

Successful Historic Streetcar Service

Learning from the San Francisco, California, Experience

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San Francisco, California, is closely associated with the operation of historic streetcars. Typically, this association is tied to the cable car; however, during the past two decades, the San Francisco Municipal Railway (Muni) has also become the nation's largest operator of historic streetcars through its F-Market and Wharves line. To assist the many cities interested in creating their own historic streetcar services, this research presents the history of the creation of this unique service, the first quantitative analysis of its operating and ridership characteristics, and a qualitative consideration of the contextual factors supportive of developing a historic streetcar service. The quantitative analysis is based on data collected as part of Muni's Transit Effectiveness Project and argues that the F line has been successful at attracting ridership, particularly in comparison with the rest of Muni's rail services, but does so at a high cost per user and with relatively low utilization of transit capacity. This finding suggests that efforts should be made to improve the efficiency of this service. The qualitative analysis is based on nonprofit publications, newspaper articles, and personal interviews. This analysis identifies a transit-friendly natural and built environment, broad existing transit agency capacity, and active public support for rail transit as key factors conducive to the development of historic streetcar service.

San Francisco, California, is closely associated with the operation of historic streetcars. Typically, this association is tied to the cable car, a local invention, which has maintained almost uninterrupted operation along the city's steep downtown hillsides since 1873. However, during the past two decades, the city and county of San Francisco, through its public transit division, the San Francisco Municipal Railway (Muni), has also become the nation's largest operators of historic streetcars.

This service, the F-Market and Wharves line, whose route is shown in Figure 1, runs 3.4 mi along Market Street, from the Castro neighborhood northeast through the heart of downtown San Francisco, and then 2.4 mi northwest along Fisherman's Wharf, one of the city's premier tourist destinations. As of June 2007 the F-Market & Wharves line operates 17 Electric Railway Presidents' Conference Committee (PCC) and nine Peter Witt cars. The PCC fleet is painted the historic colors of similar fleets formerly operating in Baltimore, Maryland; Boston, Massachusetts; Brooklyn, New York; Chicago, Illinois; Cincinnati, Ohio; Los Angeles, California; Louisville,

Kentucky; Kansas City, Missouri; Newark, New Jersey; Philadelphia, Pennsylvania; Saint Louis, Missouri; and, of course, San Francisco. The Peter Witt vehicles are all painted orange and were built in Milan, Italy, in 1928 according to a design commissioned a decade earlier by the then transit commissioner of Cleveland, Peter Witt. Examples of the PCC and Peter Witt cars in operation along the F-Market and Wharves line are shown in Figure 2. Muni owns several additional antique trolley cars from around the world and occasionally intersperses them with the regular PCC and Peter Witt car service.

Unlike the cable car service, in which legacy systems were continuously maintained, the F-Market and Wharves line represents the active creation of a historic streetcar service. Although several other municipalities have also created such niche transit services (and many have proposed them), San Francisco stands out for the extent and popularity of its historic streetcar program. To date, there has been no extensive analysis of the actual operating characteristics of the F-Market & Wharves service nor has there been a discussion about the convergence of factors that fostered the success of the system. This research begins to fill those gaps.

LITERATURE REVIEW

Several studies have examined historic streetcar service; however, they were done before the creation of the F-Market and Wharves line. A 1992 U.S. Department of Transportation (1) study on "vintage trolleys" notes a "growing renaissance" of nine such systems that serve transit, particularly if in the central business district, and tourism functions. These systems typically are relatively short (less than 5 mi) and use existing, although often abandoned, track. Most vintage trolleys run year-round and are operated by local transit agencies, although some systems are run part-time by nonprofits with volunteer labor. The supply of vintage vehicles and parts is limited and often requires import from abroad. Volunteer labor is often involved in vintage trolley restoration and maintenance.

Harris and Masberg (2) also examine vintage railways and find that system visibility and vehicle uniqueness attract customers, particularly noncommuters, who are often willing to pay a premium fare. The authors suggest that such services might be effective for introducing transit to nonriders as well as for tapping into a valuable cultural tourism market. They emphasize the need for supportive political leadership and institutional arrangements (such as nonprofit "Friends of the Trolley" groups or exemptions from transit labor union laws), welcoming operating personnel, and effective fund-raising for vehicle acquisition and maintenance. They note that it is critical to design historic streetcar routes that are near important traffic generators in areas of limited parking, extend appropriate distances, and effectively link tourist destinations.

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FIGURE 1 San Francisco historic streetcar service and key stops.

Weyrich and Lind (3) argue that running historic streetcars on preexisting track is the cheapest and easiest way to help rail transit make a new start in a community. They suggest that such projects must be designed to garner widespread local support and serve a real transportation function. They also emphasize the important roles for volunteers in ensuring the success of historic streetcar programs.

Several studies have expressly addressed the F-Market and Wharves line. *TCRP Report 33* (4), published in 1998 before the Wharves extension, claims that the F line has been a general success, with ridership doubling compared with that of the preexisting bus line. *TCRP Report 46* (5) claims that the high visibility of the program has strengthened “the presence of transit on the street” and encouraged

new riders, particularly in the upper Market Street area around the Castro neighborhood. Riders found the historic streetcars “more comfortable, less crowded, and more charming” than their modern light rail vehicle descendents on the Muni Metro underground subway and surface rail service. *TCRP Report 46* concludes that the F line streetcars are becoming as iconic as San Francisco’s cable cars (at least among San Franciscans). *TCRP Report 46* does offer some discussion of actual operations. The report finds that the PCC cars are easier to maintain than the newer, more complicated light rail vehicles and travel many miles between repairs. The report notes that operating costs have increased compared with the buses that previously served the same route, primarily as a result of increased



FIGURE 2 Peter Witt and PCC car crossing along F line at lower Market Street (left: Peter Witt–style tram from Milan, Italy, painted in a solid orange; right: double-ended PCC streetcar painted to match SF Muni Magic Carpet cars of 1940).

accidents with cars unaccustomed to sharing the road with streetcars. However, Muni has had to operate more historic vehicles to meet passenger demand and to account for the slower traffic speeds due to growth in traffic along Market Street. The study did note that the F line operators are a self-selecting group, who are quite committed to the service and enjoy interacting with patrons. The operators take a more active role compared with other Muni services in monitoring the cleanliness of their vehicles (5).

The extant literature does address some of the main factors that foster historic streetcar success as well as specific information related to the early years of the F-Market & Wharves line. This paper seeks to build on that foundation.

METHODOLOGY

This research combines a quantitative consideration of the F-line operating and patronage characteristics with a qualitative consideration of the critical conditions that led to the line's success. The operational data are drawn exclusively from Muni's reports; the qualitative sources include nonprofit publications, newspaper articles, and personal interviews. A detailed history is also provided as a critical background for the discussion.

BACKGROUND

As its name suggests, the F-Market and Wharves line is composed of two linked corridors. The service along the Market Street corridor opened in 1995 on upgraded track, and the service along the north-east waterfront, which houses the wharves themselves, opened in 2000 on newly built track.

Market Street Corridor

Market Street is the oldest streetcar corridor on the West Coast. Steam- and horse-powered rail service began along Market Street in 1860 and was followed by cable traction in 1882 and finally overhead electric traction in 1906 during the postearthquake rebuilding. PCC

cars began operation along Market Street after World War II. In 1962 voters around the region approved the Bay Area Rapid Transit District (BART) proposal, which included plans for two layers of subway tunnel underneath Market Street. Muni was to use the upper layer for a new underground light rail vehicle service called the Muni Metro. In 1968 San Franciscans overwhelmingly approved a plan to reconstruct Market Street without surface transit. The existing track and catenary was to be dismantled, and remaining surface transit provision was to be shifted to the parallel Mission Street corridor. In 1980 and 1981 Muni opened its underground tunnel and discontinued surface streetcars along Market Street (6) except for weekend service (7). The Market Street line had been in operation for 122 years and was, at the time, the longest continuously operated rail service on a main street anywhere in America (6).

At the same time that the new underground rail services were being built, there was an aboveground boom in office construction. Between 1965 and 1980 almost 30 million square feet of downtown office space was added to the existing stock of commercial real estate. This new development brought increased demand for transit, demand which exceeded the capacity of the new Muni Metro, whose 140,000-passenger-a-day ridership was double the anticipated volume. Because Mission Street remained too congested a corridor for overflow transit capacity, planners reconsidered the 1968 decision to remove surface transit from Market Street (6). As early as 1982, Muni began to investigate upgrading the rail on Market Street, and "future streetcar service between Embarcadero and Van Ness Avenue operated with historic streetcars was indicated a possibility" (7).

In the summer of 1983 a group of interested businesspeople and preservationists petitioned the mayor to approve a vintage streetcar demonstration project on the abandoned Market Street tracks as an alternative to the cable car service, which had been shut down for repairs. The demonstration project was to be called the San Francisco Historic Trolley Festival and was intended to be a one-time event (8). The festival ran 12 vintage cars, either owned by Muni or leased from other cities or museums, along Market Street between the Castro neighborhood and the Transbay terminal. The festival was very well received by the community and was repeated every summer through 1987 (9).

Through the 1983 festival, Muni had noted the demand from commuters and tourists for historic service in the downtown area and determined that a permanent historic streetcar program would meet the growth in demand from those markets (10). In 1984 San Francisco approved a plan for a historic streetcar line on Market Street that would connect with a proposed historic Embarcadero line (which is discussed in detail below). The benefits of such a line included improved transportation along Market Street, relief to tourist demands on the historic cable cars, and maintenance of a surface alternative to underground Muni Metro operations (6) as well as functional and aesthetic rehabilitation of the main transit thoroughfare of the region (11).

The Market Street Transit Thoroughfare Project work was financed with funds from the half-cent tax for transportation improvements collected by the San Francisco County Transportation Authority, FTA Section 9 grants, and California Guideway funds. Construction took place in four separate phases from 1988 to 1995. Approximately one-half of the costs were for non-transit-related, street-rebuilding improvements, such as utilities, sidewalks, street trees and furniture, light pole reinstallation, and street reconfiguration. The street improvements included streetcar track construction and the installation of new boarding islands, widened crosswalks, and new curbing, as well as the planting of palm trees in the median of upper Market Street

(4). Following the success of wayside platforms implemented on light rail lines, Muni seized the opportunity to advocate for access for people with disabilities to the planned historic streetcar line.

Market Street thoroughfare plans from 1987 include “minor street widening” to facilitate access for riders with disabilities to transit vehicles operating in the center lane via boarding islands. The historic streetcars were also modified to accommodate a 30-in. by 48-in. wheelchair securement area and a PA system. Because the historic streetcars were not designed to accommodate level boarding from a platform, Muni engineers developed an effective, low-cost access accommodation. A portable bridge was designed that the streetcar operator would physically deploy across the gap from the streetcar to the boarding platform. The streetcars were modified to include a storage closet for the bridge. The additional cost per accessibility modification per each vehicle was approximately \$10,000.

Wharves Corridor

Unlike Market Street, the Embarcadero corridor never had a rail transit line (12) although many lines terminated there. The most famous rail transit infrastructure on the corridor was the Ferry Building at the intersection with Market Street where the transit ferries from across the bay would link into the San Francisco network. The construction of the Bay Bridge in 1934 ended that transbay ferry service, and the construction of the Embarcadero Freeway in 1959 cut the corridor off from the financial district. In 1974 the San Francisco Board of Supervisors commissioned a study of transportation alternatives for the Embarcadero (13). The resulting study advocated the creation of a historic streetcar service in place of the freeway as a preferred means for moving people along the waterfront. This plan was adopted by the city in 1977, and in 1979 an E-Embarcadero historic streetcar line was included in Muni’s 5-year plan. Planning for this line precedes any discussion of historic transit on Market Street. The E line was designed to ring the waterfront from the site of the current Caltrain commuter rail terminal in the south via the Embarcadero along Fisherman’s Wharf and then through the existing freight rail tunnel beneath Fort Mason to reach the Presidio, the site of a military barracks, deployment center, and hospital, which was designated a National Historic Landmark District in 1962. It was estimated that using older historic streetcars or refurbished PCC cars would create a popular transit attraction. Existing track sections would be used wherever possible along the alignment (14).

As the plans for the F-Market line advanced in the late 1980s, Muni altered the scope of planning for the E-Embarcadero line. The E line would be an extension of the F line and would turn around at Fisherman’s Wharf rather than continuing through to the Presidio. This new F-Wharves extension (occasionally referred to as the F-Embarcadero) received increased attention after the October 1989 earthquake set the Embarcadero Freeway on its path to full removal in 1991.

Work began in July 1993 for roadway and rail construction, with a completion date for the extension dependent on the completion of the track work in the Mid-Embarcadero segment of the waterfront projects. The cost of the F line extension project, from Fremont and Market Streets to Jones and Beach Streets in the Fisherman’s Wharf area, was about \$80 million. Included in the construction costs were wayside platforms for accessibility for riders with disabilities and full compliance with the Americans with Disabilities Act at every proposed stop.

Implementing the Embarcadero phase of the F line proved to be more of a challenge because the Fisherman’s Wharf Merchant Asso-

ciation opposed losing parking spaces and was afraid that the line would bring unwanted elements to its community. These sentiments shifted once the line opened in 2000 and not only was heavily patronized by tourists, but liberated parking spaces by employees who had previously driven to work. The head of the Fisherman’s Wharf Merchant Association became quite an advocate of historic streetcars. He argued, “If our waterfront is to breed economic, social, and cultural advantages, it needs this kind of service, because it takes cars off the street and creates a delightful method of transportation” (15).

CURRENT OPERATIONS

The F-Market and Wharves line has been the object of tremendous encomiums. Much of that praise is for the system’s symbolic value to the city. For example, one local columnist exclaimed, “The F Line on Market Street is one of the best parts of the city—a rare example where San Francisco has embraced its past rather than tried to bury it in the name of progress” (16). Nonetheless, it is important to assess the success of the F line based on its actual ridership characteristics. As the Muni general manager noted, “We don’t want this to be a novelty transit service. The F line meets the standard for real transit service” (17).

To date, there has been no systematic analysis of ridership patterns published. There has been some episodic consideration in the popular press, particularly concerning high demand during the tourist season. An August 2004 headline in the *San Francisco Chronicle* read, “Non-Stop Rush Hour on F Line: Standing-Room-Only Embarcadero Streetcar Almost Too Popular” (18). This research seeks to provide a more rigorous analysis and to situate the historic streetcar line within the context of San Francisco’s other local rail services, namely, the Muni Metro and the cable cars, which also radiate out from the central business district.

This analysis is based on data collected between October 2006 and June 2007 as part of Muni’s Transit Effectiveness Project (TEP) for all five major Muni Metro lines, the F line historic streetcar, and two of the three cable car lines. The third cable car, the 59 Powell/Mason line, is not considered in this discussion because no data for this route have been included in the TEP reports.

Table 1 presents data on service provision for a typical weekday. The service measures considered include route length, revenue hours, revenue miles, seat miles, and average speed. These data show that the F line functions as a smaller Muni Metro line in regard to route length, revenue miles, and seat miles; however, the F line functions as a cable car in regard to average speed. The F line average speed of 4.8 mph is 42.9% less than that of the Muni Metro. This low velocity requires the F line to operate 60.8% more hours than a typical Muni Metro line to achieve its comparable provision of revenue miles. It should be noted that the F line historic streetcars seat only 47 patrons and are never coupled to increase their capacity; by contrast, the Muni Metro cars seat 60 patrons and service on the N, L, and M lines is always coupled to double the available number of seats. Therefore, even with a comparable number of revenue miles, the F line can offer only about three-quarters the average seat miles of the J and K lines and a third the average seat miles of the N, L, and M lines.

Table 1 also presents data on passenger ridership for a typical weekday. The ridership measures considered include boardings, passenger miles, and average passenger trip length. These data show that the F line daily ridership of 18,520 passengers is about a third less than the Muni Metro average ridership of 27,781 passengers and a bit

TABLE 1 Service and Ridership Comparison of Muni Metro, Historic Streetcar, and Cable Car Lines

Mode	Line	Name	Rail Service					Rail Ridership		
			Route Length (mi)	Revenue Hours (h)	Revenue Miles (mi)	Seat Miles	Average Speed (mph)	Boardings	Passenger Miles (mi)	Average Trip (mi)
Muni Metro	N	Judah	9.0	287	2,344	281,228	8.2	45,252	134,520	3.0
	L	Taraval	8.0	208	1,791	214,897	8.6	29,842	101,557	3.4
	M	Oceanview	9.0	204	1,428	204,890	7.0	28,671	95,629	3.3
	K	Ingleside	7.8	170	1,638	98,290	9.7	18,444	53,116	2.9
	J	Church	4.8	177	1,606	96,345	9.1	16,695	37,000	2.2
		Modal average		7.7	209	1,761	199,826	8.4	27,781	84,364
Historic streetcar	F	Market and Wharves	5.1	336	1,631	76,657	4.8	18,520	27,673	1.5
Cable car	60	Powell/Hyde	1.6	95	441	17,645	4.7	10,905	16,145	1.5
	61	California	1.5	67	273	10,926	4.1	6,596	5,441	0.8
		Modal average	1.6	81	357	14,285	4.4	8,751	10,793	1.2

more than twice the cable car average ridership of 8,751 passengers. Figure 3 uses the ridership data that Muni has reported to the National Transit database during the first decade of F line implementation (and includes data from the 59 Powell/Mason line) to show the comparative growth in ridership. During those years, F line ridership has more than doubled while the other rail services (and Muni as a whole) remained flat or declined. These findings suggest that the F line has been a success in attracting boardings.

Boardings alone, however, do not fully describe ridership characteristics because patrons report very different travel behaviors on the different rail services in San Francisco. On average, patrons on the historic streetcar line travel 1.5 mi, which is half the distance of a typical trip on the Muni Metro (although a quarter longer than the typical trip on the cable cars). As a result, the total passenger miles traveled on the F line is two-thirds less than the miles traveled on the Muni Metro (but two and a half times the miles traveled on the cable cars).

An additional layer to considering the success of a rail service is to examine comparable measures of efficiency. Table 2 uses the TEP data to present five such measures. The first three measures are based on boarding data and include boardings per route length, boardings per seat mile, and cost per boarding. Boardings per route length measures the density of transit entry along the rail route without considering the level of transit provision. On average, the F line is similar to the Muni Metro with 3,631 weekday boardings per route mile, and the cable cars report a far higher rate of 5,606 boardings per route mile. When boardings are adjusted by the amount of transit provision as measured by seat miles, more distinctions emerge between the F line and the Muni Metro lines (although the cable cars remain far more efficient). The F line ratio is 73.8% higher than that of the Muni Metro lines (although 60.6% less than that of the cable cars). This further attests to the success of the historic F line in attracting riders. Unfortunately, the operational costs for running the F line are quite high, on average \$3.36 per rider. This value is 53.4%

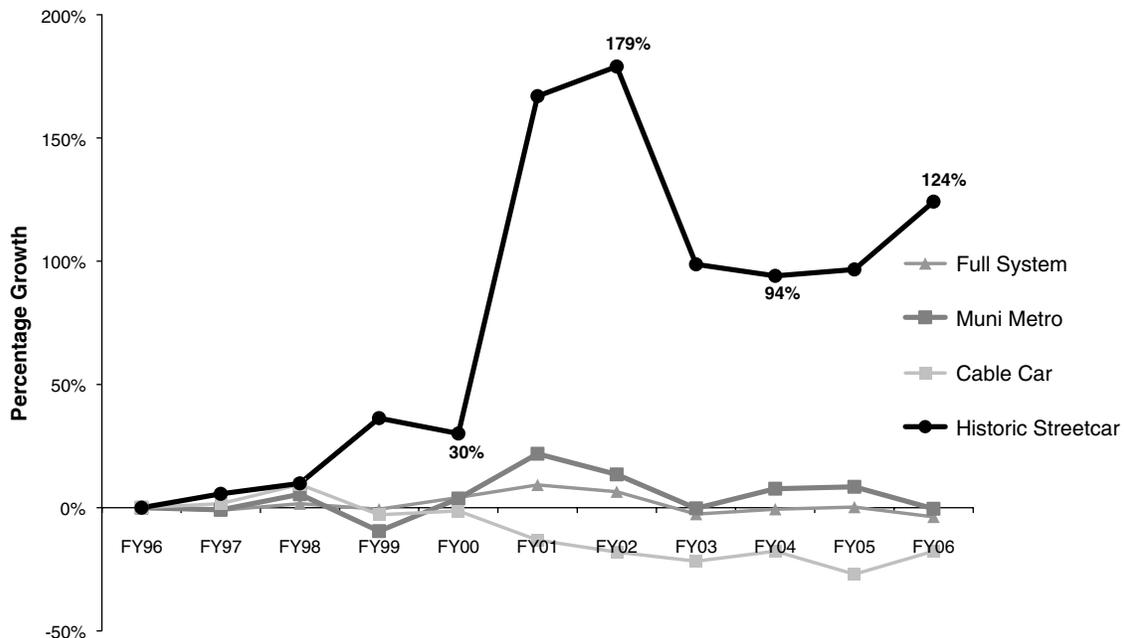


FIGURE 3 Percentage growth in weekday ridership on San Francisco Muni service (fiscal year 1996–2006 data).

TABLE 2 Efficiency Comparison of Muni Metro, Historic Streetcar, and Cable Car Lines

Mode	Line	Name	Boarding Ratios			Passenger Miles Ratios	
			Boardings per Route Length	Boardings per Seat Mile	Cost per Boarding	Passenger Miles per Route Mile	Seat Occupancy (%)
Muni Metro	N	Judah	5,028	0.161	\$1.93	14,947	47.8
	L	Taraval	3,730	0.139	\$2.18	12,695	47.3
	M	Oceanview	3,186	0.140	\$2.33	10,625	46.7
	K	Ingleside	2,365	0.188	\$2.12	6,810	54.0
	J	Church	3,478	0.173	\$2.38	7,708	38.4
		Modal average	3,557	0.139	\$2.19	10,557	46.8
Historic streetcar	F	Market and Wharves	3,631	0.242	\$3.36	6,881	36.1
Cable car	60	Powell/Hyde	6,816	0.618	\$2.42	10,091	91.5
	61	California	4,397	0.604	\$2.66	3,627	49.8
		Modal average	5,606	0.613	\$2.54	6,859	70.7

and 32.3% higher than the comparable costs for Muni Metro and cable car boardings, respectively.

The final two measures are based on passenger mile data and include passenger miles per route mile and seat occupancy. Passenger miles per route mile consider the distance traveled by passengers in relation to the length of the rail alignment. In contrast to the boarding data above, here the F line ratio is virtually identical to that of the cable car lines and a third less than the Muni Metro ratio. This finding reflects the longer trip lengths that characterize travel patterns on the Muni Metro lines compared with the historic streetcar and cable car lines. The final efficiency measure, seat occupancy, refers to the percentage of time that a seat on a rail vehicle is in use. It is calculated by dividing the passenger miles traveled by the seat miles provided. The F line seat occupancy of 36.1% is roughly three-quarters that of the Muni Metro line (46.8%) and one-half that of the cable car lines (70.7%). This finding suggests that in regard to the utilization of transit capacity, the F line is the least efficient of Muni's rail services.

Taken together, these data paint a picture of the F line as serving a niche role in the panoply of rail transit services that adorn San Francisco. The F line serves as a downtown circulator for commuters and tourists alike who take advantage of Muni's proof-of-purchase fare policy to jump on and off the F line for short trips. The total boardings are respectable for any transit line of that size, and the strong growth in boardings in comparison with the other transit services attests to the value of the historic streetcar line in drawing new riders over the bus line that had predated it. That said, the F line appears to have an expensive cost structure. These higher costs most likely reflect the slow travel conditions in the urban core, the limited seating in each vehicle, and the high costs of historic streetcar operators, who are among the most senior drivers in the Muni system. These costs may be inherent in a historic streetcar system that serves a city's busiest transit corridor. Although these findings should not besmirch the success of the historic streetcar, they should motivate ongoing efforts to improve the provision of this unique transit service, particularly in regard to operating costs and capacity utilization.

Muni plans to grow the historic streetcar program by realizing the plans that were originally laid down in 1974. It hopes to extend the F line tracks through the Fort Mason tunnel and implement the E-Embarcadero line running from the Marina District to the Embarcadero (19). The project is in the environmental review stage, and the potential ridership of such an extension is being assessed. The Muni is also exploring development opportunities and analyzing the costs of historic rail so that development cost structures for projects supporting historic rail can supplement funding sources.

Providing the Marina District with a direct rail connection to downtown could have a great benefit to commuters. The southern extension and creation of an E line would provide more frequent service between Fisherman's Wharf and Mission Bay/Caltrain. As in situations concerning previous rail extensions, the communities affected by these proposed changes have expressed concern. Along with the possibility of attracting an undesirable element, some Marina District community members fear loss of parking, street congestion, and high noise levels secondary to the new line.

SUPPORTIVE FACTORS

The F line historic streetcar service emerged in a context that fostered its success. Although the specific elements of that context are unique to San Francisco, some consideration of these elements will likely advance a general understanding of the types of factors that are conducive to such projects. The purpose of this discussion is to advance the planning thinking on historic streetcars and to provide guidance to other areas seeking to establish their own historic systems.

Environment

The natural, built, and political environment provide the context for much of the F line success. The physical environment of San Francisco's peninsular location is one of scenic grandeur, temperate weather, and land scarcity. The grandeur attracts tourists and residents. The tourists in particular are a target market for historic streetcar services. The temperate weather creates conditions that are favorable for transit use and for historic streetcar maintenance. The mild climate minimizes any contending with weather that might dissuade the use of public transit; furthermore, the narrow temperature range and lack of snow (and the street salt that is an urban corollary to snowfall) limit the physical demands on the historic carriages. Finally, the land scarcity results in dense settlement patterns conducive to transit. The way in which nature has constrained livable space on the San Francisco peninsula has resulted in a built environment that supports transit in general.

The density of the built environment is particularly beneficial to the F line. San Francisco is the second most densely populated major U.S. city after New York. This general density makes transit viable and makes the automobile alternative more costly. The downtown

core, which serves as the commercial and tourist center, is the oldest streetcar corridor on the West Coast and extremely transit friendly. The F line not only runs in a key historic corridor, but it also runs above a light rail tunnel (Muni Metro) and a heavy rail tunnel (BART). Essentially, the F line serves the densest commuter corridor in the city along Market Street and then the densest tourist corridor along the Embarcadero.

The political environment is also quite favorable to historic streetcar service. The local political organization is unusual in that the city and county are consolidated into a single governmental unit, the city and county of San Francisco. This organization reflects the unique geographical position of the city as a peninsula, and it enables a particularly strong and undivided local authority. In addition, the local government is also the governing body for the transit authority. The city entered the public transit market very early in 1912 and actively worked to consolidate transit under its control. Since 1952 the city has been the sole transit operator of local service and, as a result, transit operations and not just traffic and street operations are closely linked to the local government. Therefore, not only can transit improvements be closely coordinated with street and urban planning programs, but the success of such programs is linked to the city alone rather than to a more diffuse mix of government bodies.

Transit Agency Capacity

Muni's own history is particularly advantageous for the introduction of a historic streetcar line. As noted above, Muni has been in the streetcar business since 1912 and has owned and operated PCC cars since World War II. Therefore, not only was much of the fixed infrastructure already built, but many of the vehicles were already in the fleet (albeit out-of-service) and there was extensive internal knowledge about the operations and maintenance of the historic cars. Furthermore, as a multimodal agency, Muni is accustomed to managing a variety of vehicles and operational divisions. The addition of the F line did not disrupt existing business models. The F line possibly augmented them by adding more differentiation to the operations and maintenance departments, which can be useful for enabling career advancement opportunities for employees. Finally, Muni has wisely chosen to operate the historic service as a real transit line rather than purely as a tourist attraction and has refused to extend the line until a business case exists for effective transit operation.

Public Support

The city has a famously active political culture, much of which has been galvanized around transportation. San Franciscans are credited with initiating the "freeway revolt" in the late 1950s through which popular protest challenged the incursion of the Interstate system into urban areas.

Much of this energy has been aimed at preserving historic rail operations and promoting rail transit. San Francisco voters were instrumental in preserving the cable car lines. As part of the 1952 transit consolidation, voters passed a bond for Muni to purchase the bankrupt California Street Railroad (Cal Cable) and reopen its cable car lines. In 1964 citizen groups succeeded in securing National Historic Landmark status for the remaining cable car lines to prevent Muni from dismantling that historic mode. In 1971 voters again approved a policy that would guarantee the Muni maintenance

of cable car operations. In 1973 San Franciscans proudly celebrated the centennial of the cable car. This concern translated to historic streetcar preservation in 1983, when cable car operations were temporarily halted for extended maintenance and citizens convinced the city to offer historic trolley service on the recently abandoned Market Street tracks. During this same period, San Franciscans were supportive of the extension of new rail transit services. They approved the BART plan in 1962 and had the city adopt a transit-first policy into the municipal charter in the early 1970s (20).

This voter support for preserving and extending transit was bolstered by an urban growth coalition. The Chamber of Commerce led the call for instituting the 1983 trolley festival. The Market Street Railway, a nonprofit advocacy group, picked up that mantle in subsequent years. As the F-Market and Wharves line began to take shape, business associations along the route became involved in the process. Although the Fisherman's Wharf Merchants Association was initially opposed to any public transportation proposal that would reduce the amount of automobile parking and access to the district, it has supported the proposed Embarcadero section. There was some organized resistance among business owners in the Castro neighborhood who feared that the intrusion of straight tourists would negatively affect the gay neighborhood. This position appears to be a minority one and was not shared by the Merchants of the Upper Market and Castro business association (14). The Market Street Railway, a volunteer organization, deserves additional mention; it has been critical, not only in the political support for the project it has provided, but also in donating private funds and labor hours for the maintenance of the vehicles (8). In 2006 Market Street Railway directors and members donated more than 20,000 h to the organization, performing executive, administrative, communications, and restoration and preservation tasks, an estimated value of almost \$700,000.

CONCLUSIONS

An analysis of the implementation of historic streetcar service provided by the San Francisco Municipal Railway and the Market Street Railway has shown the program to be a success in regard to its creation, public acceptance, and use. That success is qualified by the relatively low utilization of capacity along the line and the high costs of service provision. The symbolic value associated with this project is well expressed by Guy Carder, a 10-year veteran Muni driver, who said at the outset of the historic service that

It's an honor to drive these cars . . . They are the wave of the future. They don't pollute the air, and the people will like them. You hear a lot of bad things about the Muni, but these are good things and good for the city. (21)

This praise should not detract from the important task of ensuring that such projects are continually reviewed and refined to run as optimally and efficiently as possible.

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