

# Chapter 1

## Introduction

We transportation planning and engineering professionals are currently the most significant obstacle to sustainable urbanism in North America, Australia, and other growing regions around the world who seek to emulate us. Although transportation planning's related disciplines of land-use planning, architecture, landscape architecture, urban economics, and social policy have undergone major internal reform efforts over the past few decades, transportation remains largely stuck in a 1950s mentality, believing that there is an engineering solution to all problems—that we can literally pave our way out of our cities' congestion, mobility, and economic development problems. Our colleagues in other fields have recognized that sustainable urbanism is the most important environmental issue of the coming century, and that the challenges of sustainability can be met only by joining forces—witness interdisciplinary efforts such as LEED-ND. Meanwhile, transportation remains largely isolated, focusing on the details of systems efficiency while missing the big picture.

This book aims to reunite transportation with its sister fields to fill the largest remaining gap in urban sustainability strategies. Specifically, it seeks the following.

- First and foremost, this book is written to help non-transportation professionals understand transportation practice, so that they can more effectively guide it. Although grasping the details of highway engineering and bridge design requires years of technical study and professional licensing, the basic concepts of transportation are straightforward, if much misunderstood. Many elected officials and citizens are confused by the engineering jargon and black-box tools we use. Others are intimidated by our complex manuals, unaware that these tomes are often guidelines rather than standards, and that even our standards documents offer abundant flexibility.
- For planning practitioners, policymakers, and citizen activists, this book provides step-by-step instructions for implementing smart transportation concepts in their communities. For example, how does one actually implement Don Shoup-style parking reforms and address specific pitfalls? How can a downtown implement a productive circulator shuttle? On a main street, how should a local engineer allocate limited right-of-way among the competing needs of cyclists, through traffic, parked cars, sidewalk café tables, trees, and other demands? What are the most cost-effective tools for reducing the 30 percent of U.S. carbon dioxide emissions that come from transportation?
- For planning, design, transportation, and engineering students, this book offers an overview of where transportation fits in the overall study of urbanism.
- For transportation professionals, this book seeks to provide a better understanding of where our discipline fits in the larger context of sustainable urbanism. Transportation is not, after all,

an end in itself, but rather a means by which communities achieve their larger goals. If we recognize that building roads and transit lines will never “solve the congestion problem,” what is our role?

While this book has a clear perspective, and a goal of changing the industry itself and how it relates to other fields, it is not intended to be a polemical manifesto; others have already written those. It is not a work of academic research, though many academic texts are referenced throughout. It is also not an engineering or design manual; instead, it strives to help the reader understand how best to use existing manuals, and how to update local guidelines with a larger perspective (do not, under any circumstances, use this text alone to design your streets or transportation systems!). The aim of this book is to synthesize all of these objectives in language that general audiences will find accessible, and to offer implementation-focused guidance: Here is how to define your community’s values as they relate to transportation; here is a summary of the current academic thinking in everyday language; and here is how best to use the various sets of guidelines and standards that exist, and to address the many contradictions and tensions among them. Simply put, this book is intended to demystify transportation for nonprofessionals and to act as a guidebook for avoiding the typical pitfalls of transportation for design and planning professionals.

In many ways, this book is a transitional document, aimed at helping auto-dependent cities and auto-oriented professionals find their way toward a post-carbon, health-oriented future (Figures 1-1 and 1-2). It is written with a North American perspective, so it will be of little use for cities such as Copenhagen, Freiburg, and the Dutch provincial capitals, all of which are already decades ahead of most places in the world. For the auto-dependent world, however, this book shows that it is not only possible to reduce automobile dependency, but also that doing so will help cities better achieve most of their goals—including the goal of making it easier to drive for those who need to do so.

## Why Transportation?

Transportation is not an end in itself. Rather, it is an investment tool that cities use to help achieve their larger goals. Though most transportation planners and engineers focus their efforts on the efficient movement of people and goods, transportation touches all aspects of life in a city:

- **Economic development.** Although some politicians promote major transportation capital projects to “reduce congestion,” in fact the prime motivation for most major transportation investments is economic development, because access drives real estate values. Places with excellent access by various modes of transportation tend to attract jobs and residences.
- **Quality of life.** In a poor economy, the leading citizen complaint is typically “jobs.” But in a strong economy, “congestion” typically rises to the top of the list. Indeed, since Julius Caesar first tried to ban daytime use of wheeled carts to reduce traffic congestion in ancient Rome, congestion has been one of the greatest irritants in most great cities. Ancient Rome also suffered from another transport-related annoyance we hate today: noise, whether from freight deliveries,



Figures 1-1 and 1-2  
Portland, Oregon, exhibits two  
key attributes of great places:  
pleasant places to walk and  
multimodal transportation  
options. *Source: Nelson\*  
*Nygaard.*



airplane takeoffs, honking horns, or the hum of highways.<sup>1</sup> Done well, transport can be central to the quality of life of cities, and the source of both public enjoyment and tourism dollars. San Francisco's top tourist attractions include its cable cars, historic streetcars, and a spectacular Art Deco bridge.

- **Social equity.** Transportation policy is inevitably social policy, with specific winners and losers in any transportation investment decision. Projects to benefit higher-income motorists may harm lower-income pedestrians, whereas other investments may significantly expand mobility and job opportunities for those too young, old, or disabled to drive. Advocates for the winners in conventional transportation funding allocations sometimes argue that any adjustment in the current formula is "social engineering"—a criticism with some merit—but then, any public investment in transport, even and perhaps even especially those reinforcing the status quo, results in social impacts.
- **Public health.** Particularly for children and the elderly, there is no better indicator of overall public health (particularly measured by obesity, heart disease, and Type 2 diabetes) than rates of walking. Health science tells us that our bodies are uniquely designed for walking, and the proper functioning of many of our bodily systems requires a minimum of 20 minutes of sustained walking per day. Transport systems that do not make daily walking a pleasure for all citizens will tend to result in significant public health costs.
- **Ecological sustainability.** With 27 percent of United States greenhouse gas emissions<sup>2</sup> and 72 percent of U.S. petroleum use coming from transport,<sup>3</sup> transportation is inseparable from ecological policy—and, one might argue, from international relations.

## The Big Picture: Mobility vs. Accessibility

To achieve cities' goals, transportation takes two key approaches: mobility and accessibility.

- **Mobility.** Mobility investments help us travel freely wherever we might want to go. Mobility investments are mainly capital facilities like an added highway lane, a rail extension, or a bicycle path. Mobility investments may also include measures that make the transportation system more efficient and productive, such as synchronizing traffic lights or improving transit speed, reliability, or frequency.
- **Accessibility.** Accessibility investments help us get the things we want and need. Rather than focusing on movement, accessibility may bring the product closer to the consumer. Locating a school and a retail main street in the middle of a neighborhood improves accessibility, reducing the need for people to move long distances and improving their choices. Accessibility investments include mixed-use zoning, delivery services, and high-speed Internet services that reduce the need for movement.

All transportation systems should invest in both mobility and accessibility, balancing the two. Systems that overemphasize mobility (Dubai, the exurbs of Los

Angeles County) tend to require excessive capital investment and result in dispersed land-use patterns. Mobility-oriented systems that emphasize only the automobile create all of the problems of automobile dependency addressed elsewhere in this book. Systems that overemphasize accessibility (monasteries, some resorts, some utopian communities) may result in close-knit communities isolated from the rest of the world, or levels of density too oppressive for most people. For more sustainable cities, the challenge for designers is to provide most of the needs of daily life within walking distance while maintaining the social and economic benefits of being tied to the larger region.

## Structure of This Book

This book is in three sections:

In the first section (Chapters 2–4), the framework for the rest of the book is set.

Chapter 2 introduces concepts of sustainability, including ecological, social, and economic elements of sustainability. Chapter 3 discusses issues of public health, which should be well understood by those who are interested in transportation planning. Chapter 4, “The City of the Future,” sets out some broad principles by way of describing a vision for the future of our cities that is truly sustainable and healthy.

The second section (Chapters 5–10) provides practical advice for designing sustainable transport systems. Chapter 5, on streets, is an overview of the basic building blocks of all transportation systems; Chapters 6 through 10 address individual modes, including walking, biking, transit, and automobiles (which are addressed in separate chapters on cars and parking).

Finally, the third section (Chapters 10–15) covers other important topics in transportation planning: carsharing, transit station and station area design, transportation demand management, and performance measurement. These topics aim to help make the most efficient use of any transportation system. The final chapter of the book provides sources for more information.

