

John L. Bowman, Ph. D.

Transportation Systems and Decisions Sciences

Bowman Research and Consulting

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Summary

John Bowman is best known for his development and ongoing improvement of the activity schedule approach for the forecasting of regional passenger travel demand, and for enabling planning agencies to develop knowledge, skills, models and software needed to implement and use the approach. He also conducts planning studies for advanced model development; develops market demand simulators (based on customer and stated choice data), airport access models and commuter rail demand forecasts; and evaluates models developed by others. Dr. Bowman contributes to the field through publications, presentations and journal reviews, and has taught occasionally at MIT, where he earned graduate degrees (MST 1995, PhD Transportation Systems and Decision Sciences 1998).

Experience: 16 years

Advanced travel demand modeling

2010-present. NCHRP (project 08-78). With J. Richard Kuzmyak and others. Developing methods for a guidebook for practitioners on estimating and forecasting bicycling and walking activity.

2009-present. Chicago Metropolitan Agency for Planning (CMAP). With Peter Vovsha, Tom Rossi, Kostas Goulias and Ram Pendyala. Developing data development component of a strategic plan for advanced travel modeling at CMAP.

2009-present. FHWA (SHRP2 C10A project). With Resource Systems Group (RSG), Mark Bradley and AECOM Consult. Integrating an activity-based model system (DaySim) with the TranSims Router and Microsimulator.

2009-present. Puget Sound Regional Council (PSRC). With Bradley, DKS Associates, RSG and Urban Analytics. Managing project to implement an activity-schedule-based travel demand model system. Serving as technical lead, principal designer and model developer (with Bradley). Guiding and assisting all other aspects of project.

2008-present. Mid-Ohio Regional Planning Council (MORPC). Assisting University of Texas at Austin to compare MORPC trip-based model system with their new tour-based model system.

2008-2010. FHWA. With Bradley, Joe Castiglione and RSG. Integrated the SACOG activity-based demand model (DaySim) with the TranSims Router.

2003-2009. Developed a population synthesizer (PopSyn) for Atlanta Regional Commission (ARC). Helped DRCOG, PSRC and SANDAG implement it for their regions.

2008. Florida DOT Region 7 (Tampa Bay area) and Southern California Association of Governments (SCAG). With Bradley. Explained the state of practice and prepared activity-based model system design and implementation plan.

2008. Puget Sound Regional Council (PSRC). With Bradley and Castiglione. Implemented a day-activity schedule microsimulation model and integrated it with PSRC's existing trip-based model system. Conducted planning and design for a subsequent full implementation of an activity-based model system.

2006-2008. Denver Regional Council of Governments (DRCOG). Helped design and develop a new activity-schedule-based travel demand model system. Guided the development of model components by DRCOG staff.

2005-2008. Sacramento Area Council of Governments (SACOG). With Bradley. Designed, developed, programmed and implemented a new activity-schedule-based travel demand model system with detailed treatment of time and space dimensions (DaySim). Integrated it with traffic assignment, validated and calibrated it with SACOG and DKS. Enhancing it over time.

2001-2004. Atlanta Regional Commission (ARC). Designed model system with Bradley and Vovsha.

2001-2003. Mid-Ohio Regional Planning Commission (MORPC). Assisted in design and model estimation.

1996-2001. Portland Metro. Designed activity-based model system, the first practical modern activity-schedule-based model system used for policy analysis. Assisted Mark Bradley in model estimation.

1993-1998. Massachusetts Institute of Technology (MIT). For Masters and PhD theses, developed the first modern integrated activity-schedule-based travel demand model, demonstrating the correlation of activity schedule choices with transport level of service. Also, developed an integrated discrete choice model system of a household's residential location choice and its members' activity and travel schedules, demonstrating how activity-based accessibility impacts residential location.

Teaching

1995-present. Occasionally provide instruction in activity-based travel demand forecasting to individuals and groups.

1995-present. MIT. Teaching assistant, substitute instructor, and occasional instructor in charge of the core graduate demand modeling course. Topics include least squares, generalized least squares, instrumental variables, maximum likelihood, random utility theory, multinomial choice, probit, logit, GEV, multidimensional choice with nested logit, stated preferences, model specification and testing, sampling, forecasting, iterative proportional fitting.

Other experience

1998-2008. Stated choice market simulators. Serve as technical advisor, and perform experimental design, sample design, survey design, model estimation, and market simulator development for demand analysis by major public and private sector clients in North and South America and Europe. Projects have included demand for transportation (bus and rail transit, commuter rail, inter-city rail, intercontinental air), technology (TV, internet, telephone, wireless, automated IT services) and financial services (investment brokerage, credit cards, employee benefits).

2006-2007. Developed demand models to predict future customer behavior based on past customer behavior, for a major U.S. mutual fund company.

2006. Atlanta Regional Commission (ARC). Researched and advised on state of the practice in land use modeling.

2002. Airport access models (Portland Metro and SACOG). Developed airport access mode choice models.

1999-2001. Model evaluation and uncertainty analysis (North America and Asia). Technically evaluated travel demand forecasts made by other consulting firms for urban rail transit and inter-city passenger rail systems, providing expert advice to litigators and estimates of bias and uncertainty for the placement of revenue guarantee insurance.

1997-2001. Commuter rail demand forecasts (Mexico and South America). Designed survey, selected survey intercept sites, designed demand models, developed EMME2 network model, developed demand model, calibrated and applied the model system under alternative forecast scenarios.

Refereed publications (most are available at <http://JBowman.net>)

M. Bradley, J.L. Bowman and B. Griesenbeck, "SACSIM: An applied activity-based model system with fine-level spatial and temporal resolution", *Journal of Choice Modeling* (publication pending), 2010.

X. Dong, M.E. Ben-Akiva, J.L. Bowman and J. Walker, "Moving from Trip-Based to Activity-Based Measures of Accessibility", *Transportation Research A*, 40: 163-180, 2006.

J. Bowman and M. Ben-Akiva, "Activity-based Disaggregate Travel Demand Model System with Activity Schedules", *Transportation Research A* 35: 1-28, 2001.

J. Bowman, M. Bradley, Y. Shifan, T.K. Lawton and M. Ben-Akiva, "Demonstration of an Activity Based Model System for Portland", in *Proceedings of the 8th World Conference on Transport Research (WCTR)*, Antwerp, Belgium, Vol. 3: 171, Pergamon, 1999.

M. Ben-Akiva and J. Bowman, "Activity Based Travel Demand Models", in *Equilibrium and Advanced Transportation Modeling*, P. Marcotte and S. Nguyen, eds., Kluwer Academic Publishers, 1998.

M. Ben-Akiva and J. Bowman, "Integration of an Activity-based Model System and a Residential Location Model", *Urban Studies* 35 (7): 1231-1253, 1998.

M. Ben-Akiva, J. Bowman and D. Gopinath, "Travel Demand Model System for the Information Era", *Transportation* 23: 241-266, 1996.

Selected other publications, working papers and presentations (most are available at <http://JBowman.net>)

J.L. Bowman. "Activity Model Development Experiences", TMIP Webinar, June 18, 2009.

J.L. Bowman. "Activity-Based Models: 1994-2009", presented at the MIT ITS Lab, March 10, 2009.

J.L. Bowman. "Historical Development of Activity Based Model Theory and Practice", *Traffic Engineering and Control*, Vol. 50 No. 2: 59-62 (part 1) and Vol. 50 No. 7: 314-318 (part 2), 2009.

J.L. Bowman and M.A. Bradley. Activity-Based Models: Approaches used to achieve integration among trips and tours throughout the day", presented at the 2008 European Transport Conference, Leeuwenhorst, The Netherlands, October, 2008.

J.L. Bowman. "The Day Activity Schedule Approach of Bowman, Ben-Akiva and Bradley: 1994-2008", presented at the Transportation Research Board Innovations in Travel Modeling Conference, June 22-24, 2008.

J.L. Bowman, M.A. Bradley and J. Gibb. SacSim, a regional travel forecasting model system developed in 2005 and implemented in 2006 for the Sacramento Area Council of Governments (SACOG), a series of technical reports, 2006.

J.L. Bowman and G. Rousseau, "Validation of the Atlanta (ARC) Population Synthesizer (PopSyn)", white paper presented at the TRB Conference on Innovations in Travel Modeling, May 21-23, 2006, Austin, Texas, 2006.

J.L. Bowman, "A comparison of population synthesizers used in microsimulation models of activity and travel demand", working paper, 2004.

J. L. Bowman, D. Gopinath and M. Ben-Akiva, "Estimating the probability distribution of a travel demand forecast", working paper, 2002.

J.L. Bowman and M. Ben-Akiva, "Activity-Based Travel Forecasting", in *Activity-Based Travel Forecasting Conference*, June 2-5, 1996, Summary, Recommendations and Compendium of Papers, U.S. Department of Transportation report number DOT-T-97-17, 1997.