ABSTRACT

This paper examines attempts by planners and policy makers to analyze and bring about the coordination of rail and bus transit in the San Francisco Bay Area. Drawing on studies and plans before and after the creation of the rapid rail system BART (Bay Area Rapid Transit), the author points to technical, analytical and political problems in attempts to link BART and buses. Some options and cautions are presented for planners considering route coordination, feeder buses, transfers and institutional arrangements to manage bus and rail services.

1. Introduction and Summary

Rising costs of energy, transit construction and operations have caused policy makers in the U.S. and abroad to ask, "What is the best use of available transit resources and what combination of resources provides the most service for least cost?" Achieving better coordination [1] between buses and rail systems like BART, the Bay Area Rapid Transit System in California, is sometimes suggested as part of the answer. In this connection, recent State of California legislation (AB 1107, 1977) requires transit operators to participate in coordination committees for joint marketing, maintenance, scheduling and purchasing. Other legislation (SB 620, 1979) provides funds for "intermodal" and "transfer" facilities for transit. Proposals to reroute buses to feed BART are another example of attention to coordination. Some transportation planners argue strongly for reducing bus routes running in parallel.
with rapid rail. Certain studies suggest rapid rail systems carry passengers at less cost per mile than buses beyond high volumes of riders per hour. Thus, the argument goes, parallel bus services should be routed to feed new or existing rail systems.

Drawing mainly from BART impact studies [2], the following paper examines several questions in coordinating bus and rail services. The first questions are retrospective and intended only for planners and policy makers contemplating new rail systems coordinated with bus feeders where the alternative is an all-bus system; or, where the options are an extension of an existing rail service by more rail and bus feeders, or buses alone. Is society better or worse off with the kind of coordinated bus and rail system envisioned by planners of BART, or would an all-bus system have been more cost efficient? The answer is the least total cost system for the Bay Area would have been the bus alternative. This is certainly true for the kind of bus—rail coordination which has evolved, admittedly far short of what planners had envisioned. However, it is also true for a most aggressive coordination plan, where curtailing parallel bus services would have diverted all parallel bus patrons to rail. Of course, such diversion is unlikely, as curtailed bus services would force some bus patrons to turn to cars. These findings should caution policy makers where new rail coordinated with buses is hailed as better than expanded bus services. In the Bay Area, this finding should also caution suggestions for BART extensions linked to feeder buses. Express buses are probably the better plan.

If the retrospective picture is clear, the prospective picture is not. A second set of questions relates to places, like the Bay Area, where bus and rail now already exist. Are we better or worse off rerouting parallel bus services to feed existing rail? This issue hinges on a comparison of bus and rail on the basis of marginal costs. These costs relate to variable costs, not sunk fixed costs. On this question, the BART experience is less helpful. We do know that BART's operating costs per passenger mile are greater than for the local bus system. However, we do not know how these costs might drop under an aggressive feeder service and curtailed bus service. Also, there are political hurdles involved in trying such a combination of strategies, as evidenced by experience with BART, and the unlikelihood of greatly increased rail ridership. Thus, only small, carefully evaluated demonstrations ought to be tried to see how riders respond. Also, compensations to bus operators ought to be part of any such demonstrations.

A third set of questions about coordination includes whether new rapid rail systems spawn local and feeder bus services in outlying areas, and what are the difficulties of creating smooth transfer systems between buses and rail. Where rail—bus coordination is discussed in the U.S. and abroad, the expectation is sometimes expressed that a certain amount of coordination will be spontaneous. In the case of BART, early planning studies expressed