

RESEARCH YOU CAN USE

Accessibility vs. Mobility: The Right Methodology

In a 1996 article titled “Beyond Speed: The Next Generation of Transportation Performance Measures,” I lamented that transportation planning in the U.S. focused on “auto-mobility,” rather than on the broader goals of accessibility, livability, and sustainability. I also predicted that the Clean Air Act Amendments of 1990 and the Intermodal Surface Transportation Efficiency Act of 1991 would spur a shift to these broader metrics, which promised cleaner air, stronger neighborhoods, and less dependence on foreign oil.

which rates urbanized areas in terms of their congested travel times divided by free-flow travel times. This study makes headlines everywhere. And regional transportation plans prepared by metropolitan planning organizations continue to give more weight to congestion relief than any other single objective. The 2008 Atlanta RTP, with hundreds of goals, included only one measurable objective, and it related to congestion.

So it was with considerable interest that I read “Does Accessibility Require Density or Speed? A Comparison of Fast Versus Close in Getting Where You Want to Go in U.S. Metropolitan Regions” in the Spring 2012 issue of the *Journal of the American Planning Association*. The authors, Jonathan Levine, Joe Grengs, and Qingyun

conclusion: “Despite theoretical reasons to expect that the speed effect dominates, results suggest that the proximity effect dominates, rendering the denser metropolitan areas more accessible.” Indeed, the proximity effect is 10 times stronger than the speed effect. This is perhaps the most compelling argument for compact urban development I have ever seen.

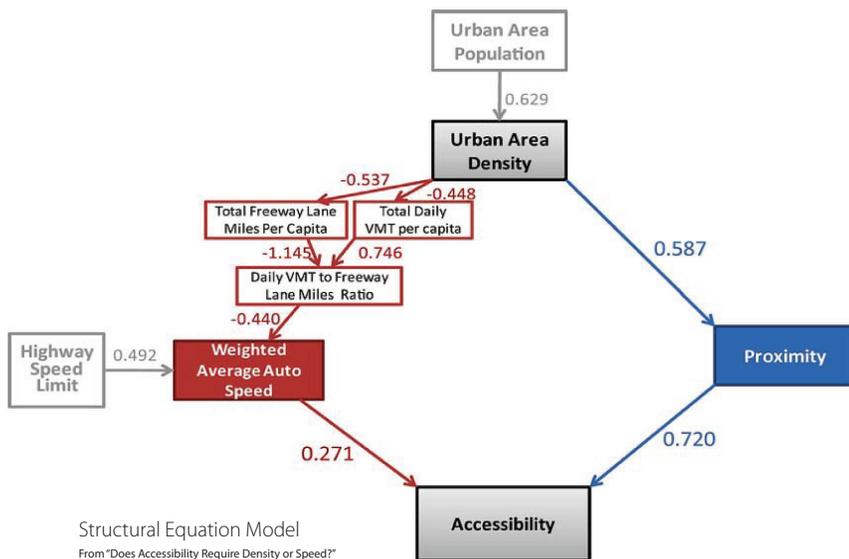
Methodology counts

Beyond its message, I like this article because of its methodological approach. The relationships that characterize metropolitan areas are complex. Yet planners have historically modeled urban form as simple and one-directional, with many explanatory variables acting independently on a single outcome. You know this from your graduate course in statistics, which taught analysis of variance and linear regression in just such terms. Univariate models, including analysis of variance and linear regression, are designed to study individual processes and are not well suited for studying systems. The *JAPA* authors instead use path analysis, also referred to as structural equation modeling, to capture complex interactions among density, speed, proximity, and accessibility. I made a case for this “model-centered” methodology in an earlier column (“Different Models of Metropolitan Economic Performance,” June 2008). SEM seeks to evaluate theoretically justified models against data rather than simply rejecting the “null hypothesis” of no relationship among variables.

In a 2006 book on the subject, Jim Grace, a leading expert on SEM, wrote, “The dominance of the univariate statistical model in the natural sciences has, in my personal view, retarded (greatly) the progress of science.” It is scary to think that the same could be true in our social scientific field.

Reid Ewing

Ewing is a professor of city and metropolitan planning at the University of Utah and an associate editor of *JAPA*. “Beyond Speed” appears in *Performance Standards for Growth Management*, PAS Report 461, published by APA in 1996. Jim Grace’s book on SEM is *Structural Equation Modeling and Natural Systems*. Ewing’s past columns are available at <http://plan.utah.edu/research-projects/research-you-can-use>.



Boy, was I wrong! Here we are in 2012, and transportation planners and engineers are still evaluating system performance largely in terms of “level of service,” which assesses roadway performance on an A to F scale—like a student’s report card. LOS A represents free flow, LOS F gridlock. Transportation planners and engineers pursue “good” grades with the same single-minded determination that students pursue As.

It is not just traffic operations and traffic impact studies that revolve around LOS. The most widely reported transportation study each year is the Texas Transportation Institute’s Annual Urban Mobility Report,

Shen of the University of Michigan, and Qing Shen of the University of Washington, argue that accessibility—the ease of getting to a destination—is more important than mobility—how fast you travel on the way there. This seems obvious on its face. The purpose of transportation isn’t movement per se but rather access to activities.

The authors note that dense regions are more congested but that they also keep activities closer to one another, leading to the tantalizing research question: Which offer greater accessibility—denser regions with lower travel speeds, or regions with lower densities and higher speeds? Their