

# Statistical Summary of Operating North American Commuter Rail Services

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The results of a survey of major established commuter rail services in the United States and Canada are presented. The survey was needed for comparable operating statistics to help justify a commuter rail service fare increase for the Peninsula Commute Service (Caltrain). The limits of use of the reported data, observations on the results, and identification of possible further research needs are discussed. The reported data were used in implementing a fare increase for the Caltrain service in 1991 and will also be used to indicate areas for improvements in efficiency and effectiveness of Caltrain operations in the future.

Commuter rail is defined as "a passenger railroad service that operates within metropolitan areas on trackage that usually is part of the general railroad system. The operations, primarily for commuters, are generally run as part of a publicly owned regional system or by a railroad company as part of its overall service. In some areas it is called regional rail (1, p. 65)." The terms "commuter rail" and "regional rail" will be used interchangeably to identify the same services.

Commuter rail services in North America are growing at a healthy pace both in ridership for the older systems and in the number of operations. In recent years, new services have been implemented in Florida, Ontario (Canada), and California. Several factors fuel this growth, including congested highways, increased motor fuel costs, air quality concerns and spreading suburbanization, which is often a function of housing costs and perceived-quality-of-life choices. Interest in this mode of urban travel is continuing to increase, and indications are that many new and expanded services will be added to the commuter-rail inventory in the 1990s.

To study the feasibility of new or added commuter rail services, it is useful to estimate the full range of costs and revenues associated with the proposals. At present, aggregated costs and operating data of the existing services are scarce. UMTA's—now the Federal Transit Administration (FTA)—report *Compendium of National Urban Mass Transportation Statistics* (2) is based on reported transit operating statistics as required by Section 15 of the UMTA/FTA statutes. This report provides basic information, however, not enough data are available to identify opportunities for improving the efficiency of existing commuter rail services or for analyzing the feasibility of new or expanded services.

The American Public Transit Association's *1990 Transit Operating and Financial Statistics* (3) is almost the same as the UMTA Section 15 report and is not, in the judgment of many, adequate for service feasibility studies.

The research into the operating statistics of existing commuter rail services reported herein was used to fill the need for such data. It also served the more immediate need of gathering statistical information on the North American commuter rail services so that comparison data relating to the fare structure of the Peninsula Commute Service (PCS or Caltrain), which operates in California between San Francisco and San Jose, could be obtained. The basic problem and need for this information was that the Caltrain service, by legislative mandate, is to operate at a minimum revenue recovery ratio of 40 percent, based on an income-cost definition established by legislation, which is considered very restrictive and more constrained than any other in the industry. For instance, operator incentive payments, advertising, property taxes, and insurance are all charged to operating expense under the definition established in the current California statutes (4).

With the late 1990 Mideast crisis and its resulting fuel cost fluctuations, the PCS recovery ratio was calculated at about 38 percent, with contributed local funds used to increase the income up to the required 40 percent level. Although efforts to reduce the operating costs continued, it was apparent that until the service was operated directly by those paying the costs, thereby reducing many of the expenses caused by contracting through the Southern Pacific Transportation Company, the opportunities to reduce costs in the short term would be few. This was especially true in the face of unstable fuel prices and existing Southern Pacific labor agreements.

The obvious alternative to lowering costs was to raise fares, which had been static since 1982 at about \$0.06/passenger-mi. A fare increase is never welcome, to management or to user, but there was little option because there were no signs of increased federal or state subsidy.

## SURVEY NEED

In the late 1970s, the state of California opposed the proposed service abandonment by the Southern Pacific of the San Francisco–San Jose commute service. This ultimately resulted in a contract, beginning July 1, 1980, between the state and the Southern Pacific for continuing the service. This contract provided for a 10-year service continuation with options for contract extension. As the initial 10-year period drew to a close, the state informed local governments of its intent to turn the service over to local control. A joint powers authority was formed and was composed of representatives of the three counties involved (San Francisco, San Mateo, and Santa Clara). This authority began discussions with the Southern Pacific toward purchase of the service and was successful in obtaining

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legislation to extend the state responsibility for the management of the service until June 30, 1992, giving the authority time to negotiate for the purchase of the rights-of-way.

To provide service continuity, an extension to the original state management contract was consummated in June 1990. This extension provided for a service discontinuance on 90-day notice by either party with such notice to be given no sooner than March 1, 1991. On January 2, 1991, the joint powers authority and the railroad executed a letter of agreement covering the terms and conditions for the purchase of the rights-of-way. It is anticipated that this proposed sale will have been completed by June 30, 1992.

Because the state expects to relinquish the service to the joint powers agency or its successor by no later than June 30, 1992, and has a cost-sharing agreement with them, any fare increase must include agreement from the transit authorities of the three counties (Muni for San Francisco, SamTrans for San Mateo County, and the Santa Clara County Transit Authority). The best marketing strategy for a fare increase would be to present evidence that Caltrain was operating efficiently and that user costs were comparatively low.

After consulting the existing commuter rail cost data and finding them inadequate for the intended purposes, a survey requesting information from all the readily identified major North American commute rail operations was initiated.

Seventeen requests were sent out in September 1990. The request packet included data and information covering the Caltrain operation, a filled-in form covering Caltrain, and a blank form for the requested data. These items are shown in Figure 1. Several of the 17 requests were known duplications. For example, in the Chicago area, inquiries were sent not only to Metra but also to the Regional Transit Agency (RTA) and the railroads that provide service for Metra. The goals of the survey were to obtain adequate information adequate to use as

1. A report card for existing services,
2. An indication of the health of particular commuter rail services, and
3. An indication of cost and revenue levels expected from such services.

## SURVEY RESULTS

Results were ultimately obtained from all of the major commuter rail services in the United States and Canada. The results covered nine major urban areas in North America. Several services were not included in the subsequent statistical analysis either because of their newness or because of their demise during the reporting period, which was generally FY 1990. The resulting statistics are presented in Table 1. This table also provides specific information on Caltrain and, for comparison purposes, the San Francisco Bay Area Rapid Transit (BART) service. Table 2 presents service information and operating statistics on the eight services that reported.

Caution is urged in using this information because no attempt has been made to ensure that the data are based on uniform definition and each service should be judged on its own particular circumstances. For example, operating costs cited are as reported by the respective services, yet there is

Name of service: Peninsula Commute Service (Caltrain)  
 Provider: State of California - Caltrans  
 Operator: Southern Pacific Transportation Company  
 Service area: San Francisco - San Jose  
 Reporting year: 1989-90 Fiscal Year  
 Miles of line(s): 46.9 miles  
 Trains/work day: 52  
 Trains/Saturday: 26  
 Trains/Sunday: 20  
 Passengers/year: 6.35 million  
 Passenger-miles/year: 148.75  
 Train-miles/year: 727,231  
 Operating cost/year: \$27.75 million  
 Farebox revenue/year: \$9.42 million  
 Total revenue/year: \$10.68 million  
 Seat-miles/year: 358.85 million  
 Operating cost/passenger: \$4.37  
 Fare revenue/passenger: \$1.48  
 Total revenue/passenger: \$1.68  
 Operating cost/passenger-mile: \$0.19  
 Fare revenue/passenger-mile: \$0.06  
 Total revenue/passenger-mile: \$0.07  
 Passengers/car-mile: 2.60  
 Passenger-miles/train-mile: 204.55

**FIGURE 1** Sample of commuter rail service survey.

reason to believe that the differentiation between capital and operating costs is not uniform.

The Caltrain service offers an example of keeping the service characteristics in mind when using such gross data. The Caltrain service does not adequately serve its major market, the central business district of San Francisco. A "typical" patron drives to the Caltrain depot, pays a modest parking fee, rides an average 23.4 mi, and catches a Muni bus to a workplace 2 mi from the Caltrain San Francisco station, so the passenger is paying more than the train fare. There is a Peninsula Pass honored by the four major transit systems serving the peninsula, but neither the pass cost nor the parking charges are reflected in these reported costs.

In addition, no attempt has been made to group the services to ascertain possible cost differences that result from such basic factors as source of power, (i.e., electricity or diesel fuel), labor rule requirements, or salary levels for the reporting services. For example, the labor cost for engineers of the Caltrain service at \$25.97/hr is the highest amount reported for any commuter rail service (5, p. 6).

## OBSERVATIONS

Although caution is urged in using these results, certain observations can reasonably be made from Table 1.

1. A service range of 14 to 30 mi, as reflected in the average trip length information, can be a valuable indicator of the possible demand service range. This range indicates where marketing may have maximum effect.
2. The operating cost per passenger range of 100 percent (\$4 to \$8) may be largely a function of the differences in power source, labor costs, meld of single trip and commuted fares, and charges for using the track. To obtain expected costs for proposed new systems, a detailed analysis is necessary.
3. Data on fare revenue per passenger coupled with trip length information indicates that the present market will ac-

TABLE 1 SUMMARY OF OPERATING STATISTICS<sup>a</sup> AND COSTS FOR NINE NORTH AMERICAN PROPERTIES<sup>b</sup> (REPRESENTING NEW YORK, NEW JERSEY, TORONTO, CHICAGO, BOSTON, PHILADELPHIA, WASHINGTON, D.C./BALTIMORE, SAN FRANCISCO/SAN JOSE)

	Range	Average	PCS	BART <sup>c</sup>
Average trip length	13.9-29.4 mi	22.0 mi	23.3 mi	12.6 mi
Operating cost per passenger	\$4.07-\$8.00	\$5.28	\$4.37	\$2.74
Fare revenue per passenger	\$1.48-\$3.54	\$2.51	\$1.48	\$1.40
Operating costs per passenger-mile	\$0.17-\$0.44	\$0.26	\$0.19	\$0.20
Fare revenue per passenger-mile	\$0.06-\$0.17	\$0.12	\$0.06	\$0.11
Total revenue per passenger-mile	\$0.07-\$0.19	\$0.125	\$0.07	\$0.12
Passengers per car-mile	1.31-2.60	1.75	2.60	unknown
Passenger-miles per train-mile	75.5-337.0	191.5	204.6	unknown
Revenue recovery ratio <sup>d</sup>	38%-62%	50%	38%	55%

<sup>a</sup>Total passengers per year: 272 million.

<sup>b</sup>Properties and year of reported statistics: Long Island RR (F.Y. 1989), New Jersey Transit (F.Y. 1990) GO Transit (F.Y. 1990), Metra RTA (Calendar 1989), NICTD (Calendar 1989), MBTA (F.Y. 1990), PCS (F.Y. 1990), SEPTA (F.Y. 1990), MARC (F.Y. 1990).

<sup>c</sup>BART statistics ('90 F.Y.) are not included in the Range and Average computations.

<sup>d</sup>Total revenue divided by operating cost.

Note: Problems in definition of terms may exist, see text.

TABLE 2 STATISTICAL SUMMARY OF COMMUTER RAIL SERVICE

	PCS	SEPTA	LIRR	GO Tran.	Metra	MBTA	NJT	MARC
Reporting year	'90 F.Y.	'90 F.Y.	'89 F.Y.	'90 F.Y.	1989	'90 F.Y.	'90 F.Y.	'90 F.Y.
Miles of line(s)	47	282	595	245	424	244	781	151
Trains/workday	52	360	732	145	598	373	569	64
Trains/Saturday	26	248	465	75	269	136	256	0
Trains/Sunday	20	173	471	62	135	68	216	0
Passengers/year (millions)	6.4	25.7	75.4	24.0	67.8	19.2	46.9	3.5
Passenger-miles/year (millions)	149	357	2019	456	1415	348	1020	103
Train-miles/year (millions)	0.73	4.73	7.61	1.35	5.74	2.60	6.68	0.61
Operating cost/year (millions \$)	27.8	157.9	603.1	179.1	275.4	88.6	279.8	17.2
Farebox revenue/year (millions \$)	9.4	61.1	266.7	86.5	142.8	unknown	143.2	10.1
Total revenue/year (millions \$)	10.7	66.3	288.2	95.2	163.7	33.3	173.6	10.2
Seat-miles/year (millions)	359	1443	6917	1979	4551	1500	4397	267
Operating cost/passenger (\$)	4.37	6.15	8.00	4.09	4.07	4.61	5.96	4.98
Fare revenue/passenger (\$)	1.48	2.38	3.54	2.51	2.11	1.74	3.05	2.92
Total revenue/passenger (\$)	1.68	2.58	3.82	2.68	2.42	1.74	3.70	2.95
Operating cost/passenger-mile (\$)	0.19	0.44	0.30	0.28	0.20	0.25	0.27	0.17
Fare revenue/passenger-mile (\$)	0.06	0.17	0.13	0.14	0.10	0.10	0.14	0.10
Total revenue/passenger-mile (\$)	0.07	0.19	0.14	0.16	0.12	0.10	0.17	0.10
Passengers/car-mile	2.60	2.07	1.31	1.96	2.30	1.46	1.33	1.34
Passenger-miles/train-mile	204.6	75.5	265.5	337.0	246.5	135.4	152.7	169.0

Note: Problems in definition of terms may exist, see text.

cept a fare of approximately \$0.115/passenger-mi. This charge is a bargain for the single-occupant automobile driver and the two-occupant automobile if it covers the major portion of the trip cost, because automobile costs average \$0.25 to \$0.35/mi, including insurance.

4. At present, existing systems are not generating much income from nonpassenger sources. This is reflected in the incremental increase shown in information for total revenue per passenger mile compared with fare revenue per passenger mile. It appears that there are unaddressed opportunities in

this area. For example, income from rental of nonoperating station areas has been a reliable source for PCS.

5. The passenger miles-per-train mile information is a gross figure that lumps peak and off-peak information together and is of little value as presented, because some of the reported services are more peak-period-oriented than others. In the case of PCS, the weekend and off-peak weekday ridership is growing at a faster rate than the peak-period ridership.

6. The peak-versus-off-peak ratio for a particular service also corrupts the reported data for passenger miles per train

mile. However, this factor is of value for indicating the worth of specific services and balancing train size with demand.

### HOW DATA WERE USED

The information presented in Table 1 was used in obtaining approval for changes in Caltrain's fare structure. These changes, effective as of September 1, 1991, resulted in a fare increase averaging about 6 percent. It took 1 year from the date of the initial survey to implement the increase and 1½ years from the initial identification of the need for a fare adjustment. Ridership statistics for the first 2 months of the new fares indicate the goal of a 6 percent increase in income was obtained without an overall decrease in patronage.

The data for BART presented in Table 1 has been used by some to argue the relative roles of BART and Caltrain types of services. BART has many commuterrail service attributes, especially when considering its currently proposed line extensions. However, because of operational restrictions, such as inability to provide skip-stop service, it is less flexible than Caltrain in providing high-speed service. The statistics indicate that with equal fare policies, the two services would have comparable operating costs per passenger mile and a higher farebox recovery ratio for PCS.

The survey results will also be used as follows:

1. To develop the service under the expected new service provider. As of November 1991, it is expected that the local transit districts under the leadership of the previously formed Peninsula Corridor Joint Powers Board will take over PCS by mid-1992 with the service being provided by contract.
2. To identify possible changes in marketing strategy.
3. To identify possible efficiency and effectiveness improvement opportunities.

### RESEARCH NEEDED

The reported data are a beginning in the identification of operating costs for providing commuter rail services. Fur-

ther work is needed, for example, to match costs with the following:

1. Power source (diesel versus electric);
2. Labor costs (for both operations and management);
3. Contract versus owned services [including National Railroad Passenger Corp. (Amtrak) versus non-Amtrak contracted services];
4. Service levels (especially peak versus off-peak and weekend services); and
5. Fare policies (especially commuter and other reduced fares versus single-trip fares).

In addition, there is a need to define operating costs for commuter services to uniformly identify what costs should be charged to operations. The UMTA Section 15 reporting requirements go a long way in this regard, but not far enough. To exacerbate this, the Amtrak definition, as well as those used by several states, is not in agreement with the UMTA definition per Section 15.

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