



Transportation Safety Community Models: Modeling Task Force Demonstration

September 25, 2024

Background: Project Origins

- SCAG played a major role in NCHRP 17-81 agency outreach.
 - *NCHRP Research Report 1044: Development and Application of Quantitative Macro-Level Safety Prediction Models.*
- Outreach helped guide the form & function of planning-level crash prediction models (CPMs).
 - Referred to as “areawide models” in the upcoming 2nd Edition of the Highway Safety Manual (HSM).
- FHWA technical assistance to help implement NCHRP 17-81 research at SCAG.
 - **Last met with the MTF in July 2021!**



Background: Emphasis on a Safe System

- Areawide models predict average crash frequency, by crash type & severity, for a defined area (rather than an intersection or corridor). For example:
 - Census tracts
 - Traffic analysis zones (TAZ)
 - Counties
- Predictor variables for areawide safety models characterize the broader area for which the models apply & may include:
 - Demographic/Socioeconomic characteristics
 - Urban/Rural area
 - Land Use
- Support a proactive approach to safety planning.






What Does the Application Do?

What does the application do?	>>	Helps practitioners quantify planning-level safety outcomes in long-range or scenario planning process (like other transportation metrics).
How does the application work?	>>	Crash types are correlated with land use & demographic characteristics, & associated VMT. Uses “areawide” models to predict crashes at TAZ level based on land use/demographic changes.
When should I use the application?	>>	When you want to understand how planning level-decisions & demographic/land use changes might affect safety – Before major design details are known (e.g., shoulder width, horizontal curvature) in places where people will live, work, & play.
What’s the role of the Regional Transportation Plan in this?	>>	The RTP is your plan. Projects have been selected (or being evaluated) & land use changes are proposed. These models support evaluating safety outcomes before traditional HSM safety models may be used effectively. The application is not meant to replace your existing planning process – it is meant to support it.
What’s the role of the Scenario Planning Model in this?	>>	Allows users to intuitively consider land use changes with respect to safety. SCAG’s SPM already has land use typologies with an associated number of households & employees. Rather than trying to estimate population & employment numbers directly, users may rely on SPM Place Type typologies to generate safety model inputs (i.e., number of residents & employees) associated with land use decisions.
How do I interpret the results?	>>	You use the results to consider relative change. That is, for different scenarios, how do crashes increase & decrease and by how much. The specific amount is not as important as understanding the relative differences

How can I Change the Outcomes?

- 1. Estimating changes to crashes based on the adopted RTP/SCS:** The application already includes the 2024 Connect SoCal long-range plan projections and the estimated changes in crashes that will result.
- 2. Estimating changes to crashes based on changes to land use:** You can “paint” scenario planning zones (SPZs) within the study and make changes to the planned future land uses.
- 3. Estimating changes to crashes based on changes to the transportation network:** In addition to changes in land use, you can modify characteristics of the transportation system.

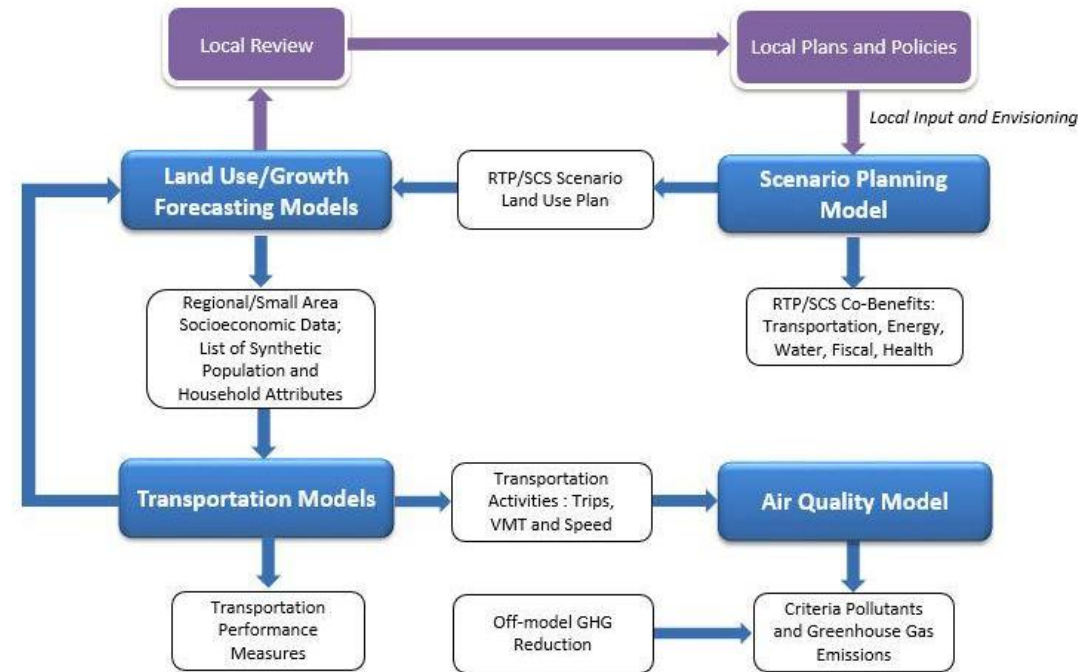
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<p>Description</p> <p>City Mixed Use areas are transit-oriented and walkable, and contain a variety of uses and building types. Typical buildings are between 5 and 30 stories tall, with ground-floor retail space, and offices and/or residences on the floors above. Parking is usually structured below or above ground.</p>																											
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<p>Description</p> <p>The central business districts of most cities contain areas exemplary of City Commercial, with many mid- and high-rise office towers and government buildings. Typical structures are between 4 and 40 stories tall, with ground-floor retail space, and offices on the floors above. Parking is usually structured, though many workers arrive by transit, foot, or bicycle.</p>																											
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<p>Description</p> <p>An dense residential-focused type, City Residential is dominated by mid- and high-rise residential towers, with some ground-floor retail space. Parking is usually structured, below or above ground. Residents are well served by transit, and can walk or bicycle for many of their daily needs.</p>																											

Demonstration

The background features a complex, abstract pattern of overlapping, semi-transparent shapes in various shades of teal, blue, and green. The shapes include circles, triangles, and irregular polygons, creating a layered, geometric effect. The overall color palette is cool and vibrant, with a gradient from dark teal on the left to a lighter, more yellowish-green on the right.

Example Use Cases

- Evaluating bundles of projects in a proposed Regional Transportation Plan (RTP) or capital improvement plan.
- Incorporating quantitative safety assessment in long range planning decisions.
- Understanding potential safety impacts on priority equity communities or other demographic groups.
- Supporting local jurisdictions developing local or regional comprehensive safety plans (Safe Streets and Roads for All, for example) or modal plans.
- Conducting scenario planning for new development or redevelopment in conjunction with Complete Street planning.



Other National Implementation Efforts

- Areawide models will comprise a chapter in the upcoming HSM2.
- NCHRP Implementation Project 20-44(53) will help ~4 states pursue areawide models like SCAG.
 - <https://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=5574>
- Peer Exchanges & workshops are included in the project scope, offering opportunities to demonstrate practical use of the application.



Thank you!

Mike Gainor | gainor@scag.ca.gov | 213.236.1822

Ian Hamilton | ihamilton@vhb.com | 919.741.5401