

Modeling Growth for the Nation's Capital: A Work in Transit

Los Angeles and San Francisco in the dubious competition for the worst traffic in the country, the Washington, DC, metropolitan area poses an additional challenge for land use and transportation planners—multiple jurisdictions at the state, county, and federal level. Over the past few decades, the number of cars, jobs, and people has soared while long-term, strategic solutions are debated and usually litigated.

The problems encountered by DC-area planners are the same as those faced by their counterparts across the country, albeit writ large. Suburbs spawn ex-urbs that quickly overwhelm road infrastructure planned decades before. Shifting demographics, the rise or fall of the local economy, and national and worldwide economic trends introduce confounding variables that further complicate the policy process. And

across the country, many governors and big city mayors are promoting once radical transportation measures like cordon pricing and high-occupancy/ toll roads as a means of combating congestion, air pollution, and climate change.

All of this makes efforts to reduce congestion all the more convoluted. Because policymakers can't run experiments in the real world by say, deciding to build a highway only to dismantle it later, they turn to the next best thing, an economic model. With a model, it is possible to examine the effects of individual policy variables one by one. More importantly, models allow us to see whether a policy of interest would be effective at what it is designed to achieve and what side effects, or unintended consequences, it is likely to produce.

Two RFF scholars, Elena Safirova and Winston Harrington, have built an integrated model of land use, strategic transport, and regional economy (LUSTRE) that can examine the long-run trade-offs of both transportation policies and land-use regulations. Because land use and transportation decisions are very much intertwined, unintended consequences are likely to be very common. For example, a cordon toll is designed to make people switch to public transit to drive less. However, in the long run a toll is also likely to encourage some residents to move to

the suburbs and therefore contribute to urban sprawl.

At a recent RFF workshop, discussants talked about LUSTRE modeling results of two policies that address DC congestion problems as well as the value of models to local planners in general.

Tensions and Trade-offs

All participants agreed that models were essential in land use planning, serving as test beds for understanding how policies might play out in the real world. But any model is inevitably a simplification of reality. One simplifies because the lack of data demands it. As Michael Repogle, transportation director, Environmental Defense, noted, "The closer you are to the data, the more unhappy you are with it." Simple models are also transparent, which is especially important when used for policy analysis, said Ken Small, research professor and professor emeritus of economics, University of California–Irvine. Neither the public nor the decisionmaker is likely to trust a model that cannot be understood.

And yet, good models often need complexity as well. The real world is constantly tossing up outcomes that are unexpected and often counterintuitive, and frequently policies fail because they have unintended consequences. Because these unexpected outcomes are of special interest, models that can identify them are particularly valuable.

The problem is, how do you balance the need for transparency with the demand for complexity? And even if a model generates interesting results, how can you tell if those results are relevant to the real-world problem at hand, or are simply an artifact of the model? For modelers, balancing the tensions between simplicity and complexity and distinguishing between real and manufactured outcomes are never-ending concerns. ■

A "LUSTRE-ous" Model

LUSTRE (Land Use, Strategic Transport and Regional Economy) is an integrated and spatially disaggregated land use and transportation model that is calibrated for the Washington, DC, metropolitan area. It combines two smaller models: Regional Economy and Land Use (RELU), which represents economic and spatial behavior of consumers, firms, and developers in a metropolitan area and was developed by Alex Anas and Elena Safirova; and Strategic Transport (START), which provides details on transportation choices made by economic agents such as mode, time period, and parking. START was developed by Tony May and is now maintained by MVA Consultancy of the UK. Unlike in other land use/transportation models, the integration in LUSTRE takes place at the level of individual agents, who make tradeoffs in housing, transport, and other goods based on their idiosyncratic preferences and the unique prices they face. The model also incorporates unemployment, taxes, and alternate transportation modes.