



T. KEAR

TRANSPORTATION PLANNING
& MANAGEMENT, INC.

Tom Kear, PhD, PE

Dr. Kear has 20 years of experience in transportation planning, traffic operations, and environmental analysis. He has prepared studies for NEPA and CEQA since 1991 and has provided training on environmental analysis of transportation projects for Caltrans, FHWA, and the UC Davis Extension.

Dr. Kear coauthored Caltrans' guidance for air quality elements in NEPA/CEQA documents and has numerous peer-reviewed publications that address both technical and policy elements of environmental studies. He managed major research efforts on how vehicle emissions change with speed, and congestion. Dr. Kear led maintenance of the CALINE4 dispersion model for Caltrans for the decade from 1995 through 2005, including the development of new user interfaces and related emission modeling tools. He also worked on industrial air pollution permitting, health risk assessments, and dispersion modeling throughout the early 1990's as the requirements of California's AB2588 regulations were being phased in.

Dr. Kear has applied his detailed analytical skills and expertise in NEPA and CEQA on a variety of traffic impact studies and unique travel demand modeling problems. He has experience with TP+/Cube, VISUM, and TransCAD packages along with traffic operations analysis tools including Traffix, Synchro/SimTraffic, VISIM, CORSIM, and HCS.

Dr. Kear is also a member of the Hearing Board for the Yolo-Solano AQMD where he volunteers his time to adjudicate applications for variances to the district's rules and permits for stationary sources of air pollution.

RELEVANT EXPERIENCE

Quantitative Mobile Source Air Toxics (NCHRP 25-25 Task 70)

Dr. Kear helped lead research to evaluate conditions under which mobile source air toxic emissions, exposure, and health impacts may differ among project alternatives. Dr. Kear was responsible for emission and dispersion modeling using the MOVES, CAL3QHCR, and AERMOD tools for highway expansion and intermodal freight case studies, and contributed to the review of over two dozen project environmental documents to identify how MSATs were treated and how levels varied among project alternatives.

Education

Ph.D., Civil and Environmental Engineering, University of California at Davis, 2005

M.S., Civil and Environmental Engineering, University of California at Davis, 1993

B.S., Environmental Resource Engineering, Humboldt State University, 1991

Areas of Expertise

Environmental Analysis
NEPA/CEQA

Travel Demand Forecasting

Traffic Operations

Transportation Air-Quality
Policy

Emission Factor Modeling

[Southern California Regional Goods Movement Master Plan](#)

Dr. Kear guided the development and analysis of scenarios for truck and rail electrification in the goods movement plan. Different mixes of hybrid, catenary hybrid, plug-in hybrid, alternate fuel, and traditional vehicles were considered for both rail and truck based container transport. Rail strategies examined likely ranges of electric and diesel fuel costs within Southern California.

[U.S. / Mexico Border Emissions and Wait-Time Analysis Template](#)

For the Federal Highway Administration (FHWA), Dr. Kear lead a consultant team to quantify the relationship between border operations and emissions. An analysis template was developed to help the U.S./Mexico Joint Working Committee improve border planning efforts and provide information to prioritize strategies to improve real-time border crossing operations. The project focused on private and commercial vehicle activity at land ports of entry along the U.S./Mexican border.

[SANDAG Model Validation for Health Modules](#)

For the San Diego Association of Governments (SANDAG), Dr. Kear coordinated an expert review panel consisting of California's four largest metropolitan planning organizations and San Diego County Health and Human Services experts to review tools for assessing the effect of transportation and land use decisions on chronic disease and obesity rates.

[SB 375 Target Setting Methodology Review](#)

For the San Diego Association of Governments (SANDAG), Dr. Kear reviewed portions of the methodology SANDAG developed to set targets for regional greenhouse gas (GHG) reduction, as required by state climate change legislation (SB 375). The review considered the reasonableness of SANDAG's assumptions regarding the strategy level of deployment and resulting GHG estimates for both on-model and off-model strategies, including commute reduction strategies, bicycle and pedestrian network investments, transit investments, bottleneck relief, and parking pricing.

[Gateway Cities SCS](#)

For the Gateway Cities Council of Governments (CA), Dr. Kear performed the emission calculations for the first subregional Sustainable Communities Strategy (SCS) under the landmark California legislation requiring a statewide reduction in greenhouse gas (GHG) emissions from transportation. The SCS delivered a 10 and 25 year plan to reduce GHG in this dense, highly industrialized corridor that must withstand significant scrutiny from environmental advocates, business communities, neighborhoods, regional and state regulators.

[EPA Truck Drayage Environmental and Energy Model and Case Studies](#)

For the SmartWay Transportation Partnership and EPA, Dr. Kear managed development of the emissions portion of the DrayFLEET model. DrayFLEET is a screening level tool that analyses port management alternatives according to their cost and emissions performance.

SCAQMD Technical Assistance Related to Air Quality Impacts of Regional Goods Movement

Dr. Kear managed a team supporting development of the 2007 Air Quality Management Plan (AQMP) and implement related emission reduction strategies. Assignments included cleaning up fleet, accrual, and VMT assumptions from EMFAC that were over estimating near term emissions and the analysis of a proposed sulfur emission control area along the west coast that would require ships to burn low sulfur fuel inside of US territorial waters.

TCMs/RACM/BACM –

At the request of Caltrans, a one day workshop (2/26/2006) with 50 federal, state, and regional agency participants was set up to coordinate planning and documentation of reasonably available, and best available, control measures (RACM & BACM) in a manner that would subject them to the timely implementation requirements for TCMs. The workshop allowed air quality and transportation planners to share insights about SIP commitments and TCMs, document past experiences, and provide guidance for upcoming SIPs to help coordinate each region's effort with federal and state requirements.

Particulate Matter and Transportation Projects: An Analysis Protocol

A project level analysis protocol was developed in coordination with federal and state agencies to help Caltrans implement the PM hot spot analysis requirements. The procedures were designed using real world comparisons wherever possible to clean-screen projects. Because dispersion models had been shown to be unreliable under the geometric and atmospheric conditions of greatest concern, look up tables for the projects contribution to nearby PM concentrations were derived from field data and the literature.

PM2.5 Modeling Capabilities of CALINE4

In response to a request to identify how the CALINE4 model performed for dispersion of road dust and exhaust particulate, an analysis of modeled and measured concentrations was prepared. Study databases were developed from prior field work in suburban Sacramento, and a street canyon location in London that had both hotspot and background particulate data available. CALINE4 was found to work acceptably at the suburban site in Sacramento, but the models performance degraded under calm conditions. CALINE4 was generally off by a factor of two or larger when applied to the street canyon. These model issues are significant because it is under calm conditions and in locations such as street canyons that exposure to un-healthy concentration of exhaust particulate is of greatest concern.

ARB Link/Zone Based Mobile Source Emissions Model Development Protocols and Peer Review

The Air Resources Board is developing a new link/zone based on-road mobile source emissions inventory model. ARB staff contracted with Dr. Kear for peer review of draft model components including algorithms to replicate undocumented portions of the EMFAC model, How to set up QA/QC tests, and recommendations for further improvements.

PEER REVIEWED PUBLICATIONS

Kear, Tom P., Douglas Eisinger, Debbie A. Niemeier, Mike Brady (2008). US Vehicle Emissions: Creating a Common Currency to Avoid Model Comparison Problems. *Transportation Research Part D*, 13(3), 168-176. doi:10.1016/j.trd.2008.01.004.

Yura, Elizabeth, Tom P. Kear, Debbie A. Niemeier (2007). Using CALINE Dispersion to Assess Vehicular PM_{2.5} Emissions. *Atmospheric Environment*, 41(38), 8747-8757. doi:10.1016/j.atmosenv.2007.07.045.

Kear, Tom P., Debbie A. Niemeier (2006). On-Road Heavy-Duty Diesel Particulate Mass Emissions Modeled Using Chassis Dynamometer Data. *Environmental Science and Technology*, 40(24): 1828-7833. doi: 10.1021/es060177e.

Eisinger, Douglas S., Debbie A. Niemeier, Till E. Stoeckenius, Tom P. Kear, Michael J. Brady, Alison K. Pollack, Jeff Long (2006). Collecting Driving Data to Support Mobile Source Emissions Estimation, *Journal of Transportation Engineering*, 132(11), 845-854 doi: 10.1061/(ASCE)0733-947X(2006)132:11(845).

Kear, Tom P., Debbie A. Niemeier (2005). Assessing Air Quality Progress Using On-Road Emissions Inventories Updates. *Environmental Science and Technology*, 39(22): 8571-8577, 2005. doi: 10.1021/es0489240.

Niemeier, Debbie A., Yi Zheng, Tom P. Kear (2004). UCDrive: A New Gridded Mobile Source Emission Inventory Model. *Atmospheric Environment*, 38(2), 305-319. doi:10.1016/j.atmosenv.2003.09.040.

Kear, Tom P., Debbie A. Niemeier (2003). Composite Exhaust Emissions Rates: Sensitivity to Vehicle Population and Mileage Accrual Assumptions. *Transportation Research Record (1842)*: 73-82. Doi:10.3141/1842-09.

Foresman, Erin L., Michael J. Kleeman, Tom P. Kear, Debbie A. Niemeier (2003). PM₁₀ Conformity Determinations: The Equivalent Emissions Method. *Transportation Research Part D*, 8(2), 97-112. doi:10.1016/S1361-9209(02)00035-4.

Eisinger, Douglas S., Kelly Dougherty, Daniel P.Y. Chang, Tom P. Kear, and Pamela F. Morgan (2002). A Reevaluation of Carbon Monoxide: Past Trends, Future Concentrations, and Implications for Conformity "Hot-Spot" Policies. *Journal of the Air & Waste Management Association*, 52: 1012-1025.

CONFERENCE PROCEEDINGS

Kear, Tom P., Debbie A Niemeier. (2004). *Diesel Particulate Matter: Risk Management Strategies for the Transportation Planning Process*. Transport 2004, Wessex Institute of Technology, UK, Dresden, Germany, May 19, 2004.

Eisinger, Douglas S., Kathy Nanzetta, Tom P. Kear, Debbie A. Niemeier, Robert O'Loughlin, Michael J. Brady (2003). *Particulate Matter and Transportation Projects, an Analysis Protocol*. (Paper No. 70067) the Air & Waste Management Association's 96th Annual Conference and Exhibition, "Energy, Economic, and Global Challenges: Environment in the Balance", San Diego, CA, June 22-26.

Kear, Tom P., Debbie A. Niemeier (2003). *Composite Exhaust Emissions Rates: Sensitivity to Vehicle Population and Mileage Accrual Assumptions*. Transportation Research Board 82nd Annual Meeting, Washington, D.C., January 2003.

Eisinger, Douglas S., Debbie A. Niemeier, Tom P. Kear (2002). *The California Department of Transportation/Air Resources Board (CAMP) Program: New Research to Improve Speed Correction Factors and Mobile Source Emissions Modeling*. U.S. Environmental Protection Agency's 11th Annual Inventory Conference, "Emissions Inventories-Partnering for the Future", Atlanta, GA, April 16-18.

Niemeier, Debbie A., Douglas S Eisinger, Tom P. Kear, Michael J. Brady, J. Steven Borroum, Daniel P.Y. Chang (1999). *Serving the Public Interest Through Partnership: The UC Davis-Caltrans Air Quality Project*. Transportation Research Board 78th Annual Meeting, Washington, D.C., January 1999.

Kear, Tom P., Whitney R. Leeman (1997). *Implications of Using MVEI 7f and MVEI 7g for Carbon Monoxide (CO) Conformity Determination*. Air & Waste Management Association 90th Annual Conference and Exhibition, Toronto, ON, Canada, June 8-13, 1997.

Kear, Tom P., Tony Held, Daniel P.Y. Chang, and J.J. Carroll (1996). *Are Buoyancy Effects Important During Worst Case Meteorology?*, Transportation Research Board Transportation & Air Quality Committee (A1F03), 1996 Summer Conference: "Regional Transportation and Air Quality Planning: Expanding the Dialogue, Advancing the Practice", Irvine, CA.

Kear, Tom P., Vicente J. Garza (1996). *Alternatives to Air Quality Modeling for Project Level Conformity*. Transportation Research Board Transportation & Air Quality Committee (A1F03). 1996 Summer Conference: "Regional Transportation and Air Quality Planning: Expanding the Dialogue, Advancing the Practice", Irvine, CA.

Kear, Tom P., Anna Peteranecz (1992). *Landfill Gas Health Risk Assessment: Case Study*. Hazardous Materials Control Research Institute, Proceedings of R&D 92 National Research & Development Conference on the Control of Hazardous Materials, February 4-6, 1992, The Fairmont Hotel, San Francisco, California.

COURSES TAUGHT

Kear, Tom P., (2004). *Transportation Air Quality Analysis: An Overview*. University Extension, University of California, Davis, Davis, CA, February 13, 2004.

Kear, Tom P., Douglas S Eisinger., and Oliver Gao (2003). *Advanced Project-Level Air Quality Analysis*. Training course presented at Caltrans District 11, San Diego, CA, by Caltrans and the U.C. Davis Air Quality Project, GEV126, March 12-13,2003.

Kear, Tom P., Douglas S Eisinger., and Oliver Gao (2003). *Project-Level Air Quality Analysis Overview*. Training course presented at Caltrans District 11, San Diego, CA, by Caltrans and the U.C. Davis Air Quality Project, GEV125, March 11,2003.

Kear, Tom P., (2003). *Transportation Air Quality Analysis: An Overview*. University Extension, University of California, Davis, Davis, CA, February 5, 2003.

Leeman Whitney R., Tom P. Kear, Douglas S. Eisinger (2002). *Advanced Project-Level Air Quality Analysis*. Training course presented at the Caltrans DES Training Facility, Sacramento, CA, by Caltrans and the U.C. Davis Air Quality Project, GEV126, October 2-3, 2002.

Leeman Whitney R., Tom P. Kear, Douglas S. Eisinger (2002). *Project-Level Air Quality Analysis Overview*. Training course presented at the Caltrans Maintenance Training Center, Woodland, CA, by Caltrans and the U.C. Davis Air Quality Project, GEV125, October 1, 2002.

SOFTWARE

Smith, Daniel, Tom P. Kear, Frank R. Harder, Stephen C. Nieman, Harold J. Cerveny, Peter A. Rutski, Vasin Kiattikomol (2008). *DrayFLEET: EPA SmartWay Drayage Activity and Emissions Model*. <http://www.epa.gov/smartway/transport/partner-resources/resources-drayage.htm>.

Niemeier, Debbie A., Yi Zheng, Tom P. Kear (2004). *UCDrive*. University of California at Davis.

Coe, Dana L., Douglas S. Eisinger, Jeff D. Prouty, and Tom P. Kear (1998). *CL4: a User-Friendly Interface for the CALINE4 Model for Transportation Project Impact Assessment*, Prepared for Caltrans - U.C. Davis Air Quality Project, Sacramento, CA, by Sonoma Technology, Inc., Petaluma, CA.

Sierra Research (1994). *TCM Tools Transportation Control Measures Evaluation Software*, Central Puget Sound Region. Puget Sound Regional Council,

Sierra Research (1994). *Software to Quantify the Emission Reductions and Cost Effectiveness of Selected Transportation Control Measures*. U.S. Department of Transportation Federal Highway Administration.