

Microsimulation Projects

Alameda County CMA Central Freeway Study

As a subconsultant to Kimley Horn, Dowling Associates is responsible for the traffic forecasting, simulation, and operations analysis of the 11-miles long I-880, I-238, and I-580 freeway corridors in central Alameda County, California.

Dowling Associates used the ACCMA countywide travel demand model, which is a CUBE implementation of the MTC model focused on Alameda County, to develop short range (2015) and long range (2030) AM and PM peak 4-hour forecasts for the freeways, ramps, and arterial streets in the freeway corridors. Select link analysis was used to identify long and short distance trip patterns in the corridor and to identify future freeway-to-freeway cut-through problems requiring amelioration. The ACCMA demand model was also used to generate the existing traffic OD table for the corridors. An OD estimation process was used to adjust the ACCMA OD table to match the observed on and off-ramp and mainline freeway peak period volumes in the corridors.



The Paramics microsimulation model was coded for the two freeway corridors (I-880, and I-238/I-580). The model was validated against traffic counts and probe vehicle speed/travel time data. Measures of effectiveness were identified for evaluating the corridors' traffic performance. The Paramics model was then run for 2015 and 2030 to generate future baseline MOE's for use in assessing future performance, identifying problems, and developing mitigations. The model will be used to test 5 different strategies for addressing the problems identified in the baseline future forecasts.

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Client: Alameda County Congestion Management Agency

Reference: Ms. Beth Walukas, Senior Planner, phone: 510-836-2560

Relevant Dowling Staff: Marty Beene, Allen Huang

Budget: \$285,000

Start/End Dates: January 2007 – June 2007

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Railyards EIR Traffic Study (Sacramento, CA)

Dowling Associates prepared a traffic study assessing the Railyards redevelopment project in downtown Sacramento. The study included phased development of 10,000 dwelling units, 1,200 hotel rooms, 3.9 million square feet of office and 400,000 square feet of historic/cultural use, a 20,000 seat sports arena, light rail stations, and the new Sacramento Intermodal Transportation Facility (SITF). Dowling Associates' work included making adjustments to trip generation and parking estimates to account for the project's proximity to transit and its transit oriented design features, as well as a review of the project transit impacts.



The analysis had to consider the areas treatment under multiple historic studies and specific plans (e.g., ROMA, North CBD Access Study, and the 1997 Railyards Specific Plan). Detailed traffic simulation accounting for the light rail "soft preempt" at downtown and Richards area intersections was included along the light rail lines using the VISSIM microsimulation mode. The SACMET model served as the bases for traffic forecasts, with assignments being done on a more detailed network splitting zones into individual blocks and allocating parking to each blocks land use.

Client: City of Sacramento

Reference: Ms. Samar Hajeer, (916) 808-7808, shajeer@cityofsacramento.org

Relevant Dowling Staff: Mark Bowman, Allen Huang

Budget: \$171,000

Start/End Dates: June 2006 – June 2007

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State Route 238 Corridor Improvement Study and EIR (Hayward, CA)

As a subconsultant to Mark Thomas and Company, Dowling Associates prepared the travel forecasts, traffic operations studies, and congestion management alternatives analyses for the State Route 238 Corridor Improvement Project and its Environmental Impact Report. Dowling has integrated the city travel demand model (EMME/2) with a signal operations optimization tool (Synchro), a traffic level of service analysis tool (TRAFFIX), and a traffic microsimulation tool (VISSIM).

Twenty-six signalized and unsignalized intersections were analyzed in this 5-mile long conventional state highway corridor. Signal timing strategies were developed by Dowling to address 2025 no-project and project congestion levels. The impacts of an overpass at the five-legged intersection of Mission/Jackson/Foothill were analyzed in terms of impacts on mean intersection delay, mean travel times between critical points in the corridor, total vehicle-hours of delay, level of service, transit service impacts, and bicycle and pedestrian accessibility impacts. Reduced project alternatives and variations were analyzed as well. Dowling worked with city staff and an appointed citizen's working group to explain the traffic analysis tools and assumptions, develop project alternatives and refinements, and present the results of the alternatives analyses.



Dowling Associates developed and calibrated a VISSIM simulation model for the corridor, which was integrated with a regional travel demand model (EMME/2), an intersection level of service tool (TRAFFIX) and a signal operations tool (Synchro). A special consideration in the evaluation of the alternatives was that future demand exceeded corridor capacity. This required the development of special tools and analyses to report and explain traffic operations results to staff and public. These analyses captured "unserved demand" not normally reported in the simulation results and explained how the congestion at future bottlenecks would reduce downstream traffic flows to below existing levels on some stretches of the arterial street. We also provided animations and training of City staff for public presentations of the results.

Client: City of Hayward

Reference: Bob Bauman, Public Works Director, (510) 583-4740

Relevant Dowling Staff: Richard Dowling, Damian Stefanakis, Allen Huang

Cost: \$390,000.00

Start/End Dates: July 2003- June 2007

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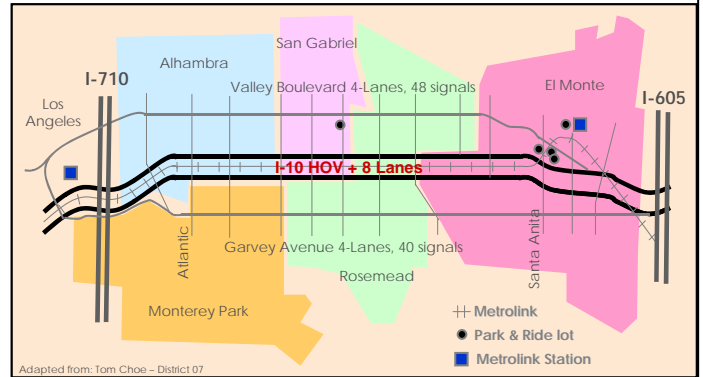


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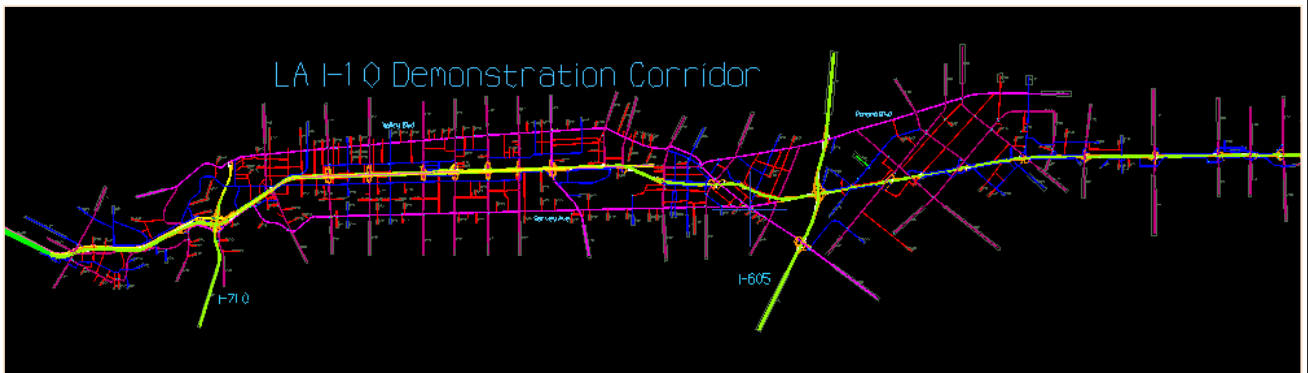
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Paramics I-10 Freeway Corridor Model

This project was a joint effort of Caltrans and Dowling Associates to develop an analysis tool for the I-10 Freeway in Los Angeles County California. Caltrans staff provided the input data and the initial raw Paramics network. Dowling Associates then refined the network, gathered some additional calibration data, fitted a SCAG Model generated OD table to the count data, and calibrated the Paramics model. Caltrans 07 staff will then take the calibrated model and use it to test various improvement alternatives for the I-10 freeway.



The Paramics model covers 5-hours of the morning peak period for a 21-mile long section of the I-10 freeway including the I-710 and the I-605 interchanges. This section of the I-10 freeway is a 10-lane freeway with HOV lanes. The model also included two parallel arterial streets, Valley and Garvey Boulevards, and 22 freeway interchanges.



A special Paramics API was written for this project by UC Irvine to evaluate the System Wide Adaptive Ramp Metering (SWARM) System to maximize freeway flow rates. The simulation model will be used by Caltrans 07 to identify current and future bottleneck locations, and to evaluate several multimodal improvement alternatives to the freeway and parallel arterials.

Client: Caltrans

Reference: Mr. Steven Hague, Associate Transportation Engineer, phone: (916) 654-3626

Relevant Dowling Staff: Richard Dowling

Budget: \$100,000 Dowling, plus similar amount Caltrans in-kind effort.

Start/End Dates: September 2003- March 2004

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Traffic Simulation Guidelines (Caltrans and FHWA)

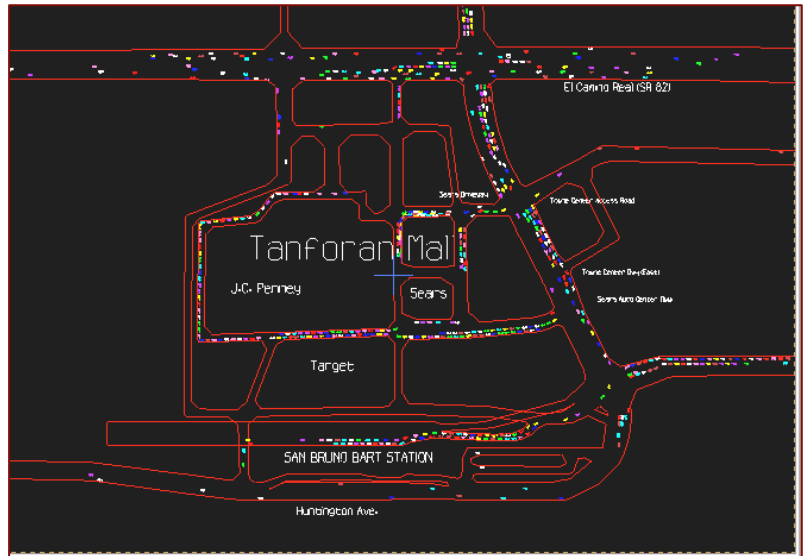
Dowling Associates developed “Guidelines for the Applications of Microsimulation Models” for Caltrans. This book provides guidance on when microsimulation is the appropriate analysis tool, management of in-house and consultant microsimulation efforts, calibration of microsimulation models, and validation of microsimulation models. This guidebook was expanded for use at the national level by the Federal Highway Administration. Volume 3, Guidelines for Applying Traffic Microsimulation Modeling Software is currently available at <http://ops.fhwa.dot.gov/trafficanalysisistools/toolbox.htm>

Paramics Training

Dowling Associates organized and conducted training classes in Paramics Modeler, Paramics Processor, and Paramics Analyst for beginning and intermediate level Caltrans employees. Each 3-day class was a mixture of lecture and "hands-on" computer laboratory. Employees learned how to and practiced coding a signalized intersection during the first day. Error checking and calibration procedures were covered. During the second day they practiced coding and debugging a freeway interchange. On the last day various advanced topics were covered and participants got a chance to work with a large network consisting of 3 freeway interchanges plus a dozen signals.

Tanforan Shopping Center – BART Station Simulation Model (Paramics)

Dowling Associates created a Paramics model based on engineering drawings, aerial photographs, and field observations in order to evaluate impacts of the proposed addition of a BART parking garage to the area. We calibrated the model to existing conditions using recent traffic counts and field observations of queuing. In order to model the parking garage traffic, we coded surges of traffic that would occur when trains arrive at the station. We later prepared a paper describing the traffic surge coding that was published by the Transportation Research Board (TRB) and presented at a recent conference on simulation modeling.



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