

# 1.0 Introduction

Across the United States, local, state, and federal agencies have been working in recent years to make the “land use, transportation, air quality connection.” Motivation for these efforts has come from a number of sources, including state and federal legislation, international agreements, and local initiatives.

At the national level, the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) has been a prime motivator. Among other provisions, ISTEA requires states and metropolitan planning organizations (MPOs) to consider

“[t]he likely effect of transportation policy decisions on land use and development and the consistency of transportation plans and programs with the provision of all applicable short- and long-term land use and development plans.”<sup>1</sup>

It also requires consideration of methods to expand and enhance transit services, and ways to increase the use of such services. Similarly, the 1990 Clear Air Act Amendments require states to consider the use of demand-management strategies to reduce vehicle use and improve air quality, including strategies that would alter land-use and development patterns.

Internationally, the United States is a signatory to the U.N. Framework Convention on Climate Change developed at the 1992 Global Summit in Rio de Janeiro. The Convention commits signatory countries to decrease greenhouse gas emissions. Though the amount of reduction was not agreed upon, the U.S. has indicated its support for stabilizing CO<sub>2</sub> emissions at 1990 levels (Clinton, 1993). Transportation contributes slightly more than thirty percent of the nation's total CO<sub>2</sub> emissions; two-thirds of those emissions are produced by automobiles (EPA, 1995a). This has led some governmental agencies to focus on ways to cut transportation demand. In some cases, this has included land-use strategies (Portland, 1993).

Locally, some efforts at land-use/transportation integration have been inspired by the national and international provisions mentioned above. Many more, however, have occurred through simple desires to improve quality of life at regional and neighborhood levels, to reduce the need for roadway expenditures, or to increase transit ridership.

Thus, whether the impetus is an international treaty or a neighborhood issue, jurisdictions have increasingly acknowledged the importance of land use in assessing transportation and air-quality policy options. During the past six years, 1000 Friends of Oregon has published a series of technical reports relating to these issues as part of *Making the Land Use, Transportation, Air Quality Connection*, better known as the LUTRAQ project:

Volume 1: *Modeling Practices* (1991). The *Modeling Practices* report reviews the state-of-the-practice in integrated land-use modeling in the United States and abroad.

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<sup>1</sup>. 23 U.S.C. § 134(f)(4); *see also* 23 U.S.C. § 135(c)(14).

It also summarizes the characteristics and structure of the travel-demand forecasting system used in the Portland, Oregon metropolitan area, which includes the LUTRAQ project study area.

Volume 2: *Existing Conditions* (1991). Volume 2 is a base-line study, containing an analysis of existing land-use and socioeconomic conditions in the LUTRAQ study area.

Volume 3: *The LUTRAQ Alternative* (1992). Volume 3 provides a detailed description of the pedestrian- and transit-oriented land-use/transportation/demand-management elements of the LUTRAQ alternative.

Volume 3A: *Market Research* (1992). In Volume 3A, the authors assess the demands for residential and non-residential real estate in the study area. This independent assessment of market trends became the basis for developing the transit-oriented neighborhoods contained in the LUTRAQ alternative.

Volume 4: *Model Modifications* (1992). The *Model Modifications* report describes enhancements made to the Portland region's travel-demand forecasting model to make it more responsive to land use. It also reports on the calibration process of land-use models developed by S.H.Putman Associates for use in the Portland metropolitan area.

Volume 4A: *The Pedestrian Environment* (1993). *The Pedestrian Environment* focuses on the ways in which the characteristics of the built environment affect automobile dependence. It quantifies the contributions made by such factors as street and sidewalk connectivity on the use of automobiles and alternative modes in the Portland metropolitan area.

Volume 4B: *Building Orientation* (1994). *Building Orientation*, a supplement to *The Pedestrian Environment*, focuses on the role played by proximity of commercial buildings to the street in influencing automobile and transit use.

Volume 5: *Analysis of Alternatives* (1996). Volume 5 contains the results of the simulations conducted for the LUTRAQ project. It presents findings of the transportation impacts of the LUTRAQ alternative, and includes estimates of the alternative's air-quality, energy-consumption, and greenhouse gas benefits. These data are compared to similar measures made of other scenarios, including those that focus on highway development.

Volume 6: *Implementation* (1995). The *Implementation* report contains a sample set of design guidelines which communities can use to implement neo-traditional design principles, a model zoning ordinance, and a discussion of ways to use transportation impact fees to encourage the construction of neo-traditional development patterns.

In addition to these reports, there is a summary report—*Making the Connections: A summary of the LUTRAQ project*—that, combined with this technical report, compiles key con-

clusions from the project, and is designed for use by a wide audience of citizens and elected officials.

This technical report does more, however, than summarize previous LUTRAQ findings and conclusions. Chapter 2 attempts to summarize what is known about the relationships between transportation and urban form, drawing not only from our work on the LUTRAQ project, but also from a wide variety of research around the United States and the world. It discusses the ways in which urban form influences travel patterns, and, conversely, the ways in which transportation investments influence land use and urban form. The chapter summarizes the connection between these relationships and the air-quality problems faced by many metropolitan areas.

Chapter 3 presents a step-by-step approach to developing an integrated transportation and land-use plan. For each step in the process, the chapter identifies the basic questions which need to be answered. It summarizes the ways in which the LUTRAQ project has shed light on these questions, and identifies lessons which have been learned from other, similar projects across the United States.

The intent of this volume is to furnish a working plan for communities, agencies, and organizations seeking to re-think their planning processes. The report emphasizes the importance of creating alternative visions for metropolitan growth and development, developing sound alternatives, evaluating them carefully, and implementing a recommended plan.

During the last six years, work on the LUTRAQ project and on similar projects across the United States has generated a wealth of experience from which many valuable lessons can be drawn. We hope that this body of experience is well summarized in the pages that follow, and that this combination of knowledge and advice will support and inspire citizens, policy leaders, and technical staff interested in transportation and land-use relationships in metropolitan areas.

