Chapter V

Integrating the End User into Infrastructure Systems: A Customer Centric Approach to the Design and Function of Intelligent Transportation Systems

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ABSTRACT

This chapter analyzes the role of users in enacting Intelligent Transportation Systems (ITS) functions and services. Preliminary evidence from recent demonstrations and market research studies is reviewed with a focus on the role of travelers in producing and using information about traffic conditions and traveler options. The potential for systems development is then considered with specific regard to alternative mode travel, flexible travel, emergency, and commercial services. Based on these findings, several directions and
recommendations are made for creating the next generation of ITS systems that enhance user-based elements. Several areas for research and development are recommended, including integrating a wider range of market segments into ITS systems planning, developing a better understanding of how users drive complex systems, and creating new institutional partnerships for delivering innovative services.

INTRODUCTION

The Electronic Generation of Infrastructure

Information technology is transforming the way civil infrastructures function (Zimmerman & Cusker, 2001). Whereas a century ago, transportation, water, and building infrastructures would have been built without regard to their electronic and communication properties, today information technology is increasingly integrated into the process of designing, building, and operating these infrastructures. Within this transformation, there is also an opportunity to integrate the end user more closely in the system. That is, rather than being treated as a “demand” on the system, the end user can be treated as an active integral part of the system. This article explores this development, and challenges thereof, within the context of the surface transportation system and with specific regard to the role of ITS in facilitating this user involvement.

ITS has emerged over the last decade as a major new vector in surface transportation investment. Spurred on by some $2 billion in federal support, states and localities throughout the United States have begun deploying a range of information systems that comprise the general ITS approach (U.S. Department of Transportation, 2001). As documented by the ITS National Systems Architecture (Iteris, 2000), these information systems serve a variety of surface transportation centers (e.g., traffic management, commercial vehicle administration, transit management) through active wireline and wireless communication to the infrastructure and vehicles traveling on the infrastructure (see Figure 1). However, these systems do not exist in a vacuum, but rather have the ultimate goal of improving travel for users of the transportation system. Within the wide array of technology-based services that constitute the ITS program, the principle focus of this article is how travelers obtain and use Advanced Traveler Information Systems (ATIS), such as real-time information about travel and traffic conditions. The implications, however, are broader, as these user-related ITS research and demonstrations suggest a next generation of information system design and use.
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