
Energy and Urban Form: Special Feature

Introduction

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One of the important lessons that we have learned over the past twenty years is that patterns of household energy use are as much the product of trends in lifestyles as of trends in resources and technology. Technological advances and increased affluence have allowed us to opt for lifestyles that provide us with more leisure and greater variety. Household refrigeration has made it possible to replace daily trips to the market with weekly trips to the supermarket. Air travel has allowed us to replace trips to the local lake with trips to ski resorts or tropical islands. The pervasive availability of automobiles has greatly increased the scope of our opportunities for employment, consumption, and recreation. The common thread in all this is that our lifestyles have become more energy intensive.

In North America – an increasingly in the rest of the developed world – the most conspicuous change has been from the urban to the suburban lifestyle. Living at lower density implies a variety of things. Chief among them is the increased demand for mobility, which is satisfied by high rates of automobile ownership and use. Naturally, this has important energy and environmental implications. Other related activities, such as the provision of public services to a more dispersed population, also affect energy demand and emissions.

The energy and environmental implications of changes in urban form have been the subject of energy research for at least twenty-five years (Real Estate Research Corporation, 1974; Kenworthy and Newman, 1990; Bannister, 1992; Anderson,

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Miller and Kanaroglou, 1996). Given that suburbanization is now a fact of life, planners and architects have proposed new types of suburban landscapes which, among other things, reduce energy use and negative environmental impacts (Calthorpe, 1993; Ewing, 1996). Still, the empirical base for understanding the link between urban form and energy use remains relatively thin, and a number of controversies and unanswered questions persist (Breheny, 1992; Giuliano, 1995).

In light of this, the three papers in this special feature of *Energy Studies Review* seek to shed further light on how urban form affects energy use. The first paper by Eric Miller and Amal Ibrahim looks at one of the most important underlying connections: the link between urban form and work trip commuting behavior. Their results, which are based on a travel survey for Toronto, indicate that the structure of the urban area – especially the existence of high-density activity/employment centres—underlies the efficiency of commuting and that density in itself does not provide an adequate explanation. Pavlos Kanaroglou and Robert South introduce a comprehensive urban modelling system that can be used to predict the effectiveness of land-use planning policies aimed at reducing energy use by and emissions from light duty vehicles. Their application of the model to the Hamilton, Ontario metropolitan area is preliminary, but it demonstrates the utility of this type of tool for policy analysis. Both papers demonstrate that the links between urban form and energy use are reasonably complex, so formulating policies will be no simple matter.

The final paper by Brian Baetz examines the effect of new approaches to more rational planning of suburbs (known collectively as “new urbanism”) on energy requirements both for the construction of local infrastructure such as roads, water and sewage facilities and for the provision of public services such as solid waste disposal. His case study is hypothetical but it provides a detailed

accounting and illustrates that a variety of small savings can add up to a significant reduction in energy use.

Taken together, the three papers provide evidence of the complexities of the issues involved and of the emerging base of high quality research upon which policy makers will be able to draw as they attempt to steer urban developments down more energy-efficient paths in the coming years.

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