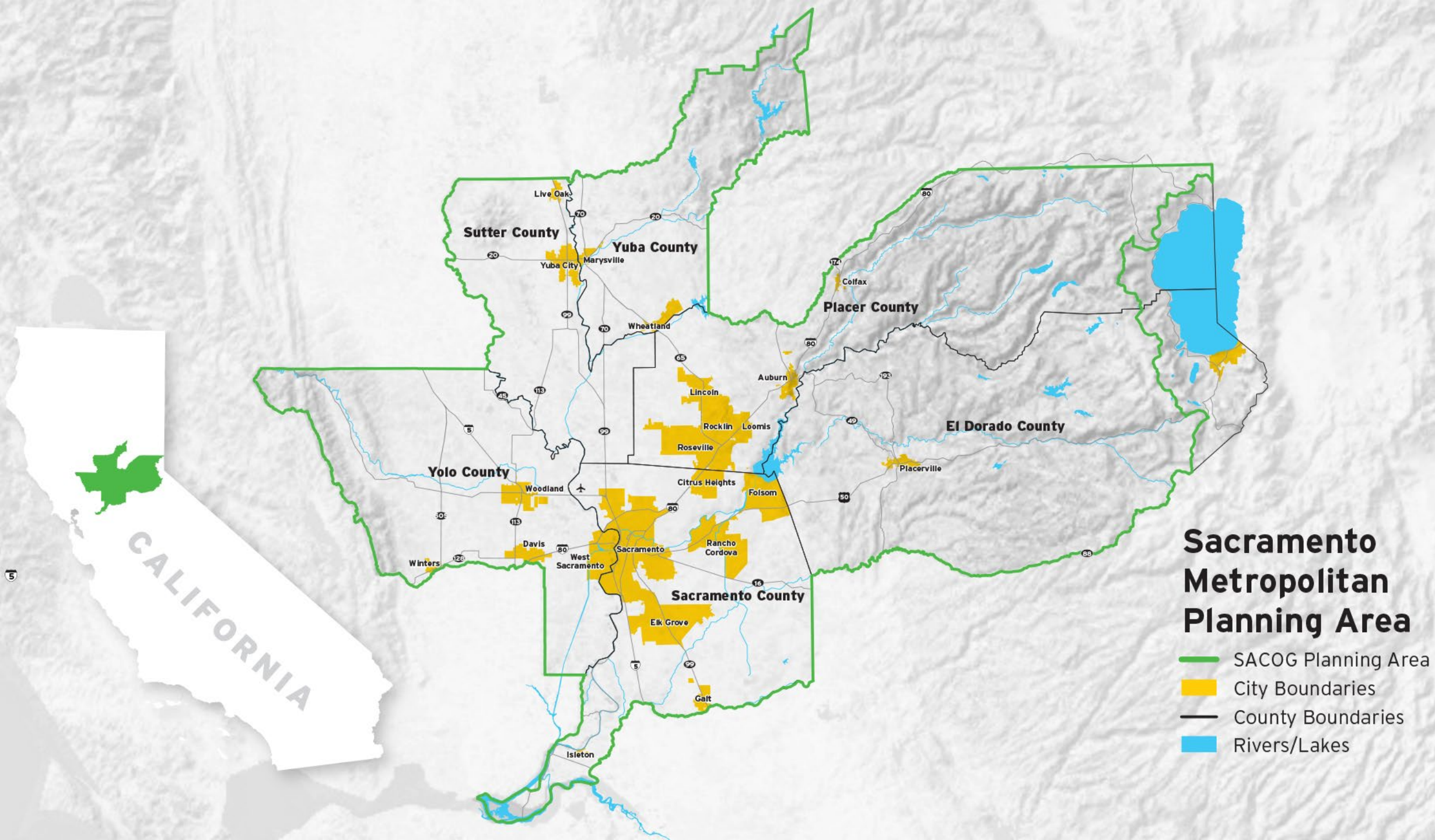


March 10, 2021 – SACOG's Travel Modeling User Conference

---

# **A ROAD MAP TO A BRIGHTER FUTURE**

**METROPOLITAN TRANSPORTATION PLAN /  
SUSTAINABLE COMMUNITIES STRATEGY**



# What is the MTP/SCS?

Long Range Economic Forecast

Land Use Forecast

Transportation Budget & Investments

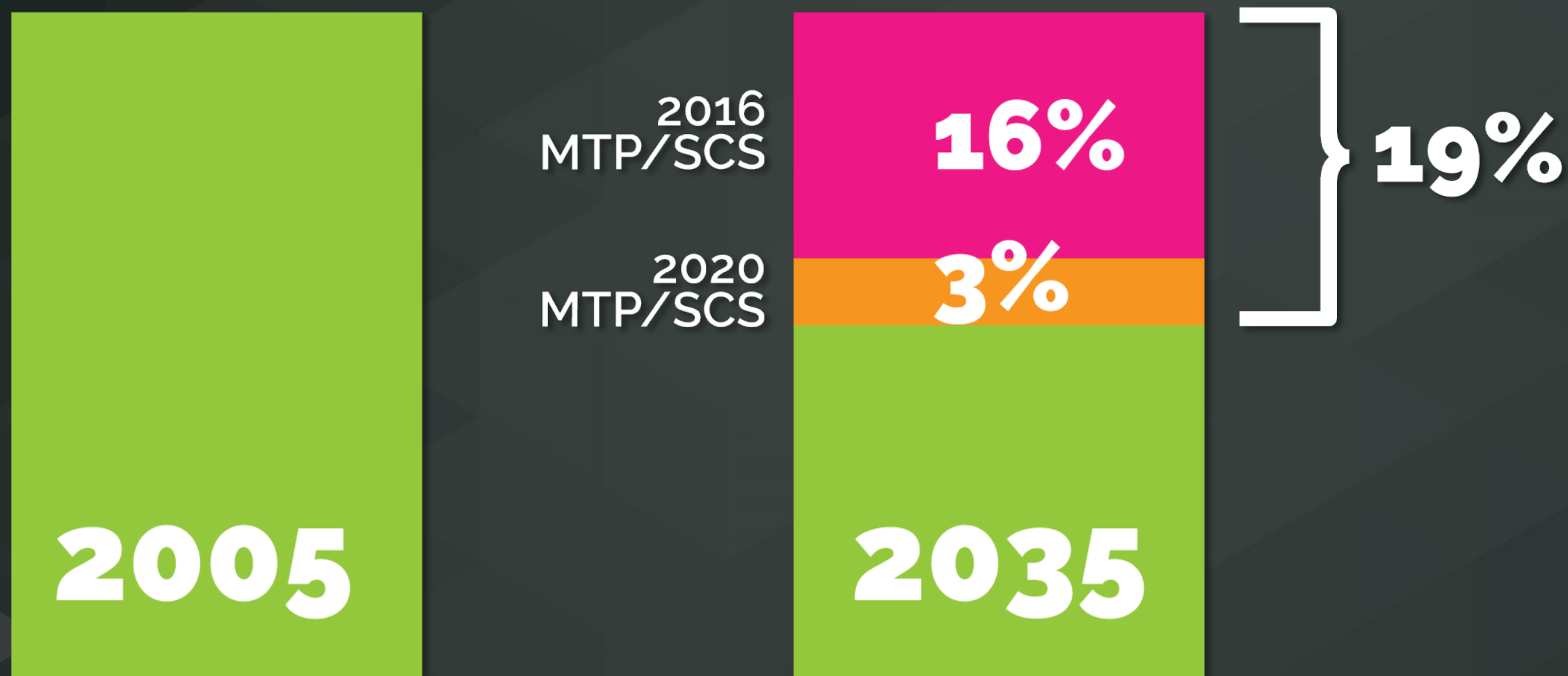
Performance Outcomes

Policies and Strategies

# STATE AND FEDERAL AIR QUALITY REQUIREMENTS



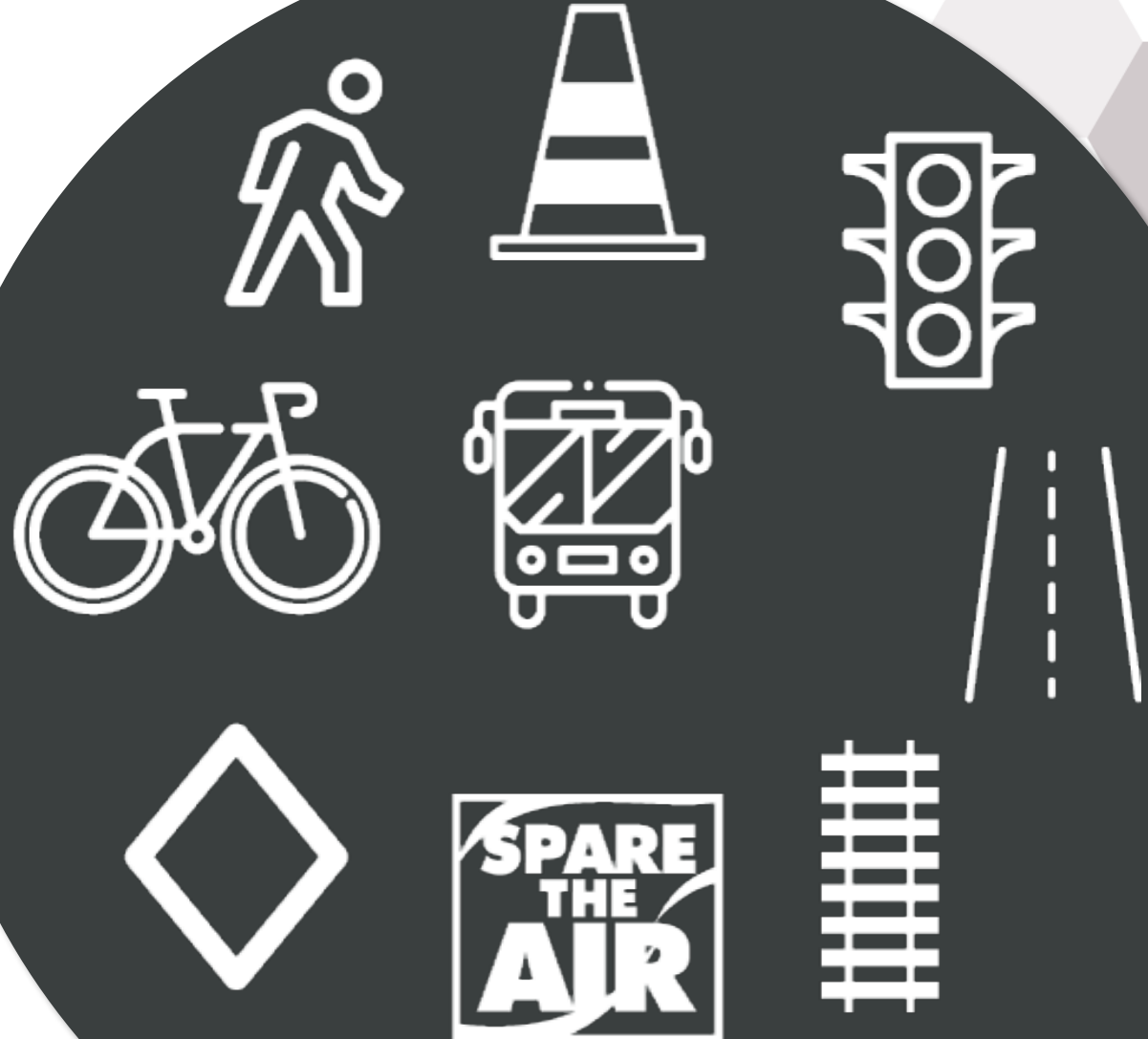
# Greenhouse Gas Reduction Target



Transportation  
Needs



Land Use  
Forecast



---

# What is the Base Year?

- 'Snapshot' in time
- Best estimation of what we see on the ground with data comparisons and validation for Housing Units and Employment
- Starting point in creating and modeling the forecast scenarios for horizon year estimates

Section 1

---

# HOUSING

---

## Parcel/ Assessor Data

- Yearly collection of county parcel boundaries
- Assessor data with land and structure value, land use codes

## Housing Inventory (Census block)

- 2010 Decennial Census- housing counts at block level
- Housing Permits- annual collection of finalized permits
- **Will be re-calibrated to the 2020 Census**

Unit counts by  
Census Block

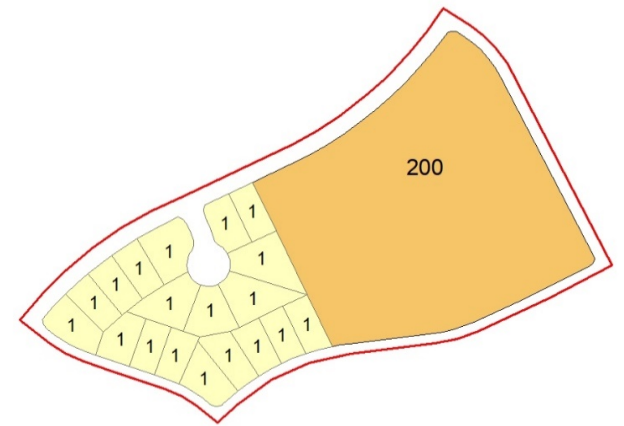
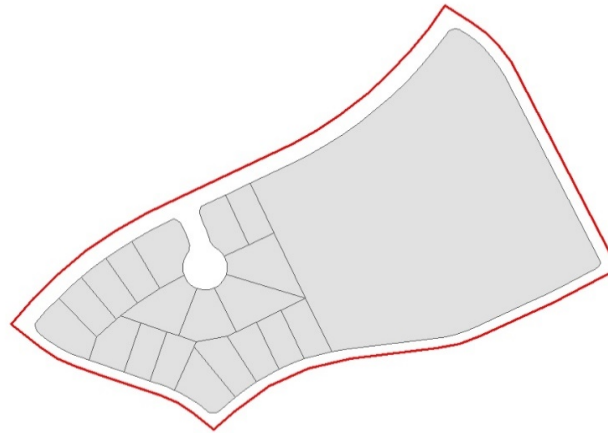


Parcels



Parcel land use  
with housing units

Block = 219 Units



Section 2

---

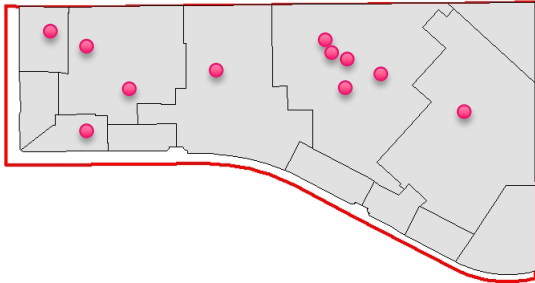
# EMPLOYMENT

# Employment Inventory

- Procure business dataset that is geocoded to parcels with data attributes (NAICS Codes, # of employees, addresses)
- SACOG integrates additional employment sources and internal research:
  - Schools/University/Colleges
  - Medical facilities
  - State and local government
  - Large Employers

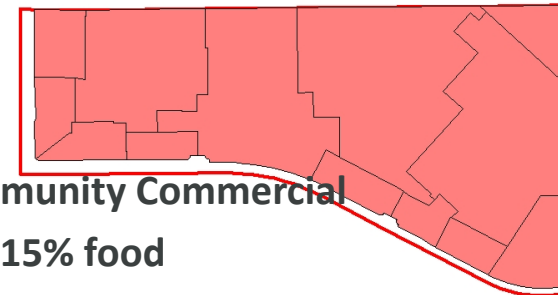
## 200 Employees (10 inventory points)

- 5 medical emp
- 20 food emp
- 20 service emp
- 75 office emp
- 80 retail emp



## 200 Employees (12 parcels)

- 0 medical emp
- 30 food emp
- 20 service emp
- 90 office emp
- 50 retail emp



### Community Commercial

- 15% food
- 15% service
- 45% office
- 25% retail

## Challenges & Solutions

- **Incomplete/inconsistent housing permits reported by jurisdictions**



In California, all jurisdictions are required to submit their General Plan Annual Progress Report (APR) and their Housing Element APR to the Office of Planning and Research (OPR) and the Housing and Community Development Department (HCD) by April 1 of each year.

- **Employment data clean up, extensive staff time needed**



New methods of automation and programmatic solutions

# 2020 Base Year Calendar

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2020 Census housing counts – September 2021

Base Year completion- December 2021

# 2020 SACOG Base Year Update



March, 2021

Binu Abrams, MTP Project Manager

[BAbraham@sacog.org](mailto:BAbraham@sacog.org)

Jeanie Hong, [JHong@sacog.org](mailto:JHong@sacog.org)



# MTP/SCS Land Use Forecast

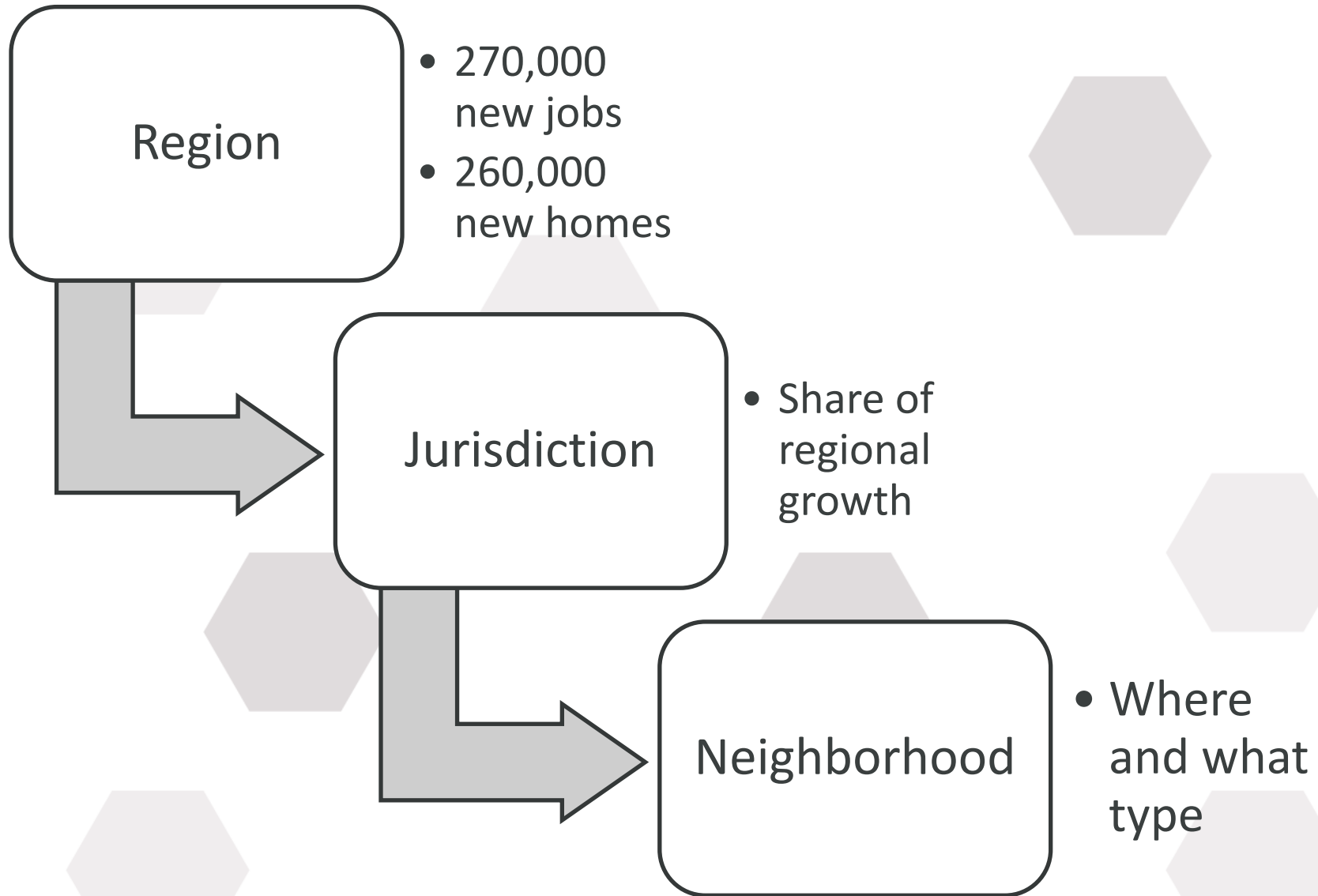
- For more info,  
please contact

Dov Kadin:

[dkadin@sacog.org](mailto:dkadin@sacog.org)

(916-340-6238)

# What is a land use forecast?



## What it is

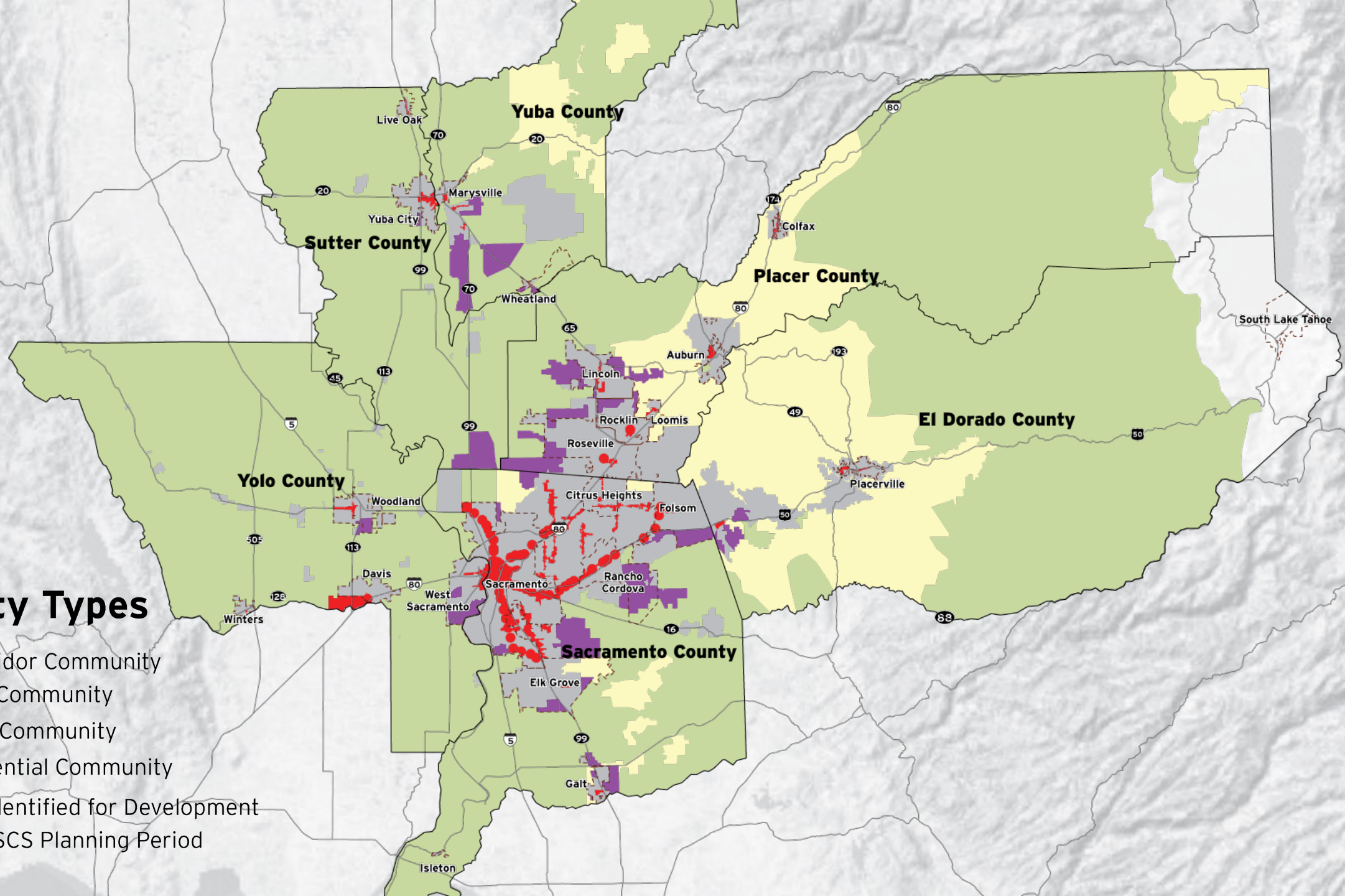
- 20-year plan for transportation investments
- Regional
- Financially constrained
- Achievable and ambitious
- Phasing plan
- Updated every 4 years

## What it is NOT

- General Plan, but is consistent with General Plans
- Stapling exercise
- Taking or exercising any land use authority

# Community Types

- Center/Corridor Community
- Developing Community
- Established Community
- Rural Residential Community
- Lands not Identified for Development in the MTP/SCS Planning Period



## Factors Considered in Updating the MTP/SCS Land Use Forecast

|            | Regulatory/Policy and Market Factors                    | Description of projects assumed to have the highest likelihood to build within 20 years                                                 | Middle range of conditions                                                                                                                                                                                                                                                                                                                                                                                                                                 | Description of projects assumed to have the lowest likelihood to build within 20 years                                   |
|------------|---------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| REGULATORY | Local Entitlements                                      | Specific Plan approved, Annexation complete (if required), Tentative Map(s) in process                                                  | Range of conditions includes: projects that are approved but still need annexation; projects approved but no tentative maps submitted; projects approved but have unsettled lawsuit; projects currently in process; projects in pre-application                                                                                                                                                                                                            | No current entitlement activity; identified by general plan or SOI as future growth area                                 |
|            | State/Federal Entitlements                              | Approved                                                                                                                                | Range of conditions includes: projects that are not yet approved but in process; projects participating in an HCP or NCCP; projects with no significant resource issues                                                                                                                                                                                                                                                                                    | Significant, unresolved resource issues                                                                                  |
| POLICY     | Air Quality                                             | In SCS with lower VMT than average for Developing Communities                                                                           | Range of conditions includes: projects that are in the SCS with average VMT; projects in the SCS with higher than average VMT; projects not in the SCS with lower than average VMT; projects not in the SCS with average VMT                                                                                                                                                                                                                               | Not in SCS with above average VMT for Developing Communities                                                             |
|            | Regional Plans and Policies                             | Consistent with 2012 MTP/SCS and Blueprint                                                                                              | Range of conditions includes: projects in MTP/SCS and partially consistent with Blueprint; projects in MTP/SCS and not consistent with Blueprint; projects consistent with Blueprint and not MTP/SCS; projects partially consistent with Blueprint and not in MTP/SCS                                                                                                                                                                                      | Not consistent with 2012 MTP/SCS or Blueprint                                                                            |
| MARKET     | Proximity to Job Centers                                | Close proximity to a regional jobs center                                                                                               | Range of conditions includes: projects partially within 4 miles of a regional job center; projects within 4 miles of a secondary job center; partially within 4 miles of a secondary job center                                                                                                                                                                                                                                                            | Significant distance from any job center(s)                                                                              |
|            | Housing Mix                                             | Mix of housing types including mostly small-lot and attached                                                                            | Range of conditions includes: projects that have a mix of housing types including small-lot and attached housing at varying amounts; projects that are primarily large-lot residential because they are in more rural areas                                                                                                                                                                                                                                | All large-lot single-family where higher densities could be supported (i.e more urban or suburban locations)             |
|            | Market Area Saturation                                  | Historically high market demand and limited number of approved or pending projects in market area                                       | Range of conditions includes: projects in areas with high market demand and high number of approved or pending projects in market area; projects in areas with average market demand and a high number of approved or pending projects in market area; projects in area with lower market demand and a high number of approved or pending projects in market area, but have a unique factor that could significantly change the market demand for the area | Historically low market demand and a high number of approved or pending projects in market area                          |
|            | Adjacency                                               | Adjacent to existing urban development or has significant borders with a city boundary or areas designated for future urban development | Range of conditions includes: projects that are adjacent to existing development at varying rates                                                                                                                                                                                                                                                                                                                                                          | Less than 10% adjacent with existing urban development, a city boundary or areas designated for future urban development |
|            | Developer Activity                                      | Very active, single ownership or experienced ownership partnerships, multiple completed projects in region                              | Range of conditions includes: very active to active, single or multiple ownerships with no development history; single or multiple ownerships with varying levels of activity and some projects completed in the region; single or multiple ownerships with varying levels of activity and no history of completed projects in or outside the region                                                                                                       | Not active, single or multiple ownership, no completed projects in the region                                            |
|            | Transportation Infrastructure                           | No major or regional infrastructure needed or infrastructure is fully funded                                                            | Range of conditions includes: projects that have some infrastructure, but need more; projects that can build some before significant infrastructure investment is needed; projects that need significant infrastructure and have funding                                                                                                                                                                                                                   | Significant infrastructure needed and not funded or not yet defined                                                      |
|            | Other Infrastructure (sewer, water, flood control, etc) | No major or regional infrastructure needed or infrastructure is fully funded                                                            | Range of conditions includes: projects that have some infrastructure, but need more; projects that can build some before significant infrastructure investment is needed; projects that need significant infrastructure and have funding                                                                                                                                                                                                                   | Significant infrastructure needed and not funded or not yet defined                                                      |

# Must be Reasonable (But Also Ambitious)

## Regulatory

- Local Zoning and General Plans
- Local Entitlements
- Federal and State Entitlements

## Market

- Proximity to jobs
- Housing mix
- Market area demand
- Developer activity
- Infrastructure need

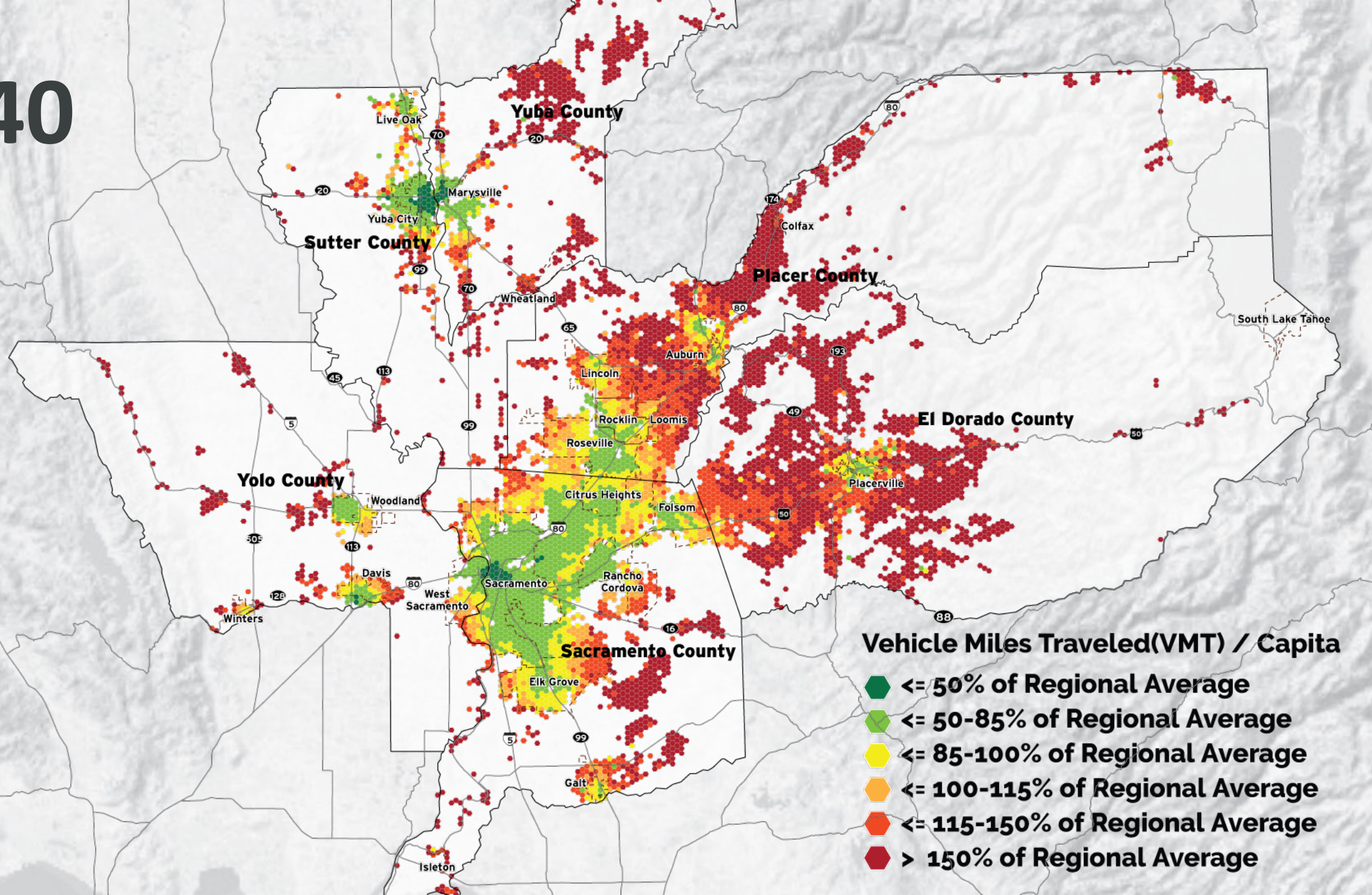
## Policy/Performance

- GHG Target

**Achievable/Reasonable**

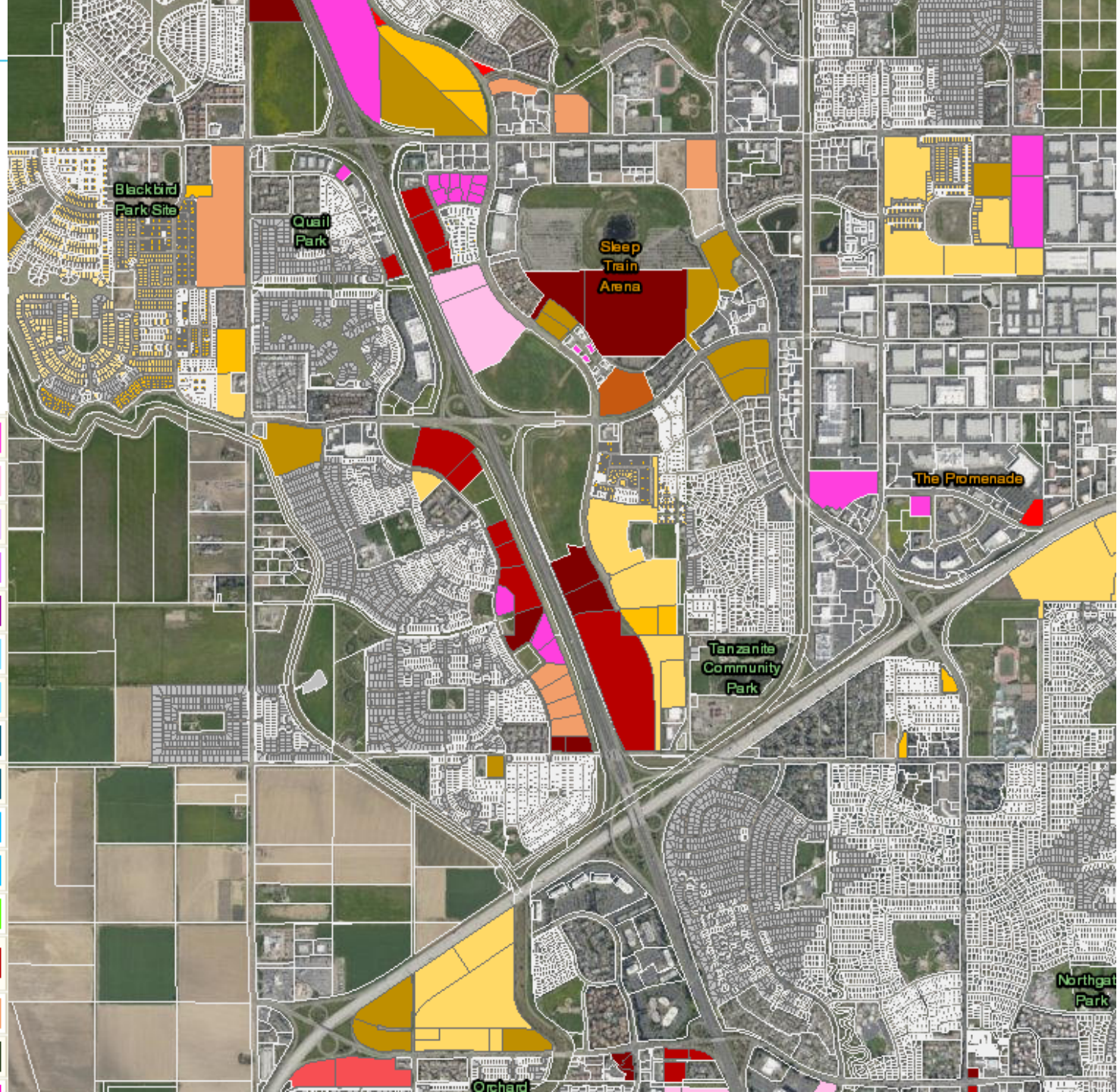
**Ambitious**

# 2040



# Envision Tomorrow Online

| Development Type                         | Symbol |                                            |  |
|------------------------------------------|--------|--------------------------------------------|--|
| Erase                                    |        | Low-Intensity Office                       |  |
| Rural Residential                        |        | Moderate-Intensity Office                  |  |
| Very Low Density Detached Residential    |        | Light Industrial/Office                    |  |
| Low Density Detached Residential         |        | Light Industrial                           |  |
| Medium Density Residential               |        | Heavy Industrial                           |  |
| Medium-High Density Residential          |        | Medical Facility                           |  |
| High Density Attached Residential        |        | Medical Office                             |  |
| Very High Density Attached Residential   |        | K-12 School                                |  |
| Urban Attached Residential               |        | College/University                         |  |
| Residential/Retail Mixed Use Low         |        | Civic/Institution                          |  |
| Residential/Retail Mixed Use High        |        | Public/Quasi-Public                        |  |
| Community/Neighborhood Retail            |        | Park and/or Open Space                     |  |
| Community/Neighborhood Commercial        |        | Employment Focus Mixed Use Center/Corridor |  |
| Community/Neighborhood Commercial/Office |        | Mixed Use Center/Corridor                  |  |
| Regional Retail                          |        | Sac High Density Mixed Use                 |  |



| Placetype                                  | Max<br>Units/Acre | Max<br>Jobs/Acre | Education | Food | Government | Industrial | Medical | Office | Retail | Service |
|--------------------------------------------|-------------------|------------------|-----------|------|------------|------------|---------|--------|--------|---------|
| Civic/Institution                          | 0                 | 21               |           |      | 17%        |            |         |        |        | 83%     |
| College/University                         | 0                 | 95               | 100%      |      |            |            |         |        |        |         |
| Community/Neighborhood Commercial          | 0                 | 28               |           | 15%  |            |            |         | 45%    | 25%    | 15%     |
| Community/Neighborhood Commercial/Office   | 0                 | 37               |           | 14%  |            |            |         | 42%    | 23%    | 21%     |
| Community/Neighborhood Retail              | 0                 | 22               |           | 32%  |            |            |         |        | 54%    | 14%     |
| Employment Focus Mixed Use Center/Corridor | 9                 | 92               |           | 17%  |            |            |         | 53%    | 29%    | 0%      |
| Heavy Industrial                           | 0                 | 14               |           | 0%   |            | 100%       | 0%      |        |        |         |
| High Density Attached Residential          | 42                | 0                |           |      |            |            |         |        |        |         |
| K-12 School                                | 0                 | 18               | 100%      |      |            |            |         |        |        |         |
| Light Industrial                           | 0                 | 27               |           | 4%   |            | 60%        |         | 22%    |        | 14%     |
| Light Industrial/Office                    | 0                 | 46               |           | 4%   |            | 10%        |         | 67%    |        | 19%     |
| Low-Intensity Office                       | 0                 | 39               |           |      |            |            |         | 80%    |        | 20%     |
| Low Density Detached Residential           | 8                 | 0                |           |      |            |            |         |        |        |         |
| Medical Facility                           | 0                 | 178              |           | 0%   |            |            | 100%    |        |        |         |
| Medical Office                             | 0                 | 123              |           | 0%   |            |            | 100%    |        |        |         |
| Medium-High Density Residential            | 24                | 0                |           |      |            |            |         |        |        |         |
| Medium Density Residential                 | 12                | 0                |           |      |            |            |         |        |        |         |
| Mixed Use Center/Corridor                  | 20                | 12               |           | 20%  |            |            |         | 33%    | 21%    | 26%     |
| Moderate-Intensity Office                  | 0                 | 179              |           | 1%   | 29%        |            |         | 60%    |        | 10%     |
| Public/Quasi-Public                        | 0                 | 21               |           | 0%   | 100%       |            |         |        |        |         |
| Regional Retail                            | 0                 | 16               |           | 32%  | 0%         |            |         |        | 54%    | 14%     |
| Residential/Retail Mixed Use High          | 57                | 41               |           | 7%   | 0%         |            |         | 43%    | 24%    | 26%     |
| Residential/Retail Mixed Use Low           | 25                | 74               |           | 7%   | 0%         |            |         | 43%    | 24%    | 26%     |
| Rural Residential                          | 1                 | 0                |           |      |            |            |         |        |        |         |
| Sac CBD Mixed Use                          | 103               | 603              |           |      | 56%        |            |         | 44%    |        |         |
| Sac High Density Mixed Use                 | 100               | 103              |           | 10%  | 20%        |            |         | 60%    |        | 10%     |
| Urban Attached Residential                 | 120               | 6                |           | 17%  | 0%         |            |         | 53%    | 29%    |         |
| Very High Density Attached Residential     | 81                | 0                |           |      |            |            |         |        |        |         |
| Very Low Density Detached Residential      | 4                 | 0                |           |      |            |            |         |        |        |         |

# Buildout Inventory

- Updated workbook of every land use designation in the region with density, intensity, FAR restrictions
- Updated placetype library with every parcel consolidated into the regional placetypes
- Robust Market Data, including a market-based capacity analysis



# Thank You

For more info,  
please contact

Dov Kadin:

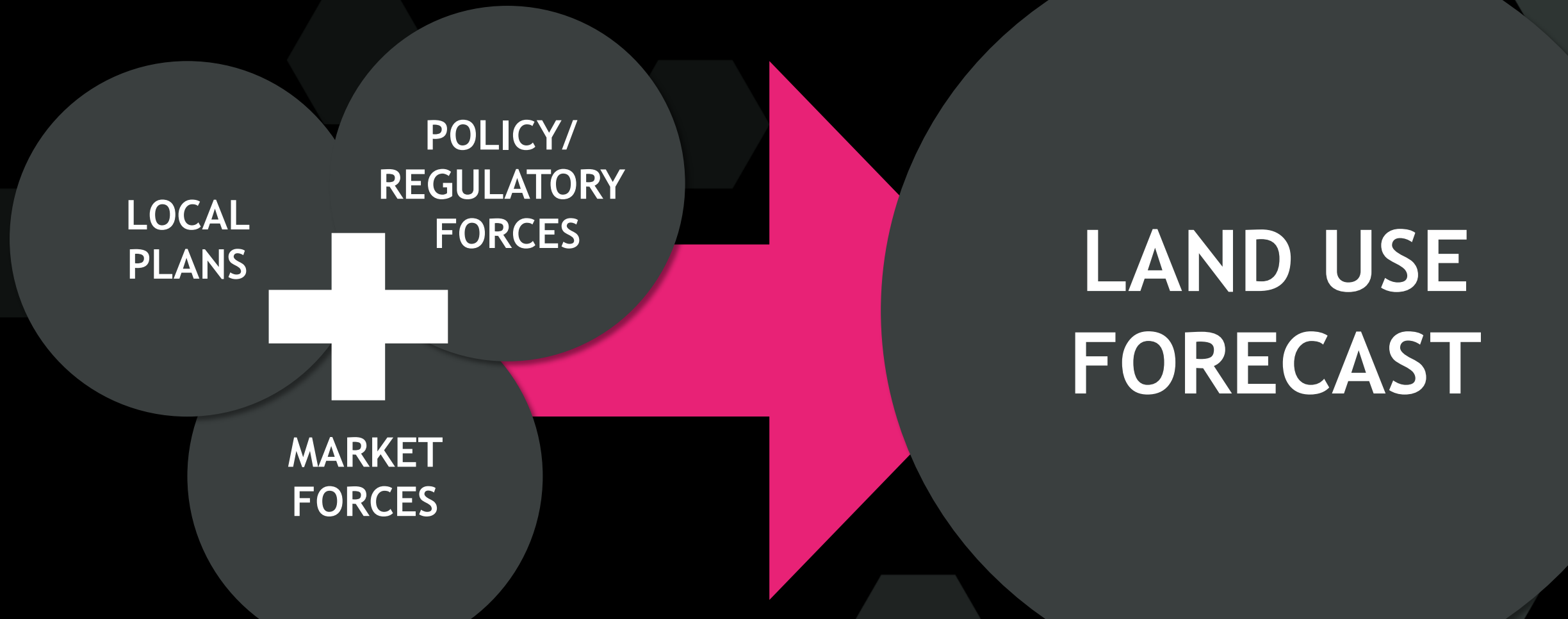
[dkadin@sacog.org](mailto:dkadin@sacog.org)

(916-340-6238)

# Building Land Use inputs for the Travel Demand Model (SACSIM19)



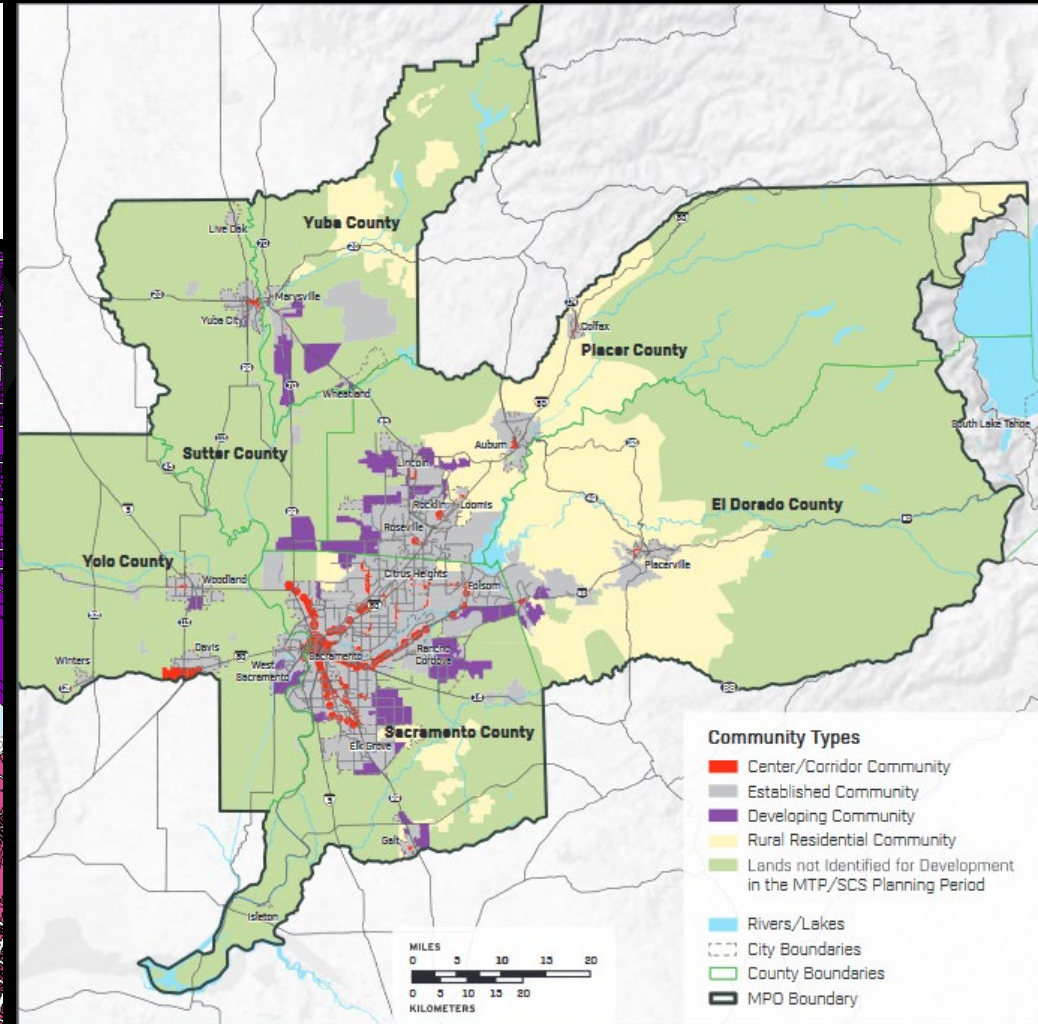
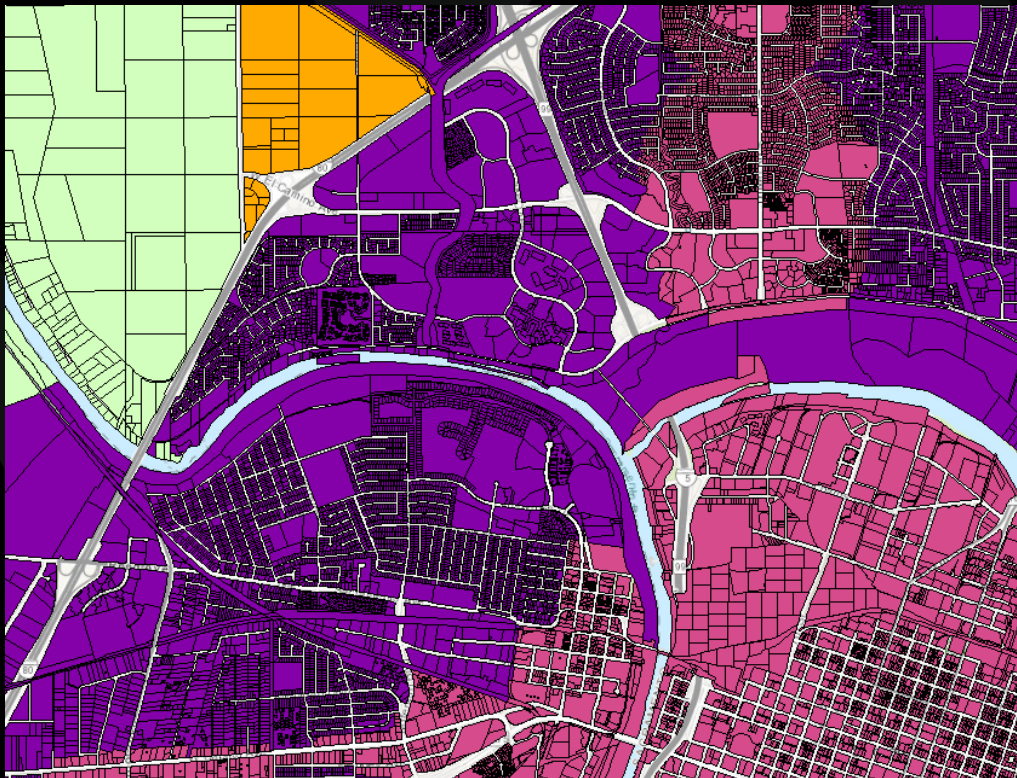
# Where and What Growth is Most Likely to Occur?



# Land Use Inputs



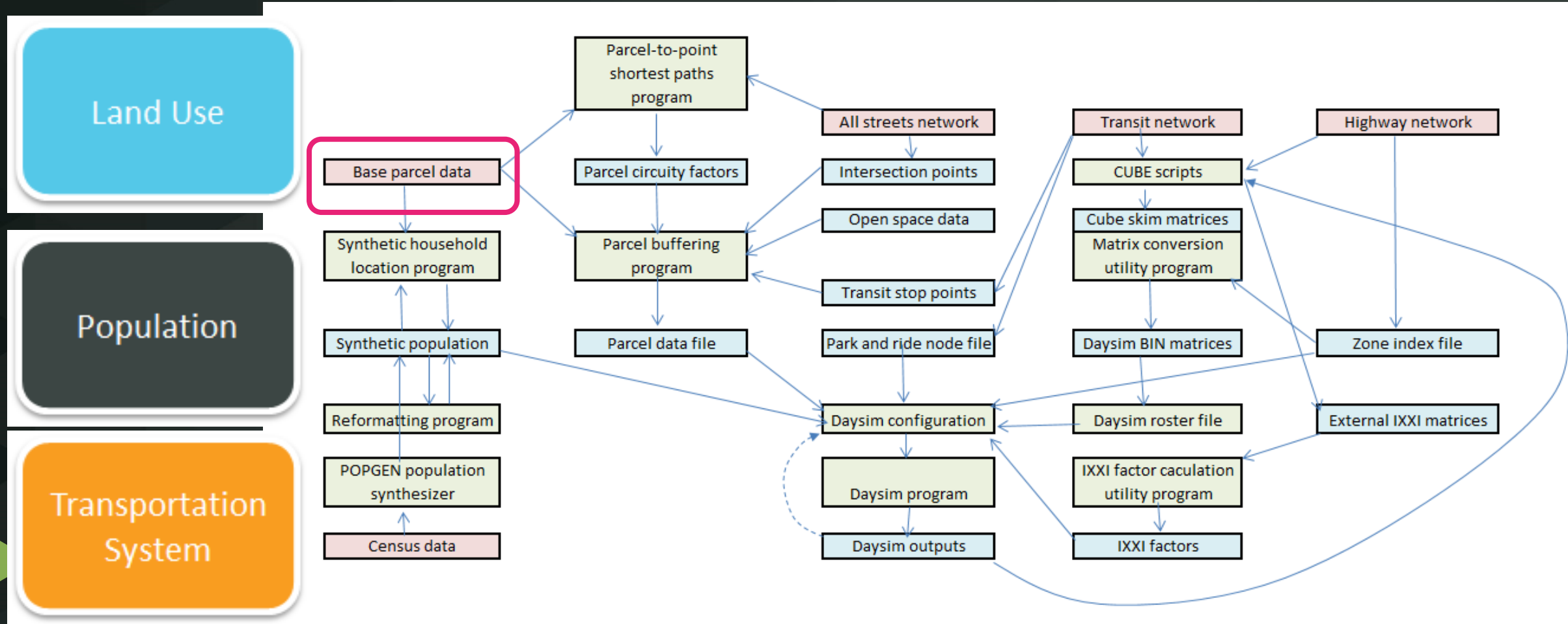
Land Use



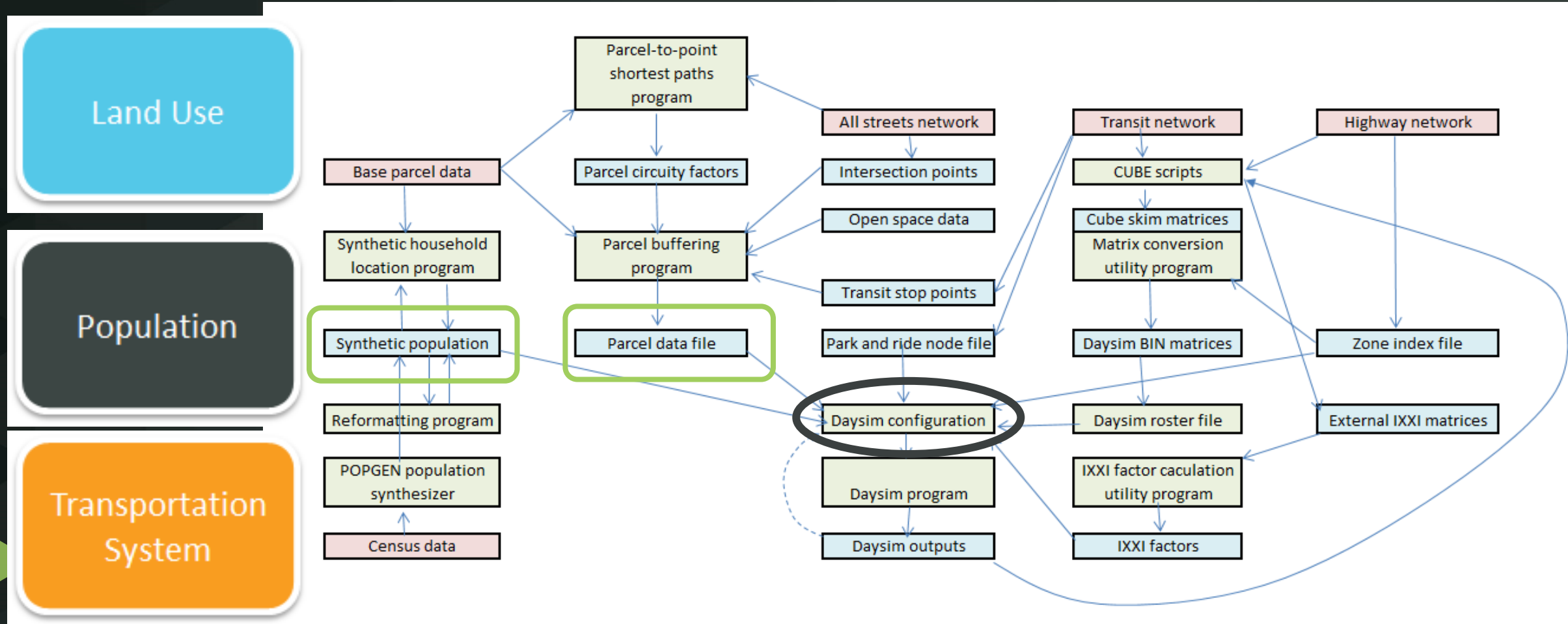
## Community Types

- Center/Corridor Community
- Established Community
- Developing Community
- Rural Residential Community
- Lands not Identified for Development in the MTP/SCS Planning Period
- Rivers/Lakes
- City Boundaries
- County Boundaries
- MPO Boundary

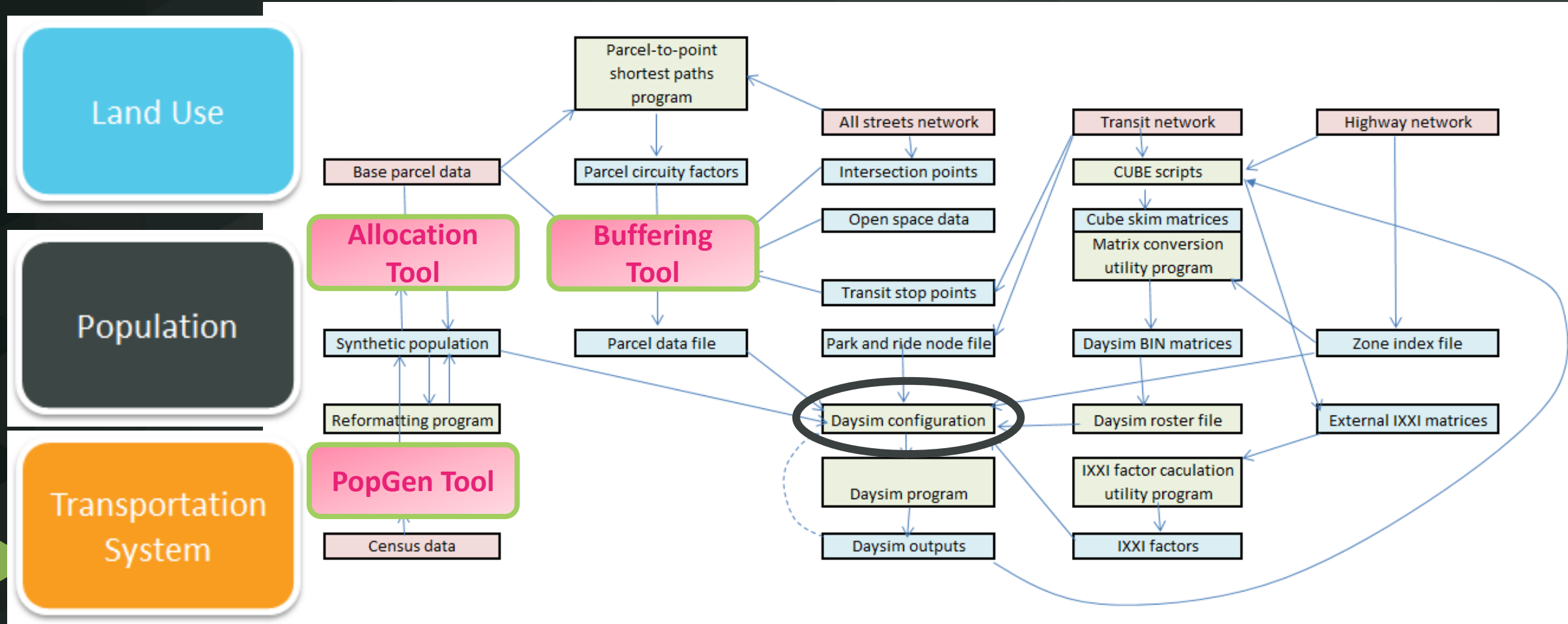
# SACSIM Land Use / Population Relationships



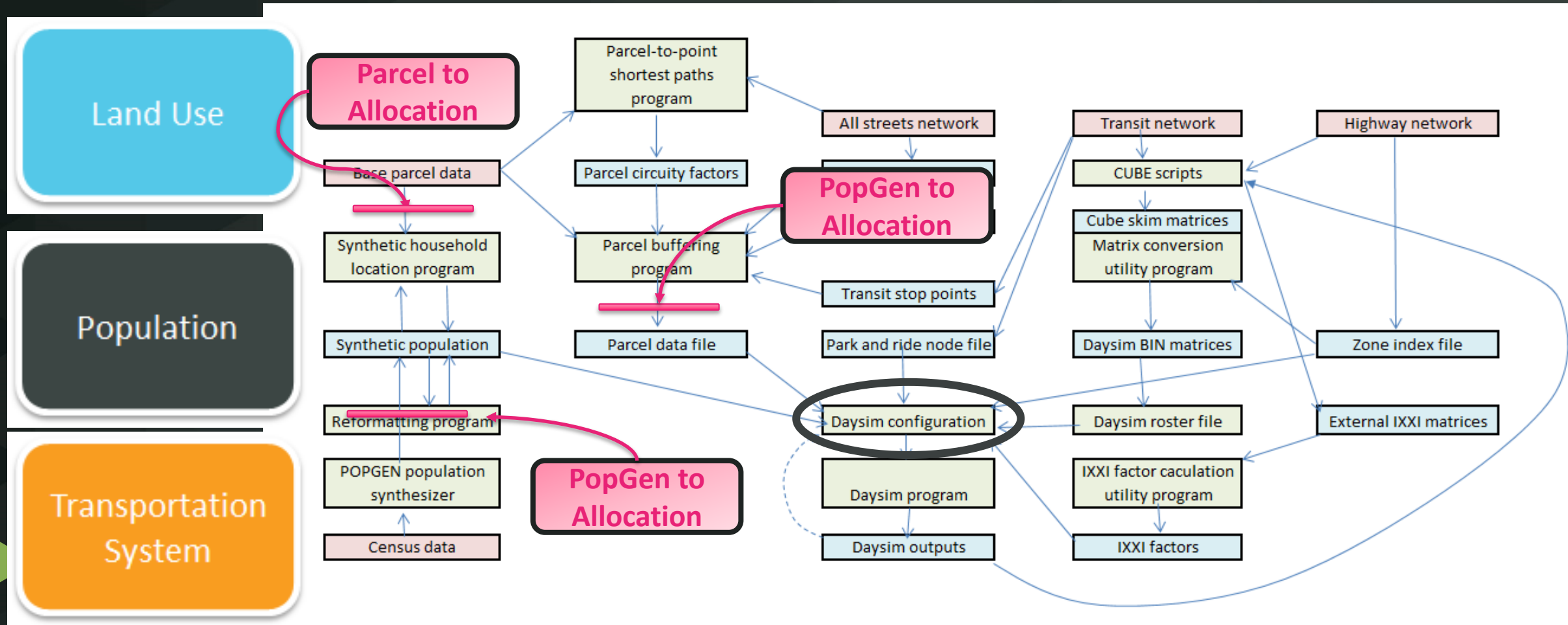
# SACSIM Land Use / Population Relationships



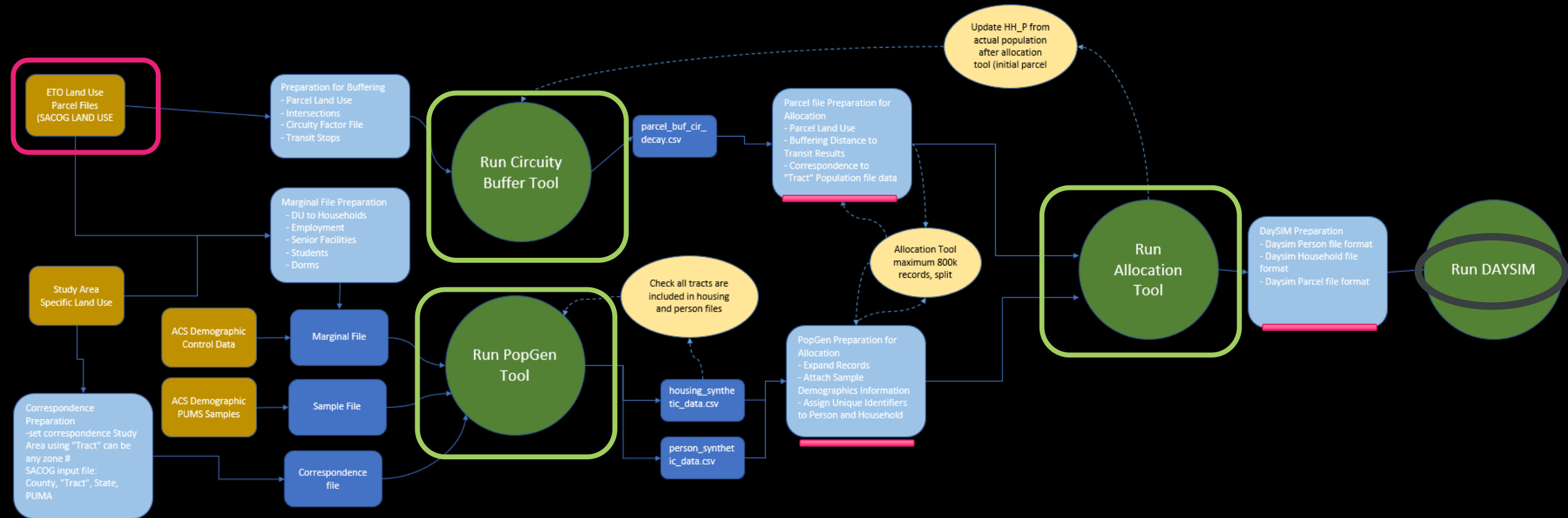
# SACSIM Land Use / Population Relationships



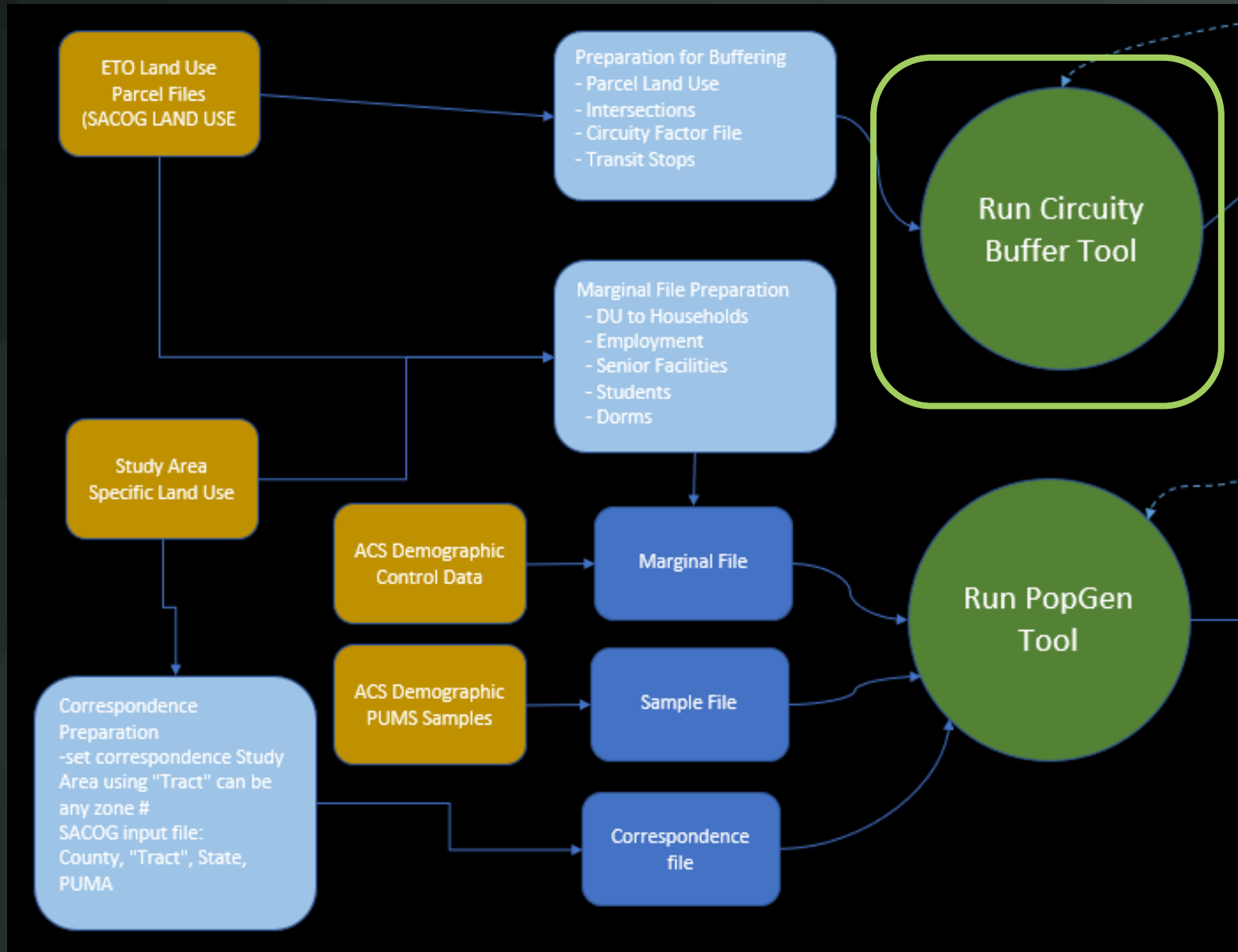
# SACSIM Land Use / Population Relationships



# Update Parcel & Population File Flow Chart

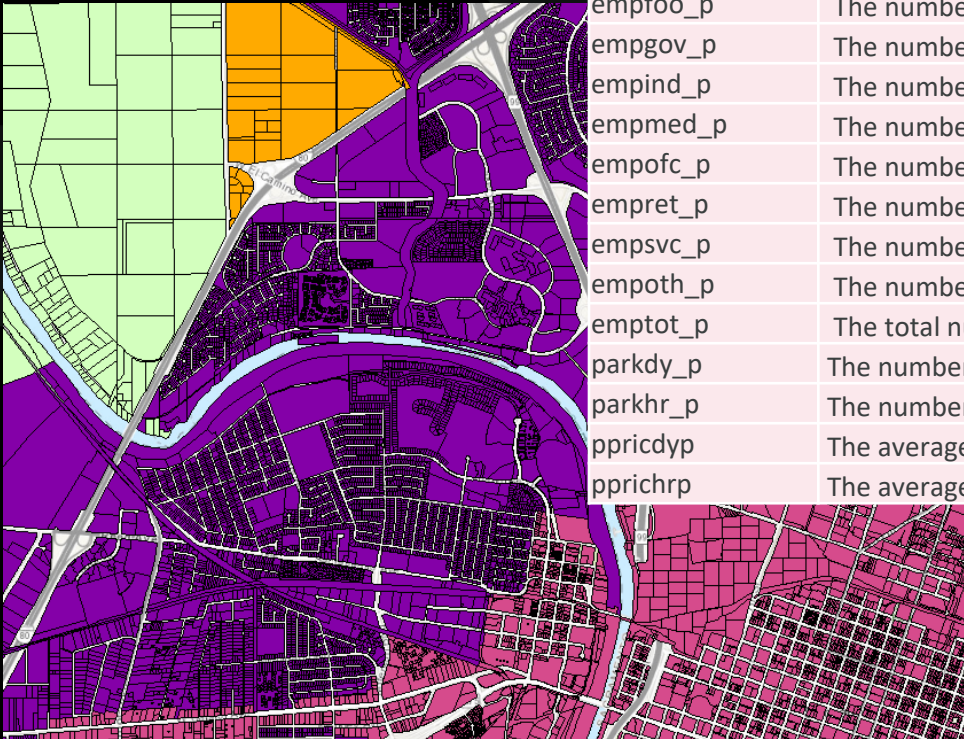


# Update Parcel & Population File Flow Chart



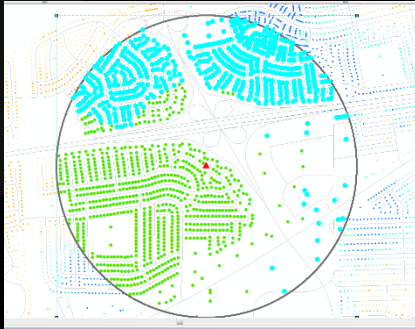
# Developing the Parcel file for SACSIM

Land Use



|          |                                                                                                                 |
|----------|-----------------------------------------------------------------------------------------------------------------|
| lotype_p | The land use type code (housing density class)                                                                  |
| hh_p     | The number of households residing on the parcel                                                                 |
| stugrd_p | The number of grade school (K-8) students enrolled at the parcel                                                |
| stuhgh_p | The number of high school students enrolled at the parcel                                                       |
| stuuni_p | The number of college students enrolled at the parcel                                                           |
| empedu_p | The number of educational employees working at the parcel                                                       |
| empfoo_p | The number of food service employees working at the parcel                                                      |
| empgov_p | The number of government employees working at the parcel                                                        |
| empind_p | The number of industrial employees working at the parcel                                                        |
| empmed_p | The number of medical employees working at the parcel                                                           |
| empofc_p | The number of (other) office employees working at the parcel                                                    |
| empret_p | The number of retail employees working at the parcel                                                            |
| empsvc_p | The number of (other) service employees working at the parcel                                                   |
| empoth_p | The number of other sector employees working at the parcel (typically agriculture, mining - not used for SACOG) |
| emptot_p | The total number of employees working at the parcel (equals the sum of the previous 9 values)                   |
| parkdy_p | The number of paid off street parking spaces on the parcel with per day pricing                                 |
| parkhr_p | The number of paid off street parking spaces on the parcel with per hour pricing                                |
| ppricdp  | The average price per day for paid off street parking spaces on the parcel                                      |
| pprichrp | The average price per hour for paid off street parking spaces on the parcel                                     |

# Run Circuitry Buffer

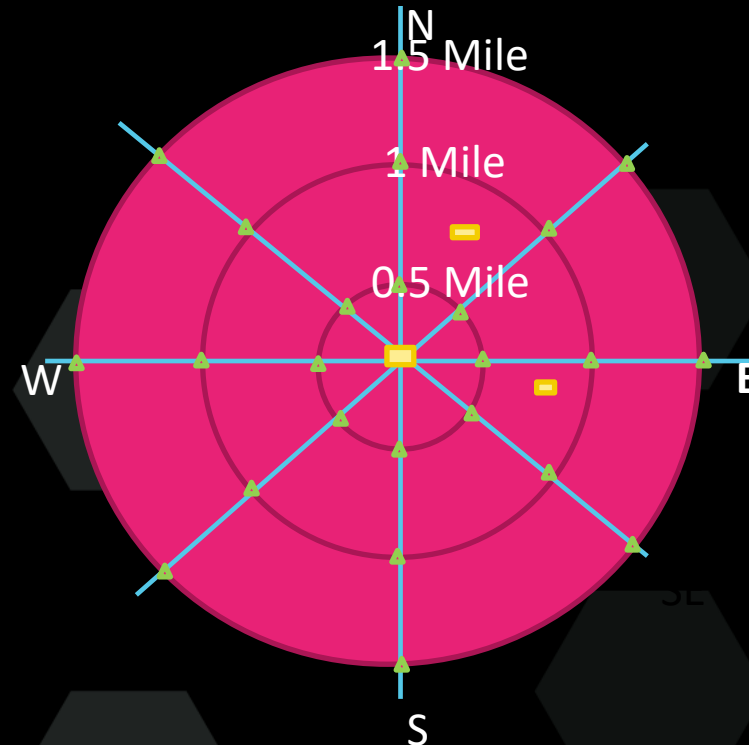


- Update Input Files (new jobs)

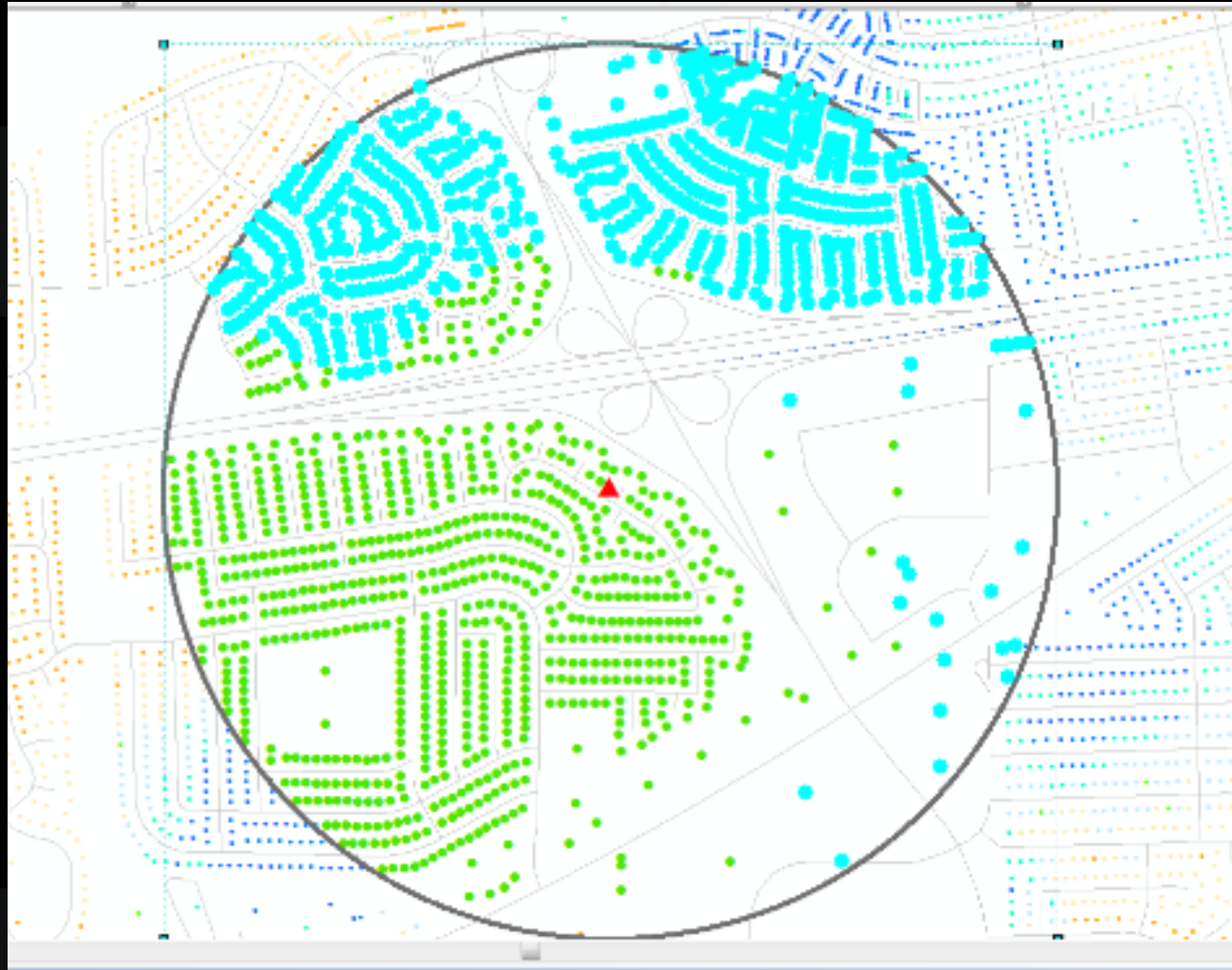
- sacog\_parcelbase\_<scenario>.dbf
- sacog\_intersections\_<scenario>.dbf
- sacog\_transitstops\_<scenario>.dbf
- sacog\_openspace\_<scenario>.dbf
- sacog\_parcel\_<scenario>\_circuitry.dat

- Run

- DaySimParcelBufferingV3.exe
- sacogbuffering2016\_cir\_decay\_v3.ctf



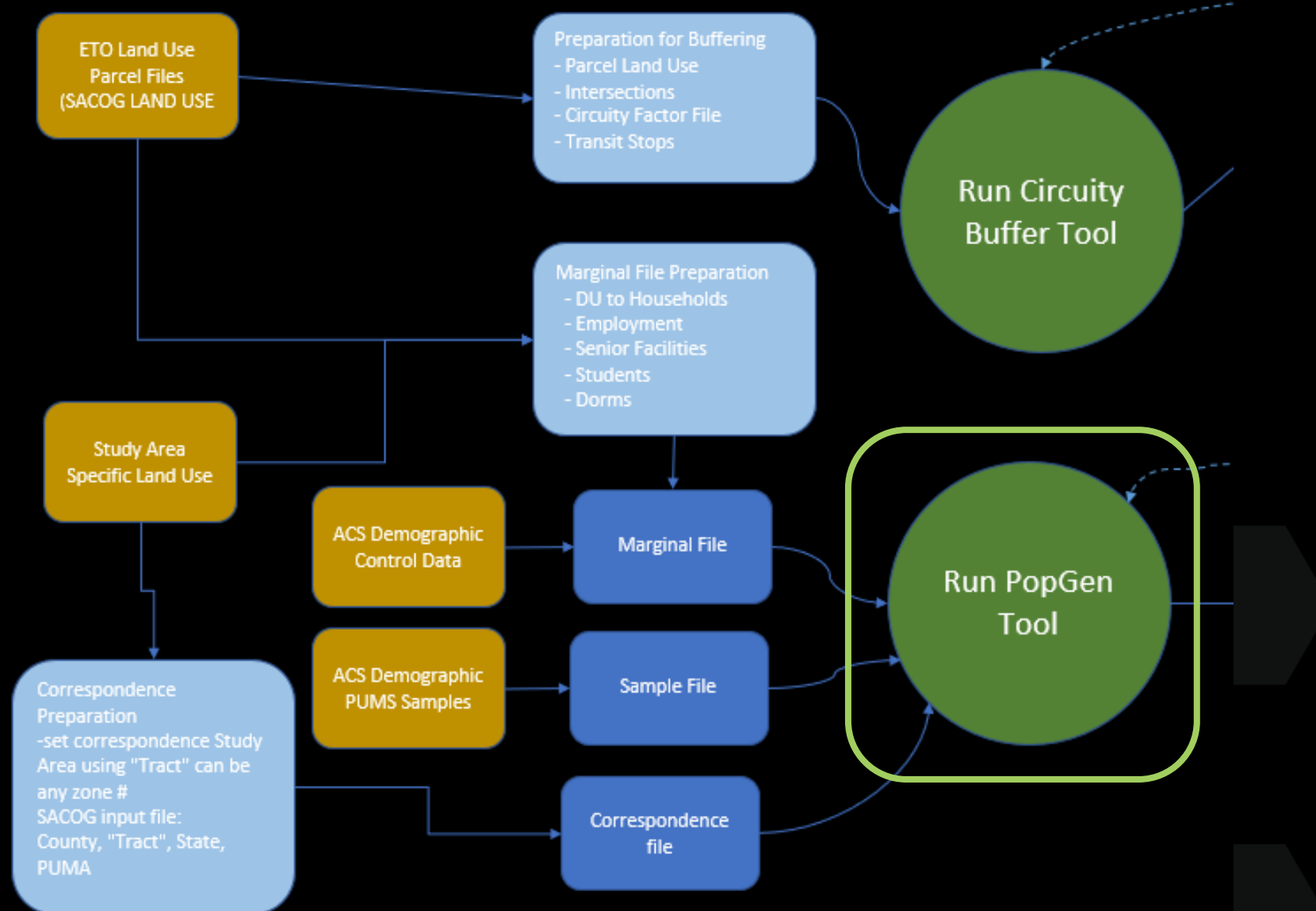
# Variables in Parcel File



# Generating a Representative Population



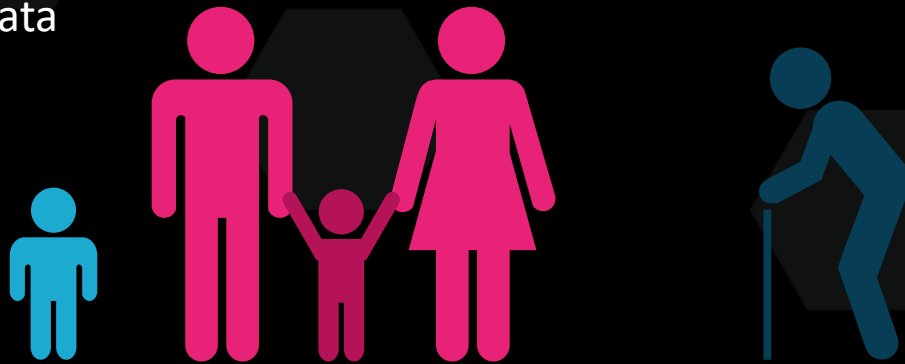
# Update Parcel & Population File Flow Chart



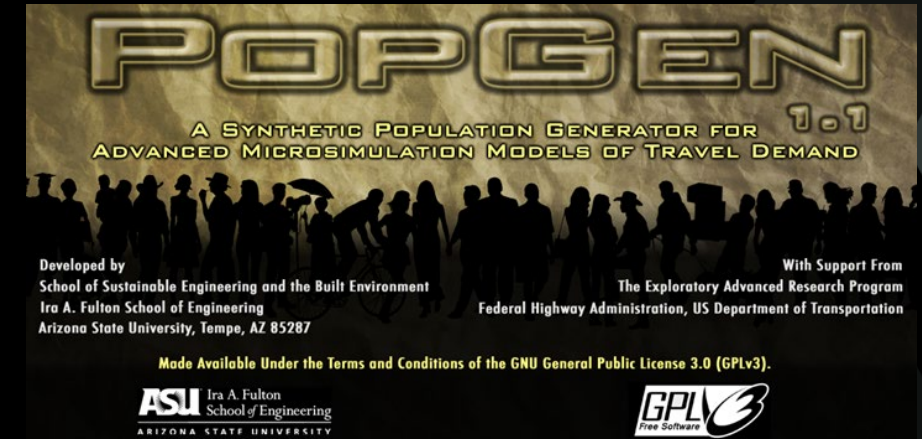
# Population/Demographic Inputs

5 year ACS (American Community Survey) Marginal data

5-year PUMS (Public Use Microdata Sample) sample population data



Population



CENTER FOR CONTINUING STUDY OF THE CALIFORNIA ECONOMY

385 HOMER AVENUE PALO ALTO • CALIFORNIA • 94301

TELEPHONE: (650) 321-8550  
FAX: (650) 321-5451  
[www.ccsce.com](http://www.ccsce.com)

December 2017

**SACOG Growth Forecast 2016-2050**

Final Report

Corresponding Sample Categories with Marginal Variables

a. Do you wish to match distributions of both Persons and Household attributes of interest?

☒ Yes
☐ No

b. Set the correspondence between the sample variable categories and the columns in the Marginals table

Household Variables
Person Variables
Groupquarters Variables

Do you wish to modify the household size marginal distribution?

☐ Yes
☒ No

Select the household size variable name

hsize

Enter the average value for the last household size category

Select the person variable to obtain the person total

agec

Sample Table

hhld\_sample

Marginal Table

hhld\_marginals

Sample Variable

np  
nworker  
hincp  
wif  
age\_owner  
seri\_old

Selected Variable

hsize  
worker  
income  
hher  
univ

Selected Variable Categories

worker, Category 4  
income, Category 1  
income, Category 2  
income, Category 3  
income, Category 4  
income, Category 5  
hher, Category 1  
hher, Category 2  
hher, Category 3  
univ, Category 1  
univ, Category 2

Marginal Variables

worker3  
income1  
income2  
income3  
income4  
income5  
hher1  
hher2  
hher3  
uni1  
uni2

Select>>
<<Deselect

Correspondence between the Sample Variable Categories and the Marginal Variables

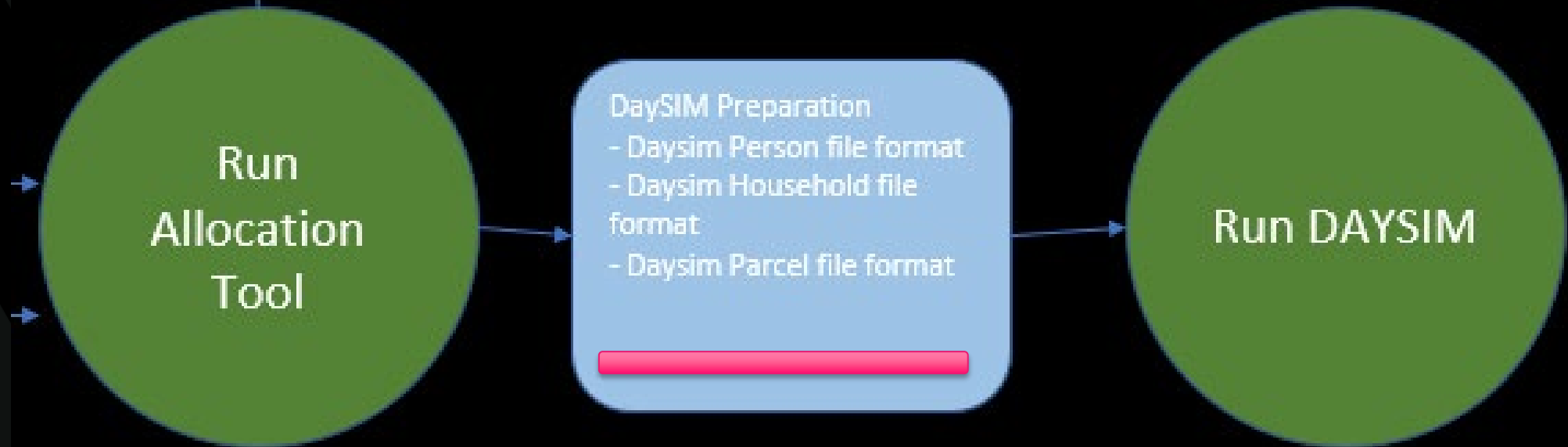
hsize, Category 1 - size1  
hsize, Category 2 - size2  
hsize, Category 3 - size3  
hsize, Category 4 - size4  
worker, Category 1 - worker0  
worker, Category 2 - worker1  
worker, Category 3 - worker2  
worker, Category 4 - worker3  
income, Category 1 - income1  
income, Category 2 - income2  
income, Category 3 - income3

Add Correspondence  
Delete Correspondence

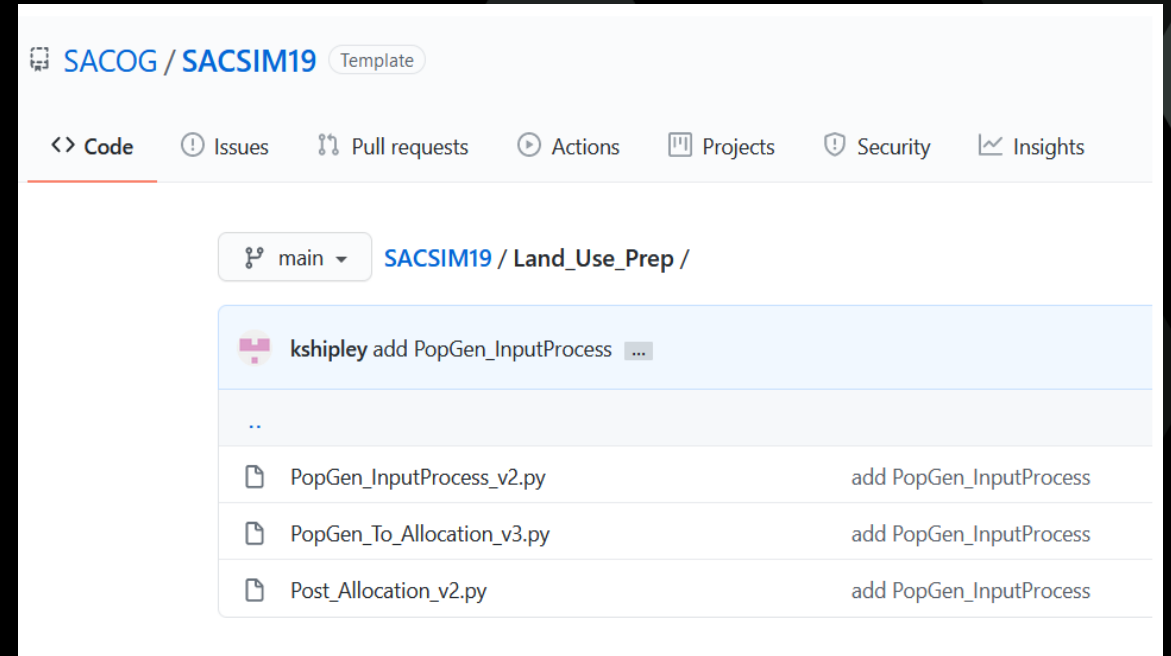
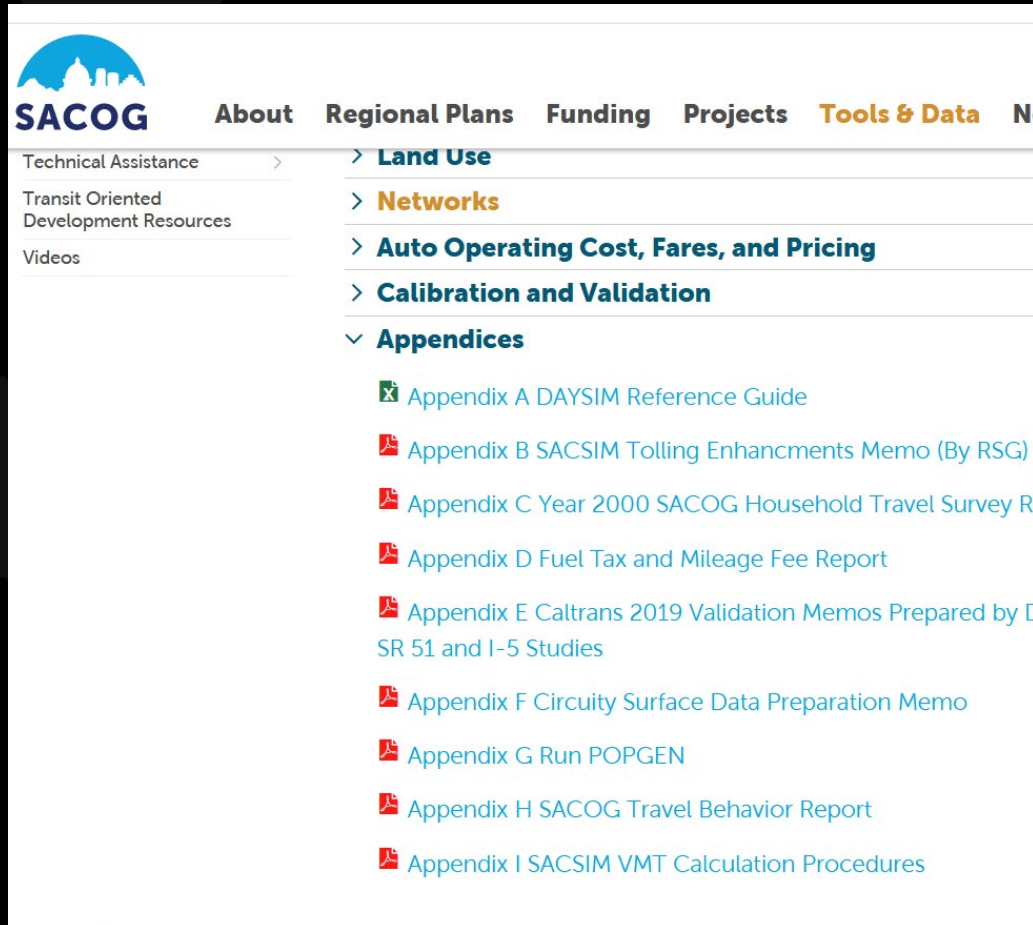
Note: Select household/person/groupquarter variables of interest from the 'Sample Variable' that you wish to control. Once these have been selected, create appropriate mapping between the categories of the selected variables and the columns in the marginal tables. To do this, highlight a category from the 'Selected Variable Categories' and the corresponding column name under the 'Marginal Variables' and click on 'Add Correspondence'.

OK
Cancel

# Parcel & Population SACOG Processing Tools



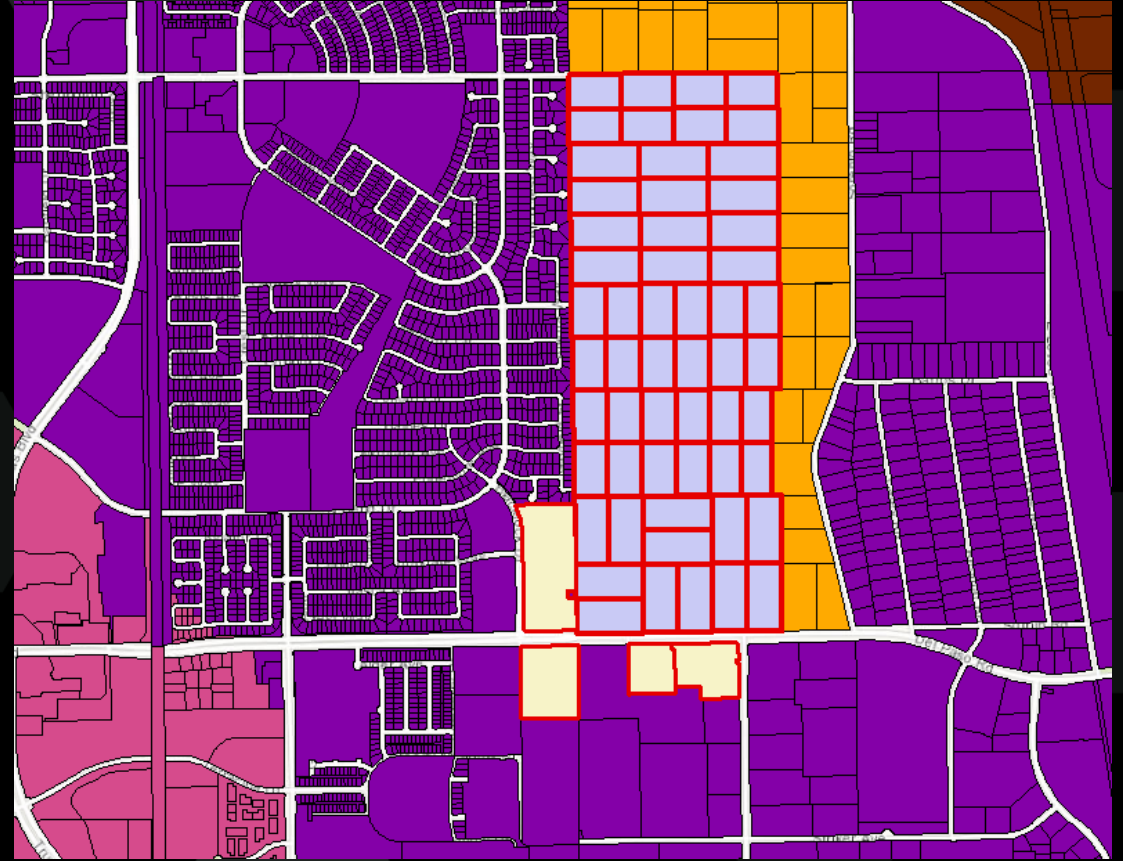
# Parcel & Population SACOG Processing Tools



# Project Example

## Mixed Use

- Identify parcels in the project area
- Define new land use code
- Run POPGEN
- Run Circuity Buffer



# Additional Parcel & Population Support



SACSIM streamlining 1: parcel file preparation



SACSIM streamlining 2: population file preparation



SACSIM streamlining 3: user interface & performance (run speed)



Less than 4 year base year updates



SACMET: bring back into maintenance

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# Committed Parcel & Population

- ✓ SACSIM Model Documentation and User Guide
- ✓ SACSIM Parcel & Population User Guide
- ✓ 4 year base year updates
- ✓ Project Level Parcel & Population Technical Support

Thank You

For more information on SACSIM contact [KShipley@sacog.org](mailto:KShipley@sacog.org)  
or visit <https://www.sacog.org/modeling>

