

## **MOBILITY AND SOCIAL, TECHNOLOGICAL, AND ENVIRONMENTAL CHANGES**

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### **Summary**

There have been many waves of social and technical change that have had an impact on the life and welfare of individuals, organizations, groups, and society in general. Only a very few have had broad, systemic, deep, and thus highly disruptive effects over relatively short periods. The agricultural and industrial revolutions, and now the creation of the information or knowledge age—driven by the development of information and computer technology (ICT)—are examples that have wrought rapid and disruptive changes in most social and economic institutions and, in turn, many behavior patterns.

Much of the increase in demand for mobility stems from the growth and adoption of ICT over the past two decades. Mobility is the ability to move around to different places. ICT, like most of human history's other innovations in communication technology, has broadened and deepened linkages in social and economic organizations, and in turn created the need for greater mobility. The rapid increase in demand for mobility has in turn contributed to increased congestion and environmental effects, despite the fact that new engine technology has countered what would have been intolerable impacts on air quality.

This topic-level paper provides an introduction and overview of the theme of mobility and social, technological, and environmental changes. As such, it examines the nature of mobility and accessibility, two terms that are often confused with each other. In addition, the relationships between technology and social and economic change are discussed in order to provide a framework for examining the impact that recent developments in these areas have had on mobility, congestion, and the environment. The paper then examines and explores methods or paradigms for sustaining and improving mobility. Paradigms—such as infrastructure investment; new technology, including intelligent transportation systems (ITS); information technologies, such as telecommunications, telework, and teleconferencing; and behavioral and institutional change—are considered as mobility sustaining and enhancing measures. After this, environment, energy, and social equity considerations are explored. The papers that follow this overview delve more deeply into the issues introduced here.

## **1. Introduction**

The last part of the twentieth century witnessed a major social and economic revolution driven by the rise of a new generic technology in the form of ICT. Its evolution over the past 40 years has had an impact on almost every aspect of social life, ranging from how the economy operates to how we communicate with each other. It is, therefore, not surprising that transportation in general and mobility in particular have also been impacted. As a consequence of this revolution it became easier for people to communicate, developing wider personal and business networks, and so the demand for mobility accelerated. In short, the ICT revolution—and to some degree other factors—contributed immensely to an increased demand for mobility.

This paper explores and outlines the social and economic change dynamics of the post-Fordist or knowledge age, how this has had an impact on mobility, and how these change dynamics are or may be channeled to sustain mobility. The paper first defines mobility, and how it is similar yet different from accessibility, and its importance to society in the knowledge age. Second, the nature of the social and economic change motivated by the growth of ICT is examined, and the ways it has had an impact on various aspects of society and the economy are also described and examined. The implications for sustained mobility are considered. Next, methods for sustaining mobility and related impacts are reviewed. Infrastructure investment; technology approaches, such as intelligent transportation systems and telework; and behavioral and institutional change are the primary tools for achieving improved and sustained mobility—and reduced congestion. At the same time increased travel and mobility lead to increased fuel consumption and environmental impacts. In addition, attempts to improve and/or sustain mobility in a growth context create potential for equity impacts, for example, the fairness issues that have emerged around the use of pricing of road transport infrastructure. Efforts to improve or sustain mobility raise a variety of efficiency, equity, and institutional issues for both the public and private sectors. References to the six papers that comprise this topic area are made in the context rather than summarized at the end of the paper.

## **2. Mobility and Accessibility**

In the first paper of this theme section, Ken Button notes that, at base, transportation provides mobility and accessibility. It enables people to move around and access various locations, and it serves as a basic factor input for commercial entities. Button also notes that there are fundamental differences between mobility and accessibility. Mobility refers to the ability to move around or to be mobile. Accessibility, on the other hand, is the ability to visit or reach specific locations (e.g., work and shopping places) or undertake certain activities, such as sightseeing and shopping. The public policy implications of this distinction are significant, as most policies are aimed at improving the accessibility of places, such as city centers and other work, shopping, and recreation centers. In this paper the central concern is with improving or sustaining the ability to move around in metropolitan and corridor areas, or even larger regions. In the end, however, it is often impossible to treat mobility issues and related policy considerations independently from accessibility. Button also shows that mobility is often a matter of the ease or quality of travel. So the maintenance and management of transport systems can have significant impacts on the quality of mobility. Recently, a new policy emphasis on the maintenance and operation of transport networks in the United States and the European Union has been stressed for just this reason.

Transportation in general, and mobility and accessibility more specifically, are important input factors to the growth process. In general, the greater the mobility of a transport system, the greater its value as an input, and vice versa. Consequently, personal and business transaction costs are lower in a high mobility system, and conversely, lower in a system with more constrained mobility. In the so-called “new economy” and in an era of the globalization of most economic activities, systems that enable just-in-time inventory (JITI) production, and a seamless flow of inputs to production sites and products to market are more competitive. In sum, mobility is an important policy variable because it has an impact on personal and commercial costs, and cannot be improved solely by individual persons, companies, or industries. In short, it is a “near public good.”

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### **Biographical Sketch**

**Dr. Roger R. Stough** began his education with an undergraduate degree in International Trade and Economics from Ohio State University, USA. This was followed with a Master’s degree in Economic Geography from the University of South Carolina, USA, and then a Ph.D. in Geography and Environmental Engineering at the Johns Hopkins University, Baltimore, MA, USA. In the 1970s he built a program in environmental psychology while directing an urban design and metropolitan quality-of-life program in the Center for Metropolitan Planning and Research at Johns Hopkins University. In 1977 he moved to the College of Charleston in South Carolina where he founded a Master’s degree program in Public Administration and the Center for Metropolitan Development and Policy. While in Charleston he conducted numerous sponsored research projects on regional development and coastal management.

In 1983 he moved to the School of Public and Environmental Affairs at Indiana University, USA, where he served as Chair of the Urban and Regional Faculty statewide, and in 1989 as acting Associate Dean. Much of his research while at Indiana University focused on regional economic development issues and policy aimed at addressing structural change in the urban economies of Indiana and the Midwest. He became increasingly active in international training and consulting during his stay at Indiana, with assignments in the Caribbean and Europe, and as a visiting faculty member at Erasmus University in the Netherlands.

In 1990 he moved to the George Mason University, Fairfax, VA, USA, to help establish the Institute in Public Policy, which in 2000 became the School of Public Policy. He holds the NOVA-endowed chair in Public Policy, and is Professor of Public Policy. His positions while at George Mason University have included Associate Director of the Institute, Founding Director of the Ph.D. program in Public Policy, Director of the International Commerce and Policy masters degree program, Associate Dean for Academic Affairs, and currently Associate Dean for Research and External Relations. He also founded the Center for Regional Analysis and the Center for Transportation, Operations, and Logistics. Currently, he directs the Mason Enterprise Center, a university-wide center that directs the university’s entrepreneurship programs. He also directs the US\$25 million National Center for ITS Deployment Research, a multiuniversity center that conducts research on technical and institutional barriers to the implementation of intelligent transportation systems technologies.

Dr Stough has been the principal investigator for more than US\$40 million of sponsored research while at George Mason University. Much of this has been in the field of transportation and focused on institutional and policy barriers to the adoption of new technology across all transportation modes, including space. At the same time he continued to publish extensively in the field of regional economic analysis and policy. His international work expanded considerably during this period with a visiting professorship at Leiden University, The Netherlands, research and consulting work in Spain, Sweden, the Netherlands, and for the European Union in Europe, and in Australia, China, Taiwan, Japan, Korea, Hong Kong, and India in Asia and Oceania. During this period a number of research and faculty exchange programs were developed with universities in these countries.

Dr Stough is editor of the international journal, *The Annals of Regional Science*, is coeditor of *The Journal of Public Affairs Research*, a joint English and Chinese journal, and serves on the editorial board of several other international journals. He is currently the President of the Western Regional Science Association, and has served on the board of the North American and European Regional Science Associations. He has published extensively, with 12 books on topics ranging from surface and air transportation to regional economic policy and analysis, as well as more than 200 scholarly and professional papers and reports. His research has focused on regional economic analysis, transportation, regional and transport modeling, logistics, public policy analysis, and technology-led economic development. Dr Stough teaches courses in public policy, macro policy, urban and regional policy, regional economic analysis, planning and policy, and environmental planning and policy.

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