

A Success Story That Was Not Supposed To Happen

CAMERON BEACH

The idea of a light rail transit (LRT) line in Sacramento started with a grass roots citizens group looking at alternatives to automobiles, freeways, and air pollution in the mid-1970s. Transportation "experts" predicted nothing but problems for construction and operation of light rail transit in a low-density area like Sacramento. "It isn't going to the right places," "Nobody will ride it," and "We got rid of the streetcar once, do we have to do it again?" were commonly heard statements during the early stages of the LRT development. RT Metro service was started in March 1987 despite the serious lack of operating funds that plagued the system initially. The service has expanded to provide a viable alternative to the automobile that is cost-effective and operating within the confines of long-standing collective bargaining agreements that have been in place for almost 90 years. Sacramento's light rail success story continues toward the 21st century with serious plans for system expansion, extensions, and a higher level of service.

Sacramento, the capital of California, is in the great valley between the Coast Range and Sierra Nevada mountains. Located at the confluence of the American and Sacramento Rivers some 85 mi northeast of San Francisco, Sacramento, until 1849, was a sleepy little valley community from which agricultural goods were shipped to San Francisco. With the discovery of gold by John Sutter near Coloma in 1849, Sacramento made an almost instant transition to boom town. People from all over the world and all walks of life rushed to northern California in their quest for gold. Many settled in and around Sacramento, including four merchants named Huntington, Crocker, Stanford, and Hopkins. The "Big Four" formed a partnership to construct a transcontinental railroad with Sacramento as its western terminal. The railroad was completed in 1869, making Sacramento a major gateway for commerce in the West.

Public transportation in Sacramento began with horse-drawn omnibuses in the late 1850s. These gave way to horse cars in the 1880s. In 1889 a new technology was introduced: the battery-powered streetcar. Electric streetcars replaced the battery cars in 1890 when overhead wire was strung in Sacramento. In 1895 the first hydroelectric plant opened in Folsom, 22 mi east of Sacramento. This power was used to run the streetcars and to power buildings and street lights as well. In 1906 the merger of several utility companies resulted in the formation of the Pacific Gas and Electric Company (PG&E), which operated streetcar service to all parts of the urbanized area, providing fast, frequent transportation between downtown and the outlying neighborhoods. The streetcar system

reached its peak at the end of World War I, when PG&E carried about 16 million passengers annually on the 10 routes within the city. The fare was only 5 cents, and most of the local cars ran every 10 minutes.

The 1930s brought the first declines in ridership. In 1932 PG&E began substituting buses for streetcars on some routes. By the end of World War II, Sacramento had five streetcar routes left and about a dozen bus lines.

National City Lines, a transportation holding company owned by Firestone, Goodyear, Standard Oil, Phillips Petroleum, General Motors, and Mack Truck, purchased the PG&E streetcar and bus system in 1943. It was renamed Sacramento City Lines and began a modernization program that did not include Sacramento's streetcars. On January 4, 1947, the last streetcar made its final run in Sacramento.

Operation of the transit system was passed to the city of Sacramento in 1955 with the formation of the Sacramento Transit Authority (STA). During the 1950s and 1960s STA acquired other private operators and the bus system grew moderately in both fleet size and ridership. By 1970 STA was operating buses on 16 routes with an annual passenger ridership of 7.7 million. The STA provided service primarily to the city. During the late 1960s and 1970s the metropolitan area grew tremendously, primarily in the unincorporated county areas north and east of downtown. In recognition of this growth and the ensuing transportation needs, the Sacramento Regional Transit District was legislatively created to provide public transit service in the greater Sacramento metropolitan area, which had grown to more than 350 mi². Regional Transit took over STA's service on April 1, 1973. Additional buses were purchased and employees hired to provide a comprehensive network of bus routes throughout the area. By 1978 the fleet consisted of 223 buses operated and maintained by employees. Annual ridership had grown to 12.8 million, a 66 percent increase over the 1970 figure.

Population growth in California continued at a rapid rate in the 1970s with some less desirable side effects: runaway real estate prices, air pollution, and massive traffic congestion. Growth was primarily centered in the Los Angeles basin and the San Francisco Bay Area where inflation, pollution, and congestion reached all-time highs.

During that same period, a loosely formed citizens advocacy group of environmentalists and public transit supporters was put together in Sacramento. Calling themselves the Modern Transit Society (MTS), they enlisted the aid of more established organizations such as the Sierra Club and the American Lung Association and proposed an alternative form of public transportation in Sacramento.

A 10-block area adjacent to the Sacramento River had become the city's "skid row" following World War II. Many of the historical buildings dating from the gold rush era had fallen into disrepair. In the mid-1970s, efforts were being made to clean up "Old Sacramento," restore the buildings, and begin construction of the California State Railroad Museum that would house a priceless collection of steam and diesel locomotives and passenger cars from the gold rush era through the 1950s. The consulting firm of Wilbur Smith and Associates was commissioned to do a study of a historical streetcar operation to connect the railroad museum, Old Sacramento, and the downtown area. This report, published in 1975, became the basis for MTS to look at light rail transit as a problem solving transportation mode for the entire metropolitan area. MTS began meeting with city council members, county supervisors, state assemblymen, and senators, as well as congressional representatives to present their ideas on light rail transit's role in Sacramento's future.

MTS focused on available, underutilized railroad rights-of-way and a 4.5-mi section of freeway right-of-way purchased and cleared in the early 1970s as a bypass route for Interstate 80 into downtown Sacramento. MTS pushed the idea that light rail transit could be a low-cost alternative to additional freeway construction. Arguing that the citizenry did not want to have Sacramento become another Los Angeles or San Jose, they were successfully able to stall the additional freeway construction. MTS pointed out that light rail transit could be built on a "no frills" basis, using service-proven technology and a combination of single and double track to minimize capital expenses.

In 1976 the City Council halted further construction on the I-80 bypass and requested that federal funds programmed for additional freeway construction be allocated toward building a light rail transit line. Additional federal and state monies were sought, and work started on the alternatives analysis process in the late 1970s. In mid-1981 the environmental impact report (EIR) was completed. The EIR envisioned an 18.3-mi (29.2-km) light rail line using the former I-80 bypass right-of-way, an abandoned Sacramento northern interurban right-of-way, a seldom used Western Pacific corridor, and a portion of the Southern Pacific's Placerville Branch right-of-way. The Southern Pacific right-of-way was the location of the first railroad built in California. It had been designed by Theodore Judah and constructed in 1854 as the Sacramento and Folsom Railway. (Judah later gained fame as the chief engineer of the Transcontinental Railroad built by the Central Pacific over the Sierra Nevada through Donner Summit.) In addition to the railroad and freeway rights-of-way, a substantial amount of the light rail operation downtown would be in city streets, giving Sacramento's line more mixed traffic operation than most new light rail starts in recent years.

Construction of the light rail system was delegated to a new joint powers agency called the Sacramento Transit Development Agency (STDA). STDA consisted of the city of Sacramento, the county of Sacramento, the California Department of Transportation (Caltrans), and Regional Transit. STDA's goal was to design and build the light rail line that on completion would be operated by Regional Transit. Historically Caltrans' focus had been the construction of highways and freeways in California. But its director at the time,

Adriana Gianturco, wanted to focus on other solutions to transportation problems besides additional road construction. Caltrans was designated as the general engineering contractor for the light rail project, and a selected group of Caltrans engineers assembled to complete final design, procure equipment, award civil contracts, and manage the construction of the system.

In theory the joint powers agency was a good one. It focused political attention on the system at several levels of local government. In practice, however, the agency suffered from a lack of accountability to any one entity. Further complicating the agency's activity was the fact that Regional Transit was the designated federal grantee and as such was responsible for any cost overruns the project might suffer.

In late 1983 Regional Transit, concerned about cost overruns, hired its own consultant to review the project. This evaluation showed that the project budget would be inadequate to complete the system and pointed out the organizational problems created by the joint powers agency.

After a great deal of political handwringing, it was decided that Regional Transit should take over the project in its entirety. A new, more realistic project budget was adopted that projected the final cost at approximately \$176 million. The city of Sacramento, in cooperation with the Sacramento Housing and Redevelopment Agency, issued certificates of participation to make up the \$45 million difference between the original project budget of \$131 million and the revised number. During these difficult times, numerous comments were made about the project. Several parties, including elected officials, voiced such opinions as "Why are we doing this?" "Can we stop the project now and cut our losses?" and "We all knew light rail would not work in Sacramento anyway." Nevertheless the project proceeded. Twenty-six light rail vehicles, ordered from Siemens/Duewag in 1983, were in various stages of construction. Rail, ties, and special trackwork were arriving in the North Sacramento storage yard. Utility relocation was well under way and approximately 3 mi (5 km) of track had been put down by August 1985. On August 16, 1985, Regional Transit formally took responsibility for the project and announced that completion and opening would occur in spring 1987.

The construction of light rail transit in Sacramento was the largest public works program ever undertaken in the area. Even after the budget and organizational problems had been resolved, it seemed that a new hurdle was thrown in the path of the project every week. UMTA raised concerns about the American content of the vehicles. Two of the trackwork contractors went bankrupt during construction. Utility relocation in a downtown area more than 125 years old was always full of surprises. Nevertheless construction continued. The first vehicle was delivered to the shop and yard facility in November 1985. The vehicle was placed on display in North Sacramento on the day after Thanksgiving of that year and received great accolades.

Unlike San Diego's light rail project (to which the Sacramento project was frequently compared), Regional Transit would be starting up a new light rail system within the confines of existing collective bargaining agreements. The Amalgamated Transit Union (ATU) had represented operators on this property since the early 1900s. The International Broth-

erhood of Electrical Workers (IBEW) had represented maintenance employees for almost as long. San Diego's new start was not obligated to honor any existing collective bargaining agreements. In Sacramento the precedence of union/management relations established over years became the floor for negotiating a separate agreement for light rail operations. In early 1985 Regional Transit management began extensive discussions with both unions concerning wages, promotions, transfers, and training programs. Arrangements were made for union officials to visit other light rail properties, including San Francisco and Calgary. Both Regional Transit and the unions were acutely aware of the political implications of a delayed light rail start-up. To this end both parties worked diligently on agreements to deal with the transition from an all-bus operation to one that was multimodal. These agreements, signed in late 1985, provided a mechanism for both labor and management to work through this transition period.

As a result of the agreements, bus operators represented by the ATU were allowed to bid according to their seniority on light rail operator positions. Any operator wanting to bid a position in the light rail department was required to pass an Ishihara color blindness test that requires picking out numbers from a dot matrix. The Ishihara test is generally regarded as more comprehensive than the standard color identification required by the Department of Motor Vehicles. Given the differences between traffic signals and railroad signaling equipment, Regional Transit decided this test would be critical in the evaluation of employees involved in train operation. The labor agreement also contained provisions that allowed operators to bid back and forth between the bus and rail divisions at an annual "system" sign-up. In addition by mutual agreement operators could be asked to return to the bus division prior to the expiration of the 1-year sign-up. This system has worked reasonably well. It does create a training burden at sign-up time if large numbers of operators are moving between the bus and rail divisions. So far the largest group has been seven people out of 33 budgeted positions.

The agreement with the IBEW specified requirements for filling positions in maintenance classifications. It also required that individuals wanting to move into rail maintenance pass a test of basic electrical, mechanical, and electronic skills. This test was administered to in-house employees as well as new applicants from outside the agency. The maintenance work force consists of approximately one-third in-house transfers and two-thirds new hires. Most of the wayside maintenance staff (linemen and rail maintenance workers) came from main-line railroads in the area that were undergoing major layoffs at the time light rail was starting up.

Regional Transit was fully aware of the need to create a management staff responsible for the day-to-day operation of the system, now called RT Metro. An operations manager was hired in January 1983. By fall 1985 transportation and maintenance superintendents were in place, a small group of supervisors was in training, and the first two operators scheduled to run the test cars were sent to Calgary for training.

By spring 1986 several cars were on the property. A limited amount of test track was available for vehicle testing and evaluation. At the same time construction was proceeding through the downtown area of Sacramento. Building a new street railway in an existing downtown retail and business area

was not without its problems. Retailers blamed construction for lost revenue, dirt, flooding, and anything else that could go wrong. Regional Transit had the foresight to bring on board a community relations consultant who had a good working relationship with the downtown merchants. The consultant was able to ease the downtown merchants' concerns through frequent contact and sincere efforts to mitigate the problems. Despite these efforts it was still common to hear disparaging remarks about light rail as the system proceeded to opening day.

During the last few months before opening, Regional Transit's operations and engineering/construction divisions worked closely together to accomplish a long list of integrated tests. These tests determined if the various components of the system would work together. Vehicle clearances were checked, signals were tested, and all the components were evaluated on their ability to work as part of a total system. The last few weeks before opening were spent simulating the actual service to be operated for the public. Drills were held with the police and fire departments to ensure that RT Metro could deal with any emergency.

Friday, March 9, 1987, dawned cloudy and cool in Sacramento. The inaugural train was to depart from the Watt/I-80 Station at 10 a.m. Following speeches by local, state, and national dignitaries, the first train proceeded toward downtown Sacramento. Large crowds were on hand at every station to applaud the return of the electric railway to Sacramento after an absence of 40 years, 2 months, and 5 days. The northeast segment of the line was the first portion opened. Fourteen cars were in service that Friday, Saturday, and Sunday. During that weekend the public was invited to take a free ride on the system. The clouds of Friday turned into the rain storm of Saturday and Sunday. Despite numerous minor delays, more than 200,000 Sacramentans turned out to ride their light rail system on the first weekend of operation.

The following Monday was the first day of revenue operation. Approximately 6,500 people rode the system each weekday during its first month. This number jumped to about 9,000 when connecting bus service was rerouted to the light rail stations on April 5. From the start the system was immensely popular with riders. On Saturday, September 5, 1987, the entire 18.3-mi (29.2-km) Folsom Corridor was opened. Again free rides were offered on the system and again hundreds of thousands of Sacramentans turned out to ride.

With the entire line open, ridership grew to about 12,000 passengers per day. Service was operated from 6 a.m. to 10 p.m. weekdays, 8 a.m. to 6 p.m. on Saturday, and approximately 9 a.m. to 5:30 p.m. on Sundays. Trains operated every 15 min during the week with a half-hour headway evenings, Saturdays, and Sundays. This was substantially less service than had been envisioned, but was all the district could afford given a lack of local financial support for transit service.

The starter line, as originally designed, was more than 60 percent single-track operation. Passing sidings were located at strategic "meet points" that allowed operation of a 15-min headway. Despite numerous negative remarks by transit professionals, the single-track operation worked very well. On-time performance exceeded 98 percent during the first year of operation. It was always RT Metro's intent to double-track as much of the system as possible once the initial starter

line had been completed. Additional double-track territory would allow for more forgiveness in the tight schedule and, more importantly, an ability to run trains more frequently than every 15 min.

The first double-track project was put in service in late 1988. This project consisted of approximately 1 mi of main-line track in exclusive right-of-way. The project was relatively simple as no station modifications or grade crossing improvements were involved. Before this project, tail tracks had been constructed at each end of the line to allow bad order cars to be removed from service. At this same time a scissors crossover was installed midpoint on the line. This was located on the K Street Mall. Neither the tail tracks nor the crossover are used extensively. However in cases of emergency, they become a vital part of the system.

The second double-tracking project involved approximately 1.25-mi of track, virtually all of it located in mixed traffic territory. This construction project was substantially more difficult as it involved traffic mitigation and extensive modifications to an existing station. Nevertheless the project was completed on time and under budget. The most recent double-tracking project consisted of approximately 1.5 mi of double track, three modified stations, an additional park-n-ride facility, and enhanced grade crossing protection. This was by far the most extensive project attempted since the line opened. This additional track opened for service in early 1991.

Double-tracking projects, once service has commenced, are at best difficult to complete when trains are in regular service. It requires that extensive work be done on nights and weekends. It also requires using buses to offset occasional disruptions of rail service. Replacement bus service is not as fast or efficient as the trains it replaces. When bus substitutions are necessary, schedules must be rewritten and a substantial amount of operator overtime incurred to accomplish the task. More importantly passenger travel is disrupted, resulting in many unhappy customers. Even though the ultimate result (faster and more efficient rail service) justifies these interruptions, the average rider does not appreciate being 15 min late for work.

Today, the system is approximately 40 percent single track. Additional projects are under way to complete double tracking of most, but not all, of the system in the next few years. In some cases the cost to double track structures would be prohibitively expensive. Therefore the decision has been made to defer such "high-cost" projects until they are required.

In November 1988 voters in Sacramento passed Measure A, which imposed a 1/2-cent sales tax within the county. Two-thirds of these funds were for road construction and maintenance and one-third went to Regional Transit for capital improvements and operational expenses. With the passage of Measure A, Regional Transit quickly ordered 10 additional light rail vehicles to enable the system to operate all four-car trains in rush hour. In addition service was increased on the rail line to the level envisioned during design in the early 1980s. Trains operated every 15 min on weekdays from 5 a.m. until 6 p.m. with half-hour headways continuing until 1 a.m. the following morning. Fifteen-minute service was also introduced on Saturdays and Sundays between 7:30 a.m. and 6:30 p.m. Half-hour headways were also added on weekend mornings between 5 a.m. and 7:30 a.m. and between 6:30 p.m.

and 1 a.m. Bus feeder service was increased to provide additional connecting service.

With these service improvements, ridership that had been hovering around the 14,000 to 15,000 weekday average jumped to more than 19,000. Once the citizens of Sacramento realized that increased bus and rail transportation was available, ridership quickly built to more than 21,000 a day. This was an important benchmark for the system, because ridership forecasts in the early 1980s had assumed that 20,500 passengers a day would use the system. Ridership continued to grow to the 22,000 passengers per weekday level.

With the additional rail service operating nights and weekends, bus connections to the rail system became even more critical. The original concept of light rail in Sacramento envisioned timed transfer connections between neighborhood or feeder-type buses and the rail line. This was a new concept for Regional Transit, especially in terms of writing schedules tied to specific time points (light rail stations). The rail system operates on a clock headway with trains running every 15 or 30 min throughout the operating day. Because the trains are not materially affected by traffic, running time remains constant. This is not true for the connecting bus systems, for which running time varies substantially depending on the time of day and day of week. Long motor coach lines scheduled to meet trains at intermediate points have a great deal of difficulty making these connections, especially when heavy traffic or passenger loads impair on-time performance. Although some of these problems have been worked through, a high level of focus still needs to be maintained on transfer connections within the system. Long lines may need to be broken into shorter segments and interlining of different routes may not always prove practical when constructing meets at transit centers geared to the time transfer concept.

Citizens who made comments in the early 1980s like "Why are we doing this?" changed their tune. The new battle cry became "Who gets the next extension?" The sales tax passed in November 1988 was for light rail extensions to the original 18.3-mi (29-km) starter line.

In November 1990 Californians, tired of freeway congestion, air pollution, and a lack of urban mobility, passed \$2 billion worth of state bonds for rail transportation improvements in the state. These bonds, along with Measure A revenues and scarce federal funds are being programmed to build two 6.6-mi (11-km) extensions to the RT Metro system. The first of these will use surplus Southern Pacific right-of-way to continue northeast toward the city of Roseville in Placer County. The Folsom Line extension will continue along the Southern Pacific's Placerville Branch toward the city of Folsom.

The recent Surface Transportation Act signed by President Bush identifies \$26 million in Federal Transit Agency (FTA) discretionary funds for corridor selection, alternatives analysis, and preliminary engineering of a 13-mi (20-km) south line between downtown Sacramento and Cosumnes River College. The south area has the heaviest concentration of transit ridership in the entire metropolitan area. Two corridors are being evaluated in this process. The first would share the Union Pacific (formerly the Western Pacific) right-of-way between downtown Sacramento and Elk Grove. This corridor would provide service to Sacramento City College and a heavily built-up urban area. The other corridor would use the

former Southern Pacific Walnut Grove Branch. This property, purchased by the Sacramento Regional Transit District in the early 1980s to preserve it, wanders through several residential neighborhoods. The land would be shared with the California State Parks Department, which would use some of the right-of-way for historical train operation using vintage steam and diesel locomotives from the State Railroad Museum in Old Sacramento.

Regional Transit is justifiably proud of the system in Sacramento. It has proven that it is possible to build a low-cost, no frills, off-the-shelf light rail transit system for less than \$10 million per mile (in 1987 dollars). The system represents the least-expensive federally funded rail transit project in the United States. It is most gratifying that visitors from cities from around the world consult Regional Transit in efforts to duplicate the Sacramento success story that was not supposed to happen.