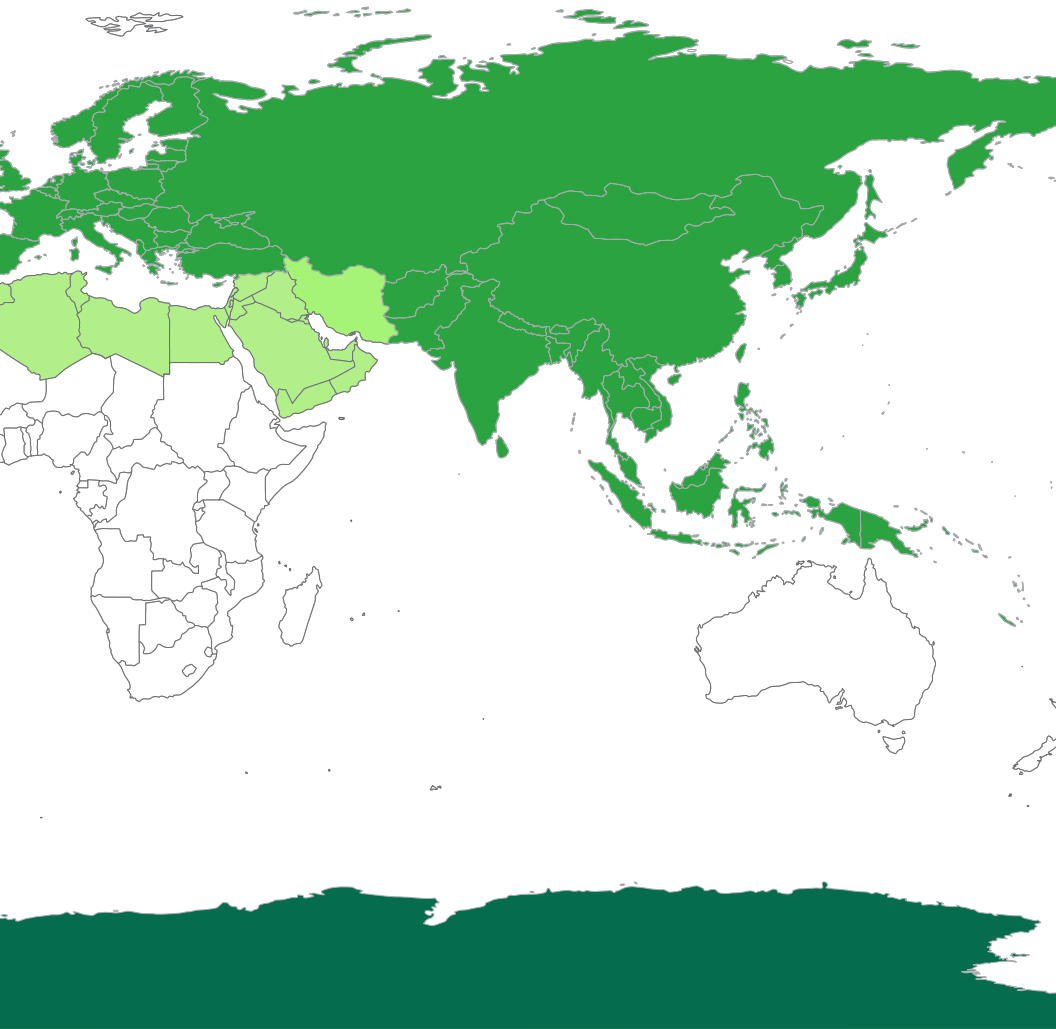


SUSTAINABLE TRANSPORTATION

AN INTERNATIONAL PERSPECTIVE



A NOTE OF THANKS Editorship is an adventurous journey. I learned a lot and enjoyed it – and it could not have been possible without my mentors and supporters. First, I would like to thank Larry Vale, my faculty advisor, for his support, his guidance and practical advice throughout the process of bringing this *Projections* volume to life. I am also grateful to Ezra Glenn for pushing forward this volume and the journal's future.

I would like to thank the authors, who contributed through their knowledge to this volume, iterated patiently through several revisions, and showed tremendous passion for their fields of expertise. I also would like to thank the editors for giving advice that improved this *Projections* volume significantly.

The former managing editors of *Projections* were very open in sharing advice - thank you Anna Brand, Isabelle Anguelovski and Rachel Healy. I hope you will enjoy the layout of this volume, and would like to thank Marissa for designing and improving the graphic design with her ideas.

- EVA KASSENS, 2009

FOUNDER

Eryn Deeming

MANAGING EDITOR

Eva Kassens

DESIGN + LAYOUT

Marissa Cheng

FACULTY ADVISOR

Lawrence J Vale

PROJECTIONS *volume 9*

MIT JOURNAL OF PLANNING

EDITORIAL BOARD

Dr. Arturo Ardila-Gómez

Urban Transport Specialist, LCSTR, World Bank

Dr. David Banister

Professor of Transport Studies, Director of the Transport Studies Unit, Oxford University

Dr. Randall Crane

Professor of Urban Planning, Associate Director, Institute of Transportation Studies, UCLA

Dr. Harry Dimitriou

Professor of Planning Studies, Director of the OMEGA Centre, University College London

Dr. Ralph Gakenheimer

Professor of Urban Planning, Department of Urban Studies & Planning, MIT

Dr. Rodrigo Garrido

Associate Professor of Freight Transport and Logistics, Department of Transport and Logistics, Pontificia Universidad Católica de Chile

Dr. Peter Nijkamp

Professor in Regional Economics and Economic Geography, Faculty of Economics, Free University

Amsterdam

Dr. Qing Shen

Professor of Urban Studies and Planning, Associate Dean of the School of Architecture, Planning & Preservation, University of Maryland

Dr. Zmarak Shalizi

Independent Scholar, Director of the World Development Report 2003, former Chief of the Transportation Division, World Bank

Dr. Christopher Zegras

Assistant Professor of Transportation and Urban Planning, Department of Urban Studies & Planning, MIT

SUSTAINABLE TRANSPORTATION

AN INTERNATIONAL PERSPECTIVE

COVER IMAGE Map courtesy of Eva Kassens; data courtesy of World Resources Institute, 2005. This map shows CO₂ emissions by transport as a percentage of emissions. The more grey the continent, the higher the CO₂ transport emissions in relation to total emission of that continent; the more green the continent, the lower the CO₂ transport emissions in relation to total emission of that continent.

(c) 2009 MIT DEPARTMENT OF URBAN STUDIES + PLANNING

All rights reserved. No part of this journal may be reproduced in any form by any electronic or mechanical means without prior written permission from the publisher.

TEXT SET Univers 57 Condensed, Univers 47 Condensed. Digitally published using Adobe InDesign. Printed and bound in the United States of America by Sherman Printing, Canton, MA.

Professor David Banister

CONCLUSION

**THE DILEMMAS OF
SUSTAINABLE TRANSPORT**

This set of five international papers builds on the burgeoning literature on sustainable transport, taking the three pillars of sustainability or 3Es (the economic, equity and environmental pillars) and applying them to a range of topics, mainly based on cities. The focus is primarily, but not exclusively urban, and in each case different elements of the 3Es are taken. The first paper on Sydney highlights the importance of looking holistically at urban sustainability, arguing for the need to make assessments over time, through monitoring and linking explicitly the sometimes conflicting aims of development and transport. Its focus is economic and environmental. This is in contrast to the much more local concern of the second paper that examines different design principles at the neighbourhood level in Newcastle (UK), by exploring the means to reconcile the demands of traffic with those of the local community through different patterns of layout and the use of urban space. The concern here is with equity and the environment.

The priorities of cities in the developing world are very different, and here the example of Delhi is taken to promote the importance of accessibility in determining access to jobs in both the formal and informal sectors. But the principal concern is over access for the urban poor to jobs, and the problems they have to overcome in situations where rapid urbanisation and motorisation are taking place, resulting in longer distance journeys and low levels of accessibility. The focus is on economic and equity factors. The fourth paper does not have a locational focus, but explores the ownership of the road infrastructure, arguing that if it was seen as a private rather than a public good, it would be clear as to whom it belongs and the environmental externalities of transport could be internalised. The concern is over the reconciliation of the economic and the environmental priorities.

The final paper looks at six different scenarios for transport and land use policies in Denver, taking the reader through the thinking and comparison of alternatives to the realities of implementation. The options consider the trade-offs between more or less intensive use of land, and a greater or lesser priority given to public transport. Here again the interest is over the economic and environmental arguments. All five papers seem to focus more on the economic and environmental elements of sustainable transport, and to a lesser extent on the equity problems, but none of them considers all three pillars of sustainability at the same time. This observation encapsulates the difficulty of thinking holistically on sustainable transport as it relates to cities. The Sydney and Denver papers get closest, but in both cases the equity elements are restricted to spatial variations, rather than the more commonly used social and intergenerational definitions of equity (as stated in the Brundtland Report, 1987).

There seems to be a basic dilemma here, particularly when sustainable transport is based within the more recent debates on climate change and the contribution that transport should make in achieving reduction targets for the emissions of carbon dioxide. All people like talking about sustainable transport, but there is little enthusiasm about changing the ways in which travel is actually undertaken. When city transport is considered, the common reaction is to look at

technological innovation as the way forward, so that existing patterns of travel can continue, but with the use of less carbon. In principle, this preferred alternative appeals to most people, but the reality is more complex.

Even if the most efficient cars and other forms of urban transport are used, there is still the substantial growth in traffic, and this severely reduces any positive impacts resulting from the technology. The purchasing patterns of individuals do not match up to expectations, as very few people buy the most energy efficient options, selecting higher performance vehicles instead, and even the current optimism for electric city vehicles has a time horizon of 2020, as it will take at least ten years to switch the electricity supply industry from carbon energy sources to renewables. There are also the substantial costs of switching from one well established carbon based infrastructure to another non carbon based system. The transition costs are high. In addition to using the most efficient technologies, behavioural change is essential. Technological futures are important, but on their own they will not provide the elusive sustainable transport system.

Cities provide us with the best opportunity for moving towards sustainable transport. The starting point needs to be a view as to the sustainable city of the future, in terms of its economic functions (e.g. employment, government, housing, education and health), as well as its attractiveness (e.g. cultural, social and community). The city should be inclusive and cater for all sections of the population. The quality of life should be high, with city living based around good quality affordable housing, strong neighbourhoods and good facilities that are easily accessible. This would seem to match up with the three pillars of economic, equity and environmental elements of the sustainable city. The city must be seen as a place for people, providing opportunities for all, in a safe and secure neighbourhood, with green space and other recreational facilities accessible to all. It is then that we consider what sort of sustainable transport system might be most appropriate to fit this vision of the city - transport serves the city.

In many European cities, over 50% of all trips are made by walk and cycling, and this target could be even higher. The quality of the public transport system should be so good that it is not necessary to own a car in the city. The car spends most of its time parked, occupying valuable urban space. It is expensive in terms of the capital and running costs, its depreciation and its insurance costs. The car should be seen as a functional form of transport, not an icon or an identity statement. If a car is needed, then it could be hired for a specific purpose, and this would ensure the right sized vehicle is being used in each situation. These hire vehicles would all be "clean", probably small electric or plug-in hybrid city vehicles, using the latest technology. Smart card hire schemes could also be operated for delivery vans, scooters and bicycles. All public transport would be powered by renewable energy, either electric (trams) or hydrogen fuel cells (buses, bus rapid transit and flexible minibus transport). All transport in the city would be "clean", with low energy costs and power coming mainly from renewable electricity.

Many of the streets could be closed to vehicles, either permanently or at particular times, so that space can be reallocated to priority users, or for markets, or for safe travel to schools. Such a change would have health and safety benefits, as would very low speeds in residential and shopping areas where people outnumber vehicles. Cities would be designed around their public transport networks, with high densities at public transport accessible interchanges, and new residential locations could be designed as car free developments. So much is possible.

What conclusions can be drawn from these papers? First, as noted above, we need to move away from belief that technology can provide a low carbon transport system. It underestimates the scale of the problem to be addressed in the transport sector, which is characterised by a steady and continuous increase in travel with no real contribution to carbon dioxide reductions. There needs to be a much greater focus on the role that land use planning can have in determining the urban form of the sustainable city at all levels from the city wide to the local neighbourhood (see papers 1 and 2). There must be a much greater concern over the disadvantaged, as cities should be inclusive of all people (see paper 3), and this includes important issues concerning the ownership and use of space (see paper 4). There should also be a much greater recognition of the problems of translating good ideas into practice, in particular when the complexity of the relationships between pricing, urban form and transport are considered (see papers 4 and 5).

In addition, the young people need to be engaged in the process of serious debate, as they are the ones that have to sort out the problems that today's decision makers have failed to address. The intergenerational equity argument introduced by Brundtland (1987) has come full circle. The planet is not being passed onto future generations in as good or a better shape as it was inherited. Current young researchers and decision makers need to have the commitment and courage to reverse the inaction of previous generations. This means that there must be effective leadership that places environmental issues and social equity at the same level, or even above, economic growth. Too often, key environmental and equity concerns are ignored when economic growth is possible, but this option tends to emphasise the short term gains rather than the longer term losses.

Effective leadership must look at new visions of the city and implement effective strategies that are both politically and publicly acceptable. It is unlikely that there is going to be any substantial increase in the supply of city infrastructure for transport, and so the biggest challenge for urban planners is to decide how that infrastructure can be managed in the most sustainable way. This includes the allocation of space to different types of use (perhaps by time of day and day of week), substantial increases in the costs of access by car to that space, and decisions about who actually owns that space.

This is the basic dilemma facing society in terms of climate change and sustainable transport. People like travelling and much more travel is being undertaken, yet there is also an awareness

of the environmental and social costs of travelling, and the individual responsibilities, both locally and globally. Social networks are growing, and they are increasingly international in their scope, and the global economy is also totally dependent on long supply chains. To some extent individual behaviour can be modified and travel substituted through technological innovation. But in many cases, there is no substitute for face to face contact, and people want to experience other places and cultures. It presents a classic case of the conflict between individual preferences and choices, as opposed to the wider concerns of society to protect the environment and future generations. This is why there are no simple answers to the question about what is sustainable transport, and even the understanding of the complexities of the choices available are also embryonic, and serious debate between all parties now needs to become central to all decisions on the future of cities.

AUTHOR'S BIOGRAPHY

David Banister (david.banister@ouce.ox.ac.uk) is Professor of Transport Studies and Director of the Transport Studies Unit at Oxford University. He is also Acting Director of the Environmental Change Institute in the Department of Geography and the Environment at Oxford University.