SAN DIEGO HOUSING COMMISSION

SDHC

*We're About People*

# Residential Vacancies in the City of San Diego

*September 2021*

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## INTRODUCTION

Homes held vacant in the City of San Diego, whether for investment or vacation use, are cited frequently as potential contributors to the ongoing housing affordability crisis in the City of San Diego, in which many San Diegans are unable to find market-rate rental housing or homeownership opportunities they can afford.

To help determine the extent to which homes are vacant, the San Diego Housing Commission (SDHC) Board of Commissioners directed SDHC staff to commence a study to identify housing units vacant for six months or longer.

SDHC staff worked with San Diego Gas & Electric (SDG&E) to obtain a dataset of 468,352 SDG&E premises IDs with utility usage for five calendar years, which resulted in 86 million anonymized records of residential utility usage in the City of San Diego between January 1, 2015, and December 31, 2019, predating the COVID-19 pandemic, during which Governor Gavin Newsom's executive orders required California residents to stay home to help prevent the spread of COVID-19.

In addition to the five years of utility data SDG&E provided, the City of San Diego Public Utilities Department (PUD) provided five years of data for this study, covering the same timeframe from 2015 to 2019. Residential electricity usage data and water consumption data are two of the most common datasets used to identify vacant units based on vacancy studies conducted in other jurisdictions. This is due to a number of factors, but primarily because a) nearly all occupied residential units use these utilities, b) they are billed on a regular basis, and c) they are provided citywide.

SDHC contracted with Circulate San Diego and Evari GIS Consulting to work with SDHC to analyze these datasets. The project team developed two methodologies to analyze each of the datasets, respectively, and identify vacant units. For this study, vacancy is defined as a residential unit that had either 1) statistically low electricity usage for a period of six consecutive months or more and/or 2) no associated PUD water accounts for at least six consecutive months at any time during the five years for which the data were analyzed.

### GLOSSARY

- SDG&E – San Diego Gas and Electric
- PUD – City of San Diego Public Utilities Department
- Hexbin - A standardized geographical unit that allows for easy pattern- and hot-spot recognition in large datasets
- kWh – kilowatt hour, a measure of energy usage
- Unoccupied – Period of notably low energy usage based on an individual residential unit's average energy usage
- Vacant – A period of at least six consecutive months of being unoccupied

## FINDINGS

Less than 1 percent of residential housing units in the City of San Diego were determined to have been vacant for six consecutive months at any one time in the five years for which data were obtained (2015 to 2019), based on analysis using methodologies detailed later in this report.

The analysis performed on five years of SDG&E data identified between 1,512 and 3,708 potentially vacant residential units in the City of San Diego, depending on the number of standard deviations used in the analysis. Using the 468,352 individual premises IDs provided by SDG&E for this study, the percentages equate to between 0.32 percent and 0.79 percent of all residential properties as being potentially vacant for six months or more.

A second analysis using PUD data identified 2,138 potentially vacant units out of 252,324 records, or approximately 0.85 percent of all residential contract accounts. The discrepancy between datasets is a result of the way the respective agencies track energy usage. SDG&E bills are generally associated with an individual dwelling unit, while PUD bills may often cover several dwelling units, particularly in multifamily structures, where one water meter may be associated with the overall usage for all the dwelling units on the property.

The methodologies used to analyze the two datasets for this study are detailed in the Methodology section of this report.

The project team mapped the results of the analyses using several geographies—City Council district, Community Plan Area, and conceptual "hexbins," which are a common way of displaying aggregate data using hexagonal geographic units of identical size.

Figure 1a, Figure 1b and Figure 2 show the generalized location of vacant units using the hexbin method. Table 1 and Table 2 present the findings by City Council district and Community Plan Area boundaries.

The sum of vacant units by Community Plan Area and Council District do not correlate to the total number of vacant units provided by SDG&E, as their geographies do not match the geography of the census tracts, the original geographic unit of the SDG&E data. In addition, the PUD results may have undercounted potentially vacant, individual dwelling units found on multifamily parcels with a single water meter; however, this assumption was not definitively proved as part of this project's scope.

*Figure 1a – Geographic Distribution of City of San Diego Vacant Units, SDG&E Data; Three Standard Deviations*

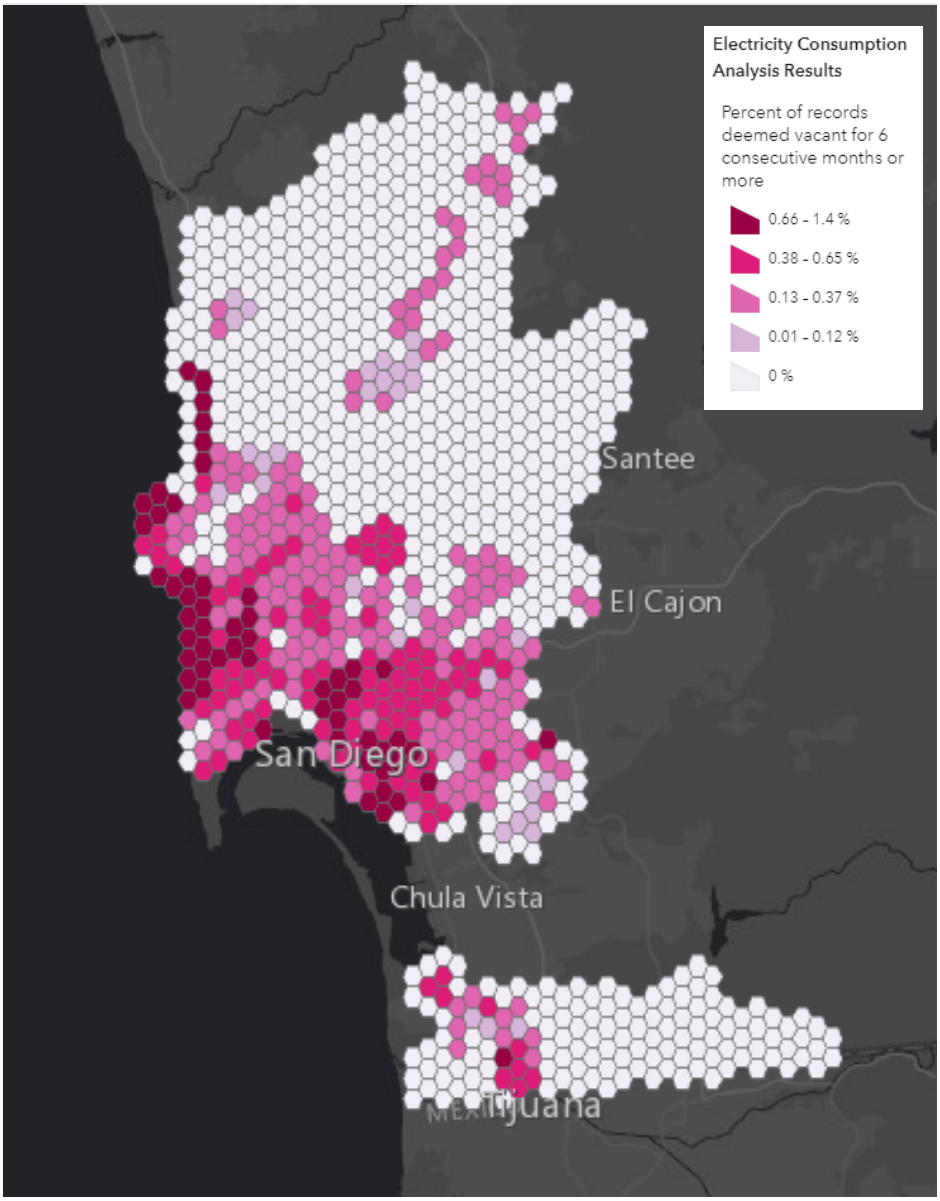


*Figure 1b – Geographic Distribution of City of San Diego Vacant Units, SDG&E Data; Two Standard Deviations*

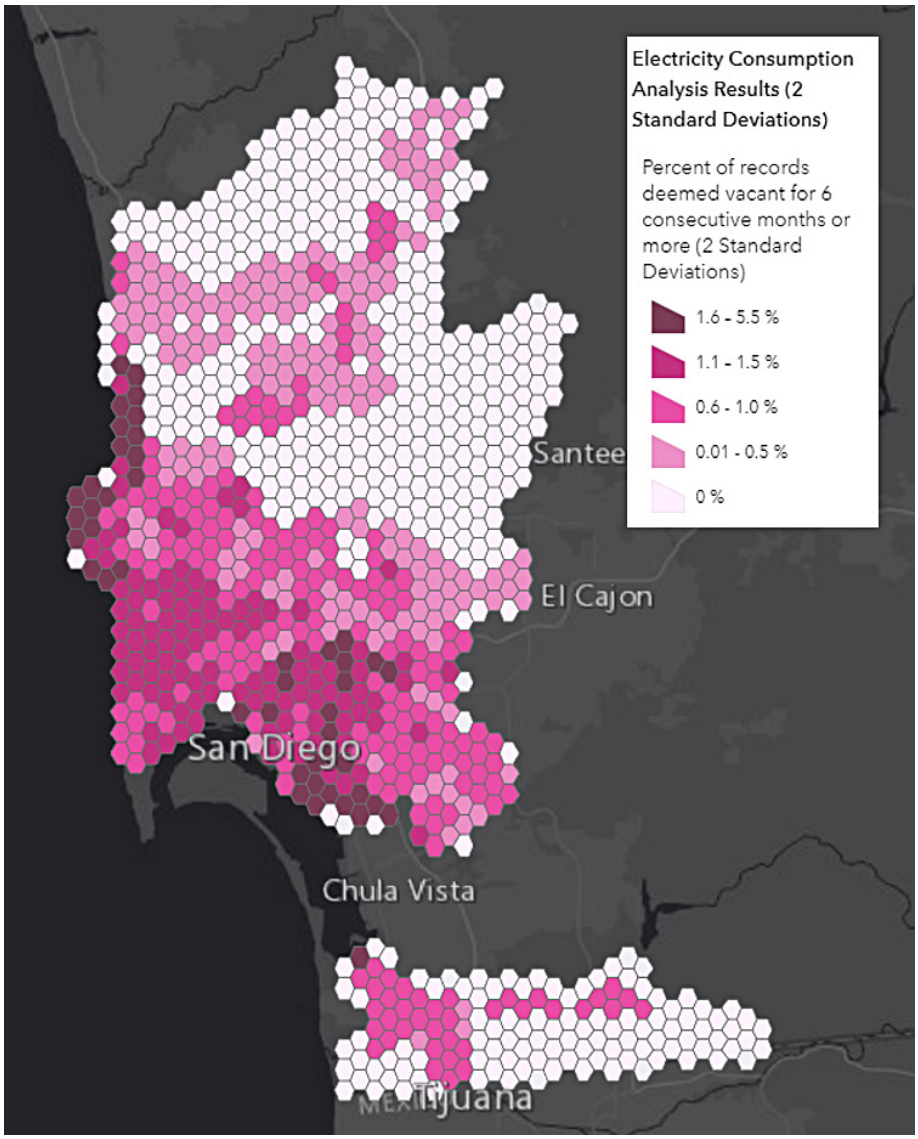
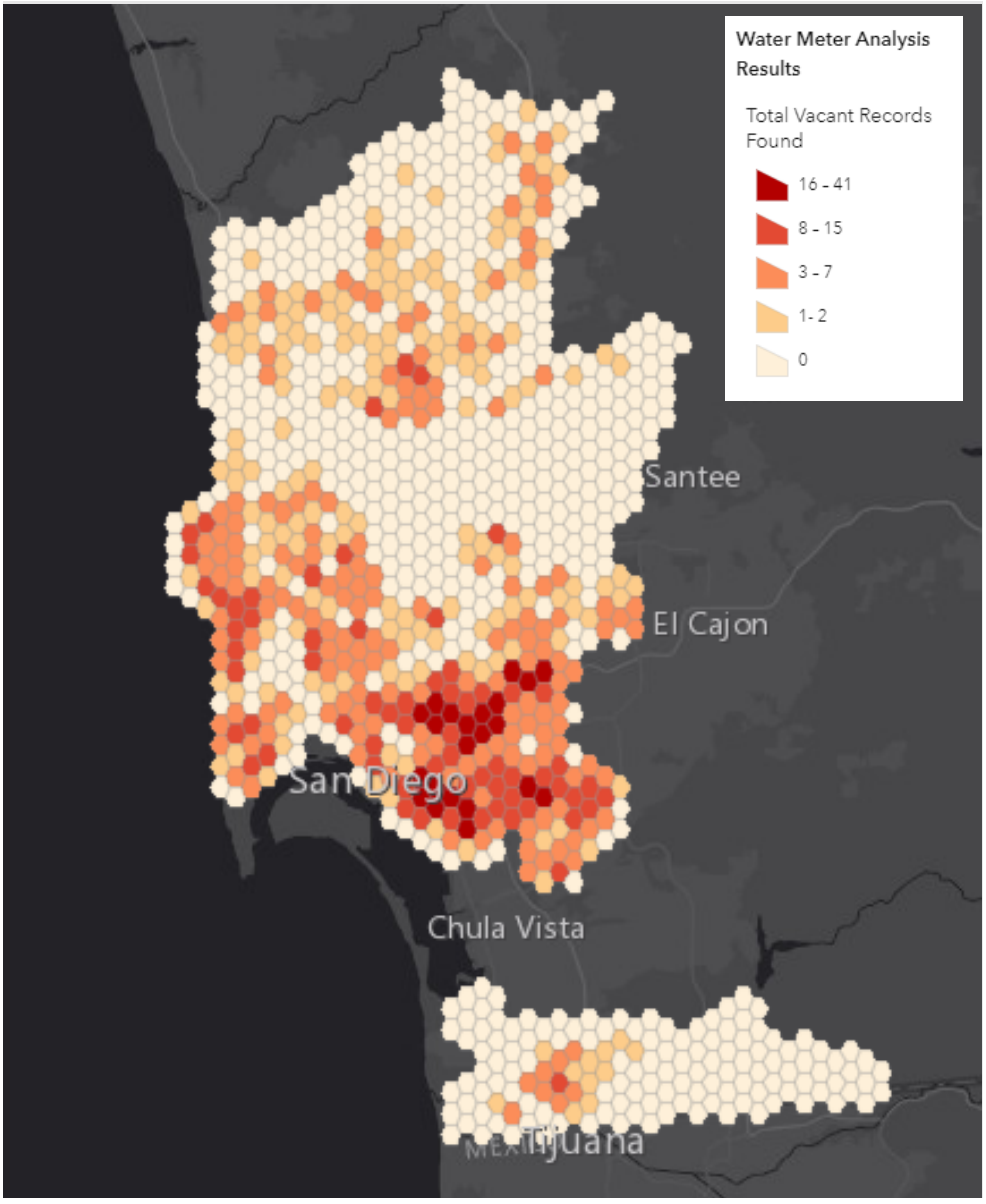


*Figure 2 – City of San Diego Vacant Units, PUD Data*




*Note: SDG&E data may reflect higher vacancy rates in coastal areas than PUD data because of a higher number of multifamily dwelling units in those areas that are on a single water meter. For example, a six-plex at the coast would have six SDG&E bills but only one water meter/bill. SDG&E data would reflect vacancies for each unit in the complex because each unit has its own record. However, PUD data would only display the property as vacant if all six dwelling units were vacant at the same time and the water to the entire complex was turned off.*

*Table 1 – Count of City of San Diego Potentially Vacant Units by Community Planning Area*

| Community Plan Area | SDG&E Data | | PUD Data |
|---|---|---|---|
| | Two Standard Deviations | Three Standard Deviations | |
| Balboa Park | 22 | 9 | 0 |
| Barrio Logan | 30 | 14 | 12 |
| Black Mountain Ranch | 3 | 0 | 13 |
| Carmel Mountain Ranch | 5 | 0 | 14 |
| Carmel Valley | 29 | 8 | 24 |
| Clairemont Mesa | 202 | 78 | 116 |
| College Area | 54 | 22 | 108 |
| Del Mar Mesa | 5 | 2 | 5 |
| Downtown | 150 | 65 | 19 |
| East Elliott | 0 | 0 | 0 |
| Encanto Neighborhoods | 72 | 26 | 173 |
| Fairbanks Ranch Country Club | 0 | 0 | 0 |
| Greater Golden Hill | 95 | 59 | 42 |
| Kearny Mesa | 19 | 9 | 2 |
| La Jolla | 125 | 46 | 106 |
| Linda Vista | 100 | 41 | 51 |
| Los Penasquitos Canyon | 3 | 0 | 0 |
| Mid-City:City Heights | 283 | 115 | 157 |
| Mid-City:Eastern Area | 96 | 29 | 70 |
| Mid-City:Kensington-Talmadge | 68 | 22 | 28 |
| Mid-City:Normal Heights | 131 | 41 | 36 |
| Midway-Pacific Highway | 31 | 11 | 0 |
| Military Facilities | 1 | 0 | 0 |
| Mira Mesa | 99 | 20 | 90 |
| Miramar Ranch North | 7 | 4 | 8 |
| Mission Bay Park | 50 | 33 | 1 |
| Mission Beach | 2 | 1 | 33 |
| Mission Valley | 62 | 23 | 4 |
| Navajo | 71 | 20 | 78 |
| NCFUA Subarea II | 2 | 1 | 1 |
| North Park | 284 | 135 | 116 |
| Ocean Beach | 61 | 45 | 21 |
| Old Town San Diego | 5 | 2 | 3 |
| Otay Mesa | 11 | 2 | 9 |
| Otay Mesa-Nestor | 80 | 22 | 21 |
| Pacific Beach | 204 | 91 | 85 |
| Pacific Highlands Ranch | 4 | 1 | 14 |

| Community Plan Area | SDG&E Data | | PUD Data |
|---|---|---|---|
| | Two Standard Deviations | Three Standard Deviations | |
| Peninsula | 148 | 56 | 69 |
| Rancho Bernardo | 23 | 11 | 38 |
| Rancho Encantada | 0 | 0 | 5 |
| Rancho Penasquitos | 42 | 13 | 28 |
| Sabre Springs | 3 | 1 | 4 |
| San Pasqual | 1 | 1 | 0 |
| San Ysidro | 37 | 21 | 29 |
| Scripps Miramar Ranch | 10 | 1 | 10 |
| Serra Mesa | 48 | 13 | 24 |
| Skyline-Paradise Hills | 87 | 18 | 115 |
| Southeastern San Diego | 253 | 107 | 181 |
| Tierrasanta | 34 | 4 | 25 |
| Tijuana River Valley | 11 | 5 | 5 |
| Torrey Highlands | 4 | 0 | 8 |
| Torrey Hills | 2 | 0 | 1 |
| Torrey Pines | 13 | 1 | 16 |
| University | 121 | 43 | 32 |
| Uptown | 305 | 176 | 84 |
| Via De La Valle | 0 | 0 | 2 |
| **TOTAL** | **3,702** | **1,468** | **2,136** |

*Table 2 – Count of City of San Diego Vacant Units by Council District*

| Council District | SDG&E Data | | PUD Data |
|---|---|---|---|
| | Two Standard Deviations | Three Standard Deviations | |
| 1 | 304 | 121 | 201 |
| 2 | 614 | 301 | 273 |
| 3 | 984 | 488 | 300 |
| 4 | 217 | 64 | 345 |
| 5 | 97 | 30 | 120 |
| 6 | 213 | 75 | 165 |
| 7 | 301 | 88 | 169 |
| 8 | 375 | 197 | 387 |
| 9 | 507 | 148 | 178 |
| **TOTAL** | **3,612** | **1,512** | **2,138** |

## METHODOLOGY

The project team developed two methodologies to analyze the SDG&E data and PUD data, respectively. These methodologies were based on approaches used by other jurisdictions reviewed as part of the literature review for this study, along with a review of the available San Diego datasets.

The methodology developed to analyze the SDG&E data was informed by the Vancouver, British Columbia study, while the methodology developed to analyze the PUD data was informed by the Melbourne, Australia study. This section provides details on how each methodology was developed, tested, and used for this study to identify potentially vacant residential units in the City of San Diego.

### SDG&E Data Methodology

SDG&E provided anonymized monthly residential electricity data, allowing the project team to evaluate five calendar years (60 months) of electricity data for each residential unit within the City of San Diego. These data were mapped by census tract, using each record's unique premises ID. Each of the 468,352 residential unit records under study for the City of San Diego yielded 60 monthly billing cycles of information available for analysis.

The average monthly kWh usage was calculated for each premises ID, using a unit-specific average based on the unit's historical billing data. Using this "per unit" average, an outlier analysis was performed. Outlier analysis is the process of identifying abnormal observations in a dataset. Focusing on the variability of electric consumption within a specific residential unit provided greater insight into whether a unit could be deemed vacant rather than comparing individual units against each other.

The project team determined that unoccupied units were potentially vacant only if the utility data showed them to be unoccupied for at least six consecutive months based on that unit's average monthly electricity usage. Six consecutive months was selected as the threshold in accordance with the SDHC Board of Commissioners' request and because it is half of the calendar year and thus representative of a significant period of time for a unit to be unoccupied. Given the mild climate of San Diego, not much seasonal change in vacancy rates occurs, so this analysis did not consider seasonal changes in vacancy rates. Seasonal changes have been evident in other studies, including Vancouver, British Columbia. Jurisdictions with significant seasonal variances used three or four consecutive months to identify periods of vacancy.

Identifying consecutive months of a unit being unoccupied is important because a unit could have several unoccupied months over the course of the 60 months under study, yet never be considered potentially vacant due to high residential turnover, extended vacations, or other conditions likely to result in periods of low-energy usage data.

In rare instances, certain units were vacant for more than one six-month period within the 60 months under study. These scenarios were counted only once to maintain a consistent count of residential units across the five years of data analyzed. There were no readily apparent or significant differences in potential vacancy rates from year-to-year in the five years under study.

A unit was determined to be "unoccupied" if the usage for a particular month fell below three standard deviations of the unit's respective 60-month average. The Empirical Rule states that 99.7 percent of data observed following a normal distribution lies within three standard deviations of the mean. Any month with usage that fell below this threshold was considered an outlier and classified as unoccupied for that particular month.

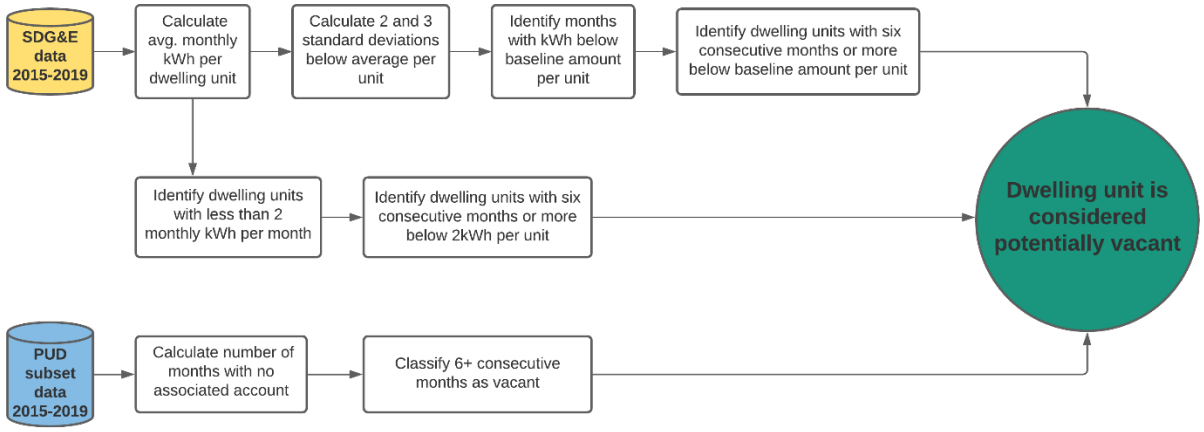
Using this analysis, the project team identified the number of monthly utility bills, out of 60, that fell more than three standard deviations outside of the average for that specific unit. For three standard deviations, the amount of potentially vacant properties was estimated at 1,512 out of 468,352 (0.32 percent).

As a comparison, the project team also conducted the data analysis using a cutoff of two standard deviations, in which 95 percent of the data fall within two standard deviations of the mean. This analysis yielded 3,708 potentially vacant units (0.79 percent). Based on monthly utility usage, between 1,500 and 3,700 units could reasonably be considered potentially vacant for six months or more in the City of San Diego in the period between 2015 and 2019.

The project team evaluated reporting the dwelling unit energy usage data using an approach based on both two standard deviations and three standard deviations from the unit's mean energy usage amount. Reporting two standard deviations would indicate more potential vacancies, with less statistical confidence in the results, while three standard deviations would yield greater confidence in the results, but would yield fewer records. Following this discussion, three standard deviations were considered to be the more conservative choice and were used in this report. At the same time, the results for two standard deviations are presented here for comparison, allowing the reader to understand the range of potential vacancies identified in the SDG&E monthly energy usage data.

Speculating, or otherwise determining, the reason for lower monthly totals was beyond the scope of this study. Residents may take vacations, travel for work, or transactions may result in a change in ownership or leasing of units over the course of weeks, or occasionally months, all of which could result in an individual unit falling below its own average use, thereby yielding an outlier designation.

Diagram of SDG&E data methodology



**PUD Data Methodology**

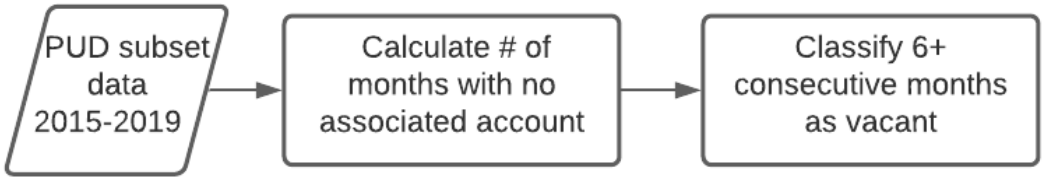
The City of San Diego Public Utilities Department (PUD) also provided data to the project team for analysis. PUD provided a list of 33,848 residential contract accounts that had active water meters, but no associated contract accounts at some point during the period under study between CY2015 and CY2019 (the same window of time evaluated using SDG&E data). The data PUD provided were a subset of all contract accounts from CY2015 through CY2019, approximately 252,324 individual metered residential accounts.

Each water meter record included a date range for when the property started and ended this condition, ranging from a period of a few days to, in rare cases, every month of the study period. Using the "six months consecutive" definition of potential vacancy consistent with the SDG&E data methodology, the project team considered a record to be potentially vacant if it had no active metering for six consecutive months or more.

Despite the similar definitions for potential vacancy, the analysis of PUD water usage data differs slightly from the SDG&E electricity data methodology in that PUD did not provide water consumption data, and thus the project team was not able to perform an outlier analysis on monthly usage amounts. Rather, PUD data provided a record of a binary on/off condition of the property's water meter.

A cursory field review using Google Streetview of approximately 25 percent of the roughly 60 extreme-duration records (those with 50 or more months of no active water meters) yielded a number of vacant properties, but appeared to also include vacant lots where no new development has yet occurred. Conducting a field review of all 33,848 records PUD provided was beyond the scope of this study.

Diagram of PUD data methodology



## LITERATURE REVIEW

The project team reviewed nine residential vacancy studies performed in the following eight jurisdictions to help inform the analysis performed in this study:

1. Vancouver, British Columbia
2. Toronto, Ontario
3. Washington, D.C.
4. Oakland, California
5. Los Angeles, California – Study 1
6. Los Angeles, California – Study 2
7. San Francisco, California
8. Richmond, California
9. Melbourne, Australia

A summary for each study is provided below and formatted as a table in the Appendix. Each summary includes the study author, year, definition of vacant, dataset(s) used, brief methodology overview, and the source. Note: Washington, D.C., and Richmond, California, have an existing vacancy tax, or are proposing a vacancy tax, but did not perform a formal vacancy study.

**Vancouver, British Columbia**

Author:
Ecotagious

Year:
2016

Definition of vacant:
A unit that was unoccupied for 25 or more days within the non-heating months of August and September, then the following June and July.

Dataset(s) used:
BC Hydro electricity consumption data from CY 2002-2014

Methodology overview:
Occupancy was analyzed separately in periods of 2 months, 4 months, and 12 months. Twelve months was ultimately used for the analysis. The first year of electricity data was removed for each home in the City of Vancouver data to account for distortion of newly built homes.

The data were displayed using Vancouver's five geographic sectors and split into the following three major housing types:

1. Apartments
2. Rowhouses
3. Single-Family Dwellings and Duplexes

Findings:
The City of Vancouver had a vacancy rate of 4.8 percent in 2014 across all housing units.

Source:
https://council.vancouver.ca/20160308/documents/rr1EcotagiousReport.pdf

**Toronto, Ontario**

Author:
Deputy City Manager & Chief Financial Officer

Year:
2017

Definition of vacant:
Vacancy was not defined in the initial 2017 report. The initial report drafted by the Deputy City Manager and Chief Financial Officer in 2017 compared hydro (electricity) and water consumption data and building permit data, but did not define how vacancy was determined from the data. The definition of how a home is deemed vacant will be part of the tax development process. City staff are expected to report back to Council in late 2021.

Dataset(s) used:
Hydro and water consumption data
Building permit data

Methodology overview:
n/a

Findings:
n/a

Source:
https://www.toronto.ca/legdocs/mmis/2017/ex/bgrd/backgroundfile-104734.pdf

Additional resources:
https://www.toronto.ca/news/city-council-approves-an-implementation-plan-for-a-tax-on-vacant-homes-in-toronto/
https://www.toronto.ca/wp-content/uploads/2017/10/969d-PRESENTATION-Implementing-a-Vacant-Home-Tax-In-Toronto-Aug22.pdf
https://www.toronto.ca/legdocs/mmis/2018/ex/bgrd/backgroundfile-113808.pdf

**Washington, D.C.**

Author:
n/a

Year:
n/a

Definition of vacant:
When a building becomes vacant and the owner is not actively seeking to rent or sell the building, or the building is not underdoing active construction or subject to probate or litigation, or pending application for development.

Dataset(s) used:
The current Washington, D.C., vacant tax program is a self-regulating system that requires owners to register a vacant building with the Mayor within 30 days of the unit becoming vacant. Vacant properties are taxed at varying rates. Class 3 properties, vacant commercial and resident properties, are taxed at $5.00 per $100 of assessed value. Class 4, blighted properties, are taxed at $10.00 per $100 of assessed value. "

Methodology overview:
n/a

Findings:
n/a

Source:
http://dccode.elaws.us/code?no=42-3131.06
https://dcra.dc.gov/node/514292
https://otr.cfo.dc.gov/page/otr-vacant-real-property

Additional resources:
https://www.bizjournals.com/washington/stories/2003/01/13/newscolumn2.html
https://d3n8a8pro7vhmx.cloudfront.net/silverman/pages/57/attachments/original/1454440578/Vacant_Property_Enforcement_Amendment_Act_of_2016.pdf?1454440578

**Oakland-Hayward-Berkeley, California**

Author:
U.S. Department of Housing and Urban Development (HUD)

Year:
2017

Definition of vacant:
A housing unit is vacant if no one is living in it at the time of the Census interview, unless its occupants are only temporarily absent. A unit is considered occupied if it is the occupant's primary residence.

Dataset(s) used:
U.S. Census Bureau

Methodology overview:
The Census Bureau collects data by surveying respondents directly and from additional federal, state and local government data. The census defines vacancy in two housing markets, the sales housing market and the rental housing market. The analysis performed for the Oakland-Hayward-Berkeley Housing Market Area compared vacancy of sales market and rental market, as well as expected demand and homes currently under construction.

Findings:
The sales housing market had an estimated sales vacancy rate of 0.6 percent. The overall apartment vacancy rate was 2.7 percent.

Source:
https://www.huduser.gov/portal/publications/pdf/OaklandCA-comp-17.pdf

Additional sources:
https://www.oaklandca.gov/news/2019/measure-w-outreach-and-civic-engagement-forums#:~:text=On%20November%206%2C%202018%2C%20Oakland,a%20margin%20of%2070.04%20percent

**Los Angeles, California – Study 1**

Author: Strategic Actions for a Just Economy, Anti Eviction Mapping Project, and UCLA Community Economic Development Law Clinic

Year: 2020

Definition of vacant:
A housing unit is vacant if no one is living in it at the time of the American Community Survey (ACS) Census interview.

Dataset(s) used:
2017 ACS 5-year estimates
2017 Individual Public Use Microdata Statistics (IPUMS)
Los Angeles County Assessor Data

Methodology overview:
Researchers performed a geographic information system (GIS) analysis of ACS vacancy data by census tract then analyzed the LA County Assessors data to identify the percentage of units and vacant lots owned by corporate entities/non-individual owners and private owners. Researchers performed a correlation analysis of the number of ACS vacant buildings survey and the monthly cost of rent. The same correlation analysis was performed for structures built before 1980 and structures built in 1980 or later. These analyses were performed to understand correlation of vacancy and the increasing high-end housing production occurring in Los Angeles. In addition, Ellis Act filling data was compared to census tract vacancy rate.

Findings:
Researchers found the higher the unit rent, the more likely the unit is vacant. These findings indicate a relative oversupply of high-rent housing and an undersupply of low-rent housing. The report determined 93,500 housing units were vacant in 2017. The report did not include the total number of housing units studied to calculate the percent vacant.

Source:
https://www.saje.net/wp-content/uploads/2020/09/The_Vacancy_Report_Final.pdf

**Los Angeles, California – Study 2**

Author:
Los Angeles Housing + Community Investment Department

Year:
2020

Definition of vacant:
Vacancy is defined differently across each dataset used.

- American Community Survey (ACS) a housing unit as vacant if no one is living in the unit at the time of the ACS census interview;
- United States Postal Service (USPS) defines a unit as vacant if the mail has not been collected by the address in 90 days;
- Los Angeles Department of Water and Power (LADWP) defines vacant as a house that is not receiving electricity service;
- CoStar (a market research company) defines a unit as vacant when the rental unit is not occupied by a tenant regardless of any lease obligation.

Dataset(s) used:
- ACS
- USPS
- LADWP
- CoStar

Methodology overview:
The following study included a spatial analysis and quantitative analysis. The spatial component compared total vacant units, according to LADWP and ACS data, using the census tract geographies within the City of Los Angeles' 15 Council Districts. Then CoStar data was used to perform an analysis of vacancy rates by CoStar's 5-star rating scale. The scale is determined by properties' amenities, quality, and design.

Findings:
The study estimates a citywide vacancy rate between 6 percent and 7 percent (85,000 - 100,000 units).

Source:
http://clkrep.lacity.org/onlinedocs/2019/19-0623_rpt_HCI_06-12-2020.pdf

**San Francisco, California**

Author:
Paige Dow

Year:
2018

Definition of vacant:
Gross vacancy rate is calculated based on the number of vacant units divided by the total number of housing units. It captures all vacant units, including those owned or rented but not occupied for a variety of reasons. A unit is determined vacant by site visit. For a unit to be classified as vacant by the ACS staff, it must meet certain conditions. The unit must be considered habitable. If the unit is newly constructed but not yet occupied, there must be floors and windows for it to be considered a vacant unit. The unit must be intended for residential use; a vacant commercial unit would not be counted as a vacant housing unit. If a housing unit meets these conditions, and its occupancy is determined to be vacant, then ACS staff conduct a "vacant interview" with an informed respondent such as a neighbor, property manager, real estate agent, or other informants to gather information about the unit and why it might not be occupied. Through this method, the unit is placed into one of the six vacancy categories: For Rent; For Sale; Rented or Sold, Not Yet Occupied; For Seasonal, Recreational, or Occasional Use; For Migratory Workers; and Other Vacant.

Dataset(s) used:
Primary data: Census, ACS, and Public Use Microdata (PUMs)
Secondary data: For-profit Single-Room Occupancies (SROs), Airbnb listing data, and Department of Building Inspections permit data

Methodology overview:
ACS and Census data were used to conduct initial analysis on geographic concentration on vacancy, characteristics of vacant units, and trends in vacancy over time. For-profit SRO address data was geocoded and mapped in relation to vacant units. The SRO data also included the number of vacant residential units in all of the for-profit SROs in 2015. Airbnb data provided by the Office of Short-Term Rentals provided insight into how many units were full-time, entire-unit Airbnb rentals, and where those units were concentrated in the City. Permit data from the Department of Building Inspections provided a method to look at increases in major renovations to the housing stock that may be causing entire units to be vacant in the City by using permit cost as a proxy for whether or not a renovation is a "major" renovation.

Findings:
Approximately 8.6 percent or 33,000 units were vacant at the time of the ACS estimate in 2015.

Source:
https://ternercenter.berkeley.edu/wp-content/uploads/pdfs/CR_Final_2.3.19.pdf

**Richmond, California**

Author:
Mayor Tom Butt

Year:
2018

Definition of vacant:
A property is classified as vacant if it is in use fewer than 50 days during a calendar year. This includes undeveloped private property, vacant commercial and industrial buildings, and vacant residential units.

Dataset(s) used:
Mayoral Staff provided estimates, but did not provided information on the vacancy data.

Methodology overview:
n/a

Source:
http://www.tombutt.com/forum/2018/18-8-3.html#_ftnref1

Findings:
Mayoral staff estimate between 980 and 1,180 vacant parcels are in Richmond and 250 vacant structures, most of which are abandoned residences. This memo did not include total number of units studied.

**Melbourne, Australia**

Author:
Prosper Australia

Year:
2013

Definition of vacant:
A unit was considered vacant if it used fewer than 50 liters of water per day averaged over a 12-month period.

Dataset(s) used:
Water consumption data from CY2012.

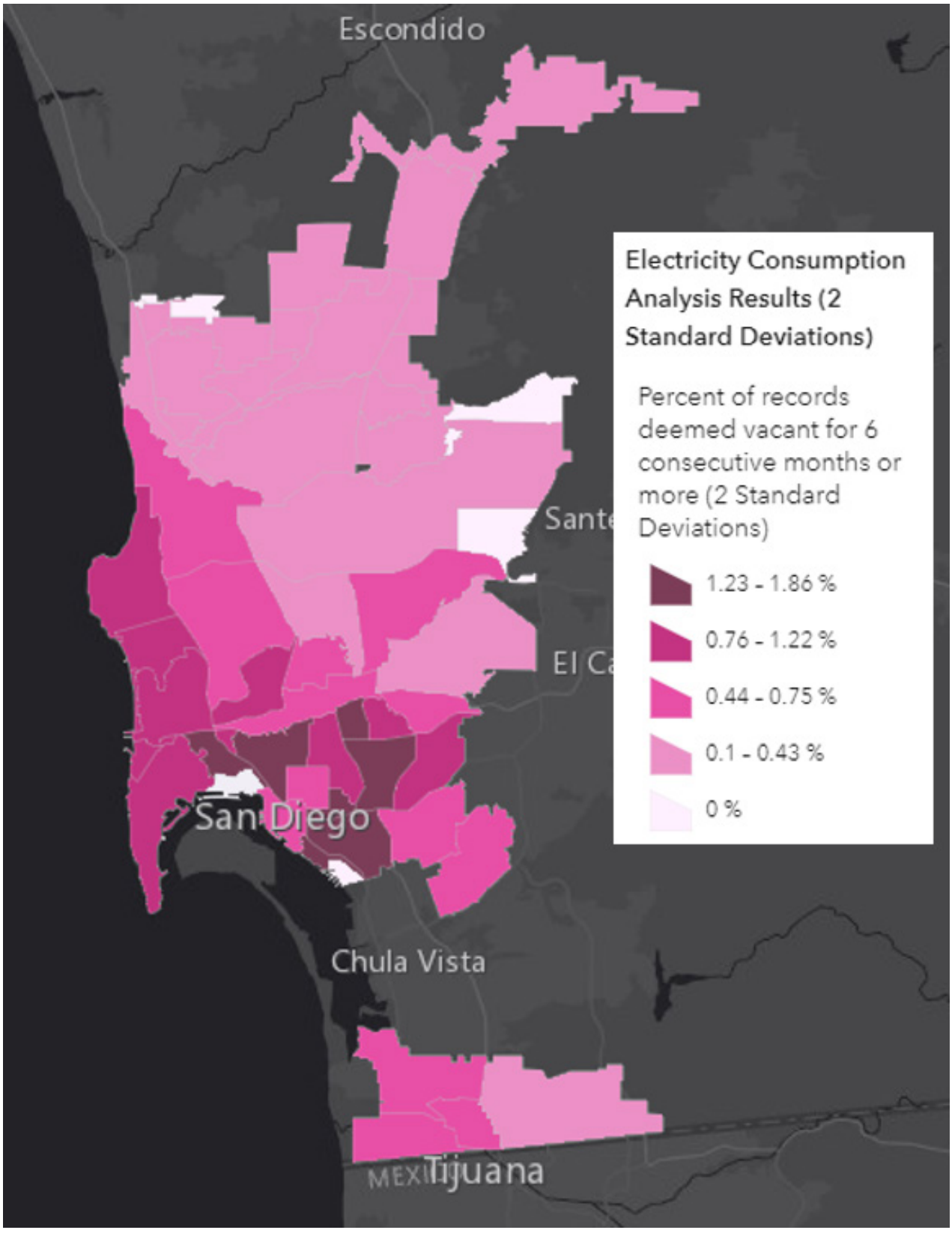
Methodology overview:
Water consumption data for residential and commercial units were sourced from Melbourne's six water retailers. Average water consumption of households was calculated from quarterly meter readings in a one-year period. The residential daily per capita water consumption in Melbourne in 2012-13 was 161 liters per day (LpD). As such, a unit was considered vacant if it used fewer than 50 liters of water per day on average over a 12-month period.

Findings:
Approximately 4.4 percent of residential properties were potentially unused in 2013.

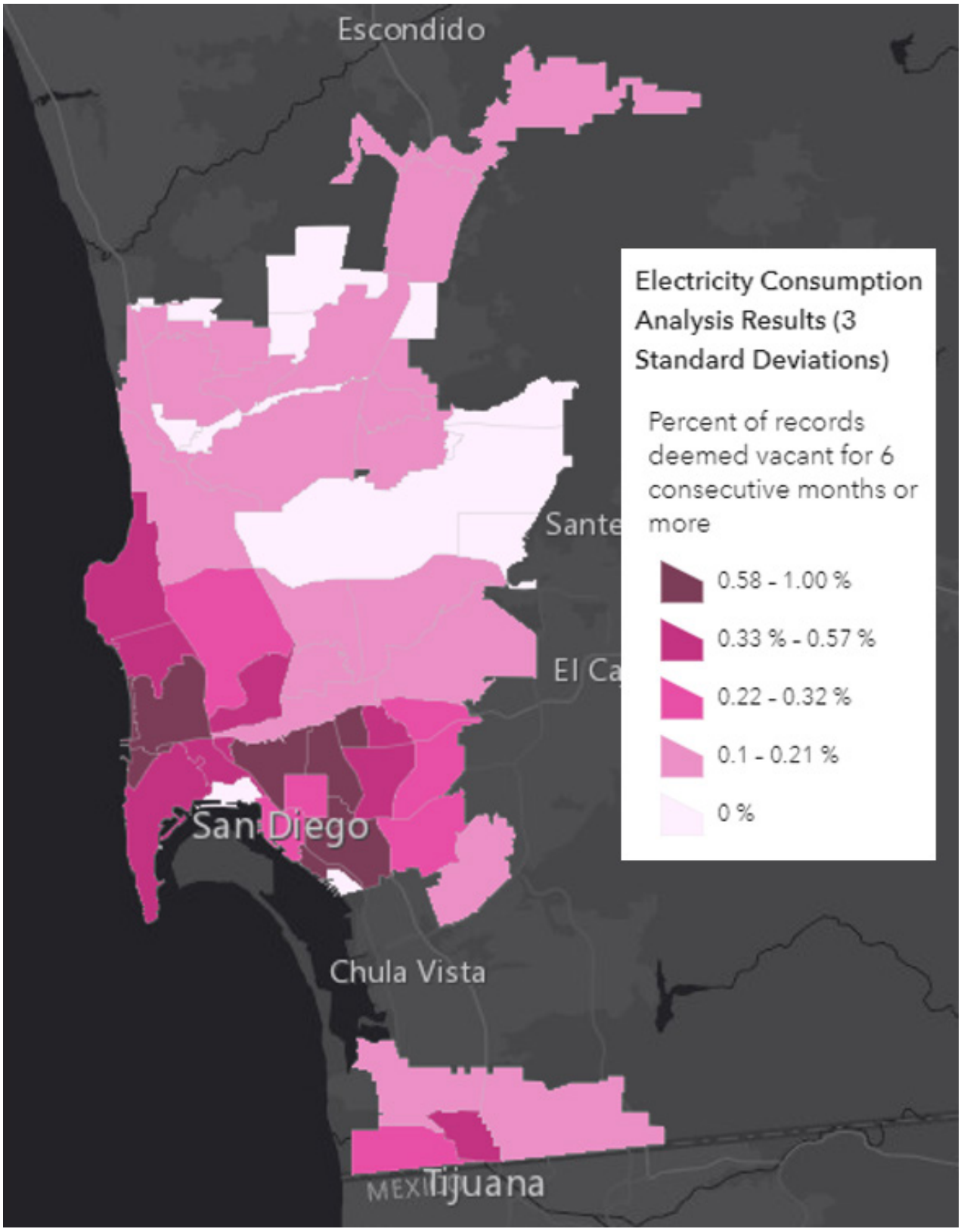
Source:
http://www.prosper.org.au/wp-content/uploads/2013/11/Prosper%20SVMR_2013_final.pdf

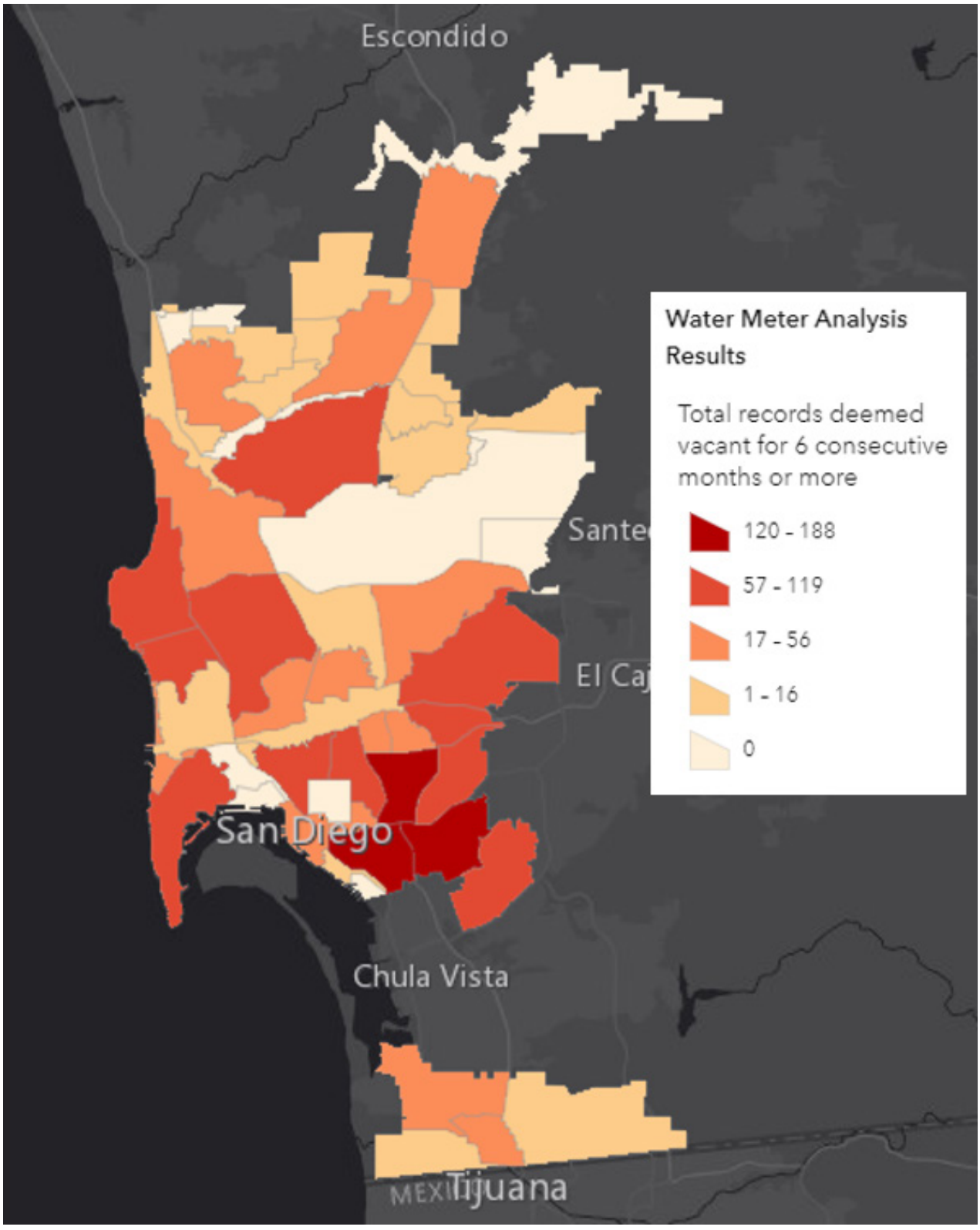
# Appendix

***Community Electricity Consumption Analysis Results (2 Standard Deviations)***

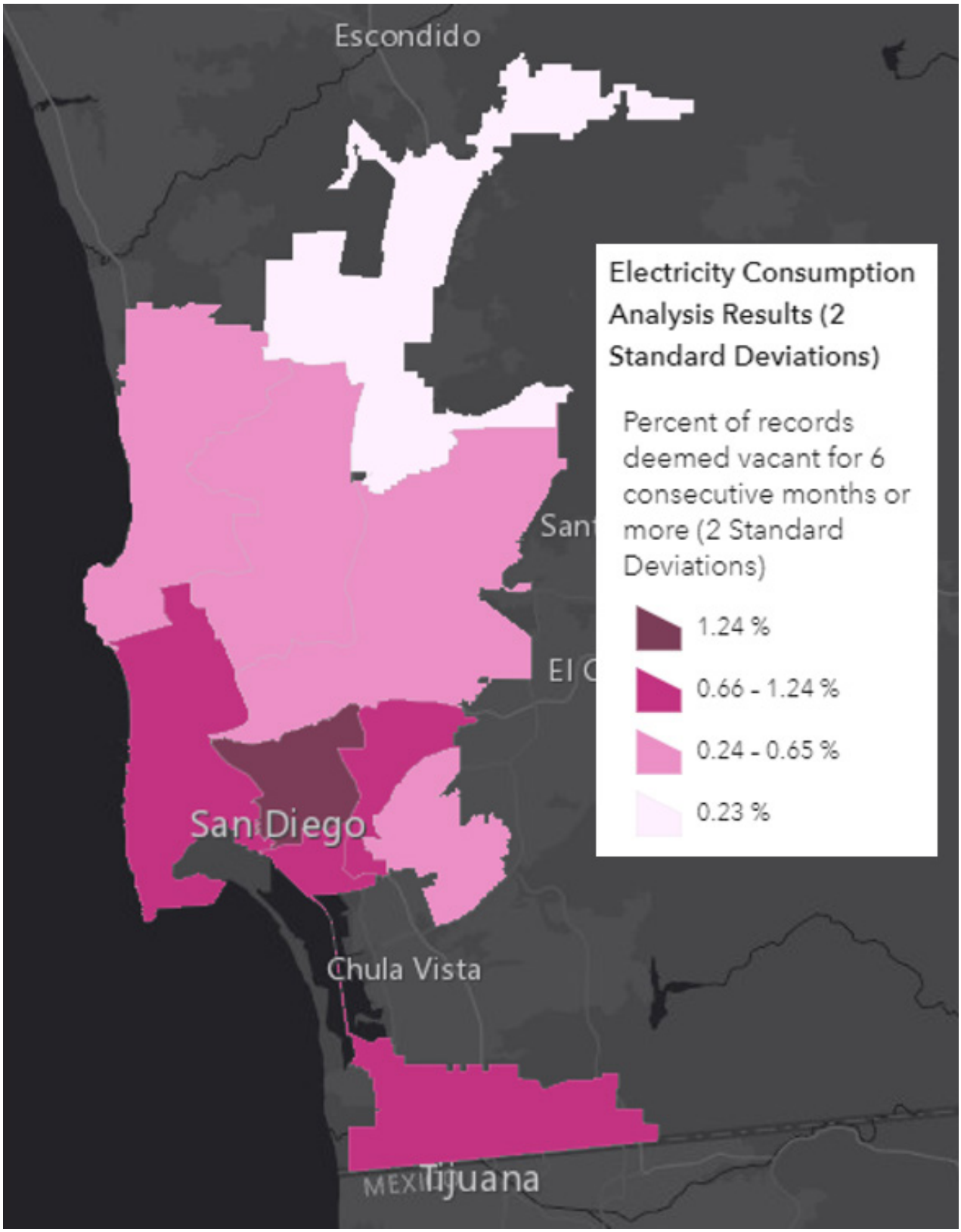


***Community Electricity Consumption Analysis Results (3 Standard Deviations)***

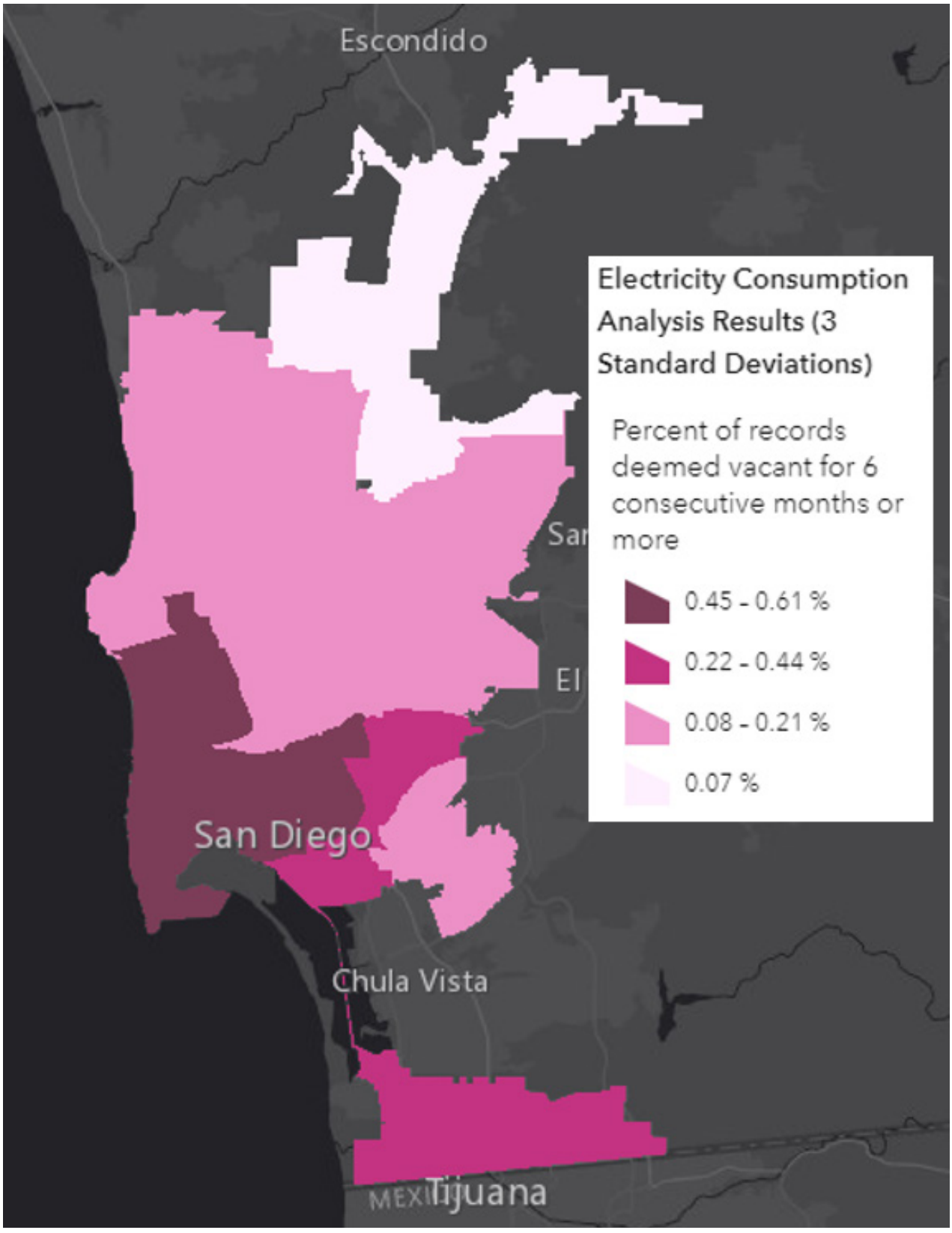


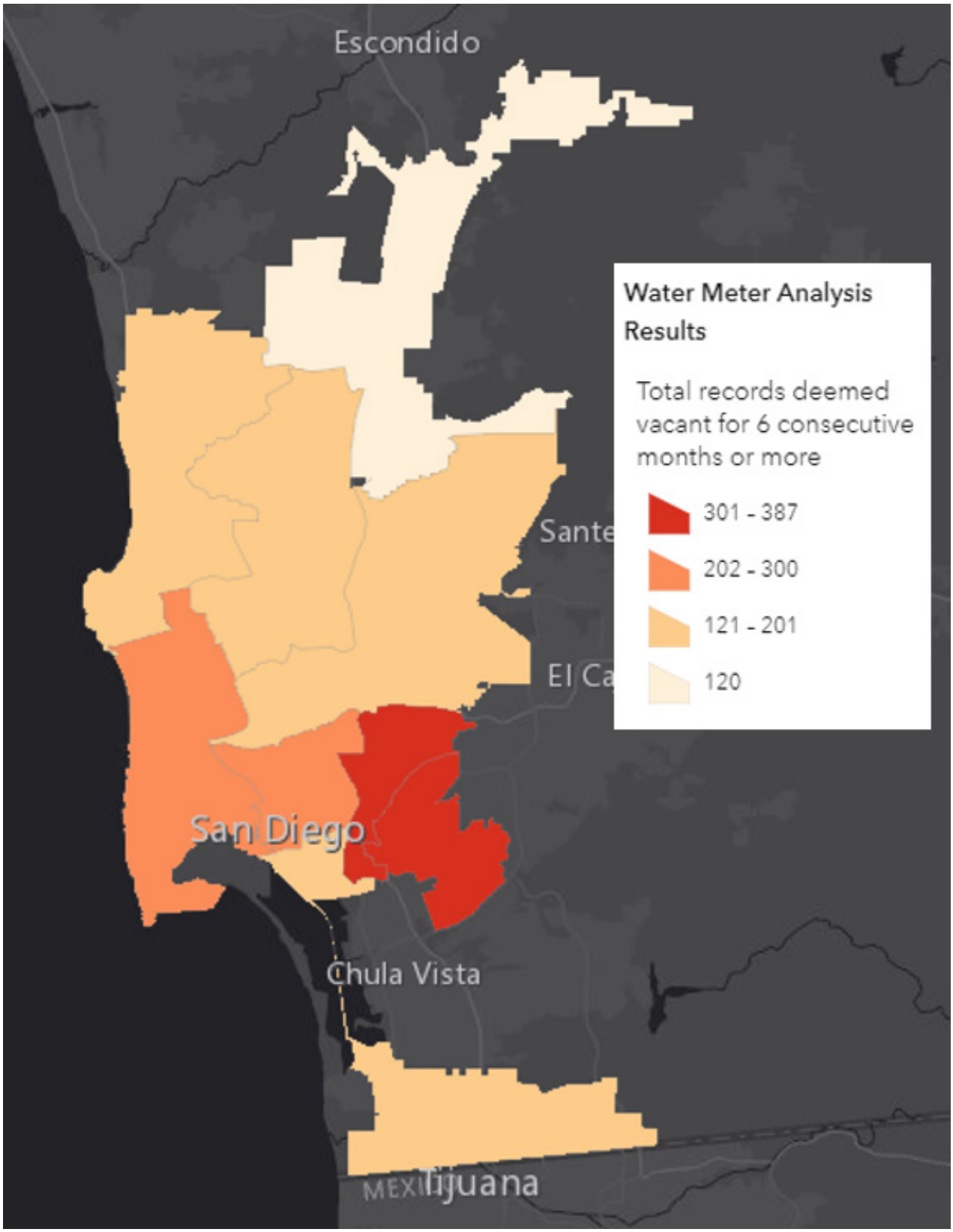

Escondido
Water Meter Analysis Results
Total records deemed vacant for 6 consecutive months or more
120 - 188
57 - 119
17 - 56
1 - 16
0
San Diego
Chula Vista
Tijuana

***Council Electricity Consumption Analysis Results (2 Standard Deviations)***

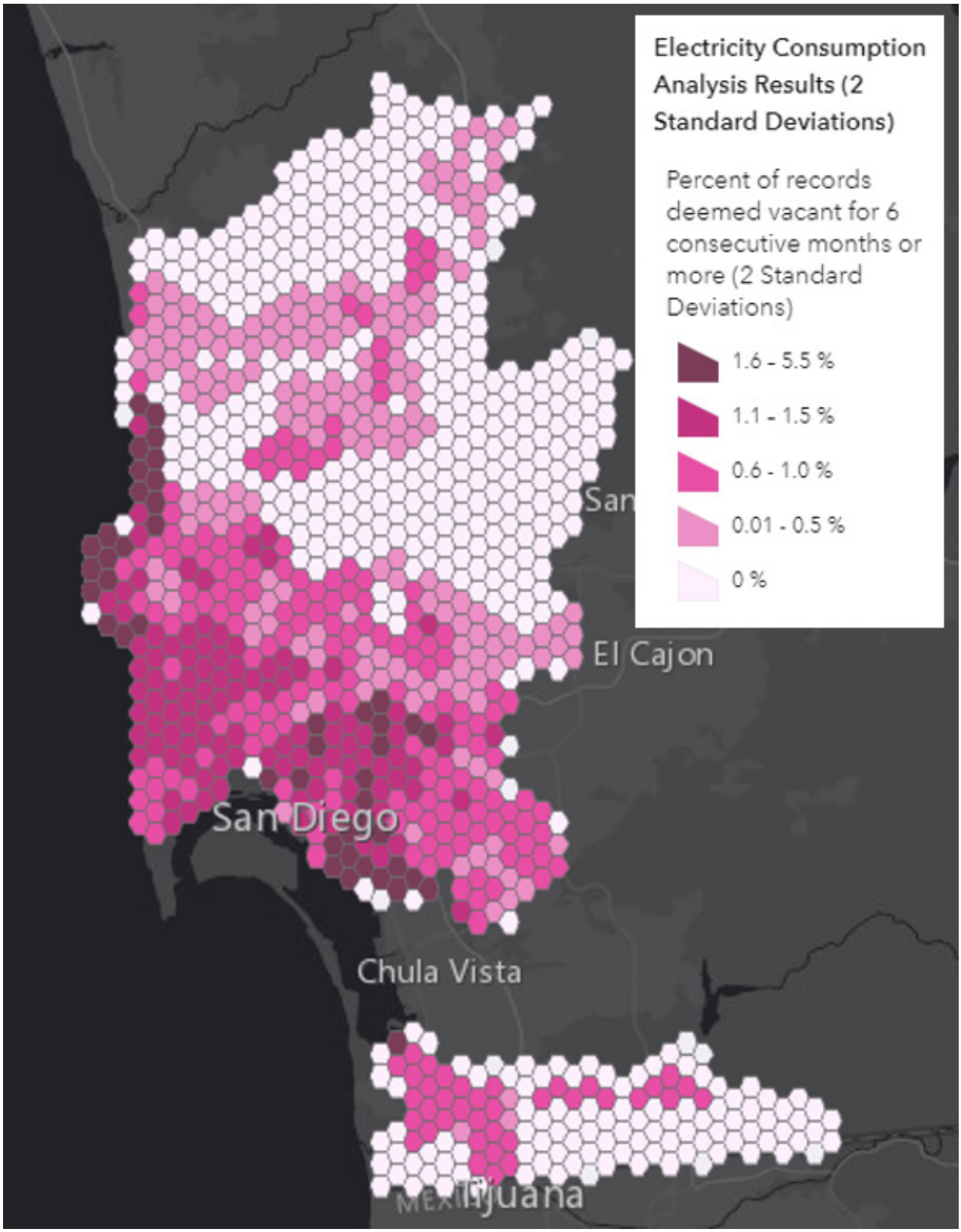


***Council Electricity Consumption Analysis Results (3 Standard Deviations)***

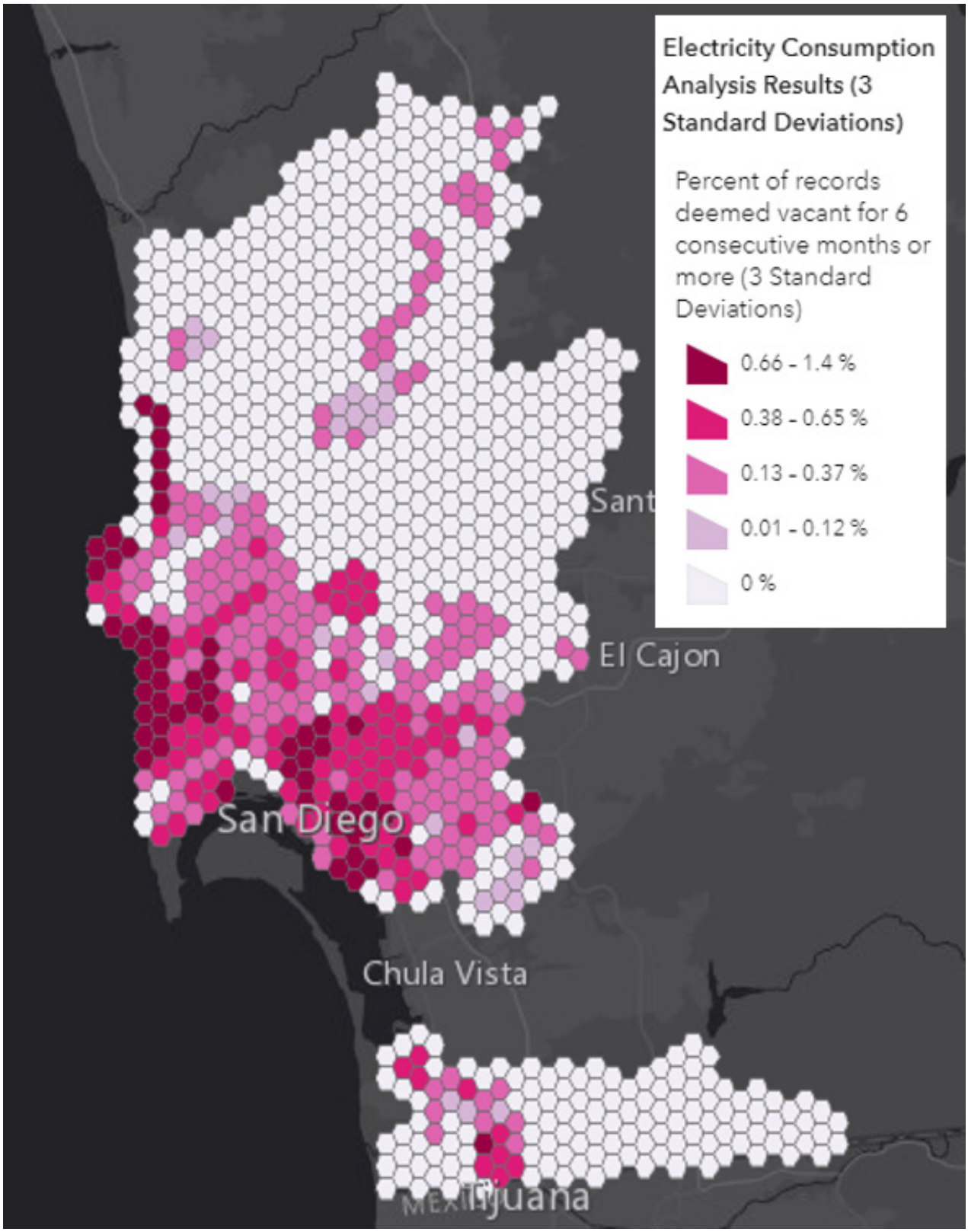



Escondido
Water Meter Analysis Results
Total records deemed vacant for 6 consecutive months or more
301 - 387
202 - 300
121 - 201
120
Sante
El Ca
San Diego
Chula Vista
MEXI
Tijuana

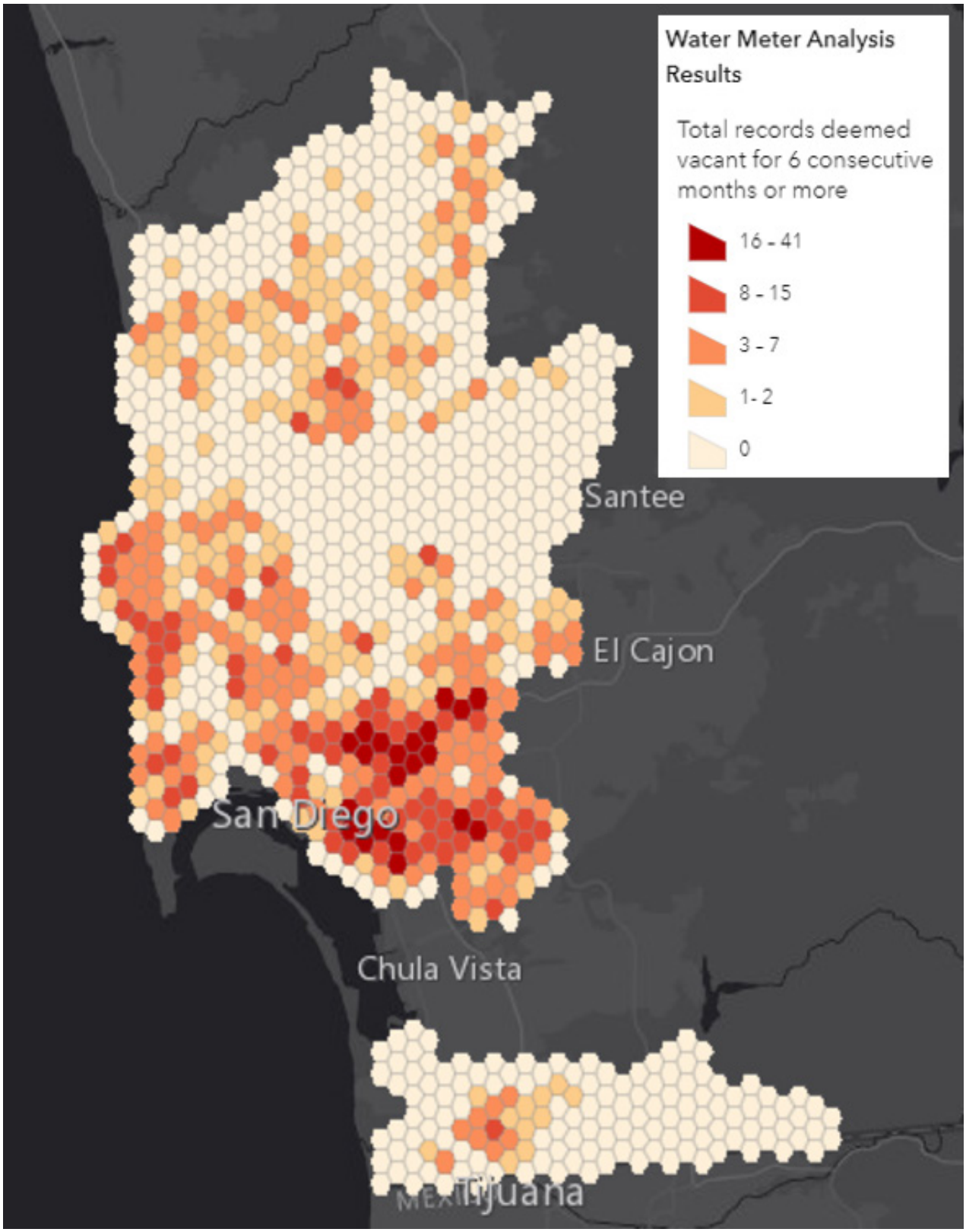
### *Hexbin Electricity Consumption Analysis Results (2 Standard Deviations)*



### *Hexbin Electricity Consumption Analysis Results (3 Standard Deviations)*



### *Hexbin Water Meter Analysis Results*



| SDHC Vacancy Study: Preliminary Methodology Research for GIS Literature Review | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | **Vancouver, CAN** | **Toronto, CAN** | **Washington D.C.** | **Oakland-Hayward-Berkeley, CA** | **Los Angeles, CA - Study 1** | **Los Angeles, CA - Study 2** | **San Francisco, CA** | **Richmond, CA** | **Melbourne, AUS** |
| **Year of Study** | 2016 | 2017 | n/a | 2017 | 2020 | 2020 | 2018 | 2018 | 2013 |
| **Author(s)** | Ecotagious | Deputy City Manager & Chief Financial Officer | n/a | U.S. Department of Housing and Urban Development (HUD) | Strategic Actions for a Just Economy, Anti Eviction Mapping Project, and UCLA Community Economic Development Law Clinic | Los Angeles Housing + Community Investment Department | Paige Dow | Mayor Butt | Prosper Australia |
| **Definition of Vacant** | When a unit was unoccupied for 25 or more days within the non-heating months of August and September, then the following June and July. | n/a; Vacancy was not defined in the initial 2017 report and will defined during the tax development process. City staff are expected to report back to Council in late 2021 with an proposed vacancy tax update. The initial report drafted by the Deputy City Manager & Chief Financial Officer in 2017 compared hydro (electricity) and water consumption data and building permit data, but did define how vacancy was determined from the data. | When a building becomes vacant and the owner is not actively seeking rent or selling the building, or the building is not undergoing active construction or subject to probate or litigation, or pending application for development. | A housing unit is vacant if no one is living in it at the time of Census interview, unless its occupants are only temporarily absent. A unit is considered occupied if it is the occupant's primary residence. | A housing unit is vacant if no one is living in it at the time of the interview and if the occupant has plans to stay in the unity for two or more months. (ACS definition). | Vacancy is defined differently across each dataset used. | Gross vacancy rate is calculated based on the number of vacant units divided by the total number of housing units. A unit is determined vacant by site visit. For a unit to be classified as vacant by the ACS staff, it must meet certain conditions. | A property is dassified as vacant if it is in use less than 50 days during a calendar year. This in dudes un developed private property, vacant commercial and industrial buildings, and vacant residential units. | A unit was considered vacant if it used less than 50 liters of water per day averaged over a 12-month period. |
| **Dataset(s) Used** | BC Hydro electricity consumption data from 2002-2014 | Hydro and water consumption data + Building permit data | n/a; but vacant tax program is a self-regulating system that requires owners to submit application within 30 days of the unit becoming vacant. | U.S. Census Bureau | 2017 ACS 5-year estimates; 2017 Individual Public Use Microdata Statistics (IPUMS); Los Angeles County Assessor Data | ACS, USPS, LADWP, and CoStar | Determined? | Mayoral Staff provided estimates, but did not provided information on the vacancy data. | Water consumption data from 2012 |
| **Methodology Overview** | Occupancy was analyzed separately in periods of 2 months, 4 months, and 12 months. Twelve months was ultimately used for the analysis. The data was displayed using Vancouver's five geographic sectors and split into the following three major housing types: (1) Apartments, (2) Rowhouses, and (3) Single Family Dwellings and Duplexes. | n/a | n/a | The Census Bureau collects data from surveying respondents directly and from additional federal, state, and local governments data. The census defines vacancy into two housing markets, the sales housing market and the rental housing market. The analysis performed for the Oakland-Hayward-Berkeley Housing Market Area compared vacancy of sales market and rental market, as well as expected demand and homes currently under construction. | Researchers performed a GIS analysis of ACS vacancy data by census tract then analyzed the LA County Assessors data to identify the percent of units and vacant lots owned by corporate entities/non-individual owners and private owners. Researchers performed a correlation analysis of the number of ACS vacant buildings survey and the monthly cost of rent. The same correlation analysis was performed for structures built in 1980 or later and structures built before 1980. These analyses were performed to understand correlation of vacancy and the increasing high-end housing production occurring in Los Angeles. In addition, Ellis Act filling data was compared to census tract vacancy rate. | The following study included a spatial analysis and quantitative analysis. The spatial component compared total vacant units, according to LADWP and ACS data, using the census tracts geographies within the City of Los Angeles' 15 Council Districts. Then CoStar data was used to perform an analysis of vacancy rates by CoStar's 5-star rating scale. The scale is determined by properties amenities, quality, and design. | ACS and Census data were used to conduct initial analysis on geographic concentration on vacancy, characteristics of vacant units, and trends in vacancy over time. For-profit SRO address data was geocoded and mapped in relation to vacant units. The SRO data also included the number of vacant residential units in all of the for-profit SROs in 2015. Airbnb data provided by the Office of Short-Term Rentals provide insight into how many units are full-time, entire-unit Airbnb rentals, and where those units are concentrated in the City. Permit data from the Department of Building Inspections provided a method to look at increases in major renovations to the housing stock that may be causing entire units to be vacant in the City by using permit cost as a proxy for whether or not a renovation is a "major" renovation. | n/a | Water consumption data for resident and commercial units was sourced from Melbourne's six water retailers. Average water consumption of households was calculated from quarterly meter readings in a year period. The residential daily per capita water consumption in Melbourne in 2012-13 was 161LpD. As such, a unit was considered vacant if it used fewer than 50 liters of water per day on average over a 12-month period. |
| **Findings** | The City of Vancouver had a vacancy rate of 4.8% in 2014 across all housing units. | n/a | n/a | The sales housing market had an estimated sales vacancy rate of 0.6 percent. The overall apartment vacancy rate was 2.7 percent. | Researchers found the higher the unit rent, the more likely the unit is vacant. 93,500 housing units were vacant in 2017. Report did not include total number of housing units studied to calculate percent vacant. | The study estimates a citywide vacancy rate between 6% to 7% (85,000 - 100,000 units). | Approximately 8.6 percent or 33,000 units were vacant at the time of the ACS estimate in 2015. | Mayoral Staff estimate between 980 and 1,180 vacant parcels in Richmond and 250 vacant structures, most of which are abandoned residences. This memo did not indude total number of units studied. | Approximately 4.4% of residential properties were potentially unused. |
| **Source** | Link | Link | Link to DC Official Code § 42-3131.06 | Link | Link | Link | Link | Link to Memo from Mayor Tom Butt | Link |

| SDHC Vacancy Study: Preliminary Research on Cities with a Vacancy Tax | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **Vancouver, CAN** | **Toronto, CAN** | **Washington, D.C.** | **Oakland, CA** | **Los Angeles, CA** | **San Francisco, CA** | **Melbourne, AUS** | **Richmond (Contra Costa, CA)** |
| **Summary** | The Vancouver Empty Homes Tax has been used as a model for most of the other cities adopting, or considering, a vacancy tax. Their definitions and tax structure are echoed throughout most programs we were able to find in North America. | Tax was passed by Toronto City Council Dec 2020, Tax development will take place in 2021 and should take effect in 2022. | Washington, D.C. has different tax "classes" so what we consider a vacancy class is the tax on class 3 and 4. They do not have a separate account for these funds. | Oakland's Vacancy Tax was approved by voters in 2018, | A Vacancy Tax should be on the ballot in 2022, this was originally set to be on the 2020 ballot but the LA city council didn't think the program was detailed enough and pushed it to 2022. | San Francisco's vacancy tax only applies to retail properties and has been delayed to 2022 due to the pandemic. | 2021 vacant residential land tax has been waived as part of the Victorian Government's coronavirus relief measures, this was passed in 2018 and the major difference in their model is they use a "self identification method" | Was on the 2018 ballot but did not receive enough votes- looking to potentially try again in 2022 although a recent presentation to their city council said it may not pass again. |
| **Vacancy Definition:** | Unoccupied for more than six months during the tax year (Jan 1 – Dec 31). | Proposed: A minimum 6-month occupancy period within a 12-month calendar reference year | 4 different classes of properties. Class 3 & 4 (defined below) are included in the vacancy tax. | It is in use less than fifty (50) days during a calendar year | TBD | Empty for more than six months | Properties are considered vacant if they have not been lived in for at least 6 months (collectively) of the preceding calendar year. The occupation does not need to be by the same occupant or for a single continuous period. | A condominium, duplex, or townhouse residential unit under separate ownership that is in active use less than 50 days during a calendar year. A developed / undeveloped parcel of land that is in active use less than 50 days during a calendar year. |
| **Tax applies to:** | Vacant Residential Property | Vacant Residential Property | Vacant/ Blighted property (both residential and commercial) | Vacant Property (both residential and commercial) | Vacant Residential Rental Property | Retail Property | Residential only | Vacant Developed/ Undeveloped Parcels (both residential and commercial) |
| **Tax structure:** | The rate of the Empty Homes Tax was initially 1% of assessed property value 1.25% of assessed property value as of 2020, now increased to 3% | TBD, although a 1% of property assessed taxable value was used as an example | Class 3, vacant property, is taxed at $5.00 per $100 of assessed value and Class 4, blighted property, is taxed at $10.00 per $100 of assessed value. | $3,000 to $6,000 on vacant property (Residential- $6,000, Condominium, duplex, or townhome unit under separate ownership- $3,000, Undeveloped- $6,000) | TBD | Tax on retail properties starting at $250 per linear foot of store frontage in the first year, then doubling to $500 in year two and peaking at $1,000 for each year after. | 1% of assessed property value | The tax imposed by this chapter shall be at the rate of $3k annually per vacant developed parcel; $6k annually per vacant undeveloped parcel; $3k annually per vacant residential unit for condominiums, duplexes, or townhouse units under separate ownership<br><br>The Richmond ordinance states: "Developed parcel" means all parcels, regardless of zoning or other land use designation, upon which permanent improvements have been constructed or placed |
| **Recurrence of Tax:** | Annually | Proposed: Annually | Annually | Annually | Annually | Annually | Annually | Annually |
| **Length of Tax:** | 20 years | TBD | No end date stated | 20 years | TBD | Not Stated | Not stated | 20 years |
| **Vacancy reference period (taxable reference period)** | Calendar Year, Jan- Dec | TBD | Calendar Year, Jan- Dec | Calendar Year, Jan- Dec | TBD | Calendar Year Jan-Dec | Calendar Year Jan- Dec | Calendar Year, Jan- Dec |
| **Year Tax Began:** | 2017 | to begin in 2022 | 2011 | Approved by voters in Nov. 2018 (Measure W)<br><br>Tax took effect 2019 | TBD - LA to vote on this on 2022 ballot | delayed until 2022 due to pandemic | January 1, 2018 | Was on the 2018 ballot but did not receive enough votes- looking to potentially try again in 2022 although a recent presentation to their city council said it may not pass again. |
| **Name of Tax (for reference)** | The Empty Homes Tax is also known as the Vacancy Tax | TBD | Fiscal Year 2011 Budget Support Act of 2010 | Oakland Vacant Property Tax ("VPT") | TBD | Proposition D San Francisco Vacant Property Tax | Vacant Residential Land Tax | Special Parcel Tax on Vacant Property |
| **Enforcement** | Collector of Taxes must review the property status declaration and must determine whether or not the parcel is taxable property | Proposed: Universal declaration – where all residential property owners are required to make a declaration – choices of occupied, vacant, vacant with exemption; and if no declaration is made, the property is deemed vacant | Department of Consumer and Regulatory Affairs receives complaints, identifies and processes the registration of vacant properties by owners, and administers certain fines if property owners do not register. DCRA also inspects properties, completes an annual survey of vacant properties, and certifies a list of vacant improved properties to Office of tax & revenue | The City Administrator may develop methods to identify, based on objective, available data, properties that are most likely to be vacant | Proposed self reporting by homeowners and additional monitoring by city. | TBD | Only residential property owners with vacant properties are required to make a declaration ("self-identification")<br><br>Random checks<br>—Tips and notifications from general public<br>—Audits selected based on risk assessment and data from other state/federal agencies | The City Council shall establish, by ordinance, a method for determining and identifying the use and vacancy status of each parcel of real property in the City. |
| **Funding Information:** | Net revenues from the Empty Homes Tax will be reinvested into affordable housing initiatives. | Proposed: funds will be applied to the creation of affordable housing | This is not a separate affordable housing fund. | City Council budgeted $7 million generated from the tax to be used in the 2020-21 fiscal year to pay for a homeless commission, a pilot program to create self-governed homeless encampments, grants for housing accessibility improvements, a mobile homeless outreach team, surveillance cameras to catch illegal dumping and crews to pick up dumped trash. | Proposed: Homelessness services and programs., Other Preservation of existing affordable housing and production of new affordable housing. Maintain and clean-up blighted properties. To create a Commission on Homelessness that make funding decisions, as established by the voter approved measure. Administrative costs associated with tax. | TBD | Introduced this tax to help address the lack of housing supply in Victoria. | A separate account the Vacant Property Tax Fund, for the funding of programs and services for homeless people, to reduce homelessness, and to support the provision of affordable housing |