

July–December 2004 • \$10.00 / San Diego Trolley • San Francisco Convention • BART Airport Extension

# HEADLIGHTS



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San Diego Trolley #1007 west of 47th Street.

RAY BERGER • 3-16-86

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**On the Cover:** San Diego Trolley in a classic view from 1982. Nothing looks the same today. The single track Southern Pacific-era trestle over Otay River is now a double track, concrete structure and the Siemens-Duewag U2 train received air conditioning early on, obviating the need for all the opened transom windows. MICHAEL GLIKIN

# NEWS



Little Rock, Ark.

## River Rail Streetcar Enters Service

The River Rail streetcar line began service on November 1, 2004. After a 10 AM ceremony on the north side of the river, transit officials, government leaders and local businessmen rode a streetcar across the Main Street bridge. When they arrived in downtown Little Rock they were joined by other dignitaries for a dedication ceremony at the Chamber of Commerce headquarters.

The 2.5-mile line cost \$19.6 million to construct. Service is

provided by a fleet of three replica double-truck Birney cars built by the Gomaco Trolley Company. Several attractions are located along the line including the Alltel Arena, the Statehouse Convention Center, the River Market, the Robinson Auditorium Concert Hall and the Riverfront Amphitheater, along with the main library, several museums, government buildings, hotels, restaurants, apartments and office buildings.

FRANK MIKLOS





# SAN DIEGO TROLLEY GROWS UP

By Raymond R.  
Berger (ERA #2298)

U.S./Mexican Border marker  
sits just beyond end of track  
at San Ysidro Station.

RAY BERGER • 12-27-81

**T**wenty-six years ago, San Diego Trolley began a new era in electric railroading in North America with the opening of the first segment of its light rail network on July 26, 1981. The San Diego Trolley's initial success was due to its low cost of construction in an area that was perceived as automotive-oriented. Since its first years of revenue service, the San Diego Trolley has transformed into a technologically-sophisticated 53-mile (85.3 km) LRT network that has been the measuring stick for the dozen cities that have introduced the light rail concept to their own communities over the last quarter-century. Planners in other cities look to the success of San Diego to emulate, while those who have succeeded in starting systems measure their own operation against the achievements in this Southern California conurbation.

The San Diego Trolley has three distinct line segments: the Blue Line (North and South), Orange Line (East) and Green Line (also East). The LRT system is operated and maintained by San Diego Trolley, Inc. (SDTI), a wholly owned subsidiary of the San Diego Metropolitan Transit System (MTS). The original line, now part of the Blue Line, was 15.9 miles long and runs over the former San Diego and Arizona Eastern Railway (SD&AE) right-of-way south of downtown San Diego at Park Boulevard (formerly Twelfth Avenue) and Imperial Avenue to the border with Mexico at San Ysidro. The northern-most

1.2 miles of this route is a double track street running operation which permits the San Diego Trolley to access San Diego's Central Business District via Park Boulevard and C Street. The total cost for the initial operating line was \$86 million, quite a bargain even 25 years ago. Initially it was planned to run trains only every 20 minutes and much of the SD&AE Railway line was kept single track, using existing spidery wooden bridges to cross marshes and estuaries along its route.

## Creating the San Diego Trolley

The Metropolitan Transit Development Board (MTDB) was formed in 1975 by passage of California Senate Bill 101 and came into existence on January 1, 1976. San Diego Trolley, Inc. was created by MTDB (now known as MTS) in 1980 to operate light-rail service along the Main Line of the San Diego and Arizona Eastern Railway, which had been purchased by MTDB from Southern Pacific Railroad in 1979 for less than \$20 million. Construction soon followed. Very quickly catenary wire, parking lots, station buildings and 11 power substations began to appear. The only new track was at some stations as bypasses for freight trackage and the new alignment on 12th Avenue and on C Street. In total there are six stations on the street running portion of the line and 12 below the 12th & Imperial Transfer Station.

In short, economy was the key word in its construction in the hope of keeping the cost of building the new line down. Even the stations were no more than expanded shelters, made possible by barrier-free fare collection, a new concept in the United States. This was the first known application in modern times of passengers paying for their rides using the honor system.

The story about the selection of the railcar vehicle is of interest, too. San Diego felt that substantial savings would occur if an off-the-shelf vehicle were selected. An offer by Dusseldorf Waggonfabrik, now a part of Siemens Transportation Systems, met their criteria. They offered to manufacture a car that was a duplicate of Frankfurt's Model U-2, then in successful operation for a few years. The U-2 is a railcar capable of rapid transit operation while at the same time being capable of making the 90-degree turns found on street railways. Remember that Frankfurt's first subway consisted of four lines that ran partially in streets as former streetcar lines, but ran into their Central Business District on a new alignment using a short rapid transit subway featuring high-platform boarding and alighting. Frankfurt designed the U-2 car based on their dual needs and Dueweg manufactured these initial U-2's and successfully built additional U-2's as the system expanded. Even before San Diego, the U-2 was selected for new systems being built in Edmonton and Calgary. San Diego chose the U-2 and the initial order was followed by others as the system expanded.



### Construction 1980

MIKE GLIKIN PHOTOS

(Top to bottom) Track construction on C Street, looking east from about 3rd Avenue. 9-80

International border facing Mexico. San Diego & Arizona Eastern meets Southern Pacific Mexican subsidiary Tijuana & Tecate Railway. 11-80

Ramp from SD&AE right-of-way down to San Ysidro station under construction. View is looking north. Route diverges just north of the border, where freight cars are seen. 11/80

This is what the end of the Euclid Line looked like on April 17, 1986, shortly after opening and before construction began to upgrade the remainder of this line to El Cajon.

RAY BERGER



First order of 14 Siemens/  
Duewag model U2 articu-  
lated LRVs being delivered in  
sections to San Diego Trolley  
shops. 12-80





## Testing

MIKE GLIKIN  
MAY 1981

Pacific Southwest Railway  
Museum ex-Santa Fe GE  
44-ton locomotive 7485  
heading for pre-service test  
area (Chula Vista station)  
at National City 8th Street  
Station.

MTDB acquired a small number of tracks at the San Diego Yard of the SD&AE Railway south of 12th & Imperial Avenue for their storage yard and three-track maintenance shop. As the system grew, the facility was expanded; eventually a whole new yard and maintenance facility was constructed across the street (known as the “C” Yard) and the original yard, known as the “A” Yard, served as an annex.

July 26, 1981 was the first day of revenue service. Despite its critics, the first line to San Ysidro was an instant success. It was feared that no one would leave their cars to ride the San Diego Trolley except to try the line once out of curiosity. The basis for this apprehension was that San Diego Transit Bus Route 32, which served the same basic area as the initial San Diego Trolley line, ran M-A-N Model SG-220 articulated buses every 15 minutes, but were much slower.

## Expanding the Original Route

Once the San Diego Trolley began operation, it was clear that their 14 U-2 railcars were insufficient to meet the demands of traffic on the line. Tourists visit San Diego throughout the year and one “must-do” event is visiting the city of Tijuana, just across the border in Mexico and footsteps from the end of the San Diego Trolley in San Ysidro. Additionally, there are many Mexicans who board the San Diego Trolley as part of their trip to and from work at U.S. businesses.

Low operating costs helped realize a maximum return on fares well in excess of 90% in the first years of operation. Since the initial success of the first San Diego Trolley line, the general population and politicians have all clamored for additional service and new routes. MTDB’s first improvements were the replacement of the existing wooden bridges and the double tracking of the SD&AE line. When the double track reached an estuary or marshland, a new steel bridge would be constructed and the original single track was diverted on to the new bridge. The original wooden structure would be demolished and replaced by another steel bridge. This resulted in a complete double-track line for the full 16-mile length.

At first, service was provided by six two-car train sets with just two more cars as spares. Soon additional U-2 cars were ordered from Siemens Duewag, resulting in two-car trains, later three cars and finally four-car trains. As new cars arrived, headways improved, first to 15 minutes and currently 7½ minutes in peak periods.

The demand for additional lines was met by the extension of the San Diego Trolley over SD&AE’s El Cajon Branch, known as the East Line. A 6.2-mile extension to Euclid Avenue opened on March 23, 1986, adding four new stations, and an 11.1-mile extension to El Cajon opened in 1989, adding eight stations. Finally, a 3.2-mile extension to the Santee Town Center opened on August 28, 1995, adding three stations.

A triangular-shaped route encircling the downtown area was inaugurated in June 1990; this extension was known as the Bayside Line. In 1992, the America Plaza building, a 32-story office complex with two platforms and two tracks for San Diego Trolley at street level was completed and replaced the Santa Fe Depot stop at the foot of C Street. Service on the Old Town (North) Line extended 3.2 miles from the America Plaza station (with a new stop on the train side of the Santa Fe Depot) to the Old Town Transit Center in two stages. A one-stop extension to the Convention Center-Little Italy station opened in July 1992 and the remainder to Old Town on June 16, 1996. Then, the Mission Valley West segment opened in November 1997 from the Old Town Transit Center to the Mission San Diego station. Finally, the newest addition to the San Diego Trolley network known as the Mission Valley East Line opened in July 2005, connecting the Mission San Diego station with the Grossmont Transit Center on the East Line.

A real benefit that aided in the expansion of San Diego Trolley was the MTDB's ownership of the SD&AE Railway. The East line is built on the SD&AE's line to El Cajon and Lemon Grove and a single track now extends north east to the community of Santee at the edge of the mountains. The only new construction in the early years on a totally new alignment had been on the waterfront, where the new Bayside Line forms a triangle connecting the original northern terminal at the former Santa Fe Railroad station at the foot of C Street with 12th & Imperial Transfer Station, where the South line and East line separate.

The Old Town (North) Line and the Mission Valley (East and West) Lines are also built on new alignments, first terminating at the Old Town Transit Center and now extended eastward to join back with the East line west of Grossmont Transit Center. Completed in 2005, it is on this new route that some of the most interesting right-of-way is encountered, including several lengthy elevated sections culminating in a high crossing of Interstate Highway 8 and San Diego's first subway, underneath the San Diego State University campus. Currently, the system experiences weekday ridership of between 100,000 to 110,000 passengers.

## Nighttime Freight Service

Among many distinctions, San Diego Trolley was the first new LRT system to operate both LRT service and nighttime freight service through a temporal separation arrangement. The entire right-of-way is owned by MTS through a Nevada Corporation, the San Diego Arizona Eastern Railway Corporation. Of the entire 108-mile right-of-way purchased from the Southern Pacific Railroad in 1979, 30.5 miles of the line south and east of the 12th & Imperial complex represent joint-service territory. Since 1982, freight service has shared the route at night after San Diego Trolley service ends. Freight service is currently leased to RailAmerica's San Diego and Imperial Valley Railroad (SD&IV).



### Training 1981

MIKE GLIKIN PHOTOS

(Top to bottom) PSRM Locomotive and new, un-numbered LRV in pre-service testing at Barrio Logan Station. 2-81

Northbound training run utilizing a 3-car train at 12th & E Streets. 7-81

Pre-operation testing at Chula Vista. The cars never used the Chula Vista headsign reading in regular service. 5-81



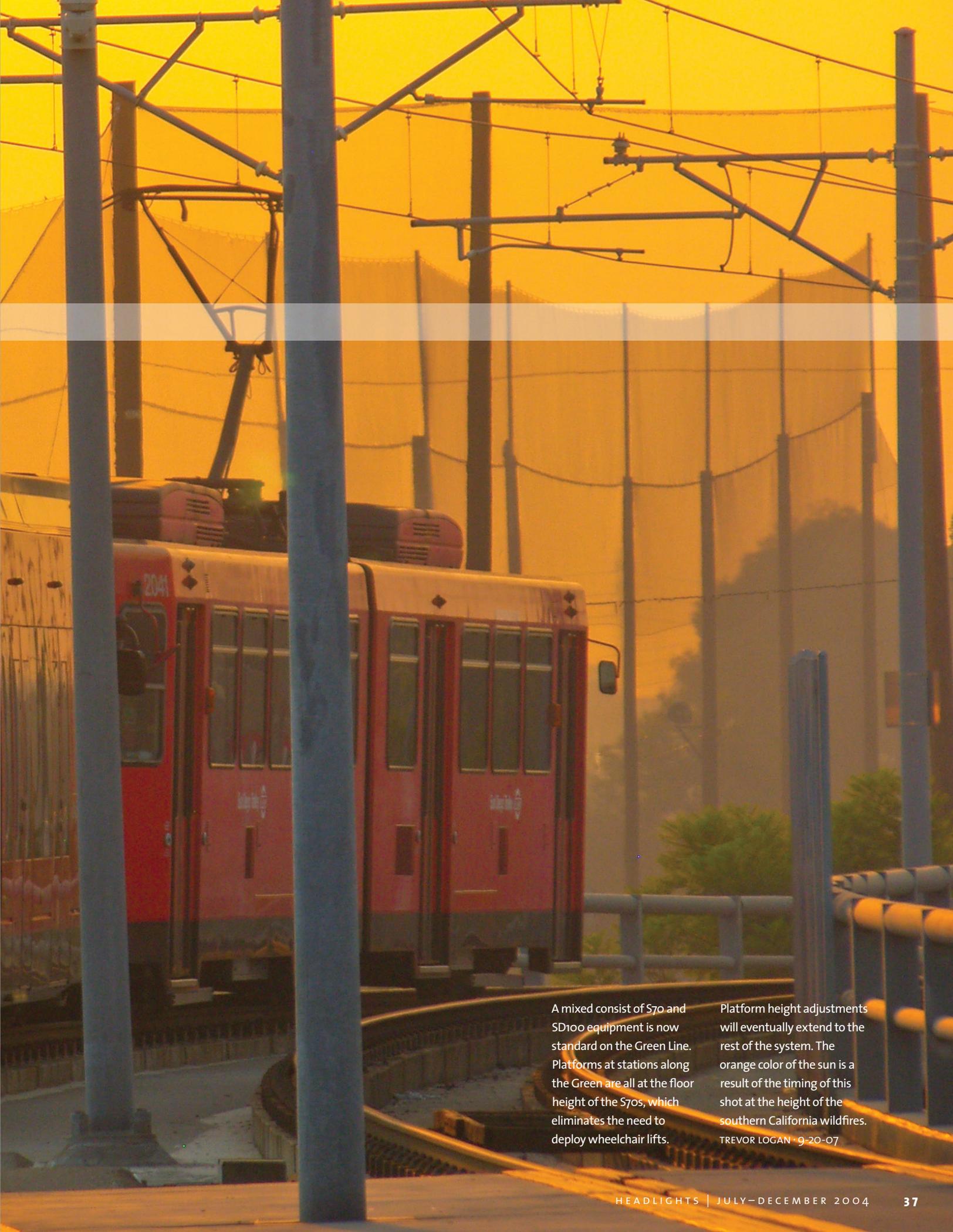
Southern Pacific 1111 pulling a northbound San Diego & Arizona Eastern freight during pre-operation service at National City 24th Street.

All freight operations began running overnight under temporal separation one month later. 6-81



# sandiegotrolleytoday

By John Pappas



A mixed consist of S70 and SD100 equipment is now standard on the Green Line. Platforms at stations along the Green are all at the floor height of the S70s, which eliminates the need to deploy wheelchair lifts.

Platform height adjustments will eventually extend to the rest of the system. The orange color of the sun is a result of the timing of this shot at the height of the southern California wildfires. TREVOR LOGAN · 9-20-07

Having started off as a largely single track system, everything now is double track, with this exception.... the short spur through the shopping center near the end of the line in Santee (right). Single track extends from the end of the Santee Station platform to just north of the Gillespie Field station, about 1.3 miles.

A reasonably short stretch, but one that largely controls the scheduling of the entire system, since the scheduling of Green Line trips must make this work while allowing for the turning back of Orange Line trains on through tracks at Gillespie Field. S70 3008 demonstrates how it is now impossible to double track this section.

JOHN PAPPAS · 10-16-05

**A**s the Trolley rolls on through its 26th year as the first US modern light rail system, it has reason to be optimistic... and concerned. As with much of transit, its parent agency, the San Diego Metropolitan Transit System (MTS), is looking at an increasingly smaller revenue stream. Capital funding has shrunk, in line with the general downturn in transit funding in California.

Fares are rising accordingly and are now among the highest in the country at \$2.25 base fare (with transfers to be eliminated in January 2008) and mileage-based zone charges on the Trolley. Infrastructure is wearing out on the original line and both track and overhead need replacing. The bill for bringing the physical plant up to a state of good repair is now well over \$100 million.

On the other hand, the Trolley has become a vital link in the transit network, carrying an average of 107,000 riders each weekday. Newer sections of the system, particularly the Green Line through the Mission Valley, were built to a high standard which should remain in good health for decades.

The following pictures tell the story of some of the more noteworthy recent developments.



The newest section of the system is Mission Valley East and was built to very high standards, as may be seen by this elevated section extending 1.6 miles from

Jack Murphy Stadium east to Grantville Station, seen at right. Two SD1000s are east-bound approaching the station on 10-16-2005.

JOHN PAPPAS



The heart of the system is still the 12th & Imperial Transfer Station (top), which is seen here full of activity on each of the three tracks. The track layout at this end of the station is scheduled

to be improved in the next few years to allow more freedom of movement, but this too awaits sufficient capital funding.  
JOHN PAPPAS · 7-27-03



The Trolley's A Yard (above) has grown several times over the years in an effort to keep up with system growth and an expanding fleet. The fleet now numbers 134 cars

which are housed here and in the smaller east "C" yard. Coaster trains are stored in the yard during the midday period on weekdays.  
JOHN PAPPAS · 10-17-05





With Mission Valley East, the Trolley acquired its first tunnel operation. The 4,000 foot bore runs under the main campus of San Diego State University with a station midway. The station is situated along the edge of

a ridge, affording the use of natural light. SD100 2001 is one of the first to be repainted in the high gloss red and sports a new orange LED headsign. TREVOR LOGAN · 9-20-07

Another view of a mixed consist train. A significant portion of the Mission Valley alignment is on elevated structure, as seen here, east of Fashion Valley Station.

TREVOR LOGAN · 10-07







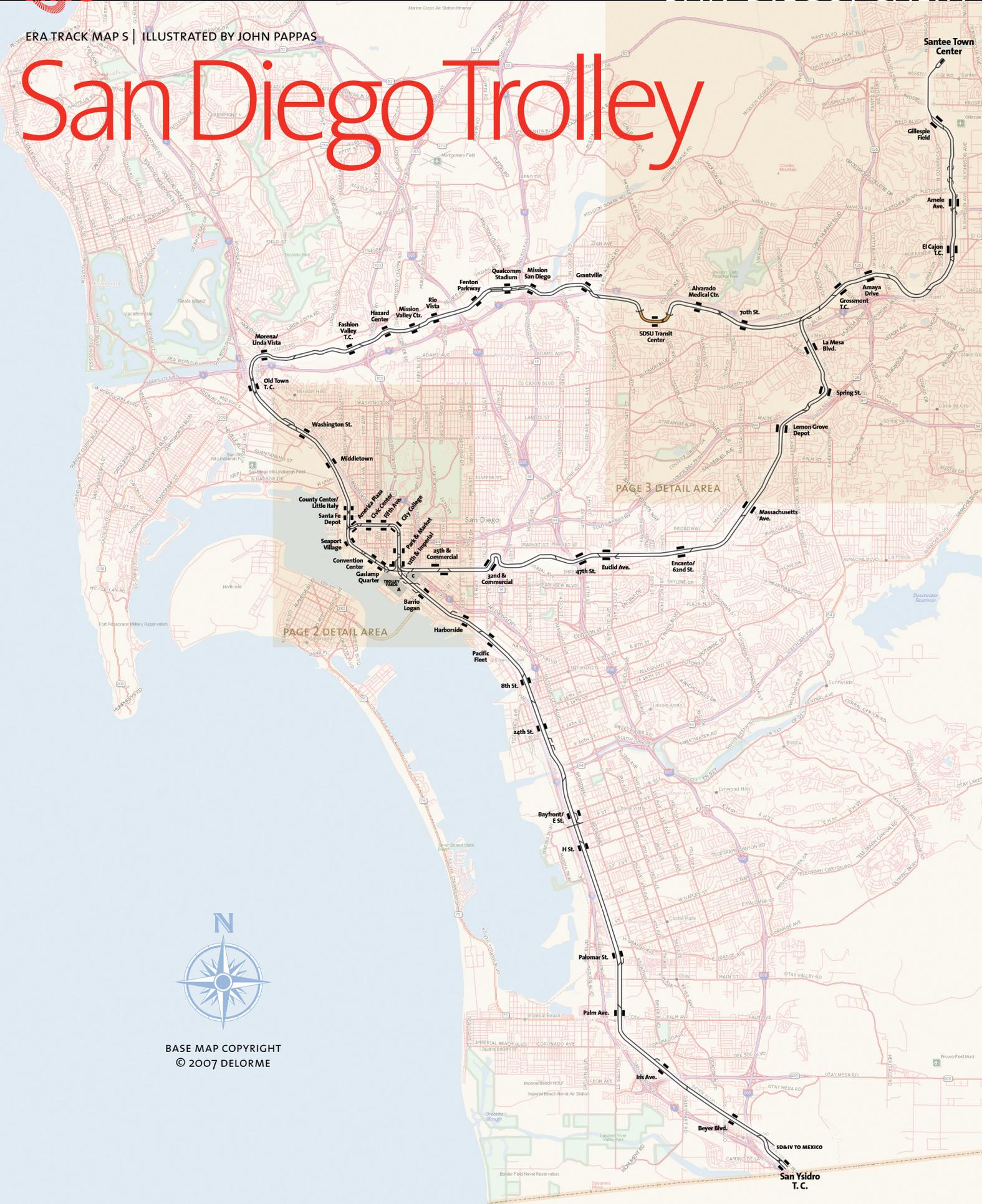


A three car train headed by 1049, waits for passengers as it heads northbound from Santa Fe station to Old Town. The shiny red paint indicates this car has been through the repainting program, which has given it a shine

much nicer than the original factory paint. It has also received the latest MTS circular logo. The bus fleet is now being painted in colors that match this red.  
TREVOR LOGAN · 9-20-07



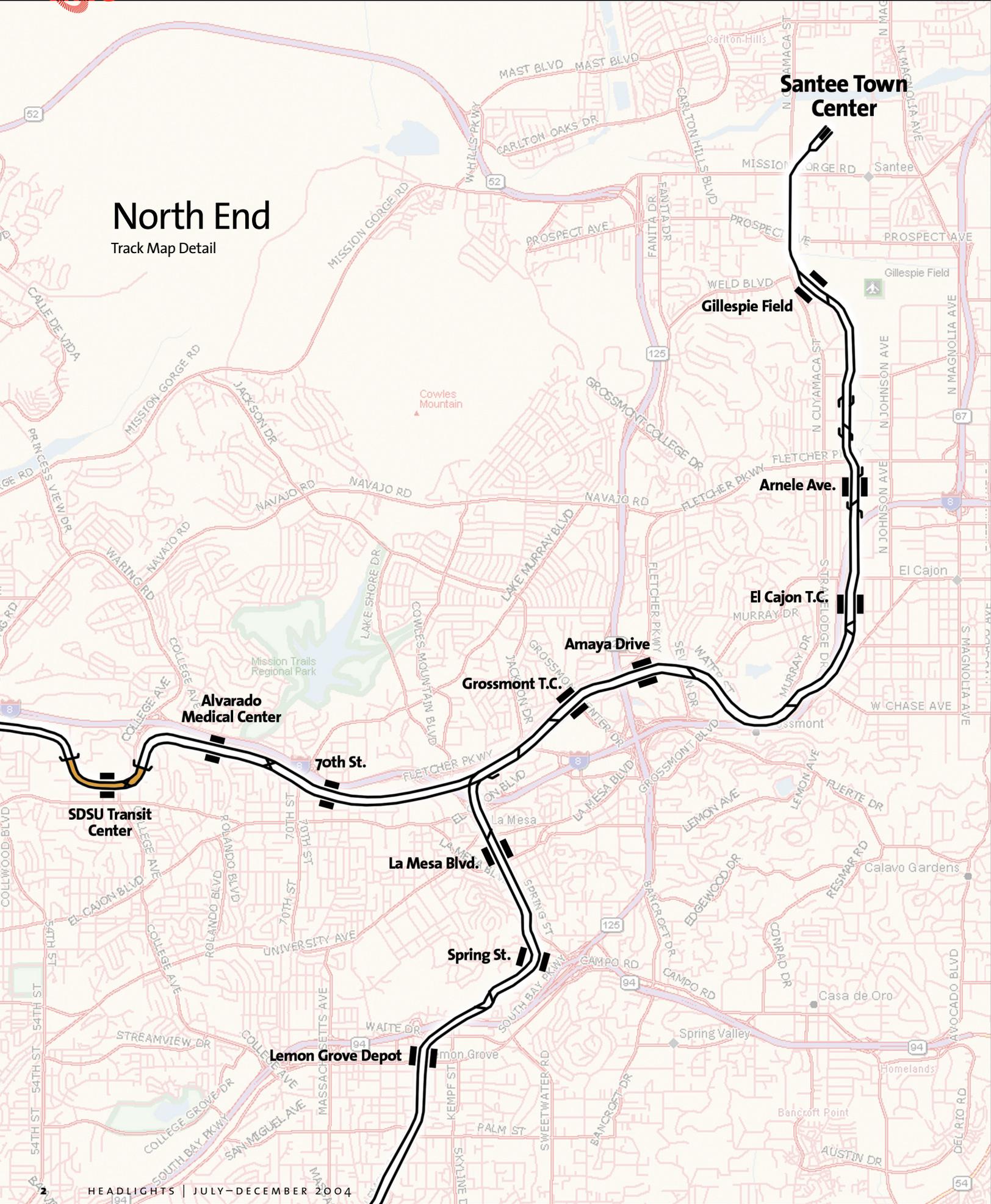
# San Diego Trolley



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# North End

Track Map Detail



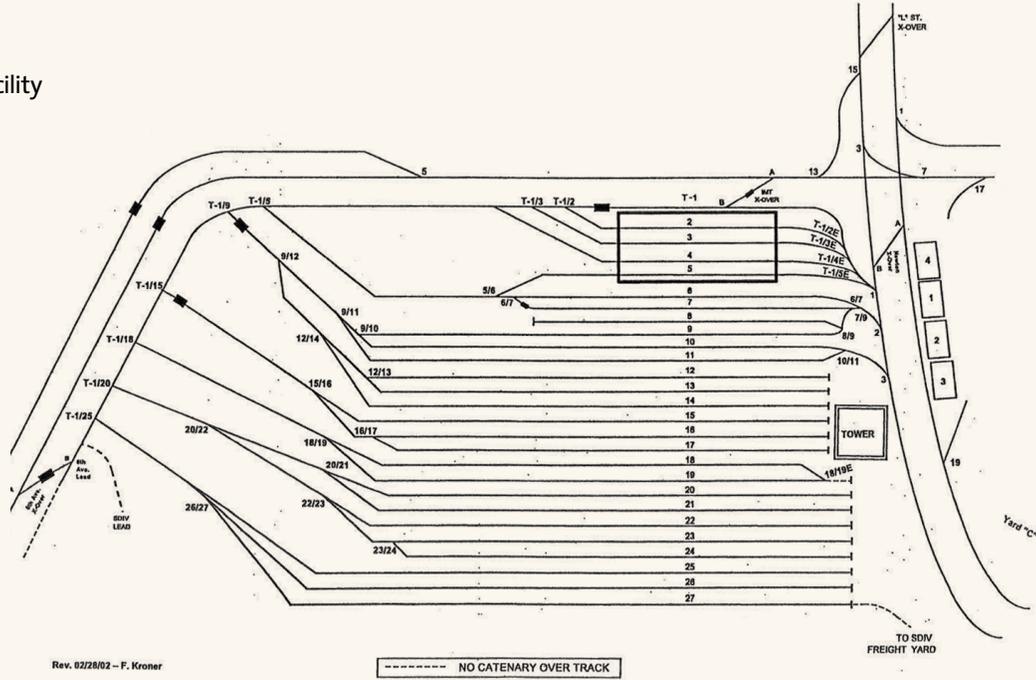


# Central Loop

Track Map Detail

## 'A' Yard

SDTI Maintenance Facility



## 'C' Yard

SDTI Maintenance Facility

