

BEFORE THE PUBLIC UTILITIES COMMISSION  
OF THE STATE OF CALIFORNIA



**FILED**  
09/10/19  
04:59 PM

Order Instituting Rulemaking to  
Establish a Framework and Processes  
for Assessing the Affordability of  
Utility Service.

Rulemaking 18-07-006

**OPENING COMMENTS OF THE PUBLIC ADVOCATES OFFICE  
ON THE ADMINISTRATIVE LAW JUDGE'S RULING  
INVITING POST-WORKSHOP COMMENTS**

**NOEL OBIORA**

Attorney for Public Advocates Office

California Public Utilities Commission

505 Van Ness Avenue

San Francisco, CA 94102

Phone: (415) 703-5987

Fax: (415) 703-2262

Email: [noel.obiora@cpuc.ca.gov](mailto:noel.obiora@cpuc.ca.gov)

**KRISTINA DONNELLY**

**MATTHEW KARLE**

**JAMES AHLSTEDT**

**MARSHALL WORSHAM**

**JENNY REMPEL**

**MEGAN YOUNG**

California Public Utilities Commission

505 Van Ness Avenue

San Francisco, CA 94102

Email: [matthew.karle@cpuc.ca.gov](mailto:matthew.karle@cpuc.ca.gov)

September 10, 2019

## TABLE OF CONTENTS

	Page
TABLE OF AUTHORITIES.....	iii
I. INTRODUCTION AND SUMMARY.....	1
II. DISCUSSION AND ANALYSIS.....	3
1. DO THE PROPOSED AFFORDABILITY METRICS ADEQUATELY ASSESS AFFORDABILITY? IF NOT, HOW SHOULD THE METRICS BE CHANGED? .....	3
a. The Data Inputs to the Affordability Metric Should Be Disaggregated in Order to Display Changes in Utility Costs, Rates, and Bills.....	3
b. Recommended Refinements to the Affordability Metrics.....	5
2. ARE THE PROPOSED SOURCES OF DATA FOR HOUSEHOLD-LEVEL INFORMATION ACCEPTABLE FOR CONSTRUCTING AFFORDABILITY METRICS? IF NOT, WHAT SOURCES WOULD BE MORE APPROPRIATE, AND WHY? .....	11
a. Measuring Essential Quantity of Service .....	11
3. WHAT REGULATORY, OPERATIONAL, AND/OR RESOURCE CONSIDERATIONS MIGHT BE NECESSARY TO EFFECTIVELY IMPLEMENT AFFORDABILITY METRICS? HOW SHOULD THE COMMISSION MONITOR AND TRACK AFFORDABILITY ON A RECURRING BASIS, OUTSIDE OF SPECIFIC PROCEEDINGS? .....	21
a. Energy Metrics Should be included in Commission Annual Reports.....	22
b. The Commission Should Base The Ability-To-Pay Index Upon A Few CalEnviroScreen Indicators For Ease of Updating, Consistency and Transparency .....	22
4. WHAT IS THE MOST EFFECTIVE WAY TO UTILIZE AFFORDABILITY METRICS IN COMMISSION DECISIONS AND PROGRAM IMPLEMENTATION? .....	24

III. CONCLUSION.....26

APPENDIX A: MODIFIED AFFORDABILITY RATIO CALCULATIONS..... A-1

APPENDIX B: FCC INTERNET ACCESS SERVICE REPORT-CALIFORNIA  
BROADBAND SUBSCRIPTIONS .....B-1

APPENDIX C: RESIDENTIAL WATER USE ANALYSIS BY THE PUBLIC  
ADVOCATES OFFICE.....C-1

APPENDIX D: COMPARISON OF ABILITY-TO-PAY INDICES BASED  
UPON COMBINATIONS OF SOCIOECONOMIC INDICATORS ..... D-1

**TABLE OF AUTHORITIES**

**Page**

**CPUC Decisions**

D.16-12-025.....	21
D.18-06-027.....	23

**CPUC Code**

Section 739.2b .....	12
Section 913.1 .....	22

**Federal Communications Commission**

FCC 477.....	5, 9
--------------	------

**Other Statutes**

AB 1668.....	12
SB 606 .....	12
SB 695 .....	12

BEFORE THE PUBLIC UTILITIES COMMISSION  
OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking on the  
Commission's Own Motion to address  
affordability framework.

Rulemaking 18-07-006

**OPENING COMMENTS OF THE PUBLIC ADVOCATES OFFICE  
ON THE ADMINISTRATIVE LAW JUDGE'S RULING  
INVITING POST-WORKSHOP COMMENTS**

**I. INTRODUCTION AND SUMMARY**

In response to Administrative Law Judge (ALJ) Park's August 20, 2019, Ruling Releasing the Staff Proposal and Inviting Comments (Ruling) in Rulemaking (R.) 18-07-006 (Staff Proposal), the Public Advocates Office at the California Public Utilities Commission (Public Advocates Office) provides these Opening Comments.

The Staff Proposal recommends three metrics to assess affordability of water, energy, and telecommunications services: Affordability Ratio (AR), Hours at Minimum Wage (HM), and Ability to Pay Index (API). These values are to be calculated at the household scale using samples<sup>1</sup> drawn from U.S. Census Bureau geographical boundaries in California<sup>2</sup> that intersect with the service territory boundaries of those utilities subject to an affordability evaluation.<sup>3</sup> These metrics can be a viable starting point for assessing affordability of Commission-regulated utility services, provided the Commission adopts the refinements discussed below.

---

<sup>1</sup> Public Use Microdata Samples (PUMS).

<sup>2</sup> California Public Use Microdata Areas (PUMAs).

<sup>3</sup> California contains 256 contiguous PUMAs comprising approximately 3,000 households each.

The Commission should refine the metrics as follows:

- Disaggregate projected rate and bill impacts from the Affordability Ratio (AR) and Hours at Minimum Wage (HM) metrics.
- Include all communications companies,<sup>4</sup> and not only Local Exchange Carriers (LECs) in affordability evaluations.
- Maintain methodological consistency in determining essential service quantities by deriving values from actual residential usage data rather than end-use estimates or conservation benchmarks.
- Calculate essential service quantities per residential connection rather than per capita.
- Disregard household size when measuring income and essential service quantities.
- When calculating the AR in a specific industry proceeding, include in the numerator only the utility bill for the industry under evaluation, and in the denominator account for bills or proxy bills of the remaining utility services.
- When calculating the denominator for AR in a specific industry proceeding, use Household Income Net of Housing costs less the bills for utilities not under consideration.
- Track complementary data on utility cost changes and impacts, service quality, disconnections, rates, and billing structure changes for each industry.
- Base Ability to Pay on more readily available indicators from CalEnviroScreen, rather than National Renewable Energy Laboratory (NREL) “Solar for All” data.
- The Commission should test the proposed metrics in small-scale pilot programs (pilots) for each industry. The Commission should invite further input from stakeholders after the completion of the pilots so refinements can be made to address implementation issues that arise. The Commission can initiate pilots in the following proceedings:
  - For energy, Southern California Edison Company’s (SCE) recently filed general rate case (GRC) phase 1 (Application 19-08-013).

---

<sup>4</sup> All communications companies defined as any company submitting annually to the CPUC Communications Division broadband subscriber and deployment data, per Decision 16-12-025, Ordering Paragraph 1. Reporting companies include fixed broadband providers (wireline, fixed wireless, satellite) as well as mobile broadband providers. As discussed in section 2.b., fixed broadband should be subject to the affordability metrics, and the Commission should track mobile broadband prices.

- For water, an informal proceeding, such as a Class A water company's next Advice Letter filing with impacts to customer rates and bills
- For water, a formal proceeding, such as the Suburban Water Company or the Golden State Water Company GRC Applications, which will be filed in 2020.
- For communications, the AT&T and Frontier annual rate change Advice Letters.

Finally, the Public Advocates Office requests that the Commission ensure that the methods, calculations, and data used to develop the affordability metrics and applied in specific proceedings remain sufficiently transparent and available for parties to replicate and verify results. Provided these refinements and pilot trials are implemented, the Public Advocates Office believes that the metrics will provide the Commission with a comprehensive picture of how affordability changes over time and will adequately support the Commission's decision-making processes without substantial additional effort.

## **II. DISCUSSION AND ANALYSIS**

The Ruling requests feedback from parties on several specific questions regarding the staff proposal. The Public Advocates Office addresses the ALJ's questions below and offers recommended modifications to the metrics where appropriate.

### **1. Do the Proposed Affordability Metrics Adequately Assess Affordability? If Not, How Should the Metrics Be Changed?**

The proposed metrics are a good starting place in developing a framework for assessing affordability consistently across Commission proceedings. The following changes to the metrics are intended to improve the transparency of the metrics and their source data.

#### **a. The Data Inputs to the Affordability Metric Should Be Disaggregated in Order to Display Changes in Utility Costs, Rates, and Bills**

A comprehensive assessment of affordability must include tracking over time changes to investor owned utility (IOU) costs, specifically, revenue requirements (utility

costs), customer rates, and customer bills. For energy, the Public Advocates Office has recommended tracking of indicators such as residential average rate, Tier 1 baseline rate, and average customer bills over time. The affordability of a given program or application should be assessed based on how it moves these indicators.<sup>5</sup> To the extent that these data are included in the Staff Proposal's formulation of the affordability metrics, they should be disaggregated and available for analysis.

For example, the Staff Proposal HM and AR metrics require the calculation of a sample bill. For the electric industry, the sample bill is calculated by multiplying the essential use quantity (in this case the baseline quantity) by the cost per kilowatt-hour (kWh) (in this case the Tier 1 or baseline rate). Both the input (the Tier 1 rate) and the output (the average bill for an essential quantity) are useful indicators. Tracking changes in these indicators over time complements the Staff Proposal's affordability metrics without adding additional complexity or calculation.

Similarly, tracking changes to water utility costs, as well as bill impacts for both non-Low Income Rate Assistance (LIRA) and LIRA customers at both average and Tier 1 usage levels in each water utility filing complements the Staff Proposal's affordability metrics.

The Commission should track and use the AR and HM metrics in formal (e.g., applications) and informal (e.g., advice letter) utility filings. To calculate sample bills for the HM and AR metrics, the Commission should calculate the essential service quantity based on an average customer usage for the ratemaking area<sup>6</sup> and multiplying that essential service quantity by the rate structure, including all relevant surcharges, credits, and fees (e.g., for balancing account amortization, etc.). Tracking utility costs and bill

---

<sup>5</sup> Opening Comments of the Office of Ratepayer Advocates on the Rulemaking to Develop Methods to Assess the Affordability Impacts of Utility Rate Requests and Commission Proceedings; August 13, 2018, pp. 3-6.

<sup>6</sup> The Public Advocates Office recommends using a top-down rather than a bottom-up approach to the calculation of an essential use quantity. See pp. 12-20, and Appendix C for discussion of this recommendation.



impacts over time and across formal and informal proceedings is a straightforward way to track changes in affordability.

**b. Recommended Refinements to the Affordability Metrics**

The Commission should make several refinements to the Staff Proposal metrics to improve the feasibility of implementation and to ensure the data inputs are more transparent and accessible to parties and stakeholders.

**Household Size**

Household size should be excluded when calculating the affordability metrics. Including household size invites data quality issues, unnecessarily complicates the metric calculation, and creates inconsistency in how the metrics are calculated for each type of utility. Further, in the case of energy, the baseline quantity is set at a fixed percentage of the average usage in each climate zone and is based on actual verifiable data. The Commission can easily gather actual data regarding average usage from energy and water utilities, as these data are already collected. For communications, companies are required to annually report broadband subscribership by speed. Decision (D.)16-12-025<sup>7</sup> states, “all communications providers certificated and/or registered with the California Public Utilities Commission (CPUC), that also file Form 477 with the Federal Communications Commission, shall submit annually to the Communications Division by April 1st, broadband subscriber and deployment data at a *Census Block level* as of the prior calendar year’s end in a form as designated by Communications Division Staff.”<sup>8</sup> The data request format defines the subscriber speeds as, “[t]he downstream speed in Mbps to which the customer in census block subscribes (e.g. 12).”<sup>9</sup>

---

<sup>7</sup> Decision 16-12-025, Ordering Paragraph 1.

<sup>8</sup><ftp://ftp.cpuc.ca.gov/Telco/BB%20Mapping/2019/Data%20Request/CPUC%20Broadband%20Data%20Request%202019.pdf>

<sup>9</sup><ftp://ftp.cpuc.ca.gov/Telco/BB%20Mapping/2019/Data%20Request/Data%20Format%20for%20Broadband%20Subscribers%20by%20Census%20Block%202019.pdf>

Because utilities do not collect or maintain data on household size, household size would need to be derived using representative statistical data. This adds greater abstraction and complexity to the metrics without adding analytical value. In fact, the example PUMA data provided in the August 21, 2019 Staff Presentation for two and four-person households do not show meaningfully different metric scores.<sup>10</sup> Calculating essential service quantities and household income without making assumptions for household size is a more parsimonious approach for building a metric.

### **Representing All Utility Sectors in the Metric Denominator**

The Staff Proposal assesses the affordability of energy, communications, and water by combining the price of an essential quantity of each of these services, and using this in calculating the AR and HM metrics. While this approach may provide an overall picture of the impact of rate changes on a given customer's combined bills, it raises concerns over diluting the actual affordability impact on each individual utility service, and regarding the use of such a metric as a decision-making tool.

The Commission should simplify the AR and HM metric by only reflecting the bill of the specific industry being measured in the numerator and accounting for the combined bills of the remaining utilities in the denominator. In other words, if the energy industry is being evaluated, set  $AR = E_{ES}/(IAHC - W_{ES} - T_{ES})$ .<sup>11</sup> Including only the costs of the specific industry being measured in the numerator isolates the change in rates for the specific utility sector in question. Since the denominator in the equation is meant to reflect the overall financial condition of the household, the other utility bills can be included here. The proposed change is illustrated in tables 1 and 2 below.

---

<sup>10</sup> Staff Presentation slides 32-35 use San Jose Water Company to illustrate how the change in 2015 to 2018 rates changes the affordability metrics. The slides do not separately calculate  $AR_{20}$  and  $AR_{50}$  for the various household sizes, but HM is calculated with the four-person household showing a final HM 1.58 hours greater than the two-person at \$12/hour, and 1.29 hours at \$15/hour.

<sup>11</sup>  $E_{ES}$ : Annual energy bill;  $W_{ES}$ : Annual water bill;  $T_{ES}$ : Annual communication bill; Energy bill  $IAHC$  = Annual household income subtracting annual housing cost.

**Table 1. Affordability Ratio and Modified Affordability Ratio (MAR) for Del Norte, Lassen, and Modoc Counties with an Illustrative \$5 Bill Increase**

	Proxy Bill	Median Income after Housing Cost	AR	MAR (Energy)	MAR (Water)	MAR (Communications)
Water	\$49.47					
Energy	\$129					
Communications	\$173.95					
Total Bill	\$352.42	\$3145	11.21%	4.42%	1.74%	5.86%
EB/WB/CB increase of \$5			11.36%	4.59%	1.92%	6.03%
<b>AR or MAR Change %</b>			<b>1.42%</b>	<b>3.88%</b>	<b>10.11%</b>	<b>2.87%</b>

**Table 2. Affordability Ratio and Modified Affordability Ratio for Del Norte, Lassen, and Modoc Counties with an Illustrative \$15 Bill Increase**

	Proxy Bill	Medium Income after Housing Cost	AR	MAR (Using energy as an example)
Water	\$49.47			
Energy	\$129			
Communications	\$173.95			
Total Bill	\$352.42	\$3145	11.21%	4.42%
Energy Bill increases \$15			11.68%	4.93%
<b>AR or MAR Change %</b>			<b>4.26%</b>	<b>11.63%</b>

Measuring the AR metric using all three utilities in the numerator is problematic because it dilutes the changes in affordability of each utility service. For example, a change in water or electric rates which is significant on its own terms may be lost in an affordability assessment where non-rate regulated telecommunications prices may be the largest driver of a customer’s combined utility bills. This could lead to a decision-

making framework wherein a change in rates appears more affordable in relative terms than it is in real terms.

Further, an affordability framework that measures affordability across industries combined invites Commission decision-making that considers one utility's affordability as a lever to affect another. For example, a water rate increase to pay for a system upgrade that is deemed to be necessary for health and safety, with a minor impact on affordability, should not be delayed because the communications or energy rates in the same PUMA are unusually unaffordable. Conversely, an "unaffordable" communications bill does not become more affordable because of an energy rate decrease. The Commission should avoid a framework where the affordability of one utility is unduly impacting decisions regarding the rates of another. Indeed, this is especially true where some utilities are rate-regulated (energy and water) while some are not (communications). The Commission should not use the rates it can regulate as a lever to impact the affordability of rates it does not currently regulate. To address these concerns, the Commission should not place equal value in a decision-making context on metrics that combine all utility industries.

**The Staff Proposal is Correct in Designating Broadband and Voice as Essential Services.**

Voice service has been the cornerstone of communications essential use for decades and is still critically important for the health and safety of Californians today. As some parties in the workshop mentioned, voice service is critical during emergencies and disasters for communications to and from first responders and serves as one of the first lines of defense in those scenarios.

In addition to voice, broadband service is necessary for full participation in society,<sup>12</sup> with applications in education, employment, health, safety, and more. The Staff Proposal makes the important first step by clearly acknowledging both voice and

---

<sup>12</sup> Staff Proposal, page 5.

broadband as essential services and beginning to create a framework for supporting widespread affordable access to those essential services.<sup>13</sup>

The Commission should utilize fixed voice and broadband as essential communications services in the HR and HM, in order to promote affordable access to these services for all Californians.

### **The Commission Should Track Pricing Data for Mobile Voice and Broadband Services**

The Staff Proposal is correct in finding that mobile broadband is not a viable substitute for fixed broadband.<sup>14</sup> Consumers rely both on fixed and mobile communications and, as such, the Commission should track mobile voice and broadband prices. Omitting affordability metrics for mobile communications risks missing the significant number of households estimated to rely solely on mobile services.<sup>15</sup> As of June 2017, there were nearly 42 million mobile subscriptions in California, equating to a penetration rate of 141%.<sup>16</sup> Meanwhile, the number of residential broadband subscriptions at download speeds of 10 Mbps or greater was 9.6 million households, equating to a penetration rate of 75%.<sup>17</sup> Approximately 80% of calls to 9-1-1 come from wireless devices.<sup>18</sup>

---

<sup>13</sup> Staff Proposal, page 5.

<sup>14</sup> Staff Proposal 12.

<sup>15</sup> As of end of 2016 50% of California households were estimated to be wireless only. National Health Interview Survey Early Release Program, National Center for Health Statistics. December 2017. Available from: <https://www.cdc.gov/nchs/nhis.htm>. While no California-specific statistics at a later date are known, as of the end of 2016, 56.9% of households in the Western States were estimated to be wireless only. Blumberg SJ, Luke JV. Wireless substitution: Early release of estimates from the National Health Interview Survey, July–December 2017. National Center for Health Statistics. June 2018. Available from: <https://www.cdc.gov/nchs/nhis.htm>.

<sup>16</sup> See Appendix B for calculation of penetration, based on FCC 477 data as of the end of 2017.

<sup>17</sup> See Appendix B for penetration calculations. Source of broadband subscriptions is FCC Form 477 Internet Access Services Report as of 06/30/17, Tables, Figures 32 and 34, available at <https://www.fcc.gov/internet-access-services-reports>. To calculate penetration, source households and population over age 15 is US Census Bureau American Community Survey 5 year estimates 2013-2017 (same as used by FCC).

<sup>18</sup> California Office of Emergency Services (Cal OES), Workshop on November 1, 2018 in Commission Rulemaking 18-03-011, slide 6.

The California LifeLine program also shows the importance of tracking affordability for mobile services. The LifeLine program currently provides discounted wireless phone service for 1,378,216 households in California, of which 81% are wireless subscriptions.<sup>19</sup> Although California LifeLine officially only supports voice service, federal LifeLine supports both mobile voice and broadband service and most service plans offered in California include mobile broadband in addition to voice. The Commission could use the retail pricing information to better inform the level of service and the price appropriate for these subsidies.

### **The Affordability Metric Should Include All Communications Companies and Not Just Local Exchange Carriers**

The Staff Proposal mentions that communications prices in the affordability metric will be taken from the Local Exchange Carrier (LEC) with the highest number of customers in each area. It is unclear if “LEC” includes just incumbent LECs or if it also includes competitive LECs or other large companies like Comcast and Charter/Time Warner/Brighthouse. If the Commission relies on the largest incumbent LEC and does not include competitive LECs or Cable companies, the Commission would miss out on service offerings that may be more or less expensive than the incumbent LEC’s prices for voice and broadband service.

The Commission must collect pricing information from all communications companies offering broadband service in each PUMA. Price is the main component of affordability. Furthermore, the number of residential providers should make this task manageable. As of the end of 2018, a handful of companies provided 95% of residential fixed broadband subscriptions in California, and eleven companies provided 98% of these

---

<sup>19</sup> July 2019 Maximus Subscriber Count, Third Party Administrator Customer Counts, California Public Utilities Commission, accessed on August 27, 2019.

[https://www.cpuc.ca.gov/uploadedFiles/CPUC\\_Public\\_Website/Content/Utilities\\_and\\_Industries/Communications -  
Telecommunications and Broadband/Consumer Programs/California LifeLine Program/2019%20MaximusSubscriberCountsasof%20081419.xls](https://www.cpuc.ca.gov/uploadedFiles/CPUC_Public_Website/Content/Utilities_and_Industries/Communications_-_Telecommunications_and_Broadband/Consumer_Programs/California_LifeLine_Program/2019%20MaximusSubscriberCountsasof%20081419.xls)

subscriptions.<sup>20</sup> Together with the coverage data for each provider, the Commission can develop average prices per PUMA which can be used in the affordability analyses.

**2. Are the Proposed Sources of Data for Household-Level Information Acceptable for Constructing Affordability Metrics? If Not, What Sources Would Be More Appropriate, and Why?**

The Staff Proposal derives household level data from the US Census Bureau's Public Use Microdata Samples (PUMS) database. The PUMS data is chosen because it provides a breakdown of housing and utility costs, which the more granular American Community Survey data at the census tract level aggregates into a single measure. The Staff Proposal recommends obtaining custom American Community Survey crosstabs in the future, to provide census tract level data which breaks out costs for utilities and housing. The Commission should ensure that any custom datasets under consideration for future use are made public along with the affordability model. The value of increased granularity in census tract level data does not outweigh the need for the affordability model to be transparent, and for data inputs to be publicly available so that parties can replicate and verify staff findings.

**a. Measuring Essential Quantity of Service**

The Commission should modify the calculation of essential quantity of service included within the HM and AR metrics, for consistency across industries and to simplify the metrics themselves. Determining an appropriate measure of essential quantity of service is a key input to the HM and AR metrics included in the staff proposal. Using a non-representative or unrealistic measure of essential quantity in the metrics risks obscuring the affordability impacts the Commission is attempting to quantify, and thus limits the usefulness of the metrics. For this reason, the Commission should use a relative, top-down approach to determining essential quantity, rather than the bottom-up approach of building an essential use model from end uses.

---

<sup>20</sup> Public Advocates Office analysis of CPUC reported broadband subscribership data as of December 31, 2018.

## **Energy Essential Service Should Rely on Energy Baselines**

The energy baseline quantity identified in the Staff Proposal as a proxy metric for electric essential service should serve as the model for all three essential use determinations. Electric baseline quantities are set at a percentage (50-60%) of actual average usage for each climate zone.<sup>21</sup> Using average usage at the household level for the climate zone implicitly captures household size without complicating the analysis by calculating affordability for various household sizes. This has the benefit of being a consistent methodology across industries and requiring less effort to regularly update.

The electric essential use study currently being initiated for Pacific Gas and Electric and Southern California Edison will require months of detailed survey analysis by a contractor hired for the project. The data is important and worth gathering but would be impractical to update on a regular basis. It is better used to validate the baseline measure we already have than as the basis of a new bottom up model of essential usage.

## **The Essential Water Service Standard Should Rely on Actual Customer Use**

The Staff Proposal recommends using 50 gallons per capita per day (gpcd) as the essential use standard for measuring the affordability of water service. Staff derives this figure from both a 2018 report by the Pacific Institute<sup>22</sup> that cites indoor residential end use studies, and new water conservation legislation from 2018.<sup>23</sup> The Staff Proposal holds that “50 gpcd strikes an acceptable balance between conservation and ensuring that a sufficient quantity of water is affordable for the most economically vulnerable populations.”<sup>24</sup> The Staff Proposal states that the question of an essential quantity of water is currently being examined by the State Water Resources Control Board as well as

---

<sup>21</sup> PU Code §739.2b.

<sup>22</sup> Feinstein, Laura. (2018). “Measuring Progress Toward Universal Access to Water and Sanitation in California: Defining Goals, Indicators, and Performance Measures.” Oakland, CA: Pacific Institute. <https://pacinst.org/publication/measuring-progress/>.<sup>23</sup> Assembly Bill 1668 and Senate Bill 606, passed on May 31, 2018.

<sup>23</sup> Assembly Bill 1668 and Senate Bill 606, passed on May 31, 2018.

<sup>24</sup> Staff Proposal R.18-07-006 SJP/gd2, p. 12. <sup>25</sup> Staff Proposal R.18-07-006 SJP/gd2, p. 9.



Commission staff in Rulemaking 17-06-024, and that Commission staff will “adjust the value of essential indoor usage as necessary to align with the Water Board and R.17-06-024.”<sup>25</sup>

While this rationale makes sense, we recommend a different methodology that we believe is simpler, easier to update, and better at capturing the variety of circumstances that affect households paying water bills. Below, we describe the primary differences between the methodology we propose and the standard included in the Staff Proposal, and why we believe these revisions are necessary and supported by existing research. We then describe the results on a recent Public Advocates Office analysis and how it can inform the calculation of essential water use, moving forward.

First, the Commission should establish a standard that is calculated per residential connection, rather than per capita. Using a per-connection essential service quantity would keep the affordability framework consistent across utility services while minimizing calculation error and analytical burden by maintaining consistency with how utilities bill their customers, which is at the level of the individual connection. Since the proposed affordability framework recommends evaluating utility bill affordability at the household level, a daily essential water use standard established for an individual will always require additional calculations – including the number of people per household and the average length of the billing period – in order to estimate the bill impact per connection. Not only does this introduce uncertainty by requiring the analysis to make additional assumptions, it also introduces subjectivity because it implicitly assumes that any use beyond 50 gpcd is not essential. Our proposal, in contrast, requires only two assumptions: that the median customer’s indoor water demand is sufficient to approximate essential demand for most customers and that winter use is a viable proxy for indoor consumption.

It might be reasonable for the Commission to adopt a per capita standard for measuring the affordability of water service, if water consumption at the connection level

---

<sup>25</sup> Staff Proposal R.18-07-006 SJP/gd2, p. 9.

scaled linearly with the number of people per connection; that is, if each additional person increased total water consumption by the same amount. However, existing research does not support this conclusion. One 2010 study in Spain shows that the quantity of water consumed per person decreases for each additional person per connection.<sup>26</sup> According to this study, while the first person in a household uses nearly 50 gallons per day, each additional person uses far less. The authors discuss the economies of scale in larger households, which enable them to use water more efficiently than smaller households.

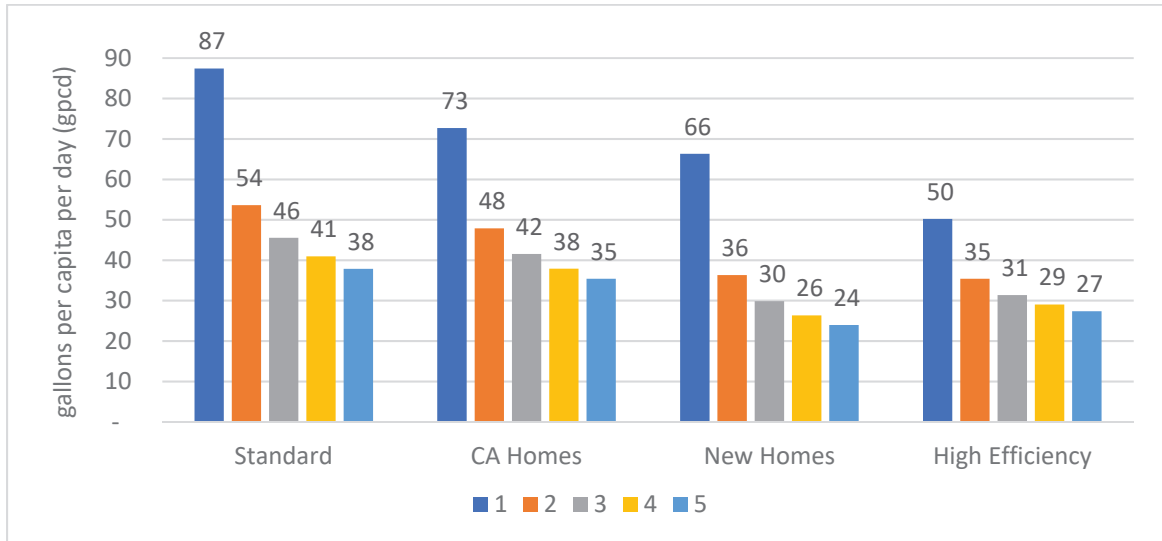
Another California-specific report from 2011 (DeOreo et al.) comes to a similar conclusion (Figure 1).<sup>27</sup> DeOreo et al. also evaluates indoor use by housing type and concludes that per capita demand estimates also vary considerably by the age of the home and the efficiency of water using appliances and fixtures. DeOreo et al. conclude that total household demand ranges from 146 to 228 gpcd for a 4-person household and 117 to 187 gpcd for a 3-person household, depending on the building's characteristics. While the Commission's proposed 50 gpcd standard would ultimately fall within these ranges (where 50 gpcd translates into 150 gpd for a 3-person household and 200 gpd for a 4-person household), the wide variability indicated by DeOreo et al. suggests that establishing 50 gpcd as the essential use standard would tend to overestimate use per connection in areas with a high percentage of new or high-efficiency homes, and would tend to underestimate use per connection for less efficient homes (Figure 2).

---

<sup>26</sup> Arbués, Fernando & Villanúa, Inmaculada & Barberán, Ramón. (2010). Household Size and Residential Water Demand: An Empirical Approach. *Australian Journal of Agricultural and Resource Economics*, 54: 61-80.

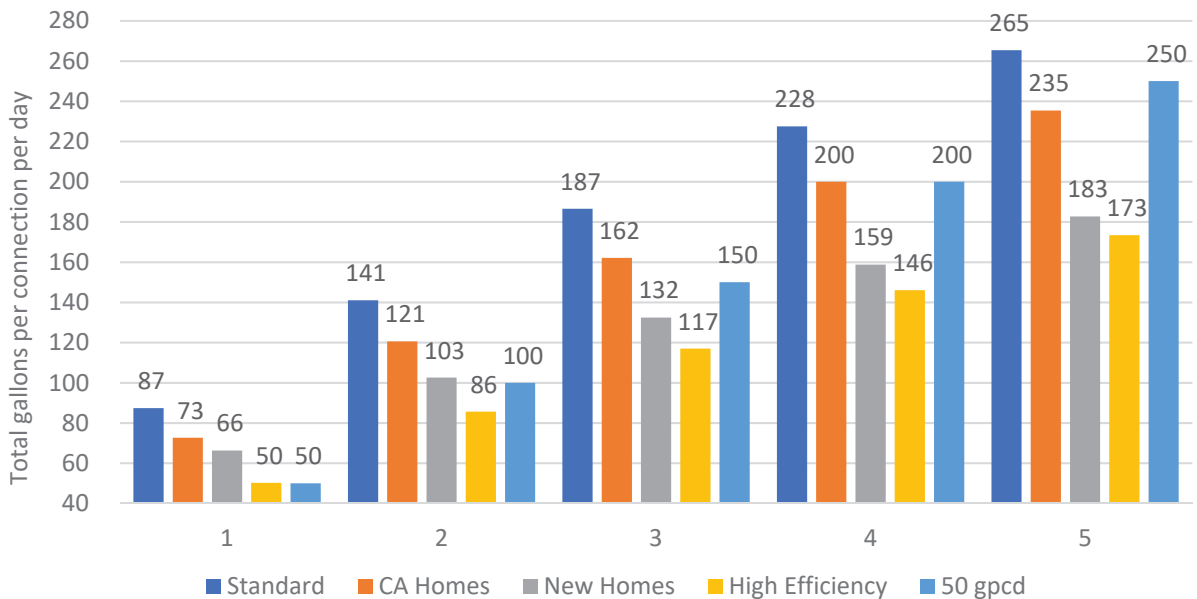
<sup>27</sup> DeOreo, William B., Peter W. Mayer, Leslie Martien, Matthew Hayden, Andrew Funk, Michael Kramer-Duffield, Renee Davis, et al. 2011. "California Single Family Water Use Efficiency Study." Aquacraft. <http://www.allianceforwaterefficiency.org/WorkArea/showcontent.aspx?id=6018>.

**Figure 1. Marginal water consumption for each additional person per connection, by housing type**



Source: DeOreo, William B., Peter W. Mayer, Leslie Martien, Matthew Hayden, Andrew Funk, Michael Kramer-Duffield, Renee Davis, et al. 2011. “California Single Family Water Use Efficiency Study.” Aquacraft.

**Figure 2. Total Daily Use Per Connection, By Number of People**



Source: DeOreo et al. 2011

Second, rather than relying upon one standard number statewide, the Commission should instead allow this standard to vary by utility and by service district. As noted in the Staff Proposal, the conservation legislation passed in 2018<sup>28</sup> established 50 gpcd as a conservation standard to help measure and achieve the state's conservation goals; it was not designed to accurately reflect customer use for the purposes of assessing the affordability of essential water service. The Pacific Institute report, like the statewide estimate described above, implicitly assumes the same statewide saturation of efficient appliances and fixtures, as well as behavioral characteristics and leakage rates. These assumptions may not represent households served by investor-owned water utilities or households that experience financial hardship, and may mask important regional variations in residential water use.

To further inform the development of the essential use quantity standard for water, the Public Advocates Office conducted an analysis of customer billing data from California's investor owned water utilities. Appendix C to these comments contain the results of the analysis, which lend empirical support to the proposal that follows.

The Public Advocates Office proposes that the Commission determine the essential use standard for each water service company or district, if applicable, by calculating the annualized average of median monthly water use for single-family residences during winter months. In this calculation, single-family residences are those residential connections determined by the water provider to be single-family residences and/or billed under a company's single-family residential water rate schedule. Winter months typically span January, February, and March, but (for utilities that bill customers on a monthly basis) generally the Commission can rely on the two or three consecutive months of lowest water usage within a district, for the most recent three years of data. The Commission would therefore calculate the annualized average by taking the unweighted average of the nine monthly median values (that is, for example, January through March, for the years 2016 through 2018).

---

<sup>28</sup> Assembly Bill 1668 and Senate Bill 606.

Our study also found variability in the median use per connection for single-family residential connections that receive low-income assistance and connections that do not receive assistance. Therefore, we also recommend the Commission calculate median residential water demand for all single-family customers and for customers enrolled in low-income assistance programs separately; then, in districts where median low-income consumption per connection is greater than median consumption per connection among all single-family residential households, the Commission should elect to use the higher value as the essential service quantity.

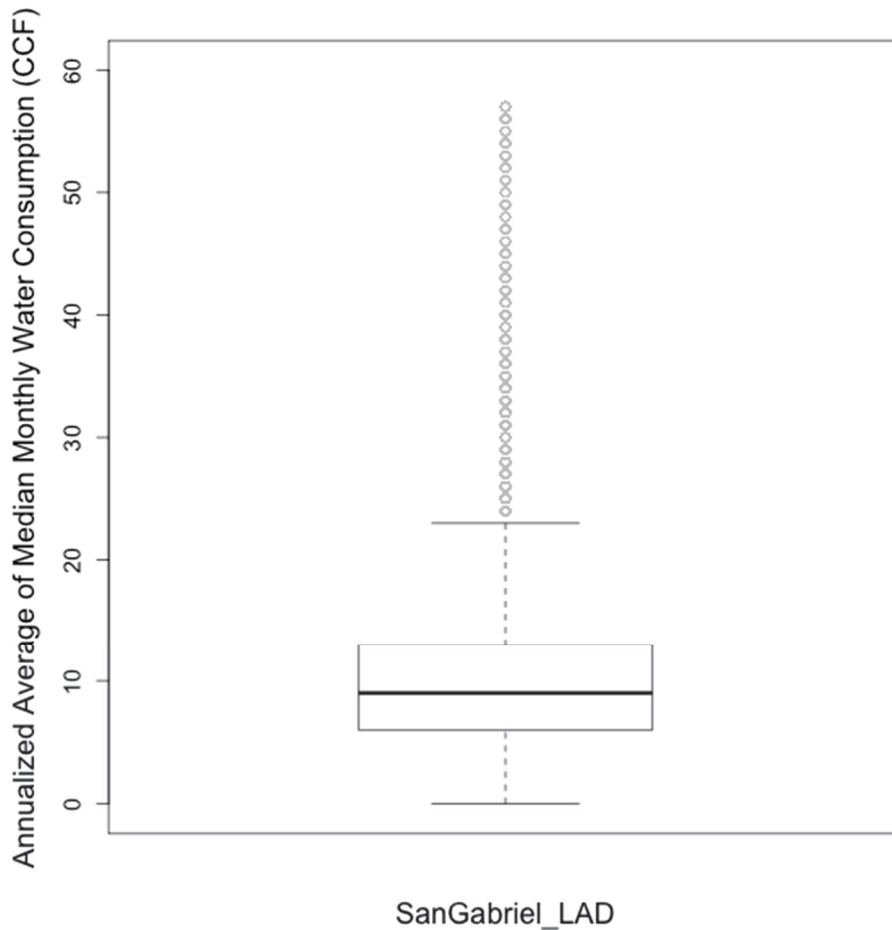
The calculation we propose would produce a reliable proxy for essential indoor water demand for at least two reasons. First, overall water demand declines precipitously during California’s wetter winter months; this difference is largely attributable to a decline in outdoor use. Second, because water demand is typically skewed such that median use is lower than average use because of a small number of very large users (see Figure 3), median use, therefore, is more likely to accurately represent customer water use.

///

///

///

**Figure 3. Distribution of monthly water delivery to single-family residences in San Gabriel Valley Water Company’s Los Angeles District (Jan–Mar, 2015–2018)**



The box-and-whisker plot above illustrates the second point, showing the distribution of monthly water delivery to single-family residential customers in San Gabriel Valley Water Company’s Los Angeles District. The plot portrays connection-weighted averages of monthly consumption volume in January, February, and March, 2015–2018. The dark bar near the box’s center depicts the median or middle value of the data; the upper and lower edges of the box mark the interquartile range, or the range of values between the 25th and 75th percentile of consumption. The “whiskers” extending above and below the box indicate “minimum” and “maximum” values; here, these are defined as values 1.5 times the interquartile range, measured from the top or bottom of the box (or to the furthest observed data point within that distance). Circles represent outliers beyond the minimum and maximum. Here, volumetric water consumption

ranged from 0 to >57 CCF per month in the period of analysis. Median consumption was 9 CCF per month, and half of the district's connections used between 6 and 13 CCF per month. The "minimum" value was 0; the "maximum" was 22; and values greater than 22 CCF can be considered outliers.

The low median value suggests that water consumption tended to skew toward the lower end of the monthly volumetric range. The relatively tight grouping of data around the median (6 - 13 CCF) suggest that the median is representative of the majority of customers. All service districts included in this study followed the same patterns of consumption, with only slight variations in the median values and IQR width. Taken together, these inferences support using the median-based approach we propose here.

There are several other merits to this approach. For one, creating a standard that can vary by company or district enables the standard to accommodate areas that have reduced consumption as a result of factors like a higher penetration of water-efficient appliances and fixtures, while also accounting for areas where customers have not had the means or ability to upgrade or adequately maintain their water systems. The standard is also comparatively simple to re-evaluate and adjust over time, based on data already collected by water companies, and, as was the case in our study, with only a moderate reporting burden for water IOUs. Our proposed methodology also allows the Commission to avoid having to conduct periodic, expensive, time-consuming, and challenging end-use studies, or having to determine which specific indoor uses of water are essential and which are not.

### **The Broadband Essential Use Standard Should Rely on Actual Customer Use in California**

The Staff Proposal relies on a "bottom up" or "building block" approach to justify the broadband essential use standards.<sup>29</sup> This approach tallies up the individual broadband functions that are deemed a necessity and calculates the minimum service

---

<sup>29</sup> Staff Proposal, page 13.

speeds necessary to accommodate the minimum functions for two devices simultaneously. Staff found the resulting speed was 20 Megabits per second (Mbps) download and 3 Mbps upload (20/3 Mbps).<sup>30</sup>

Further, the Staff Proposal found that the federal LifeLine program uses a “Substantial Majority” standard for its minimum broadband standards; broadband speeds that 70%<sup>31</sup> of Americans subscribe to.<sup>32</sup> On a national scale, the Federal Communications Commission (FCC) found that 70% subscribe to speeds of 20/3 Mbps or greater.<sup>33</sup> However, Staff found that 70% of Californians subscribe to speeds of 70/5 Mbps or greater.<sup>34</sup>

Because customers in California purchase higher broadband speeds than the rest of the country, the Commission must instead set its standards to reflect what *Californians* purchase and use. The Staff Proposal’s building block approach does not go far enough to ensure that all Californian’s have affordable access to essential broadband service. 20/3 Mbps service may soon be, or already is, obsolete when considering the bandwidth requirements for telemedicine, telecommuting, and educational opportunities which are all being used by Californians today. The Commission should regularly monitor what consumers are purchasing and maintain an up to date measure of what is an essential quantity of service.

### **Broadband and Voice Pricing Are Critical Components of The Affordability Metric and Should Be Cataloged Regularly**

The Staff Proposal’s affordability metric uses prices for voice and broadband services in California to help illustrate an area’s affordability. Because of this, the

---

<sup>30</sup> Staff Proposal, page 13.

<sup>31</sup> Staff Proposal, page 13.

<sup>32</sup> Meaning that 70% of Americans subscribe to that speed or greater.

<sup>33</sup> Staff Proposal, page 13.

<sup>34</sup> Staff Proposal, page 13.



Commission should make it a priority to regularly catalogue prices for voice and broadband service bundles<sup>35</sup> of communications companies in California.

At minimum, the Commission must collect pricing information for voice and broadband speeds at or around the essential use standard for all communications companies in California annually. The Commission should also consider collecting multiple ranges of voice, broadband, and bundled prices besides the essential use standard. Indeed, in its most recent Market Pricing Survey Staff Report, the Commission's Communication Division points out the necessity of tracking and reporting prices and services.<sup>36</sup>

**3. What Regulatory, Operational, and/or Resource Considerations Might Be Necessary to Effectively Implement Affordability Metrics? How Should the Commission Monitor and Track Affordability On a Recurring Basis, Outside of Specific Proceedings?**

To use the Staff Proposal metrics in the Commission's proceedings, the Commission needs to consider who will update the necessary input data, how frequently should the data be updated, and in what forum the data will be vetted. The Commission should order small-scale pilots in actual proceedings to shed light on these issues, and other unexpected implementation issues. There are implementation challenges that will be specific to each industry, as further discussed below.

---

<sup>35</sup> Bundled services are often less expensive than the combined standalone prices for a bundle's components. Where bundled prices are not available, standalone prices should be used instead.

<sup>36</sup> "Because several communications sectors remain moderately or highly concentrated as evidenced in the Market Share Analysis of Retail Communications report, and in the Competition Proceeding Decision (D.16-12-025), monitoring the State's communications markets remains appropriate." Market Pricing Survey of Retail Communications Services In California: Sample of Residential Communications Services and Price Changes 2010 – 2017 Compared to Wireline Basic Voice Service, Staff Report, California Public Utilities Commission, Communications Division, April 2018, p. 3 available at <https://www.cpuc.ca.gov/General.aspx?id=6442457235>.

**a. Energy Metrics Should be included in Commission Annual Reports**

The proposed metrics can be incorporated in the annual report that the Commission releases regarding its actions to limit utility cost and rate increases pursuant to Public Utilities (PU) Code Section 913.1. In this report, the Commission provides general electric and gas revenue and rate trends, as well as legislative program costs. Currently, the report includes electricity burden (EB) which is derived based on average monthly electric bill over average monthly household income.<sup>37</sup> The 2019 Report, which generally covers historical costs and rates for year 2018 and earlier, adds projected rate and bill changes based on 2019 program budgets. The 2019 report further suggests that moving forward, the Commission should develop and include a rate and bill tracking tool to be used by decision-makers to better evaluate programs mandated by statute.<sup>38</sup> The staff's proposed metrics (including any modifications adopted by the Commission responsive to parties feedback) can be included in this report as an additional reference point to track of energy service affordability. The report should track historical EB and AR measures, show the change in EB and AR over time, and include projected EB and AR based on known pending rate increases for the coming year to effectively support the Commission in prioritizing projects.

**b. The Commission Should Base The Ability-To-Pay Index Upon A Few CalEnviroScreen Indicators For Ease of Updating, Consistency and Transparency**

The Staff Proposal proposes an Ability-To-Pay Index to complement the AR and HM metrics. An Ability-To-Pay index, a ranking of census tracts with reference to both median household income and housing costs, is useful to provide a relative sense of economic conditions in California's varied geographies. However, the Commission should base an Ability-To-Pay Index (API) upon the more readily available indicators from the CalEnviroScreen. This way, the Commission can leverage data regularly

---

<sup>37</sup> 2019 SB 695 Report, p.17, Table 1.

<sup>38</sup> 2019 SB 695 Report, p.6.

updated and more clearly described from a similar census tract ranking that is used to prioritize California geographies for a number of California programs.

The current version of CalEnviroScreen combines twenty-one indicators to construct a ranking of California's census tracts, used to direct funding to Disadvantaged Communities. The ranking combines five socioeconomic indicators<sup>39</sup> with pollutant and other vulnerability data, such as health statistics, to rank tracts. However, specific indicators can be included or excluded, and combined to produce different results appropriate to the question or program at hand. Since CalEnviroScreen indicators include reference to the same data on median household income, housing costs, and poverty levels utilized in the NREL API, the Public Advocates Office compared results to see if the CalEnviroScreen data would be equally effective. The CalEnviroScreen data appears to be superior for a number of reasons. Appendix D shows four comparison maps showing how the NREL API would compare to APIs constructed with different combinations of CalEnviroScreen socioeconomic indicators. An appropriate combination of the five CalEnviroScreen indicators would be preferable to the NREL inputs, because the data is more transparent and is updated regularly; and because using CalEnviroScreen is consistent with the practices at other state agencies.

The California Office of Environmental Health Hazard Assessment documents development of CalEnviroScreen data, and provides comparison maps similar to those in Appendix D.<sup>40</sup> The Commission has reviewed this process, and has previously adapted CalEnviroScreen rankings to inform program implementation, as it did to define areas for the Disadvantaged Communities-Single-family Affordable Solar Program in Decision 18-06-027.<sup>41</sup> Furthermore, the Commission's reasons to rely upon the CalEnviroScreen

---

<sup>39</sup> The five CalEnviroScreen socioeconomic indicators include educational attainment, housing burden, linguistic isolation, poverty, and unemployment. See <https://oehha.ca.gov/calenviroscreen/indicators>.

<sup>40</sup> See <https://oehha.ca.gov/media/downloads/calenviroscreen/report/approachesidentifydisadvantagedcommunitiesaug2014.pdf>, and <https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-version-20>, and <https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-version-20>, and <https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-30>.

<sup>41</sup> D.18-06-027, pp. 13-16 discusses the consideration of, and eventually building up, CalEnviroScreen indicators.

indicators for this program apply equally to this Affordability Rulemaking. "...is a well-vetted and credible methodology for identifying populations that face disproportionate environmental pollution and socioeconomic burdens.....Staff suggests that consistency across state agencies and Commission proceedings is beneficial, as it helps simplify internal and external administration and coordination, and allows for the potential to leverage benefits across all programs that utilize this definition within the designated communities themselves.”<sup>42</sup>

**4. What is the most effective way to utilize affordability metrics in Commission decisions and program implementation?**

As suggested in the Staff Proposal, the Commission should not set hard thresholds for affordability and unaffordability based on the metrics, but rather should measure them on a comparative basis, over time. Testing the metrics in real Commission proceedings should be the first step to implementation.

**a. How should the Commission use or interpret the resulting values from affordability metrics in proceedings?**

Please see the response to Question 4c.

**b. How should the Commission use affordability metrics to prioritize or design ratepayer programs?**

Please see the response to Question 4c.

**c. Prior to adopting a final framework to assess affordability, in which types of proceedings should the Commission assess affordability? What criteria should be used to determine if a proceeding requires an affordability assessment?**

Prior to adopting a final framework to assess affordability, the Commission should test the operation of the AR, HM and API through existing proceedings, whether formal

---

<sup>42</sup> Rulemaking 14-07-002, Administrative Law Judge’s Ruling (1) Accepting Into The Record Energy Division Staff Papers On The Ab 327 Successor Tariff Or Contract; (2) Seeking Party Proposals For The Successor Tariff Or Contract; (3) Setting A Partial Schedule For Further Activities In This Proceeding, June 4, 2015, pp. 2-5 and 2-5.

or informal. Adopting the affordability framework on a pilot basis will test the robustness of the framework. If implementation challenges are identified, these should be addressed, to the extent possible, within the scope of the proceedings that are chosen to pilot the metrics. With regard to how the Commission might interpret the metrics and utilize metrics to prioritize or design ratepayer programs, pilots would also be the place to assess how much value is gained by generating the AR, HM and API. The feedback during and after the pilots should be reported out at the conclusion of proceeding. This way, the Commission can make iterative adjustments responsive to the real-world application of the framework for future proceedings where appropriate.

### **The Affordability Metric Could be Piloted During AT&T or Frontier's Rate Change Advice Letter**

The Commission should consider testing the effectiveness of the Staff Proposal's affordability metrics in the next AT&T or Frontier Advice Letter filing to make a change to their residential voice rates. This would allow the Commission to focus their analysis on one or two large companies whose service territory includes multiple varied PUMAs. Although these companies would be filing voice rate changes, the Commission should use this as the venue to also consider broadband service and bundled rates as well. However, AT&T and Frontier do not have a time-sensitive requirement to file a rate change Advice Letter in the near future. In the meantime, the Commission should consider conducting a trial analyses outside of a formal Advice Letter process based on current rates.

### **Electric Metrics Should be Piloted During an Upcoming GRC Phase 1 Filing**

The Commission should pilot the electric affordability metrics in an upcoming GRC phase 1 filing. SCE has recently filed A.19-08-013 their 2021 GRC, and this would be an appropriate venue for such a pilot. The pilot should test the change in affordability metrics between current rates and a 2021 illustrative rate which holds all rate components constant with current rates except the revenue requirement change. This will allow the Commission to isolate the affordability impacts of the revenue requirement changes

included in the GRC application without requiring the updated rate factors which will be developed in the next GRC phase 2.

### **The Affordability Metrics Could be Piloted During an Upcoming Class A Water Company Rate Change Advice Letter or a 2020 Class A Water Company GRC**

The Commission could pilot the affordability metrics the next time a Class A water company files an advice letter with implications for customer bills, such as an upcoming escalation year request or a supply cost offset filing. This would allow the Commission to consider the ability to adequately develop the proxy bills for other industries and to test the water bill calculations in a situation with a more complicated utility rate structure, such as tiered rates with surcharges and fees. In addition, the Commission could consider testing the affordability metrics during an upcoming Class A water company general rate case (GRC), such as the Suburban Water Company GRC anticipated to be filed in January 2020 or the Golden State GRC, which may be filed in July 2020. This would enable the Commission to pilot using the affordability metrics in both an informal and a formal proceeding.

### **III. CONCLUSION**

The Commission should refine the Staff Proposal metrics as described above to provide better value for the Commission as decision-making tools. In particular, the fewer the inputs needed to generate the metrics, the more confidence that decision-makers and the general public can have in the results. The metrics and their data inputs must be as transparent as possible, so that stakeholder parties can replicate the analysis included in the metrics. Without stakeholder confidence in the operation of the metrics, they cannot effectively advance the Commission's understanding of affordability, and will instead invite controversy regarding their implementation and interpretation. Only through metrics that are truly transparent and replicable can stakeholders have full confidence in the operation of the metrics, and thus in the validity of their outputs.

The Commission should utilize metrics that disaggregate utility costs, rates and bills in the AR and HM, and eliminate consideration of the number of members of a

household. Doing so will allow for metrics that match the level at which bills are issued, the household level, since the number of household occupants in population most of interest may vary more than stay constant. The Commission should base metrics regarding essential service quality on regularly generated and reported utility data on average usage, which will better represent the variability in the state. When there is a choice of data inputs, the Commission should use inputs that are based on utility generated and reported data, because these data are more reliable, reflective of actual usage, and can be regularly updated without requiring an expensive and complicated study.

Respectfully submitted,

/s/ NOEL OBIORA

---

Noel Obiora

Attorney for  
Public Advocates Office

California Public Utilities Commission  
505 Van Ness Street  
San Francisco, CA 94102  
Telephone: (415) 703-5987  
Facsimile: (415) 703-4592  
E-mail: [noel.obiora@cpuc.ca.gov](mailto:noel.obiora@cpuc.ca.gov)

September 10, 2019

**APPENDIX A: Modified Affordability Ratio Calculations**

**Table 1. Affordability Ratio and Modified Affordability Ratio (MAR) for Del Norte, Lassen, and Modoc Counties with an Illustrative \$5 Bill Increase**

	Proxy Bill	Median Income after Housing Cost	AR	MAR (Energy)	MAR (Water)	MAR (Communications)
Water	\$49.47					
Energy	\$129					
Telecom	\$173.95					
Total Bill	\$352.42	\$3145	$(49.47+129+173.95)/3145=11.21\%$	$129/(3145-49.47-173.95)=4.42\%$	$49.47/(3145-129-173.95)=1.74\%$	$173.95/(3145-49.47-129)=5.86\%$
EB/WB/CB increase of \$5			$(49.47+129+173.95+5)/3145=11.36\%$	$(129+5)/(3145-49.47-173.95)=4.59\%$	$(49.47+5)/(3145-129-173.95)=1.92\%$	$(173.95+5)/(3145-49.47-129)=6.03\%$
<b>AR or MAR Change %</b>			<b><math>(11.36-11.21)/11.21=1.42\%</math></b>	<b><math>(4.59-4.42)/4.42=3.88\%</math></b>	<b><math>(1.92-1.74)/1.74=10.11\%</math></b>	<b>2.87%</b>



**APPENDIX B: FCC INTERNET ACCESS SERVICE REPORT-  
CALIFORNIA BROADBAND SUBSCRIPTIONS**

**Data as of December 31, 2017, in thousands**

	<u>Number of Residential Subscriptions</u>	<u>% of Residential Subscriptions</u>
Fixed broadband: download speed of at least 200 Kpbs or greater	11,259	87%
Fixed broadband: speeds of at least 10/1 Mbps or greater	9,977	77%
Fixed broadband: speeds of at least 25/3 or greater	8,215	64%
Fixed broadband: speeds of at least 100/10	4,175	32%
Wireless broadband	40,211	128%
U.S. Census Bureau Demographic Data (used to calculate percentages above)		
California population age 15+	31,420	
California households	12,888	

Data Sources

Broadband Subscriptions:	FCC Form 477 Internet Access Services Report as of 12/31/17, Tables, Figures 32 and 34, available at <a href="https://www.fcc.gov/internet-access-services-reports">https://www.fcc.gov/internet-access-services-reports</a>
CA households & population:	US Census Bureau American Community Survey 5 year estimates 2013-2017

## **Appendix C: Residential Water Use Analysis by the Public Advocates Office**

In order to evaluate an appropriate quantity for the level of water service evaluated for affordability, the Public Advocates Office collected and analyzed monthly residential water use billing data from Class A and B investor-owned water utilities. In the analysis discussed in these comments, we evaluate data from six Class A water utilities, representing more than 30 districts and 809,000 single-family residential connections.<sup>1</sup> Tables 1 and 2 summarizes the companies and data included in this analysis.

Our analysis suggests there is a great deal of variability in water use, both between companies and from year to year. Although Figure 1 does not identify any individual district, it highlights this variability. In the winter months (assumed to be January through March), median use is similarly variable; Figure 2 shows that, between 2016 and 2018, median use per district was as low as 3 CCF and as high as 11 CCF, which is approximately 16-21 gpcd and 64-86 gpcd, assuming 4-person and 3-person household sizes, respectively.<sup>2</sup> Figure 2 does suggest that median winter water use per connection is approximately 7 hundred cubic feet (CCF) per month, or 180 gallons per day (see Figure 1). Assuming a 4-person or 3-person household, this represents 43 to 57 gpcd, respectively. While this range includes the proposed 50 gpcd standard, it nonetheless highlights the variability when using different assumptions of household size. The California Department of Finance publishes annual estimates of the number of people per household by city; in 2019, the number of people per household ranges from about 1.4 to 5.<sup>3</sup> Thus, for some areas, assuming a household size of 3 or 4 people could either greatly over-estimate or under-estimate total household demand in a particular billing period.

---

<sup>1</sup> While we also received billing data from companies and districts that bill some or all residential customers bi-monthly, we have not included those results in this analysis.

<sup>2</sup> All figures and conversions in this appendix have been calculated from the raw data before rounding.

<sup>3</sup> California Department of Finance. 2019. "E-5 Population and Housing Estimates for Cities, Counties, and the State, 2011-2019 with 2010 Census Benchmark." Accessed: August 29, 2019. <http://www.dof.ca.gov/Forecasting/Demographics/Estimates/E-5/>.

**Table 1. Summary of Companies Included in Results Discussed in These Comments**

Company Name	District (if applicable)	Customer Billing Frequency	Metering	SFR Connections (Dec 2018)	Low-income SFR Connections (Dec 2018)	County/COUNTIES	Cities Served <sup>1</sup>
San Gabriel Valley Water Company	Los Angeles	All Monthly	All Metered	39,100	19,184	Los Angeles	Arcadia, Baldwin Park, El Monte, Industry, Irwindale, La Puente, Montebello, Monterey Park, Pico Rivera, Rosemead, San Gabriel, Santa Fe Springs, South El Monte, West Covina, Whittier, Hacienda Heights, South San Gabriel
	Fontana	All Monthly	All Metered	42,245	23,184	San Bernardino	Fontana, Rancho Cucamonga, Rialto
	Whittier-La Mirada	All Monthly	All Metered	31,117	2,324	Los Angeles, Orange	Portions of Whittier, La Mirada, Buena Park, La Habra
Suburban Water Systems	San Jose Hills	All Monthly	All Metered	39,620	5,196	Los Angeles	Covina, West Covina, Walnut, La Puente, Glendora, Hacienda Heights
	Arden - Cordova	All Bi-Monthly, scaled <sup>3</sup>	Both; unmetered customers excluded from analysis	14,937	1,306	Sacramento	Rancho Cordova, Gold River, Arden Manor, Arden Cordova, Sacramento
Golden State Water Company	Los Osos	All Bi-Monthly, scaled <sup>3</sup>	All Metered	3,100	353	San Luis Obispo	Los Osos, Edna Valley
	Region 3	All Bi-Monthly, scaled <sup>3</sup>	All Metered	89,556	12,207	Imperial, Los Angeles, Orange, San Bernardino	Barstow, Claremont, Montclair, Pomona, Upland, Calipatria, Niland, Victorville, Lucerne, Cypress, La Palma, Los Alamitos, Placentia, Seal Beach, Stanton, Yorba-Linda, Cowan Heights, San Dimas, Charter Oak, Arcadia, El Monte, Irwindale, Monrovia, Monterey Park, Rosemead, San Gabriel, Temple City, Morongo Valley, Wrightwood
						no	

	Simi Valley	All Bi-Monthly, scaled <sup>3</sup>	All Metered	12,740	1,490	Ventura	Simi Valley
	Bay Point	All Monthly	All Metered	4,820	1,015	Contra Costa	Bay Point
	Clearlake	All Monthly	All Metered	2,063	526	Lake	Clearlake
	Region 2	All Monthly	All Metered	74,445	19,202	Los Angeles, Orange	Artesia, Bell, Bell Gardens, Carson, Cerritos, Compton, Cudahy, Culver City, Downey, El Segundo, Gardena, Hawaiian Gardens, Hawthorne, Huntington Park, Inglewood, Lakewood, La Mirada, Lawndale, Long Beach, Norwalk, Paramount, Santa Fe Springs, South Gate, Athens, Lennox, Willowbrook, Moneta, Florence-Graham, Del Aire, Los Alamitos
	Santa Maria	All Monthly	All Metered	14,132	1,699	San Luis Obispo, Santa Barbara	Santa Maria, Lake Marie, Nipomo, Orcutt, Sisquoc, Tanglewood, Cypress Ridge
California Water Service Company	Bear Gulch	All Monthly	All Metered	16,139	748	San Mateo	Atherton, Bear Gulch, Los Trancos, Menlo Park, Portola Valley, Redwood City, Skyline, Woodside
	Bakersfield	All Monthly	Both; unmetered customers excluded from data received	52,136	18,394	Kern	Bakersfield, North Garden, Tejon-Castac
	Bay Area Region <sup>2</sup>	Both	Both	N/A	N/A	Lake, Marin, Mendocino, San Mateo, Sonoma	San Carlos, San Mateo, South San Francisco, Daly City, Colma, Bayshore, Broadmoor, Mid-Peninsula, Palomar Park, Lucerne, Dillon Beach, Redwood Valley, Santa Rosa, Duncans Mills, Guerneville, Armstrong Valley, Coast Springs, Hawkins, Noel Heights, Rancho del Paradiso

Chico	All Monthly	All Metered	24,907	3,820	Butte, Glenn	Chico, Hamilton City
Dixon	All Monthly	All Metered	2,715	693	Solano	Dixon
Dominguez	All Monthly	All Metered	28,688	7,989	Los Angeles	Palos Verdes Peninsula, Carson, Compton, Dominguez, Harbor City, Hawthorne, Lomita, Rancho Dominguez, Rolling Hills, Torrance, West Basin
East Los Angeles	All Monthly	All Metered	20,091	10,989	Los Angeles	Bell, Commerce, East Los Angeles, Los Angeles, Montebello, Monterey Park, Vernon
Hermosa Redondo	All Monthly	All Metered	22,175	1,037	Los Angeles	Hermosa Beach, Redondo Beach
Kern River Valley <sup>2</sup>	Both	All Metered	N/A	N/A	Kern	Bodfish, Kernville, Lake Isabella, Onyx, Wofford Heights, Arden, Camp Erwin
Los Angeles Region	All Monthly	All Metered	23,086	1,099	Kern, Los Angeles	Owens, Countrywood, Kern River Valley, Lakeland, Mountain Shadows, Ponderosa Pine, Riverkern, Sierra Trailer Lodge, South Lake, Split Mountain, Squirrel Mountain
Los Altos Suburban	All Monthly	All Metered	16,570	442	Santa Clara	Antelope Valley, Fremont Valley, Grand Oaks, Lake Hughes, Lancaster, Leona Valley
Livermore	All Monthly	All Metered	16,887	1,243	Alameda	Cupertino, Los Altos, Los Altos Hills, Mountain View, Sunnyvale
Monterey Region	All Monthly	All Metered	26,501	7,132	Monterey, Santa Cruz	Livermore
Marysville	All Monthly	All Metered	2,993	1,116	Yuba	Bolsa Knolls, Buena Vista, Country Meadows, Foothill Estates, Indian Springs, Las Lomas, Las Palmas, Oak Hills, Salinas, Salinas Hills, Toro Park, Watsonville, King City
Oroville	All Monthly	All Metered	2,585	1,067	Butte	Marysville

	Selma	All Monthly	Both; unmetered customers excluded from data received	5,305	2,792	Fresno	Selma
	Stockton	All Monthly	All Metered	37,906	15,297	San Joaquin	Stockton
	Visalia	All Monthly	All Metered	39,070	14,409	Tulare	Fairway, Goshen, Mullen, Oak Ranch, Porterville, Tulare, Tulco, Visalia
	Willows	All Monthly	All Metered	1,983	715	Glenn	Willows
	Westlake	All Monthly	All Metered	5,673	415	Los Angeles, Ventura	Westlake Village, Thousand Oaks
	Ventura	All Monthly	All Metered	19,149	1,189	Ventura	Camarillo, Newbury Park, Thousand Oaks
	San Diego	All Monthly	All Metered	18,484	3,708	San Diego	Coronado, Imperial Beach, San Diego
	Sacramento	All Monthly	All Metered	55,583	8,087	Sacramento, Placer, Sonoma, Yolo	Antelope, Arden Estates and Sunrise Security Park, Arden Highlands, Arlington Heights, Citrus Heights, Doyle Ranch, Dunnigan, Foothill Farms, Geyserville, Isleton, Lindale, Linwood, Loretto Heights, Morgan Creek, Ox Bow, Parkway Estates, Rancho Cordova, Riolo Greens, Rosemont, Sabre City, Sun Valley Oaks, Walnut Grove
	Larkfield	All Monthly	All Metered	1,669	140	Sonoma	Fulton, Larkfield and Wikiup Subdivisions
	Los Angeles <sup>2</sup>	All Monthly	All Metered	N/A	N/A	Los Angeles	Adams Ranch, Baldwin Hill, Bradbury, Duarte, Irwindale, Ladera Heights, Monrovia, Rosemead, San Gabriel, San Marino, Temple City, View Park, Windsor Hills
California American Water Company							

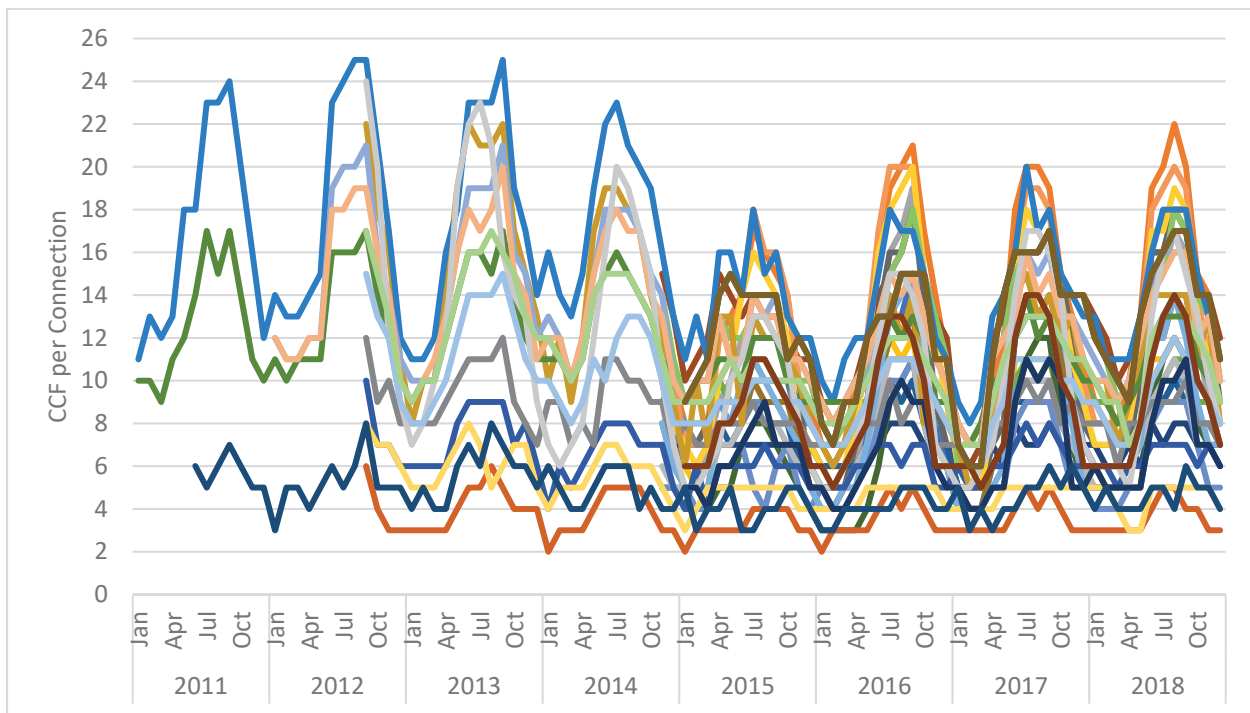
	Monterey <sup>2</sup>	All Monthly	All Metered	N/A	N/A	Monterey	Ambler Park Subdivision, Bishop Subdivision, Carmel-by-the-Sea, Chualar Sub-Units, Del Rey Oaks, Garrapata, Hidden Hills Subdivision, Laguna Seca Ranch Estates, Monterey, Oaks Subdivision, Pacific Grove, Ralph Lane, Rancho El Toro Country Club, Rim Rock Subdivision, Ryan Ranch Subdivision, Sand City, Seaside, Toro Sub-Units
San Jose Water Company <sup>4</sup>		Monthly	All Metered	374	9	Santa Clara	Cupertino, San Jose, Santa Clara, Campbell, Los Gatos, Monte Sereno, Saratoga

1. Service territories can represent all or portions of the areas listed, and may also include unincorporated or other neighboring areas that are not listed here.
2. These districts are currently excluded from the analysis described in this appendix.
3. For these districts, Golden State Water Company provided bi-monthly billing data scaled by multiplying by one-half to approximate monthly consumption.
4. Note that the majority of San Jose customers are billed bi-monthly and are therefore excluded from the analysis described in this appendix.

**Table 2. Reporting period for company data received**

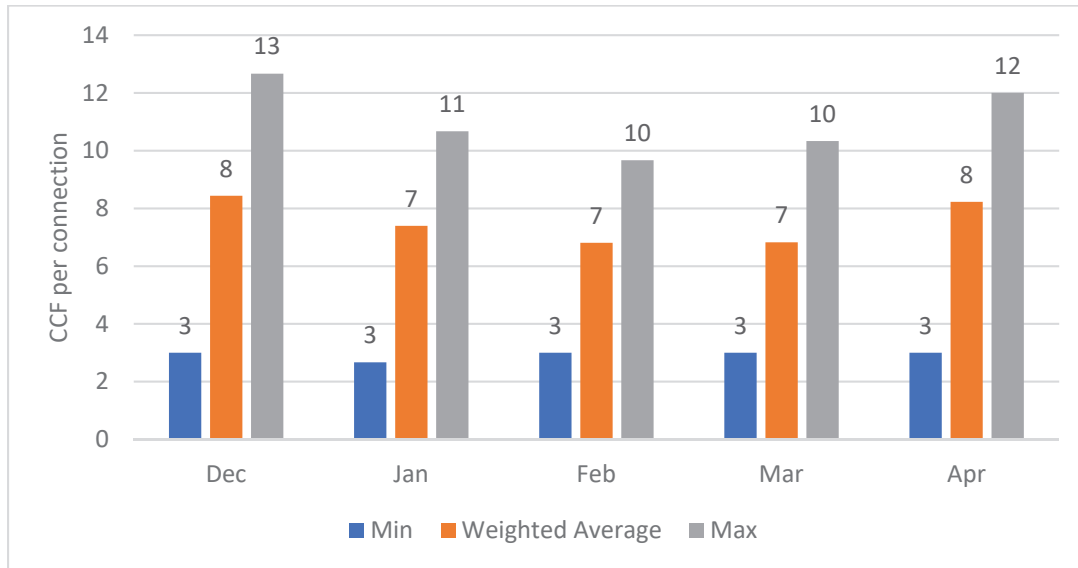
Company Name	Reporting Period
San Gabriel Valley Water Company	1/11 -12/18
Suburban Water Systems	1/12 - 12/18
Golden State Water Company	9/12 - 12/18
California Water Service Company	11/15 - 12/18
California American Water Company	6/15 - 12/18
San Jose Water Company	6/11 - 12/18

**Figure 1. Median Water Consumption per Single-family Residential Connection, per Month, by Utility District (January 2011 through December 2018)**





**Figure 2. Median Water Demand for All Companies Analyzed (Water Years 2016-2018)**



Note: Median use is averaged across districts, weighted by the total number of customers billed each month.

However, neither the Commission nor the companies themselves can definitively conclude precisely what accounts for such wide variability between companies. While it could be that higher median use per connection is a result of wasteful or non-essential use, there is no practical way to differentiate this from essential uses that are simply higher because of other factors such as the type of appliances used; the efficiency of appliances and fixtures; or lifestyle choices such as the number of people living in the household or the number of meals cooked at home. Therefore, in order to ensure an affordability analysis accurately represents the population being examined, we recommend the Commission establish an essential use standard at the household, rather than individual, level, and the Commission should allow this standard to vary to accommodate more granular estimates of indoor use.

Another line of inquiry in this study focused on potential differences in consumption between water customers receiving low-income assistance (LIA) and those not receiving assistance (NLIA). We hypothesized that median water demand for LIA customers would, in many cases, exceed that of NLIA customers and used data

disaggregated along this dimension to explore whether this was the case. First, we calculated the mean of median water consumption for each month between 2015 and 2018 (so that, for example, the value in August for any one district represents the average of values taken from August 2015, August 2016, August 2017, and August 2018).

As shown in Figure 1, there was considerable variability across the districts evaluated in this study. Values below 0% indicate that LIA consumption is higher than NLIA consumption; values above 0% indicate that NLIA consumption is higher. At one extreme, NLIA customers in California Water Service's Westlake (CWS\_WLK) district consumed 42% more water, on average, than LIA customers in the same district. At the other extreme, LIA customers in California Water Service's Marysville District (CWS\_MRL) consumed 24% more water than NLIA customers in that district.

**Figure 1. Percent Difference in Monthly Average of Median Water Consumption by District, NLIA vs. LIA**

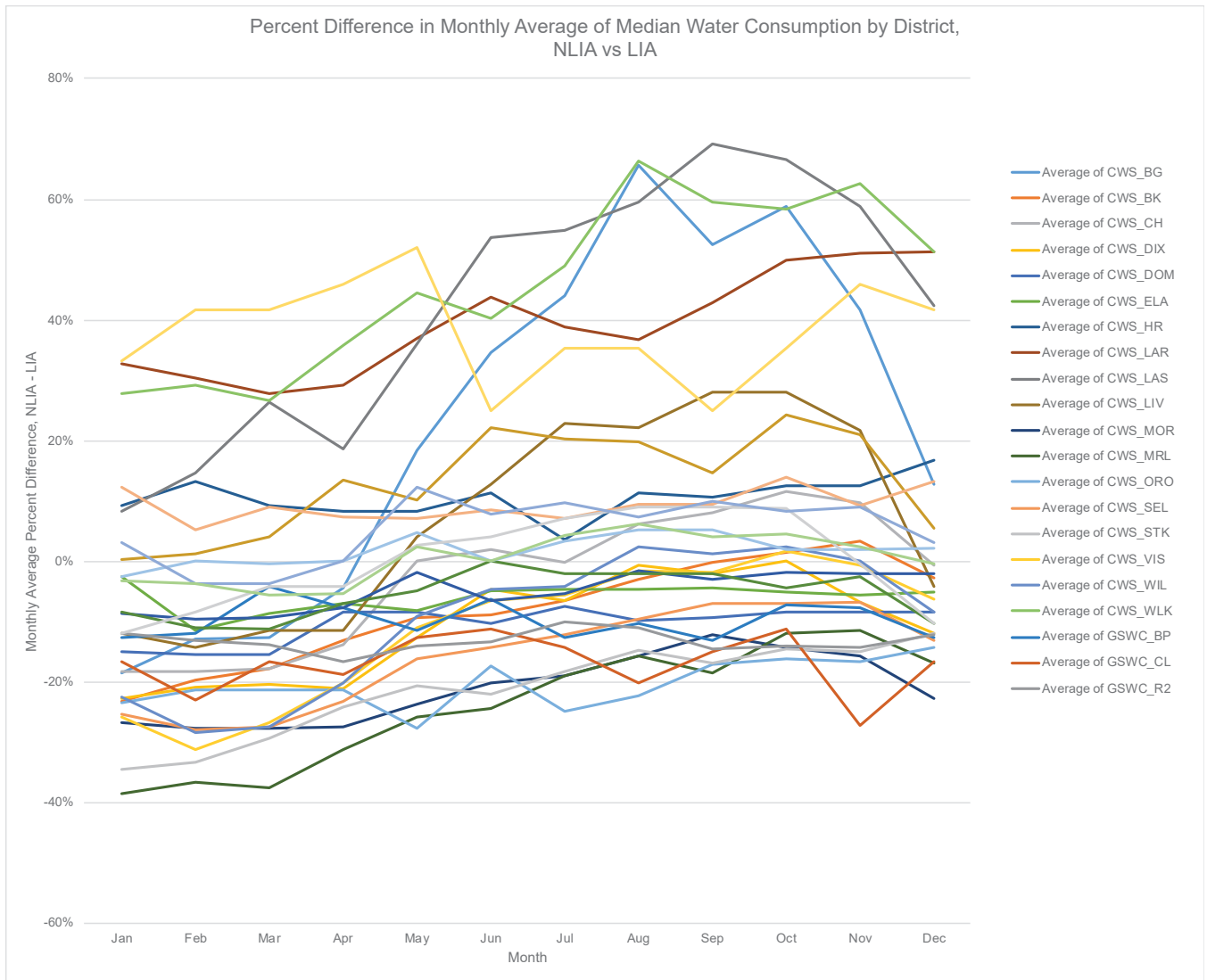
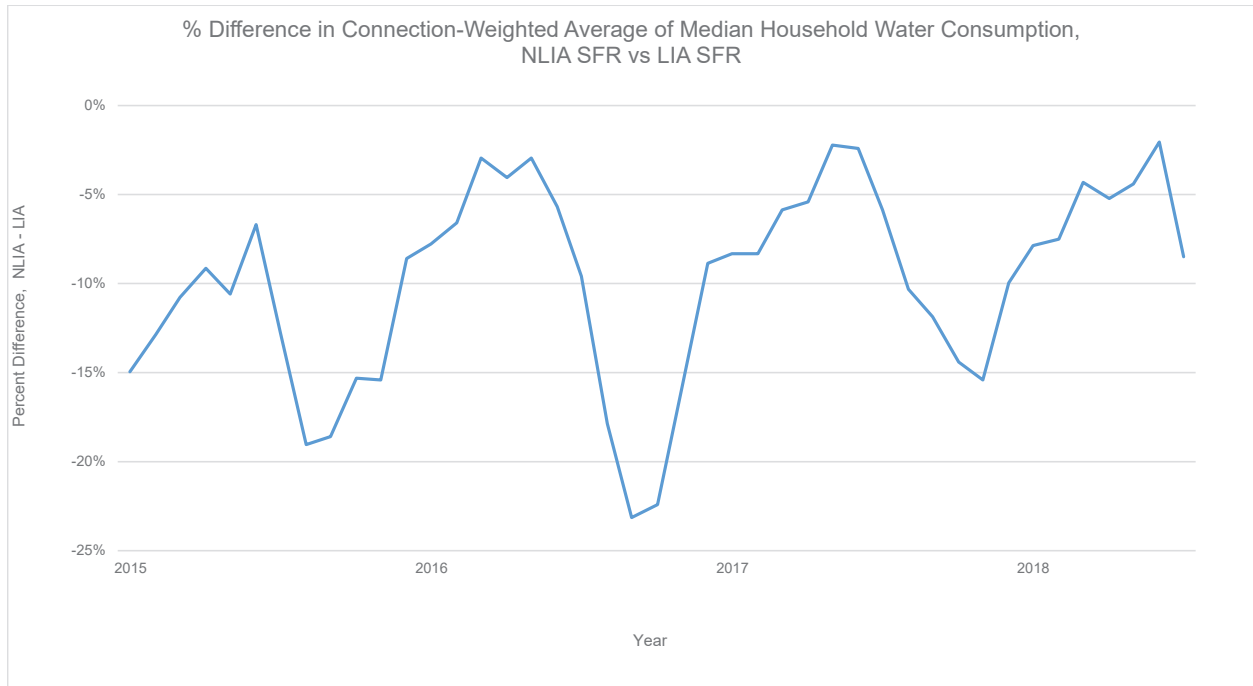


Figure 2 further summarizes these data across the districts. The calculations reflected in this figure weight the median monthly water consumption by the proportions of LIA and NLIA customers in each district, then produce the percent difference in the average of those weighted values. Again, where values in the chart fall below zero, consumption among LIA households exceeds that of NLIA households. In short, when we look across the entire population of households studied, LIA water demand does appear to exceed NLIA demand.

**Figure 2. Percent Difference in Connection-Weighted Average of Median Household Water Consumption, NLIA SFR vs. LIA SFR**



The variability across districts and the overall trend both suggest that LIA and NLIA customers exhibit differential patterns of consumption, which may be related to differences in the efficiency of household appliances, the age of structures, maintenance schedules, household sizes, or vocational requirements. While hypothesizing about what accounts for the variability is outside the scope of the present study, the data suggest that there are at least some locations in California where water demand for customers receiving financial assistance exceeds that of other customers in the district. For this reason, the Commission should include a “preferential option” for low-income consumers. In determining the essential quantity at a service district level, the Commission should calculate median residential water demand for all single-family customers and for customers enrolled in low-income assistance programs separately. In districts where low-income median consumption is greater than consumption among all

SFR households, the Commission should elect to use the higher value as the essential service quantity.

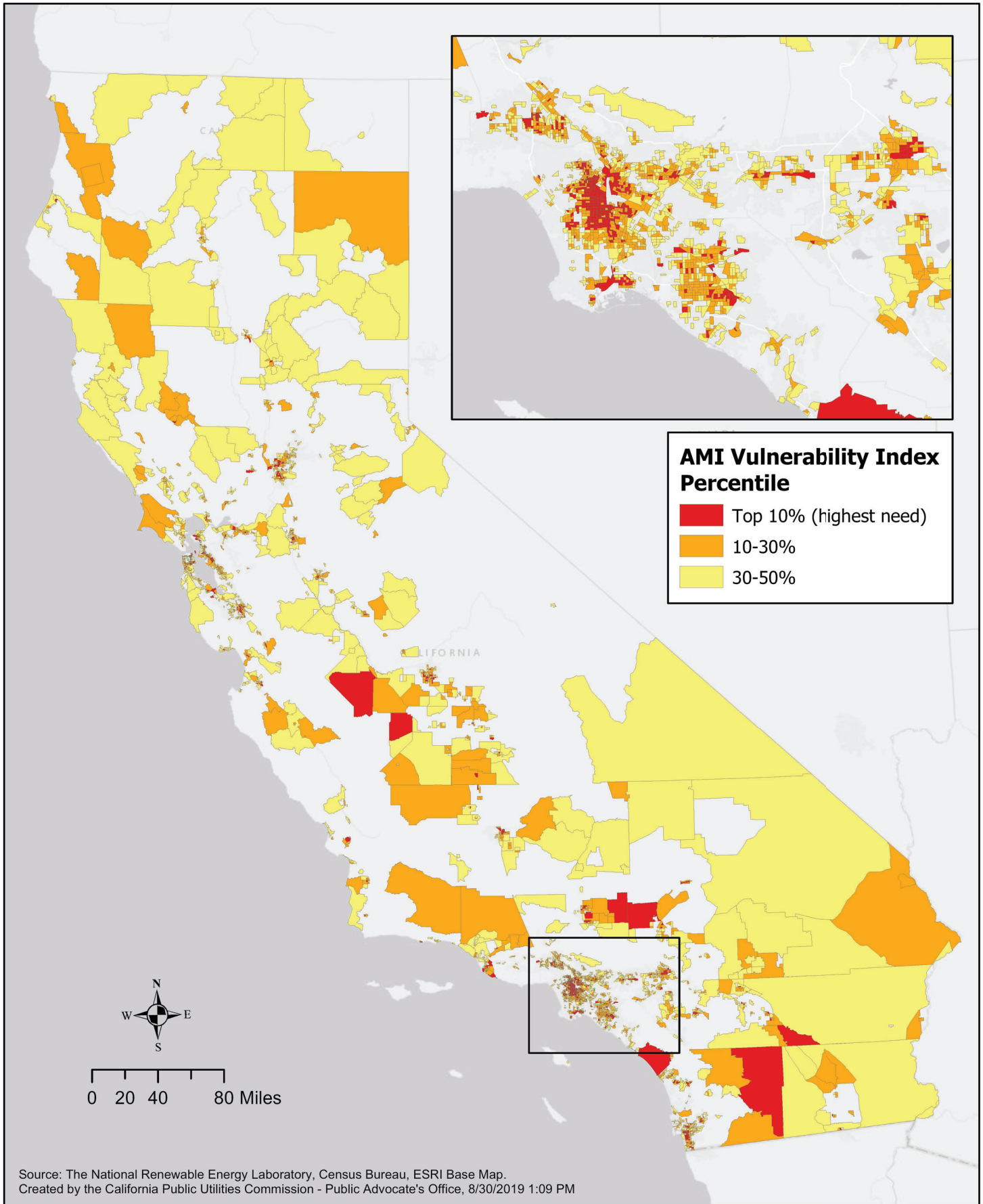
### **Conclusions**

Based on existing literature as well as the results of an assessment conducted by the Public Advocates Office, the Commission should not rely on 50 gpcd as the essential water use standard for the purposes of measuring affordability of utility services. Establishing a single statewide value ignores the wide variation in water use, and, by extension, water need. Moreover, establishing a standard for individuals rather than connections unnecessarily introduces uncertainty because the calculation requires assumptions be made about behavioral and lifestyle factors such as the number of people living in a household, as well as the type and efficiency of water-using appliances and fixtures. Moreover, gpcd as a standard requires additional assumptions about the marginal use of water per person, since existing research suggests there is not a direct, linear correlation between the number of people per household and total household water demand. In contrast, an essential use standard based on the customer connection requires only two assumptions: that the median customers' indoor water demand is sufficient to approximate essential demand for most customers, and that winter use is a viable proxy for indoor consumption. Therefore, we recommend the Commission adopt the process described in herein to calculate the essential water use standard to assess affordability.

**Appendix D: Comparison of Ability-To-Pay Indices Based Upon  
Combinations of SocioEconomic Indicators**

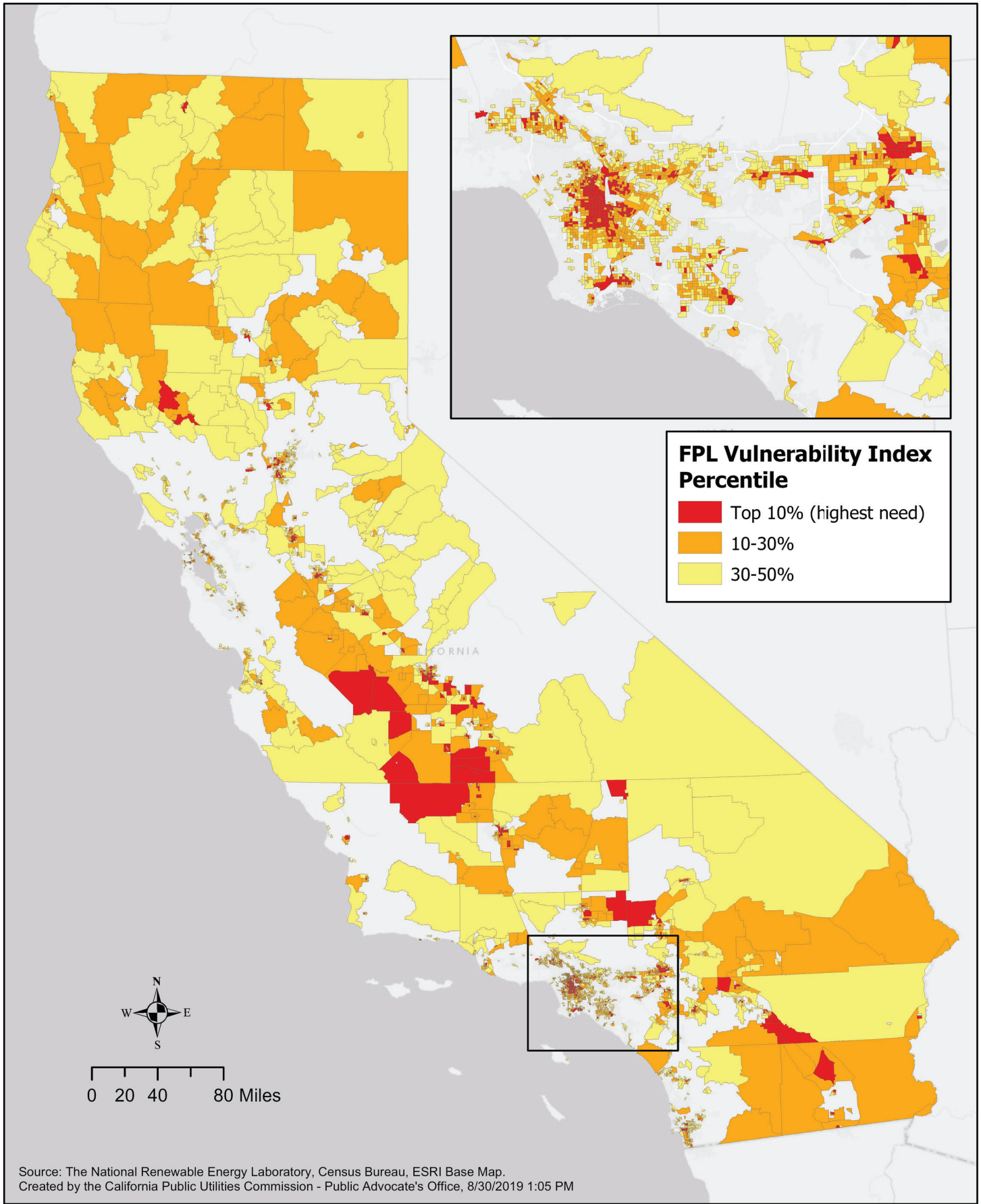


# NREL Ability-to-Pay Index (AMI) by Tract





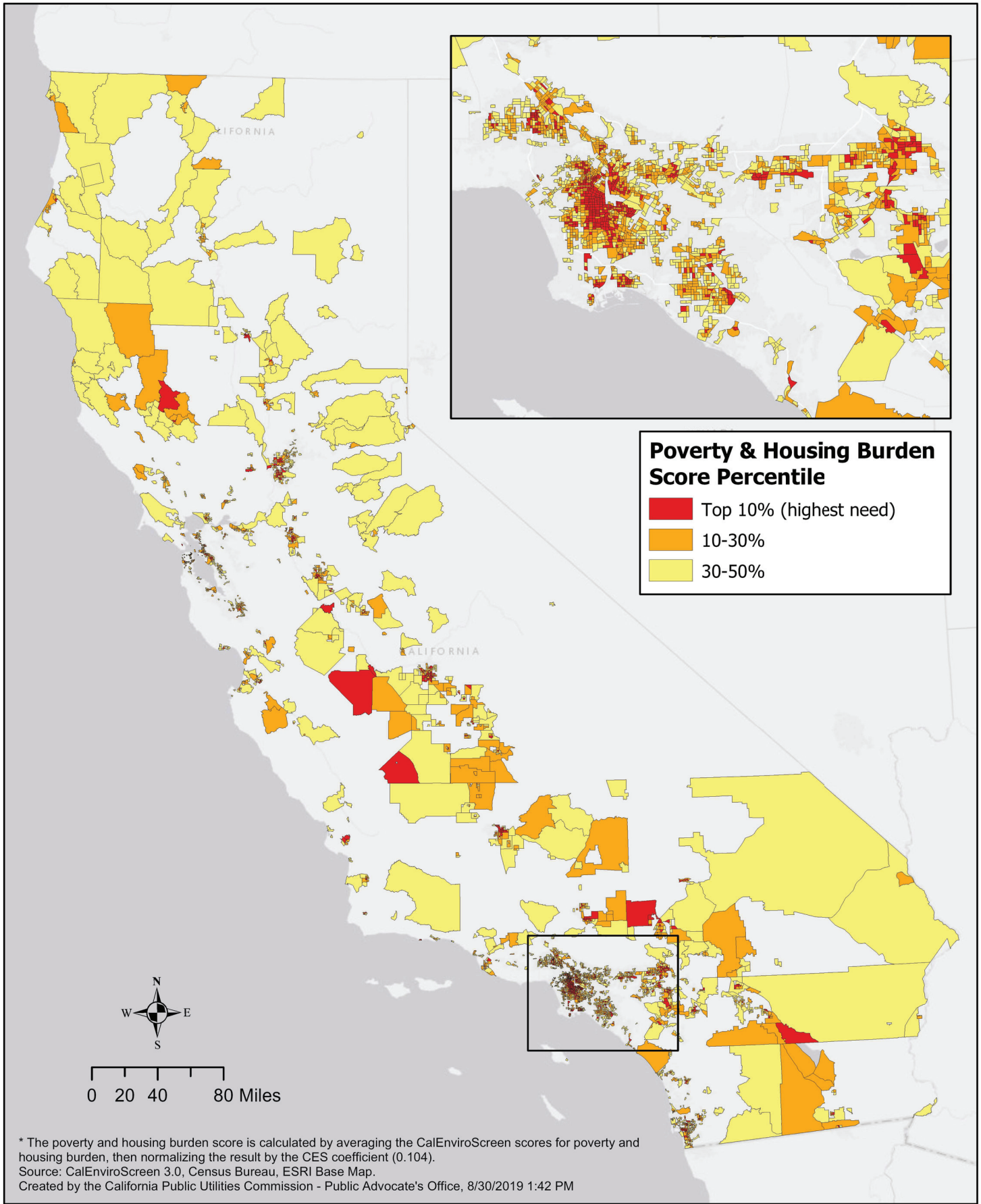
# NREL Ability-to-Pay Index (FPL) by Tract







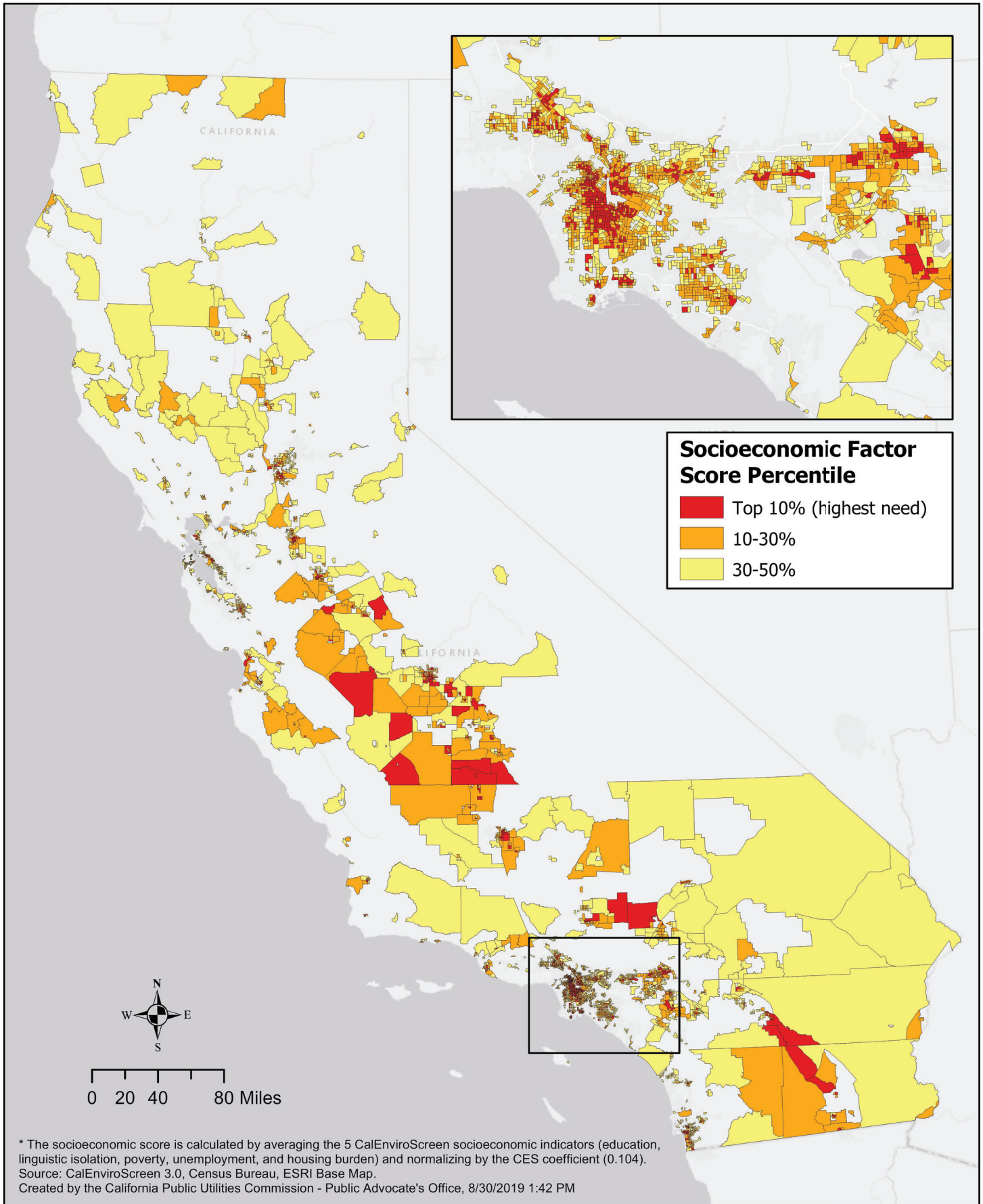
# CalEnviroScreen Poverty and Housing Burden Scores by Tract



\* The poverty and housing burden score is calculated by averaging the CalEnviroScreen scores for poverty and housing burden, then normalizing the result by the CES coefficient (0.104).  
Source: CalEnviroScreen 3.0, Census Bureau, ESRI Base Map.  
Created by the California Public Utilities Commission - Public Advocate's Office, 8/30/2019 1:42 PM



# CalEnviroScreen Socioeconomic Factor Scores by Tract





# CalEnviroScreen 3.0 Scores by Tract

