Chapter 7

BEYOND BENEFITS AND COSTS
Understanding Outcomes of ITS Deployments in Public Transit

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Intelligent Transportation Systems technology is promoted as a means for improving public transit services. The intended benefits of ITS include better and more regular information, seamless transportation services, and improved productivity. A necessary condition of realizing these benefits is operational technology. However operational technology does not necessarily lead to successful projects. Rather, institutional issues drive project outcomes. This chapter presents results from six case studies of recent ITS tests to illustrate both conditions for successful ITS deployment and the consequences of not meeting these conditions. We close with some suggested strategies for improving ITS implementation outcomes.

1. INTRODUCTION

The 1991 Intermodal Surface Transportation Efficiency Act (ISTEA) launched extensive efforts to use Intelligent Transportation Systems (ITS) technology to improve public transit. ITS was intended to improve transit productivity, safety, accessibility, and mobility as well as increase service quality (Casey et al., 2000). The federal government has encouraged ITS adoption via funding of transit Field Operational Tests (FOTs) and other deployments around the U.S. Outcomes of these deployments have been varied, some reporting significant success and leading to permanent adoption of the new technology, others experiencing problems. What accounts for successful deployment of ITS technology in public transit? We conduct six case studies of public transit technology tests to identify determinants of outcomes. ITS technology is often seen as a means for accomplishing service integration in public transportation, e.g., via integrated fare media or coordinated scheduling. We find technical performance of the technology is a
necessary but not sufficient condition for effective deployment. Rather, effectiveness depends on institutional capacity, functional relationships among all partners, and other organizational factors. These factors are particularly important in service integration projects.

This chapter is organized in four parts. First, we provide some background on the institutional context of ITS in public transit. We discuss the legislative context of FOTs as well as issues associated with public transit deployments. Second, we survey the methodologies being used to evaluate ITS deployments and briefly review the results of some of the first deployments. Third, we present an overview of six different ITS experiments within public transit. The case studies involve electronic payment and fare integration (San Francisco Bay Area TransLink, Washington DC SmarTrip, Chicago SmartCard), automated trip scheduling (Santa Clara SMART), and more ambitious service integration that may or may not include fare integration (San Gabriel Valley Smart Shuttle, Ventura Smart Card). Finally, we consider the policy implications of our findings and make recommendations for future policy action.

2. INSTITUTIONAL CONTEXT OF ITS APPLICATIONS IN PUBLIC TRANSIT

Despite billions of dollars in federal subsidies, public transit’s market share has continued to decline (Lave, 1991; Pucher, Evans, and Wenger, 1998; Kain, 1999). Massive investments in new rail systems and capital stock as well as heavily subsidized fares eventually stabilized ridership. In the late 1990s ridership increased, though market share has either remained constant or declined. According to Bureau of Transportation statistics, public transit systems recorded nine billion trips in 1999, a 20 percent increase over 1995 figures. Over the same period, however, the percentage of work trips made on public transit actually decreased from 5.1 percent to 4.9 percent, while automobile use for the same purpose increased from 86.5 percent to 87.7 percent. The 2000 census commuting data indicate that public transit’s share of overall work trips has returned to 1995 levels, at 5.2 percent. Automobile use is at 87.5 percent.

This moderate increase in transit share is occurring at an increased cost to the public. While the percentage of operating expenses recovered through fare revenues has remained relatively stable over the past decade (just shy of 39 percent in 2000), the subsidy per passenger has increased 22 percent over the same period. Between 1997 and 2000, the rate of increase alone was 19.4 percent (American Public Transportation Association, 2001). Efforts to use new technology to improve public transit service are the latest in a long series