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INCENTIVIZING WATER EFFICIENCY THROUGH SYSTEM DEVELOPMENT CHARGES:

Case Study on Aurora, Colorado

Aurora, Colorado

Aurora is the third largest city in Colorado, with a population of more than 345,000 people.[1] About 1/3 of the land within its boundaries has been developed,[2] with more growth projected, and new water supplies are increasingly difficult and expensive to obtain. In 2014 the city adopted a new Development and Connection Fee Schedule that directly correlates water fees with the expected water demand (indoor and out) for each customer class. The schedule also incentivizes low-water using landscaping through lower fees, including one particularly innovative program called the "z-zone" in which no fee is charged if the landscape requires no water after plant establishment.

DEFINITION

System Development Charges—

Also known as tap fees, impact fees, and plant investment fees, among others—are one-time fees charged to new developments to help pay for the infrastructure and water resources that have been developed to support new development.

New Fee Structure Designed to Cover Costs and Reduce Water Demands

The fees collected under the previous schedule were not adequately covering the City's costs for infrastructure and water. Changes in water demand and growth patterns had shifted the balance of water use between customer classes, such that residential fees were effectively subsidizing larger water users' (e.g. irrigation, commercial) fees. In addition, there were requests from the building community to lower the fees. New leadership at the utility initiated a process to develop a fee structure that would better align the fees with water utility costs, and provide an incentive to builders to construct more water-efficient developments.

Fee Calculations are Based on Robust Analysis

Aurora's Development and Connection Fees help to pay for past and future capital investments in the water system, in five categories[3]:

1) Water resources (the market cost of water in the region),
2) Source of supply (the existing and projected assets required to move and store water),
3) Treatment and distribution (the existing and projected assets),
4) Carrying costs (the financial costs incurred to obtain water), and
5) Water losses in the system.

The cost of a gallon of water per day was calculated for each of these categories and then summed, totaling $57.45 per gallon per day. This cost is then multiplied by the projected average daily demand of each new development type (residential, multi-family, commercial), to determine the connection fee. Six years' worth of billing data were analyzed to determine projected average daily demands.

1 US Census QuickFacts, 2013.
2 City of Aurora Comprehensive Plan 2010. Chapter IV, A. pg. 1
3 Van Ry, P. 2013. Aurora Water. Water Service Connection Fees Presentation.

Residential Fee Structure Charges for Indoor and Outdoor Use, and Offers Xeric Landscaping Credit

New detached single family residential homes are charged a two-part water service connection fee: one for indoor use and one for outdoor use.[4] The indoor use fee is either $5,509, $8,901, or $15,425 depending on the number of bathrooms in a home (1-2, 3-4, 5+, respectively). The number of bathrooms was found to be a reasonable proxy for the volume of indoor water use, based on billing data analysis.

Table 1: 2015 Fee Structure for Single Family Residential (Detached)

Indoor Use Fee		Outdoor Use Fee
Number of Bathrooms	**Fee**	
1-2	$5,509	$0.941 / sq. ft. of lot size -$1,000 for 100% front yard xeriscaping
3-4	$8,901	
5+	$15,425	

The outdoor water use fee is $0.941/sq. ft. and is applied to the total area of the lot. In addition, if 100% of the front yard is xeric landscaping then a $1000 credit is given. Xeric landscapes are designed to be drought-tolerant, using low-water plants and specific techniques such as soil amendment, mulch, and grouping of plants with similar water needs, to maximize water efficiency. The City provides a list of xeric plant species that are suited to the semi-arid environment, using no more than 15" of water per year, and as little as no water after the initial plant establishment period. Establishment of landscape requires higher amounts of water during the first few months or years, until the plant is established in the soil. Once established, less water is required to maintain optimal health.

Table 2: 2015 Sample Connection Fees for Single Family Residential (Detached)

House Type	Indoor Use Fee	Outdoor Use Fee	Total Fee
3 bedroom, 2 bathroom, 8000 sq. ft. lot	$5,509	($0.941 x 8,000) = $7,528	$13,037
5 bedroom, 3 bathroom, 8000 sq. ft. lot with front yard xeriscaped	$8,901	($0.941 x 8,000) -$1,000 = $6,528	$15,429

Irrigation Meter Fees are Tiered for Non-Conserving, Conserving and 'Zero Use' Landscapes

Irrigation meters are used for irrigation water in commercial or residential common areas. They are assessed in three tiers: $2.75/sq. ft. for non-water conserving landscape (e.g. bluegrass), $1.47/sq. ft. for water conserving landscape,[5] and $0/sq.ft for "z-zone" landscapes that use zero water after establishment. More than 50 plants currently meet the z-zone requirement in Aurora.

If a z-zone is elected, the developer is required to put down a $20,000 deposit on the temporary irrigation meter, pay an administrative fee, and agree to a "water budget" for the landscaped area during the plant establishment period. A water budget has two parts: a calculated volume of water that the entire landscape should use if watered properly (the budget limit), and a tiered pricing structure that charges a lower rate ($/gallon) for water used up to that budget limit, and a higher rate(s) if that limit is surpassed. After the plants are established, the water utility will remove the irrigation meter and fully refund the deposit.

4 City of Aurora. 2014. Development and Connection Fee Schedule. https://www.auroragov.org/cs/groups/public/documents/document/021682.pdf

5 Water conserving landscape means any turf or plant using less than 15 inches per year through automatic irrigation, in normal weather conditions. City of Aurora's Landscape Reference Manual 2014.

Table 3: 2015 Fee Structure for Irrigation Meters		
Landscape Type	**Cost Per Sq. Ft. of Landscaped Area**	**Cost for 10,000 sq-ft of Landscaped Area**
Non-Water Conserving Landscape	$2.75	$27,500
Water Conserving Landscape	$1.47	$14,700
z-zone	$0 [$20,000 deposit, 100% refundable after establishment period]	$0 after refund

The cost of conserving landscape is almost half the price per square foot as non-conserving landscape. Fees for z-zones cost the least.

Flat Fee Replaced by Conservation-Oriented Fee

The fee schedules prior to 2014 had a flat fee per residential type (single family attached, single family detached, and multi-family). For example, a Detached Single Family Home had a flat fee of $24,460, regardless of home or lot size. But under the 2014 schedule, that cost can range from as little as $5,509 (1-2 Baths with no lot) to as much as $109,507 (5+ baths and 100,000 sq. ft. lot). See Figure 1. However those low and high figures are very rare, as the average lot size is about 8,200 sq. ft. and more than 97% of lot sizes are less than 14,000 sq. ft.[6] Thus, a home in 2014 with an 8,000 sq. ft. lot and 3-4 baths would result in a fee of about $16,400 as compared with a $24,460 fee in 2013.

Commercial and multifamily fees were also changed to account for projected average daily demand. Irrigation fees were significantly less expensive prior to 2014: $0.71/sq. ft. for non-water conserving landscape and $0.36/sq. ft. for water conserving landscape. The 2014 fees are almost four times higher, but also feature a tremendous cost saving opportunities through the z-zone program.

Figure 1: Single Family Residential Fees Under Aurora's New & Old Connection Fees Structures

The "typical" fee shown represents a home with an 8,000 sq. ft. lot. The minimum fee shown represents a 0 sq. ft lot, and the maximum fee shown represents a 100,000 sq. ft lot. The previous, flat connection fee did not vary with lot size.

Stakeholder Engagement Helped Create Innovative New Program

The new fee schedule was developed a little over a year before it was adopted. Several private and public meetings were held with the Homebuilders Association, the Citizens Water Advisory Committee, the City/Development Community Joint Task Force (comprised of developers, landscape professionals, planners, and water utility staff), and the City's Infrastructure and Operations Committee. There was a high degree of transparency through this process,

6 Van Ry, P. 2013. Aurora Water. Water Service Connection Fees Presentation.

especially with respect to how and why the new fees were to be calculated. Transparency throughout the process helped gain the support of various stakeholders—which helped lead to its adoption by City Council.

Once the new schedule was adopted, developers expressed concerns about the new fees for irrigated areas, since those costs increased significantly. The water utility met with the Joint Task Force over the course of several months to try to address this, and as a result the z-zone concept was born. It was a solution that satisfied both parties by reducing costs to developers, and reducing water demands on the system.

Water Utility is Now More Involved with the Development Approval Process

The way in which developers and city planners work together has changed a bit as a result of this new schedule. Usually the entire plan would go through the City's land use planning department, but if any area is intended to be a z-zone, the water utility now also reviews the plan. In addition, developers may choose to have a pre-development meeting with Aurora Water to go over the draft landscape plan. This provides the Aurora Water the opportunity to tell them more about how the z-zone works, and the other water efficient landscaping incentives that are built into the fee schedule. There are also on-going efforts by the utility to educate developers about xeriscape, and promote the $1000 residential fee credit.

Fee Structure Benefits the Utility, Builders and Home Owners

The City and Aurora Water benefit from this new fee schedule because the fees charged to new customers are now in line with the costs to the utility incurred by those customers. The Detached Single Family Home fee structure also incentivizes the development of smaller lots—which tend to have lower water demands – which in turn reduces the burden on the city to develop additional infrastructure and acquire new water supplies.

The z-zone is a benefit to both developers and the City. A typical irrigation meter for a large, landscaped area can cost $200,000 - $300,000 dollars, so the z-zone provides developers with a voluntary option to eliminate that large fee entirely. This program is a benefit to the City because those landscaped areas do not create a permanent water demand and therefore there is no need for new permanent infrastructure or water supply.

Importantly, the water utility also has a couple of financial safeguards through this program. First, if the landscaped area continues to require water on a permanent basis, then the developer must pay the normal irrigation fee. Second, the developer must agree to a water budget pricing system for the landscaped areas. Thus, in the event that the z-zone plants continue to be watered after the establishment period and after the developer's deposit is refunded, the city will recover their monthly costs through the water budget pricing structure.

Majority of New Plans are Using the Z-Zones Option

Within the first few months of the z-zone program being adopted, the City of Aurora saw 5 out of 6 plans using the z-zone option. Together, these five plans include more than 730,000 square-feet dedicated to z-zone plant material, resulting in a potential water savings of 21 acre-feet per year—enough for 42 families of four for almost a year. The utility will continue to promote this program, as well as the $1000 xeriscape rebate program which has not yet created as much interest as the z-zone, in the coming years.[7]

7 Personal communications with Lyle Whitney, Water Conservation Supervisor, Aurora Water. February 4, 2015.

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