

To SACOG
From Steer
Date November 15, 2024
Project **Mobility Zones**

Memo

Equity Priority Community Methodology

This memorandum summarizes the methodology for identifying Equity Priority Communities (EPCs) for the SACOG Mobility Zones project. EPCs are the foundation of the Mobility Zones project, which aims to prioritize investments in communities that have been historically marginalized or underserved by transportation decisions. This document provides context on the EPC development process and details the technical methodology and analytics used to define EPCs.

Overview

The purpose of developing EPCs is to identify communities that have historically been most marginalized and underserved by transportation projects. EPCs are the starting point for identifying Mobility Zones. The EPC methodology predominantly focuses on demographic characteristics within communities, rather than broader mobility concerns, including barriers to access and quality of life issues. These considerations will be layered onto the evaluation once EPCs have been established and will be used to identify Mobility Zones.

The EPC methodology aims to assess community needs uniformly across the SACOG region while also providing counties with the flexibility to tailor their equity priorities to their local context. To achieve this flexibility, input from the project's Community Committees and a regional public survey were used to assign unique weights to the Equity criteria for each county. The results of the weighted evaluation were shared with Community Committees in October 2024 and the Mobility Zones Task Force approved the results at their November 2024 meeting. The SACOG Board will take an action to approve the EPCs in December 2024.

EPC Criteria

The Mobility Zones evaluation framework includes ten criteria under the Equity goal, shown in Table 1. These criteria were developed and refined through an iterative process based on research and best practice, Committee input, and data availability. Table 1 also shows how each criterion was measured, and the data source used to conduct the evaluation.

Table 1 Equity Criteria

Criteria	Measurement	Data Source	Geography
Race and Ethnicity	% Non-white and/or Latino	ACS 2018–2022 5-year	Block Group
Low-Income	% of HHs with income below 200% of the Federal poverty level	ACS 2018–2022 5-year	Block Group
Cost Burden	CNT Housing + Transportation Index (0-100)	CNT H+T index (https://htaindex.cnt.org/)	Census Tract

Pollution Burdens	CalEnviroScreen percentile (0-100)	CalEnviroScreen 4.0 (https://oehha.ca.gov/calenviroscreen)	Census Tract
Youth	% Youth (17 and younger)	ACS 2018–2022 5-year	Block Group
Older Adults	% Older Adults (65 and older)	ACS 2018–2022 5-year	Block Group
People with Disabilities	% of People with a Disability	ACS 2018–2022 5-year	Block Group
Linguistic Isolation	% of HHs with Limited English Proficiency	ACS 2018–2022 5-year	Block Group
Lower Educational Attainment	% of Adults with no High-School Diploma	ACS 2018–2022 5-year	Block Group
Tribal Areas	Tribal area	Tribal land reservation boundaries	Tribal Input

EPC Identification Process

The section presents the detailed technical methodology used to identify EPCs, starting with a summary of the seven steps involved and additional detail on each step to follow.

Overview of Proposed Approach:

- **Step 1: Calculate each criterion:** Compile and clean data, calculate each criterion, and summarize all criteria at the block group level.
- **Step 2: Standardize criteria:** Values for all criteria across all block groups are standardized (on a scale of 0 to 100) to account for varying units of measurement. This step is critical for enabling cross-criteria comparison and assigning weights in the following steps.
- **Step 3: Assign criteria weights:** Each county assigns a total of 100 points to Race/Ethnicity and Income and 100 points to seven other criteria based.
- **Step 4: Score block groups:** Sum all weighted criteria to obtain a score for each block group across the SACOG region. This score is then normalized on a scale of 0-100.
- **Step 5: Identify home-based EPCs:** For each county, select the highest scoring block groups until 20% of the county's population is included in an EPC.
- **Step 6: Identify destination-based EPCs:** Use Replica to identify destinations throughout the SACOG region where EPCs are traveling to.
- **Step 7: Draft EPCs:** Combine home-based and destination-based EPCs.

Step 1: Calculate Each Criterion

This section provides the data source, geography, and formula used to calculate each of the Equity criteria.

Race & Ethnicity

Measurement: % Non-white and/or Latino

Data Source: ACS 2018-2022 5 year

Geography: Block Group

Formula: [$*Total\ Population* - (*Total\ Population:\ Not\ Hispanic\ Or\ Latino* - SUM(*Total\ Population:\ Not\ Hispanic\ Black\ Or\ African\ American\ Alone*, *Total\ Population:\ Not\ Hispanic\ American\ Indian\ Or\ Alaska\ Native\ Alone*, *Total\ Population:\ Not\ Hispanic\ Asian\ Alone*, *Total\ Population:\ Not\ Hispanic\ Native\ Hawaiian\ Or\ Pacific\ Islander\ Alone*, *Total\ Population:\ Not\ Hispanic\ Some\ Other\ Race\ Alone*, *Total\ Population:\ Not\ Hispanic\ Two\ Or\ More\ Races\ Alone*)) / *Total\ Population*$]

Low-Income

Measurement: % of HHs with income below 200% of the Federal poverty level

Data Source: ACS 2018-2022 5 year

Geography: Block Group

Formula: sum of all estimate columns with the number of households whose income is between “under 0.50” and “1.85 to 1.99” percent of the federal poverty level.

Cost Burden

Measurement: Indexed valued of housing + transportation cost burden (0-100)

Data Source: Center for Neighborhood Technology

CNT Housing + Transportation (H+T) Index includes both the cost of housing and the cost of transportation at the neighborhood level. The (H+T) Index measures the true affordability of living in an area by combining housing and transportation costs. It helps to understand how much of a household's income is spent on these essential expenses, providing a clearer picture of cost of living Methodology: <https://htaindex.cnt.org/about/method-2022.pdf>

Geography: Census Tract

Formula: n/a

Pollution Burden

Measurement: CalEnviroScreen percentile

Data Source: CalEnviroScreen 4.0

- CalEnviroScreen is a screening methodology that can be used to help identify California communities that are disproportionately burdened by multiple sources of pollution.
- The score in the data represents the percentile of the given census tract
- Source website: CalEnviroScreen 4.0 | OEHHA

Geography: Census Tract

Formula: n/a

Youth

Measurement: % Youth (17 and younger)

Data Source: ACS 2018–2022 5-year

Geography: Block Group

Formula: $\frac{\text{sum}(*\text{Total Population: Males Under 5 Years}*, *\text{Total Population: Males Aged 5-9 Years}*, *\text{Total Population: Males Aged 10-14 Years}*, *\text{Total Population: Males Aged 15-17 Years}*, *\text{Total Population: Females Aged Under 5 Years}*, *\text{Total Population: Females Aged 5-10 Years}*, *\text{Total Population: Females Aged 10-14 Years}*, *\text{Total Population: Females Aged 15-17 Years}*)}{*\text{Total Population}*$

Older Adults

Measurement: % Older Adults (65 and older)

Data Source: ACS 2018–2022 5-year

Geography: Block Group

Formula: $\frac{\text{sum}(*\text{Total Population: Males Aged 65-66 Years}*, *\text{Total Population: Males Aged 67-69 Years}*, *\text{Total Population: Males Aged 70-74 Years}*, *\text{Total Population: Males Aged 75-79 Years}*, *\text{Total Population: Males Aged 80-84 Years}*, *\text{Total Population: Males Aged 85 Years And Over}*, *\text{Total Population: Females Aged 65-66 Years}*, *\text{Total Population: Females Aged 67-69 Years}*, *\text{Total Population: Females Aged 70-74 Years}*, *\text{Total Population: Females Aged 75-79 Years}*, *\text{Total Population: Females Aged 80-84 Years}*, *\text{Total Population: Females Aged 85 Years And Over}*)}{*\text{Total Population}*$

People with Disabilities

Measurement: % of People with a Disability

Data Source: ACS 2018–2022 5-year

Geography: Block Group

Formula: $\frac{\text{sum}(*\text{Total: Males Aged 18 To 34 Years With A Disability}*, *\text{Total: Males Aged 35 To 64 Years With A Disability}*, *\text{Total: Males Aged 65 To 74 Years With A Disability}*, *\text{Total: Males Aged 75 Years And Over With A Disability}*, *\text{Total: Females Aged 18 To 34 Years With A Disability}*, *\text{Total: Females Aged 35 To 64 Years With A Disability}*, *\text{Total: Females Aged 65 To 74 Years With A Disability}*, *\text{Total: Females Aged 75 Years And Over With A Disability}*)}{*\text{Total Population}*$

Linguistic Isolation

Measurement: % of HHs with Limited English Proficiency

Data Source: ACS 2018–2022 5-year

Geography: Block Group

Formula: $\frac{\text{sum}(*\text{Total Limited Speaking English Household: Spanish}*, *\text{Total Limited Speaking English Household: Other Indo-European Languages}*, *\text{Total Limited Speaking English Household: Asian and Pacific Island Languages}*, *\text{Total Limited Speaking English Household: Other Languages}*)}{*\text{Total Households}*$

Lower Educational Attainment

Measurement: % of Adults with no High-School Diploma

Data Source: ACS 2018–2022 5-year

Geography: Block Group

Formula: $\text{sum}(*\text{Less than 9th grade}*, *9\text{th to 12th grade, no diploma}*) / *Total\ Population: 25\ years\ and\ over*$

Tribal Areas

Tribal community representatives provided geographic guidance on Tribal Areas throughout the SACOG region

Step 2: Standardize Criteria

Standardizing each criterion is required to enable a fair comparison and compilation of metrics with different units. For example, Race & Ethnicity is measured as the percent of the population in each block group that is non-white, whereas Pollution Burden is measured as an index developed by CalEnviroScreen. The standardization process assigns a value of 100 to the highest scoring block group, regardless of units, and a score of 0 to the lowest scoring block group. For the Mobility Zones project, standardization was applied at the county level. The block groups in each county are treated as distinct sets of data to which the standardization methodology is applied. The standardization formula is as follows:

$$BG_S = (BG_N - \text{MIN}(\text{range})) / (\text{MAX}(\text{range}) - \text{MIN}(\text{range}))$$

Where:

BG_S = Standardized block group value

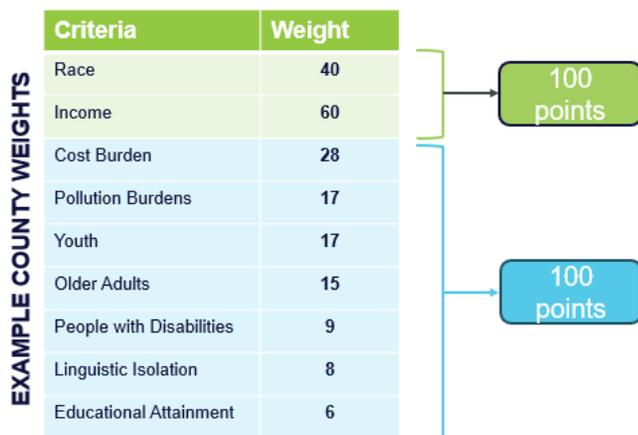
BG_N = Non-standardized block group value

range = All block groups in the county

Step 3: Assign Criteria Weights

The EPC methodology allots each County a total of 200 points to assign to the nine Equity criteria. To align with policy guidance and region-wide priorities, Race & Ethnicity and Low-Income criteria are allotted a combined total of 100 points, and the remaining seven criteria are allotted a combined total of 100 points (Figure 3). Community Committee input and public survey responses were used to inform weighting at the County level. These results are shown in the Tables 2 - 4.

Figure 1 Example County Criteria Weighting



Each committee member voted on the allocation of points across criteria. Municipal and technical committees include representatives from across the SACOG region. Their input was used to validate the county-level weighting results.

Table 2 Community Committee Weighting Results

County	Cost Burden	People with Disabilities	Older Adults	Educational Attainment	Linguistic Isolation	Youth	Pollution Burden	Income	Race & Ethnicity
Sacramento	16	15	12	16	17	11	13	52	48
Yolo	14	25	16	15	16	8	7	58	42
Yuba	13	14	25	9	10	18	11	68	33
Sutter	13	14	25	9	10	18	11	68	33
Placer	28	15	17	17	6	9	8	68	32
El Dorado	20	34	21	7	4	13	1	76	24
Technical Committee	32	12	16	9	10	4	17	62	38
Municipal Committee	21	16	14	11	16	9	12	57	43

A non-representative public survey was administered to assess the importance of each Equity criteria to community members. The survey was used as a supplement to the committee weightings, since some committees are made up of only a few representatives.

Table 3 Public Survey Weighting Results

County	Cost Burden	People with Disabilities	Older Adults	Educational Attainment	Linguistic Isolation	Youth	Pollution Burden	Income	Race & Ethnicity
Sacramento	28	12	13	12	5	11	18	58	42
Yolo	28	11	13	11	7	12	17	59	41
Yuba	27	11	15	16	4	12	15	76	24
Sutter	29	13	14	15	7	12	10	78	22
Placer	27	10	17	13	2	12	18	67	33
El Dorado	26	14	17	10	4	13	15	75	25

To account for discrepancies between Committee and public survey weighting, the sets of weights were averaged to produce the final weightings shown below.

Table 4 Final Weights

County	Cost Burden	People with Disabilities	Older Adults	Educational Attainment	Linguistic Isolation	Youth	Pollution Burden	Income	Race & Ethnicity
Sacramento	22	14	13	14	11	11	16	55	45
Yolo	21	18	15	13	12	10	12	59	42
Yuba	20	13	20	13	7	15	13	72	29
Sutter	21	14	20	12	9	15	11	73	28
Placer	28	13	17	15	4	11	13	68	33
El Dorado	23	24	19	9	4	13	8	76	25

The standardized values for each block group are then multiplied through the weight assigned to each criterion and county. The step produces a weighted standardized score for every block group across each criterion.

Step 4: Score Block Groups

Next the weighted criteria values are summed to generate a composite score, with 200 being the highest theoretical score. The composite scores are then normalized on a scale of 0-100, with 100 representing the highest scoring block

group and 0 representing the lowest scoring block group. The normalization allows for an analysis of the relative performance for each of the block groups compared to the highest- and the lowest-scoring areas across the SACOG region. The formula for summing the weighted criteria is as follows:

$$BG_{CS} = S_C + S_D + S_O + S_E + S_{LI} + S_Y + S_P + S_I + S_{R\&E}$$

Where:

BG_{CS} = Composite Score for the block group

S_C = Cost Burden standardized and weighted value for the block group

S_D = People with Disabilities standardized and weighted value for the block group

S_O = Older Adults standardized and weighted value for the block group

S_E = Educational Attainment standardized and weighted value for the block group

S_{LI} = Linguistic Isolation standardized and weighted value for the block group

S_Y = Youth standardized and weighted value for the block group

S_P = Pollution Burden standardized and weighted value for the block group

S_I = Income standardized and weighted value for the block group

$S_{R\&E}$ = Race & Ethnicity standardized and weighted value for the block group

The formula for normalizing the block group scores is as follows:

$$BG_{NCS} = (BG_{CS} - \text{MIN}(\text{range})) / (\text{MAX}(\text{range}) - \text{MIN}(\text{range}))$$

Where:

BG_{NCS} = Normalized Composite Score for the block group

range = Composite Score values for all block groups in SACOG region

Normalized scores are then visualized for the entire SACOG region. This process is summarized in Figure 2. Table 5 shows the minimum and maximum block group score for each county, as well as the normalized score.

Figure 2 Block Group Scoring Overview

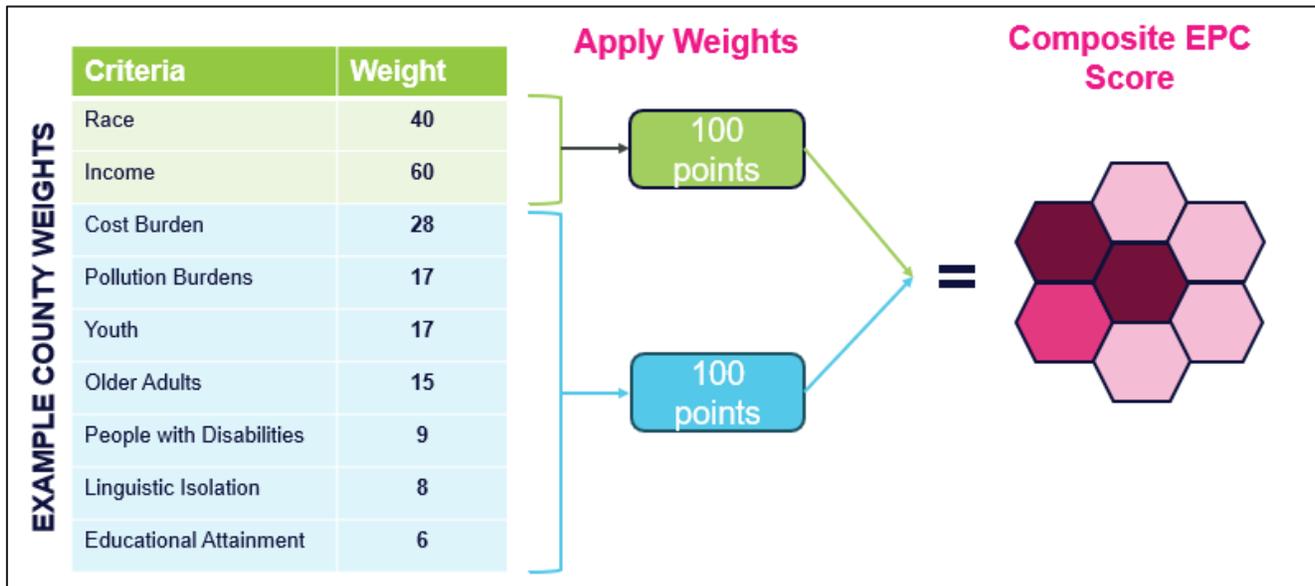


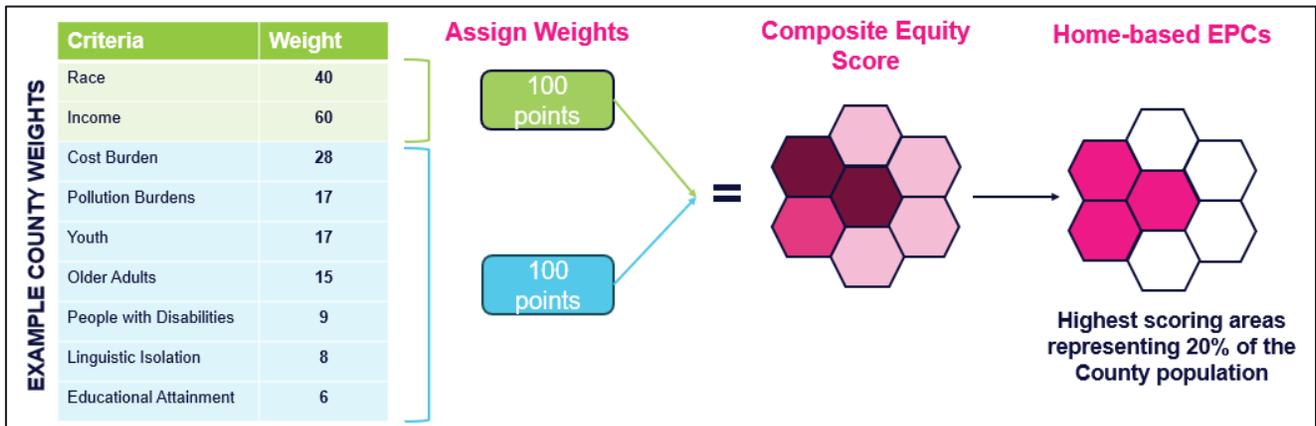
Table 5 Summary of Block Group EPC Score Range

County	Min Score	Max Score	Min Normalized Score	Max Normalized Score
El Dorado	91	137	54	84
Placer	56	108	32	66
Sacramento	98	142	59	87
Sutter	113	161	68	100
Yolo	101	140	61	86
Yuba	69	149	40	92

Step 5: Identify Home-Based EPCs

This step involves selecting the top scoring block groups in each county to move forward as EPCs. A 20% population target was set for each county. This ensures that roughly the same number of residents are included in EPCs across each county within SACOG region, even if the number of block groups differ. For example, the top 52 ranked block groups in Placer County include 20% of the Placer County population, whereas the top 13 ranked block groups in Yuba County include 20% of the Yuba County population. These top ranked block groups were then visualized, as demonstrated in Figure 3.

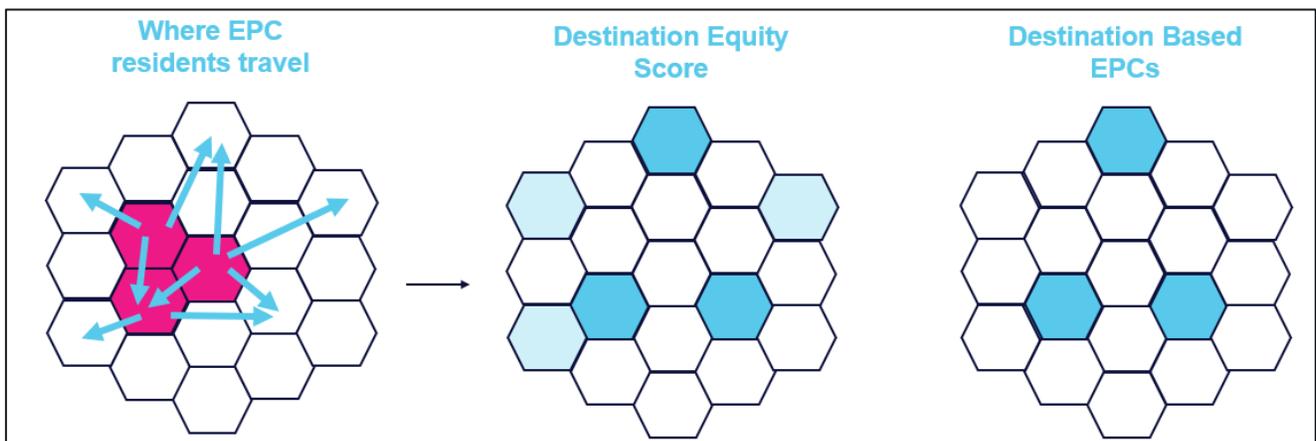
Figure 3 Summary of Home-based EPC Identification Process



Step 6: Identify Destination-Based EPCs

The selection of destination-based EPCs is based on the volume of trips originating from selected home-based EPCs and are meant to reflect the destinations where members of disadvantaged communities are typically travelling. The analysis of trip volumes was based on Replica 2024 data - origin-destination trip matrix on block group level. The block groups with over 4,000 daily trip destinations were selected as destination-based EPCs.

Figure 4 Summary of Destination-based EPC Identification Process



Step 7: Draft EPCs

Some selected Destination-based EPCs were already identified as Home-based EPCs. Hence, as a result of this analysis there are three types of EPCs:

1. Home-based EPCs
2. Destination-based EPCs, and
3. Both Home- and Destination-based EPCs

Combined, these make up the EPCs used as a basis for identifying Mobility Zones. These are shown in Figures 5 – 9.

Figure 5 El Dorado County EPCs

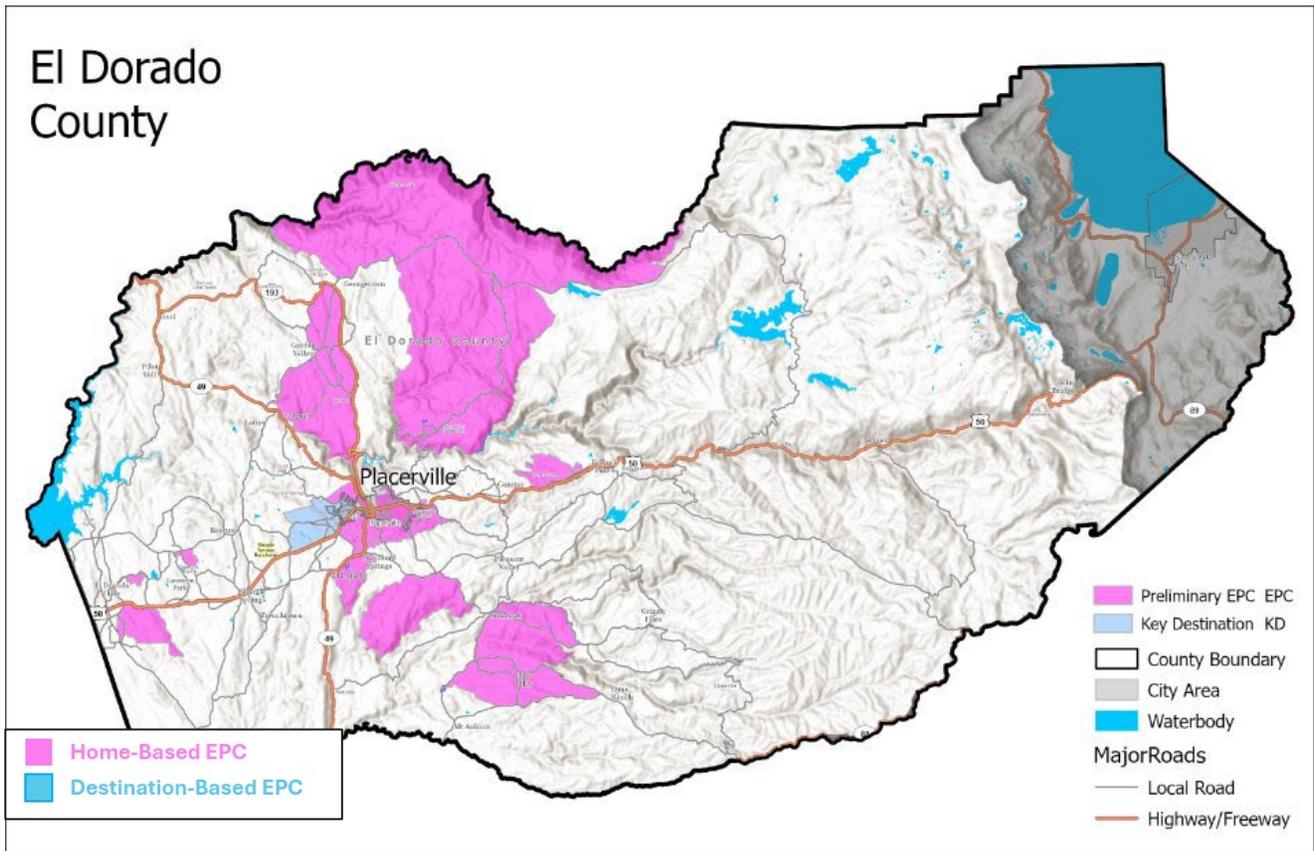


Figure 6 Placer County EPCs

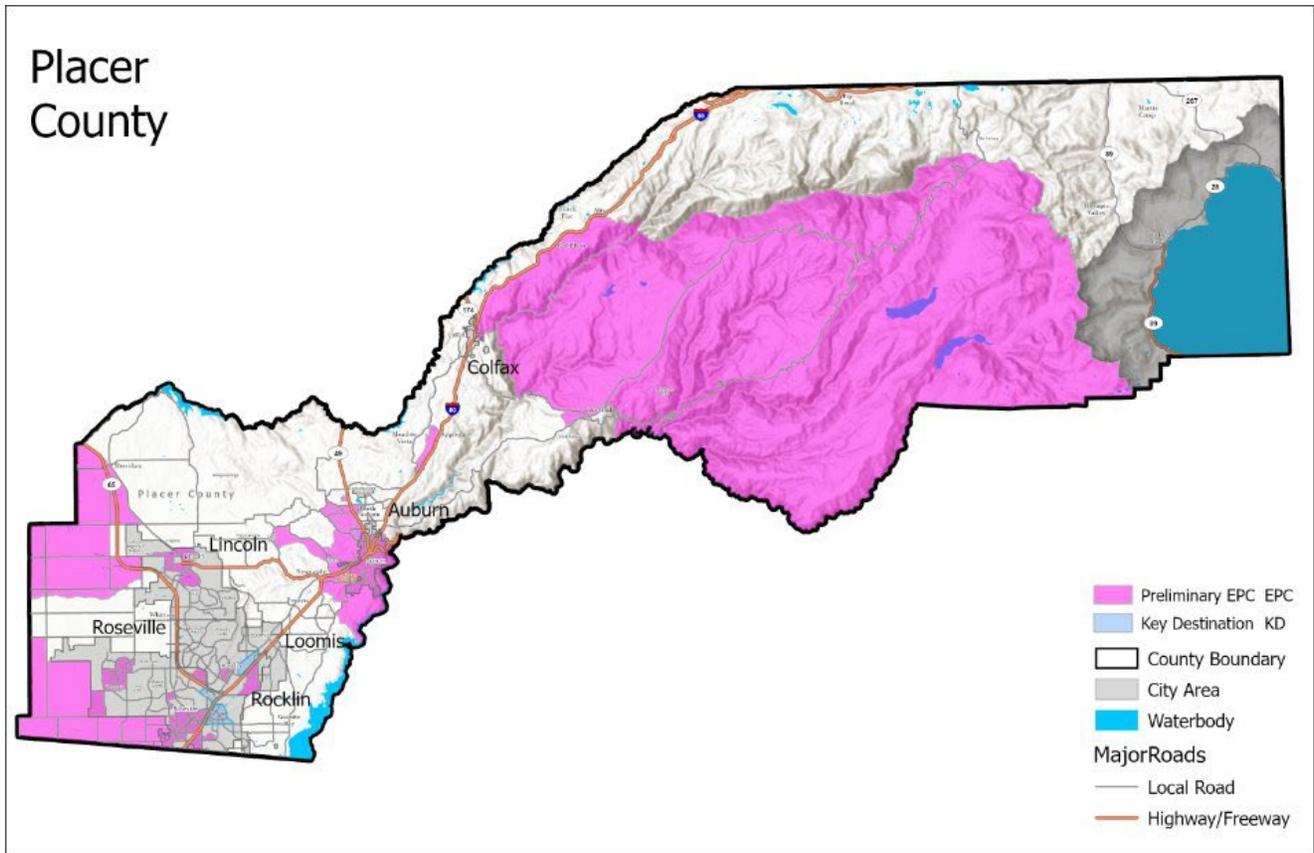


Figure 7 Sacramento County EPCs

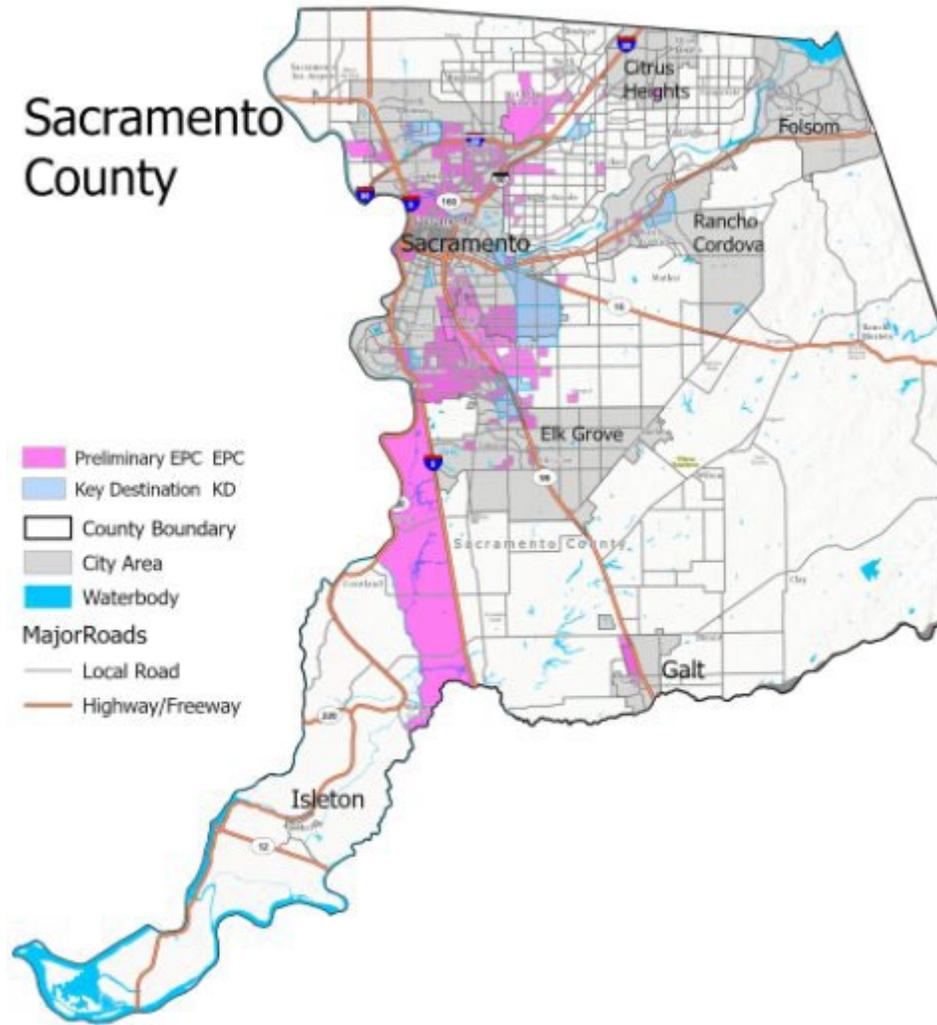


Figure 8 Yolo County EPCs

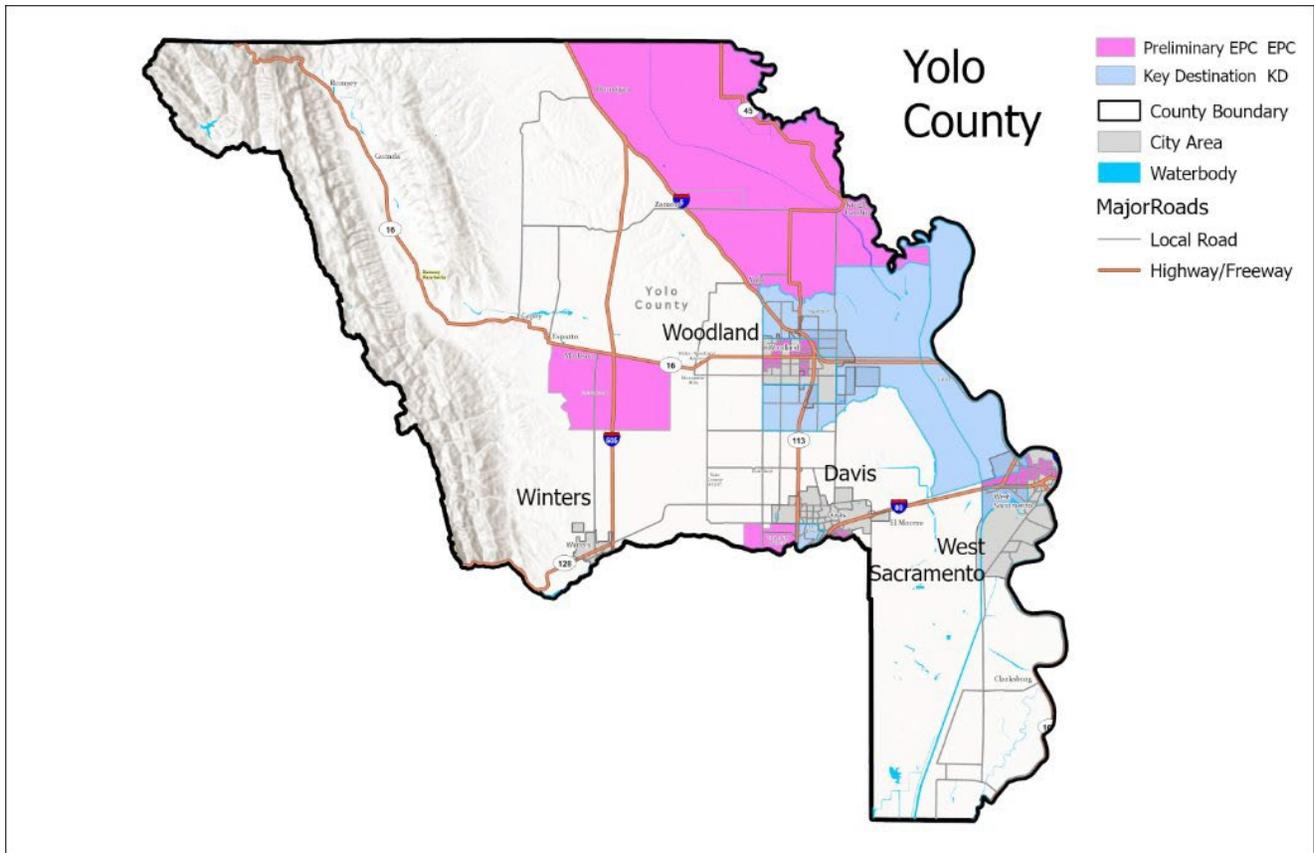


Figure 9 Yuba/Sutter Counties EPCs

Sutter / Yuba Counties

