SCAG™

INNOVATING FOR A BETTER TOMORROW

User Guide: SoCal Transportation Safety Community Modeling Tool

JULY 2025

Table of Contents

List of Exhibits ii

Purpose and Background 1

User Guide 6

Appendix A: Place Type & Density Values 15

Appendix B: Data Dictionary 16

List of Exhibits

Exhibit 1 The Safe System Approach....2
Exhibit 2 Equation. Negative Binomial Regression Functional Form....2
Exhibit 3 SCAG's Integrated Forecasting and Modeling Framework....4
Exhibit 4 Scenario Set Up Interface....6
Exhibit 5 Create a New Scenario in the Scenario Set Up Interface....7
Exhibit 6 Return to an Existing Scenario in the Scenario Set Up Interface....8
Exhibit 7 Determine Geographic Study Area in the Site Selection Interface....8
Exhibit 8 Example Geographic Study Area Selection in the Site Selection Interface....9
Exhibit 9 Select an SPZ to Edit in the Plan Future Scenario Interface....10
Exhibit 10 Edit an SPZ in the Plan Future Scenario Interface....10
Exhibit 11 Edit Future Place Type and Density in the Plan Future Scenario Interface....11
Exhibit 12 Edit TAZ-Level Characteristics in the Site Characteristics Interface....12
Exhibit 13 Select the Desired Crash Predictions in the Desired CPMs Interface....13
Exhibit 14 Review Crash Predictions in the Evaluate and Compare Results Interface....14

Purpose and Background

The Southern California Community Transportation Safety Modeling tool was developed for the Southern California Association of Governments (SCAG) metropolitan planning organization (MPO) to implement the findings and results of the recently completed Federal Highway Administration (FHWA) Safety Data and Analysis Technical Assistance Program (SDATAP) efforts. These areawide safety models, which predict crashes for different travel modes and severities at the Tier II Traffic Analysis Zone (TAZ)-level, support a methodology for incorporating safety into SCAG's scenario planning, particularly when engaging county transportation commissions and other local stakeholders. This work was derived from the completed National Cooperative Highway Research Program (NCHRP) 17-81 project and resulting NCHRP 1044[1] research report. A second FHWA technical assistance effort developed a tentative plan to integrate these crash predictive models into SCAG's broader scenario-planning process (i.e., this interactive application).

Areawide Safety Model Objectives & Development

Areawide models predict average crash frequency, by crash type and severity, for a defined area, such as a census tract, traffic analysis zone, or county. Predictor variables for areawide safety models characterize the broader area for which the models apply and can include:

- Area Type Classifications and Geography
- Socioeconomics
- Land Use
- Presence/type/extent of Multimodal Transportation Infrastructure

These models are intended to supplement the long-range transportation planning process, not replace it. This approach is highly compatible with a Safe System Approach and the United States Department of Transportation's (USDOT's) National Roadway Safety Strategy (NRSS) with its emphasis on proactive safety (**Exhibit 1**).

[1] https://www.trb.org/Main/Blurbs/183006.aspx

Exhibit 1 The Safe System Approach

The Application Objectives section contains further discussion on the role of these models and the Transportation Safety Community Model application.

SCAG'S AREAWIDE MODELS

SCAG's areawide models use data inputs that are readily available through its Regional Transportation Planning (RTP) process. Areawide models use a negative binomial count regression model approach to predict crashes. Negative binomial regression is a commonly used method in transportation safety as it applies to over-dispersed count data (i.e., the variance exceeds the mean of the observed data). The dependent variable in the model is the number of crashes, making a count model appropriate for the data. The functional form of the negative binomial regression model is shown in **Exhibit 2**.

Exhibit 2 Equation. Negative Binomial Regression Functional Form

$$\lambda_i = e^{\beta X_i + \varepsilon_i}$$

Where:

$e^{\varepsilon i}$ = gamma distributed error term, where $e^{\varepsilon i}$ is gamma-distributed with a mean equal to one and variance equal to α.

λi = expected number of crashes at location i.

β = vector of estimated parameters.

Xi = vector of independent variables that characterize location i and influence crash frequency.

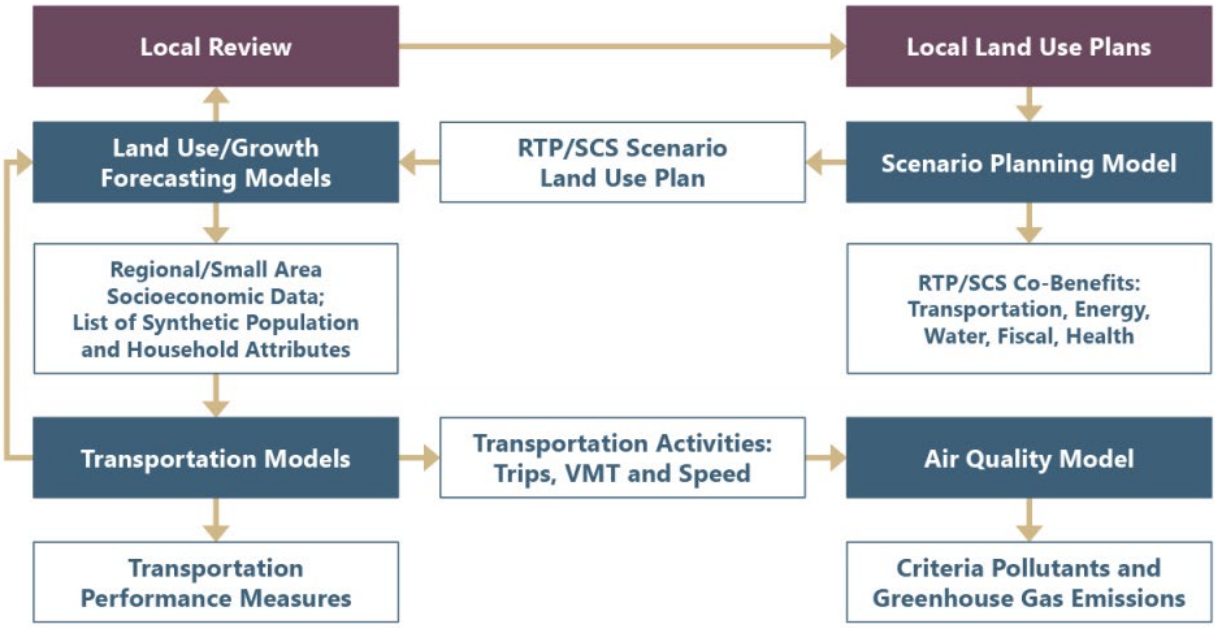
Application Objectives

Areawide models serve a specific purpose that traditional predictive safety models, which predict crashes for a segment or intersection, struggle to serve. When using areawide safety models, practitioners should note the following:

- Models represent the baseline, business as usual path.
- Inputs can be adjusted or projected based on possible future outcomes.
- New information or changes to the transportation system can affect projections.
    - Local road safety initiatives.
    - Increased investment and data-driven project programming.
    - Speed management or implementation of a safe system approach.
    - Improved vehicle safety features.
    - Vehicle and infrastructure connectivity and other operational improvements.
    - Development trends and personal travel choices.
- Community models are most effective:
    - When relative trends are used (i.e., relative increase or decrease in predicted crashes),
    - Before major design details are known (e.g., lane width, shoulder width, horizontal curvature, etc.), and
    - In places where people (will) live, work, and play.

SCAG currently employs a sophisticated suite of transportation planning models collectively referred to as the Scenario Planning Model (SPM) modeling framework (**Exhibit 3**). This suite of models supports SCAG as the agency refines growth projections, travel forecasts, and emissions estimates to support the region's various planning programs and regional plans.

Exhibit 3 SCAG's Integrated Forecasting and Modeling Framework



The SPM framework provides an opportunity to integrate quantitative safety metrics (i.e., crash prediction) into long-range planning activities. The application serves several objectives with respect to SCAG's planning initiatives:

- Deliver quantitative safety tools to County Transportation Commissions (CTCs) and other local agency partners.
- Use quantitative safety metrics for scenario planning and preliminary project screening with outcomes.
- Provide a mechanism for communicating planning outcomes with stakeholders.
- Compare predicted safety outcomes as a result of Regional Transportation Plan (RTP)/Sustainable Communities Strategy (SCS) development with respect to underserved communities and communities of concern.
    - Senate Bill (SB) 535 Disadvantaged Communities.
    - RTP/SCS Communities of Concern.
    - RTP/SCS Environmental Justice Areas.

POTENTIAL USE CASES

SCAG's areawide safety models can support several safety planning use cases and needs. The following list is a brief discussion of potential use cases to consider:

- Incorporating quantitative safety in long-range planning decisions, similar to other planning objectives such as VMT, air quality, greenhouse gas emissions, energy consumption, public health, and fiscal feasibility.

- Understanding potential safety impacts on communities of concern or other demographic groups, either through the RTP process, small area study, or proposed redevelopment.
- Supporting local jurisdictions developing local or regional comprehensive safety plans or modal plans, including street network evaluations (e.g., future collector street plan).
- Conducting scenario planning for new development or redevelopment, as well as in conjunction with Complete Streets planning.

Evaluating bundles of projects in a proposed RTP or capital improvement plan.

User Guide

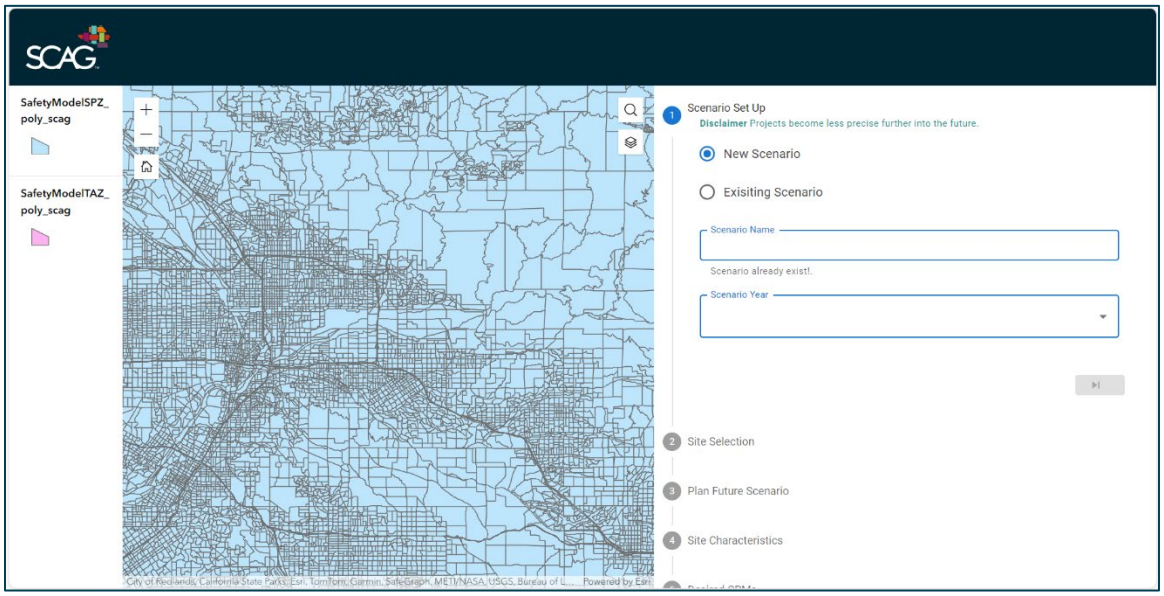
This chapter provides a guided walkthrough of the application interface and the interaction with application data. The six steps of the interface include:

1. SCENARIO SET UP
2. SITE SELECTION
3. PLAN FUTURE SCENARIO
4. SITE CHARACTERISTICS
5. DESIRED CRASH PREDICTION MODELS (CPMs)
6. EVALUATE AND COMPARE RESULTS

1. Scenario Set Up

This is the landing page for the application (**Exhibit 4**). The application presents users with a web map displaying the SCAG planning area (center panel), active layers (left panel), and scenario planning wizard (right panel). Users can interact with the web map by adjusting layer visibility, panning or zooming around the map, and searching for a specific location.

Exhibit 4 Scenario Set Up Interface



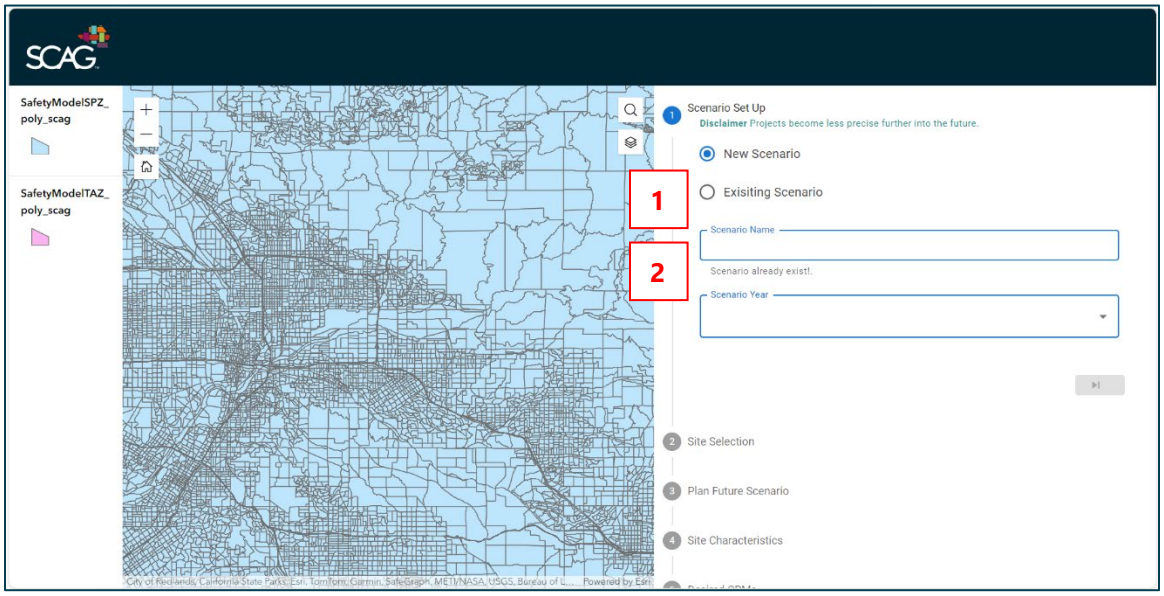
In this step, users have the option to 1) create a new scenario by defining the name of the scenario and defining the horizon year (e.g., 2040) or 2) return to a previously saved scenario.

CREATE A NEW SCENARIO

If users opt to create a new scenario, the user will provide ***1) custom name for the scenario***, and ***2) applicable horizon year for the scenario*** (**Exhibit 5**). The horizon year, selectable in 5-year increments, reflects the year at which the scenario (i.e., transportation project or redevelopment) is complete. The current version of the tool reflects the base and plan year for the *Connect SoCal 2024 RTP, 2020 and 2050* respectively. The horizon year determines the estimates of areawide model inputs based on the

interpolated model values established in the RTP planning process. Users advance to the **SITE SELECTION** step by selecting the right arrow below the *Scenario Year* drop-down.

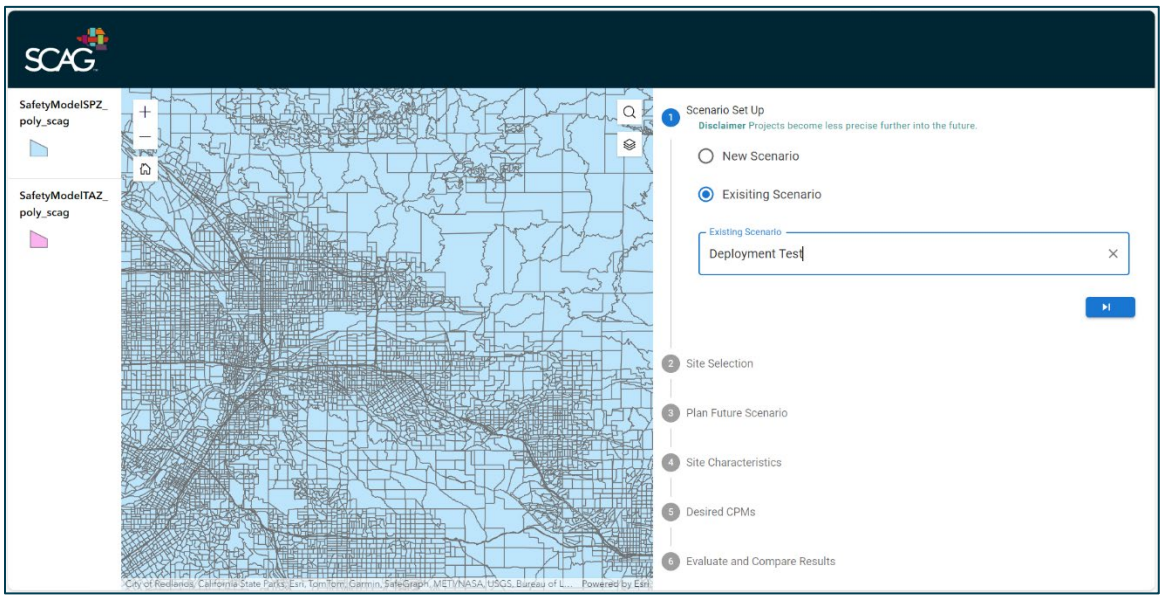
Exhibit 5 Create a New Scenario in the Scenario Set Up Interface



RETURN TO EXISTING SCENARIO

Users can return to saved scenarios by selecting the applicable named scenario from a drop-down list in the ***Existing Scenario*** option (**Exhibit 6**). Users will not be able to alter study areas for previously saved scenarios, but users will be able to edit data in Steps 3 and 4, as well as select different areawide models if desired. Users advance to the **SITE SELECTION** step by selecting the right arrow below the ***Existing Scenario*** drop-down.

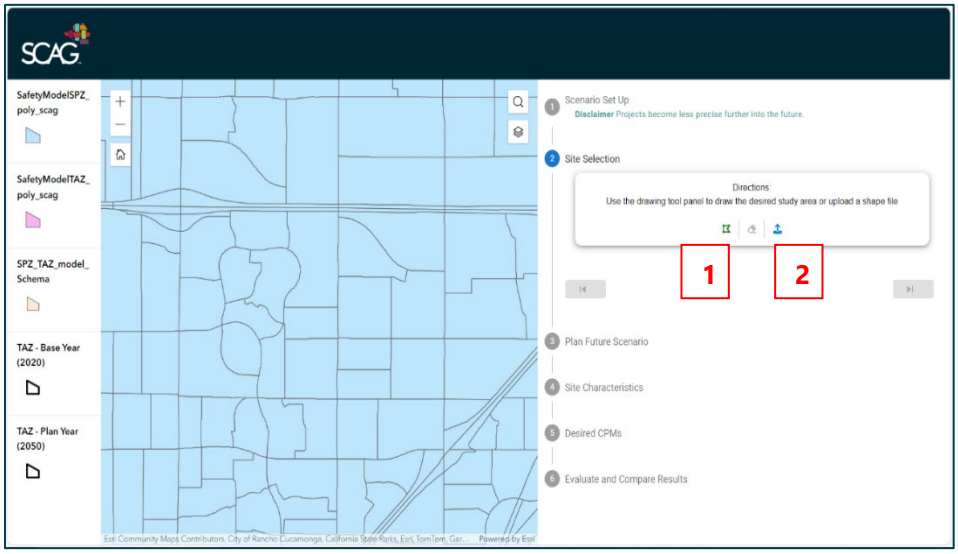
Exhibit 6 Return to an Existing Scenario in the Scenario Set Up Interface



2. Site Selection

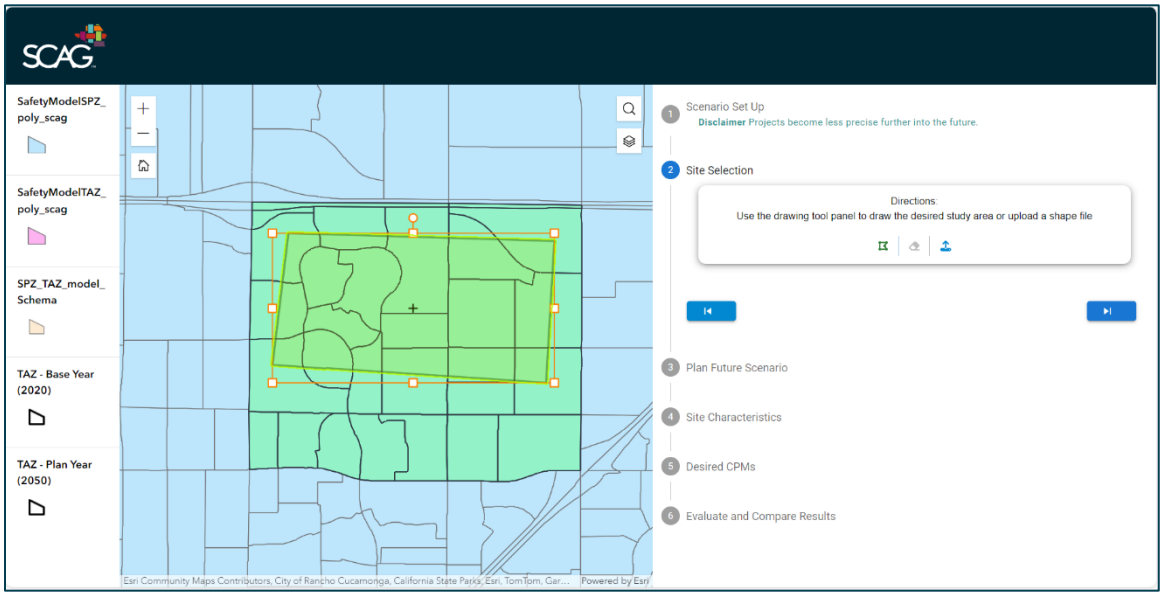
The Site Selection interface allows users to select a geographic study area for their analysis. This can be accomplished by ***1) interactively drawing a polygon in the web map interface*** or ***2) uploading a zipped polygon shapefile*** (**Exhibit 7**).

Exhibit 7 Determine Geographic Study Area in the Site Selection Interface



The polygon selects against the TAZ layer. Any TAZ with at least a portion of its area in the custom study area will be selected for further analysis (along with all Scenario Planning Zone (SPZs) associated with selected "parent" TAZs). Users advance to the **PLAN FUTURE SCENARIO** step by selecting the right arrow, or return to the **SCENARIO SET UP** step by selecting the left arrow below the study area tools interface (**Exhibit 8**).

Exhibit 8 Example Geographic Study Area Selection in the Site Selection Interface



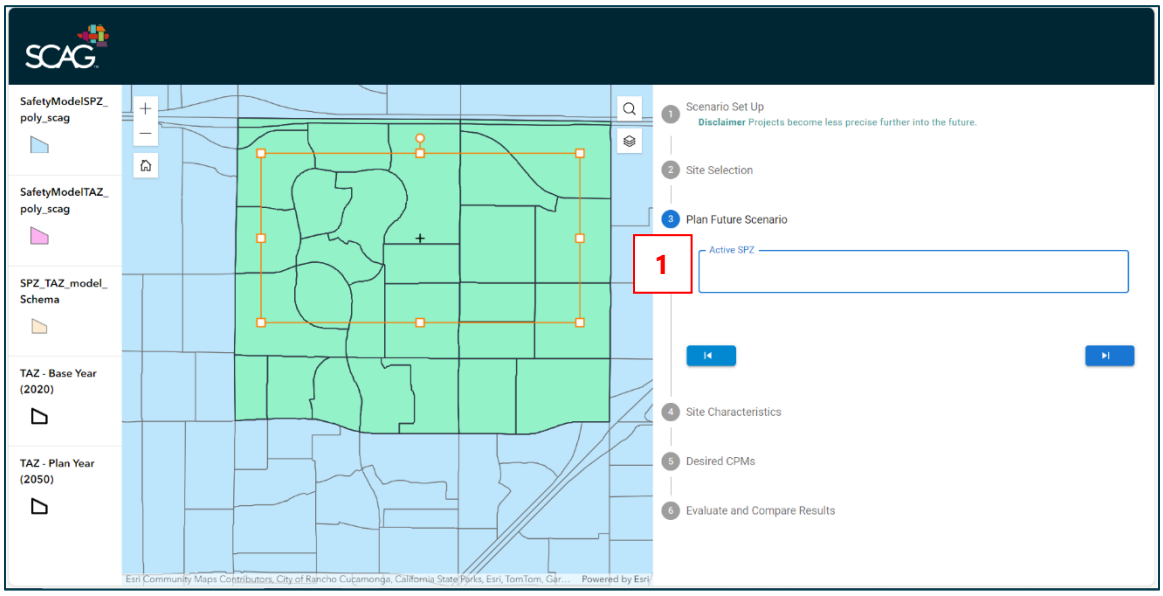
3. Plan Future Scenario

If desired, users may alter the current RTP in this step by creating a custom scenario based on land use changes at the SPZ-level. By engaging in this step, users are making the following changes that contribute to the crash prediction:

- Altering an SPZ changes the total population, total commuting age population, total employment, and intersection density from the planned values in the RTP to new values as determined by the user (*Appendix A: Place Type & Density Values*).
- Changes made to SPZs are summed at the parent TAZ(s)-level and create new future values for the VMT and crash prediction.
- By changing the planned number of residents and employees residing in the SPZ, and thereby the parent TAZ, users are also altering the potential VMT that occurs in the TAZ.

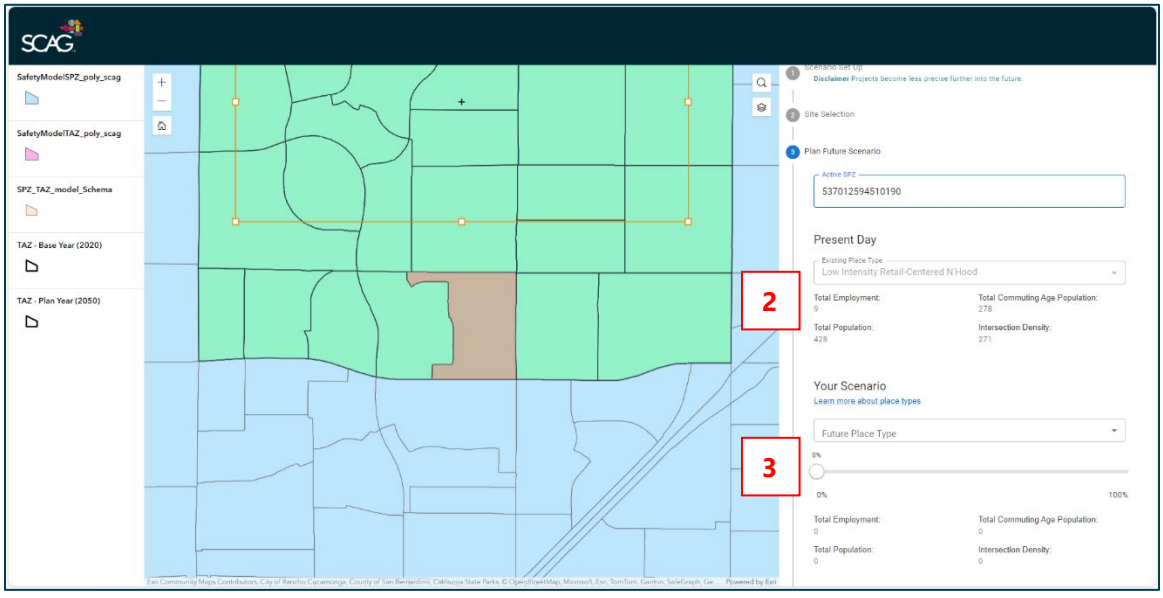
Users alter SPZs by ***1) selecting an SPZ*** from the ***Active SPZ*** drop-down. The application will zoom to and highlight the applicable SPZ on the web map (**Exhibit 9**).

Exhibit 9 Select an SPZ to Edit in the Plan Future Scenario Interface



The application presents the user with the ***2) current Place Type associated with the SPZ, along with the relevant input values that contribute to VMT and crash prediction***, as well as the ***3) future Place type and input values that the user will generate*** (**Exhibit 10**). The current values are not editable by the user and reflect the Base Year (2020) values for that SPZ.

Exhibit 10 Edit an SPZ in the Plan Future Scenario Interface

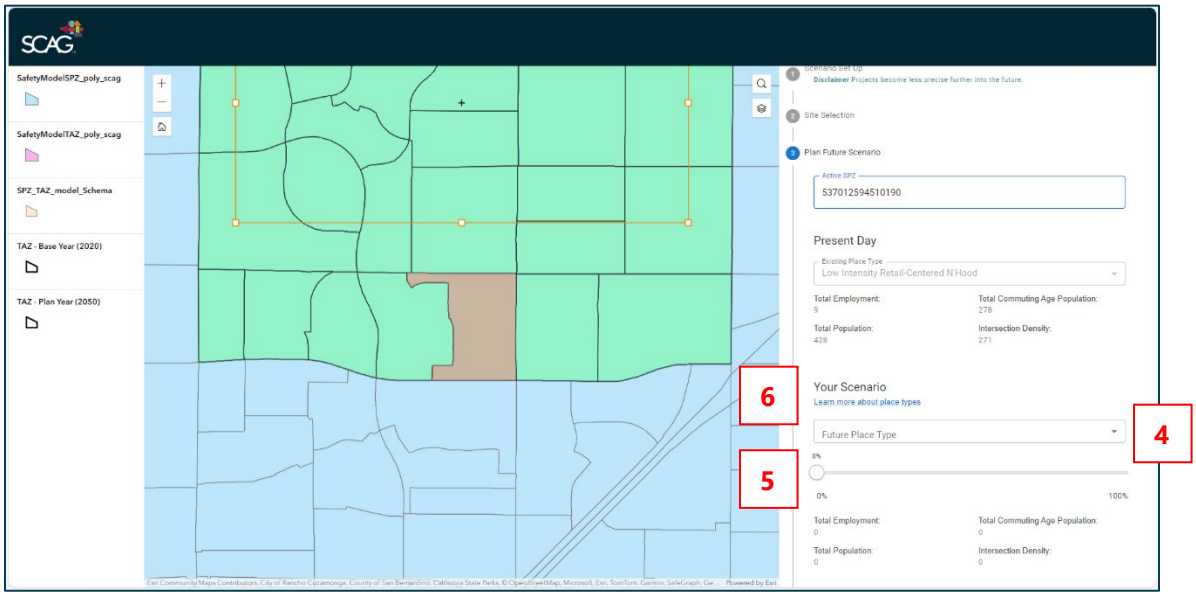


Users can alter the future of the SPZ by ***4) selecting an alternative Place Type*** and ***5) editing the density (i.e., developed area)*** of the SPZ. Each Place Type has individual assumptions of minimum, maximum, and typical values for the 4 data inputs, and the projected values for the SPZ (based on user

input) are reflected in the application as the user modifies the position of the density slider. A 0% reflects the minimum value for that SPZ based on the selected Place Type and 100% reflects the maximum value for that SPZ based on the selected Place Type. To support user experience, a ***6) link is provided*** for users who may not be familiar with Place Types in SCAG's scenario planning framework.

The user can compare differences in the user created future and the current day by comparing the total employment, total population, total commuting age population, and intersection density values in the ***Present Day*** and ***Your Scenario*** areas (**Exhibit 11**).

Exhibit 11 Edit Future Place Type and Density in the Plan Future Scenario Interface



Users can edit as many SPZs as desired, and SPZs that do not need to be edited can be skipped by the user. Users advance to the **SITE CHARACTERISTICS** step by selecting the right arrow or return to the **SITE SELECTION** step by selecting the left arrow below the study area tools interface.

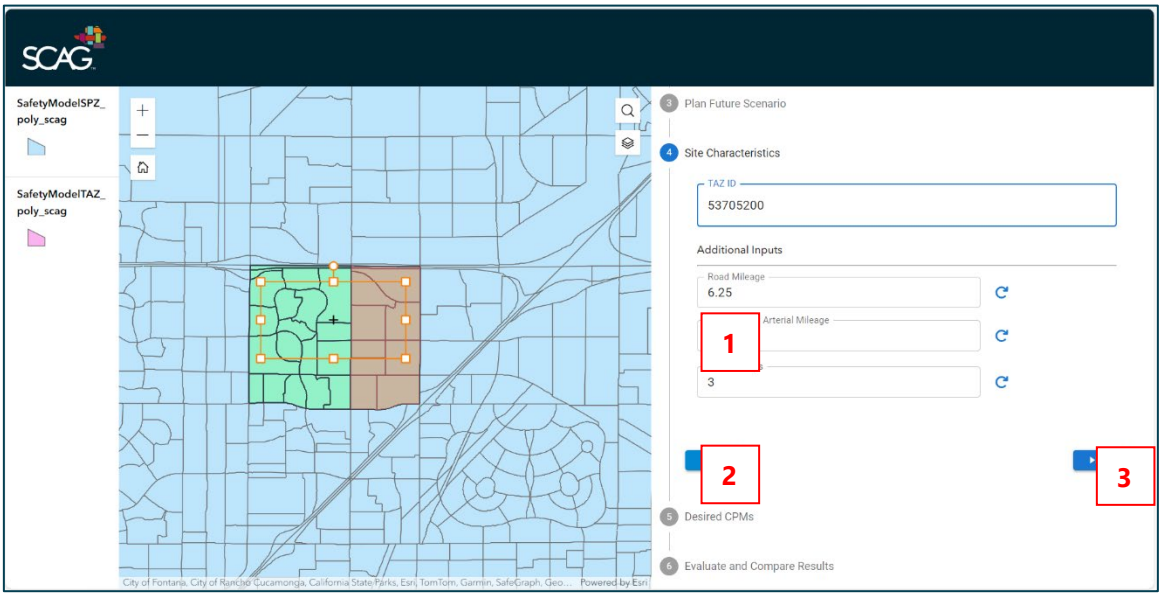
4. Site Characteristics

If desired, users can change certain characteristics that are not part of SCAG's scenario planning framework but can still affect areawide crash prediction. This step edits values associated with TAZs and does ***not*** alter SPZ-level data or projections developed at the SPZ level in the **PLAN FUTURE SCENARIO** step. By engaging in this step, users are making the following changes that contribute to the crash prediction:

- Altering a TAZ changes the road mileage, freeway and arterial mileage (i.e., mileage on the NHS), and transit stop count from the current day values.
- By changing the road mileage and freeway and arterial mileage in the TAZ, users are also altering the potential VMT that occurs in the TAZ. This is reflected in the equation in **Exhibit 4**.
- Please note the simplifying assumption for freeway and arterial mileage in the **SUPPORTING VEHICLE MILES TRAVELED MODEL** section.

Like the SPZ editor, users select an applicable TAZ by ***1) selecting a TAZ from the TAZ ID drop-down*** (**Exhibit 12**). Once a TAZ is selected, the application highlights the applicable TAZ and users are presented with the current values for road mileage, freeway and arterial mileage (i.e., mileage on the NHS), and transit stops in the TAZ. Users can ***2) edit the values of any of these inputs to reflect the projected future scenario***. If a user would like to alter this projection, they may ***3) select Reset button next to the input to return to the current day (i.e., Base Year value)***.

Exhibit 12 Edit TAZ-Level Characteristics in the Site Characteristics Interface

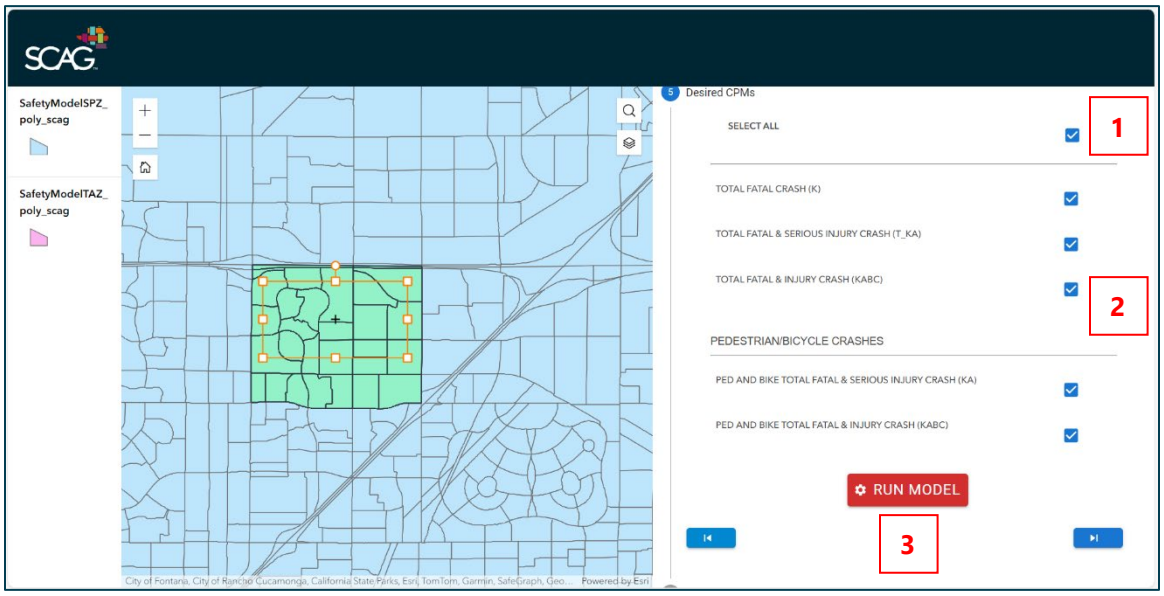


Users advance to the **DESIRED CPMS** step by selecting the right arrow, or return to the **PLAN FUTURE SCENARIO** step by selecting the left arrow below the ***Transit Stops*** value interface.

5. Desired CPMs

This step allows users to select the crash predictions that are relevant to their work. Potential options include the models noted in the **SCAG'S AREAWIDE MODELS** section. Users may select ***1) all possible crash predictions*** or ***2) any subset of crash predictions*** by selecting the check box to the right of the option list. Users must ***3) select the Run Model button*** to advance to the next step, **EVALUATE AND COMPARE RESULTS**, in the application (**Exhibit 13**). They may return to the **SITE CHARACTERISTICS** step by selecting the left arrow below the ***Run Model*** button.

Exhibit 13 Select the Desired Crash Predictions in the Desired CPMs Interface



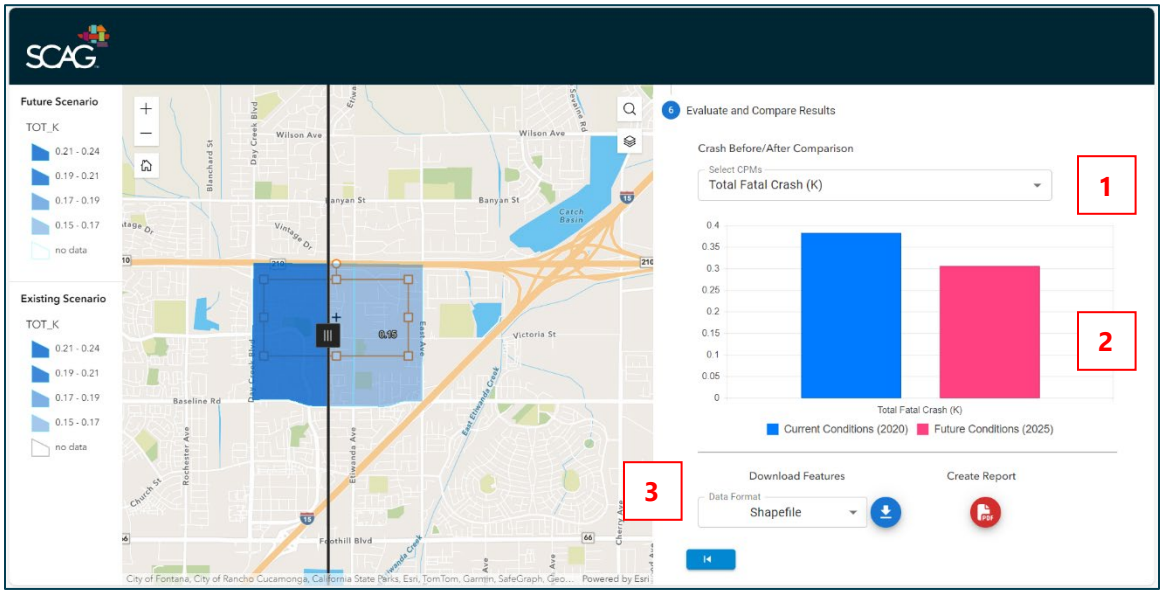
6. Evaluate and Compare Results

This interface allows users to review the crash prediction estimates of their areawide models and compare the present-day estimate (***Current Conditions***) with the projected future estimate (***Future Conditions***). The interface components are as follows (**Exhibit 14**):

- The left panel provides a layer legend of crash predictions. The Existing Scenario layer and Future Scenario layer have the same symbology characteristics for 1:1 comparison.
- The center web map panel provides a graphic, spatial view of crash predictions by TAZ using the symbology noted in the left panel. The user can view current and future crash predictions by moving the slider left to right. Current projections are represented in the "left" web map, and future projections are represented in the "right" web map.
- The right panel provides an interface for the user to shift between areawide model predictions and view the difference between the current and future crash projection.
    - **Users can switch the visible crash prediction type by selecting from the *Select CPM* drop-down menu.** Only areawide models selected on the **DESIRED CPMS** are available for selection. The web map will also adjust to display the selected option in the drop-down.
    - **Users can compare the cumulative crash prediction for the entire study area between the current day projection and the future projection.** These represent the sum total across all TAZs in the study area selected in the **SITE SELECTION** step.
    - **Users can download their results using the *Download Features* option beneath the graphic projections.** Users can download a shapefile, file geodatabase, GeoJSON, csv, JSON, or SQLite format.

Users may return to the **EVALUATE AND COMPARE RESULTS** step by selecting the left arrow below the ***Download Features*** option.

Exhibit 14 Review Crash Predictions in the Evaluate and Compare Results Interface



Appendix A: Place Type & Density Values

Place Type	Typical Intersection Density (Acre)	Min Intersection Density (Acre)	Max Intersection Density (Acre)	Typical Population Density (Acre)	Min Population Density (Acre)	Max Population Density (Acre)	Typical Employment Density (Acre)	Min Employment Density (Acre)	Max Employment Density (Acre)	Typical Commuting Age Population Density (Mi^2)	Min Commuting Age Population Density (Mi^2)	Max Commuting Age Population Density (Mi^2)
Campus/ University	75	0	150	56.54	0	278.34	22	10	100	41.88	0	206.17
City Commercial	150	0	200	11.36	0	271.13	200	90	250	7.70	0	183.68
City Mixed Use	150	0	200	72.61	11.59	216.52	85	25	165	50.06	7.99	149.29
City Residential	150	0	200	104.74	54.08	213.58	14	0	17	72.43	37.40	147.69
High Intensity Activity Center	65	0	130	48.42	0.57	156.28	69	3	250	32.32	0.38	104.29
Industrial Focus	17.5	0	35	0	0	108.90	14	8	16	0	0	67.17
Industrial/Office/Res Mixed High	30	0	60	84.27	26.13	131.98	42	3	250	58.28	18.07	91.28
Industrial/Office/Res Mixed Low	30	0	60	21.04	5.74	125.18	18	1	35	13.36	3.64	79.47
Institutional	65	0	130	2.59	0	458.80	96	5	250	1.57	0	278.84
Large Lot Residential Area	10	0	20	6.96	0.53	76.10	1	0	2	4.19	0.32	45.82
Low Density Employment Park	17.5	0	35	0	0	180.26	6	1	8	0	0	110.88
Low Intensity Retail-Centered N'Hood	32.5	0	65	9.93	0.50	64.05	4	1	6	6.12	0.31	39.48
Mid Intensity Activity Center	35	0	70	12.66	0.50	90.71	11	3	22	7.78	0.31	55.72
Mixed Office and R&D	22.5	0	45	0	0	111.82	33	25	150	0	0	69.53
Neighborhood Low	150	0	230	13.01	0.21	106.89	2	0	5	8.01	0.13	65.77
Neighborhood Residential	150	0	180	19.73	5.60	79.37	3	0	3.5	12.32	3.50	49.56
Office Focus	22.5	0	45	0	0	240.68	65	35	150	0	0	156.06
Office/Industrial	20	0	40	0	0	78.15	21	16	25	0	0	48.42
Parks & Open Space	50	0	150	0	0	73.19	0	0	0.01	0	0	44.93
Residential Subdivision	45	0	90	12.03	2.64	96.24	1	0	6	7.39	1.62	59.07
Retail: Strip Mall/Big Box	30	0	60	0	0	177.77	15	1	100	0	0	112.19
Rural Employment	5	0	10	0.06	0	65.82	0.01	0	0.05	0.04	0	40.85
Rural Ranchettes	5	0	10	0.44	0	40.51	0.01	0	0.02	0.27	0	25.18
Rural Residential	7.5	0	15	1.23	0.21	48.54	0.01	0	0.02	0.74	0.13	29.22
Suburban Mixed Residential	45	0	90	28.59	8.59	111.05	2	0	6	18.06	5.43	70.15
Suburban Multifamily	45	0	90	65.52	27.18	130.53	2	0	6	43.81	18.17	87.28
Town Commercial	150	0	200	11.72	0	269.27	75	60	90	7.53	0	172.94
Town Mixed Use	150	0	200	40.53	9.02	265.38	50	25	70	28.40	6.32	185.94
Town Residential	150	0	220	40.23	12.92	225.66	12	0	25	26.93	8.65	151.06
Urban Commercial	150	0	200	15.22	0	142.78	402	250	500	10.38	0	97.38
Urban Mixed Use	150	0	200	153.36	112.06	307.14	266	50	500	115.35	84.28	231.00
Urban Residential	150	0	200	205.28	110.37	395.10	44	0	50	140.46	75.52	270.35
Village Commercial	150	0	230	4.22	0	180.78	40	1	60	2.67	0	114.41
Village Mixed Use	150	0	220	21.19	5.51	157.77	14	5	40	13.63	3.54	101.52
Village Residential	150	0	180	26.20	8.99	117.60	2	0	5	16.74	5.75	75.17
Military	25	0	150	0.59	0	68.19	1	0	80	0.42	0	48.51

Appendix B: Data Dictionary

Field	Alias	Data Layer	Source	Description
year	Year	SafetyModelSPZ_poly_scag	derived	Year of data origin
taz_id	TAZ ID	SafetyModelSPZ_poly_scag	SCAG RTP - Base Year	Unique TAZ ID
spz_id	SPZ ID	SafetyModelSPZ_poly_scag	SCAG RTP - Base Year	Unique SPZ ID
city	City	SafetyModelSPZ_poly_scag	SCAG RTP - Base Year	City
county	County	SafetyModelSPZ_poly_scag	SCAG RTP - Base Year	County
acre	Acreage	SafetyModelSPZ_poly_scag	SCAG RTP - Base Year	Total area of the SPZ (acres)
tot_area	Square Miles	SafetyModelSPZ_poly_scag	SCAG RTP - Base Year	Total area of the SPZ (sq. mi.)
year_base	Base Year	SafetyModelSPZ_poly_scag	SCAG RTP - Base Year	Applicable RTP Base Year
place_type_base	Place Type (Base)	SafetyModelSPZ_poly_scag	SCAG RTP - Base Year	Categorical Place Type of the SPZ based on UrbanFootprint™ categories and SCAG's SPM (Base Year)
place_type_density_base	Place Type Density (Base)	SafetyModelSPZ_poly_scag	SCAG RTP - Base Year	Density of gross developed area
tot_emp_base	Total Employment (Base)	SafetyModelSPZ_poly_scag	SCAG RTP - Base Year	Total employment working in the SPZ (Base Year)
emp_dens_base	Employment Density (Base)	SafetyModelSPZ_poly_scag	derived	Total employment working in the SPZ per acre
tot_pop_base	Total Population (Base)	SafetyModelSPZ_poly_scag	SCAG RTP - Base Year	Total population residing within the SPZ (Base Year)
pop_dens_base	Population Density (Base)	SafetyModelSPZ_poly_scag	derived	Population residing in the SPZ per acre (Base Year)
tot_comm_age_18_64_base	Total Commuting Age Population (Base)	SafetyModelSPZ_poly_scag	SCAG RTP - Base Year	Total commuting age population within the SPZ (18-64) (Base Year)
tot_int_base	Total Intersections (Base)	SafetyModelSPZ_poly_scag	derived	Total intersections physically within the SPZ (Base Year)
int_dens_base	Intersection Density (Base)	SafetyModelSPZ_poly_scag	SCAG RTP - Base Year	Intersection density per sq. mi. (Base Year)
year_plan	Plan Year	SafetyModelSPZ_poly_scag	SCAG RTP - Plan Year	Applicable RTP Plan Year
place_type_plan	Place Type (Plan)	SafetyModelSPZ_poly_scag	SCAG RTP - Plan Year	Categorical Place Type of the SPZ based on UrbanFootprint™ categories and SCAG's SPM (Plan Year)
place_type_density_plan	Place Type Density (Plan)	SafetyModelSPZ_poly_scag	SCAG RTP - Plan Year	Density of gross developed area
tot_emp_plan	Total Employment (Plan)	SafetyModelSPZ_poly_scag	SCAG RTP - Plan Year	Total employment working in the SPZ (Plan Year)
emp_dens_plan	Employment Density (Plan)	SafetyModelSPZ_poly_scag	derived	Total employment working in the SPZ per acre (Plan Year)
tot_pop_plan	Total Population (Plan)	SafetyModelSPZ_poly_scag	SCAG RTP - Plan Year	Total population residing within the SPZ (Plan Year)
pop_dens_plan	Population Density (Plan)	SafetyModelSPZ_poly_scag	derived	Population residing in the SPZ per acre (Plan Year)
tot_comm_age_18_64_plan	Total Commuting Age Population (Plan)	SafetyModelSPZ_poly_scag	SCAG RTP - Plan Year	Total commuting age population within the SPZ (18-64) (Plan Year)
tot_int_plan	Total Intersections (Plan)	SafetyModelSPZ_poly_scag	derived	Total intersections physically within the SPZ (Plan Year)
int_dens_plan	Intersection Density (Plan)	SafetyModelSPZ_poly_scag	SCAG RTP - Plan Year	Intersection density per sq. mi. (Plan Year)
year	Year	SafetyModelTAZ_poly_scag	derived	Year of data origin
taz_id	TAZ ID	SafetyModelTAZ_poly_scag	SCAG RTP - Plan Year	Unique TAZ ID
city	City	SafetyModelTAZ_poly_scag	SCAG RTP - Plan Year	City
county	County	SafetyModelTAZ_poly_scag	SCAG RTP - Plan Year	County
acre	Acreage	SafetyModelTAZ_poly_scag	SCAG RTP - Plan Year	Total area of the TAZ (acres)
tot_area	Square Miles	SafetyModelTAZ_poly_scag	SCAG RTP - Plan Year	Total area of the TAZ (sq. mi.)
year_base	Base Year	SafetyModelTAZ_poly_scag	SCAG RTP - Base Year	Applicable RTP Base Year
hpms_vmt	Total VMT	SafetyModelTAZ_poly_scag	derived	Estimate of daily VMT within the TAZ (Base Year)
tot_emp	Total Employment	SafetyModelTAZ_poly_scag	SCAG RTP - Base Year	Total employment working in the TAZ
tot_pop	Total Population	SafetyModelTAZ_poly_scag	SCAG RTP - Base Year	Total population residing within the TAZ

Field	Alias	Data Layer	Source	Description
pop_dens	Population Density	SafetyModelTAZ_poly_scag	derived	Population residing in the TAZ per sq. mi.
tot_comm_age_16_64	Total Commuting Age Population	SafetyModelTAZ_poly_scag	SCAG RTP - Base Year	Total commuting age population within the TAZ (16-64)
tot_comm_1000	Commuting Age Population (1,000's)	SafetyModelTAZ_poly_scag	derived	Total commuting age population within the TAZ (16-64) divided by 1,000
trans_stops	Total Transit Stops	SafetyModelTAZ_poly_scag	derived	Total transit stops in the TAZ; all fixed route public transit modes
med_hh_inc	Median HH Income	SafetyModelTAZ_poly_scag	SCAG RTP - Plan Year	Median household income ($2011)
med_inc_1000	Median HH Income ($1,000)	SafetyModelTAZ_poly_scag	derived	Median household income divided by 1,000 ($2011)
tiger_centerline_mi	Total Road Mileage	SafetyModelTAZ_poly_scag	derived	Total roadway centerlines (mi.) within the TAZ
hpms_nhs	NHS Mileage	SafetyModelTAZ_poly_scag	derived	Total roadway centerlines (mi.) on the National Highway System (NHS) within the TAZ
tot_int	Total Intersections	SafetyModelTAZ_poly_scag	derived	Total intersections physically within the TAZ
area_inv	Inverse Area Variable	SafetyModelTAZ_poly_scag	derived	1/(1+ total area of the TAZ in sq. mi.)
tot_kabc	Total Fatal and Injury Crashes	SafetyModelTAZ_poly_scag	derived	Total predicted KABC (fatal and injury) crashes for the TAZ
tot_ka	Total Fatal and Serious Injury Crashes	SafetyModelTAZ_poly_scag	derived	Total predicted KA (fatal and serious injury) crashes for the TAZ
tot_k	Total Fatal Crashes	SafetyModelTAZ_poly_scag	derived	Total predicted K (fatal) crashes for the TAZ
pedbike_kabc	Ped/Bike Fatal and Injury Crashes	SafetyModelTAZ_poly_scag	derived	Total predicted pedestrian and bicyclist KABC (fatal and injury) crashes for the TAZ
pedbike_ka	Ped/Bike Fatal and Serious Injury Crashes	SafetyModelTAZ_poly_scag	derived	Total predicted pedestrian and bicyclist KA (fatal and serious injury) crashes for the TAZ
year_plan	Plan Year	SafetyModelTAZ_poly_scag	SCAG RTP - Plan Year	Applicable RTP Plan Year
hpms_vmt_plan	Total VMT (Plan)	SafetyModelTAZ_poly_scag	SCAG RTP - Plan Year	Estimate of daily VMT within the TAZ (Plan Year)
tot_emp_plan	Total Employment (Plan)	SafetyModelTAZ_poly_scag	SCAG RTP - Plan Year	Total employment working in the TAZ
tot_pop_plan	Total Population (Plan)	SafetyModelTAZ_poly_scag	SCAG RTP - Plan Year	Total population residing within the TAZ
tot_comm_age_16_64_plan	Total Commuting Age Population (Plan)	SafetyModelTAZ_poly_scag	SCAG RTP - Plan Year	Total commuting age population within the TAZ (16-64)

SCAG™
INNOVATING FOR A BETTER TOMORROW

MAIN OFFICE
900 Wilshire Blvd., Ste. 1700
Los Angeles, CA 90017
Tel: (213) 236-1800

REGIONAL OFFICES

IMPERIAL COUNTY
1503 N. Imperial Ave., Ste. 104
El Centro, CA 92243
Tel: (213) 236-1967

ORANGE COUNTY
OCTA Building
600 S. Main St., Ste. 1108
Orange, CA 92868
Tel: (213) 630-1599

INLAND EMPIRE
3403 10th St., Ste. 805
Riverside, CA 92501
Tel: (951) 784-1513

VENTURA COUNTY
4001 Mission Oaks Blvd., Ste. L
Ventura, CA 93012
Tel: (213) 236-1960

LEARN MORE / SCAG.CA.GOV

AJ1 25-416-CPLPER-0107.2025.07.08