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Book review

Moving Towards Low Carbon Mobility, Moshe Givoni, David Banister (Eds.). Edward Elgar Publishing Ltd., Cheltenham, UK (2013). $94.50 (hardback), $36.00 (paperback 2014), ISBN: 978 1 78100 722 8

In their new book, *Moving Towards Low Carbon Mobility*, Moshe Givoni and David Banister have succeeded in doing what few edited volumes achieve. They have put together a set of chapters by international experts on a range of topics that link together tightly as a coherent whole. This coherence, I imagine, stems partly from the book's origin in a series of workshops at Oxford University, and the cross-authorship on numerous chapters. The main theses of the book are that transitioning towards low-carbon transport requires a holistic approach integrating economics, policy, culture, technology, and geography, and that we need to change how we think about transport and mobility. An interdisciplinary approach to transportation is not in itself new, although this book does it exceedingly well and makes a strong case that compartmentalized approaches are fated to fall short. As for changing how we think about transport, the book introduces the reader to numerous relatively recent interdisciplinary theoretical frameworks, some of which will be new and useful to even experienced researchers. In addition, the editors themselves offer some thought-provoking final thoughts that challenge basic assumptions, some of which some readers may not agree with wholeheartedly.

The book is organized into two parts. The first part consists of 11 chapters on different themes that help the reader understand both the current high-carbon mobility system and the barriers to change. Rather than a breakdown by mode, scale, or region, Part 1 takes a more conceptual approach with chapters on mobility cultures, accessibility and equity, governance, urbanization, unpacking travel behavior, technology, energy mix, finance, supply chains, and the environment. Their role in reinforcing the current system and contributing toward the transition is explored effectively in each chapter. Part 1 concludes with a transitional chapter by James Macmillen on how these themes combine into a complex system of mobility.

While I learned a great deal from each of these initial chapters, like any reader I was bound to disagree with certain chapters on certain issues. As a Senior Sustainability Scientist at ASU's Global Institute of Sustainability, I take issue with the characterization in Chapter 4 (citing work by Ney) that the sustainable transportation paradigm views contemporary mobility as "environmentally exploitative and socially unjust" (p. 46) while a "balanced" approach strives for "a satisfactory degree of 'equilibrium' between economic, societal, and environmental interests" (p. 46). In my view, Chapter 4's "balanced" approach is exactly what sustainability is all about, while what Ney labels as sustainability is much more characteristic of the earlier environmental paradigm that saw its role as convincing the world that environmental problems were real and serious, or the Marxist paradigm that views the capitalist system as fundamentally exploitative. In any case, I am in full agreement with Macmillen that a balanced/sustainable approach is key. Robin Hickman's urbanization chapter will be a great reference for recent literature on urban form, but I do think that, at least for North American students, the Adams 4-stage model of urban transport technologies and city-building eras still deserves a prominent place in the curriculum. Martino Tran's chapter on the future energy mix for transport will bring readers up to speed on the competition among fuel and vehicles, but it perpetuates the common misperception that the up-front investment required for the distribution infrastructure will be prohibitive, citing an estimate of "trillions of US dollars" for hydrogen infrastructure (p. 123). At a March 2014 workshop on "Rolling Out Hydrogen Infrastructure for Transportation: From Scratch to Reality" at the European Hydrogen Energy Conference, the speakers agreed that the costs will be far more modest. US subsidies needed to get hydrogen infrastructure to the breakeven point were estimated at US$1–2 billion (NRC, 2013). In Germany, the H2 Mobility Action Plan calls for 400 stations by 2023 at a total cost of €350 million (Fuel Cells Bulletin, 2013). Comparing these estimates with other subsidies in the transport system, external environmental costs, and annual expenditures on importing oil (US$335 billion in 2011) puts them in an even more favorable perspective. Additionally, Kelley and Kuby (2013) showed that early alternative-fuel vehicle adopters are willing to deviate up to 6 min out of their way to refuel at the beginning, middle, or end of their trip, thus enabling a modest number of stations located at key funnel points on the road network to serve a large percentage of trips and freeing infrastructure providers of the burden of locating a station in every neighborhood.

The second part of the book is more oriented to the future and provides the book's real payoff. Co-editor Moshe Givoni explores three distinct "pathways" towards low-carbon mobility based on (1) decoupling mobility and emissions, (2) decoupling growth and mobility, and (3) changing lifestyles. The proposals are sketched broadly, in contrast to Gilbert and Perl's (2010) *Transport Revolutions* that specifically recommends grid-connected electric vehicles as the most promising future direction. Tim Schwanen then explores the nature of transitions and "lock-in" barriers, and critically examines the ability of the multi-level perspective (niches, regimes, and landscapes) to help us understand the process. David Banister's penultimate chapter argues that, in contrast to longer-distance transport, cities offer a clear path to a mobility system using "very little carbon" (p. 225). Most intriguing and perhaps controversial is the final chapter by the co-editors plus Macmillen and Schwanen on "thinking change and changing thinking." The two key ideas here are that change is hampered by the consensus that "the key decisions in policy-making concern the questions of what type of infrastructure to provide and where" (p. 269) and "the misconception that travel time is merely a disutility" (p. 270). At first I found myself thinking that they had

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overstated both cases, but as I read on, the discussion became more nuanced and I began to realize how much I myself have been steeped in both presuppositions. It was an eye-opening conclusion to an excellent book.

The book, based on my experience, might be tough going for American undergraduate students. The authors are mostly from the UK, with one author each from the US, Israel, China, and Canada. In addition, it is fairly theoretical, its examples are drawn mainly from Europe, and some chapters could use more graphics. On the other hand, non-European students (especially in North America) desperately need exposure to European approaches and practices. For graduate students worldwide, I have no doubt it will make an excellent centerpiece for a course on sustainable transportation, and even experienced scholars will encounter helpful new concepts and theoretical frameworks.

The pace of change in the field of sustainable transport is breathtaking, and so I conclude this review with some of the trends that have emerged in just the year or so since the authors submitted their final draft. Elon Musk proposed the hyperloop for passenger transport by pneumatic tube, while his Tesla electric vehicle startup is locked in legal battles with the car dealership lobby, and crowd-sourced transportation startups Lyft and Uber with the taxi industry. Drones are being proposed for package delivery, Hyundai is launching mass-produced hydrogen fuel-cell vehicles in 2014, and the storm surge from late-season Superstorm Sandy flooded New York City subway tunnels for the first time ever. Progress towards low-carbon mobility is more threatened by lower oil prices due to continued expansion of Canadian tar sands and horizontal drilling and fracking for oil. The book, by the way, doesn't address the other direction of human-environment interaction, namely climate change's impact on transportation, but I would point readers to resources such as the US's National Climate Assessment for more information on planning for what looks more and more like the inevitable.

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