AN ASSESSMENT OF

Water Affordability & Conservation Potential

Long Beach CALIFORNIA

Alliance for Water Efficiency

PROMOTING
THE EFFICIENT
& SUSTAINABLE
USE OF WATER

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Executive Summary

THIS REPORT CONTAINS A COMPREHENSIVE WATER AFFORDABILITY ASSESSMENT OF THE CITY OF LONG BEACH, CALIFORNIA AT THE CENSUS TRACT LEVEL.

Specifically, it includes information on the current water affordability efforts of Long Beach, an assessment of water affordability using the Household Burden Indicator, a review of customer water consumption and billing data, a three-year look at accounts in arrears data, and water conservation bill impacts for customers. The results of the report indicate that while water affordability may vary throughout the city, Long Beach has taken extensive action to help make essential water use more affordable. The analysis also demonstrates that water conservation can play a meaningful role in lowering water and sewer bills for Long Beach customers.

Summaries of each major section of the report follow this paragraph. These summaries include background information and a short discussion on the results for each part of the water affordability analysis.

Current Water Affordability Efforts of Long Beach

BACKGROUND

Long Beach has instituted a variety of policies and programs aimed at helping reduce the economic burden of water service costs on customers. Policy efforts include the city's establishment of a Utility User Tax Exemption Program to assist low-income customers and LBWD's 2017 rate restructure. The 2017 rate restructure lowered the price of Tier 1 (essential) water usage from $1.43/CCF to $0.00/CCF for customers enrolled in the Utility Users Tax Exemption Program, and from $2.57/CCF to $1.92/CCF for non-exempt customers. Long Beach Water Department offers a plethora of water conservation programs to reduce both indoor and outdoor water consumption for consumers, such as Lawn-to-Garden, Native Plant Parkway, Direct Install Gardens, and SoCal Water$mart. The Direct Install Gardens program was created to provide homeowners in low-income neighborhoods with a sustainable landscape free-of-charge.

FINDINGS

Participants in the Utility User Tax Exemption Program pay significantly lower water bills than non-exempt customers. This program helps customers that are either disabled or over the age of 62 and meet income eligibility requirements. The 2017 rate restructure resulted in lower water bills for non-exempt customers for monthly consumption less than 11 CCF. Exempt customers do not pay for the first 6 CCF of consumption. LBWD's conservation program offerings can help reduce bills in a meaningful way, as is detailed later in this report.

Water Affordability Assessment Using the Household Burden Indicator

BACKGROUND

This report evaluated water affordability in Long Beach, California using a modified version of the Household Burden Indicator (HBI). Originally introduced by Raucher, et al., 2019, the HBI evaluates the basic cost of water as a percent of income for households at the 20th percentile for income. This report uses billing data from 53,565 single family accounts in Long Beach to calculate basic water costs for the HBI at the census tract level, rather than using an essential water use estimate such as 50 gpcd.

FINDINGS

The citywide average HBI in Long Beach was 3.27, meaning the average annual cost of water and sewer ($824.27) represented 3.27% (or more) of the annual income of households in lowest income quintile. Across all 104 census tracts in Long Beach, the HBI ranged from 0.90 to 24.16, and averaging the tracts resulted in an HBI value of 3.48. Additionally, over 85% of census tracts had an HBI under 5.

Analysis of Exempt Accounts, Non-Exempt Accounts, and Accounts in Arrears

BACKGROUND

This report investigated the average monthly water usage and average total combined water and sewer bill for accounts enrolled in the Utility User Tax Exemption Program (exempt account), non-exempt accounts, and accounts in arrears. The analysis reviewed the consumption data from 53,565 residential accounts over the twelve-month period of August 2019 to June 2020. Average water usage and average total combined water and sewer bills were then compared across these different groups of residential customers.

FINDINGS

The average monthly water use by a residential single-family account in Long Beach was 10.24 CCF. Exempt customers used on average 8.08 CCF, or 21% less water than the city average, while accounts in arrears consumed an average of 14.44 CCF, which is 40.60% higher than the city average. The data indicated that exempt customers had lower water use on average and were paying lower water bills than their non-exempt counterparts. The high average consumption for accounts in arrears signals an opportunity for these customers to be targeted with conservation and affordability programs.

Water Conservation Bill Impacts for Customers

BACKGROUND

This report assessed the potential water savings from different indoor and outdoor conservation measures for customers in Long Beach. Indoor water savings from replacing inefficient toilets, showerheads, and clothes washers were calculated using the Alliance for Water Efficiency's Water Conservation Tracking Tool, while outdoor water savings from landscape transformations were calculated using estimates from the City of Long Beach and the Simplified Landscape Irrigation Demand Estimate (SLIDE) equation.

FINDINGS

Participating in water conservation programs through LBWD can lower the average water bill for a single-family residential customer up to 21.89%. Over 80% of all housing stock in Long Beach was built prior to 1980, well before the Energy Policy Act of 1992 or WaterSense standards came into effect. This means there is likely ample opportunity for homes to replace inefficient fixtures and appliances. Furthermore, customers with high outdoor water use stand to benefit the most in terms of water and bill savings due to the effectiveness of turf replacements.

Takeaways

The data and analysis detailed in this report show that the City of Long Beach has taken successful action to help make water more affordable throughout the city. Long Beach residents also have opportunity to reduce their annual cost of water and sewer bills by taking advantage of water conservation programs and incentives. The findings in the report demonstrate that implementing water conservation and efficiency programs are important ways to help meaningfully lower water and sewer bills for residential customers.

Water affordability indicators, such as the HBI, provide context water providers can use to better understand how customers may be burdened by the cost of water and sewer service. For example, these indicators can be used to approximate the number of customers that may be struggling to pay bills and to identify where these customers are concentrated. This information can be used to create or refine water affordability programs and direct targeted outreach. Water affordability indicator comparisons among water providers may produce misleading and unfair conclusions. There are multiple factors at play, including water providers' unique costs of providing service, and local economic conditions.

Water affordability indicators, such as the HBI, can be used to approximate the number of customers that may be struggling to pay bills and to identify where these customers are concentrated. This information can be used to create or refine water affordability programs and direct targeted outreach.

Introduction

THE ALLIANCE FOR WATER EFFICIENCY (AWE) ENVISIONS A FUTURE WITH RELIABLE, AFFORDABLE, AND EQUITABLE WATER RESOURCES, HEALTHY ECOSYSTEMS, AND ECONOMICALLY STRONG COMMUNITIES.

Water unaffordability undermines this future and is a growing concern in some parts of the U.S. as water rates rise to account for the costs of aging infrastructure and/or as depleted water supplies make it costlier to provide water. Water conservation and efficiency can provide a way to lower water and sewer bills and play a key role in making water more affordable.

AWE is conducting research to better understand whether water is a financial burden for some households and the extent to which water conservation and efficiency can lower water bills for customers. This includes AWE's 2020 report, An Assessment of Water Affordability and Conservation Potential in Detroit, Michigan, which demonstrated that water and sewer services are a financial burden for many customers, there is a large potential for water conservation to save water, and that water conservation can provide meaningful bill reductions for customers.[1]

AWE is pleased to continue this research in partnership with the Long Beach Water Department (LBWD) and the Metropolitan Water District of Southern California (Metropolitan) with the release of An Assessment of Water Affordability and Conservation Potential in Long Beach, California. AWE continues to explore the variety of ways that consumers can lower water consumption and reduce costs, such as changes in their water using habits, installing more efficient fixtures and appliances, reducing outdoor water use, and fixing household leaks. Water affordability is far from a one dimensional or single faceted issue. Opportunities and optimal strategies will vary from community to community.

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Long Beach, California is located roughly 20 miles south of Los Angeles along the Pacific Ocean, and it is the second largest city in the Greater Los Angeles Metropolitan Region. The city of almost 500,000 people covers 50 square miles and receives its water services from the Long Beach Water Department. Long Beach is one of the founding member agencies of the Metropolitan Water District of Southern California, which is the largest urban water agency in the United States and provides imported water supplies to Southern California. Long Beach has made strides in the area of water affordability over the past decade and continues to explore initiatives to further assist Long Beach residents.

This report details the city's efforts and includes a water affordability assessment at the census tract level, using single-family customer consumption data. It also explores and quantifies the impact that water conservation offerings available through the Long Beach Water Department and the Metropolitan Water District of Southern California can have in helping customers lower their water and sewer bills.

1. Alliance for Water Efficiency. 2020. An Assessment of Water Affordability and Conservation Potential in Detroit, Michigan. https://www.allianceforwaterefficiency.org/impact/our-work/assessment-water-affordability-and-conservation-potential-detroit-michigan

Long Beach Water Affordability Efforts

OVER THE YEARS LBWD HAS IMPLEMENTED A VARIETY OF PROGRAMS AND INITIATIVES designed to help make water more affordable for its customers. These efforts include the Utility Users Tax Exemption Program, a rate restructure intended to lower the cost of basic water service, and various water conservation incentive programs to reduce indoor and outdoor water consumption and utility bills.

Utility Users Tax Exemption Program

The Utility Users Tax Exemption Program provides several utility benefits to customers that are either disabled or over the age of 62 and meet income eligibility requirements. At the time of this writing, the income-eligibility requirement for the Utility Users Tax Exemption Program is $34,480 or less combined gross income of all members of the household for up to two people. Each additional person adds $8,960 to the income-eligibility requirement.[2]

The Utility Users Tax Exemption Program offers the following benefits:

Twenty percent discount on gas services.
Exempts customer from paying the five percent (5%) Utility Users Tax on gas, water, electric, and telephone bills.
Provides an approximate $5.00 monthly water service charge credit.
Exempts customer from paying for Tier I water usage.
Provides reduced refuse/recycling rate.
Reduces $35.00 service establishment fee to $15.00, if customers qualify within six months of establishing service.[3]

2. City of Long Beach, California. 2020. Utility Users Tax Exemption Application/Declaration. https://www.longbeach.gov/globalassets/utility-services/media-library/documents/uute---exemption-application

3. City of Long Beach, California. 2021. Utility Assistance. http://www.longbeach.gov/utilityservices/billing-and-payments/utility-assistance/

Rate Restructure

Long Beach Water Department significantly restructured its inclining block rates in 2017. For the rate restructure, LBWD adjusted the block switch points of the tiers and the volumetric charge for each tier. According to LBWD, "the proposed rate structure and rates send a stronger conservation pricing signal while maintaining affordability for essential use, which are part of the top 10 pricing objectives ranked by LBWD (pg. 6)."[3] For customers enrolled in the Utility Users Tax Exemption Program, the first tier was changed from $1.43/CCF to $0.00/CCF. The first tier was also adjusted for customers not enrolled in the Utility Users Tax Exemption Program from $2.57 to $1.92. As of 2017, when the restructure was implemented, there were 1,448 accounts that qualified for this program.[4] For perspective, there were approximately 80,000 residential accounts, 1,050 irrigation accounts, and 6,700 commercial/industrial accounts during the same time. This section evaluates the changing cost of water from a volumetric standpoint along with the total water and sewer bills for exempt and non-exempt customers.

Table 1 contains the tiers, block switch points, and water rates before and after the rate restructure. It is important to note that the block switch points changed in addition to the volumetric rates for each block. The first row of Table 1 (Tier IA) shows the first tier for customers in the Utility Users Tax Exemption Program. The second row contains the first tier for all other customers, and rows three and four (Tiers II and III) apply to both exempt and non-exempt customers. The water service charge changed from $0.49 to $0.55 per day. For 5/8 and 3/4-inch meters, the sewer service charge decreased from $0.281 to $0.246 per day and the uniform volumetric sewer rate stayed the same at $0.39 per CCF.

Table 1: Tiers and Volumetric Rates Before and After 2017 Rate Restructure per CCF. *Tier IA represents first tier applied to customers who qualify for the Utility Users Tax Exemption Program

Tier	Before 2017 Rate Restructure		After 2017 Rate Restructure	
	Block Switch Point	Volumetric Rate	Block Switch Point	Volumetric Rate
IA*	First 5	$1.43	First 6	$0.00
IB	First 5	$2.57	First 6	$1.92
II	Next 10	$2.85	Next 7	$3.68
III	Over 15	$4.28	Over 13	$5.37

4. Long Beach Water Department. February 1, 2017. Cost of Service and Rate Study. https://lbwater.org/wp-content/uploads/2018/09/LongBeach_COS_Report_Reduced.pdf

Figure 1: Cumulative Volumetric Cost of Water by CCF Based on Rates Before and After Restructure for a Billing Cycle

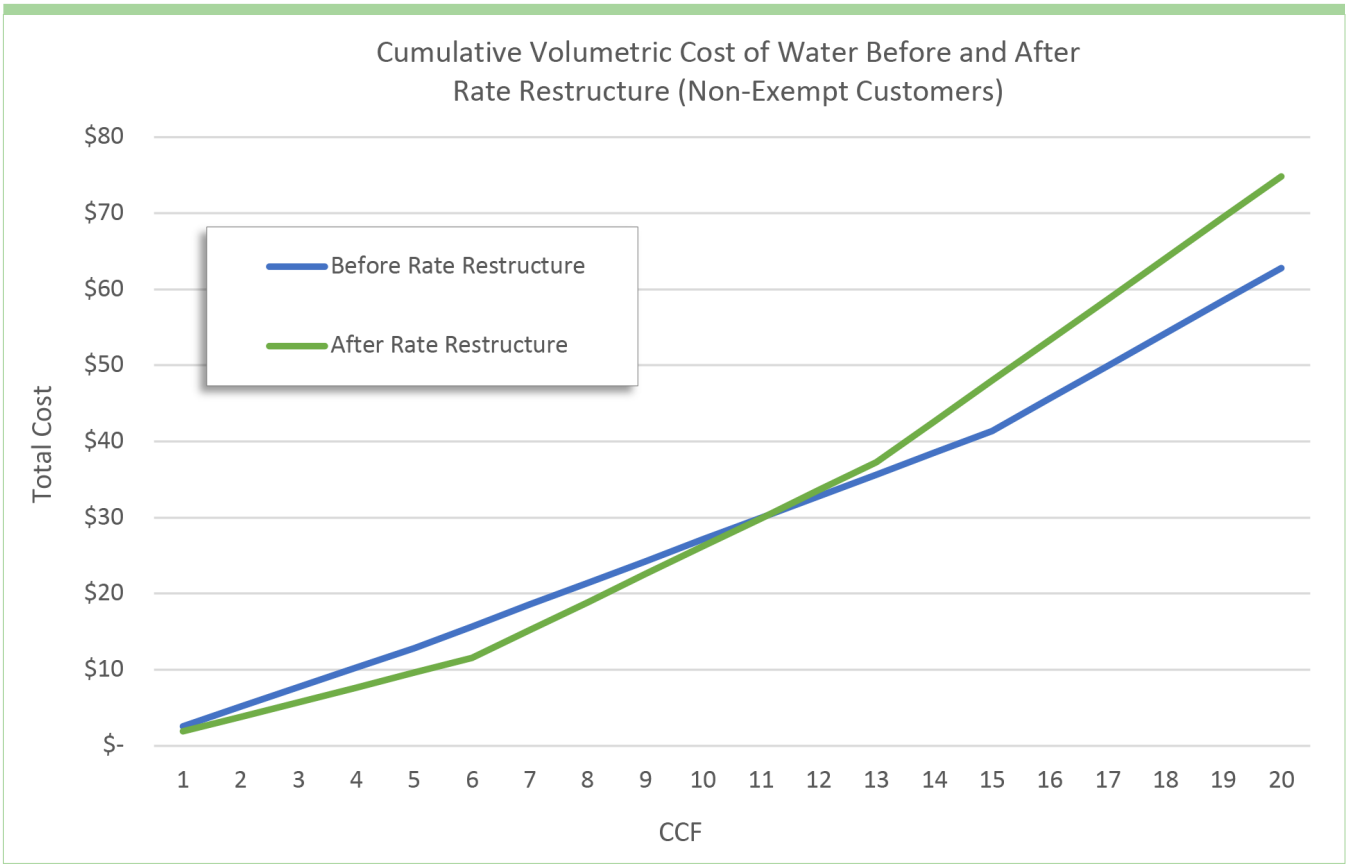


Figure 1 visually displays the dynamics of the rate restructure and how the volumetric cost of water changes as consumption increases. Figure 1 does not include the service charge or the cost of sewer service. At lower consumption levels (1-10 CCF), the volumetric cost of water in a billing cycle is less after the rate restructure. At a consumption level of 11 CCF, the volumetric cost is roughly the same before and after the rate restructure. However, once consumption levels exceed 11 CCF, water becomes increasingly more expensive under the new restructured rates. The rate restructure reduced the cost of what can be considered "essential water use" by shifting justifiable costs from the lowest consumption level to the higher consumption levels. The rate restructure pushes the cost of water to higher consumption levels. The rate restructure pushes the cost of water to higher consumption levels, which financially incentivizes Long Beach residents to reduce nonessential water use. This is an example of using volumetric water rates as a tool to make essential water use more affordable.

Figure 2: Cumulative Volumetric Cost of Water by CCF Based on Rates Before and After Restructure for a Billing Cycle for Customers in the Utility Users Tax Exemption Program

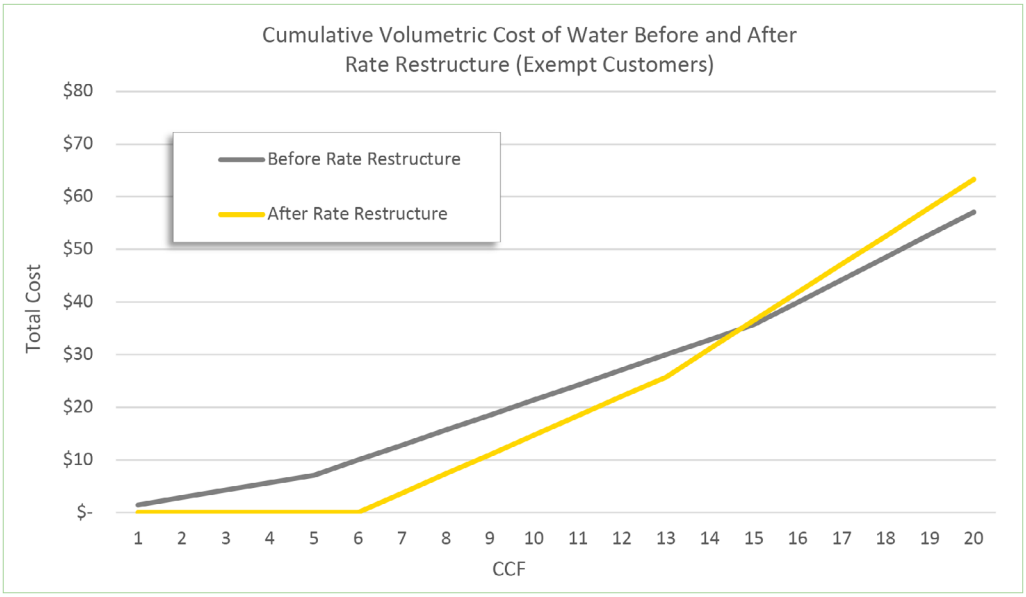


Figure 2 illustrates the rate restructure impact on volumetric water costs as it applies to customers enrolled in the Utility Users Tax Exemption Program. Like Figure 1, this chart excludes the service charge and the cost of sewer service and focuses on volumetric water charges. As such, it also excludes the $5.00 monthly water service charge credit exempt customers receive. Under the restructured rates, the first 6 CCF have no cost from a volumetric standpoint. As can be seen in Figure 2, the volumetric cost of water is less after the rate restructure for consumption levels under 15 CCF.

Figures 1 and 2 focus exclusively on the volumetric cost of water. Table 2 contains the total water and sewer bill before and after the 2017 rate restructure for exempt and non-exempt single-family customers from 1-20 CCF in a 30-day billing cycle. It is important to note that the rate restructure addressed multiple objectives such as water affordability, but also revenue requirements and cost allocations. The rates and charges for exempt customers underwent the biggest structural change. Before the rate restructure, sewer charges were waived for exempt customers. After the rate restructure, exempt customers were charged for sewer service, but no longer had to pay Tier I water rates and were given a $5.00 water service charge credit. In Table 2, negative values in the "Percent Difference" columns indicate lower bills.

Table 2: Total Single-Family Water and Sewer Bill for a 30-Day Billing Cycle, 5/8 or 3/4-Inch Meter, Nominal Dollars

CCF	Before 2017 Rate Restructure	After 2017 Rate Restructure	Percent Difference	Before 2017 Rate Restructure	After 2017 Rate Restructure	Percent Difference
	Exempt*	Exempt**	Exempt	Non-Exempt	Non-Exempt	Non-Exempt
1	$ 16.10	$ 19.27	19.69%	$ 26.06	$ 26.19	0.50%
2	$ 17.53	$ 19.66	12.15%	$ 29.02	$ 28.50	-1.79%
3	$ 18.96	$ 20.05	5.75%	$ 31.98	$ 30.81	-3.66%
4	$ 20.39	$ 20.44	0.25%	$ 34.94	$ 33.12	-5.21%
5	$ 21.82	$ 20.83	-4.54%	$ 37.90	$ 35.43	-6.52%
6	$ 24.67	$ 21.22	-13.98%	$ 41.14	$ 37.74	-8.26%
7	$ 27.52	$ 25.29	-8.10%	$ 44.38	$ 41.81	-5.79%
8	$ 30.37	$ 29.36	-3.33%	$ 47.62	$ 45.88	-3.65%
9	$ 33.22	$ 33.43	0.63%	$ 50.86	$ 49.95	-1.79%
10	$ 36.07	$ 37.50	3.96%	$ 54.10	$ 54.02	-0.15%
11	$ 38.92	$ 41.57	6.81%	$ 57.34	$ 58.09	1.31%
12	$ 41.77	$ 45.64	9.27%	$ 60.58	$ 62.16	2.61%
13	$ 44.62	$ 49.71	11.41%	$ 63.82	$ 66.23	3.78%
14	$ 47.47	$ 55.47	16.85%	$ 67.06	$ 71.99	7.35%
15	$ 50.32	$ 61.23	21.68%	$ 70.30	$ 77.75	10.60%
16	$ 54.60	$ 66.99	22.69%	$ 74.97	$ 83.51	11.39%
17	$ 58.88	$ 72.75	23.56%	$ 79.64	$ 89.27	12.09%
18	$ 63.16	$ 78.51	24.30%	$ 84.31	$ 95.03	12.71%
19	$ 67.44	$ 84.27	24.96%	$ 88.98	$ 100.79	13.27%
20	$ 71.72	$ 90.03	25.53%	$ 93.65	$ 106.55	13.77%

*Sewer charges were waived for exempt customers before the rate restructure but instituted after.
**A $5.00 water service charge credit was instituted after the rate restructure for exempt customers.

The 2017 rate restructure provided a foundation that impacts all future rate increases. For example, water providers needing an increase in revenue to meet a changing cost of service may increase the price of all tiers by the same percentage, which is what Long Beach has done since the rate restructure. The 2017 rate restructure will result in lower costs for essential water use (first tier) in the future than it would be under the pre-2017 LBWD rate structure.

Table 3: Theoretical 2020 Water and Sewer Rates if 2017 Rate Restructure did not Occur

Tier or Charge Type	Before 2017 Rate Restructure		After 2017 Rate Restructure		Current Rates Effective October 2020		Post Restructure to 2020 - Percent Difference	Theoretical 2020 Rates without Restructure*	
	Block Switch Point	Volumetric Rate	Block Switch Point	Volumetric Rate	Block Switch Point	Volumetric Rate		Block Switch Point	Volumetric Rate
IA*	First 5	$ 1.43	First 6	$ -	First 6	$ -	N/A	First 5	$ 1.81
IB	First 5	$ 2.57	First 6	$ 1.92	First 6	$ 2.44	26.8%	First 5	$ 3.26
II	Next 10	$ 2.85	Next 7	$ 3.68	Next 7	$ 4.66	26.8%	Next 10	$ 3.61
III	Over 15	$ 4.28	Over 13	$ 5.37	Over 13	$ 6.81	26.8%	Over 15	$ 5.43
Water Daily Service Charge 5/8 or 3/4-inch Meter	$ 0.49		$ 0.55		$ 0.70		26.5%	$ 0.62	
Sewer Volumetric Rate per CCF	$ 0.39		$ 0.39		$ 0.36		-8.5%	$ 0.36	
Sewer Daily Service Charge 5/8 or 3/4-inch Meter	$ 0.28		$ 0.25		$ 0.23		-8.5%	$ 0.26	

Table 3 shows the rates and charges (1) before the restructure, (2) after the restructure, (3) effective as of October 2020 (current as of this writing), and (4) a theoretical current rate if the pre-restructure rates followed the same percent increases. This is theoretical and assumes that the same percentage increases would have been prescribed if rates were not restructured in 2017. This is useful for seeing the benefits of the rate restructure over time, relative to the affordability of essential water use. It is important to note that the restructured rates (tiers and prices) were justified based on water supply sources and their cost and were not arbitrary.[5]

5. See section 4.2 of Long Beach Water Department. February 1, 2017. Cost of Service and Rate Study. https://lbwater.org/wp-content/uploads/2018/09/LongBeach_COS_Report_Reduced.pdf

Table 4: Theoretical Water and Sewer Bill Differences in 2020, with-and-without 2017 Rate Restructure.

CCF	Theoretical Current Rates if No Restructure Non-Exempt	Current Rates Effective October 2020 Non-Exempt	Percent Difference Non-Exempt
1	$ 29.89	$ 30.43	1.78%
2	$ 33.51	$ 33.22	-0.87%
3	$ 37.13	$ 36.02	-3.00%
4	$ 40.75	$ 38.81	-4.75%
5	$ 44.37	$ 41.61	-6.22%
6	$ 48.34	$ 44.41	-8.14%
7	$ 52.32	$ 49.43	-5.52%
8	$ 56.29	$ 54.45	-3.26%
9	$ 60.26	$ 59.48	-1.31%
10	$ 64.24	$ 64.50	0.41%
11	$ 68.21	$ 69.52	1.92%
12	$ 72.18	$ 74.54	3.27%
13	$ 76.16	$ 79.57	4.48%
14	$ 80.13	$ 86.73	8.24%
15	$ 84.11	$ 93.90	11.64%
16	$ 89.89	$ 101.06	12.42%
17	$ 95.68	$ 108.23	13.11%
18	$ 101.47	$ 115.39	13.72%
19	$ 107.25	$ 122.56	14.27%
20	$ 113.04	$ 129.72	14.76%

Table 4 shows the theoretical difference in current water and sewer bills for a 30-day billing cycle if rates had not been restructured in 2017. It is theoretical because it is based on the “what if” assumption that tier prices would have been increased by the same percentage if the rate restructure did not occur. Following that assumption, bills are less now than they would have been without the restructure for consumption levels of 2-9 CCF. This further demonstrates the effort that was made by LBWD to make essential water use more affordable through the rate restructure.

Water Conservation Incentive Programs

In addition to their recent rate restructure, LBWD and Metropolitan have a variety of water conservation incentive programs that can reduce water use and help make water more affordable for Long Beach residents. SoCal Water$mart (administered by Metropolitan) offers rebates to Southern California residents for the purchase and installation of high-efficiency devices including toilets, clothes washers, sprinkler nozzles and weather-based irrigation controllers, while Long Beach Water Department has multiple programs, such as Lawn-to-Garden, Direct-Install-Gardens, and the Parkway Program that revamps home landscapes to remove turf and reduce outdoor water consumption.

Photo by Raychan on Unsplash

The following list contains various offerings available to Long Beach residents and brief descriptions.

- The LBWD **Lawn-to-Garden** program provides $3.00 per square foot of lawn removed in the front yard and/or $2.00 per square foot in the backyard, for a total of up to 5,000 square feet. A design reimbursement of up to $1,500 for the cost of a professional landscape design is also available.
- The LBWD **Native Plant Parkway** program provides native plant installation kits for the area between the sidewalk and street for turf removal. Kits include native plants, pavers, and mulch.
- The LBWD **Direct Install Garden** program was created to provide homeowners in low-income neighborhoods affected by environmental pollution with a sustainable landscape free-of-charge. DIG gardens are designed to reduce runoff, capture and sequester carbon dioxide, and create habitats for birds and insects. This program is currently being offered in one census tract in Long Beach. Participants can choose from various drought tolerant landscape styles depending on shade availability and lot type.
- The **SoCal Water$mart** program is administered by the Metropolitan Water District of Southern California, and as a member agency of Metropolitan, Long Beach is able to offer residents the following incentives:
  - High-Efficiency Clothes Washer rebates starting at $170. Both LBWD and Metropolitan evenly contribute to this rebate.
  - Premium High-Efficiency Toilet rebates starting at $80. Both LBWD and Metropolitan evenly contribute to this rebate.
  - Flow Monitor/Leak Detection Device rebates starting at $100.
  - Weather-based Irrigation Controller rebates starting at $160 per controller for less than one acre and $40 per station for areas larger than one acre
  - Soil Moisture Sensor System rebates starting at $100 per controller for less than one acre and $40 per station for areas larger than one acre.
  - Rotating Sprinkler Nozzle rebates starting at $2 per nozzle with a minimum quantity of 30 nozzles.
  - Rain Barrel and Cistern rebates starting at $35 per barrel up to 2 barrels, or $250-$350 for a cistern depending on gallon capacity.

Water Affordability Assessment Using the Household Burden Indicator

Water affordability was assessed in Long Beach, California using a slightly modified version of the Household Burden Indicator (HBI). The HBI was put forth by Raucher, et al., 2019 in a paper titled, Developing a New Framework for Household Affordability and Financial Capability Assessment in the Water Sector.[6] The HBI gives insight into the cost of water for households in the lowest income quintile (i.e., the lowest 20% of households based on household income). The HBI was originally designed to use the cost of basic water service which is often approximated using an estimate such as 50 gallons per capita per day (gpcd).[6] The modified HBI used in this analysis uses average water use obtained from billing data, rather than an essential water use estimate like 50 gpcd.

Data and Methods

For this analysis, Long Beach Water Department provided AWE with consumption data for 59,875 single-family accounts. The billing data represented 12 months from August 2019 through July 2020. After initial data review, 5,674 accounts were removed for having incomplete water use data and an additional 636 accounts were removed because they were missing census tract data. From there, the analysis proceeded using the remaining 53,565 single family accounts. For the purpose of this analysis, all 53,565 single-family accounts were considered non-exempt water users according to LBWD's customer type classification system.

The monthly water and sewer bill cost was calculated for each of the 53,565 single family accounts in Long Beach using rates and charges from 2019. The water and sewer bills both had a fixed and volumetric component, and the steps for calculating the water and sewer bills for each count are outlined below. After calculating monthly water and sewer bills, the results were summed to determine the annual combined water and sewer bill for each account.

1. **Annual Combined Water and Sewer Bill = Monthly Water Bills + Monthly Sewer Bills**
2. **Monthly Water Bill = Water Service Charge + Volumetric Water Charge**
    i. **Service Charge:** Multiplied Long Beach's water service charge for an account's specific meter size by the number of days in the billing period.
    ii. **Volumetric Charge:** Calculated based on the account's monthly water use (in CCF) and the Long Beach tiered water rate structure.
3. **Monthly Sewer Bill = Sewer Service Charge + Volumetric Sewer Charge**
    i. **Service Charge:** Multiplied Long Beach's sewer service charge for an account's specific meter size by the number of days in the billing period.
    ii. **Volumetric Charge:** Calculated using a two-step process. First, determined the average winter sewer volume for an account. This was accomplished by averaging the monthly water use (in CCF) for the three "winter months" of December, January, and February, and then multiplying this number by the Long Beach volumetric sewer rate of $0.357. The ensuing number was then used as the volumetric sewer rate for every single month.

6. Raucher, R., Clements, J., Rothstein, E., Mastracchio, J., & Green, Z. (2019). Developing a New Framework for Household Affordability and Financial Capability Assessment in the Water Sector. American Water Works Association, National Association of Clean Water Agencies, and Water Environment Federation.

After the water and sewer bills were calculated for each individual account, the accounts were aggregated by census tract. It was determined that the 53,565 accounts were linked to 104 census tracts, and the accounts were then sorted into their respective census tracts. Once the accounts were properly matched with their corresponding census tract, the annual water and sewer bills for each account in a given census tract were averaged to determine the average annual water and sewer bills for each of the 104 census tracts.

The Household Burden Indicator (HBI) was calculated as a metric to better understand water affordability in each census tract in Long Beach. The HBI described by Raucher, et al., 2019, is defined using the formula below.[6]

HBI (Raucher Et Al.)

$$HBI = \frac{\textit{Total Annual Basic Water Sector Household Cost}}{\textit{Upper Boundary of the Lowest Quintile Income}}$$

For this analysis, the HBI formula was modified to use an average annual combined water and sewer bill derived from billing data. That is, the average annual combined water and sewer bill for a given census tract was used instead of the total annual basic water sector household cost. The upper boundary of the lowest quintile income was obtained for each census tract from the Household Income Quintile Upper Limits table from United States Census Bureau 2018 American Community Survey 5-Year Estimates.[7] The HBI formula used specifically for this report is defined below. Each census tract had its own unique average water and sewer bill and a unique value for the upper boundary of the lowest income quintile.

HBI (Modified for Long Beach Billing Data)

$$HBI = \frac{\textit{Average Annual Combined Water and Sewer Bill}}{\textit{Upper Boundary of the Lowest Quintile Income}}$$

Long Beach at dusk

7. Income data from the American Community Survey combine single-family and multi-family households. Disaggregated data are not available. The average cost of water and sewer reflects single-family customers.

Findings

After careful analysis of the customer billing data, it was determined that the average annual cost of combined water and sewer service for a single-family customer in Long Beach, CA is $824.27. Water represents an average of $698.31, which is 84.7% of the total cost, and sewer represents an average of $125.96, which comprises the remaining 15.3% of the total annual cost.

Figure 3 shows a histogram of the average monthly water use for the single-family water accounts. The average monthly water use by a consumer in Long Beach was 10.24 CCF. Water usage was fairly uniform across the city, as 68% of accounts consumed between 5 and 15 CCF, while 94% of all accounts used under 20 CCF of water every month on average. There were very few outliers as only 2% of accounts consumed over 25 CCF of water per month on average.

Figure 3: Average Monthly Water Use for Single-Family Accounts in Long Beach, CA

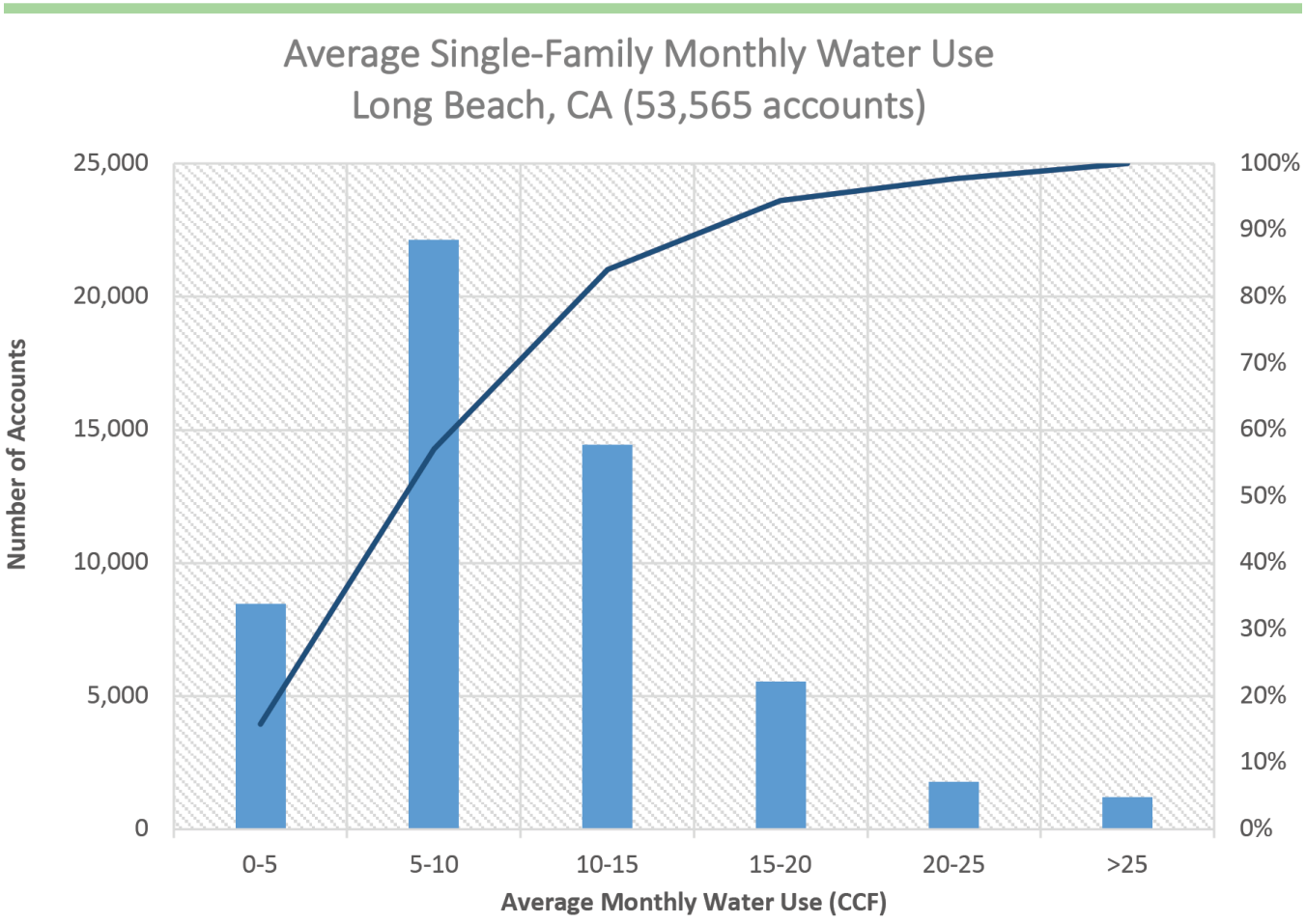


Figure 4: Household Burden Indicator by Census Tract • Long Beach, CA

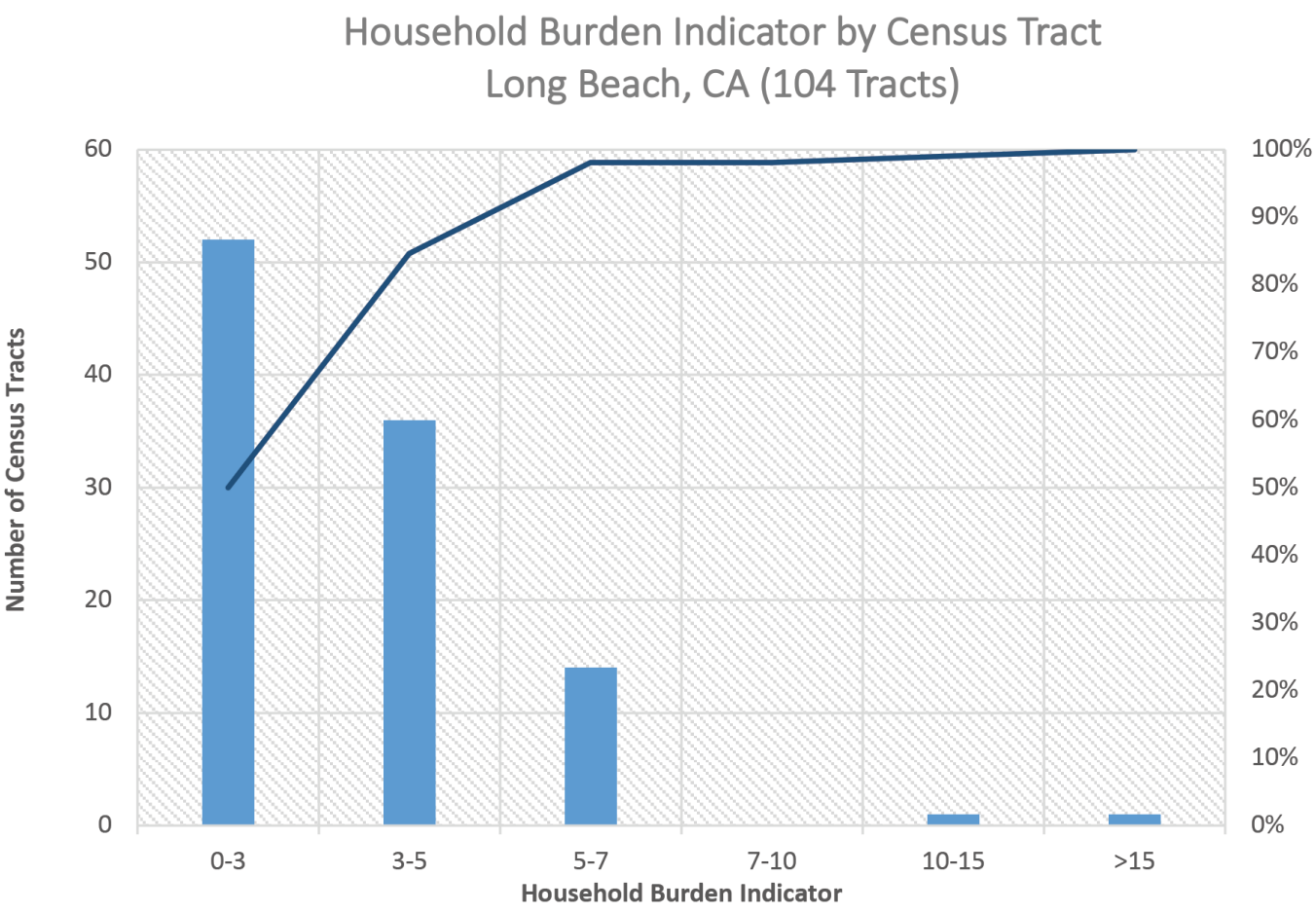
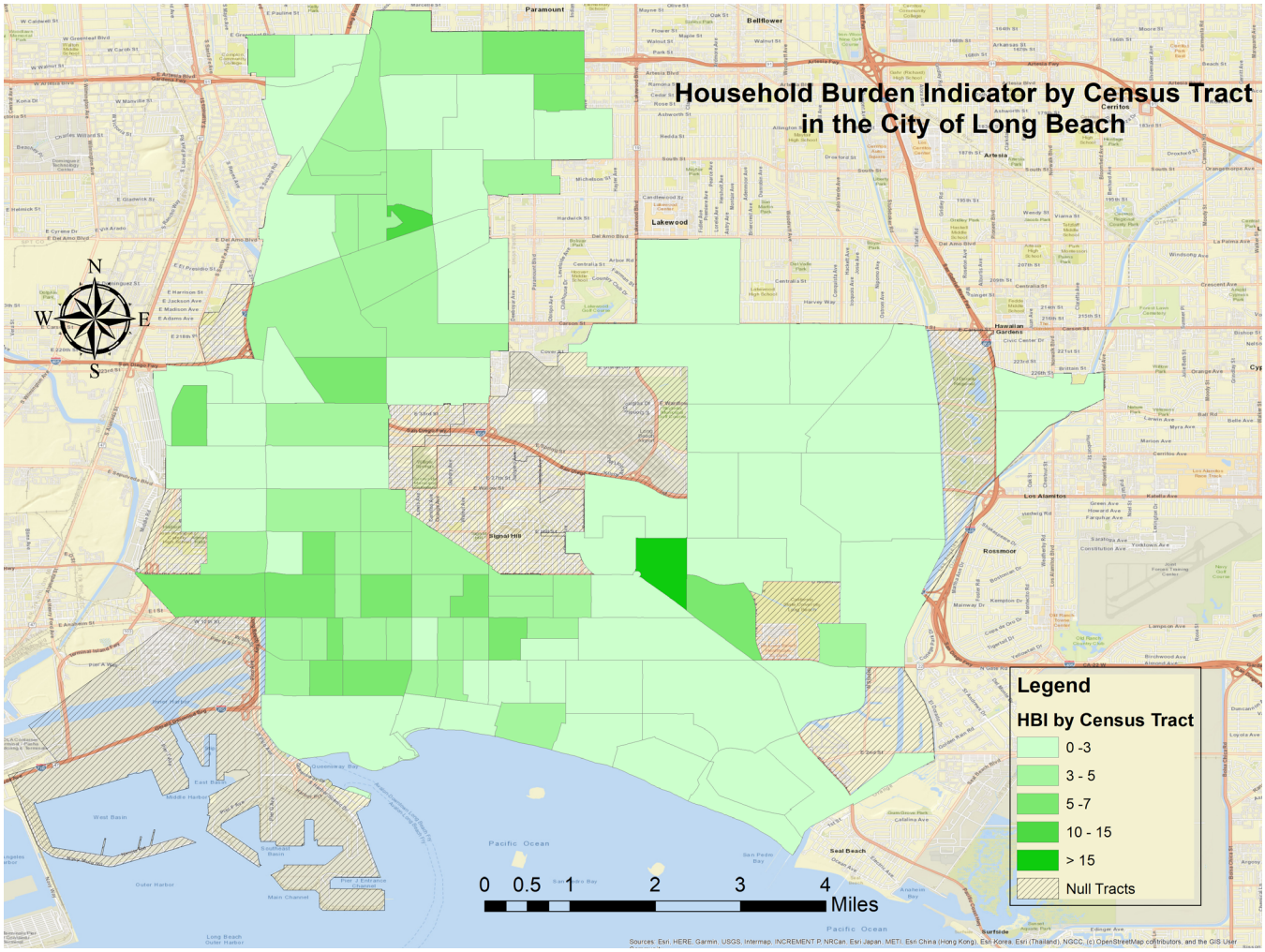


Figure 4 displays a histogram of HBI's by census tracts across the City of Long Beach. The HBI for a census tract in Long Beach ranged from 0.90 to 24.16, with an average of 3.48, while the minimum was 0.90 and the maximum was 24.16. Exactly half, or 50%, of all Long Beach Census tracts (52 of 104) have an HBI below 3, meaning water/sewer charges represent less than 3% of annual household income for households in the lowest income quintile. Additionally, 102 of the 104 census tracts, or 98%, have an HBI below 7. There were only two outlier census tracts where the average cost of water is greater than or equal to at least 10% of the annual income for households in the lowest income quintile.

Figure 5: Household Burden Indicator by Census Tract



Once the HBI was determined for each census tract, the data was spatially represented in a graduated color map, pictured in Figure 5. In this map, the darker the color, the higher the HBI. While the majority of census tracts in the City of Long Beach have low HBI values, the census tracts that have higher HBIs are primarily concentrated in the northwest and southwest areas of the city, whereas census tracts in the eastern portion of the city generally have lower HBIs.

Additional Data Related to Water Affordability

Long Beach Household Income

While the HBI focuses on the lowest household income quintile, income distributions were also assessed to gain additional understanding of water affordability in Long Beach throughout the entire income spectrum. Figure 6 contains the household income distribution for the City of Long Beach representing 166,988 households.

The average annual cost of water and sewer for a single-family customer in Long Beach is $824.27. This cost is expressed as a percentage of the annual income midpoint for each household income bracket in Figure 7. For example, the midpoint of the $10k to $14.9K income bracket is $12.5k a year which represents 6.6% of the average annual water and sewer bill of $824.27.

Figure 6: Long Beach Household Income

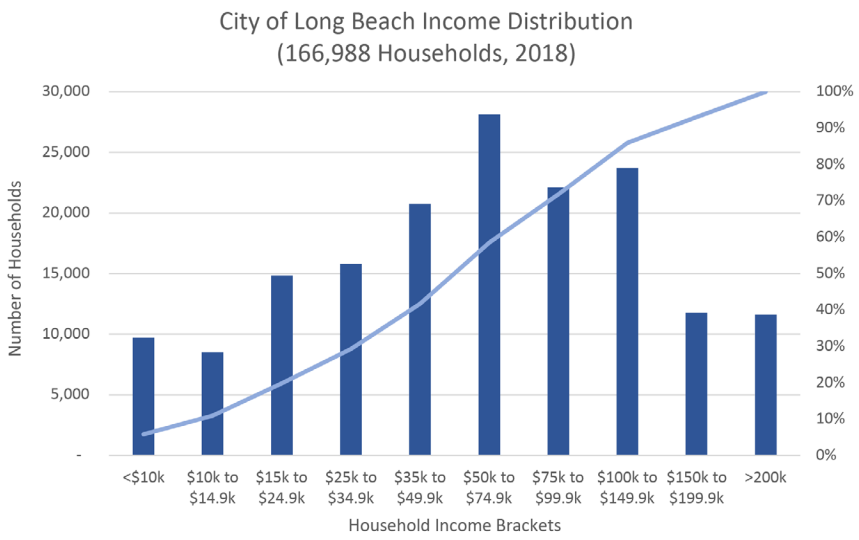


Figure 7: Average Annual Water and Sewer Bill Cost as a Percentage of the Income Group Midpoint

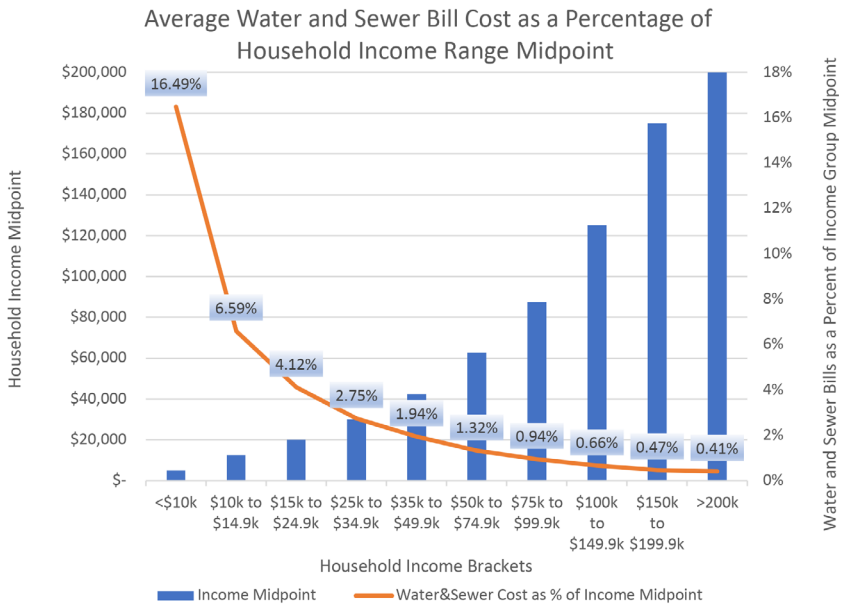


Table 5: Average Annual Water and Sewer Cost as a Percentage of Annual Household Income Range Midpoints

Annual Household Income Range	Annual Household Income Midpoint	Number of Households in Range	Percent of Total Households	Average Water & Sewer Cost as % of Income Midpoint
Less than $10k	$ 5,000.00	9,732	5.83%	16.49%
$10k to $14.9k	$ 12,500.00	8,512	5.10%	6.59%
$15k to $24.9k	$ 20,000.00	14,837	8.89%	4.12%
$25k to $34.9k	$ 30,000.00	15,807	9.47%	2.75%
$35k to $49.9k	$ 42,500.00	20,771	12.44%	1.94%
$50k to $74.9k	$ 62,500.00	28,127	16.84%	1.32%
$75k to $99.9k	$ 87,500.00	22,099	13.23%	0.94%
$100k to $149.9k	$ 125,000.00	23,713	14.20%	0.66%
$150k to $199.9k	$ 175,000.00	11,759	7.04%	0.47%
Greater than 200k	$ 200,000.00	11,632	6.97%	0.41%

Table 5 contains the same data as Figures 6 and 7 and shows the number of households in each income range. Household income data from the American Community Survey contains both single-family and multi-family households. The average cost of water and sewer referenced throughout this report is based on single-family billing data. The average cost of water for households living in multi-unit structures with one meter is unknown.

Exempt Customers

The Long Beach Water Department provided AWE with consumption data for accounts participating in the Utility Users Tax Exemption Program, which are customers who qualify for a $5.00 monthly water service credit charge and who have their Tier 1 water usage (under 7 CCF per month) charge waived. Consistent with other billing data referenced in this report, the time period was for August 2019 through July 2020. In total, there were 1,055 exempt-eligible accounts in the original dataset, but 6 accounts were removed due to insufficient water usage or census tract data. The remaining 1,049 accounts were then used for analysis. This represents 1.96% of the 53,565 accounts included in the HBI analysis.

As with the non-exempt single-family accounts, the total combined water and sewer bill was calculated for exempt accounts. After analyzing the dataset, it was determined that that the average total combined water and sewer bill for customers in the Utility Users Tax Exemption Program was $460.69. This cost was 44.11% less than the Long Beach citywide average combined water and sewer bill, which was $824.27.

Figure 8 shows a histogram of the average monthly water usage for the single-family water accounts. The average monthly water use by an exempt-eligible consumer in Long Beach was 8.08 CCF, which is 21.32% lower than the citywide average of 10.27 CCF. While exempt customers collectively have lower than average water use, there are exempt accounts with high water use that could benefit from water conservation outreach and incentives. For example, 279 (27%) exempt accounts use more than the citywide average of 10.23 CCF per month, 98 (9%) exempt accounts use more than 15 CCF, 32 (3%) use greater than 20 CCF per month, and 17 (2%) use greater than 25 CCF per month.

Figure 8: Average Monthly Water Use for Accounts in the Utility Users Tax Exemption Program

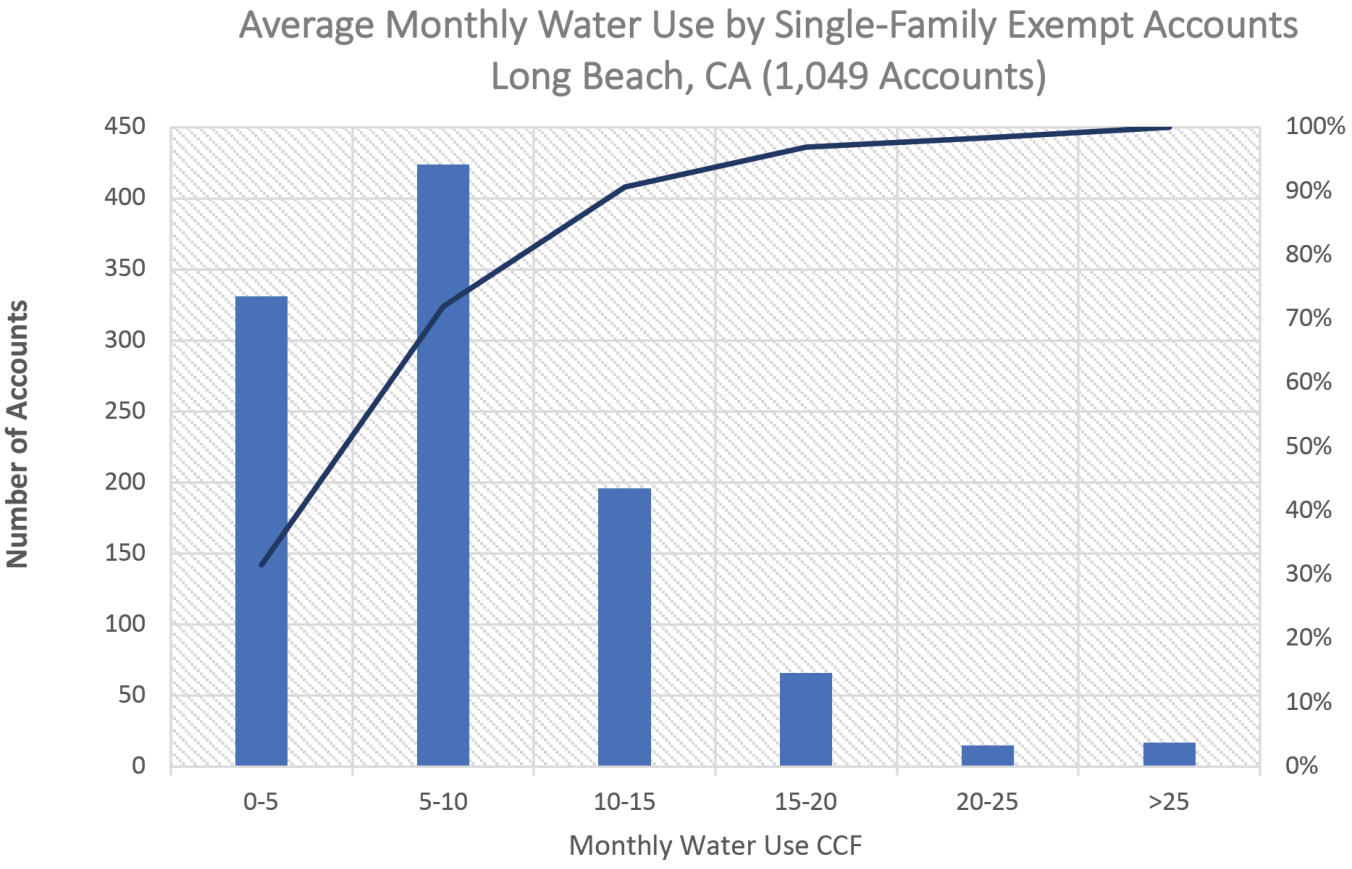


Figure 9: Map of the Number Exempt Accounts by Census Tract

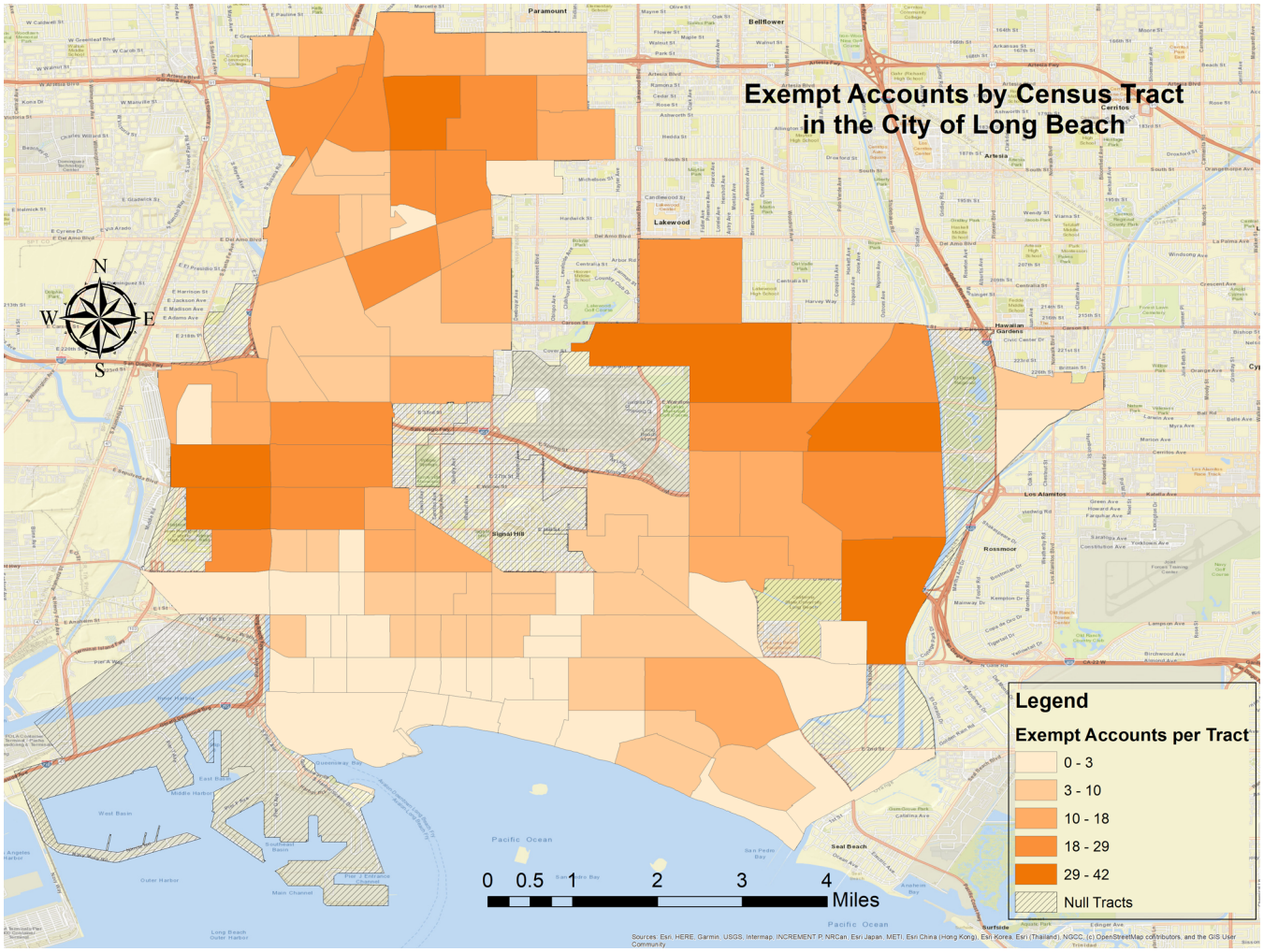


Figure 9 shows the number of exempt accounts per census tract throughout the City of Long Beach via graduated color map. The darker the color, the more exempt accounts in a census tract.

Account Arrears

Account arrears represent a clear indicator related to customer non-payment and water affordability. Accounts receivable data were available for water and sewer service for three snapshots in time: (1) as of August 31, 2019, (2) as of August 31, 2020, and (3) as of August 31, 2021. Additionally, consumption data were available for 871 single-family accounts in arrears from August 2019 through July 2020. The purpose of reviewing the consumption data was to gauge the number of accounts with unpaid balances and determine how the water use of accounts in arrears compares to the larger population of customers. For example, if these accounts had higher than average water use, it would signal an opportunity for outreach and conservation assistance.

Table 6 shows accounts receivable (A/R) total unpaid balances for water service as of August 31, 2019, August 31, 2020, and August 31, 2021 for residential customers (e.g., single family and multifamily), including the number of accounts, and average account balance per account. It also contains the total and average balances that are 0-30 days past due, 31-60 days past due, 61-90 days past due, 91-120 days past due, and over 120 days past due.

Table 6: Accounts Receivable Unpaid Balances for Residential Water Service as of August 2019, August 2020, and August 2020.

Accounts Receivable Data Type	A/R Balance as of 08/31/2019	A/R Amount 0-30 Days Past Due	A/R Amount 31-60 Days Past Due	A/R Amount 61-90 Days Past Due	A/R Amount 91-120 Days Past Due	A/R Amount Over 120 Days Past Due
Number of Residential Accounts	122	57	65	90	102	61
Total	$32,204.11	$4,130.16	$3,856.71	$5,678.90	$7,242.18	$11,296.16
Average Per Account	$263.97	$72.46	$59.33	$63.10	$71.00	$185.18
Accounts Receivable Data Type	**A/R Balance as of 08/31/2020**	**A/R Amount 0-30 Days Past Due**	**A/R Amount 31-60 Days Past Due**	**A/R Amount 61-90 Days Past Due**	**A/R Amount 91-120 Days Past Due**	**A/R Amount Over 120 Days Past Due**
Number of Residential Accounts	1,562	1,173	1,173	1,217	1,221	1,202
Total	$557,458.25	$91,043.44	$95,365.93	$102,316.26	$81,785.34	$186,947.28
Average Per Account	$356.89	$77.62	$81.30	$84.07	$66.98	$155.53
Accounts Receivable Data Type	**A/R Balance as of 08/31/2021**	**A/R Amount 0-30 Days Past Due**	**A/R Amount 31-60 Days Past Due**	**A/R Amount 61-90 Days Past Due**	**A/R Amount 91-120 Days Past Due**	**A/R Amount Over 120 Days Past Due**
Number of Residential Accounts	2,864	1,924	1,828	1,994	2,048	2,453
Total	$1,557,240.67	$159,418.93	148,844.05	158,216.60	$146,440.07	$944,321.02
Average Per Account	$543.73	$82.86	$81.42	$79.35	$71.50	$384.97

Figure 10: Accounts Receivable Unpaid Balances for Residential Water Service as of August 2019, August 2020, and August 2020.

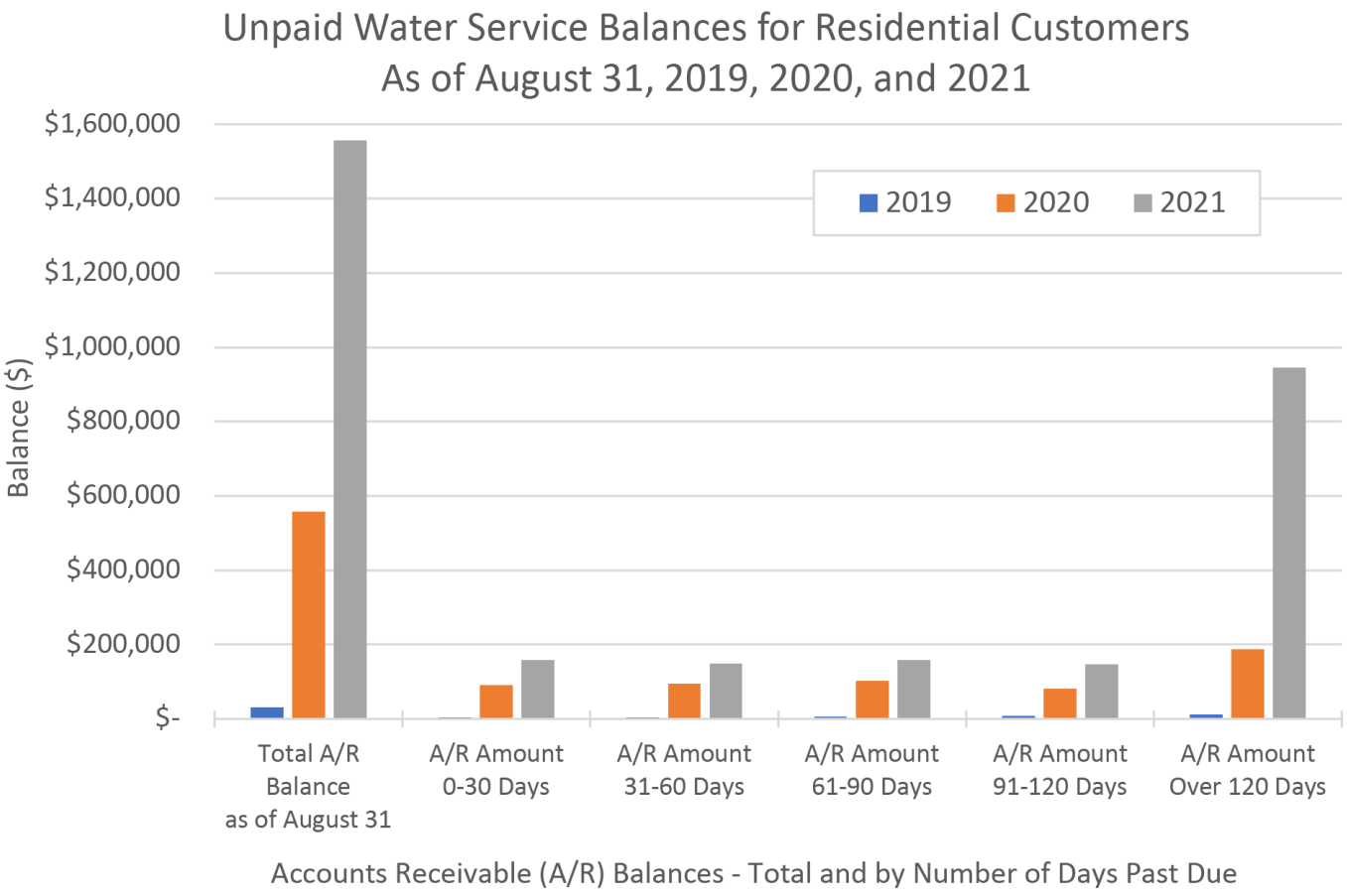


Figure 10 shows total unpaid balances and by the number of days past due as of August 31, 2019, August 31, 2020, and August 31, 2021. The time period from August 2019 to August 2021 saw an extreme increase in A/R balances and the number of accounts with unpaid balances, driven by the economic impacts of COVID-19 and a statewide moratorium on water shutoffs for non-payment. Water shutoffs were banned on March 4, 2020, by Governor Gavin Newsome via Executive Order.[8]

Consumption data were evaluated for single-family accounts with unpaid balances for water service during the period of August 2019 through July 2020, which is the same time frame for the billing data used to calculate the HBI. Consumption data were provided for 1,551 single-family accounts in arrears, but 680 accounts were removed due to insufficient water usage data (e.g., multiple months of zero reads) or lack of a census tract designation. The remaining 871 accounts were then used for analysis. Overall, 1.63% of analyzed accounts (871 out of 53,565) were classified as in arrears during the period of August 2019 through July 2020.

8. State of California Executive Department. March 4, 2020. Executive Order N-42-20. https://www.gov.ca.gov/wp-content/uploads/2020/04/4.2.20-EO-N-42-20.pdf

Figure 11: Average Monthly Water Use by Single-Family Accounts in Arrears

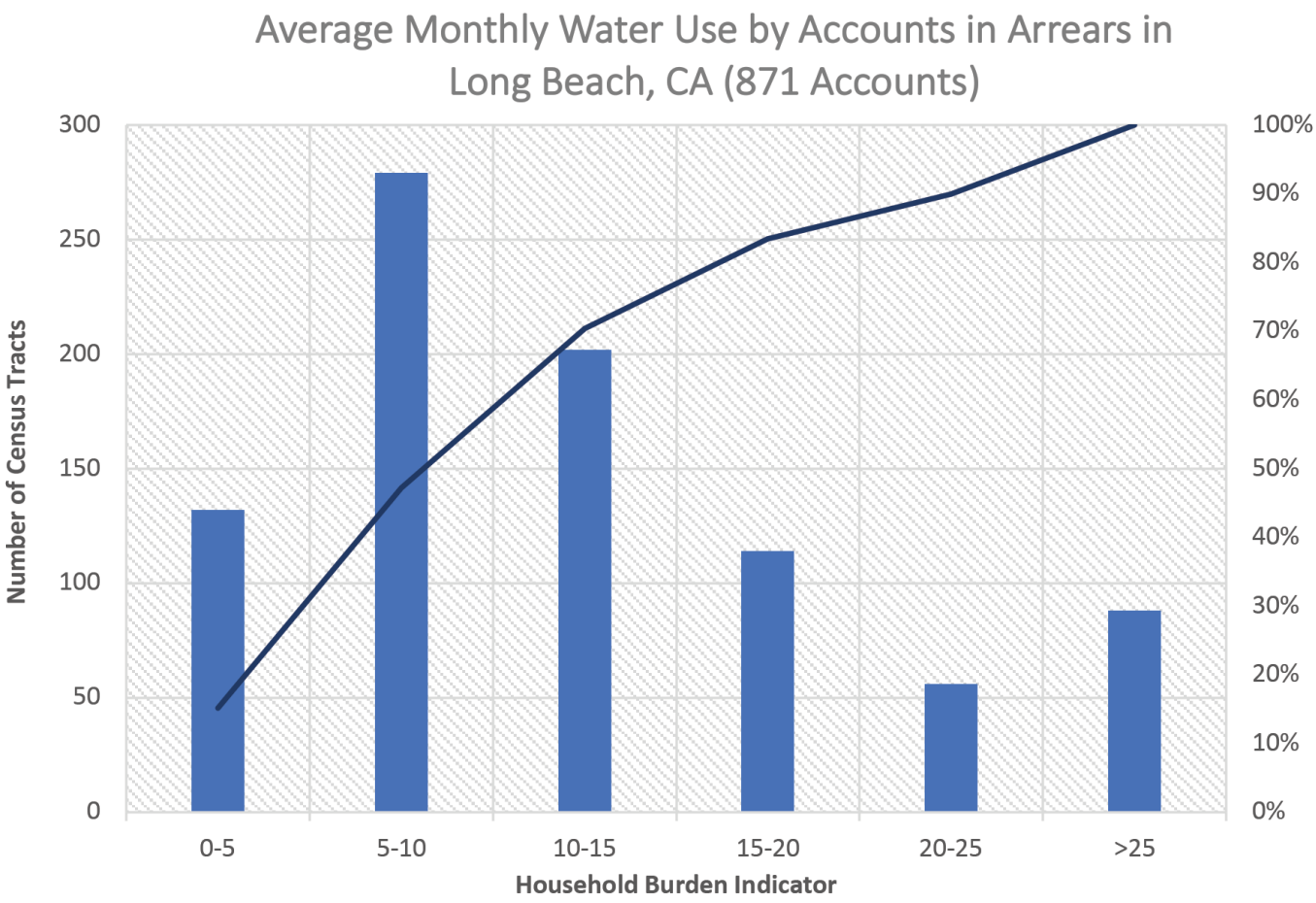


Figure 11 shows average monthly water use for single-family accounts in arrears. The average monthly water use by accounts in arrears in Long Beach was 14.44 CCF. This figure is 40.60% higher than the citywide average water consumption of 10.27 CCF. Over half (51.9%) of the accounts in arrears used more than the citywide average, 258 accounts (29.6%) had an average monthly water use greater than 15 CCF, 144 accounts (16.5%) had a monthly average greater than 20 CCF, and 88 (10.1%) had a monthly average use greater than 25 CCF. Accounts in arrears represent a customer segment that could benefit from water conservation outreach and incentives, particularly accounts with high water use.

Figure 12: Map of the Number of Accounts in Arrears per Census Tract

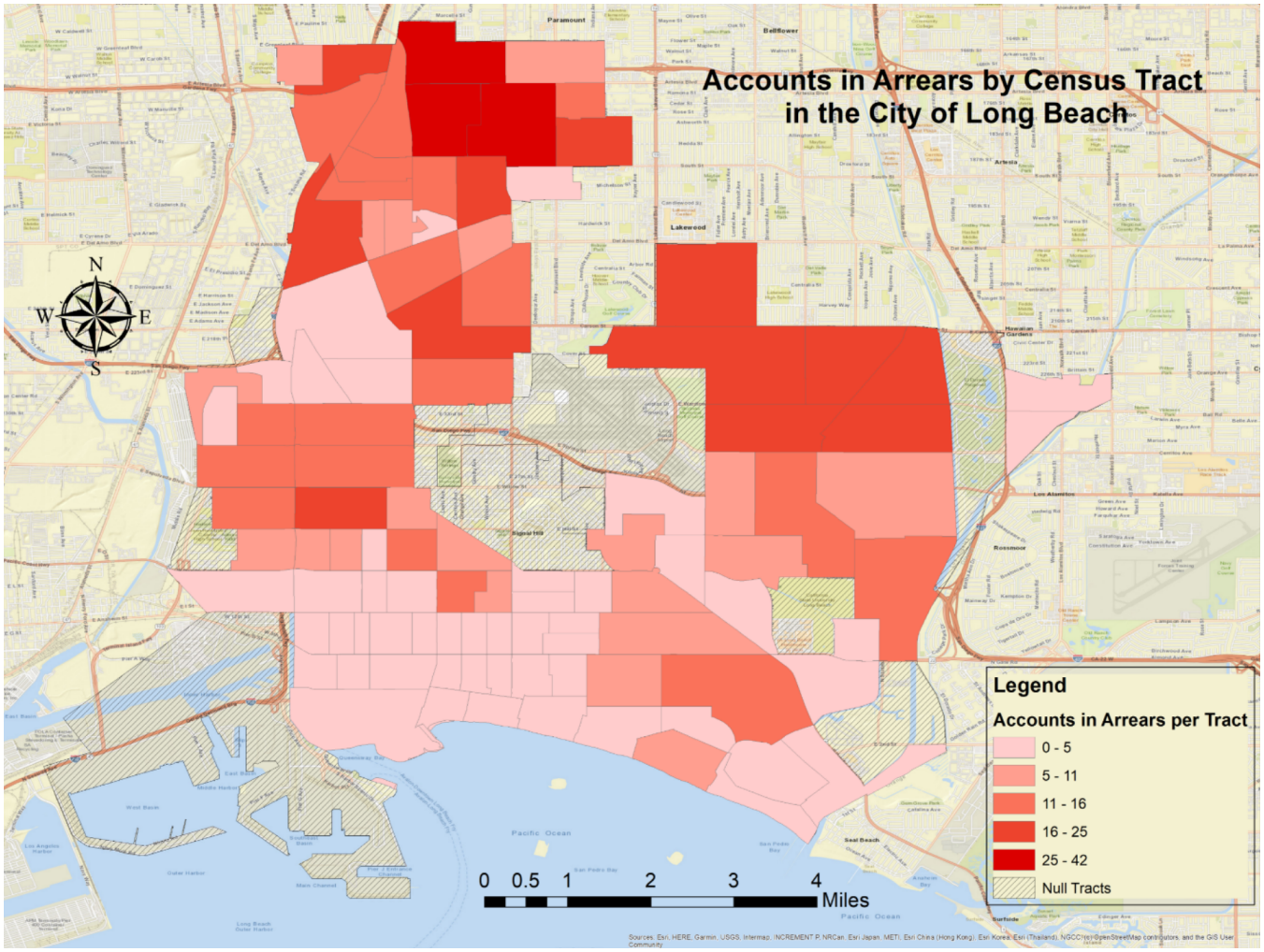


Figure 12 shows the number of accounts in arrears by census tract via a graduated color map. The darker the color the higher the number of accounts in arrears. This can be useful in identifying areas with a high number of accounts in arrears that may correlate to income, housing age, homes with large turf areas, or other variables. The number of accounts of arrears is presented in Figure 12, while Figure 13 includes the percentage of accounts in arrears.

Figure 13: Map of the Percent of Accounts in Arrears and Household Burden Indicator by Census Tract

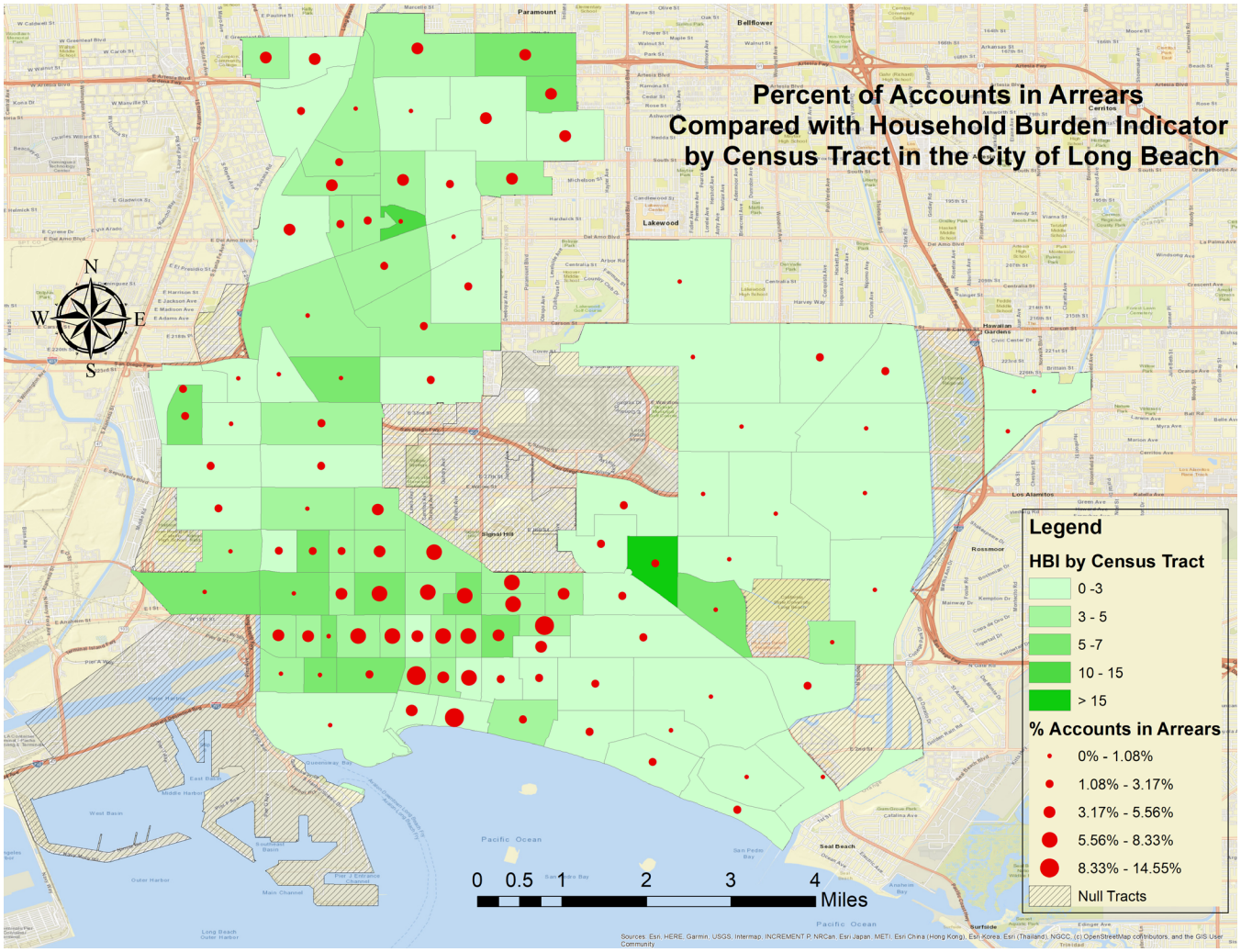


Figure 13 shows the HBI by census tract and the percent of accounts in arrears by census tract. Percent of accounts in arrears was selected because census tracts have a varying amount of customer accounts. There is no linear association between the HBI and the percent of accounts in arrears for census tracts in Long Beach. That is, a high census tract HBI does not predict a higher percentage of accounts in arrears in a census tract. For example, a simple linear regression for the 104 census tracts with the HBI as the independent variable and percent of accounts in arrears as the dependent variable yielded an R-Squared value of 0.003. However, there do appear to be geographic clusters of higher percentages of accounts in arrears in the northern and southwest areas of Long Beach, as can be seen in Figure 13.

Water Conservation Bill Impacts for Long Beach Customers

Indoor Water Use

As previously described, customers in the City of Long Beach have many water conservation offerings from LBWD and Metropolitan. For example, by replacing a combination of old, inefficient toilets and clothes washers with high-efficiency models, customers can save a meaningful amount of water and money every month. This section provides water savings estimates and estimates of bill impacts for various water conservation measures. To estimate bill impacts, the water and sewer rates that were effective as of October 1, 2019 were used to match the timeframe of the billing data used. Table 7 contains nonexempt water and sewer rates for single-family customers that were effective as of October 1, 2019 and rates that became effective October 1, 2020.

Water savings estimates were generated using the Alliance for Water Efficiency's Water Conservation Tracking Tool for the replacement of inefficient toilets and clothes washers.[9] The AWE Water Conservation Tracking Tool estimated that Long Beach consumers can save 1,417 gallons, or 1.89 CCF, of water per month by replacing their inefficient toilets and clothes washers (Table 8 summarizes this along with outdoor water savings). This amounts to a total savings of $9.01 a month and $108.09 dollars a year for a combined water and sewer bill for an average household in Long Beach. It was previously determined that the average combined water and sewer bill for a single-family home in Long Beach was $824.27, so if an average consumer replaced their inefficient appliances with more water efficient appliances, they could lower their annual water and sewer bill by 13.11%.

Reducing an annual water bill by 13.11% can provide meaningful bill reductions for Long Beach residents. Long Beach residents can take advantage of the previously mentioned SoCal Water$mart rebate programs that provide economic incentives to consumers who want to upgrade to more water efficient fixtures and appliances.

Ample opportunity remains for water conservation savings via toilet and clothes washer replacement throughout the City of Long Beach, CA. Using U.S Census data on housing age and American Housing Survey data, it was estimated that there are roughly 30,000 inefficient toilets remaining in Long Beach, even after subtracting the nearly 7,500 LBWD and Metropolitan toilet rebates that have already been implemented. This equates to over 300 million gallons of water per year savings potential. Since 2002, Long Beach Water Department and Metropolitan have distributed over 9,500 clothes washer rebates. In addition to these previously implemented clothes washer rebates, it is estimated that there are roughly 28,000 inefficient clothes washers that can still be replaced in Long Beach, which, if replaced, could potentially save 197 million gallons of water annually.[10] This demonstrates that incentive programs to replace inefficient fixtures and appliances such as toilets and clothes washers can have a major impact.

9. Alliance for Water Efficiency. 2021. Water Conservation Tracking Tool, Version 4. allianceforwaterefficiency.org/resources/topic/water-conservation-tracking-tool

10. The estimated number of inefficient toilets and clothes washers were generated using Version 4.0 of the Alliance for Water Efficiency Water Conservation Tracking Tool fixture stock models.

Table 7: Single-Family Water and Sewer Rates

Single-Family Water Rates	Tier or Meter Size	Effective October 1, 2019	Effective October 1, 2020
First 6 CCF	IB	$2.298	$2.436
Next 7 CCF	II	$4.399	$4.663
Over 13 CCF	III	$6.420	$6.805
Water Daily Service Charge	5/8" or 3/4" Meter	$0.657	$0.696
Sewer Volumetric Charge/CCF	All Meter Sizes	$0.357	$0.357
Sewer Daily Service Charge	5/8" or 3/4" Meter	$0.225	$0.225

Outdoor Water Use

Long Beach residents can save additional money and further increase water savings by taking advantage of the previously mentioned outdoor landscape programs through LBWD that help residents reduce outdoor water usage. In particular, the Direct Install Gardens (DIG) program is being piloted in an underserved census tract and replaces turf lawns with water-efficient landscapes free of charge for owner-occupied single-family housing units. Priority is given to residents who meet an income requirement at or below 80% of the local median income.[11] The Lawn-to-Garden (L2G) program provides financial incentives for any Long Beach resident looking to replace their turf landscape with a water-efficient landscape.[12] The Parkway Program provides free designs and materials to remove turf and replace it with native plants in the area between the sidewalk and the street, limiting the need for irrigation.[13]

For this analysis, outdoor water conservation potential for changing landscapes from turf to low water use plants are calculated using Simplified Landscape Irrigation Demand Estimate (SLIDE) formulas, which are depicted below.[14]

From the start of the Lawn-to-Garden program to 2017, the City of Long Beach reported that it has replaced 3,200 turf landscapes with native plants, removing 3.2 million square feet of lawn, meaning the average landscape had 1,000 square feet of turf replaced.[15] Using the estimate of 1,000 square feet of turf converted to low water use plants for the SLIDE equations, the average Landscape Water Demand for 1,000 square feet of turf grass is 19,786.48 gal/year, and the average Landscape Water Demand for 1,000 square feet of low water use plants is 7,419.93 gal/year. This means replacing a turf landscape with low water use plants would amount to an estimated water savings of 12,367 gallons per year (This estimate is rounded to 12,300 gallons per year for outdoor water savings calculations in Table 8).

By replacing water-intensive lawns with low water use plants, Long Beach consumers can potentially save 1,031 gallons, or 1.38 CCF, of water per month. This amounts to a total savings of $6.06 a month and $72.73 dollars a year for a combined water and sewer bill for an average household in Long Beach. This equates to an 8.82% reduction of an annual water and sewer bill for the average Long Beach customer. Since this is an outdoor water use reduction, the volumetric sewer rate was not included in the savings estimate. Long Beach residents have opportunity to reduce outdoor water use and save money on water bills by taking advantage of the L2G and DIG programs. The DIG program is currently being piloted in a single census tract and may prove to be something that can be expanded in the future.

$$\textit{Landscape Water Demand (gal.) for Turf Grass} = ETo \times \textit{Land Area} \times 0.8 \times 0.623$$

$$\textit{Landscape Water Demand (gal.) for Desert Adapted Plants} = ETo \times \textit{Land Area} \times 0.3 \times 0.623$$

11. City of Long Beach, California. n.d. Direct Install Gardens (DIG). https://www.lbwater.org/save-water/residential/dig/

12. City of Long Beach, California. n.d. Lawn-to-Garden (L2G). https://lblawntogarden.com/

13. City of Long Beach. 2021. Native Plant Parkways. https://www.lbwater.org/save-water/residential/parkway/

14. University of California, Division of Agriculture and Natural Resources. n.d. Using ANSI/ASABE S623 & SLIDE to Estimate Landscape Water Requirements. https://ucanr.edu/sites/UrbanHort/Water_Use_of_Turfgrass_and_Landscape_Plant_Materials/SLIDE__Simplified_Irrigation_Demand_Estimation/

15. City of Long Beach, California. 2017. Water Conservation at the Sustainable City Commission. http://www.longbeach.gov/sustainability/news/water-conservation-at-the-scc/

Behavioral Actions

In addition to taking advantage of programs to reduce indoor and outdoor water use as a means to conserve water and save money on utilities, there are a variety of behavioral actions that Long Beach Water Department recommends consumers to take to reduce their monthly water consumption. These actions include running dishwashers and clothes washers only when they are full, taking a "one song" shower, turning off faucets while brushing your teeth, checking to make sure your home has no leaks, and watering outdoor areas at dawn or dusk instead of mid-day.

Combining water-saving behavioral actions with just one of the previously mentioned water conservation rebate programs can result in meaningful water utility bill savings. A typical Long Beach single family household uses an average of 10.24 CCF of water every month. If the typical Long Beach single family household could reduce their monthly consumption by 1 CCF a month, they could save $4.76 a month, or $57.07 a year. The average combined water and sewer bill for a single-family home in Long Beach was $824.27, so a $57.07 reduction would result in a 6.92% decrease in the annual water bill for a Long Beach consumer.

Summary of Water Conservation Bill Impacts

Table 8 summarizes estimates for water use reductions and bill savings for toilet replacements, clothes washer replacements, and turf removal. These represent some of the current offerings available to Long Beach residents and demonstrate opportunity for meaningful bill reductions.

Table 8: Bill Savings Estimates Resulting from Various Water Conservation Measures

Conservation Measure	Annual Savings Estimate Gallons	Monthly Savings Gallons	Annual Bill Savings*	Percent Annual Savings Based on Average Bill**
Toilet Replacements	10,000	833	$63.58	7.71%
Clothes Washer Replacements	7,000	583	$44.51	5.40%
Landscape Transformation (turf removal)	12,300	1,025	$72.34	8.78%
Total	29,300	2,442	$180.43	21.89%

**Assumes Tier II Savings at $4.399/CCF and $0.357/CCF for Sewer for Indoor Water Savings. Rates Effective October 1, 2019. Includes fractions of CCF which may not comport with meter readings.*
***Percent savings based on an estimated average combined water/and sewer bill of $824.27.*

Summary & Conclusion

This report detailed City of Long Beach's water affordability efforts, included a water affordability assessment at the census tract level, and explored and quantified the impact water conservation efforts can have on customer water and sewer bills.

Listed below are **key findings** from each section of the report.

1. Long Beach Water Affordability Efforts

LBWD has implemented programs and policies to help make essential water use more affordable. This includes a rate restructure in 2017 that effectively made essential water use more affordable and shifted costs to higher water tiers, which means charging more when water usage per month reaches high levels. For example, after the rate restructure, a water and sewer bill based on 5 CCF of consumption would have been 8.26% less, while a water and sewer bill based on 15 CCF of consumption would be 10.60% more.

The Utility Users Tax Exemption Program provides several utility benefits to customers that are either disabled or over the age of 62 and meet income eligibility requirements. This program significantly lowers the cost of water and sewer service for eligible and participating customers. Among other things, exempt customers do not have to pay for Tier I water use and they are given a $5.00 monthly water service charge credit. The average total combined water and sewer bill for customers in the Utility Users Tax Exemption Program was $460.69 per year. This cost was 44.11% less than the Long Beach citywide average combined water and sewer bill, which was $824.27 per year. This is due to both reduced rates and lower than average water use among exempt customers compared to non-exempt single-family customers.

Additionally, there are numerous water conservation programs and incentives available to Long Beach residents through LBWD and the Metropolitan Water District of Southern California that can help lower water and sewer bills (described on pages 9 and 10).

2. Water Affordability Assessment

AWE's water affordability assessment revealed information that can be used to better understand whether customers are financially burdened by their water and wastewater bills. The Household Burden Indicator (HBI) was calculated for the city and for 104 census tracts. The HBI was calculated by dividing the average annual water and sewer household cost by the upper boundary of the lowest quintile income. At the city level, the HBI was calculated to be 3.27, meaning the average annual cost of water and sewer ($824.27) represented 3.27% (or more) of the annual income of households in lowest income quintile. There was a large range for the 104 census tracts, with the minimum HBI being 0.90 and the maximum being 24.16. Averaging the tracts resulted in an HBI of 3.48.

The report also looked at household income ranges for the City of Long Beach to gain more perspective. This shows the average cost of water and sewer as a percentage of annual income across the full spectrum of income ranges in Long Beach, and the number of households in each range.

A review of accounts receivable data revealed that residential customer nonpayment has increased in an extreme manner from August 2019 to August 2021. This is due to the financial impacts of COVID-19 and a statewide moratorium on water shutoffs for customer nonpayment. In this particular case, accounts in arrears have higher than average water use, highlighting an opportunity for water conservation outreach. Water providers may find opportunities when reviewing the data of accounts with unpaid balances.

3. Water Conservation Bill Impacts for Long Beach Customers

While there are a wide variety of water conservation programs and incentives available to LBWD customers, this report quantified bill impacts for toilet replacements, clothes washer replacements, and turf removal.

The indoor measures alone can reduce the average annual cost of water and sewer by an estimated 13.11%, while turf removal was estimated to reduce the average annual cost of water and sewer by 8.78%. If all of these measures were implemented the average annual cost of water and sewer could be reduced by an estimated 21.89%.

Water conservation and efficiency can play a key role in making water more affordable. It empowers customers and provides a way to lower water and sewer bills in a meaningful way.

Photo by Jacek Dylag on Unsplash

4. Potential Actions for Long Beach Water Department

There are a variety of potential actions to help further Long Beach Water Department's efforts to bolster water affordability for its customers. Listed below are a few options for LBWD to build off of current programs and policies to help make water more affordable.

Targeting Outreach for Rebate Programs and Direct Installation Offerings:

LBWD has established successful rebate programs for toilet replacements and clothes washers, both of which can save customers money and conserve water. To further water affordability efforts, LBWD can increase targeted outreach about these programs to low-income consumers. Low-income consumers stand to benefit the most from these rebate programs and LBWD can expand efforts to make sure everyone who can benefit from the rebate programs is aware of their existence.

Many low-income customers may not be able to take part in a rebate program as the up-front cost to purchase a fixture or appliance is not affordable. The Long Beach Water Department could explore the potential for direct installations programs, or programs that offer home water use assessments when high consumption is identified.

Using Customer Billing Data to Identify High Water Users in Exempt and Arrear Categories:

The analysis in this report uncovered that 48% of accounts in arrears and 27% of exempt accounts use more water than the citywide average of 10.23 CCF per month. Accounts that are either exempt or in arrears may be already struggling financially. LBWD can follow the practices used in this report to identify exempt and arrear accounts with excessive water use, and then implement outreach programs to help these customers change their consumption habits.

Evaluating Potential Expansion of Outdoor Water Conservation Programs:

One of the most effective ways to save water and money in Long Beach is to take advantage of outdoor water conservation programs. LBWD's Lawn-2-Garden (L2G) program is already a very successful water conservation program, while the Direct Install Gardens (DIG) program is a pilot with a lot of potential. LBWD can look into ways to expand the successful L2G program and also review water consumption data from the DIG pilot participants to see if this program should be scaled up to help more customers potentially lower their outdoor water usage and monthly water bills.

AN ASSESSMENT OF

Water Affordability & Conservation Potential

Long Beach CALIFORNIA

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Alliance for Water Efficiency