4.4 Parcel Variables

The parcel point file is used as the DAYSIM "microzone" file containing the parcel id, geographic coordinates, and land use variables including land use type, number of households, employee total and sub employee categories, public off street parking spaces and pricing. The sections that follow provide a brief description of the parcel variables and Table 4-3 lists out the field names as they appear in the parcel file.

4.4.1 Parcel Identification

The PARCELID filed is required as the unique identify for every individual parcel This must be a unique, ascending, positive integer identification number. PARCELID is required to associate back to the trip and household tables DAYSIM table outputs. SACSIM only used Parcel's with households, employment, students, and/or parking. All other areas such as forests or vacant parcels are not included. For this reason, PACELID may have gaps provided in ascending order to remove these parcels from the complete SACOG regional parcel land use file.

4.4.2 Coordinates

The XCOORD_P and YCOORD_P fields store the X and Y State plane coordinates of each parcel's location. The location is a point within the parcel area and closest to the centroid as possible. The precision of the coordinates is to the nearest foot and therefore these fields store the data as Long Integers.

4.4.3 Area

The SQFT_P field stores the area of the parcel in square feet. This is usually calculated from the geometric area of the parcel polygon feature. Some parcels may have a geometry that could be corrupt which could result in zero square feet.

4.4.4 Traffic Analysis Zone

The TAZ_P field is used to link the DAYSIM "Zone" data to the "Microzone" data. SACSIM links ~1500 Traffic Analysis Zones (TAZ) to ~800,000 parcels. TAZ are later Used for SACSIM trip aggregation and assignment.

4.4.5 Households

Households on each parcel are estimated by occupancy rate and the number of dwelling units (DU's) from land use dataset. Occupancy rate is sourced from ACS sample data and adjusted by regional control of the number of households. More information on households is in chapter 5, Representative Population Data.

4.4.6 K-12 Student Enrollment

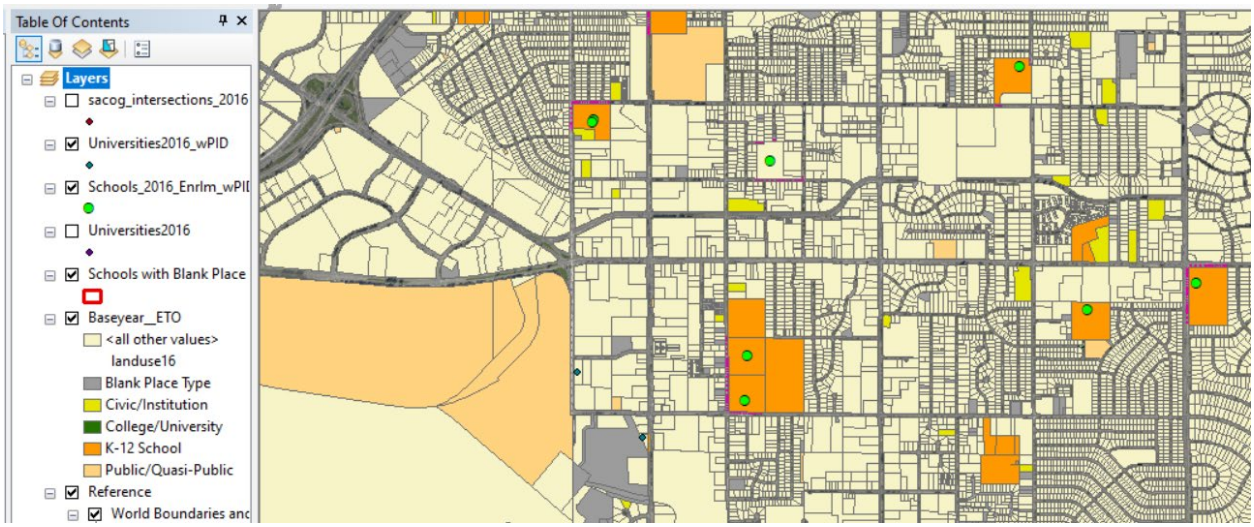
The STUGRAD and STUHGH field stores the number of students on parcels that have elementary, middle and high schools. SACOG collected student enrollment data for the base year inventory (2016), and forecasts future enrollment based on land use forecasting data. Populating student enrollment fields involves constructing a shapefile or table of existing or forecasted school locations with enrollment numbers and moving these numbers.

4.4.6.1 Base Inventory

The STUDUNI field stores the number of students on parcels that are part of major universities and community colleges. As with K-12 enrollment, university enrollment inventory, involves

constructing a shapefile or table of existing and projected university/college locations with student enrollment. Figure 4-1 illustrates an example of K-12 and University enrollment inventory spatially associated to corresponding parcel land use types.

Figure 4-1 K-12 and University Student Inventory Collection for Parcel File Development



4.4.6.2 College and University Student Enrollment

Universities with a student body largely in person are counted in full. Universities or colleges with enrollment but have a larger amount of online classes and are not likely to travel daily to campuses to attend courses are weighted by reducing the overall student enrollment. Full or primarily online programs with student enrollment that do not travel to campus are not included in STUDUNI number of students.

4.4.7 Employment

Employment variables are:

- Education (empedu);
- Food service (empfoo);
- Government (empgov);
- Industrial (empind);
- Medical (empmed);
- Office (empofc);
- Retail (empret);
- Service (empsvc);
- Other (empoth); and
- Total employment (emptot).

SACSIM employment types are based on land use model employment types, which in turn are based on a simplified scheme of industrial sector categories. That is, they are based on the industrial sector which describes the use on a given parcel, and not the classification of the job in occupational

terms (e.g. laborer, clerical, administrative, technical, professional, managerial, etc.). Table 4-2 shows SACSIM defined employment categories based on the North American Industry Classification System (NAICS) codes. These definitions were applied and used by SACOG in establishing its land use scenario analysis system.

4.4.7.1 Processing of Medical Employment

Medical employment is defined differently between land use model and SACSIM. Medical employment is generated in land use model by one place type: Medical Facility, which is defined as hospitals and major medical centers, with 400 or more employees. SACSIM requires a more expansive definition of medical employment, which includes both hospitals/major medical centers, plus medical employment in smaller offices, clinics, etc. Most of this medical sector employment is dispersed and mixed in office and business park areas, with higher concentrations located around hospitals and major medical centers. In order to resolve this inconsistency in definition, a portion of the employment in office and service areas is "converted" to medical; additionally, the portion of the total employment which is so converted varies directly with proximity to hospitals/major medical centers. That is, the closer an office- or service- employment generating use is to a hospital/major medical center, the greater the proportion of total employment which is likely to be medical

Table 4-2 NAICS Code and SACSIM Sectors

SACSIM sectors	SACSIM name	NAICS codes	Subcodes / Description
Education	EMPEDU	61	Educational Services *(exclude 6115-6117 trade school, education support, include in service)*
Food service	EMPFOOD	722	7221-7225 (restaurants and bars)
Government	EMPGOV	92	Public Administration *(exclude 9281 security and information, include in Other)*
Industrial	EMPIND	11	Agriculture, Forestry, Fishing and Hunting
		21	Mining, Quarrying, and Oil and Gas Extraction
		22	Utilities
		23	Construction
		31-33	Manufacturing
		42	Wholesale Trade
		48-49	Transportation and Warehousing *(exclude 4911 post office, include in service)*
		562	562 - (5621 - 5629) included in industrial because uses are administrative for waste, utilities and construction uses.
Medical	EMPMED	62	Health Care and Social Assistance *(exclude 623-624 nursing and residential care, social service, include in service)*
Office	EMPOFC	51	Information
		52	Finance and Insurance
		53	Real Estate and Rental and Leasing
		54	Professional, Scientific, and Technical Services
		55	Management of Companies and Enterprises
		56	Administrative and Support and Waste Management and Remediation Services (exclude 562, construction, include in industry)

SACSIM sectors	SACSIM name	NAICS codes	Subcodes / Description
		813	8131 - 8139 included in Office (Office) because uses are larger civic and charitable organizations.
Other	EMPOTH	9281	9281 (military) included in Military/Other
Retail	EMPRET	44-45	Retail Trade
Service	EMPSER	4911	4911 post office
		6115-6117	6115-6117 (trade and technical schools) included in Retail(Service) because I-PLACE3S Education is K12 and college related
		623	623 - Nursing and Residential Care Facilities
		624	624 - Social Assistance
		71	Arts, Entertainment, and Recreation
		721	Accommodation and Food Services (exclude 722, include in Food)
		81	Other Services *(except Public Administration, exclude 813 (8131-8139), include in office)*

Source: SACOG 2020.

4.4.8 Parking

Parking is included in SACSIM for off-street, paid parking only. The number of daily spaces (parkdy), hourly spaces (parkhr), daily parking cost (ppricdy), and hourly parking cost (pprichr) variables are included. Base year parking inventory was gathered by using parking inventory data from previous iterations of SACSIM, aerial imagery, and ParkMe spaces and prices. Currently, the supply variables are not distinguished; i.e. for paid off-street facilities, all spaces are assumed to be available for either hourly or daily use, and the supply variables are equal.

Table 4-3 SACSIM Unbuffered Parcel File Variables

Header label	Valid values	Description, comments
parcelid	1 – 9999999	The parcel ID number. Values must be unique positive integers, in ascending order. (Gaps are allowed, but not efficient for memory.)
xcoord_p	1-999999999	The x coordinate of the parcel centroid, in integer length units (typically SPF).
ycoord_p	1-999999999	The y coordinate of the parcel centroid, in integer length units (typically SPF).
sqft_p	0-999999999	The area of the parcel, in thousands of square length units (typically sqf, does not need to be an integer)
taz_p	1-9999999	The zone that the parcel is in. Must be a valid zone_id in the “zone” file
lutype_p	0-9999999	A land use type value. This variable currently has no mandatory use in the DAYSIM code, so is available for region-specific usage.
hh_p	Real >=0	The number of households residing on a parcel.
stugrad_p	Real >=0	The number of grade school (K-8) students enrolled in schools on a parcel
stuhgh_p	Real >=0	The number of high school (9-12) students enrolled in schools on a parcel. If this is not available separately, then set to 0 & put the number of K-12 students in stugrd_p
stuuni_p	Real >=0	The number of university/college students enrolled in schools on a parcel.
empedu_p	Real >=0	The number of educational employees working on a parcel
empfoo_p	Real >=0	The number of food service employees working on a parcel
empgov_p	Real >=0	The number of government employees working on a parcel
empind_p	Real >=0	The number of industrial employees working on a parcel
empmed_p	Real >=0	The number of medical employees working on a parcel

Header label	Valid values	Description, comments
empofc_p	Real >=0	The number of (other) office employees working on a parcel
empret_p	Real >=0	The number of retail employees working on a parcel
empsvc_p	Real >=0	The number of (other) service employees working on a parcel
empoth_p	Real >=0	The number of other sector employees working on a parcel. Typically contains construction, agriculture, mining.
emptot_p	Real >=0	The total number of employees working on a parcel. Should equal the sum of the 9 previous fields.
parkdy_p	Real >=0	The number of paid public off-street parking spaces on a parcel with per day pricing. (May overlap with parkhr_p if have both types of pricing.)
parkhr_p	Real >=0	The number of paid public off-street parking spaces on a parcel with per hour pricing. (May overlap with parkdy_p if have both types of pricing.)
ppricdyp	Real >=0	The average price of public off-street parking spaces on a parcel with per day pricing. (In cents per day)
pprichrp	Real >=0	The average price of public off-street parking spaces on a parcel with per hour pricing. (In cents per hour)

Source: SACOG 2020. Downloaded from RSG *DAYSIM Input Data File Documentation* GitHub RSGInc/DAYSIM