

RFF Report Studies Intersection of Transportation and Air Quality Planning

Peter Nelson

At the time of this writing, Congress is in the midst of the daunting task of reauthorizing its national transportation-funding program, known as the Transportation Equity Act for the 21st Century (TEA-21). The Bush administration's draft bill (called SAFETEA) has already generated criticism in Congress, particularly concerning its overall funding, which some argue is insufficient for America's transportation needs. But it's not just funding that promises to be controversial. One of the biggest battles is shaping up over provisions that affect what is called transportation conformity regulation, which governs the relationship between planning and air quality goals.

Although the general public is blissfully unaware of transportation conformity, it plays a central role in metropolitan planning. The goal of the conformity regulation is to embed air quality considerations in transportation decisions. Simply put, conformity requires that regional transportation plans in air quality nonattainment and maintenance areas be consistent with the relevant state air quality plan (the "SIP"). Through a *conformity determination*, transportation planners ensure that projected emissions from cars, pickup trucks, buses, and the like do not exceed the emissions budget specified in the SIP. If a metropolitan area's conformity determination expires and

the area is unable to make a new one, it is in a conformity lapse, and only a limited set of new projects (such as safety improvements) may proceed.

Although this may seem like a reasonable enough requirement, many argue that the conformity process has become unnecessarily disruptive to both transportation and air quality planning. In particular, many transportation planners argue that conformity places large administrative burdens on metropolitan planning organizations and saddles them with problems that are better handled by state air quality agencies or the federal government.

To examine the validity of these complaints, I worked with my colleagues Winston Harrington and Alan J. Krupnick from RFF, Arnold Howitt and Jonathan Makler from Harvard, and Sarah J. Siwek of Sarah J. Siwek and Associates on case studies of the experience of six metropolitan areas with the conformity process. In the course of the project, we conducted interviews with representatives of local metropolitan planning organizations, state air quality agencies, state transportation departments, the U.S. Environmental Protection Agency, Federal Highway Administration, and local citizens' groups.

It is difficult to summarize all the findings of our report in the short space here, but we found evidence to bolster the arguments of both critics

and supporters of the current conformity regulation. For example, we found some justification for complaints from many transportation planners about the apples-and-oranges problem that occurs when conformity determinations must be based on planning assumptions that were not used in the development of the SIP. On the other hand, another complaint—that the time horizon required for conformity is too long—did not prove to be a major issue.

Although there are many ways to skin the conformity cat, what is perhaps the best approach remains off the transportation radar screen. Studies of the costs of motor-vehicle use show, almost unanimously, that social costs, such as congestion and air pollution, greatly exceed the private costs. Unfortunately, governments have shied away from the obvious remedy, correcting this imbalance through a gas-tax increase or road pricing.

A major focus of RFF's transportation research is the analysis of various incentive policies directed at vehicle use. For example, Ian Parry (with Kenneth Small) recently estimated the optimal level for the U.S. gasoline tax. In addition, Elena Safirova, Kenneth Gillingham, Winston Harrington, and I have developed a strategic transportation model of the Washington, DC, region, which we are using to evaluate policies like high-occupancy toll lanes, increased parking fees, and a cordon system similar to the one recently implemented in London. Such policies are not exactly popular, and one of the greatest unsolved problems of transportation policy analysis is devising a politically acceptable, incentive-based program to deal with the social costs of driving.

Exhausting Options: Assessing SIP-Conformity Interactions can be found on the RFF website, at www.rff.org/reports/2003.htm. ■

RFF Workshop Explores Learning- by-Doing in Energy Technologies

To further understand the role learning-by-doing (LBD) plays in the development and adoption of renewable energy technologies, RFF organized a workshop in June to “learn-by-discussing.”

The workshop, funded by the William and Flora Hewlett Foundation and the Energy Foundation, brought together scientists, engineers, economists, and others involved in renewable energy development. It began with an overview of LBD and the role public policy can play to encourage it. Workshop participants then discussed LBD in the context of photovoltaics, wind power, and fuel cells.

“The LBD discussion has tended to be abstract and rather academic, but we wanted to be concrete and look at specific public policies as they relate to these three technologies,” said RFF Senior Fellow Raymond Kopp. “The issue boils down to what role the government should play in advancing the development and

adoption of these technologies, and how one decides which particular technologies to support.

LBD and Public Policy

T.P. Wright used the expression “learning curve” in 1936 when studying airplane manufacturing: as workers gained more experience, their skills improved, which in turn lowered labor costs and benefited production. Kenneth Arrow applied the concept to economic thought in the 1960s, coining the term “learning-by-doing.” LBD contributes to a falling cost curve when acquired knowledge results in increased production.

Consequently, some advocates feel the government should help create or increase demand in the initial stages of new technology development. For example, if LBD lowers costs as more fuel or solar cells are produced, they contend, more consumers would choose these renewable technologies.

Several presenters pointed to the difficulty in quantifying LBD’s effects. John Holdren, director of the Science, Technology, and Public Policy Program at Harvard’s John F. Kennedy School of Government, recognized that learning-by-doing is an important part of innovation, but not well understood in terms of when and how it helps. “These deficits in understanding imperil effective policymaking,” he said. Without fully understanding

how incentives contribute to energy innovation, he added, “We can’t even say ‘how much is enough.’”

LBD and Three Technologies

The sessions on photovoltaics, wind power, and fuel cells began with experts explaining each technology and the potential of LBD to lower its cost. Social scientists responded and analyzed the policy implications.

To Richard Duke, a McKinsey & Company consultant, photovoltaic cells, which use sunlight to produce electricity, are a high priority for public subsidy. He used five criteria to justify this, including public benefits and low market risk from substitutes. Ian Sue Wing, from Boston University’s Center for Energy and Environmental Policy, questioned whether LBD could indeed lower consumer costs enough to justify public expense.

Wind power, a more mature technology, has benefited from government support, according to Duke and Robert Williams of the Princeton Environmental Institute. Henry Jacoby, of the Massachusetts Institute of Technology, feels that more work needs to be done to predict its commercial future.

Frederick Panik, with Daimler Chrysler, reported that fuel cells have declined in price through the knowledge gained in successive generations of the technology. He felt public-private partnerships were key to solving issues that could lower costs further.

“Learning by Synthesizing”

RFF’s Kopp, Richard Newell, and William Pizer are preparing a synthesis, available later this year, which will delineate common themes and areas of consensus. The agenda, participant list, and most of the presentations are currently available at www.rff.org/lbd/home.htm. ■

