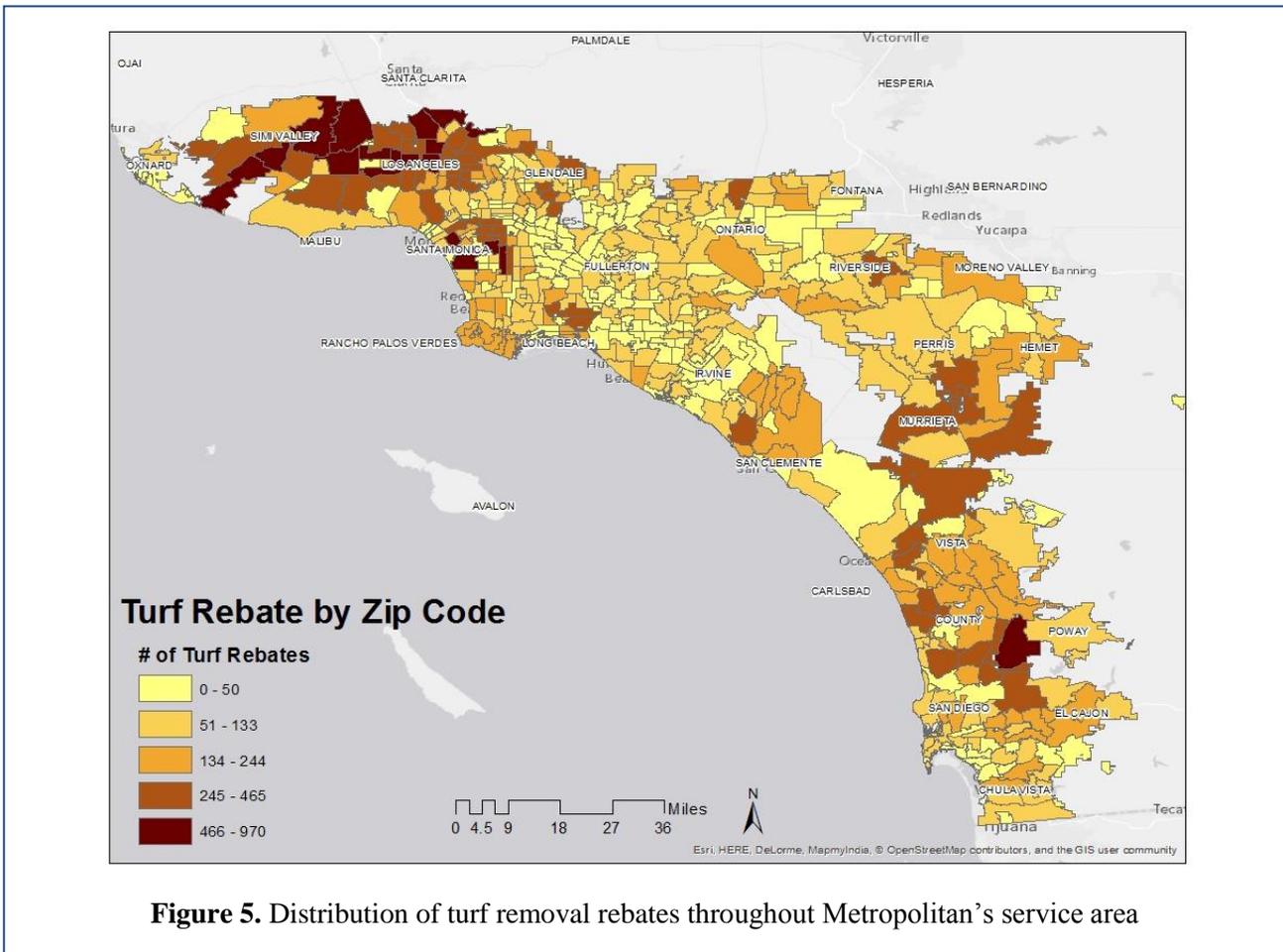
- Identifies opportunities to improve water savings, regional benefits, and cost effectiveness
- Develops research priorities to guide the future of the conservation program
- Evaluates potential technologies and new implementation approaches
- Identifies new devices or services that should be considered for the conservation program
- Helps evaluate performance of existing programs, including verification of water savings
- Identifies opportunities for legislation and regulation to advance water use efficiency
- Develops protocols for evaluation, measurement and verification
- Develops general criteria that can be used to determine incentive amounts
- Develops recommendations on reasonable saturation levels for various devices
- Develops general criteria for sunset provisions for incentives

Most recommendations that Metropolitan staff brings to the Board regarding the regional conservation program have been reviewed with the PAC in order to get advice and feedback from water use efficiency participants.

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A Regional Approach

As mentioned earlier in this report, Metropolitan's early conservation funding efforts helped to sponsor local conservation programs that were managed by member agencies. However, over time it became clear that it was not feasible for most member agencies to administer residential or commercial conservation programs on their own. Some agencies had the necessary personnel and technical capabilities while many other agencies did not. In order to have a conservation program that provided standard rebates to residential and commercial consumers throughout the region, Metropolitan's conservation model evolved to a regional scale. Metropolitan moved to focus on providing a single regional residential and commercial rebate program that could be accessed by consumers throughout the service area and to help transform the market for conservation devices. This new regional approach was established in the May 2012 letter to the Board recommending upcoming conservation program improvements which was approved by the Metropolitan Board on May 8, 2012. Consistent with this strategy, Metropolitan contracts with a vendor to administer the rebate application and review process and pays the associated service fees. This approach provides common access to rebates regardless of where a consumer lives in the service area. Consumers are able to apply for rebates through a regional website, bewaterwise.com, which is managed and administered by Metropolitan. Currently, Metropolitan offers the website in both Spanish and English with mobile capability, an online application submittal process, regular email contact providing rebate status, and expanded program functionality. The result is an easier application process, quicker rebate turnaround time, and a significantly improved experience for today's consumer. Turf removal efforts have



benefited from this regional approach (Figure 5). Virtually all of Metropolitan's service area participated in the regional Turf Removal Program.

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Some agencies also have unique programs within their service areas that provide local rebates that may differ from Metropolitan's regional program. Metropolitan continues to support these local efforts through a member agency administered funding program that adheres to the same funding guidelines described in the previous section. The member agency administered program allows member agencies to receive funding for local conservation efforts that supplement, but do not duplicate, the rebates offered through Metropolitan's regional rebate program. These unique programs administered by member agencies can include distribution events, direct install and/or custom conservation programs. In some instances, a particular type of conservation program may make more sense as a member agency program than in the regional program due to the necessity of local management.

Most of the conservation consumers that participate in Metropolitan's conservation programs do so through the regional rebate programs (Table 1). However, there are numerous commercial entities and industries within Metropolitan's service area that pursue unique savings opportunities that do not fall within the general rebate programs that Metropolitan provides. In recent years, the PAC recommended developing a special program to service the unique water efficiency needs of commercial or industrial consumers, which weren't being reached by the regional conservation rebate program. Utilizing lessons learned from the local investor-owned energy utilities, in May 2012 Metropolitan designed the Water Savings Incentive Program (WSIP) to target these unique commercial and industrial projects. In addition to rebates for devices, under this new program, Metropolitan has the ability to provide financial incentives to businesses and industries that created their own custom water efficiency projects. Qualifying custom projects can receive funding for permanent water efficiency changes that result in reduced potable demand. These incentives reflect the Base Incentive Rate and an appropriate cost share by the applicant to reinforce the value of and stake in the project.

Many of Metropolitan's conservation programs owe their success to Federal and State grant funding awards. The Bureau of Reclamation and the Department of Water Resources have been instrumental in providing additional funding to stimulate interest in various conservation programs. For example, the initial pilot regional conservation program may not have gotten off the ground had it not been for grant funding from the Bureau of Reclamation that covered the vendor administrative fees. The success of this program proved that a vendor-administered program's additional costs were worth the additional investment to achieve increased conservation activity. Grant funding can play a major role in jump starting a new program or providing additional money to make an incentive even more attractive. High efficiency clothes washers, turf removal, and toilets benefited early on in their program years from the external grant funding to become successful programs.

Non-Incentive Programs

Metropolitan's 2011 Long Term Conservation Plan (LTCP) supports non-incentive programs as a valuable tool to educate and increase public awareness on the value of water and how consumers can become more efficient in their water use. While conservation rebate programs are an effective means to saving water, changes in people's water use behavior can result in longer-term savings. The key to an effective conservation program that will reduce regional demands is to focus on both components.

Currently, Metropolitan's non-incentive programs are broken down into three distinct types: landscape classes, large landscape audits, and program quality control measures. Each of these programs provides Metropolitan with unique conservation benefits and helps to create different demand management techniques.

The California Friendly Landscape Training (CFLT) classes teach residents the benefits of sustainable landscaping along with some of the logistics they need to consider before creating a sustainable landscape of their own (Figure 6). These classes also encourage a regional conservation ethic by helping to change the consumer's perception of the value of water within the region. Almost 3,000 people attended a total of more than 100 classes in fiscal year 2015/2016. As a result of this popularity, Metropolitan is creating an additional turf removal training class based on the large public interest in last year's Turf Removal Program. This new class, slated to

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begin in early 2017, will teach residential consumers how to perform their own turf removal project. Additionally, a pilot sustainable landscape design program will be created for consumers who can seek professional design guidance in creating their own sustainable landscapes.

Another valuable non-incentive program for Metropolitan is the large landscape survey program, available to consumers with sites greater than one acre. Commercial consumers can request a free landscape audit of their outside property to determine where they can save water through irrigation improvement efficiencies and eliminating any existing leaks. Participants in this program will often seek rebates through the regional conservation program to help fund the improvements recommended in their audit. This program has become an effective vehicle in creating greater awareness of the watering needs of large landscapes and also how Metropolitan's incentive programs can assist the commercial owner to improve their landscape water efficiency.

The conservation quality control program also provides valuable tools for Metropolitan in managing its regional demand through rules and procedures, which ensure program compliance. The quality control program consists of application protocols, consumer interactions, and online aerial and physical site inspections. One important facet of this program is the SoCal WaterSmart website, which not only displays the



Figure 6. Before/After turf removal project

programs’ rules, but also has built-in features in the online application to ensure that specific rules are incorporated and program budgets are adhered to before a rebate application can be submitted. Protocols also allow for customization of the program by the local agency, which can add additional incentives for a particular device or add extra requirements for the agency’s consumers. Consumer interactions either by phone or online, help to validate application information or also provide a valuable consumer service experience. Physical and online inspections likewise play a key role in ensuring program quality control. Physical inspections ensure that installations have been completed and can provide a venue to hear consumers’ program experiences, while aerial inspections offer a low cost option to validating turf removal recipients project area measurements.

Legislative Conservation Efforts

Legislative measures that establish progressive water efficiency standards for products are critical to both driving and sustaining water conservation efforts. Once conservation legislation is passed, the competitive market adjusts to meet new requirements and then all new purchases of replacement devices contribute to the overall water savings. Therefore, water conservation legislation is a very effective savings tool, and Metropolitan regularly supports new conservation initiatives to effectively increase water conservation. Current legislation, however, is not stringent enough to effectively address all of Metropolitan’s conservation goals. Even if more stringent legislation is enacted, supplemental agency-based water conservation efforts would still be needed to create public awareness about water conservation, offer incentives to change to more water efficient devices, and to stimulate the marketplace.

One example of how conservation legislation successfully drove water savings occurred in 1992. After numerous states had earlier enacted similar legislation, the United States Energy Policy Act was passed to establish national maximum flow rates for new plumbing fixtures. This was the first time that a national set of standards was developed for the affected plumbing fixtures. This legislation has been the most effective in new construction and fixture replacements where consumers must purchase a new item that complies with updated plumbing codes. Fixtures affected by this Act include toilets (1.6 gallons per flush), urinals (1.0 gallons per flush), faucets (2.5 gallons per minute), and showerheads (2.5 gallons per minute). The end result of this legislation has been substantial water savings within Metropolitan’s service area.

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As the State of California makes significant strides towards increasing water efficiency through legislation, Metropolitan must sustain its supplemental conservation efforts in order to achieve needed water savings identified in the IRP. Legislation alone will not create the public and institutional awareness needed for behavioral change, nor will it provide sufficient motivation to replace less efficient fixtures for more efficient models. Metropolitan's approach is to provide financial incentives to help consumers while increasing public awareness through regional advertising campaigns.

The State of California has also emphasized the need and importance of conservation and local supply development. In 1999, the Metropolitan Water District Act was amended by Senate Bill 60 which directed Metropolitan to increase "sustainable, environmentally sound and cost-effective water conservation, recycling and groundwater storage and replenishment measures". This amendment made Metropolitan the only water utility in California with a specific mandate from the state Legislature to pursue water conservation and local resource development.

Senate Bill X7-7 mandated a new requirement to lower urban per capita water use 20 percent by December 31, 2020. Enacted by the state Legislature and signed into law by Governor Schwarzenegger as part of a historic package of water reforms in November 2009, the "20x2020" plan gave local communities flexibility in meeting this target while accounting for previous efforts in conservation and recycling. The Legislature found that reducing water used through conservation and regional water resources management would result in protecting and restoring fish and wildlife habitats, reducing dependence on water through the California Bay-Delta and providing significant energy and environmental benefits. Metropolitan coordinates closely with its member agencies to achieve these targets both at a retail agency level in compliance with legislative requirements and as a region in achieving a true 20 percent reduction in per capita water use.

Measuring Success

The success of Metropolitan's conservation programs may be measured in several ways. The most distinct way is achieving significant water savings from a specific device or program. Historically, the two most successful conservation devices, from a water-savings standpoint, are toilets and clothes washers. These two items have saved more water than all of the other indoor devices combined.

For the Turf Removal Program, success has been measured differently, with the goal of transforming as many landscapes as possible with the money budgeted. Metropolitan was responsible for over 75,000 landscape transformations over the course of two years. The impact from this program helped to remove approximately two percent of all irrigated turf in Metropolitan's service area. The long term water savings of this Turf Removal Program can be determined over time as the water use profiles of participants are observed. If these converted landscapes serve to influence others to convert their own landscapes, independent of Metropolitan's financial incentives, the impact of the Turf Removal Program will be even greater.

The success of non-incentive programs can be measured in many different ways, but is primarily based on the amount of interest consumers have in a particular program. The number of requests for surveys or classes is one method to gauge public interest. A large uniform distribution of classes and surveys among Metropolitan's member agencies can be a measure of the amount of regional interest in the programs. Active participation from member agencies develops local public interest and an effective marketing campaign can enhance that interest. Well-attended classes, along with positive reviews of the course, are other measures of a successful education program. Metropolitan regularly uses in-class surveys as a way of assessing consumer satisfaction with the course.

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For the quality control program, the primary measure of success is compliance. Verification of completed applications and installations ensures that Metropolitan’s conservation investments will result in the projected water savings expected. Issues of non-compliance are quickly corrected in order to stabilize operations. Another integral element of a successful conservation program is strong public awareness. An effective conservation outreach effort needs its message to be carried out clearly to its constituents. Metropolitan has established an effective public advertising campaign to carry out this message through radio, online, print, and billboard advertising campaigns and in several languages (Figure 7). Additionally, Metropolitan developed the bewaterwise.com website as a repository for all conservation-related information and programs. Education programs have also been developed to reinforce Metropolitan’s conservation message to the public.

Based on these measures of success, Metropolitan’s conservation programs are consistently being refined to reflect marketplace conditions. A prime example of a program that went through multiple revisions is the toilet program, which initially started as the ULFT program, the first large conservation program that Metropolitan managed. Starting in 1991, it ran for 18 years. The U.S. Energy Policy Act in 1994 made the Ultra-Low Flow Toilet (ULFT) the new standard in toilets, meaning that manufacturers could not sell any toilet that had a larger flush rate than the ULFT after January 1, 1994. Unfortunately, many of these new ULFTs were not designed well and performed poorly, resulting in increased water use and upset consumers. In response, Metropolitan adopted a performance testing program utilized by the Los Angeles Department of Water and Power for ULFTs and revised its rebate program to only allow models that had passed this test as qualifying models. By 2008 a new category of toilet, nicknamed “High Efficiency Toilets” (HETs), which had a maximum flush rate of 1.28 gpf and were 20 percent more water efficient than the ULFTs, entered the marketplace. Metropolitan revised its toilet rebate program to eliminate the ULFT and replace it with the HET. The HET remained in the program until November 2015, when it was replaced by an even more efficient model, the premium HET (1.1 gpf). As of January 1, 2014, the State of California only allows the sale of HETs or better. As device models become more efficient, Metropolitan’s rebate programs evolve as well to reflect on those efficiency improvements.

While the efficiency of toilets and clothes washers have increased over time and the savings are still large enough to warrant a rebate, there have been other conservation devices that have been phased out of the program due to market saturation, legislative standards, or advances in technology. Low flow shower heads and pre-rinse spray valves were popular water conservation program items a decade ago; however, as new legislative requirements were enacted, these devices became nearly ubiquitous throughout the state and a rebate was no longer effective or necessary. Advances in x-ray technology to a digital platform eliminated the need for a rebate on x-ray film processor recirculation systems. For non-incentive programs, changes usually occur when interest diminishes, costs become too prohibitive, or a better alternative is available.

Every year, Metropolitan documents the progress of its conservation programs and local resources development programs in the Senate Bill 60 (SB60) Annual Progress Report to the California Legislature – Achievements in Conservation, Recycling and Groundwater Recharge. Program highlights in local resource development are chronicled and detailed in this report. This report is provided annually to the Metropolitan Board for review and submitted to the California legislature.



Figure 7. Conservation brochure in Mandarin

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Water Use Efficiency Research

Metropolitan has been involved in conservation research since the early 1990’s, when water conservation programs focused on replacing 3.5 gallons-per-flush gpf and 5.0 gpf toilets with 1.6 gpf ULFTs. At the time, anecdotal information indicated that consumers were experiencing leaks in their new toilets. The flush valve flapper was being degraded by toilet bowl cleaners, which caused the flapper to leak. For Metropolitan’s

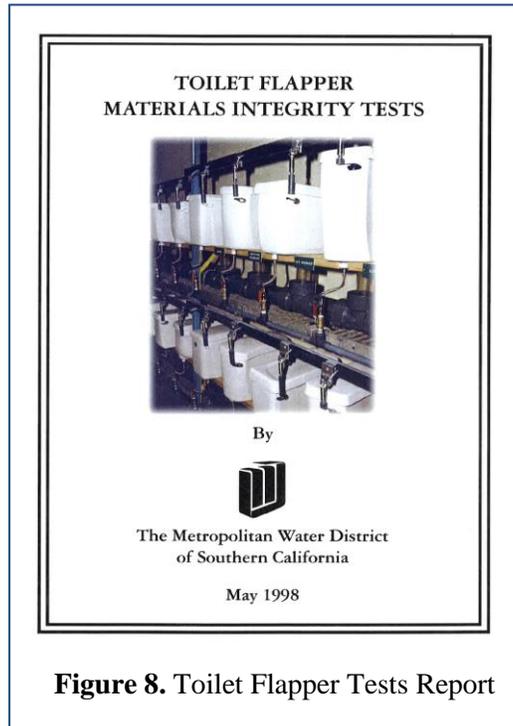


Figure 8. Toilet Flapper Tests Report

projected water savings to be achieved, the ULFTs needed to maintain their initial performance. Metropolitan worked with the American Society of Mechanical Engineers (ASME), American Water Works Association, University of Akron Polymer Science Department and others to create a testing protocol, and tests on flapper material integrity were subsequently conducted at Metropolitan’s Corrosion Laboratory in La Verne (Figure 8). These tests led to better materials being used in the manufacture of flappers, new toilet flushing designs that did not use flappers, and national testing standards which were adopted by ASME and eventually incorporated by EPA into their WaterSense specifications. This project conducted by Metropolitan on toilets and flappers not only changed the industry, but also secured Metropolitan and its member agencies water savings for years to come. There were many other early studies on toilets and toilet programs that were instrumental in shaping Metropolitan’s conservation programs and programs at other water agencies. While Metropolitan’s primary research focus began with toilet performance, a formal on-going research program for other innovative water saving technologies had yet to be developed. By the year 2000, Metropolitan and its member agencies had received numerous inquiries from universities, companies and entrepreneurs with innovative ideas on new water saving technologies that wanted

to be included in Metropolitan’s conservation rebate program. Metropolitan and its member agencies created a pilot “competitive” grant program to address this issue and bring new innovative water saving technologies to its consumers. This new program, launched in 2001, was named the Innovative Conservation Program (ICP). The ICP would allow companies, universities, entrepreneurs and anyone else to compete against each other for grant funds in order to study the viability of their innovative water saving technologies. A budget of \$250,000 was set aside for the ICP, and Metropolitan received 35 proposals for its first funding cycle in 2001.

Since 2001, the ICP has become the industry standard for water efficiency research grant programs. The ICP currently operates on a two-year funding cycle. Each new cycle sees its popularity grow as additional entities see the value of such a unique grant program and join as partners. The current ICP includes the following partners: U.S. Bureau of Reclamation, Environmental Protection Agency, Southern Nevada Water Authority, Central Arizona, Southern California Gas Company, and Western Resource Advocates. The program’s increased popularity has led to a more than doubling of available grant funding in the current ICP budget to \$560,000. Innovative research of wine grape vines, water brooms, food steamers, commercial conveyor dishwashers, drip irrigation, smart phone applications, and rain harvesting techniques has all occurred through the ICP.

Other recent conservation research activities have utilized a twofold approach: 1) studying the performance of items that are currently offered in the rebate program, and 2) investigating new areas for water saving potential and potential new program development. Metropolitan accomplishes these tasks through internal staff research, contracted research programs, partnering with other agencies, and leading research through industry groups like the California Urban Water Conservation Council and the Alliance for Water Efficiency.

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The outcome of a research project can have different implications to Metropolitan's conservation programs. If the findings are different than the current baseline, Metropolitan may revise program incentives and/or criteria to correlate with the study results. Also, member agencies are encouraged to take advantage of research results to target certain markets or types of consumers for water use efficiency programs.

One example of a performance study that resulted in a revised rebate amount was Metropolitan's analysis of high efficiency sprinkler nozzle water savings, which measured water savings from multiple types of sprinkler rebate programs: Metropolitan's regional rebate program, member agency programs, and a local program known as freesprinklernozzles.com. The water saving results showed very little savings differences among the programs, and the savings amounted to about half of what had been initially calculated to determine the rebate value. Given this new information, Metropolitan reduced the incentive from the original \$4 per nozzle rebate to \$2 per nozzle and adjusted its savings value accordingly.

Other research project findings may not have a direct impact on Metropolitan's programs, but could have implications that benefit the region and even the state. Metropolitan is a regular contributor of water conservation study presentations at the annual WaterSmart Innovations conference, a national conference on water conservation issues. In addition, a recent ICP study evaluated the irrigation needs of wine grapes through sap flow measurement. This study was innovative and Metropolitan was asked to present the findings at several agricultural conferences, as the methodology used in this study may be applied to a broader audience.

Other recent studies have looked into drought tolerant turf grass, observations from the drought experience in Australia, and criteria for efficient sprinkler nozzles. Another recent research effort also involves utilizing a conservation behavior study model to determine marketing effects on water use changes, and even exploring a GIS mapping tool for conservation and recycled water planning activities.

Current and upcoming research topics include a comprehensive turf removal savings study, creation of a conservation planning model, and a participation and water savings analysis of Metropolitan's pilot rain barrel rebates. Additionally, pilot research programs are being created to look at leak reduction methods, cooling tower efficiency, and the water savings impacts of household pressure reduction.

Lessons Learned

Metropolitan has drawn from the many challenges and successes in implementing the regional conservation program over the years. This has resulted in many lessons learned that will help in further developing the program to deal with new challenges and conservation goals in the future:

- The regional conservation programs allow Metropolitan the flexibility to easily modify program elements to accommodate different scenarios. When imported supplies are low, Metropolitan can raise incentives, launch marketing campaigns, and increase budgets in order to enhance conservation activity. Conversely, if conservation activity needs to be managed within reduced budget constraints, Metropolitan can add controls to manage the programs within the new limits.
- Though the savings potential is very difficult to estimate, the non-incentive programs provide a great public service, enhance water awareness, can lead to participation in conservation incentive programs and can help establish water efficient behavior.
- Water conservation legislation, once enacted, is a very effective savings tool and Metropolitan is constantly looking to support new conservation initiatives to increase water conservation. Supplemental agency-based water conservation efforts help compliment legislative efforts to strengthen standards. Supplemental efforts are needed to create public awareness about water conservation, offer incentives to change to a more water efficient item, and to stimulate the marketplace, which can lead to new standards in the long-run.

Board Report (Overview of Metropolitan's Efforts to Encourage Conservation)

- Conservation distribution events held by Metropolitan and some member agencies, in which consumers come to a given location and exchange their old non-conserving device for a free or discounted water efficient device, can be effective in increasing conservation activity.
- A contractor direct option program allows contractors to directly receive device rebates if the consumer approves. This program has been beneficial in increasing commercial conservation activity, especially for large projects where the consumer may not have the upfront funding needed. However, the increased activity from this program is not without its shortfalls, as noncompliant contractors have had to be removed from the program.
- When performed, in-store marketing efforts have proven to significantly increase sales and rebates for targeted water efficient devices.
- Allowing agencies to add additional conservation funding through the regional programs on specific devices has been instrumental in increasing local conservation activity.
- Recent data automation improvements have replaced paper rebate applications with digital rebate applications, ensuring that the number of applications cannot exceed program budgets.
- Conservation research can lead to legislative changes to industry standards that improve water efficiency.