

Bay Area Emergency Ferry Service: Transportation Relief After the October 17, 1989, Earthquake

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On October 17, 1989, the Loma Prieta earthquake of magnitude 7.1 disrupted the Bay Area's transportation system. Most noticeable, from a commuter's standpoint, was the loss of the use of the San Francisco-Oakland Bay Bridge (SFOBB). Emergency ferry service was developed immediately to provide transportation between San Francisco (in the West Bay) and Oakland, Alameda, Richmond, and Berkeley in the East Bay, all under one contract with the Red and White Fleet (owned by Crowley Maritime). This service lasted from October 23, 1989, through March 23, 1990. Caltrans also chartered three Washington State ferries to supplement the preexisting Vallejo-to-San Francisco service from October 30, 1989, to January 9, 1990. The Red and White Fleet also operated this service as subcharterer of the Washington vessels. Some of the problems that arose in operating the ferry service were the constant need to revise the different service contracts and ferry schedules, especially early on, as well as the uncertainty of Federal Emergency Management Agency reimbursement. Overall, however, the program was successful in providing an alternative commute mode for transbay travelers while the SFOBB was inoperative, and even after it was repaired. Evolving from the emergency service was the 1-year Oakland/Alameda-to-San Francisco ferry service pilot program as well as the development of a long-range plan for permanent Bay Area ferry service. The problems and successes of the emergency ferry service from start-up activities, through operations, to its present status are described. The main items of focus include ridership trends, operating costs and reimbursement, public sentiment, and legislation relating to the service.

The morning of Tuesday, October 17, 1989, saw a typical commute around the Bay Area. Those who lived in the East Bay and worked in or near San Francisco were commuting by one of the two available transbay modes: riding transit (Bay Area Rapid Transit or Alameda-Contra Costa Transit) or driving across one of three bridges linking East Bay to West Bay—mainly the San Francisco—Oakland Bay Bridge (SFOBB). Although there was no direct commuter ferry service connecting the East Bay to the West Bay at this time, there was ferry service serving various North Bay communities. Specifically, Golden Gate Transit ran daily commuter ferries from Larkspur and from Sausalito to San Francisco. Similarly, the Red and White Fleet operated ferry service from Vallejo and Tiburon to San Francisco.

Few, if any, of that morning's commuters were more concerned with how they would get home that night rather than with who would win that evening's scheduled third game of the World Series between (ironically) transbay rivals San

Francisco Giants and Oakland As. Their attitudes all changed shortly after the 7.1 magnitude Loma Prieta earthquake struck the Bay Area that afternoon at 5:04 p.m.

EMERGENCY FERRY SERVICE IN THE AFTERMATH OF THE EARTHQUAKE

Earthquake Damage Prompting Ferry Service

Although damage from the earthquake was extensive throughout the Bay Area and even in areas outside the Bay Area, some of the most comprehensive damage was sustained by the area's transportation system. First and foremost, a section of the SFOBB collapsed, rendering it unusable for at least 1 month. The SFOBB, which connects Oakland to San Francisco, was the main travel artery between the East and West Bay, handling an average of 243,000 vehicle-trips per day [Metropolitan Transportation Commission (MTC), unpublished data]. Now, all of the Bay Bridge commuters would be forced to find another way to get to and from work.

Another significant transportation problem created by the earthquake was the collapse of a 1-m section of the I-880 freeway, which was the main connector for people traveling from Oakland and areas south of Oakland, to the SFOBB. Closing of the I-880 freeway forced drivers to use either the already overcrowded I-580 connector, or to switch to riding BART using the Fremont line.

Other earthquake-related damage hampered travel between East Bay and West Bay because of the closures of many of the San Francisco freeways. The closures of I-480 (the Embarcadero freeway), I-280 from 101st to 6th St., the Fell St. on-ramp, and the 8th and 5th St. on-ramps to I-80 east, all made travel within San Francisco difficult. Even after the SFOBB reopened, most of these freeways and on-ramps remained closed, which continued to have an adverse effect on transbay travel.

Emergency Ferry Service

Start-Up Activities

On a typical day before the earthquake, the average number of peak-period (5 to 10 a.m.), westbound vehicle trips across the SFOBB was about 42,000 (MTC, unpublished data). The vehicle occupancy rate of westbound, morning peak-period

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SFOBB commuters was about 1.42 (MTC/Caltrans, unpublished data). Thus, about 59,640 San Francisco-bound commuters had to find alternative means of crossing the bay for the next month. Unfortunately, what was left of the Bay Area's transportation system was ill-equipped to handle this extra load. It was decided that the best way not only to get commuters across the bay, but at the same time, to get them out of their automobiles, was to provide transbay ferry service until most of the damaged roadways could be repaired. Successful commuter and recreational ferry systems were already operating on the bay, and in recent years, transportation officials had seriously discussed providing commuter ferry service between East Bay and West Bay on a permanent basis.

On Thursday, October 19, a meeting with all the major transit service providers and selected public officials was held to discuss special emergency services. Each transit agency reported on the status of its operations and its ability to provide and add services. During the meeting, emergency ferry service between San Francisco and the East Bay was developed. Specifically, ferries would be run between the Ferry Building in San Francisco and four points in the East Bay: (a) Jack London Square in Oakland, (b) Todd Shipyards in Alameda, (c) the Container Terminal in Richmond, and (d) the Berkeley Marina in Berkeley. Also, plans were made to supplement the existing runs between Vallejo and San Francisco. Most of the East Bay transit services modified their schedules to accommodate the new, temporary, ferry terminals, and adjust to the closing of the SFOBB (see Figure 1).

In order to provide this additional service, more ferry boats would be needed. Therefore, Crowley Maritime (which owns and operates the Red and White Fleet) arranged to have four of its Catalina ferries from Southern California brought north to the Bay Area. Also, arrangements were made with the State of Washington's Department of Transportation to send down three of their vessels from Puget Sound, which were not being used at the time. The Washington ferries would primarily be used to supplement the Vallejo ferry service.

Contracts and Agreements

Once the basic ferry service was formulated, contracts and agreements between Caltrans and the ferry operators had to be drawn up. This process took place over the weekend of October 21, 1989, to get the service up and running by Monday, October 23. Three different agreements were drawn up to provide emergency ferry service. One agreement, RM-25, between Caltrans and Harbor Carriers required the Red and White Fleet (a subsidiary of Harbor Carriers) to provide ferry service between San Francisco and Richmond, Alameda, Oakland, and Berkeley. A second agreement, RM-26, executed between Caltrans and Harbor Carriers, was developed to supplement the already existing service between Vallejo and San Francisco with three extra vessels. However, Harbor Carriers did not own enough ferry boats both to supplement the Vallejo service and to operate the East Bay service. There-

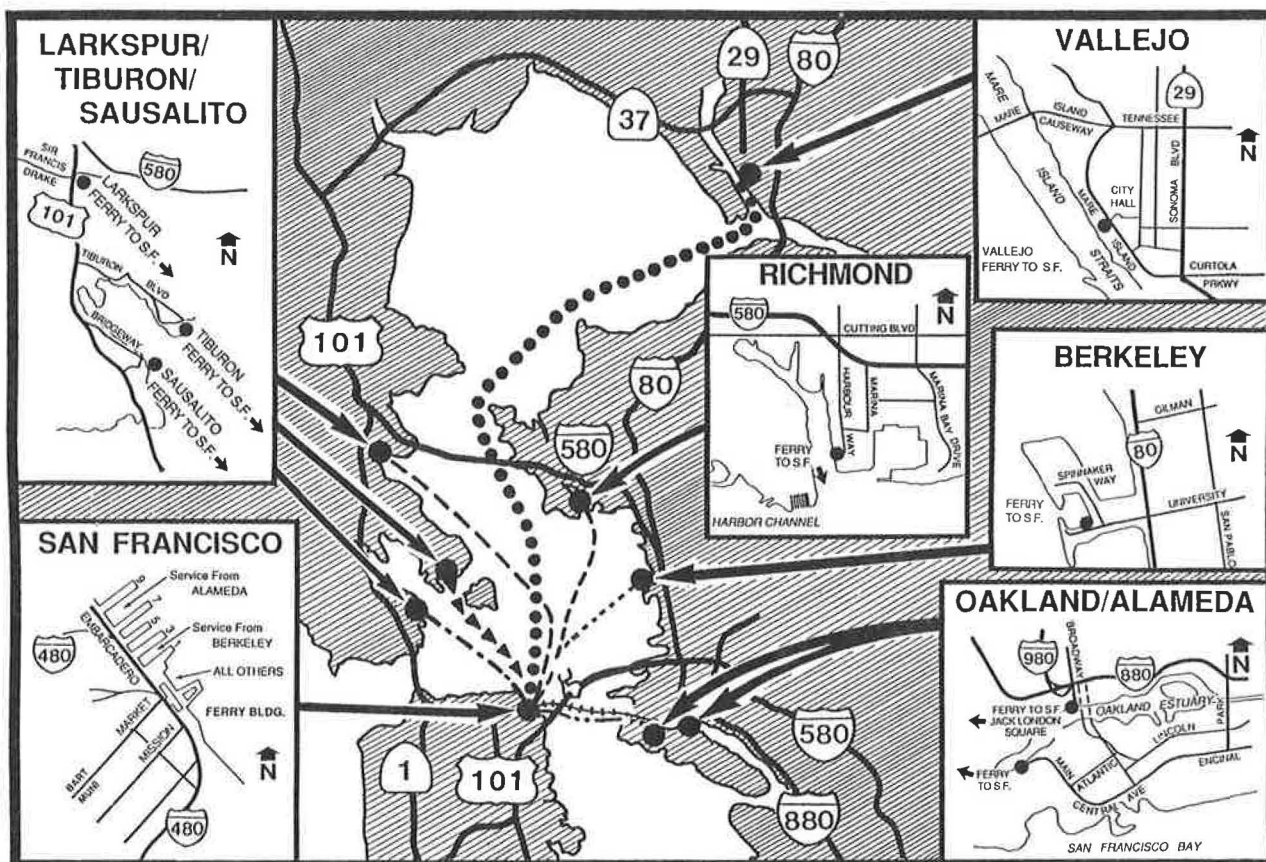


FIGURE 1 Bay Area ferry service map.

fore, a third agreement, the Bare-Boat Charter Agreement, between Caltrans and the State of Washington Department of Transportation, Marine Division, was executed, which named Caltrans as charterer of three Washington State vessels that were brought down to the Bay Area (1). Caltrans named Harbor Carriers as subcharterer to operate these ferries as part of the provision in RM-26.

Routes and Schedules

On Monday, October 23, less than 1 week after the earthquake, the emergency ferry service began operating with an aggressive schedule. The Oakland to San Francisco ferry left Oakland every 20 to 30 min beginning at 6:00 a.m. through midnight. The ferries returned on the same schedule. This made up 90 trips back and forth each day.

The Alameda ferry operated 12 runs per day on an hourly schedule only during the morning and evening peak periods. The Richmond ferry ran under an almost identical schedule also with 12 trips each day. The Vallejo ferry operated on a similar schedule with 10 runs per day, while the Berkeley ferry made 19 trips each way running hourly during peak periods and every 2 hr off-peak.

The Golden Gate Ferry Service catering to the North Bay also added extra runs to its already existing Larkspur and Sausalito ferry service to San Francisco. Figure 1 shows a map of the Bay Area with the various ferry routes as described. Throughout the entire 5 months of emergency ferry service operation, the schedule changed 17 different times. The majority of the changes, however, were minor—usually slight time changes in the routes for various reasons.

OPERATIONS HISTORY: OCTOBER 27, 1989, to MARCH 23, 1990

Ridership

Prequake Ferry Ridership

As mentioned earlier, of the emergency ferry routes just established, only the Vallejo to San Francisco service existed before the earthquake of October 17, 1989. The Red and White Fleet carried an average of 440 passengers per day between the two cities. Half of these daily passengers (220) rode the ferries during peak periods. In the aftermath of the earthquake, this service was supplemented through the use of the Washington State ferries.

Postquake Ferry Ridership

Although the daily ridership of the four East Bay ferries (Oakland, Alameda, Richmond, and Berkeley) varied greatly in total numbers, each system followed the same basic ridership pattern throughout the 5-month emergency program. From service initiation on October 23, 1989, the average daily ridership increased dramatically through mid-November, when the ridership figures peaked out and began to drop off. The reopening of the SFOBB on November 18 contributed to the steady decline in ferry patronage through December 22. On

December 23, to use the emergency funding in a cost-effective manner, major service cuts were initiated that eliminated most weekend and midday ferry runs. This procedure produced a sharp reduction in daily ridership levels, although it did not noticeably affect peak-period ridership. From this point, the average daily ridership figures began to level off around mid-January, where they remained fairly constant through the end of service on March 23, 1990 (see Figure 2).

The Vallejo service showed similar ridership trends at first. As soon as the supplemental service started, the daily ridership increased sharply from the prequake levels of 440 riders per day. It also peaked out in mid-November and began to drop off after the reopening of the SFOBB. However, ridership figures here leveled off more quickly and averaged around 700 people per day through mid-December. From this point, the passenger counts began to drop off slightly each week through the end of state service on January 9, 1990. This dropoff was probably caused by the continuing uncertainty as to whether this service could be extended or canceled. The Vallejo service graph in Figure 2 shows the average daily ridership through March 23. Even though the ferry service there returned to prequake conditions after January 9, the ridership remained above its prequake average of 440 passengers per day.

Costs and Subsidy Analysis

Even though some of the federal reimbursement funding for the ferry service was still in doubt, the majority of the costs involved in setting up and operating the emergency service had been identified. The total cost involved in operating the emergency ferry service from October 23, 1989, through March 23, 1990, was \$6,450,578. These costs are presented in Table 1.

In the following section, the operating costs of the service are compared with the ridership figures at varying times during the 5-month operation. Table 2 presents the cost per passenger for both the Vallejo service and the East Bay service during the three different phases of the East Bay contract. The four East Bay routes are grouped into one category because Caltrans's contract with Crowley Maritime specified compensation for all four services in one fixed amount, rather than a separate cost for each service. The slightly higher cost per rider for the Vallejo service is most likely the result of higher operating costs caused by the longer trip lengths than those from the East Bay. The one-way trip length from Vallejo to San Francisco is 26.4 mi, whereas the average East Bay trip was 8 mi long.

The last column in Table 2 (subsidy per rider) is simply the difference between the operating cost of the service and the revenue credited to Caltrans, divided by the number of riders for that period. As expected, the cost per passenger increased as the ridership decreased throughout the service. In fact, near the end of the service period when the East Bay ridership was averaging about 1,000 people per day and Caltrans was paying Red and White Fleet \$26,000 a day to operate, the cost per passenger was therefore \$26.00—a primary reason for terminating the service.

The last row in Table 2 contains the total cost per passenger associated with the entire emergency ferry service operations.

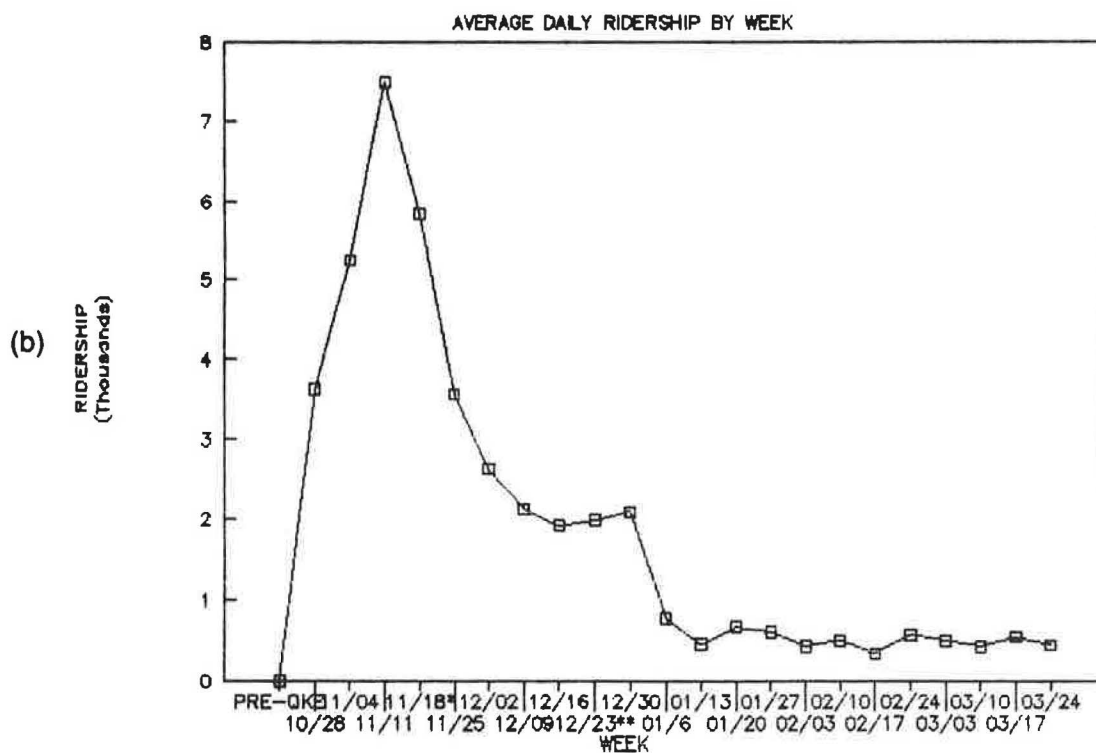
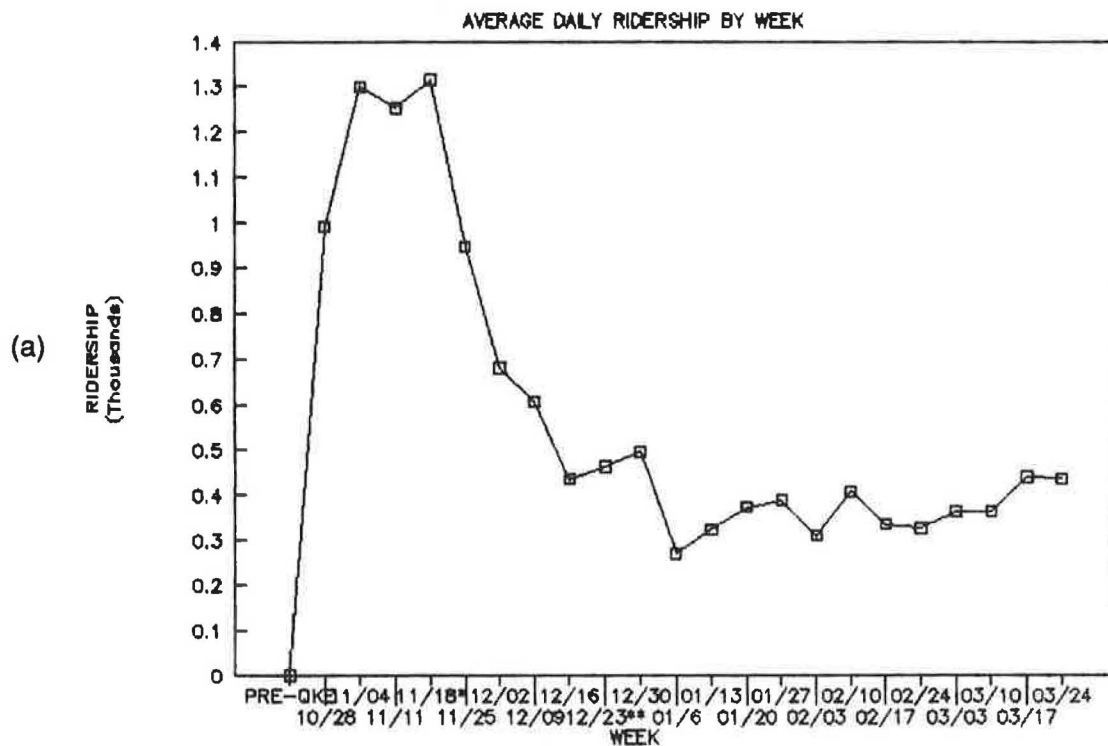


FIGURE 2 Ferry service ridership graphs for (a) Alameda, (b) Oakland, (c) Berkeley, (d) Richmond, (e) East Bay (total), and (f) Vallejo. (continued on next page)

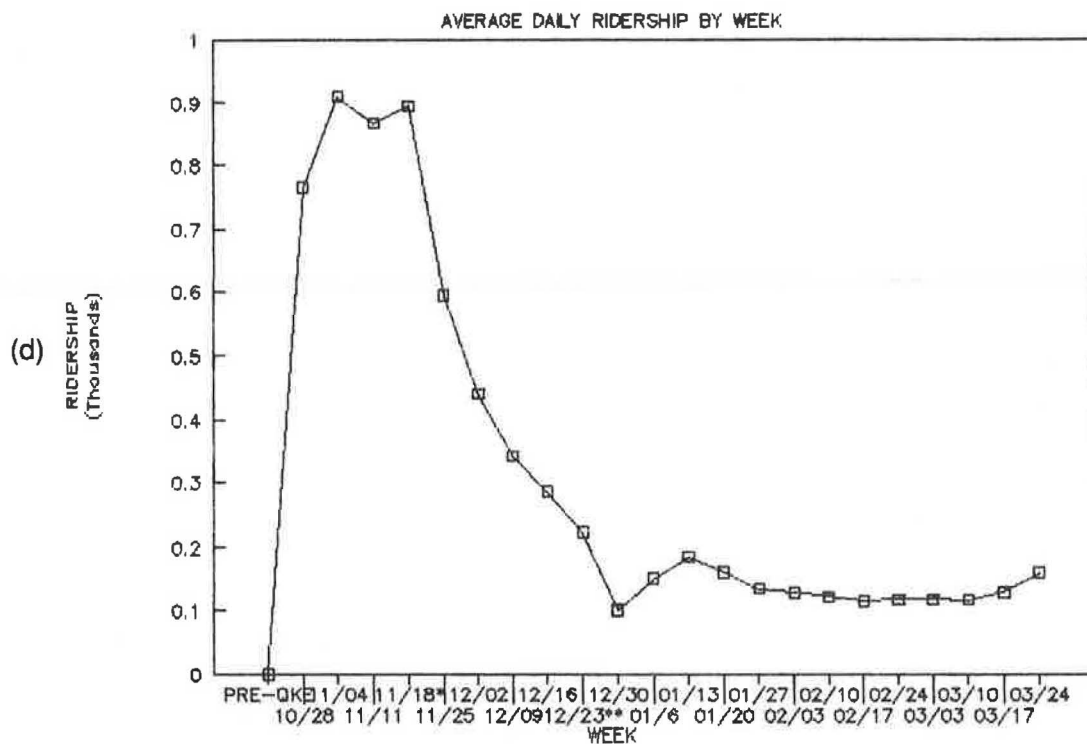
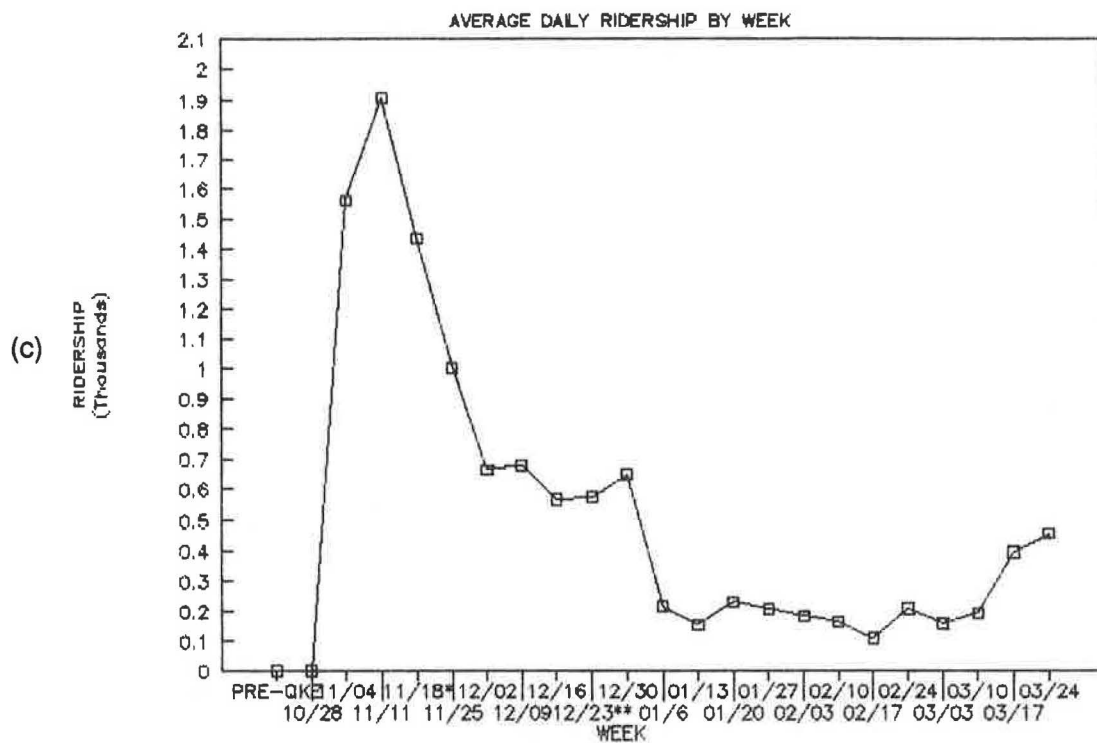
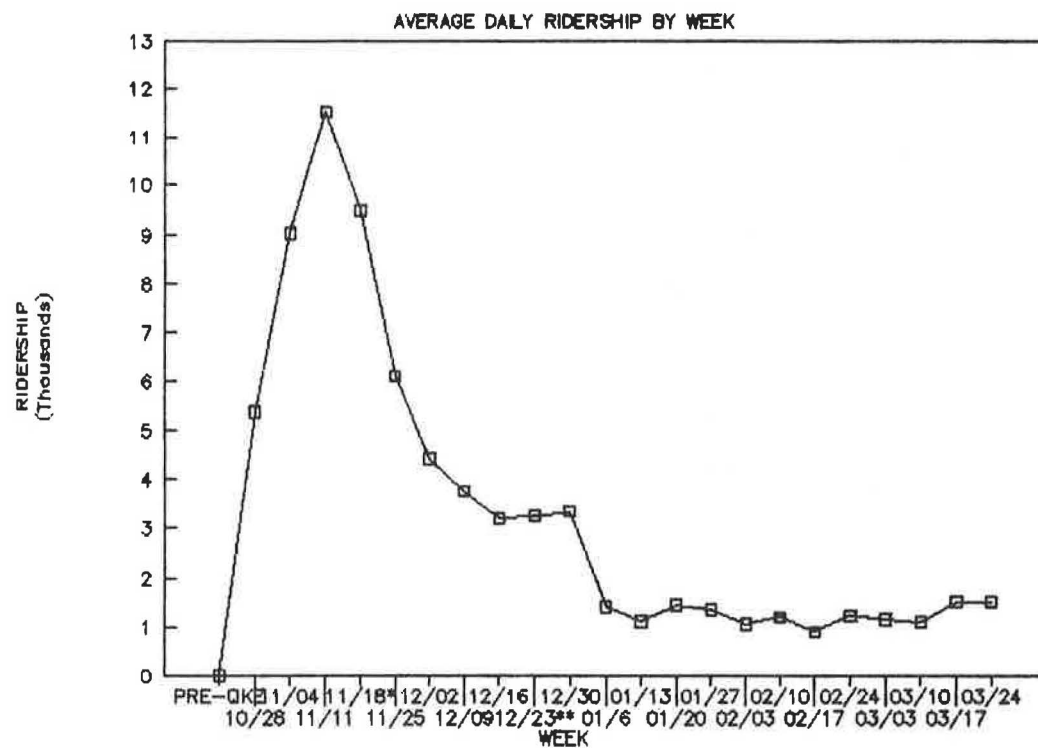


FIGURE 2 (Continued on next page)

(e)



(f)

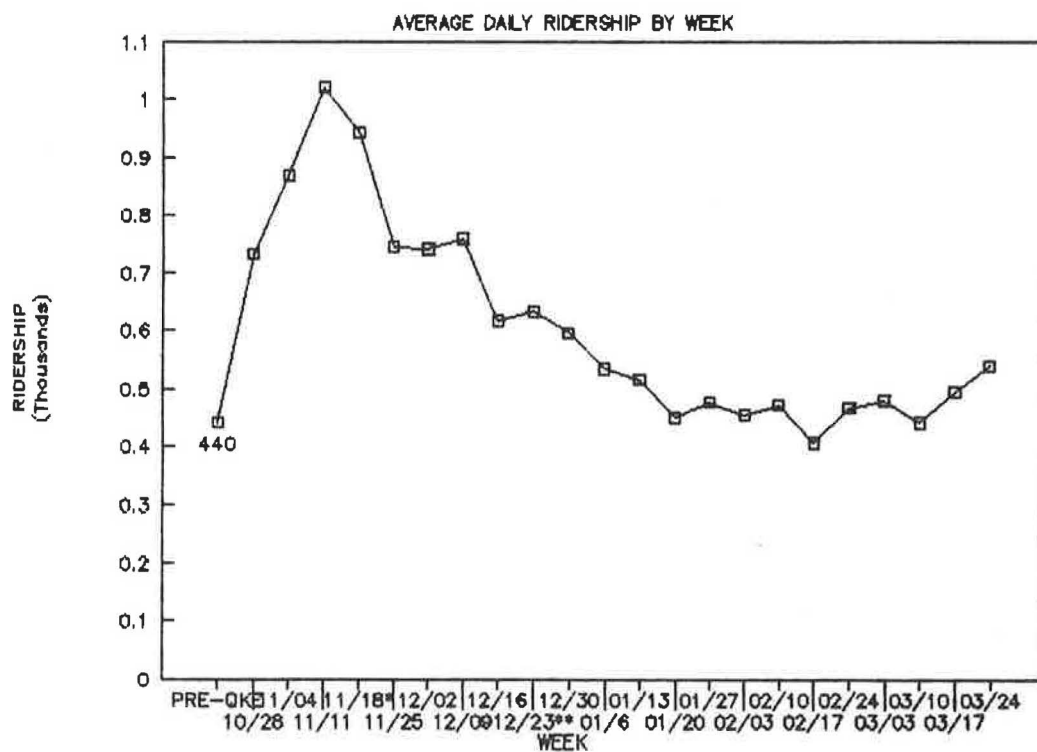


FIGURE 2 (Continued)

TABLE 1 EMERGENCY FERRY SERVICE COST BREAKDOWN

<u>Item</u>	<u>Cost</u>
Ferry Boat Facility Investigation by Army Corps of Engineers.	\$ 100,000
Ferry Boat Facility Dredging by Army Corps of Engineers.	\$ 325,000
Ticket sales by toll collectors; Labor costs.	\$ 222,082
Consultant Services.	\$ 15,324
Parking lot & access road con- struction, and signage.	\$ 145,946
Auditor Contract.	\$ 2,787
Accounting services; ticket counting.	\$ 11,436
Ticket printing.	\$ 15,441
Caltrans staff; 10/26/89-1/25/90.	\$ 20,300
Washington ferry boat charter, insurance, expenses, & repairs.	\$ 384,718.11
East Bay Ferry Services; Total Operating Costs.	\$4,466,555.50
Vallejo Ferry Service; Total Operating Costs.	\$ 740,988.75
Total Emergency Ferry Service Costs:	\$6,450,578.36

TABLE 2 ANALYSIS OF COST PER PASSENGER

<u>Contract Period</u>	<u>Service</u>	<u>Operating Costs</u>	<u>Riders</u>	<u>Cost/ Rider</u>	<u>Caltrans Revenue</u>	<u>Subsidy/ Rider</u>
10/23-11/17	East Bay	\$1,239,556	234,341	\$5.29	\$651,735	\$2.51
10/30-11/19	Vallejo	201,982	20,046	10.08	102,643	4.96
11/18-12/22	East Bay	1,615,000	144,265	11.19	133,920	10.27
11/20-12/24	Vallejo	371,402	23,340	15.91	126,993	10.47
12/23-3/23	East Bay	1,612,000	116,548	13.83	0	13.83
12/25-1/9	Vallejo	167,605	8,707	19.25	41,272	14.51
Total	East Bay	4,466,556	495,154	9.02	785,655	7.43
	Vallejo	740,989	52,093	14.22	270,908	9.02
Grand Total of All Services :		\$6,450,578	547,247	\$11.79	\$1,056,563	\$9.85

These amounts include all costs (operations plus dredging, ferry charter, ticket collection, etc.) and ridership figures for both the Vallejo and East Bay services. This indicates that the total cost per passenger was \$11.79, or \$9.85 per rider with State revenue subtracted from the cost.

Contract Amendments

Ferry Service Agreement RM-25

The following section discusses the different amendments to the three basic ferry contracts (RM-25, RM-26/Subcharter, and the Bare-Boat Charter Agreement) that occurred during the service period. As was mentioned earlier, the original service agreement RM-25 between Caltrans and Harbor Carriers, executed October 22, 1989, required Harbor Carriers to provide ferry service between San Francisco and three East Bay points: Richmond, Alameda, Oakland, and Berkeley. As compensation, Caltrans was to transmit all the revenue from \$5.00 round-trip ticket sales to Harbor Carriers, plus \$4.50 for each return-trip ticket collected. No contract termination date was identified, but instead, a 2-day cancellation notice by either party was required to terminate the agreement.

About 1 month later, Restatement and Amendment 1 modified the compensation clause so that Caltrans would reimburse Harbor Carriers \$4.75 for each one-way ticket sold. The price per round-trip ticket was set at \$5.00, with Caltrans to receive 100 percent of the revenue from ticket sales. Under this formula, Caltrans was providing a subsidy of \$4.50 per passenger for each round-trip ticket sold. This payment schedule was only effective from October 23 through November 17, 1989. The revised contract also added a new compensation clause effective November 18 so that Caltrans would pay Harbor Carriers \$47,500 per day of operation plus 60 percent of the revenue collected from ticket sales. It stated that the total payments from Caltrans to Harbor Carriers were not to exceed \$2,765,000.

Also, under this restated contract, the agreement was to terminate on December 1, 1989, the date FHWA agreed to extend reimbursement for the emergency ferry service. With the passage of Senate Bill SB36X(89), which redirected \$2,000,000 in Transit Capital Improvement funds to Caltrans to sustain the emergency ferry service, and the mounting public pressure to continue the program, the service was extended three different times during December (with Letters of Agreement) through December 29.

By this time, Caltrans was also in contact with the Federal Emergency Management Agency (FEMA) requesting its participation in reimbursement for ferry service costs. With the seemingly relative abundance in funding sources, and the outside pressure to continue the ferry service, a second amendment to the contract was executed that extended the ferry service through March 23, 1990, and increased the limit that Caltrans could pay Harbor Carriers to \$4,000,000 (2). The compensation clause was also changed again to produce a simpler payment scheme. Under this amendment, effective December 22, Caltrans was to pay Harbor Carriers \$26,000 per day to operate the East Bay ferry service. Also taking

effect were major schedule changes (discussed in the next section) that eliminated most of the weekend and off-peak trips in order to stretch the subsidy as far as possible for peak-period users.

Service Agreement and Bare-Boat Subcharter RM-26

The other two contracts, the Bare-Boat charter and RM-26 subcharter, were interrelated. As was mentioned earlier, the RM-26 subcharter agreement between Caltrans and Crowley Maritime named Red and White Fleet as subcharterer of the Washington State vessels along with other provisions to supplement the Vallejo ferry service. Although this contract was never amended throughout the service period, it did contain some gray areas open to interpretation that required certain negotiating between the two parties afterwards.

First, the original compensation provision stated that Caltrans would reimburse Harbor Carriers its total costs plus an additional 10 percent of such costs, and that the two parties would meet, some time after the first week of service, to agree on a cost-plus-fixed-fee compensation amount. Months after the State's involvement in the Vallejo service had ended, and after continued negotiations, the following provision was agreed upon: "For the first week of service, Caltrans shall reimburse Harbor Carriers for the actual costs of conducting the Vallejo ferry service plus a fixed fee of \$5,323.95," which was 10 percent of the first week's operating costs. The agreement also obligates Caltrans to pay a fixed fee of \$6,191 per week for the remainder of the service period.

Another item in the subcharter section of the original contract needing revision was the insurance clause. The original insurance clause required Caltrans to add Harbor Carriers as additional insured to the hull and machinery insurance maintained by Caltrans and by Washington, when, in actuality, Harbor Carriers maintained its own insurance covering the Washington State vessels.

Finally, there was a question as to which party was responsible for specific repairs to the Washington State ferries. Even though the Red and White Fleet operated the vessels during the service period, Caltrans was ultimately responsible for the vessels. The contract language did not clarify matters either. It stated that "Harbor Carriers shall only be responsible (i) for ordinary maintenance and (ii) for repairing any damage Harbor Carriers may cause due to (their) failure to comply with Section VI of the Bare-Boat charter." Section VI requires the charterer not to operate the vessels at more than 25 knots nor more than 16 hours per day. Although Harbor Carriers appeared to stay within these boundaries while operating the Washington ferries, there was some minor damage to the boats, as well as some missing items.

The logical solution was to have Caltrans only pay for damages sustained during the trips between Seattle and San Francisco, while Crowley Maritime should be responsible for repair costs resulting from its operations. Unfortunately, the damages were not easily distinguishable because there was no on-hire survey done in Seattle, and the one done in San Francisco was hasty because of time constraints and the urgency of beginning emergency service. Therefore, the various repair costs were still being negotiated between the two parties, and the contract language regarding repairs was not yet amended.

Bare-Boat Charter Agreement

The Bare-Boat Charter Agreement between Caltrans and the State of Washington, as mentioned earlier, allowed Caltrans to use three Washington State ferries (which were subchartered to Crowley Maritime as described) at a rental rate of \$18,300 per month, plus an additional charge of \$2.00 per operating hour per engine. The original agreement was to expire on December 1, 1989. Caltrans was also responsible for the costs involved in transporting the vessels from Seattle to San Francisco and back again, including the off-hire survey inspection and repairs. The agreement also required Caltrans to provide insurance for the ferries from the time they left Seattle until the time they were returned.

On November 27, Supplement 1 to the Bare-Boat Charter Agreement was executed for two main reasons: (a) UMTA requested that the charter agreement include a federal interest clause as a condition of approval, and (b) Harbor Carriers requested a restatement of the hull and machinery insurance coverage in a format acceptable to its underwriters (3). Also, this supplement clarified that Caltrans would be responsible for the costs relating to travel and redelivery of the vessels.

Supplement 2, executed December 1, 1989, was simply an extension agreement to continue operating the service under the original charter agreement on a day-to-day basis (4). This choice was wise because it was still unclear at that point how long the ferry service would continue.

Table 3 presents the contract amendment and supplement information for the three main emergency ferry service contracts.

Schedules

Between the beginning of the emergency ferry services on October 23, 1989, and its last day, March 23, 1990, there had been 17 different schedules. Most of the schedule changes were minor, such as a slight time change to one of the five routes. Also, most of the schedule refinements took place within the first month or two of service. Other reasons or events prompting schedule changes included pier availability, citizen group requests, transit connections, and reductions in service to maximize the subsidy. Although these schedule changes did not have a noticeable impact on ridership, the early, continuous changes drew criticism from the public and the fluctuations and uncertainty may have scared off potential riders. At the same time, however, the schedule changes may have helped attract new riders who could not use the service under the previous schedules.

As ridership declined, certain ferry runs within various routes were eliminated in an effort to keep the service cost-effective. By mid-December, about 75 percent of the riders were using the service during peak hours. It was determined that by eliminating the weekend and off-peak runs, the State could save about \$175,000 per week in operating costs, and therefore stretch the subsidy through mid-March. The most significant schedule change occurred on December 22, when most of the remaining midday and weekend runs were eliminated. The last schedule change occurred on February 17, 1990, and was used throughout the remainder of the service. Table 4 presents both the first schedule (full service), and the last (reduced service) for comparison.

TABLE 3 CONTRACT AMENDMENT SUMMARY

Original Contract	1st Amend/ Supplement	2nd Amend/ Supplement	3rd Amend/ Supplement
<i>RM-25</i> (10/23-11/17) \$4.75/ticket Revenue - CT	(11/18-12/22) \$47,500/day Revenue Split: 60%-HC:40%-CT	(12/26-3/23) \$26,000/day Revenue - HC	(2/23/90) \$4,852,635 pay cap
<i>RM-26</i> (10/30-1/9) Cost plus 10% fixed fee.	(Unsigned) 1st week's costs + 10%. Op. Costs + \$6191/week. Modified insurance clause.		
<i>BAREBOAT</i> (10/30-12/1) Charter three WA ferries.	(11/27/89) Federal clause. Ins. modification. Redelivery costs.	(12/1/89) Charter extension: Day by day agreement.	

CT = Caltrans

HC = Harbor Carriers

TABLE 4 COMPARISON OF SCHEDULE 1 AND SCHEDULE 7

SCHEDULE #1	SCHEDULE #17
<u>From Oakland to S.F. Ferry Building.</u> (40 minutes)	
- Leave at 6 a.m. and every 20-30 minutes thereafter until midnight.	- Leave at 6 a.m. and every hour thereafter until 10:00 p.m.
- Ferries return on same schedule.	- Ferries return on same schedule.
<u>From Alameda to S.F. Ferry Building.</u> (35 minutes)	
- Leave 6,7,8,9 a.m. and 5,6 p.m.	- Leave hourly from 6:15-10:15 a.m. and every other hour until 4:45 p.m., then hourly until 8:15 p.m.
- Return 7,8 a.m. and 4,5,6,7 p.m.	- Return on similar schedule.
<u>From Richmond to San Francisco Pier 9.</u> (45 minutes)	
- Leave 6,7,8,9 a.m. / 5:30, 6:30 p.m.	- Leave 6,7,8 a.m. / 5:25 p.m.
- Return 7,8 a.m. / 4:30, 5:30, 6:30, 7:30 p.m.	- Return 6:50 a.m./4:30,5:30,6:30 p.m.
<u>From Berkeley to San Francisco Pier 3.</u> (Beginning 10/30/89) (40 minutes)	
- Leave at 6:00 a.m. and every hour (two hours, mid-day) until 8:00 p.m.	- Leave at 6:00 a.m. and every other hour until 8:30 p.m.
- Return at 7:00 a.m. and every hour (two hours, mid-day) until 7:00 p.m.	- Return on similar schedule.
<u>From Vallejo to S.F. Ferry Building.</u> (60 minutes)	
- Ferries leave 6:00 and 6:30 a.m.	- Subsidized service ended 1/9/90.
- Return at 5:15, 6:15, and 7:40 p.m.	

Reimbursement Funding

As was mentioned at the outset, emergency relief funding to operate the ferry service while the SFOBB was being repaired was secured from the FHWA. Eventually, Caltrans received a funding extension from the FHWA through December 1, 1989. By this time, it was estimated Caltrans had spent \$1,635,997 in operating the emergency service, which was reimbursed by the FHWA. Also by this time, an extra \$2,000,000 had become available to extend ferry operations with the passage of Senate Bill SBX36(89).

During this time, Caltrans was submitting damage survey reports (DSRs) to FEMA as part of the process for receiving reimbursement for the costs of all repairs and services made

necessary by the earthquake. All requests for federal aid were made through the state Office of Emergency Services (OES), which would request FEMA participation on the basis of Caltrans's requests. It was originally understood that FEMA would reimburse Caltrans from the time FHWA funding stopped (December 1, 1989) through a period when traffic patterns on and around the SFOBB returned to normal. It was difficult to predict when this might happen, but by canceling most midday and weekend ferry runs, and eliminating the Vallejo subsidized service (on January 9, 1990), it was determined that the East Bay service could be maintained through mid-March of 1990 by using the available funding.

Unfortunately, Caltrans did not learn until January 9, 1990, that FEMA had planned to terminate financial assistance on

December 31, 1989. In spite of this, Caltrans decided to stick to its original plan of operating the service through March by using SBX36(89) funds and, at the same time, to appeal FEMA's December 31, 1989, cut-off date. In mid-April (3 weeks after ferry service termination), Caltrans learned that FEMA had rejected the appeal, prompting a second-level appeal to be submitted. Two weeks later, it was learned that FEMA had decided not to participate in any ferry service-related funding at all. This decision prompted a meeting between Caltrans, FEMA, and OES to resolve matters. FEMA officials indicated they would consider reimbursement for the service for as long as ridership warranted running such service. Caltrans submitted a supplement to the second appeal that specifically pointed out that FEMA should provide financial aid for the ferry service at least through February 9, the approximate date that SFOBB traffic volumes began to return to normal levels (B. Crockett, unpublished data).

Outstanding service costs to Caltrans during this period totaled \$2,910,555. With Caltrans providing a 25 percent FEMA match [using SBX36(89) funds], the total amount Caltrans requested from FEMA was \$2,182,916. Table 5 presents the entire financial spreadsheet, including costs and funding sources for the emergency ferry service.

To date, Caltrans has not received a response from FEMA either accepting or rejecting the second appeal. Therefore, Table 6 presents the breakdown of the two possible reimbursement scenarios: (a) FEMA provides financial aid through February 9, 1990, and (b) FEMA provides no aid for ferry service. The first scenario would leave Caltrans with a balance of \$518,362 in SBX36(89) funds, which would be returned to the state legislature; whereas the second leaves Caltrans with a deficit of \$1,664,553. The Caltrans cost figure of \$5,947,632 refers to the total net costs, derived from all costs less revenue and other credits.

Figure 3 shows a proportional breakdown of the net costs and reimbursement sources involved. The 3.7 percent contributed by Caltrans under the reimbursement breakdown chart reflects the labor costs of the toll collectors who sold and collected ferry tickets while the SFOBB was inoperative. The 7.1 percent reimbursed by the Army Corps of Engineers was for their postquake port investigations and Berkeley channel dredging related to the ferry service.

Public Sentiment

Although ferry ridership began to subside after the SFOBB reopened, the amount of public support for the ferries, and for continued ferry service did just the opposite. The more the State threatened to eliminate the ferry service because of decreasing ridership, the more letters that were received by Caltrans and the legislators from angry support groups and individuals. For example, Caltrans received many letters from commuters riding the Vallejo ferries when they learned that Caltrans planned to terminate the supplemental service. One ferry support group, The Berkeley Ferry Committee, submitted a letter with over 2,300 signatures, and approximately 150 separate letters, to the Caltrans district director requesting that the State keep the Berkeley ferry service operating on a permanent, subsidized basis. Similarly, many East Bay politicians were the recipients of letters from their constituents

who wanted to see the Oakland and Alameda ferries kept running on a permanent basis.

As it turned out, perhaps partly because of public pressure, the Oakland and Alameda ferry service was continued, after State involvement ceased, by the City of Alameda and the Port of Oakland as a 1-year demonstration project. Some of the different ferry support groups that were formed included the following: The Berkeley Ferry Committee, The Richmond Ferry Run, The North Bay Water Commuters out of Vallejo, The Tiburon Commuters from Marin County, and The Bay Organization for Aquatic Transit (B.O.A.T.). The latter was originally formed to support the Oakland and Alameda ferry runs, but eventually reorganized to include representatives of all the other support groups to create an alliance to help facilitate the development of a Bay Area ferry system. These groups were all successful in recruiting volunteers, distributing schedules and informational newsletters, and keeping local politicians informed of their concerns.

Legislation

Many measures were passed during the 5-month period that affected the emergency ferry service—most of which were authored by Senator Quentin Kopp (San Francisco), or Senator Keene (Vallejo). Most of the State bills passed during this time provided funds or authorization for earthquake damage relief of all types, not strictly ferry service activities. The following section, however, describes how the different measures related specifically to the ferry service.

Immediately after the earthquake, the governor declared a state of emergency. This allowed the quick implementation of the emergency ferry service. Many of the approvals and regulations that would normally apply to ferry operation on the bay were now superseded under the state of emergency. This situation enabled dredging, parking lot construction, and service contract negotiations.

A few weeks later, on November 2, Senator Keene introduced Senate Bill SBX37, which required the MTC to develop a permanent ferry plan for the San Francisco Bay and the City of Vallejo to determine the feasibility of acquiring ferries on a permanent basis. Two days later, Senator Kopp introduced Senate Bill SBX36 (adopted November 7, 1989), which, among other things, transferred \$2,000,000 from Transit Capital Improvement funds to Caltrans to sustain emergency ferry services. It also reallocated \$1,500,000 from the same funding source to MTC for allocation to transit operators for continuation of their emergency bus and rail services.

Senate Bill SBX39 by Senator Kopp, introduced on January 23, required the MTC to develop objective criteria (including ridership per run, fare box recovery ratio, and local financial support), to determine which ferry runs were the most cost-effective so that the limited funding could be used efficiently. Although this bill was not adopted until July 7, 1990, these criteria (among others) were being used all along by the State in an effort to stretch the limited funding by eliminating the least cost-effective runs, such as the midday and weekend service.

Senate Bill SBX2169, adopted at the beginning of 1990, authorized MTC to develop and adopt a long-range plan for implementing high-speed water transit on the San Francisco

TABLE 5 EMERGENCY FERRY SERVICE REIMBURSEMENT AND EXPENDITURE REPORT

Item	R&W Contract Payments (\$)	Total Costs (\$)	FHWA (\$)	FEMA (\$)	Caltrans (\$)	Army Corps (\$)	SBX36 Funding (\$)	MTC/ Vallejo (\$)	Revenue (\$)		
									Kept by R&W	Credited to Caltrans	Total
COE investigation		100,000				100,000					
COE dredging		325,000				325,000					
Toll collectors		222,082			222,082						
Consultants		15,324	15,324								
Parking/access/signs		145,946	145,946								
Auditor contract		2,787	2,787								
Accounting/Tickets counting		11,436		11,436							
Ticket printing		15,441	7,000	8,441							
Caltrans staff 10/26-1/25		20,300		20,300							
Operating costs											
Washington DOT											
Insurance		73,981	73,981								
Monthly fees (\$18,300/mo)		62,220	19,520								
Engine hours (\$2/op- hr/eng.)		18,608	3,960								
Expenses (labor, travel, etc.)		142,555	129,000								
Off hire/drydocking/ Props.		18,869	60,000								
Repairs (R&W responsible)		68,486									
Subtotal		384,718	286,461	98,258							
East Bay											
10/23-11/05 ^a (14 days)	596,330	596,330							0	313,195	313,195
11/6-11/17 (12 days)	643,226	643,226	487,815						0	338,540	338,540
11/18-12/1 ^b (13 days)	558,922	617,500	590,500						87,867	58,578	146,445
12/2-12/15 (14 days)	610,976	665,000							81,036	54,024	135,060
12/16-12/22 (7 days)	311,182	332,500							31,977	21,318	53,295
12/26-3/23/90 ^c (62 days)	1,612,000	1,612,000							558,000	0	558,000 ^e
Subtotal (122 days)	4,332,636	4,466,556	1,078,315	2,500,321 ^d			753,999		758,880	785,655	1,544,535 ^e
Operating costs + fixed fee, Vallejo											
10/30-1/9 ^f (70 days)	371,962	740,989	100,164	271,799				98,118	270,908	270,908	270,908
Total	4,704,598	6,450,578	1,635,997	2,182,916 ^g	222,082	425,000	1,481,638 ^h	98,118	1,029,788	1,056,564	1,815,444
\$ 2 mil balance							518,362				

NOTE: Assumes FHWA reimbursement, 10/30-12/1; FEMA reimbursement, 10/30-2/09. Total Payments to R&W, sum of Columns 1 and 9: \$4,704,598 + \$1,029,788 = \$5,734,386.

^a10/23-11/17: Payments to R&W = no. of tickets sold × \$4.75. CT keeps 100 percent of revenue (revenue = \$651,735.32).

^b11/18-12/22: Payments to R&W = \$47,500/day + 60 percent revenue. CT keeps 40 percent of revenue (revenue = \$334,800).

^c12/26-3/23: Payments to R&W = \$26,000/day + 100 percent revenue. (Reduced service, not on weekends).

^dThrough 2/9/90.

^eRevenue estimation: = 1800RT/Day * \$5 * days

^fVallejo 10/30-1/9: Payments to R&W = op. costs + fixed fee (\$619/wk). Weekend service throughout.

^gLess \$727,639 FEMA 25 percent match from SBX36.

^hPlus \$727,639 FEMA 25 percent match from SBX36.

TABLE 6 REIMBURSEMENT SOURCES

	(1) FEMA Aid	(2) No FEMA Aid
SOURCE	AMOUNT	AMOUNT
FEMA	\$2,182,916	\$ 0
FHWA	\$1,635,997	\$1,635,997
CALTRANS	\$ 222,082	\$ 222,082
ARMY CORPS	\$ 425,000	\$ 425,000
25% FEMA MATCH	\$ 727,639	
SBX36 FUNDS	\$ 753,998	\$2,000,000
TOTAL REIMB.:	\$5,947,632	\$4,283,079
CALTRANS COSTS:	\$5,947,632	\$5,947,632
SURPLUS SBX36:	\$ 518,362	\$ 0
DEFICIT:	\$ 0	\$1,664,553

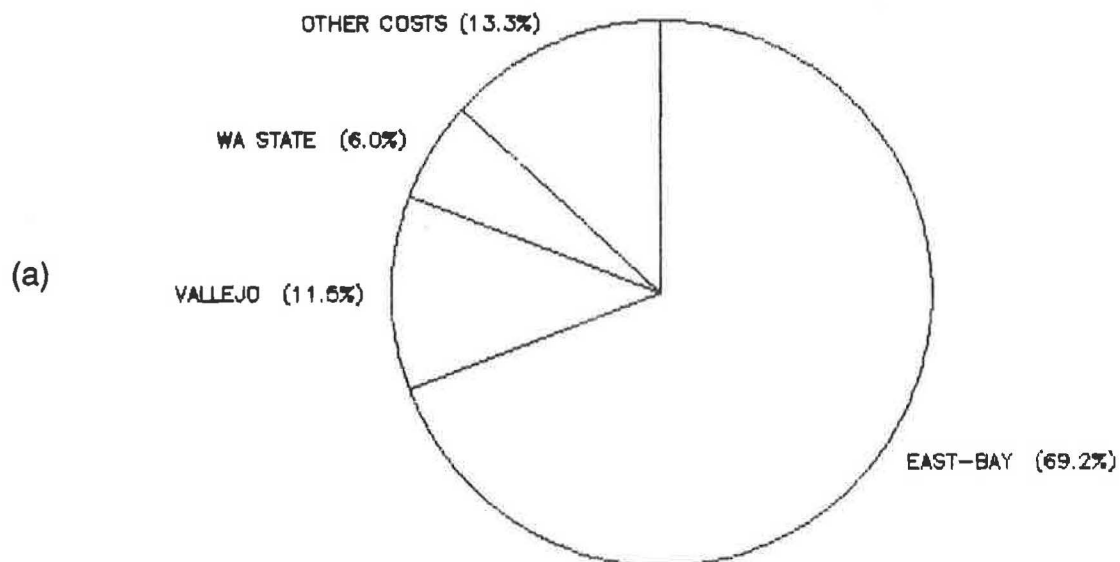


FIGURE 3 Breakdown of funds: (a) costs (total \$5,947,632) and (b) reimbursements (total \$5,947,632).
(continued on next page)

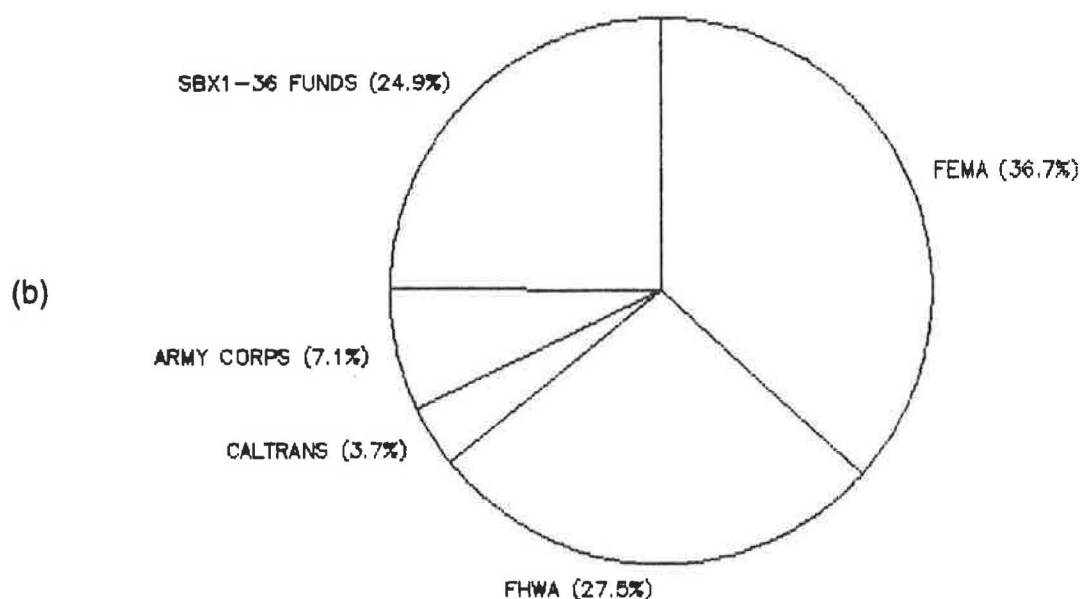


FIGURE 3 (continued)

Bay. By this point, the emergency service was winding down, so this bill was introduced to help develop a more permanent transbay ferry service.

Finally, Proposition 116 on the California ballot was passed by voters in the June election. Although this proposition had no effect on the emergency ferry service, it will provide \$30,000,000 for waterborne ferry systems through bonds. Specifically, it provides \$10,000,000 to the City of Vallejo for capital improvements to the Vallejo ferry service. It also allocates \$20,000,000 to local agencies through competitive (state-wide) grants for construction, improvements, acquisition and other capital expenditures for ferry service.

OVERVIEW

Although problems were encountered throughout its operation, the emergency ferry service successfully transported thousands of people across the San Francisco Bay on a daily basis.

Two obvious problems encountered during the 5-month period of emergency service were (a) the constant contract revisions required and (b) the continually changing ferry schedules. Considering the circumstances, however, these were minor complications. The original contracts were developed and executed quickly to implement service as soon as possible. Most of the eventual factors that necessitated contract revisions, such as additional funding sources, ridership levels, insurance needs, public pressure, etc. could not have been foreseen when the contracts were first developed. In hindsight, the contract with the fewest problems was the simplest: RM-25, Amendment 2, which required Caltrans to pay a fixed daily fee of \$26,000 for the East Bay ferry service. Of course, this fee was developed after the funding sources had been identified and the operation duration specified.

Another problem, which still exists, is the indecision by FEMA as to whether they will reimburse Caltrans for some

or any of the costs in operating the ferry service. It is not known if this dilemma could have been avoided.

On the positive side, there was tremendous and unprecedented cooperation between the local transit operators, federal, state, and local officials, local politicians, and the private sector in developing and operating an alternative public transportation system on such short notice. Also on the plus side, the emergency ferry service carried over 547,000 passengers over the 5-month period, and averaged over 4,200 trips per day. Another benefit to emerge from this situation was the long-range plan to provide transbay ferry service, which MTC is now developing. Finally, one of the most important secondary developments is that the City of Alameda, the Port of Oakland, and MTC are now jointly subsidizing a 1-year trial ferry service program between Oakland, Alameda, and San Francisco, which is simply a continuation of the emergency ferry service. If successful, it will become a permanent fixture on the Bay.

Unfortunately, however, it took a major earthquake to create the temporary transbay ferry service, and to prove to many people that there are viable alternatives to the automobile.

REFERENCES

1. *Bare-Boat Charter Agreement Between Washington State Department of Transportation Marine Division and California Department of Transportation*. Oct. 20, 1989, p. 15.
2. *San Francisco Bay Purchase of Ferry Service Agreement RM-25, Amendment 2*. Dec. 22, 1989, pp. 6-7.
3. *Bare-Boat Charter Agreement, Supplement No. 1*. Nov. 27, 1989, pp. 1,3.
4. *Bare-Boat Charter Agreement, Supplement No. 2*. Dec. 1, 1989, p. 2.

Publication of this paper sponsored by Committee on Ports and Waterways.