

Editor's Introduction

Kenneth A. Small
University of California at Irvine

Special Issue of *Regional Science and Urban Economics* on:
"Evaluating Policies to Reduce Transportation Air Pollution"

As progress on air pollution continues in developed nations, the transportation sector has emerged as one of the most important problems. Despite the extent of technological controls already imposed, transportation contributes a large and growing fraction of emissions of particular concern in many places. Therefore, finding further sources of emission reductions from this sector has become both a pressing and a potentially costly quest.

It is an opportune time, then, to take stock of what we now know about the effectiveness of various policies -- all the more so because the theory, methodology, and data for evaluating such policies have steadily improved. The papers in this special issue display both the virtuosity and the breadth of the techniques being developed, and illustrate their application to real policy questions in real settings.

The first paper, by Stef Proost and Kurt Van Dender, provides a helpful general framework for analyzing a variety of policies, both regulatory and economic. The framework is a general equilibrium one, with attention to the interaction of transportation policies with other market interventions in the form of taxes, and focusing on welfare measures to judge results. Applying the model to Brussels, their results suggest that further tightening of controls along the lines of past policy encounters sharply diminishing returns, whereas potential gains from pricing measures remain quite large.

Chris Nash, Tom Sansom, and Ben Still consider the related question of what effects are likely if principles of marginal social-cost pricing are implemented, as is now being proposed in the European Union. They find that properly accounting for social costs of emissions has a rather small effect on aggregate travel patterns, and conversely that properly accounting for social costs of congestion has a rather small effect on emissions. Together, these two papers point toward a splitting of policies dealing with the two objectives of reducing air pollution and congestion.

The next two papers deal very pointedly with some specific issues that appear to be high priority ones for emissions policy. The first is emissions from diesel-powered urban transit buses. Paul Schimek examines the cost-effectiveness of recent emission control regulations in the United States, and of several disparate proposals for effecting further reductions. He examines these on a cost-per-ton basis for both nitrogen-oxide and particulate reductions. Mandated reductions during the 1990s come out looking very well on his scale, whereas proposals for the next decade range from quite promising (low-sulfur diesel fuel, modest retrofit measures for bus engines) to very expensive for the gain realized (methanol, compressed natural gas).

Inge Mayeres and Stef Proost analyze European tax differentials affecting diesel and gasoline automobiles. Currently ownership-tax differentials favor gasoline, whereas fuel-tax differentials

favor diesel. The issues are more complex than meets the eye because the diesel fuel tax applies to both passenger and goods movements; as intermediate products, goods movements should, on first principles, be more lightly taxed than passenger movements, providing a rationale for the lower diesel fuel taxes. However, emissions are higher for diesel-powered than from gasoline-powered automobiles, which provides a rationale for the higher ownership taxes for diesels. Numerical results suggest that a still larger ownership differential would be welfare-enhancing due to the resulting environmental benefits.

Bruno De Borger also considers the taxation of diesels and gasoline vehicles, but as an example of a quite general problem of two-part taxation of externality-producing goods. His focus is on the relationship between fixed taxes (e.g. vehicle ownership) and variable taxes (e.g. fuel), and shows how second-best considerations make the fixed taxes important even if the externalities are variable in nature. De Borger also considers how the optimal tax rates are affected by user heterogeneity and by concerns about distribution of welfare across the population. The paper underscores the importance of indirect effects, e.g. through the demand for other externality-producing goods or through the overall tax system, in setting constrained optimal tax rates.

It is all very nice to advocate tax reforms based on emissions externalities. But what does the public think of such notions? Alan Krupnick, Winston Harrington, and Anna Alberini provide some strikingly clear conclusions about public reaction to emissions taxes from surveys carried out in the Los Angeles region. Several characteristics, such as age and political party, affected the results; but two findings stand out. One is that support rises dramatically, to a comfortable majority in fact, when the plan calls explicitly for using emissions-tax revenues to reduce other taxes or fees. The other finding is that people who believe that price incentives affect behavior are much more supportive. This latter result suggests that public support might be swayed considerably by a credible educational effort conveying current knowledge about the extent of behavioral responses to tax incentives.

These studies provide some specific guidance concerning policies now on the table. Equally important, they show how scientific evidence can be marshalled to identify the ever more subtle effects that must be elicited in order to make further progress on a problem where many of the "easy solutions" have already been adopted. A good mixture of technical and economic analysis can go far in making the next phase of environmental policy a positive one.