



U.S. Department of
Transportation

San Diego Trolley: The First Three Years

November 1984



San Diego Trolley: The First Three Years

Summary Report
November 1984

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Abstract

TITLE: San Diego Trolley - The First Three Years
AUTHOR: San Diego Association of Governments
SUBJECT: Selected changes in the South Bay Corridor
three years after the implementation of
the San Diego Trolley
DATE: November 1984

ABSTRACT: Since the San Diego Trolley began operation in July 1981, transit ridership has increased more than 20% in the Trolley service area, while decreasing elsewhere in the San Diego Metropolitan area.

The Trolley has had a negligible effect on automobile traffic. Similarly, no major impact on business activity or land development has been identified. This study documents the changes which have occurred.

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CHAPTER 1
SOUTH BAY TRANSIT
SYSTEM DESCRIPTION

South Bay Transit System Description

The San Diego Trolley represents a unique opportunity to study the impact of light rail transit on the modern urban environment because it is the first light rail system to be built in this country in several decades. Planned, designed and constructed by the San Diego Metropolitan Transit Development Board (MTDB), the Trolley started operation in the summer of 1981. To evaluate the impact this system has had on travel characteristics, use, and socioeconomic conditions in the area, MTDB, San Diego Trolley Inc. (SDTI), and the San Diego Association of Governments (SANDAG) have cooperated in this Guideway Monitoring Study, with funding support from the federal Urban Mass Transportation Administration (UMTA). This impact study focuses on changes in travel and land use in the area served by the Trolley.

Preliminary investigations were made in several other impact areas. Noise and Air Quality evaluations were made as part of the East Urban Corridor Environmental Impact studies, but because the impacts were minor, they are not reported here. More significantly, real estate sales information was also reviewed. At this point, no definable trends in prices have appeared, and these studies of economic impacts have not been pursued.

REGIONAL SETTING

San Diego County contains over 4,200 square miles in the extreme Pacific Southwest corner of the United States. The urbanized area lies within the western third of the region along the coastal plain and foothills. The eastern two-thirds contain mountains and desert and is, for the most part, in public ownership. San Diego is relatively isolated from the rest of Southern California, with mountains to the east, the ocean to the west and a large military reservation to the north. The southern boundary is the Mexican border. Tijuana, immediately south of the border, has a population of approximately one million persons.

In January 1984, the total population of the San Diego County region was 2.04 million persons, with over 1.5 million persons living in the southern part of the urbanized area that includes central San Diego. Population density is less than 1,500 per square mile for the southern portion of the urbanized area.

The San Diego economy has diversified significantly from the military and aerospace dominance that characterized it from the 1940s through the early 1960s. Of the 840,000 jobs in the region in 1980, 31% were military or government-related, 13% were manufacturing, 20% were tourist related, and 26% were service jobs. Employment grew by nearly 40,000 jobs between 1980 and 1983, an increase of 4.6%.

Between 1970 and 1980, San Diego County was the fifth fastest growing metropolitan area in the country. During that decade, the region's population grew by 37%, or 3.2% a year. In comparison, California grew by 1.7% a year; the nation by 1.1%. Between March 1980 and January 1984 the regional population grew by an additional 9.6%, a rate of 2.5% per year.

The San Diego Metropolitan Transit Development Board (MTDB) was created by state law in 1975, with the specific charge to plan and implement a fixed guideway system in the southern portion of the urbanized area. Within the MTDB area, there are currently five fixed-route bus operators, four taxi-based dial-a-ride services, four accessible dial-a-ride services, and one light rail service. Private jitneys, primarily serving the military, provide additional service. State law assigns MTDB the short-range planning and coordination responsibility for all of these operations, although the individual operators each carry out short-range planning for their systems. SANDAG, the Regional Transportation Planning Agency and Council of Governments, is responsible for long-range transit planning throughout the region. MTDB and SANDAG must approve funding for each of the transit operators.

The Trolley is operated by San Diego Trolley Inc. (SDTI), a separate entity created by the MTD Board specifically for that purpose. The same policy Board directs the operation of both MTDB and SDTI.

San Diego Transit Corporation (SDTC), which is owned by the City of San Diego, is by far the largest operator in the region. In addition to service within the City of San Diego, SDTC provides intercommunity service by contract to most of the other cities in the southern part of the urban area. It is the only federally funded transit operator in the MTDB area. All other bus service is provided through contracts with private-sector operators.

SAN DIEGO TROLLEY

The San Diego Trolley is classified as a light rail transit (LRT) system. The vehicles are manually operated and there is minimal grade separation. Most of the line operates in an exclusive right-of-way which is shared with freight operations. The Trolley uses overhead power pick-up and has the capability of operating on city streets, which remain open to automobile traffic.

Route Description

The Trolley system is 15.9 miles in length, operating between Centre City San Diego and the International Border with Mexico at San Ysidro. The location of the Trolley route in relationship to the region is shown on Figure 1. It operates on existing streets for a distance of 1.7 miles in Centre City. In Centre City, the vehicles travel at-grade on an exclusive, reserved path typically in the center or at one side of the street. There are seven "stops" within Centre City with approximately quarter-mile spacing.

For approximately 14 miles, the system operates on the rehabilitated main-line facilities of the San Diego and Arizona Eastern (SD&AE) Railway. All grade crossings are protected by automatic crossing gates which are activated by approaching light rail and freight trains. Although service was initiated as a single track operation, a double track system has been operating since February 1983.

Near the southern terminus, the Trolley re-enters a public street right-of-way, to directly serve the international border crossing.

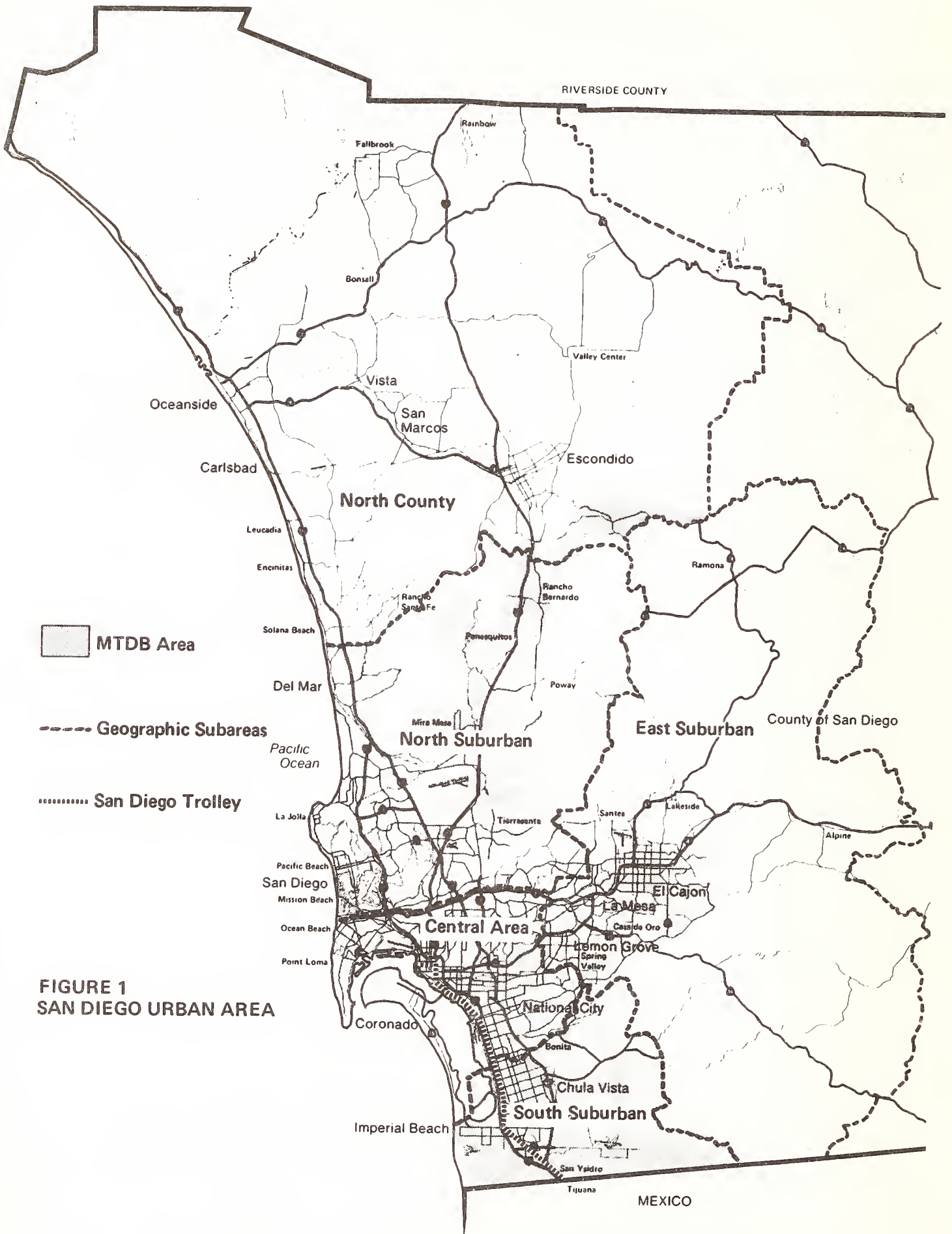
The 11 suburban stations are modest, low-level platforms with a waiting shelter, benches, light standards, transit information, ticket machines, public telephones, and trash receptacles. Except for the International Border facility, the stations are not manned, and no restroom facilities are provided. A television surveillance system is monitored by the Trolley central controller. Approximately 2,000 free parking spaces are provided at six suburban stations. All suburban stations have pedestrian access, bus access, and bicycle storage facilities. Local bus routes and schedules have been modified to provide feeder service to the Trolley.

Operating Characteristics

The operating plan for the San Diego Trolley has been modified several times in the three years since the system opened for revenue service. These changes have been evolutionary in character, dictated by service demand in the corridor as well as the continuing construction activities associated with Trolley systems improvements.

The initial operations plan envisioned five two-car trains operating at 15-minute headways, with four cars held in reserve. After several days of operation, it became clear that the system could not meet this schedule with a reasonable level of reliability. This condition was largely created by the single track operation of the system. In addition, construction activities required slow-orders on several portions of the line in the South Bay. In order to establish a good reliability record, operations were adjusted in mid-August 1981, as shown in Table 1. Service was reduced to twenty-minute headways and the scheduled travel time increased by 12 minutes. Service was also extended later into the evening.

Construction for double-tracking the line began in December 1981 and was completed in February 1983. During this timeframe, when various track sections were converted to double track from the single track configuration, it was frequently necessary to temporarily suspend trolley service over a short portion of the line during the late evening and provide supplemental bus service to sustain the required headway. Similarly, between September 1982 and December 1983, supplemental bus service was provided during the conversion from single to double track when the Coronado Avenue grade separation project was undertaken.



**FIGURE 1
SAN DIEGO URBAN AREA**

TABLE 1
OPERATING CHARACTERISTICS
SAN DIEGO TROLLEY

<u>Date Implemented</u>	<u>Headway</u>	<u>Travel Time</u>	<u>Hours of Service</u>	
			<u>Begin</u>	<u>End</u>
July 1981	15	33	5:00 AM	9:00 PM
August 1981	20	45	5:00 AM	10:00 PM
December 1981	20	43	5:00 AM	10:00 PM
February 1983	15	42	5:00 AM	11:00 PM
July 1983	15	42	5:00 AM	1:00 AM
December 1983	15	40	5:00 AM	1:00 AM

Following the completion of the double-tracking of the system in January 1983, 15-minute headways, later night-time service and slightly shorter travel times were implemented in February 1983. As noted in Chapter 2 of this report, the reduced headways introduced a period of sustained ridership growth which continued through fiscal year 1984. In December 1983, the last slow-order at the Coronado grade separation project was removed, and travel times were further reduced.

Since early 1983, a fleet of 24 Siemens-Duweg U2 light rail transit vehicles has been used to provide transit service. Initially, service was provided with only 14 vehicles. Trains consisting of two cars in the base period and three cars in the peak are currently being used, with six trains in operation at most times. A fourth car is occasionally added south of the Imperial Station to handle peak loads south of Centre City. One-car trains are common in late night service. Each articulated vehicle has a practical capacity of 150 passengers and is equipped with one wheelchair lift. Wheelchair service has been problematic because of equipment malfunctions, with fully-accessible service provided on half-hour intervals since the summer of 1984.

The Trolley operates seven days per week. On weekdays, 139 runs are scheduled at 15-minute headways between 5:00 a.m. and 8:00 p.m.; half-hour headways until 10:00 p.m.; and hour headways until 1:00 a.m. On weekends, half-hour headways are scheduled for early morning trips. The average system speed through Centre City is nine miles per hour. Along the railway portion of the right-of-way, the trains average about 30 miles per hour. Overall speed is 24 miles per hour with the running time from end to end 30 minutes less than the running time of the previous local bus service on San Diego Transit (SDTC) route 32. Trolley service is only slightly faster than former SDTC Express Route 100. However, Route 100 did not extend all the way to San Ysidro and operated on half-hour headways in the peaks, hour headways in the mid-day period. Route 100 also made fewer stops than the Trolley.

The Trolley uses a self-service barrier-free, fare collection method. Self-service "vendomat" machines are used by the passengers to purchase a single ride ticket, or validate a multiple-ride ticket before boarding the train. No fare payment or ticket collection is made on the LRT vehicle. However, passengers are subject to inspections by roving ticket inspectors to assure that a ticket purchase was made. Based on periodic on-vehicle surveys, fare payment violation rates are

estimated at less than 1%. Until July 1, 1984, the base one-way fare for the Trolley was \$1.00, with travel within Centre City costing \$0.25. Reduced senior/handicapped fares, a monthly regional pass, and multiple-ride tickets were available.

In July 1984, a distance based fare system was introduced on the Trolley, with the maximum fare raised from \$1.00 to \$1.50. This maximum fare only applies for terminal-to-terminal trips. The minimum base fare on the system is now \$.50 and applies within the Centre City as well as for trips between adjacent stations in the suburban area. Base fares of \$.75, \$1.00 and \$1.25 are charged for intermediate length trips. Reduced senior/handicapped fares, a monthly regional pass and multiple-ride tickets are still available. One objective of this new fare structure is to encourage additional shorter trips in the suburban area. Another objective is to make the fare structure more equitable by relating it to trip distance.

Operating Statistics

The increase in Trolley ridership has been accompanied by a parallel increase in SDTI personnel, operating cost and car service miles. However, as shown in Table 2, there has also been an overall improvement in the efficiency of Trolley operations. Fiscal year (FY) 1982 operating costs were actually less than the pre-operation estimate of \$3.7 million. Farebox revenues are again close to 80% of operating costs after a dip in the second year of operations. The new fare structure is designed to improve the farebox recovery rate in FY85.

TABLE 2
OPERATING COST AND STATISTICS
SAN DIEGO TROLLEY

	<u>FY82</u>	<u>FY83</u>	<u>FY84</u>
Car Service Miles (000)	1,005	1,266	1,613
Revenue Passengers (000)	3,516	3,760	4,845
Operating Cost (000)	\$3,380	\$4,101	\$4,963
Farebox Recovery Rate	81.3%	74.1%	79.7%
Total Employees	70.5	78.5	82.0
Administrative/Supervisory	21.5	25.5	27.0
Drivers	20.5	24.0	26.0
Maintenance	28.5	29.0	29.0
Car Service Mile (000)/Employee	14.3	16.1	19.7
Train Service Hour/Employee	403.6	387.0	415.1
Operating Cost/Car Service Mile	\$3.36	\$3.24	\$3.08
Operating Cost/Revenue Passenger	\$.96	\$1.09	\$1.02

Sources: 1982, 1983, SANDAG, Transit Operational and Performance Data
1984, San Diego Trolley Inc.

Project Cost and Funding

The light rail project was developed in two phases. The original Phase 1 project included all those activities required to implement a 15.9 mile single-track LRT system utilizing 14 light rail vehicles. Phase 2, which was completed in January 1983, involved the complete double-tracking of the LRT line, additional traction power equipment, and the purchase of 10 additional vehicles. System capital costs, shown in Table 3, are based on the actual contract costs for the system which were executed primarily between 1977 and 1979. These costs include the full purchase price of the SD&AE Railway, including the right-of-way for the proposed East Line Corridor transit project, and main line trackage in eastern San Diego County. The original estimated Phase 1 construction and finance cost was \$86 million.

TABLE 3

CAPITAL COST
SAN DIEGO TROLLEY
(Contract cost in thousands)

<u>Phase 1</u>	
Vehicles (14)	\$11,800
Construction and Other Procurement Contracts	39,300
SD&AE Acquisition	18,100
Non-SD&AE Right-of Way	4,100
Engineering and Construction Management	7,600
Interest on Fund Advances	<u>700</u>
Phase 1 Total:	\$81,600
<u>Phase 2</u>	
Double Tracking	\$23,300
Vehicle Purchase (10)	9,600
Additional Traction Power	<u>3,100</u>
Phase 2 Total:	\$36,000
GRAND TOTAL	\$117,600 =====

SOURCE: Metropolitan Transit Development Board, December 1982.

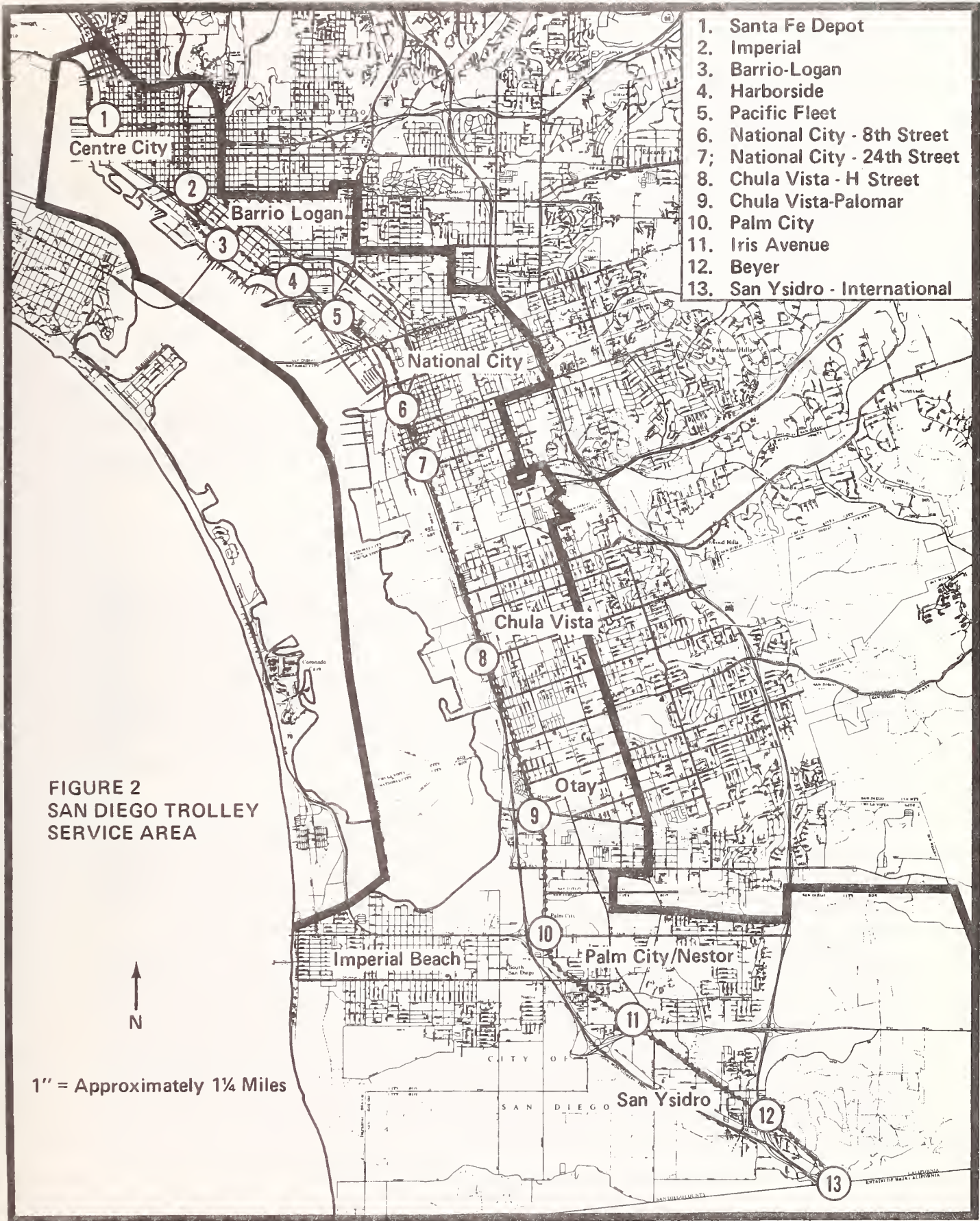
Nearly 90% of the capital funding for the Phase 1 (single-track) project was derived from state gas tax revenues. Phase 2 and the remainder of Phase 1 funding was obtained from state sales tax revenues.

SERVICE AREA DESCRIPTION

The Trolley Corridor includes Centre City (or downtown) San Diego on the north, and extends to the Mexican Border on the south. This corridor contains several major existing employment centers, including Centre City San Diego and bayfront industrial areas. It also contains suburban residential areas and a significant amount of agricultural land. The service area shown on Figure 2 is drawn on Census Tract boundaries, generally one mile from the Trolley alignment in the northern portion of the corridor but including the City of Imperial Beach and the entire South San Diego area the more isolated, southern end of the corridor. Within this service area, there is a population density of 5,400 persons per square mile, several times the regional density.

Travel Characteristics

Of the 8.3 million person-trips in the region each day, 1.2 million, or 14.5%, occur within the Trolley corridor. In 1980, approximately 3.6% of all trips within the corridor were on transit, twice the mode split of the region.



Of a total of 272 miles of freeway in the region, 25.8 miles are located within the corridor. There is no severe freeway congestion in the corridor, and only one area of moderate congestion is caused by a narrowing of the Interstate 5 freeway to cross the Sweetwater River. Severe congestion is defined as facilities which are more than 30% over capacity; moderate congestion is defined as facilities 10% - 30% over capacity.

The most unique aspect of travel in the South Bay is the International Border crossing at San Ysidro. On a typical weekend day, over 52,000 persons cross the border from Mexico. San Diego County residents account for 38.7% of those people crossing the border. A total of 31.4% are residents of Tijuana, and an additional 3.1% are residents from other parts of Mexico. Based on 1979 survey data, approximately 12% of those persons crossing the border used transit for at least a portion of their trip in the United States.

Land Use

The light rail corridor impact area covers 38 square miles. In 1980, the primary land use was residential (31.2%), followed by agriculture (13.3%), and manufacturing (12.7%). A significant amount of agriculture land is in close proximity to the Trolley alignment and the opportunity exists for increases in land use intensity throughout the corridor.

Demographic Characteristics

Over 20% of the region's civilian work force is employed in the study area, with over seven percent of regional employment in the Centre City area. The second largest employment center in the corridor is immediately south of Centre City, near the Harborside Trolley station. Between 1980 and 1983, employment in the corridor grew at about twice the rate of the region as a whole. National City and Central San Diego grew by nearly three times the regional rate of 4.6%, while employment in the southern portion of the service area showed a slight decline. Outside of Centre City, employment in the Trolley corridor grew by less than 2%. A large part of the decreases are attributed to the reduction of employment at several large facilities.

Approximately 18% of those employed in the impact area are in the military; local governments and retail trade both employ 12% of the workers. Military employment is heavily concentrated near the Pacific Fleet station; manufacturing employment is concentrated near the Harborside station and at a single Chula Vista industry, which is located within walking distance of a light rail station.

The 204,900 people living in the South Bay Corridor occupy 69,700 housing units. More than 50% of these are single-family dwellings. The average household size in the study area is 2.8 persons, which is slightly above the regional average. As shown in Table 4, population in the Trolley impact area grew by approximately 16,000 persons, or more than 8% between 1980 and 1984. Much of this growth is attributed to single family housing development near the Palm City and Beyer stations, as well as redevelopment in the Centre City community. Growth in National City is primarily attributed to increased Navy personnel.

TABLE 4
 POPULATION GROWTH
 SAN DIEGO TROLLEY IMPACT AREA
 1980 - 1984

<u>Community</u>	<u>1980</u>	<u>Total Population</u>	
		<u>1984</u>	<u>% Change</u>
Centre City	9,300	10,800	16.1
Barrio-Logan	22,500	23,500	4.4
National City	28,900	33,300	15.2
Chula Vista	23,600	24,600	4.2
Otay	23,800	25,200	5.9
Palm City/Nestor	24,200	27,200	12.4
San Ysidro	34,000	36,500	7.4
Imperial Beach	22,700	23,900	5.3
Total (Impact Area)	188,900	204,900	8.4
Regional Total	1,861,800	2,040,900	9.6

In 1980 females comprised a lower percentage (48.0%) of the population in the corridor than in the region as a whole (49.1%), reflecting the high military presence in the area. Residents of the study area tend to be younger than the population of San Diego County, with more than 48% of the study area population under 25 years old. Within San Diego County, less than 43% of the residents fall into this age bracket.

A total of 81.3% of the residents of San Diego County are white, compared to only 64.0% of the study area population. Hispanics comprise 41.3% of the total population in the study area, compared to less than 15% regionwide.

SOUTH BAY BUS SERVICE

Major South Bay bus service changes were implemented at the same time that the Trolley began revenue service. The thrust of these changes was primarily to provide coordination with the Trolley which assumed the line-haul function in the corridor. San Diego Transit Corporation (SDTC) routes were most changed, although a significant restructuring of the National City Transit (NCT) system also occurred in July 1981. Since 1981, the only major change has been the implementation of the Strand Express Agency (SEA) service between Coronado and downtown San Diego. This service replaced a portion of a San Diego Transit route which was primarily outside of the Trolley corridor.

Table 5 summarizes the level of bus service provided in the South Bay, expressed in scheduled revenue miles. Scheduled miles for the three smaller operators has increased over the last three years; service on San Diego Transit has decreased. The reduction of services on SDTC route #33 is the only case of feeder service reduction in the South Bay, and can be attributed, in part, to competition from the Strand Express service.

TABLE 5
 SCHEDULED BUS REVENUE MILES
 SOUTH BAY AREA
 (In Thousands)

<u>Operator/Route</u>	<u>FY81</u>	<u>FY84</u>	<u>% Change</u>
San Diego Transit			
29	707	616	- 12.9
32	900	255	- 71.7
33	207	172	- 16.9
51	68 *	0	-100.0
100	180	0	-100.0
Chula Vista Transit (all)	488	510	+ 4.5
National City Transit (all)	235	308	+ 31.1
Strand Express (all)	<u>132</u>	<u>416</u>	<u>+215.2</u>
TOTAL	<u>2,917</u>	<u>2,277</u>	<u>- 21.9</u>

*FY80 data: last full year of service.

Sources: SANDAG, "Transit Operational and Performance Data"; Transit Operators FY85 Funding Claims
 SDTC, "Five Year Plan Update", FY81-85 and FY85-89 (draft).

San Diego Transit.

SDTC line-haul routes were either eliminated or sharply curtailed as shown in Table 5. Express route 100, which connected Centre City with the Imperial Beach/Palm City area was eliminated. Route 29 was restructured to eliminate service to the National Steel and Shipbuilding facility south of Centre City and the 32nd Street Naval Station, now served by the Trolley. It continues to provide parallel service to the Trolley from the Iris Avenue station to Centre City. Route 32, which had been the major route in the South Bay, was restructured to provide more local service in the San Ysidro area and headways doubled. It no longer provides service into Centre City, initially terminating at the National City-24th Street Station. Since July 1983, route 32 has terminated at the Chula Vista-H Street Station. Route 51, which provided local service in San Ysidro, stopped operating in April 1981 because of lack of funding, low ridership and low overall performance. Route 33 was rerouted slightly to serve the Palm City Transit Station.

Table 6 shows the farebox recovery rates of the South Bay-San Diego Transit routes. Prior to the beginning of Trolley service, route 32 was the highest rated SDTC route, and had the highest farebox recovery rate of the SDTC system. In its new role as a local route, the route's farebox recovery rate dropped to the system average and its overall rating is now slightly below a standard adopted by SDTC in its route evaluation. Route 29, which also serves the Point Loma area north of Centre City, now has the highest overall rating in the SDTC system. It was rated

third in FY81. Although the farebox recovery rate of route 33 has improved, its overall rating remains among the lowest in the SDTC system.

TABLE 6
SAN DIEGO TRANSIT FAREBOX RECOVERY
SOUTH BAY AREA

<u>Route</u>	<u>Farebox Recovery</u>	
	<u>FY81</u>	<u>FY84</u>
29	54%	47%
32	72%	41%
33	21%	26%
51	17%	n.a.
100	33%	n.a.
Adopted Standard	30%	40%
System Average	39%	41%

Source: San Diego Transit Corp., "Five Year Plan Update, FY81-85 and FY85-89 (Draft)

National City Transit (NCT).

NCT began service in 1979, replacing a portion of a since-discontinued SDTC route. The initial system was composed of two suburban routes and a central area shuttle-route. In July 1981, the shuttle route was discontinued and the two remaining routes were restructured and rescheduled to coordinate with Trolley service at the 24th Street station. Only minor changes including a small fare increase have been made since 1981. Since FY81, however, the fare box recovery rate for NCT has improved significantly, as shown in Table 7.

TABLE 7
SOUTH BAY FAREBOX RECOVERY

<u>Operator</u>	<u>FY81</u>	<u>FY84</u>
Chula Vista Transit	14.9%	21.7%
National City Transit	10.5%	28.0%
Strand Express Agency	11.7%	44.4%
San Diego Transit (system total)	39.0%	41.0%

Source: SANDAG, "Transit Operational and Performance Data", Transit Operator's FY85 Funding Claims.

Strand Express Agency (SEA).

The SEA also began revenue operation in 1979, providing service between south San Diego and North Island Naval Air Station by way of Imperial Beach and Coronado. The route was realigned slightly in July 1981 to serve the Palm City Trolley station. In July 1982, SEA began service between Coronado and Centre City San Diego, replacing the southern portion of San Diego Transit route 9. While the ridership and performance of the original Strand service is significant, the major improvement in farebox recovery is attributed to the Centre City service.

Chula Vista Transit (CVT).

CVT, also known as South Coast Organization Operating Transit (SCOOT), has had to undertake only minor system changes to accommodate Trolley operations. The major system transfer point was moved several blocks west to the H Street Station and levels of service increased slightly.

CHAPTER 2
TRANSIT RIDERSHIP

Transit Ridership

Unquestionably, ridership levels are the most visible change which have occurred in the South Bay since the introduction of the Trolley. Although the initial overall ridership gains were minor, there has been a substantial increase in patronage over the past three years. This increase is especially significant in relationship to the nearly 20% decrease in transit ridership in areas outside of the Trolley service area. The Trolley has also been successful in attracting "choice" riders, while continuing to meet the travel needs of the transit dependent.

TROLLEY RIDERSHIP

MTDB staff estimated initial Trolley ridership would be just under 10,000 passengers a day based primarily on previous corridor ridership. As shown on Figure 3, initial ridership was 13,000 a day. After the initial month of operation, ridership dropped to approximately 11,000 daily riders and remained below 12,000 riders per day until the following summer. Second-year ridership was consistently less than the first year until March of 1983. In February 1983, headways were reduced from 20 minutes to 15 minutes, and running time was also reduced. Since July 1983, patronage has been at least 2,500 riders per day above the previous year's Trolley ridership. The annual pattern of ridership is also evident from Figure 3. Ridership is highest during the summer tourist season, dropping precipitously in September, and building slowly from January through the spring.

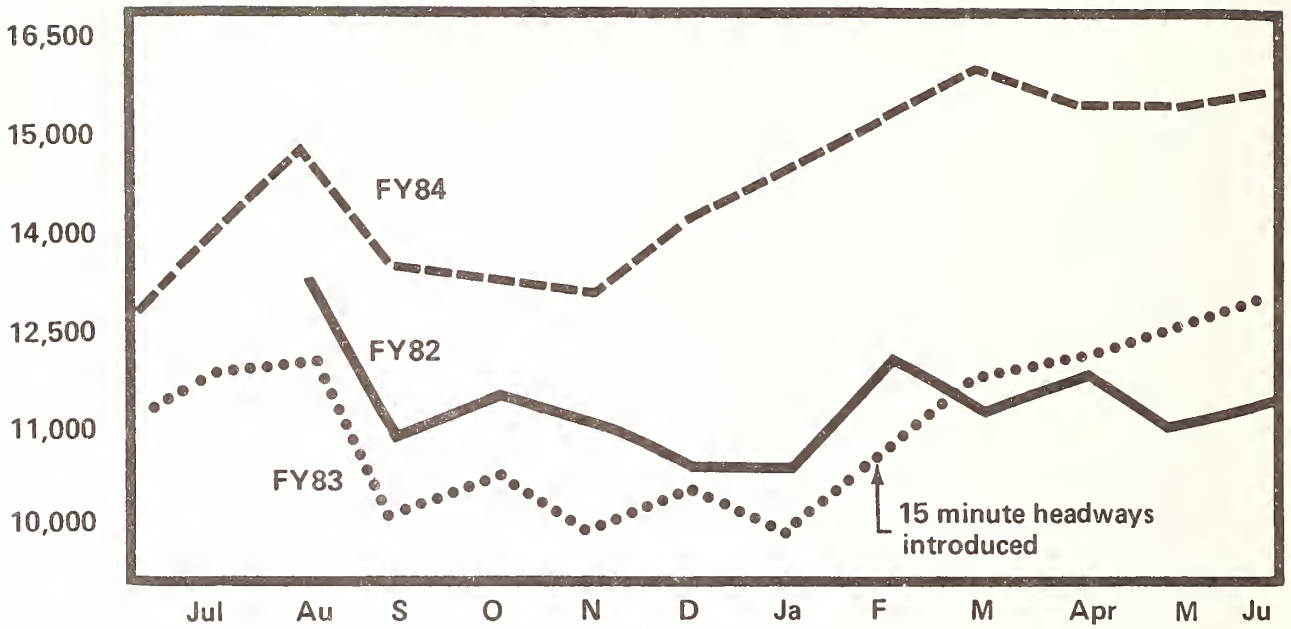
Ridership by Day of the Week

Because the Trolley is heavily used by tourists and Mexican residents, weekend travel is relatively high when compared to weekday travel. Until recently, Saturday ridership has been higher than weekday ridership by a significant amount. Average daily ridership is shown in Figure 4 for March 1982, 1983 and 1984. The trend indicates that the difference between weekday and Saturday ridership appears to be narrowing, with Sunday ridership remaining about 20% below Saturday levels. This reduction, along with other factors discussed later, indicates that the Trolley is acquiring the characteristics of a more traditional transit operation.

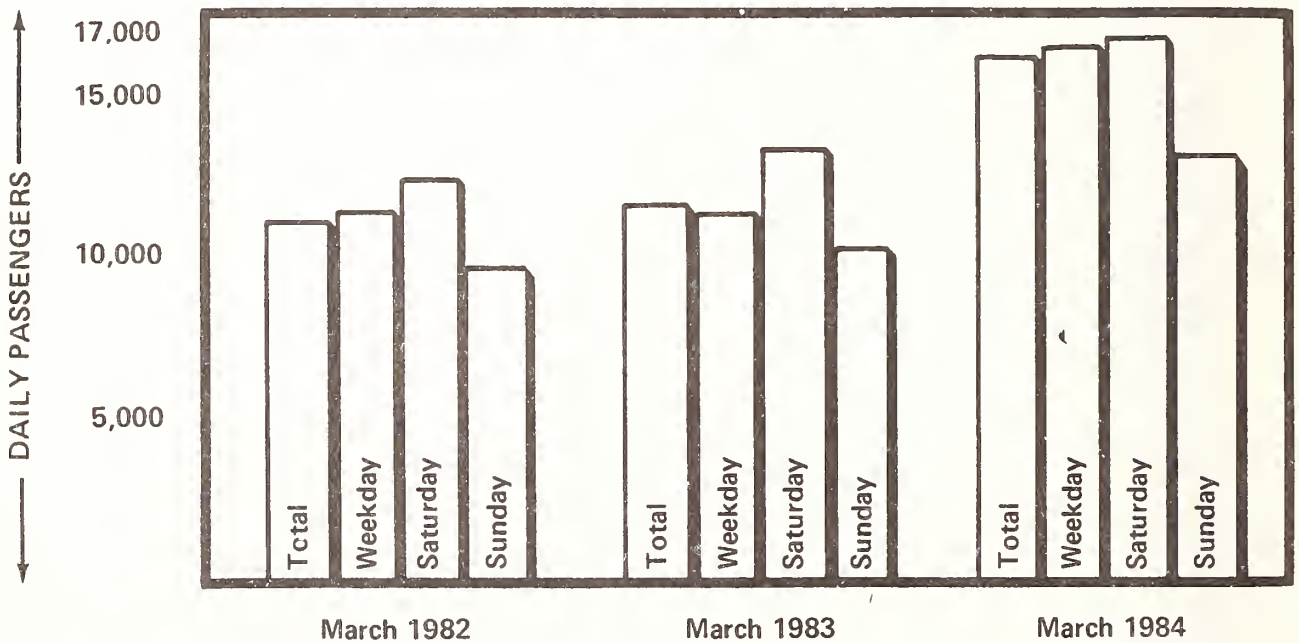
Selected Trolley Characteristics

One of these other factors is trip length. On San Diego Transit, the average transit trip is less than five miles. As shown in Table 8, the average trip length on the Trolley is over eight miles, similar to the 8.3 mile trip-length on former SDTC route 100. In 1981, before the Trolley began operation the average trip length on SDTC route 29 was five miles; on route 32 it was 6.4 miles. By the most recent counts in 1983, trip lengths had changed to 5.2 miles on route 29; 3.5 miles on route 32. Local routes in the South Bay had average trip lengths ranging from two to four miles. The Trolley trip length has decreased since the first survey

**FIGURE 3
AVERAGE DAILY RIDERSHIP
San Diego Trolley
July 1981–May 1984**



**FIGURE 4
COMPARISON OF WEEKDAY, SATURDAY AND SUNDAY RIDERSHIP
San Diego Trolley**



conducted in October 1981. The longer trip length is probably influenced by the fact that the maximum (\$1.00) fare is charged for all trips outside the Centre City. Shorter trips will be probably result from the new, distance-based fare structure implemented on July 1, 1984.

Also of note in Table 8 is the fact that passengers per mile have increased, even though shorter train headways have been introduced. Trolley passengers have increased at a faster rate than service miles.

TABLE 8
SELECTED TROLLEY CHARACTERISTICS
1981-1984

<u>Characteristics</u>	<u>10/81</u>	<u>10/82</u>	<u>2/84</u>
Daily Passenger Miles (000)	97.3	89.8	149.3
Average Trip Length	8.8	8.5	8.3
Passengers/Mile	7.5	7.1	8.3
% Miles over Capacity	8.1	6.4	8.2

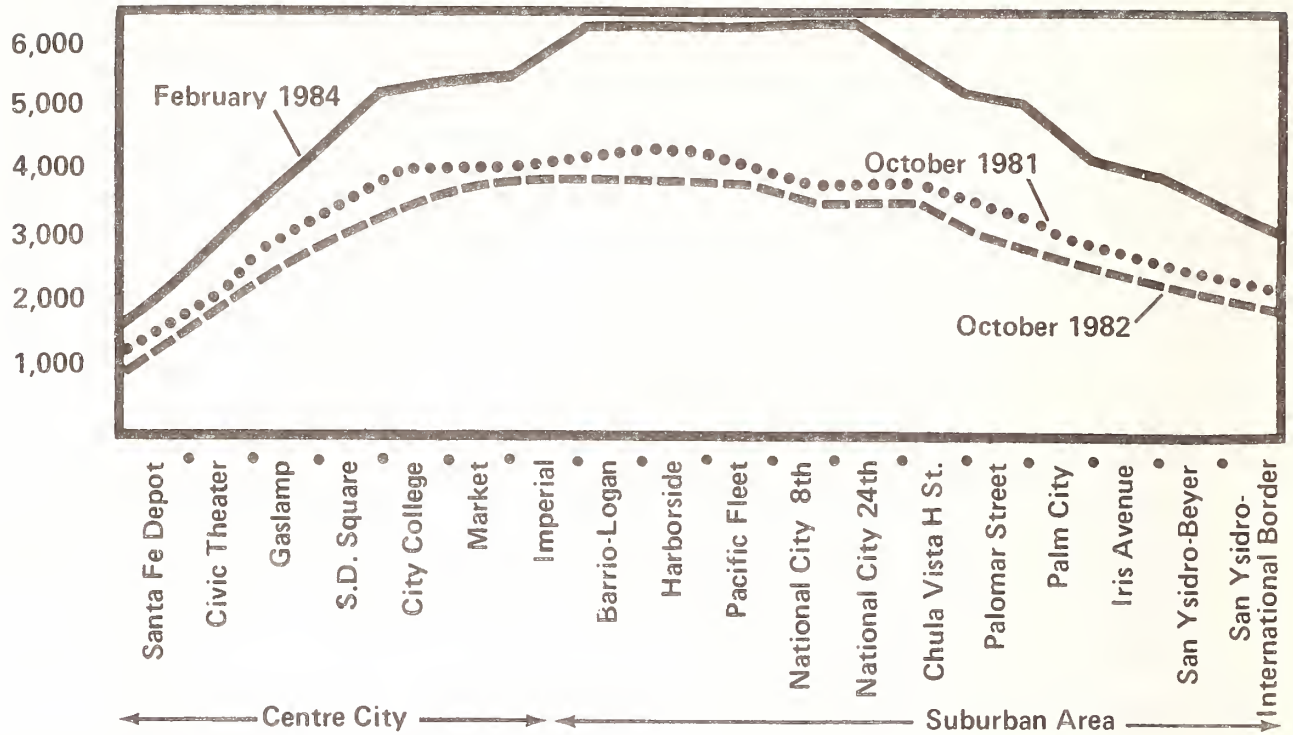
Source: SANDAG Passenger Counting Program

Station Activity

The SANDAG Passenger Counting Program provides the number of persons, by direction, boarding and alighting from the Trolley at each station. Since it opened, the Trolley has been "counted" three times: October 1981, October 1982, and February 1984. Given the unique characteristics of the San Ysidro Border Station, it accounts for nearly 20% of the trip ends on the Trolley. This station is located adjacent to the Border Gate, which accommodates 52,000 persons crossing into the United States each day. Approximately 20% of these individuals are on foot. The seven Centre City stations account for nearly 40% of the Trolley trip ends, although no single stop has the total volume of activity of the Border Station. The northern terminus, the Santa Fe Depot, is the second busiest station; H Street in Chula Vista is the third busiest station.

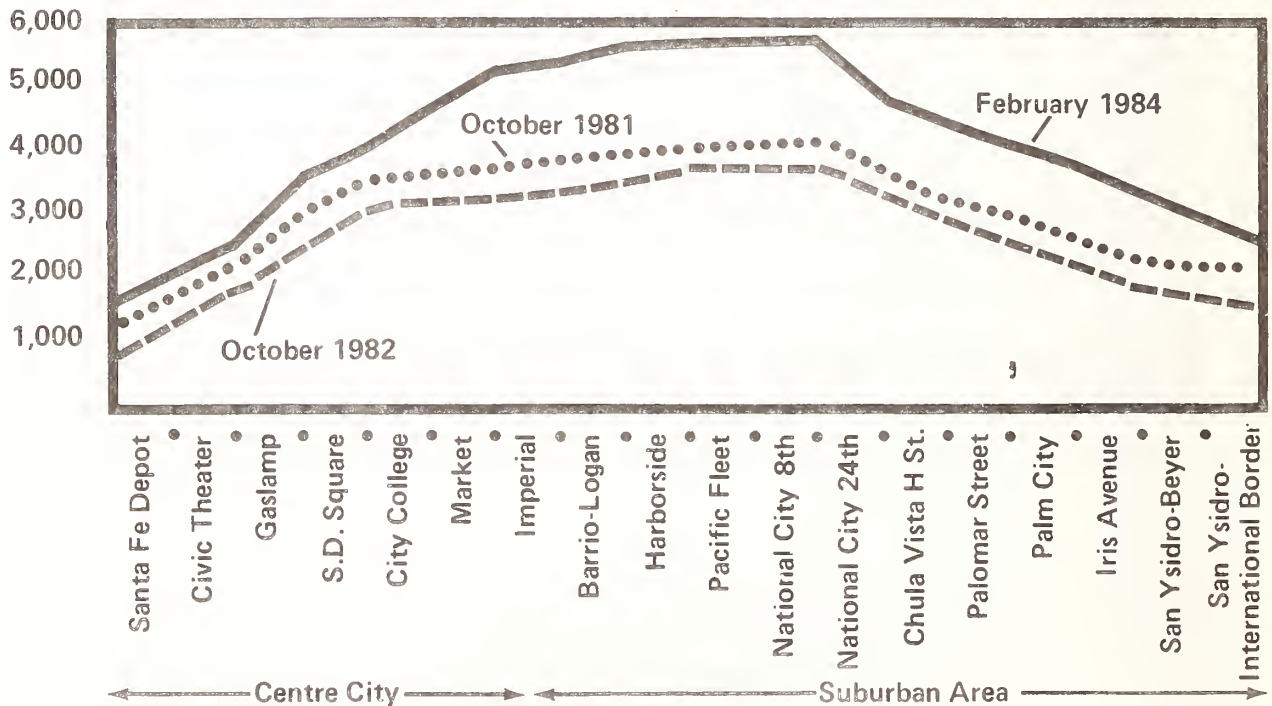
As shown in Table 9, station activity within the Central Business District (C Street) and at the Border is growing more slowly than overall ridership. Major increases are occurring at the suburban stations from 24th Street to Beyer Boulevard. The Barrio Logan station, with no parking and somewhat removed from activity centers, had the lowest level of activity and the slowest rate of growth.

FIGURE 5
DAILY PASSENGER LOADINGS – INBOUND
San Diego Trolley



Source: SANDAG Passenger Counting Program

FIGURE 6
DAILY PASSENGER LOADINGS – OUTBOUND
San Diego Trolley



Source: SANDAG Passenger Counting Program

TABLE 9

TROLLEY STATION ACTIVITY
Total Boardings and Alightings

<u>Station</u>	<u>10/81</u>	<u>10/82</u>	<u>2/84</u>	<u>% Increase</u>
San Ysidro-International	4,430	3,724	6,833	54.2
Beyer	547	580	1,169	113.7
Iris Avenue	711	904	1,482	108.4
Palm City	1,084	1,045	1,896	74.9
Chula Vista-Palomar	958	963	1,722	79.7
Chula Vista - H Street	1,993	1,893	3,342	67.7
National City-24th Street	1,136	1,215	2,202	93.8
National City-8th Street	626	602	989	58.0
Pacific Fleet	1,283	1,134	1,633	27.3
Harborside	359	602	908	152.9
Barrio Logan	365	274	440	20.5
Imperial	306	405	934	205.2
Market	653	720	1,144	75.2
City College	1,171	1,300	2,207	88.5
S.D. Square	792	777	1,157	46.1
Gaslamp	1,751	1,624	2,419	38.1
Civic Theater	1,553	1,551	2,159	39.0
Santa Fe Depot	2,356	1,917	3,434	45.8
 SYSTEM TOTAL	 21,996	 21,168	 35,786	 62.7
 Centre City (Total)	 8,582	 8,294	 13,454	 56.8
C Street (Total)	7,623	7,169	11,376	49.2

Source: SANDAG Passenger Counting Program

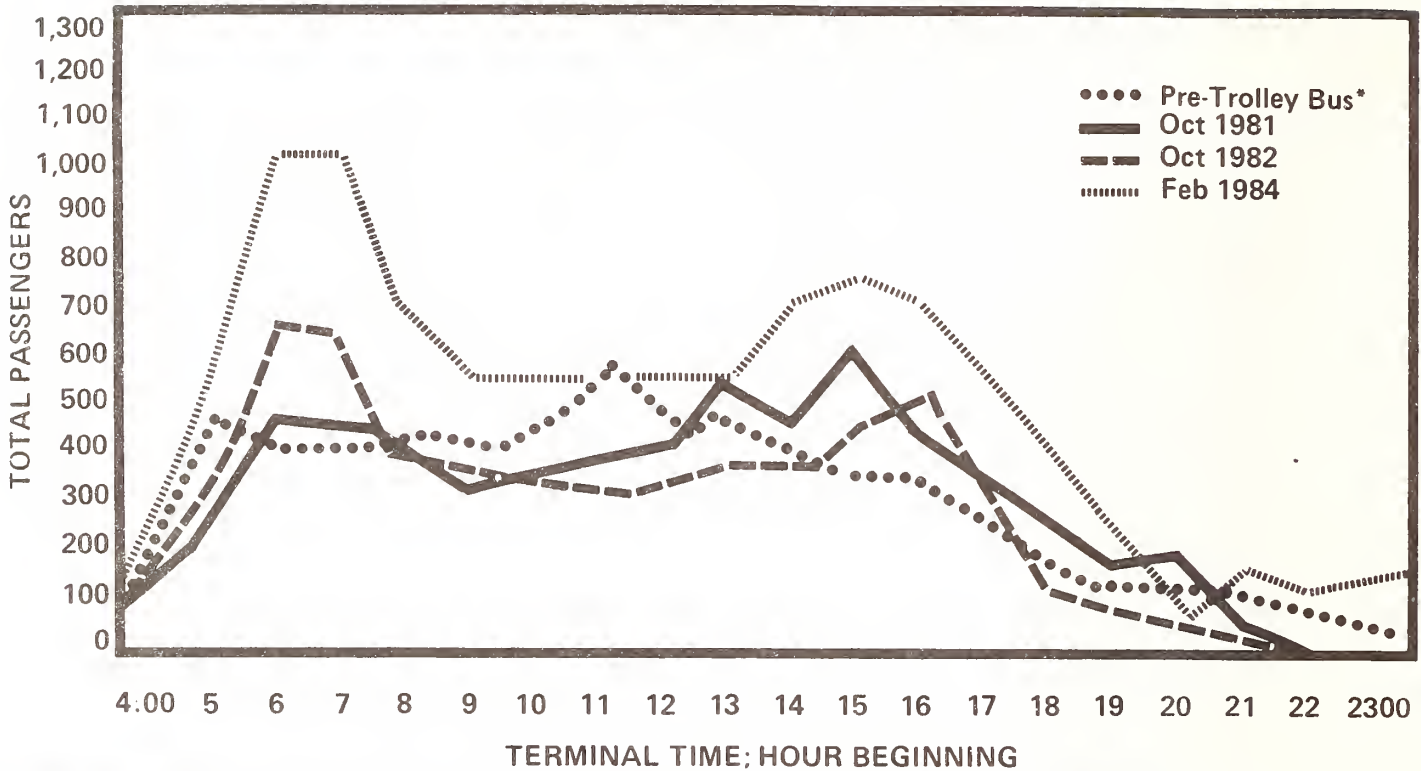
Maximum Load Point

The maximum load point for the Trolley is in National City, south of the Bayfront military and industrial employment centers. A second important Trolley characteristics illustrated by Figures 5 and 6 is the relatively high ridership experienced at each end of the line. As noted above, the system's two highest volume stations are the terminal points. Ridership boarding at the San Ysidro-International station is nearly 60% of the maximum load point. The Trolley is carrying 85% of its maximum load by the City College station, less than a mile from the northern terminus in Centre City. As a result, loadings on the vehicles are fairly constant, with only moderate amounts of excess capacity at any point.

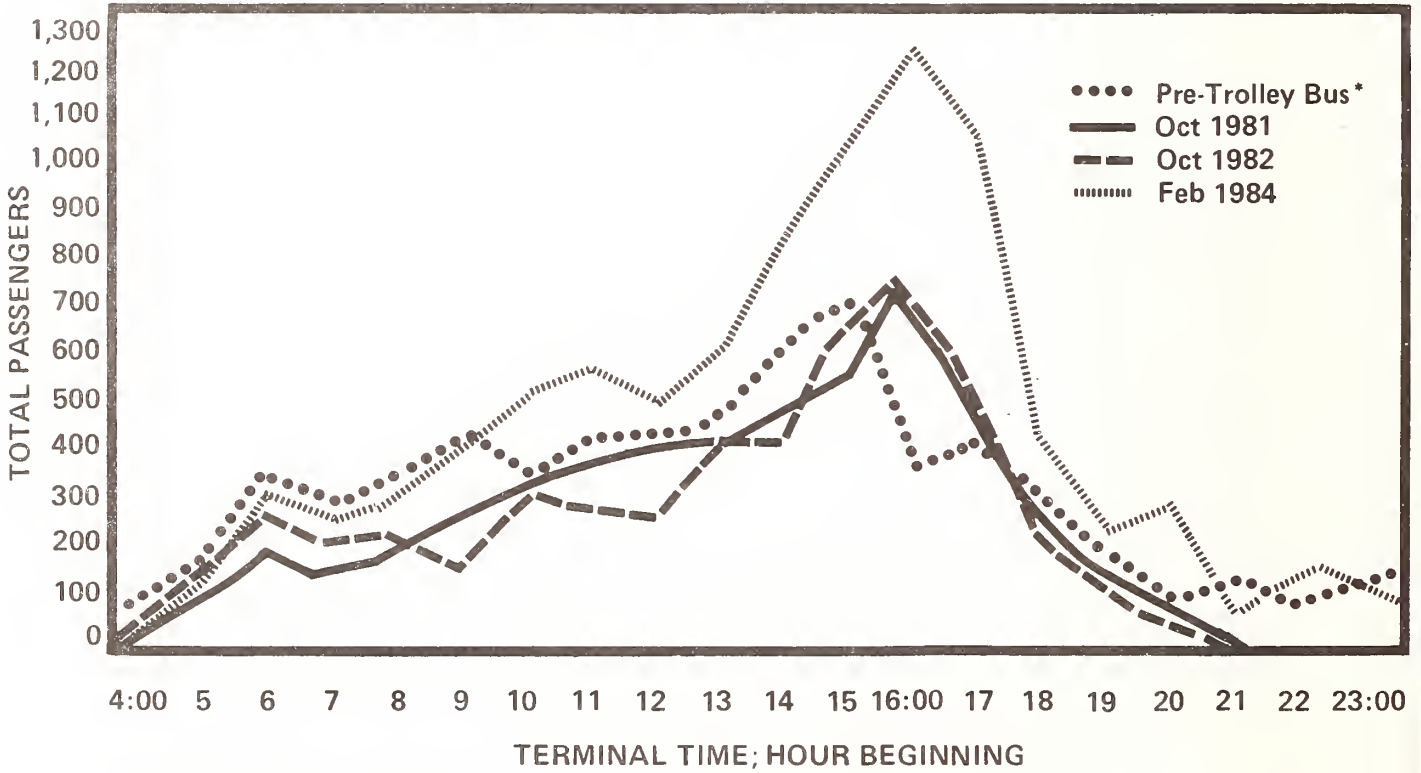
Ridership by Time of Day

The counter program provides information for each trip during the weekday, as shown on Figure 7. The April 1981, inbound patronage on former San Diego Transit Route 32, the major South Bay trunk route prior to Trolley service, is shown. There was very little "peaking" on this route, a characteristic which was retained by the Trolley in its early months of operation. Initially, the maximum

**FIGURE 7
PATRONAGE BY HOUR: INBOUND
San Diego Trolley/Pre-Trolley Bus**



**FIGURE 8
PATRONAGE BY HOUR: OUTBOUND
San Diego Trolley/Pre-Trolley Bus**



*SAN DIEGO TRANSIT ROUTE 32

inbound loads on the Trolley occurred in the afternoon, although a discernable morning peak does appear. As shown in the 1982 and 1984 counts, the morning peak has become more significant as the Trolley system matured. Figure 8 depicts the same information for the outbound (or south) direction. For outbound runs, an afternoon peak has always existed, but has become more pronounced over time and later in the afternoon. A major point, however, is the relative strength of the mid-day and evening patronage. Patronage increases were largely the result of added peak-hour riders, while off-peak ridership levels have remained fairly constant. This increase in peak-period riders has not been accompanied by an increase in the percentage of work trips on transit. While the number of work trips carried on the South Bay system has increased, work trips as a percentage of total transit trips has declined.

Previous Travel Mode

Based on a 1500-rider survey conducted two months after the Trolley began service, more than half of Trolley riders had previously used the public bus to make the same trip. As shown in Table 10, nearly 30% of all riders previously used an automobile and 10% did not make the trip before the Trolley was in service. Women were more likely to be former bus riders than men. The question of previous mode has not been asked on more recent surveys.

TABLE 10

PREVIOUS MODE OF TRAVEL
1981 TROLLEY RIDERS
(Adjusted Percentage)

	<u>Male</u>	<u>Female Total</u>	
Public Bus	54.0	59.8	56.4
Automobile Driver	25.3	21.6	23.8
Automobile Passenger	5.8	6.3	6.0
Other	4.6	2.8	3.9
Did Not Make Trip	10.3	9.5	10.0

Source: MTDB/SANDAG, Trolley Appreciation Survey, October 1981

CORRIDOR RIDERSHIP

Overall transit ridership in the South Bay increased by more than 20% in the three years since Trolley service began. This is in marked contrast with the transit patronage decreases experienced in the remaining portions of the region. Transit ridership in the MTDB area of jurisdiction, but outside of the Trolley service area, decreased by nearly five million riders a year, or about 18%.

This decrease is attributed to the fare increase noted above, decreased subsidy levels and economic conditions. Trolley operations were not a major cause for the decrease in subsidy levels. Since the Trolley was not federally subsidized, the

reduction of San Diego Transit service in South Bay freed federal operating subsidies for use in other areas, although the farebox recovery rates for the remaining South Bay service dropped. Most of the capital funds used for Trolley construction were not available for operating subsidies. And finally, Trolley operating subsidies were generated from a new funding program not previously used to subsidize bus service.

The decrease in transit ridership experienced by San Diego Transit in areas outside of the South Bay corridor was also part of a national trend. Between fiscal year 1981 and 1982, the total number of transit trips in the nation decreased from 5.7 to 5.3 billion per year.*

Prior to Trolley operations, transit trunk services within the South Bay Corridor were provided by San Diego Transit Corporation (SDTC) local routes 29 and 32, and SDTC express route 100.

When the Trolley began services, route 100 was terminated. Route 100 operated primarily on Interstate 5, but did not extend all the way to the International Border. Ridership on this primarily peak-period service was approximately 1,000 riders a day. Larger ridership occurred on San Diego Transit Routes 29 and 32 which also provided local service within the South Bay cities and communities. Both routes were restructured with the introduction of the Trolley, but continue to provide intercommunity as well as local service. Therefore, a direct comparison of Trolley ridership with ridership on a single pre-existing route cannot be made.

Transit fares were increased significantly on July 1, 1981, less than a month before the Trolley began revenue service. SDTC increased the base fare from \$.60 to \$.80. Fares were also increased by suburban transit operators and on express routes.

Table 11 shows ridership on the north-south trunk routes in fiscal years 1981 (ending June 30, 1981) and 1984. Total ridership has increased by over 20 percent on the trunk routes, although San Diego Transit ridership in South Bay dropped by more than 60% because of service reductions. Also shown is the Strand Express which provides parallel service between South San Diego, Imperial Beach and Coronado, on the west side of San Diego Bay. Much of its growth appears to be independent of Trolley operations, although about 20% of its total ridership accesses the route at Trolley stations, and 9% of SEA riders transfer to or from the Trolley.

*Source: UMTA, "National Urban Mass Transportation Statistics," 1981 and 1982 Section 15 Annual Reports. (Reports for 1983 and 1984 have not yet been published.)

TABLE 11

SOUTH BAY TRANSIT RIDERSHIP
Total Annual Passengers in 1,000's

<u>Operator</u>	<u>Route</u>	<u>Total Passengers</u>		<u>Change</u>	
		<u>FY81</u>	<u>FY84</u>	<u>Number</u>	<u>Percent</u>
San Diego Trolley	510	—	5,401	5,401	—
San Diego Transit	All	6,798	2,699	(4,099)	(60.3)
	29	2,392	1,703	(698)	(28.8)
	32	3,862	739	(3,123)	(80.9)
	33	269	257	(12)	(4.5)
	51	59	—	(59)	(100.0)
	100	215	00	(215)	(100.0)
Chula Vista Transit (SCOOT)	All	592	767	175	29.6
National City Transit	All	416	542	126	30.3
Strand Express Agency	All ¹	120	272	152	126.9
South Bay Total	All ²	7,926	9,681	1,755	22.1
Remaining MTDB Area	All ²	26,883	22,069	(4,814)	(17.9)
MTDB Area Total	All ²	34,809	31,750	(3,059)	(8.8)
North-South Trunk Routes ³		6,469	7,843	1,374	21.2

¹Imperial Beach Coronado passengers only.

²Fixed-route service only.

³Trunk routes include the San Diego Trolley (510) and San Diego Transit Routes 29, 32 and 100.

Source: SANDAG, Transit Operational and Performance Data, January 1984
MTDB, Monthly Operating Reports

The Trolley appears to have had a spill-over effect on the local transit service in the South Bay area. As noted above, 9.3% of all Strand Express riders (including those between Coronado and downtown San Diego), transfer to or from the Trolley.

As shown on Table 11, patronage on National City Transit and Chula Vista Transit increased by about 30% since the Trolley began service. About 28% of NCT and CVT riders transfer to or from the Trolley.

TRANSIT RIDER CHARACTERISTICS

The demographic composition of transit riders in the South Bay has also changed since 1980. A comparison of the characteristics of Trolley riders to overall riders indicates that the new rider which the Trolley has attracted is the predominant reason of this change. Trolley riders are more likely to be male, have higher incomes and are less transit dependent than other transit riders in the South Bay.

Table 12 shows the results of two Transit Passenger Surveys which were conducted in 1980 and 1983. Percentage responses for the entire South Bay area are shown in the first two columns; for the three north-south trunk routes serving the east side of the Bay in the third and fourth; and for the Trolley alone in the fifth column. More detailed survey responses, by transit route and company, are provided in Appendix A.

The income of Trolley riders is significantly higher than the riders of other transit service in the South Bay. Over 25% of Trolley riders have incomes over \$25,000, compared with 21% of all South Bay riders. The percentage of riders on the north-south routes with incomes over \$25,000 more than doubles between 1980 and 1983. In contrast, the percentage of riders whose income is less than \$10,000 drops significantly in all categories.

Similarly, nearly three-quarters of Trolley riders have drivers licenses and nearly forty percent had a vehicle available for the trip surveyed. Only 31% lived in households in which no one owned a motor vehicle. Before the Trolley, less than one-fifth of the north-south trunk route patrons had a vehicle available.

The major South Bay transit routes have always had a high percentage of male riders, largely because of the high number of military personnel living and working in the area. The Trolley has an even higher percentage of male riders than the 1980 corridor routes. In comparison, 1983 San Diego Transit routes in the South Bay are nearly evenly split between male and female riders (See Appendix A). Both Chula Vista and National City Transit carry approximately 60% female patrons. Only the Strand Express, serving three major military bases, carries a similar 60% of male riders.

With the Trolley as part of the system, South Bay transit riders show a larger family size and a significantly lower percentage of single-person households than the bus system alone. There did not appear to be a major shift in the age of transit riders on the South Bay system between 1980 and 1983.

Although the Trolley has been able to attract a less transit-dependent overall ridership, the transit dependent rider does not appear to have been displaced by higher fares and service changes. For the South Bay system as a whole, 41.2% of

TABLE 12
TRANSIT PASSENGER PROFILES
1980 AND 1983

	South Bay Area ¹		North-South ² Trunk Routes		Trolley
	1980	1983	1980	1983	1983
Normal Use of Transit					
6-7 days a week	31.8	23.3	31.6	24.0	18.7
4-5 days a week	37.0	35.4	35.6	32.5	30.1
1-3 days a week	13.6	1.6	14.0	14.2	13.8
Several times a month	7.0	9.3	7.6	10.3	11.3
Occasionally	10.6	17.4	11.3	19.0	24.2
Length/Time as a Bus Rider					
Less than one month	11.1	10.1	11.0	10.3	10.8
One month to one year	33.3	32.6	33.8	32.5	36.8
One year to two years	14.4	18.8	13.7	19.2	22.6
More than two years	41.2	38.5	41.5	38.0	29.8
Number of Vehicles in Households					
None	44.8	35.8	46.7	37.0	30.9
One	33.9	36.0	34.5	35.6	36.3
Two	16.0	19.8	14.8	18.9	21.8
Three or more	5.4	8.5	4.0	8.5	11.0
Was a Private Vehicle Available for this Trip?					
Yes	17.7	31.2	17.0	33.0	39.7
No	82.3	68.8	83.0	67.0	60.3
What Was Alternative to Transit for this Trip?					
Auto drive	12.0	28.9	11.4	33.1	39.7
Auto passenger	25.1	21.6	25.5	23.4	22.7
Bicycle	6.8	4.4	6.8	4.4	3.4
Walking	17.6	11.9	15.2	12.0	10.5
Taxi	14.0	7.3	15.5	8.1	7.3
Dial-a-ride	—	1.8	3.5	2.2	1.7
Social service agency	—	1.0	0.9	1.2	1.2
Not take trip	4.8	13.6	21.1	15.7	13.4
Other	19.8	9.4	—	—	—
Are You a Licensed Driver?					
Yes	58.8	64.3	58.5	66.7	73.6
No	41.2	35.7	41.5	33.3	26.4

¹Includes San Diego Trolley, San Diego Transit routes 9, 13, 29, 32, 33, 51, 100, National City routes 601, 602, 604, Chula Vista route 701-705, 707, and the Strand Express.

²Includes the San Diego Trolley and San Diego Transit routes 29, 32, 100.

TABLE 12 (Cont.)
TRANSIT PASSENGER PROFILES
1980-1983

	South Bay Area		North-South Trunk Routes		Trolley
	1980	1983	1980	1983	1983
How Many Licensed Drivers in Household?					
None	15.6	12.7	15.3	13.1	9.5
One	31.2	27.6	30.7	28.2	26.8
Two	31.9	35.0	32.1	34.7	36.6
Three	11.8	12.7	12.3	11.9	12.9
More than three	9.5	11.9	9.5	12.1	14.1
Persons in Household					
One	15.1	12.4	13.9	12.5	10.4
Two	21.9	21.6	20.8	21.1	21.3
Three	18.5	19.2	18.5	18.8	18.4
Four	15.8	16.8	17.0	16.6	16.7
Five	12.1	12.1	12.9	11.9	12.9
Six or more	16.6	17.9	16.9	19.1	20.3
Passenger Status					
Visitor or tourist	5.7	12.0	6.3	13.6	17.6
Member of armed forces	21.9	13.6	21.3	14.1	15.2
Student	23.8	21.2	19.1	18.3	17.6
Employed	49.2	42.2	48.0	41.9	41.1
Volunteer worker	7.1	3.1	3.4	3.1	3.2
Homemaker	13.1	13.8	13.8	13.5	11.7
Retired	7.1	6.6	6.1	6.8	5.9
Handicapped	3.2	2.6	3.2	2.4	2.1
Sex					
Male	55.0	55.4	56.6	57.2	60.9
Female	45.0	44.6	43.4	42.8	39.1
Age					
12-16 years	3.7	3.1	2.4	1.5	1.4
17-24 years	41.9	37.8	40.5	37.4	39.2
25-44 years	32.5	35.5	35.3	36.8	36.6
45-59 years	11.9	12.8	12.0	13.3	12.6
60 or over	10.0	10.8	9.8	11.0	10.3
Household Income					
Less than \$5,000	22.1	18.7	23.6	19.3	15.3
\$5,000 - \$10,000	30.1	19.9	30.9	20.5	18.6
\$10,000 - \$15,000	17.5	16.9	17.7	17.1	17.3
\$15,000 - \$25,000	20.1	23.4	19.2	22.3	23.6
Over \$25,000	10.3	21.2	8.5	20.8	25.2

Source: 1983 Transit Passenger Survey

1980 transit patrons, or 3,265,000 annual riders, did not have drivers licenses. In 1983, 3,305,000 annual patrons or 35.7% of the total did not have drivers licenses.

Transit dependents comprise a much smaller percentage of corridor riders in 1983 than they did in 1980. In 1980, 2.7 million, or 37%, of the annual trunk-route riders did not have drivers licenses. In 1983, a nearly identical 2.6 million trunk-route riders did not have licenses. However, these 2.6 million riders comprised only 33% of total trunk-route ridership. Similarly, 3 million trunk-route patrons in 1980, and 2.9 million in 1983, had no automobile available for their trip. It is concluded that the total number of transit dependents in the corridor is relatively constant, despite fare increases and service changes.

TRIP CHARACTERISTICS

The typical transit trip also changed with the introduction of the Trolley. These changes, for the most part, were not as dramatic as might be expected. For example, there was only a minor shift in trip purpose.

Trip characteristics from the 1980 and 1983 passenger surveys are shown on Table 13. The overall percentages of most origins and destinations are similar for the two surveys. The percentage of home-based trips is essentially constant. The Trolley carries a slightly higher percentage of school, shopping and other trips; a lower percentage of work and personal business trips than other routes in the area. None of these, with the possible exception of increased "other" trips (which includes recreation) seems significant.

TABLE 13
TRANSIT TRIP CHARACTERISTICS
1980 AND 1983

	South Bay Area ¹		North-South ²		Trolley 1983
	1980	1983	Trunks 1980	Trunks 1983	
Mode to Bus Stop					
Transferred	35.5	11.2	40.8	22.1	19.6
Walked	61.1	74.2	56.0	62.5	58.2
Drove	1.1	7.8	1.1	9.0	13.8
Was driven	2.0	6.0	1.9	5.9	7.9
Bicycled	0.3	0.3	0.1	0.1	0.1
Dial-a-ride	0.1	0.4	0.1	0.3	0.3
Fare Used for Trip					
Cash	59.0	52.4	53.8	43.1	31.7
Transfer	26.5	8.3	31.8	11.0	6.2
Pass	7.3	16.7	8.8	16.9	16.8
Transfer plus cash	2.2	2.9	2.5	5.0	7.7
Single-fare ticket	0.8	14.4	0.6	17.2	27.0
Ready 10 ticket	—	3.3	—	4.1	6.4
Ready 2 ticket	—	1.1	—	1.5	2.3
Centre City ticket	—	1.0	—	1.2	1.8
Origin of Trip					
Home	50.7	51.0	52.0	49.9	49.4
Work	23.3	22.5	23.7	23.1	23.4
School	8.3	8.5	6.1	6.8	6.2
Shopping	4.4	4.5	4.8	5.2	5.4
Personal business	7.9	7.5	8.7	8.3	7.8
Other	5.3	6.0	4.8	6.7	7.8
Mode from Bus Stop					
Transfer	32.6	27.9	31.7	24.7	23.1
Walk	—	62.3	66.4	64.0	60.5
Drive	—	5.6	0.5	6.9	10.5
Will be driven	—	3.5	1.3	3.9	5.5
Bicycle	—	3.8	0.0	0.4	0.2
Dial-a-ride	—	0.2	0.1	0.2	0.2
Destination of Trip					
Home	37.2	38.1	38.1	38.3	37.2
Work	29.4	24.6	30.1	24.3	23.2
School	5.7	7.9	4.5	6.1	6.1
Shopping	6.2	7.9	6.8	8.0	8.6
Personal business	13.3	10.9	14.1	11.6	10.4
Other	8.0	10.2	6.4	11.7	14.6

¹Includes the San Diego Trolley, San Diego Transit routes 9, 13, 29, 32, 33, 51, 100, 510, National City routes 601, 602, 604, Chula Vista route 701-705, 707, and the Strand Express.

²Includes the San Diego Trolley and San Diego Transit routes 29, 32, 100.

Source: 1983 Transit Passenger Survey

Mode of access, however, changed dramatically. When the Trolley began operations, local bus service was reoriented and rescheduled to coordinate operations with the Trolley. In the South Bay corridor the local bus network provided local bus feeder access of the north-south trunk routes in 1980. Since the Trolley stopped less frequently than previous bus service and the stations are located some distance from South Bay activity centers, feeder bus ridership was expected to increase. However, as shown on Table 13, only about 20% of Trolley riders transfer from local bus routes, less than half the percentage of riders transferring to the bus trunk routes in 1980. Of the riders transferring to the Trolley, over two-thirds transfer to or from a San Diego Transit route, most often in the Centre City area. Over 15% of Trolley transfer riders access the line or transfer on a Chula Vista route, 7.5% from a National City route and 5.5% from the Strand Express.

Walking provides the mode of access for nearly 60% of Trolley riders. As shown in Table 14, Trolley riders walk an average of four blocks to reach a trolley station, more than 50% farther than the average distance walked to local bus service.

TABLE 14

TRANSIT ACCESS DISTANCE
SOUTH BAY AREA
1983

	<u>Trolley</u>	<u>SDTC</u>	<u>NCT</u>	<u>CVT</u>	<u>SEA</u>
Average Walk Link (blocks)	4.0	2.7	2.6	2.5	3.0
Average Auto Driver Link (miles)	8.4	3.0	5.2	4.0	5.3
Average Auto Passenger Link (miles)	9.0	2.5	3.9	7.7	3.2

Source: 1983 Transit Passenger Survey

As expected, the automobile provides an important mode of access to the Trolley. Approximately 12% of Trolley patrons drove themselves to the station, and nearly 7% were driven to the station by automobile. Although bicycle storage is provided at all suburban stations, the bicycle remains a minor access mode, less important than local (elderly and handicapped) dial-a-ride systems.

Since 1980, the monthly transit pass usage has almost doubled in South Bay. As shown on Table 13, nearly 17% of all transit patrons, including those riding the Trolley, use the pass. However, pass use in the MTDB area as a whole is much higher: an estimated 25% of all riders in fiscal year 1984. Because the single fare ticket is essentially a cash fare paid at the station rather than on the vehicle, cash fare payment has also increased. In addition, the "Ready-two" and "Ready-ten" tickets were used by nearly 9% of Trolley patrons.

Bus Rider Characteristics

Ridership on the local bus service has changed significantly since fiscal year 1981. The trip characteristics of local bus riders also changed, as shown on Table 15. While some of these changes are the result of Trolley operations, the impact of the Trolley has not been uniform on the other transit operators.

San Diego Transit routes in the South Bay were changed from providing the major trunk service to providing local service and a Trolley feeder role. The characteristics of trips and riders on SDTC, therefore, became more similar to those of National City and Chula Vista patrons. On SDTC routes the percentage of riders walking to bus stops increased; the percentage of work-trips declined and the percentage of school trips increased. Fewer SDTC riders transferred from other routes than any other South Bay bus service. Less than 10% of SDTC and SEA riders transferred from or to the Trolley.

TABLE 15

BUS PASSENGER PROFILES 1980 AND 1983

	<u>SEA</u>	<u>Chula Vista</u>		<u>National City</u>		<u>San Diego</u>	
	<u>1983</u>	<u>1980</u>	<u>1983</u>	<u>1980</u>	<u>1983</u>	<u>1980</u>	<u>1983</u>
Mode of Access							
Walk	65.1	73.7	65.6	56.7	59.4	64.9	69.2
Transferred	28.9	23.3	31.5	42.4	37.4	32.2	27.6
Trolley	9.3	—	20.1	—	24.0	—	8.4
Bus	19.6	—	11.4	—	13.4	—	19.2
Automobile	4.4	2.9	2.0	0.8	2.7	2.1	2.5
Other	1.6	0.1	0.9	0.1	0.5	0.8	0.7
Trip Purpose							
Home	44.5	41.9	45.8	48.6	47.9	44.1	45.8
Work	28.9	13.6	17.6	17.6	19.8	27.4	23.6
School	6.4	28.8	19.0	16.5	11.1	5.4	8.9
Shopping	4.4	4.0	5.8	5.5	7.0	5.5	5.6
Other	15.8	11.7	11.8	11.8	14.2	17.6	16.1
Automobile Available	29.2	22.6	21.1	13.5	17.5	17.6	21.0
Income							
Under \$10,000	33.3	42.5	34.4	57.4	51.4	53.3	48.0
Over \$25,000	20.5	19.6	25.8	10.0	11.8	9.1	14.5

Source: 1983 Transit Passenger Survey

In contrast, over 20% of the riders of NCT and CVT transfer from or to the Trolley, approximately two-thirds of all those persons transferring on each system. For both these systems, the work and shopping-trip percentage grew; the

school-trip percentage dropped. The overall characteristics of SEA patrons generally fall between those of the Trolley rider and patrons of other bus services in the South Bay. The SEA route is a combination of local service in Imperial Beach and Coronado, and express service along the Strand.

TROLLEY STATION ACTIVITY

Mode of access to individual stations varied significantly, as shown on Table 16. Transfers from bus route were highest in the downtown areas, and at the planned intermodal transfer facilities at Iris Avenue, Palm City, H Street (the focus of the Chula Vista system) and 24th Street, the interface point with National City Transit. More than three quarters of the passengers at the San Ysidro, Beyer, Pacific Fleet, Harborside (industrial) and the downtown San Diego Square stations accessed by walking.

Less than one third of the riders walked to the Palm City and Palomar stations which are located in relatively low density or vacant areas. These two stations had the highest percentage of automobile access; 37.4% and 49.2% respectively. The percentage of riders accessing the downtown stations by automobile is relatively high, given the cost and scarcity of parking in Centre City.

TABLE 16

TROLLEY STATION ACCESS Percent of Unlinked Trips 1983

Stations	MODE					
	Transfer	Walk	Auto Driver	Auto Pass.	Bike	D-A-R
San Ysidro-Internacional	5.2	77.8	8.9	7.3	0.4	0.4
Beyer	11.0	76.2	8.4	4.4	0.0	0.0
Iris Avenue	31.3	41.5	22.0	3.5	1.7	0.0
Palm City	30.0	32.7	28.3	9.1	0.0	0.0
Chula Vista-Palomar	19.9	30.9	29.2	20.0	0.0	0.0
Chula Vista-H St.	32.6	41.4	23.6	2.5	0.0	0.0
National City-24th St.	28.4	46.9	17.3	7.4	0.0	0.0
National City-8th St.	7.8	66.8	11.3	13.2	0.0	0.9
Pacific Fleet	6.3	81.7	4.6	7.4	0.0	0.0
Harborside	0.0	77.7	14.9	7.4	0.0	0.0
Barrio Logan	13.8	64.2	7.2	14.8	0.0	0.0
Imperial	29.9	64.4	2.8	2.8	0.0	0.0
Market	36.4	51.0	5.4	7.2	0.0	0.0
City College	41.9	48.7	3.9	5.5	0.0	0.0
San Diego Square	17.8	76.3	3.0	2.8	0.0	0.0
Gaslamp	37.4	45.8	9.9	7.0	0.0	0.0
Civic Theatre	30.9	55.9	3.7	6.8	0.0	2.7
Santa Fe	26.3	48.8	15.2	9.8	0.0	0.0
TOTAL	19.6	58.2	13.8	7.9	0.1	0.3

Source: 1983 Transit Passenger Survey

Trip purpose also varies between stations, as shown on Table 17. As would be expected, the trip purpose varies, based on the kinds of activities located in adjacent areas. Home-based trips (both trip origins and destinations) are highest at the largely residential Palomar Station as well as the Beyer, Market Street and Barrio-Logan stations. The two stations serving the 32nd Street Naval Station, (8th Street and Pacific Fleet), show the lowest percentage of home-based trips. Work-based trips are relatively constant for most stations, but approach 40% of all trips at the Pacific Fleet station. Only 10% of those passengers using the Border station are making a work trip.

A large percentage of passengers using the San Ysidro-International station and the northern LRT terminal at the Santa Fe Depot are making shopping or "other" (which includes recreation) types of trips. This percentage reflects the highest number of tourists who appear to ride the Trolley from terminal to terminal.

TABLE 17

TROLLEY TRIP PURPOSE
ORIGINS AND DESTINATIONS
1983

Stations	PERCENT BY PURPOSE				
	Home	Work	School	Shopping	Other
San Ysidro-International	45.4	10.8	5.1	12.6	26.1
Beyer	42.6	23.0	12.4	6.5	9.6
Iris Avenue	39.5	22.3	14.1	4.4	19.6
Palm City	47.3	26.7	3.5	4.3	18.2
Chula Vista-Palomar	49.5	26.1	7.9	4.1	12.3
Chula Vista-H St.	44.1	26.0	6.7	5.3	17.8
National City-24th St.	45.7	26.8	7.0	3.8	16.7
National City-8th St.	36.2	30.8	5.3	4.7	23.0
Pacific Fleet	28.0	37.0	0.6	5.5	28.9
Harborside	46.4	32.4	0.0	5.6	15.6
Barrio Logan	47.3	24.1	9.4	3.4	15.8
Imperial	43.2	31.3	3.8	4.0	17.7
Market	47.9	24.8	4.6	8.0	14.7
City College	44.8	25.9	11.8	5.0	12.5
San Diego Square	43.9	29.2	5.3	3.1	10.5
Gaslamp	45.5	28.1	8.1	5.3	13.0
Civic Theatre	42.2	23.0	5.7	7.5	21.7
Santa Fe	40.1	22.3	3.4	8.2	26.0
TOTAL	43.3	23.3	6.2	7.0	20.3

Source: 1983 Transit Passenger Survey

CHAPTER 3 OTHER FACTORS

Other Factors

LAND USE POLICY AND DEVELOPMENT

This section describes local land use policy changes and new construction that has occurred along the light rail transit route since Trolley construction began in early 1980. The impact of the light rail transit system on land use policy and new construction in the 1980 to 1984 period is assessed.

The "land use impact study area" is identified in Figure 9. This area is more limited than the "light rail transit study area" (Figure 2) used in other parts of this report in order to ensure that the land use changes considered could be directly influenced by the Trolley. This area generally includes the lots adjacent to the Trolley right-of-way, and at stations, a 4 to 6 block area around the station site (approximately 1/3 mile, or walking distance to the station).

Data on General Plan and zoning changes and building permits issued during 1980 to 1984, were obtained from the planning departments of the four jurisdictions through which the Trolley runs - cities of San Diego, National City, Chula Vista and the County of San Diego. The number and complexity of variables involved in land development decisions did not allow meaningful comparison of these data with similar data in other locations (e.g., comparison of growth rates, density, etc.).

A survey of the developers and leasing agents for 10 of the projects constructed in the land use impact study area during the 1980-1984 period was undertaken to help assess the role of the Trolley in development location decisions and in the marketing and leasing success of the properties.

General Plan Changes

There have been two general plan amendments involving two of the 11 station sites outside Centre City San Diego and none in Centre City during the four-year period.

Only the amendments at the Palm City Station in the southern part of the City of San Diego have been made for the purpose of compatibility with the light rail transit activities. The General Plan changes at this site converted industrial designation to medium density residential for some parcels and increased residential densities for others expressly to take advantage of the access advantages provided by the Trolley.

The General Plan changes at the Palomar Street station were in conjunction with the annexation of property in the vicinity of the station to the City of Chula Vista

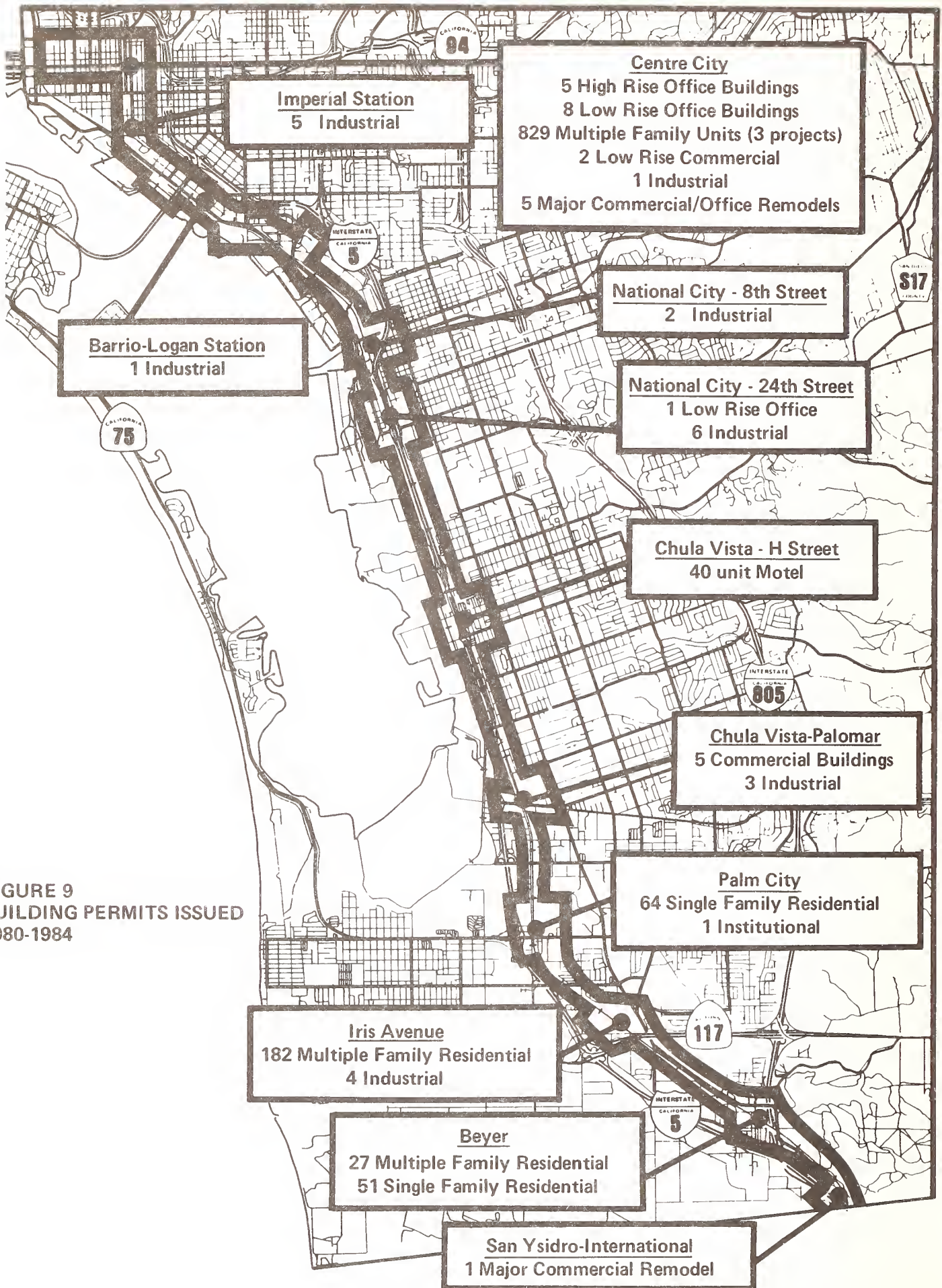


FIGURE 9
 BUILDING PERMITS ISSUED
 1980-1984

and were intended to make the area consistent with the Chula Vista General Plan. A later modification of the General Plan in this area (from Retail Commercial to Research and Limited Industrial) was not related to the Trolley station location. Following is a summary of these General Plan amendments:

- Palm City:
- a. Industrial to Medium Density Residential (15 to 30 units/acre) - 18 acres
 - b. Low Density Residential (5 to 10 units/acre) to Low-Medium Density Residential (10-15 units/acre) - 15 acres
- Chula Vista-Palomar Street: Addition to General Plan, designated Retail Commercial and Research/Limited Industrial - 55 acres.

Zoning Changes

Three separate zoning changes have been made at three separate station sites during the four years. None of these changes appear to be primarily related to their location near the station sites. These changes are summarized below:

- Beyer: Agricultural to Industrial - 5 acres
- Chula Vista-Palomar Street: Rezoning to Retail Commercial and Research/Limited Industrial - 55 acres
- Chula Vista-H Street: R-3 (high density residential, 13-26 units/acre) to Mobile Home Park (13-26 units/acre) - 20 acres (two 10-acre parcels)

In addition, the City of San Diego is considering the feasibility of initiating an industrial redevelopment project in the Barrio Logan community which includes the Imperial Avenue station. The Barrio Logan/Centre City Industrial Park Feasibility Study recommends intensifying industrial land uses around this station.

Land Development Activity

Building permits were used as an indicator of new construction activity in the land use impact study area. New structures and major remodeling or rehabilitation projects were included. Figure 9 shows building permits issued during the 1980-1984 period in the vicinity of each station. No permits were issued along the Trolley right-of-way between station areas. Table 18 shows the permit totals for the 11 suburban station, the Centre City area, and a grand total. Over 1,100 residential units and 50 commercial, industrial and institutional projects were processed in the land use impact area during this period.

TABLE 18
 BUILDING PERMIT SUMMARY BY TYPE
 1980-1984

	<u>Centre City</u>	<u>Suburban Station Areas</u>	<u>Total</u>
Single Family (units)	0	115	115
Multiple Family (units)	829	249	1,078
Total Residential	829	364	1,193
Institutional	0	1	1
Industrial	6	16	22
Commercial, freestanding	2	3	5
Commercial, centers	0	2	2
Office, low-rise	13	2	15
Office, high-rise	5	0	5

Major developments in the suburban area include a major remodeling and redevelopment by McDonald's for a large restaurant and retail/office suites in a two-story building located adjacent to the San Ysidro-International station; development of a discount department store and grocery store shopping center (Target-Ralphs) near the Chula Vista-Palomar Street station; and development of the Great American Federal Savings and Loan Computer Center, which currently employs 600 people, adjacent to the National City-24th Street Station. The approval of the City of San Diego Convention Center and its imminent construction just outside the land use impact study area, although not reflected in this data, should result in improved development potential at the Imperial station on the southeastern edge of Centre City.

The intensive development and redevelopment shown in Centre City San Diego reflects the extensive redevelopment policies of the City in this area.

Developer Survey

Developers and leasing agents were asked what role the location of the Trolley in close proximity to their project had played in the decision to develop, and in their success in marketing and leasing the property. Representatives of 10 of the projects constructed in the land use impact area during 1980 to 1984 were contacted. Six of the projects were located in Centre City and four at the suburban station sites. A combination of office and commercial projects were included. A listing of the projects surveyed is shown in Table 19.

TABLE 19
SUMMARY OF DEVELOPERS SURVEYED

<u>Project Location</u>	<u>Project Type</u>	<u>Contact</u>
San Ysidro/International	. 2-story restaurant, retail mixed use	Leasing agent
Chula Vista-Palomar Street	. Department store Grocery store "center"	Department store District office
	. Warehouse, light manufacturing building with 6 lease spaces	Leasing agent
National City 24th Street	. Computer center major office structure containing 600 employees	Vice President Savings and Loan
Centre City San Diego	. 4-story bank and office building	Leasing agent
	. Retail remodel	Leasing agent
	. Restaurant retail mixed-use remodel	Leasing agent
	. 4-story office building	Leasing agent
	. Commercial restaurant office mixed-use remodel	Leasing agent
	. Office, retail, restaurant. Office mixed-use remodel	Leasing agent
	. Office, retail, restaurant mixed-use	Developer

In general, respondents representing projects located in the vicinity of the suburban station sites indicated that the trolley station was an important factor in their decision to develop and that it was a major part of their marketing efforts in leasing space. Respondents felt that their leasing programs were making satisfactory to excellent progress. Responses regarding the trolley were more favorable the closer the project was to a station site.

In contrast, most respondents representing projects in the Centre City area said that location near a Trolley station was not a key factor in their development decision. In two cases, the Trolley was mentioned as a minor factor; in the three others, it was not even a secondary or minor factor. However, all respondents did report that proximity to the Trolley was an important part of their leasing marketing and had contributed to success in leasing space. Benefits cited were the convenience and low cost of the Trolley for clerical and service workers who might be commuting from the South Bay, and the colorful and active atmosphere created by the Trolley operations on C Street.

Conclusions

Several conclusions can be drawn from the data collected on land use policy changes and new development and the developer survey of projects in the land use impact study area.

First, the extensive residential, commercial and office development in the vicinity of the Trolley stations and the responses of developers and leasing agents indicate that the Trolley does not have a negative impact on new construction.

Second, the existence of the Trolley is seen as an advantage in locational choice for land uses, particularly in the areas outside Centre City San Diego. It is not, however, a major locational determinant.

Third, the development and market forces at work in Centre City and the typical intense scale of development tend to overpower the Trolley's role as a factor in development decisions. However, the benefits of the Trolley to building tenants are recognized and used as an important part of a leasing program.

Fourth, given the positive response of development interests to the opportunities provided by locations in the vicinity of a trolley station, little has been done by local governments to consider changes in land use policy around the stations. This may be due to other planning considerations which precludes action in some areas. However, most of the station sites present opportunities to increase the intensity and activity levels in currently built-up and developing areas which are typically encouraged or allowed by local land use policy.

MERCHANT SURVEY

An inventory of commercial establishments conducted in March 1984 identified 190 businesses within a three-block distance from suburban stations and along 12th and C Streets in the Centre City area. In order to determine the impact of the Trolley on businesses in the station areas, a survey of merchants was conducted in April 1984. There were 91 responses or a 47.9% response rate. Of the responses, half (46) were located in Centre City, one third (30) on C Street alone. There were 15 responses from Chula Vista-H Street merchants, and between one and seven responses from other station areas.

The types of businesses surveyed are showed in Table 20, with personal services and retail categories representing about 40% of the responses.

TABLE 20
TYPES OF BUSINESSES SURVEYED

	<u>Number</u>	<u>Percent</u>
Retail	23	25.3
Restaurant/Lounge	14	15.4
Professional Service	13	14.3
Business Service	12	13.2
Automobile Service	12	13.2
Hotel	3	3.3
Civic/Fraternal	3	3.3
Other	11	12.1

One quarter (23) of the businesses located at their current address since the Trolley began operation, 10% in the past year. The Trolley and the potential patrons it carried were a major factor in the location decision for about half of these businesses.

About 20 percent of the respondents indicated that the Trolley was an important positive factor in the business remaining at that location. However, three respondents indicated that they would be moving primarily because the Trolley interfered with automobile access (two respondents) or brought undesirable patrons to the area (one respondent). Less than 40% of those responding felt that the Trolley had any impact, positive or negative, on their business volume.

Thirty-six respondents made one or more written comments on the survey form. The largest number of these comments related difficulties with automobile access attributed to the Trolley, as shown in Table 21. Sixteen comments related to the removal of parking, primarily in Centre City, due to Trolley construction. An additional nine comments attributed Trolley operations or Trolley-related automobile congestion with blocking vehicular access to their business. Of those responding, twice the number of commentators indicated that the Trolley was generally good for business than the number which stated that the Trolley hurt business.

TABLE 21

MERCHANT SURVEY COMMENTS

	<u>Number</u>	<u>Percent of Comments</u>
Removal of Parking	16	44.4
Blocks Entrance	9	25.0
Helps Business	9	25.0
No Change Machines	8	22.2
Increase Crime	5	13.9
Hurts Business	4	11.1
Lack of Bathrooms	3	8.3
Noise	1	2.8
Good for Employees	1	2.8

In order to minimize security and maintenance problems, the Trolley system was built without restroom facilities, and not all stations currently have change machines. Eleven comments were received noting problems with these conditions. The lack of change machine was a particular problem in the Centre City area; the lack of bathrooms is a particular problem in the more isolated suburban locations.

While the comments themselves tend to identify specific problems, the overall response to the survey was generally supportive. Only a handful of those responding, however, have attempted to capitalize on the potential market provided by Trolley patrons.

A more detailed description of the Merchant Survey is contained in Appendix B.

TRAFFIC VOLUMES

Significant changes in traffic volumes have occurred in the South Bay and Centre City areas, however few of these changes can be directly linked to the Trolley system. The general trends indicate an increase in traffic on major north-south roads in South Bay, an overall decrease in the Centre City area, and no clear trend on the major east-west streets which cross the Trolley alignment and which provide access to the Trolley stations.

Centre City

Automobile traffic decreased significantly on most streets in the Centre City area, as shown on Table 22. The most significant decreases occurred on streets used by the Trolley. On Twelfth Street where the street was narrowed to one moving lane in each direction, traffic decreased by two-thirds or 4,500 vehicles per day. C Street lost one or two travel lanes for its entire length. On this facility, traffic decreased by nearly half or, again, 4,500 vehicles between 1979 and 1983. Of the streets which provide alternative routes to 12th and C (i.e., A, G, Broadway, 10th, 11th, and 16th), only Broadway shows an increase in traffic. Decreases have occurred on nearly all streets crossing the Trolley right-of-way.

The City of San Diego and MTDB are currently evaluating travel in Centre City as part of a general downtown plan revision. The most probable reasons for this decrease are the economy and redevelopment-related demolition activities.

TABLE 22
CENTRE CITY TRAFFIC VOLUMES

<u>Street</u>	<u>Between</u>	<u>Daily Traffic Volume (000)</u>		<u>% Change</u>
		<u>1980</u>	<u>1983</u>	
<u>Parallel Facilities</u>				
Ash	4th/5th	11.5	12.3	7.0
A	4th/5th	11.6	10.9	-(3.0)
B	10th/11th	10.5	11.3	7.6
C	10th/11th	9.5 (1979)	5.0	-(47.4)
Broadway	Front/1st	18.0	19.3	7.2
10th	G/F	10.0	9.9	-(1.0)
11th	B/C	13.9	12.1	-(12.9)
12th	Market/G	6.7 (1979)	2.2	-(67.2)
16th	Market/G	9.0	8.2	-(8.9)
<u>Perpendicular Facilities</u>				
Kettner	A/Broadway	4.3	4.2	-(2.3)
India	A/Broadway	2.8	2.6	-(7.1)
4th	A/Broadway	9.0	5.8	-(35.6)
5th	A/Broadway	8.8	7.6	-(13.6)
10th	B/C	15.9	16.4	3.1
11th	B/C	13.9	12.1	-(12.9)
Market	11th/12th	17.0	15.3	-(10.0)
F	12th/16th	15.1	14.7	=(2.6)
G	12th/16th	14.3	12.7	-(11.2)

Source: SANDAG, Average Weekday Traffic Volumes 1979-1983

South Bay

In contrast with Centre City, travel on most highways in South Bay increased between 1980 and 1983. Traffic volumes on Interstate route 5, which parallels the Trolley, increased by 3.8 to over 20 percent. Similarly, major north-south arterials experienced increases in traffic volumes of between 2 and 18 percent.

All of the east-west facilities shown on Table 23, except for Coronado Avenue, provide direct access to a Trolley station. Increases of traffic on 8th, H and Iris may be partially attributed to Trolley station access. Conversely, since the Harborside (28th Street) and Pacific Fleet (32nd Street) stations are primarily destination stations, a portion of the decreases in traffic at these locations may

1. Santa Fe Depot
2. Imperial
3. Barrio-Logan
4. Harborside
5. Pacific Fleet
6. National City - 8th Street
- 7; National City - 24th Street
8. Chula Vista - H Street
9. Palomar Street
10. Palm City
11. Iris Avenue
12. Beyer
13. San Ysidro - International

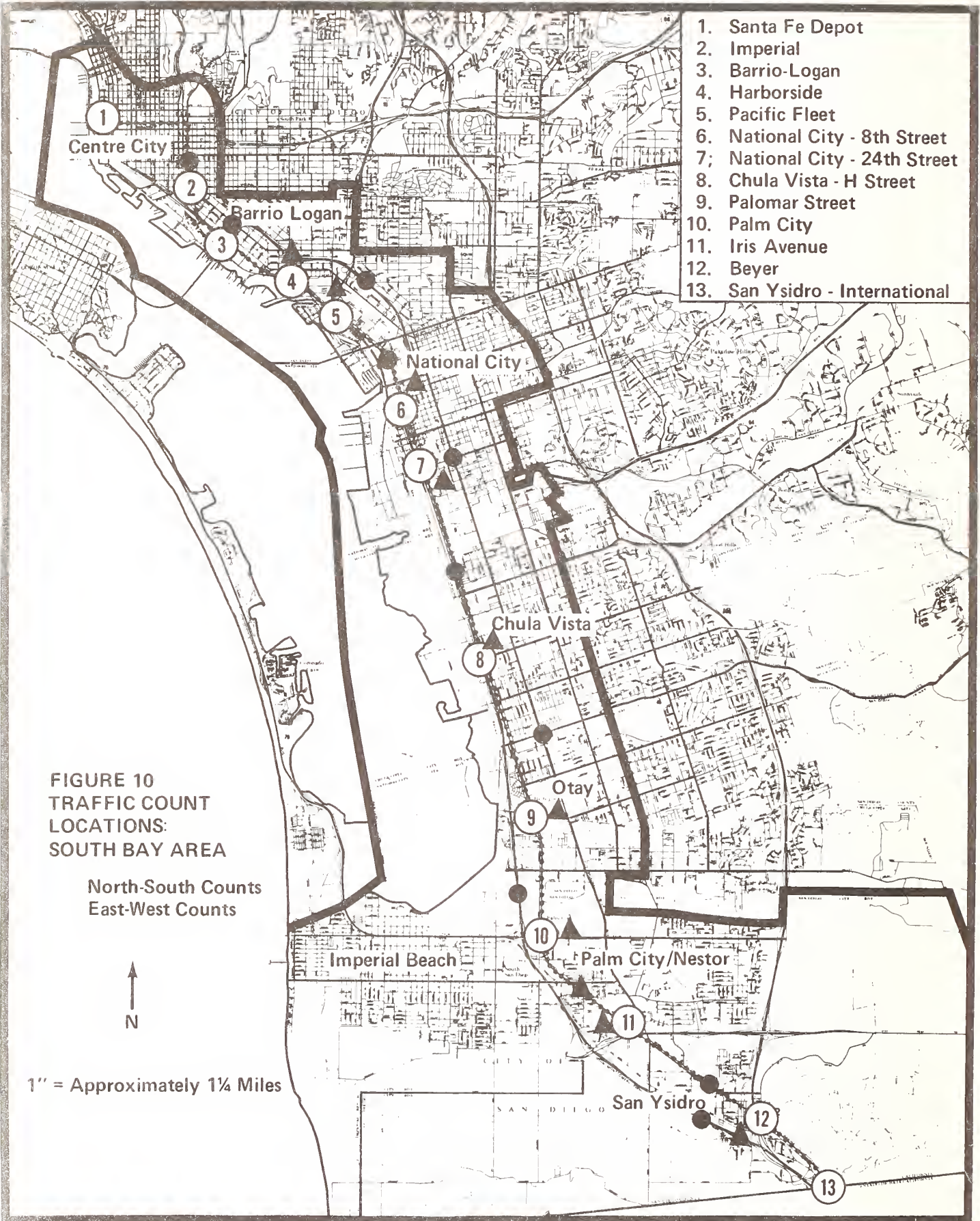


FIGURE 10
TRAFFIC COUNT
LOCATIONS:
SOUTH BAY AREA

North-South Counts
 East-West Counts



1" = Approximately 1 1/4 Miles

also be related to Trolley service. However, no clear pattern emerges. Coronado Avenue has been under reconstruction for several years to provide a grade separation with the Trolley. Completion of that construction combined with overall growth in this area accounts for the large amount of growth shown for this facility.

TABLE 23
SOUTH BAY TRAFFIC VOLUMES

<u>Street</u>	<u>Between</u>	<u>Daily Traffic Volumes (000)</u>		<u>Percent Change 1980-1983</u>
		<u>1980</u>	<u>1983</u>	
<u>North-South (Parallel Facilities)</u>				
I-5	Market/Imperial	118.2	124.5	5.3
I-5	Crosby/Coronado Bridge	106.7	117.9	10.5
I-5	Wabash/Vesta	115.5	131.2	13.6
I-5	24th/C	99.6	103.4	3.8
I-5	Main/Palm	79.0	95.2	20.5
I-5	Via San Ysidro/I-805	24.2	27.3	12.8
Harbor Drive	8th/32nd	14.3	15.4	7.7
Nat'l City Blvd.	18th/24th	15.1	15.4	2.0
Broadway	L/Naples	17.3	18.6	7.5
Beyer Blvd.	Palm/Main	8.2	9.7	18.3
<u>East-West (Perpendicular) Facilities</u>				
28th	Main/Harbor	15.0	13.8	-(8.0)
32nd	Wabash/Main	12.7	11.4	-(10.2)
8th	Harbor/I-5	14.2	14.7	3.5
24th	I-5/Wilson	23.3	22.6	-(1.3)
H	I-5/Broadway	21.5	23.0	7.0
Palomar	Industrial/Broadway	22.6	22.0	-(2.7)
Coronado	I-5/Hollister	11.4	17.8	26.1
Iris	Oro Vista/Beyer	3.5	4.2	20.0
West Park	San Ysidro/Beyer	4.4	3.8	-(13.6)

Source: SANDAG, Average Weekday Traffic Volumes, 1979-1983

CROSS STREET DELAY

One of the major capital cost savings of a light rail system when compared to a heavy rail system is the lack of total grade separation. A disadvantage of this characteristic is that some additional delay for cross traffic will occur.

For much of its length in the South Bay, the Trolley is adjacent or parallel to Interstate Route 5. The major access streets to Trolley stations are also major

access streets to the freeway. Trolleys approaching these major cross streets automatically activate the railroad crossing gates, even when they are stopping at the adjacent stations before crossing the intersection. In 50% of these cases, therefore, the gates remain down, stopping cross-traffic while passengers disembark and board the train, causing delays of one to 1-1/2 minutes. For wheelchair boardings, delays are potentially longer.

The amount of delay encountered by cross traffic was measured at five Trolley crossings and one adjacent intersection in May 1984. Cross-traffic delay at each intersection was measured for thirty-minute periods, three times on a weekday: morning rush hour (6:00-8:00), early afternoon (12:00-2:00), and evening rush hour (4:00-6:00). H Street in Chula Vista, the location of the third busiest Trolley station, was given special attention in this study. Not only is H Street the access street for the Trolley station and I-5 freeway, it is the major access street to the Rohr Industrial site, which employs 5,000 workers. This site was surveyed on a Saturday as well as on a weekday. In addition, the next major intersection to the east, on H Street, was also surveyed. This location, H Street and Broadway, is six blocks east of the H Street Trolley station. As shown on Table 24, the greatest amount of delay (per approach vehicle) in five of the six survey sites occurred at the mid-day count, not during either rush hour period.

H Street

The average delay for all vehicles crossing this intersection ranges from 5 seconds in the morning to over 12 seconds during the midday. Less than 45% of the vehicles crossing the tracks in the morning and afternoon peak are required to stop; but over 50% are required to stop in the midday period. Of those vehicles stopping, less than half were due to Trolley operations in the midday and afternoon periods, the remainder were stopped at the signalized freeway ramps. In the morning peak, over 70% of the delay can be attributed to the Trolley. The average delay for all vehicles stopping at this intersection is approximately 20 seconds.

On Saturdays the delay on H Street is marginally more severe than on weekdays. In the morning period fewer vehicles are stopped by the signals and crossing gate, but are stopped for longer periods of time. In the Saturday midday period, more delay is caused by the ramp signals than on weekdays.

H Street and Broadway, Chula Vista

This intersection was surveyed as a control. The purpose was to compare delay at the H Street station with delay at a nearby intersection not affected by the Trolley. H Street and Broadway is the next major intersection to the east of the Trolley station. At this location, H Street carries sixteen percent less traffic (19,400 vs. 23,000) than at the Trolley crossing. Nevertheless, total delay and the percentage of vehicles stopped at this (westbound) intersection is greater than at the Trolley crossing. Undoubtedly, this greater delay can be attributed to the high traffic volumes on Broadway (about 23,000/day) and the resultant signal phasing.

TABLE 24
 CROSS STREET DELAY
 SELECTED INTERSECTIONS - WESTBOUND TRAFFIC
 MAY 1984

<u>Intersection</u> <u>Delay Factor</u>	<u>Morning</u> <u>6:00-8:00</u>	<u>Midday</u> <u>12:00-2:00</u>	<u>Afternoon</u> <u>4:00-6:00</u>
H Street/I-5 (weekday)			
delay/stopped vehicle (seconds)	11.1	23.1	21.7
delay/approach vehicle (seconds)	5.0	12.4	9.1
% of vehicles stopped	44.8	53.7	42.2
% attributed to Trolley	72.7	47.4	45.5
H Street/I-5 (Saturday)			
delay/stopped vehicle (seconds)	17.3	23.6	—
delay/approach vehicle (seconds)	5.0	14.1	—
% of vehicles stopped	19.8	59.7	—
% attributed to Trolley	73.9	31.8	—
H Street/Broadway			
delay/stopped vehicle (seconds)	15.2	46.9	36.9
delay/approach vehicle (seconds)	7.5	36.2	28.0
% of vehicles stopped	49.7	77.2	75.9
% attributed to Trolley	0.0	0.0	0.0
E Street/I-5			
delay/stopped vehicle (seconds)	12.8	16.4	11.0
delay/approach vehicle (seconds)	3.8	6.5	4.6
% of vehicles stopped	30.1	39.7	42.3
% attributed to Trolley	27.5	15.2	28.6
8th Street/Harbor Drive			
delay/stopped vehicle (seconds)	38.4	27.9	24.9
delay/approach vehicle (seconds)	18.0	3.8	8.4
% of vehicles stopped	46.8	13.8	33.8
% attributed to Trolley	33.9	100.0	33.6
Palomar Street/Industrial Blvd.			
delay/stopped vehicle (seconds)	25.5	20.6	18.7
delay/approach vehicle (seconds)	8.6	12.0	7.1
% of vehicles stopped	33.9	58.2	38.1
% attributed to Trolley	56.1	30.6	43.5
Iris Avenue (no cross street)			
delay/stopped vehicle (seconds)	28.1	46.7	29.5
delay/approach vehicle (seconds)	3.2	7.5	5.3
% of vehicles stopped	11.3	16.1	18.0
% attributed to Trolley	100.0	100.0	100.0

E Street, Chula Vista

The E Street interchange is the next freeway access point north of H Street. E Street carries an almost identical 23,000 vehicles/day as H Street, and also provides access to the Tidelands industrial area. Although a Trolley station is proposed for E Street, none is currently in place. E Street was surveyed to determine the differences between an at-grade crossing and an at-grade crossing with a station. As shown in Table 24, the station location undoubtedly creates additional delay during most periods.

8th Street, National City

In addition to providing freeway access, 8th Street is also a main access road to the south gate of the U.S. Naval Station, San Diego. There is no parking lot at this LRT station, and the railroad crossing is one short block east of the signalized intersection of Harbor Drive, 8th Street and the Naval Station Gate. Most delay occurs at the morning peak period, when traffic backs up from the Harbor Drive signal across the railroad crossing. A similar but less severe condition exists in the afternoon peak with very little delay occurring in the midday period.

Palomar Street, Unincorporated Area

Palomar Street crosses the Trolley line one-fourth mile east of Interstate 5, adjacent to Industrial Boulevard. Industrial Boulevard is a light volume arterial which carries less than 5,000 vehicles per day. Despite this light volume, the intersection with Palomar Street is signalized. Palomar Street itself carries 22,000 vehicles a day.

About 30% of the delay at this intersection can be attributed to the Trolley in the midday period, but more than 56% is attributed to the Trolley in the morning peak. However, only one-third of the vehicles crossing the intersection in the morning are required to stop, but nearly 60% are required to stop in the midday period. Here, as at H Street, the major commercial centers, located several blocks to the east of the stations appear to attract midday traffic of greater magnitude than the work-induced peak period.

Iris Avenue, City of San Diego

This location was surveyed because there are no major parallel streets to the Trolley within a distance to significantly affect delay. The delay measured at this location can only be attributed to Trolley operations. As with other locations surveyed, the station is located immediately adjacent to the intersection. Therefore, the gates remain closed while southbound trains board and disembark passengers at the station. For northbound trains, the vehicle clears the intersection before coming to a full stop at the station, permitting traffic to flow normally while the northbound train is in the station.

As shown on Table 24, the amount of delay per stopped vehicle is greater here than at other Trolley intersections, indicating the longer cycle time of the Trolley, and the fact that no right-turns-after-stop can be made at this location. The total delay per approach vehicle and percent of vehicles stopped is the lowest of all sites surveyed, again because of the longer Trolley cycle times.

Level of Service

Based on the locations surveyed, the Trolley undoubtedly increases traffic delays on cross streets in the South Bay. The delays encountered, however, are well within the acceptable range by traffic engineering standards. At most intersections, the Trolley is only one part of the cause for delay, with crossing automobile traffic of equal or greater impact.

The standard used to measure the level of delay at Trolley crossings is shown in Appendix C. Delay has been converted to a level of service based on the percentage of vehicles which are required to wait at the railroad crossing gates for more than one normal cycle of the traffic signals controlling each intersection. The "normal" cycle occurs when the Trolley is not present. Cycle length was determined by actual measurement for a total of 15 minutes during a mid-week, mid-day period. The resulting levels of service are shown in Table 25. The H Street and Broadway intersection is not listed since Trolley operations do not affect this intersection. On the days that the survey was conducted, no vehicles were required to wait more than one cycle. Therefore, this intersection would also be operating at level of service A. Because there is no traffic signal at the Iris Avenue LRT crossing, a nominal signal cycle of 50 seconds was assumed for this analysis.

TABLE 25
TROLLEY INTERSECTION LEVEL OF SERVICE

	Traffic Signal Cycle		Percentage Delay ¹	Level of Service
	Red	Total		
National City - 8th Street	1:05.2	1:40.0	5.6%	B
Chula Vista - E Street	:26.8	:51.1	3.8%	B
Chula Vista - H Street	:23.3	:52.0	9.0%	B
Palomar Street	:28.0	1:15.2	5.6%	B
Iris Avenue	(:25.0) ²	(:50.0) ²	6.5%	B

¹Percent of cycles requiring vehicles to wait longer than normal.

²Assumed normal cycle.

Trolley operations undoubtedly have an impact on traffic movement, primarily because of the delay related to Trolley patrons boarding the trains at stations which are adjacent to major arterials. This delay can most clearly be seen in a comparison of the delay at H Street and E Street in Chula Vista. These intersections are similar in design and traffic volume. The increase in the percentage of traffic light cycles for which one or more vehicles is required to wait through more than one "normal" cycle is caused almost entirely by southbound trains stopped at the station.

CENTRE CITY ACCIDENTS

Because the Trolley reintroduced street-running trains in downtown San Diego, the City of San Diego has been monitoring its operation, primarily its safety aspects. This section has been excerpted from a report of City staff to their Council in November 1983. Data are derived from the City's accident record files and inquiries to the Police Department.

Total Accidents

This analysis covers the period of July 1, 1981 up to August 5, 1983. During this period, the total accident experience, including trolley and non-trolley accidents, is shown in Table 26.

TABLE 26

CENTRE CITY ACCIDENTS
Twelfth Avenue and C Street, Centre City San Diego
July 1, 1981 - August 5, 1983

	<u>C Street</u>	<u>Twelfth Avenue</u>	<u>Total</u>
Trolley Related	39	14	53
Trolley Involved	24	10	34
Trolley Not Involved	15	4	19
Not Trolley Related	81	44	125
Grand Total	120	58	178

Source: City of San Diego, 1983

Trolley-related accidents fall into two categories: Trolley Involved and Trolley Not Involved. Trolley Involved accidents are those in which a Trolley vehicle is directly involved. In such accidents, a motor vehicle or pedestrian collides with a Trolley vehicle. Trolley Not Involved accidents are those in which a trolley vehicle is not directly involved, but are considered "trolley related" because they involve some aspect of the trolley system being in place. For example, a vehicle may hit a trolley stationshelter, or a vehicle may be traveling illegally on the tracks and make an improper turn, thereby hitting another motor vehicle.

Non-Trolley Related accidents are those accidents on the remaining roadway which do not involve either the trolley, the tracks, or the trolley system. In other words, these are accidents involving vehicles hitting other vehicles, pedestrians, or fixed objects. The combined accident experience shows a total of 178 accidents on both C Street and Twelfth Avenue, of which 53 accidents, or 30 percent of the total, involved the Trolley directly or indirectly.

The accident experience on C Street and 12th Avenue has decreased both in terms of frequency and rate, since the Trolley started operating. Based on a one-year "before" and "after" comparison, the non-trolley-related accidents decreased from 143 to 53 accidents, a drop of 63 percent. This drop was larger than the additional

current year and thus do not permit an extensive before and after comparison. Furthermore, data for the year 1980 cannot be used since this was the time during which the Trolley system was under construction on C Street and Twelfth Avenue. However, a useful comparison can be made by comparing 1979 data (before) with 1982 data (after). The results are shown on Table 27.

TABLE 27
ACCIDENT RATES: 1979 AND 1982
Twelfth Avenue and C Street - Centre City San Diego

	<u>1979</u>	<u>1982</u>
Total Accidents	143	70
Trolley-Related	n.a.	17
Not Trolley-Related	143	53
12th Avenue	76	24
C Street	67	46
Average Daily Volume*	5,700	3,000
Accident Rate	37.15	34.56

* Accidents per million vehicle miles.

Source: City of San Diego, 1983

Accidents took a substantial drop on both streets after the Trolley started operating. However, this decline should be tempered by the fact that both streets were modified and vehicular traffic volumes decreased. As shown, not only did the traffic volume and number of accidents decrease but that the accident rate also underwent a slight decline.

A detailed breakdown of the causal factors of accidents during the period from July 1, 1981 to August 5, 1983, is shown on Table 28.

TABLE 28

ACCIDENTS BY CAUSAL FACTORS
Twelfth Avenue and C Street, Centre City San Diego

Trolley Involved		34
Vehicle Violated Trolley Right-of-Way	8	
Vehicle Ran Stop Sign	4	
Vehicle Ran Signal	4	
Vehicle Made Improper Turn or Lane Change	7	
Other Miscellaneous	11	
Trolley Not Involved		19
Vehicle Improperly Driving on Track	9	
Other Miscellaneous	10	
Not Trolley Related		125
Ran Signal	41	
Violated right-of-Way	17	
Improper Turn or Lane Change	16	
Following Too Closely	16	
Pedestrian Hit	7	
Other Miscellaneous	28	

Source: City of San Diego, 1983

The data above indicates that the greatest number of accidents involve autos running red lights, violating the right-of-way of other vehicles, and autos either making improper turns or making improper lane changes, or following too closely.

It should be noted that C Street has a number of unusual features such as: (1) a two-way trolley operating on a one-way street, (2) exclusive use trolley tracks (some cities permit motorists to drive on the trolley tracks), (3) multiple-use signal kiosks, (4) extensive use of street trees which may limit motorists' view of the signals. While these features may tend to confuse some motorists, it is interesting to note that in a workshop discussion conducted by the City's engineering and police staff, the police observed that follow-up inquiries with violators indicated that most motorists knew what they were doing prior to the accident (or citation) but were merely taking a chance. Thus, a major contributing factor in the accident picture does not appear to be confusion as much as a case of risk-taking behavior.

Comparison with Other Cities

Survey data obtained from MTDB from various cities is shown on Table 29. Cities are arranged in descending order of the lowest traffic accident experience in terms of transit vehicle miles traveled between accidents.

TABLE 29
COMPARATIVE ACCIDENT DATA
Light Rail Transit Systems

<u>Transit Agency</u>	<u>Total Track Route Miles</u>	<u>Street Operation¹</u>	<u>Annual Vehicle Miles Operated (1000's)</u>	<u>Vehicle Miles Operated Between Accidents</u>
GCRTA (Cleveland)	13.2	80%	1,200	80,000
SDTI (San Diego)	15.9	12%	1,280	75,400 ²
MUNI (San Francisco)	23.0	70%	1,500	23,800
MBTA (Boston)	35.1	Not Available	4,759	21,600
Calgary Transit (Canada)	7.9	10%	760	17,200
PAT (Pittsburgh)	25.0	50%	1,380	10,800

¹Percent of total system where Light Rail vehicles operate on public streets also used by automobiles.

²FY83 data; in FY84 there were 87,200 vehicle miles between accidents.

Source: MTDB, Telephone Survey, Summer 1983.

It is recognized that each light rail system has its own characteristics and that San Diego has a fairly high percentage (88%) of trackage that operates on its own exclusive right-of-way. In any case, San Diego's trolley system has a better than average experience in terms of low accidents and ranks in second position in terms of having the greatest number of vehicle miles operated between the occurrence of accidents.

STATION PARKING

The initial phase of the Trolley provided a total of 1,820 patron parking spaces at six lots in the suburban areas of the South Bay. The lots range in size from 170 parking stalls at the Beyer Blvd. station to 470 at the Palm City station. Neither terminal station is provided with publicly-provided lots, although a large number of privately-owned parking spaces are located within walking distance of both the San Ysidro-International and Santa Fe Depot stations. Parking is free at the six MTDB-owned parking lots.

The parking lots were sized to accommodate future demand and on the more pragmatic basis of land availability and parcel size. It is understandable, then, that there remains excess capacity at the MTDB facilities. Based on data collected at least monthly by SDTI staff, weekday parking lot use from October 1981 to March 1984 is shown on Table 30. During this period use has nearly doubled. While the number of parked cars generally reflect Trolley ridership trends, there are generally more cars parked in December than in the subsequent July.

TABLE 30

PARKING LOT USAGE TRENDS
October 1981 - March 1984

<u>Station</u>	<u>Number of Spaces</u>	<u>Number of</u>							
		<u>10/81</u>	<u>1/82</u>	<u>7/82</u>	<u>1/83</u>	<u>7/83</u>	<u>1/84</u>	<u>3/84</u>	
Beyer	170	18	18	20	13	20	14	23	
Iris Avenue	330	7	64	54	41	39	56	69	
Palm City	470	106	146	137	116	115	167	190	
Chula Vista-Palomar	370	90	141	111	110	84	171	176	
Chula Vista-H Street	300	161	155	130	169	106	253	256	
National City-24th Street	180	47	64	70	110	48	120	109	
TOTAL	1,820	429	588	522	559	412	781	823	

	<u>Percentage Increase</u>		<u>Percent of Capacity</u>	
	<u>10/81-3/84</u>	<u>3/82-3/84</u>	<u>10/81</u>	<u>3/84</u>
Beyer	27.8%	15.0%	10.6	13.5
Iris Avenue	885.7	25.4	2.1	20.5
Palm City	79.2	33.8	22.6	40.4
Chula Vista-Palomar	95.6	54.4	24.3	47.6
Chula Vista-H Street	59.0	57.1	53.7	85.3
National City-24th Street	131.9	109.7	26.1	60.6
TOTAL	91.8	51.0	23.6	45.2

Source: SDTI Monthly Inventory

Percentage increase, also shown on Table 30, indicates that the largest percentage increases in parking occurred at the more northerly stations, closest to Centre City. The more northerly stations are also closer to capacity than the stations located farther to the south. If these trends continue, there will be a need for additional parking in the northern Chula Vista-National City area in the next several years. Within the corridor, most residential growth is projected in the southern part of the corridor, from Palomar Street to Beyer Boulevard. If these projections are realized, use of the four southern parking facilities should increase dramatically in the next several years.

Table 31 contains data from manual counts of the number of vehicles parked at suburban lots which were conducted on four days, including three weekdays and a

Saturday. The manual counts were consistent with the monthly counts made by SDTI personnel, which were conducted during the mid-morning. The May counts were made in the early morning (prior to 6:00 AM on weekdays or before 7:30 AM on weekends); mid-morning (between 8:00 and 10:00 AM); afternoon (between 2:00 and 4:00 PM); and evening (between 7:00 and 9:00 PM).

The pattern of parking lot use was consistent between all lots, with very few vehicles parked overnight, a relatively constant number of parked vehicles in the morning and afternoon period and relatively few vehicles remaining after the afternoon peak period.

TABLE 31
 PARKING LOT USAGE BY DAY OF WEEK
 MAY 1984

	<u>Mon.</u>	<u>Wed.</u>	<u>Thurs.</u>	<u>Sat.</u>
NATIONAL CITY - 24TH STREET STATION				
<u>Parked Vehicles</u>				
Early Morning	12	—	—	16
Mid-Morning	114	96	100	15
Afternoon	109	107	107	49
Evening	9	8	13	16
CHULA VISTA - H STREET STATION				
<u>Parked Vehicles</u>				
Early Morning	24	—	—	22
Mid-Morning	229	218	206	32
Afternoon	243	240	227	106
Evening	23	26	38	41
CHULA VISTA-PALOMAR STATION				
<u>Parked Vehicles</u>				
Early Morning	18	—	—	11
Mid-Morning	161	147	149	13
Afternoon	167	150	148	44
Evening	14	14	11	9
PALM CITY STATION				
<u>Parked Vehicles</u>				
Early Morning	18	—	—	19
Mid-Morning	159	174	176	21
Afternoon	176	186	175	43
Evening	17	15	19	14
IRIS AVENUE STATION				
<u>Parked Vehicles</u>				
Early Morning	4	—	—	3
Mid-Morning	52	60	62	10
Afternoon	64	73	70	19
Evening	7	12	8	8
BEYER STATION				
<u>Parked Vehicles</u>				
Early Morning	3	—	—	5
Mid-Morning	23	26	19	5
Afternoon	33	35	27	8
Evening	3	5	5	3

Source: SANDAG Survey.

APPENDICES

Appendix A

TRANSIT PASSENGER SURVEY - 1983

The 1983 South Bay Transit Survey was conducted by the San Diego Association of Governments (SANDAG), with the cooperation of the transit company operators, on weekdays between November 3 and November 18, 1983. During this time period there were no major holidays or known major conventions; therefore, the results of the survey are representative of average weekday ridership patterns. The main purpose of the South Bay Transit Survey was to provide data necessary to evaluate the effects of Trolley operation on South Bay transit ridership.

A sample was selected from the total number of buses used throughout the day on the South Bay routes to yield 20 percent of total boardings, stratified by route. Based on previous on-board survey response rates, the number of bus trips to be sampled was calculated so as to yield the desired sample. Four routes operating in the South Bay use only one bus, and therefore on these four routes a 100 percent sample was taken. For other routes, the particular bus trips sampled were selected randomly from the bus schedules. The buses selected to be sampled were surveyed for the entire day and route.

Sample data are expanded so as to adjust for undersampling that may occur at various time periods, notably the afternoons, and also to represent average annual weekday ridership. After the survey questionnaires were edited and finalized, the number of completed survey questionnaires were expanded to the number of boardings counted on each route on a typical weekday. The expanded counts were then adjusted to average annual weekday boardings of passengers 12 years old and over. Expansion factors were calculated by individual routes, direction of travel, and time period of day. The time periods used were 5 AM to 9 AM, 9 AM to 3 PM, 3 PM to 6 PM, and 6 PM to 5 AM.

Three sources of data are needed in order to do the expansion; the survey itself, SANDAG's on-going Regional Passenger Counting Program, and transit operator data. From the on-board survey itself, surveys tallied (1) the number of children under 12 years old and (2) the number of refusals. These two tallies together with the number of forms handed out equals total boardings at the time of the survey. From these data, the percent under 12 years old, and the number of usable forms were obtained for each route by direction of travel and time period. SANDAG's on-going Passenger Counting Program provides a profile of typical weekday ridership for each route by direction of travel and time period. The final data needed to expand the sample was the average annual weekday boarding count obtained from the daily farebox audit system of the transit companies. Trolley counts were obtained from SDTI based on information from their vendomat program and fare inspector checks. Depending upon the route, direction of travel, and time period, each survey form was assigned an expansion factor. These expansion factors are used when tabulating unlinked trips, or total boardings.

Revenue boardings represent those boardings where a fare was paid within the South Bay system. Transit company profiles would account for all boardings within a particular company. Persons who used two or more buses within the same transit company would only be represented once. Those who used two or more buses from different companies would be represented on each company's profile. South Bay system profiles would account for all boardings in the South Bay Transit System. Persons who transferred on different routes within the South Bay system would only be represented once in a system profile.

Complete documentation of this survey, including coding instructions and tabulation of question responses, is contained in the SANDAG report, "1983 South Bay Transit Survey," dated September 1984. The remainder of this appendix contains the survey instrument and survey data by route and transit operator.



TRANSIT SURVEY FORM

(Versión en español al dorso)

The San Diego Association of Governments, in cooperation with the transit operators, is trying to understand your transit needs. You can help us by filling out the questions below and returning the form to the interviewer on this vehicle. Thank you.

6

10

13

15

16

DO NOT WRITE
IN THIS SPACE

20 1. WHAT IS YOUR RESIDENCE ZIP CODE?

25 2. HOW DID YOU GET TO THE TRANSIT STOP
WHERE YOU GOT ON THIS VEHICLE?

26 Transferred from Trolley
28 Waited _____ minutes for transfer

31 Transferred from Bus Route No. _____
Waited _____ minutes for transfer

Walked _____ blocks Bicycled _____ miles
 Drove _____ miles Dial-A-Ride
 Was driven _____ miles

33 3. WHAT TYPE OF FARE DID YOU PAY FOR
THIS TRIP? (CHECK ONE)

Cash Ready Pass
 Transfer slip Ready 10 ticket
 Transfer slip plus cash Ready 2 ticket
 Single fare ticket Centre City ticket

34 4. WHERE DID YOU COME FROM? (CHECK ONE)

Home Personal Business
(medical, banking, etc.)
 Work Social Activity
 School Social Activity
 Shopping Recreation

35 5. WHAT IS THE ADDRESS OF THE PLACE
YOU CAME FROM?

_____ City
Address or intersection (cross street),

39 6. WHERE WILL YOU GET OFF THIS VEHICLE?

_____ City
Address or intersection (cross street),

43 7. AFTER YOU GET OFF THIS VEHICLE, HOW
WILL YOU GET TO YOUR DESTINATION?

44 Will transfer to Trolley
Will transfer to Bus Route No. _____
47 Will walk _____ blocks Will bike _____ miles
Will drive _____ miles Dial-A-Ride
Will be driven _____ miles

49 8. WHERE ARE YOU GOING? (CHECK ONE)

Home Personal Business
(medical, banking, etc.)
 Work Social Activity
 School Social Activity
 Shopping Recreation

50 9. WHAT IS THE ADDRESS OF YOUR FINAL
DESTINATION?

_____ City
Address or intersection (cross streets),

54 10. WHICH OF THE FOLLOWING STATEMENTS
BEST DESCRIBES YOUR NORMAL USE OF
PUBLIC TRANSIT?

6 - 7 days a week Several times a month
 4 - 5 days a week Just occasionally
 1 - 3 days a week

65 11. IF YOU ARE A REGULAR USER (ONCE A
WEEK OR MORE), HOW LONG HAVE YOU
BEEN RIDING PUBLIC TRANSIT?

Less than one month
 One month to one year
 One to two years
 More than two years

12. WOULD YOU CONTINUE TO USE PUBLIC
TRANSIT IF FARES WERE INCREASED?

5¢ Yes No
10¢ Yes No
15¢ Yes No
20¢ Yes No
25¢ Yes No

13. HOW MANY MOTOR VEHICLES DO YOU
HAVE IN YOUR HOUSEHOLD FOR EVERY-
DAY USE?

None Two
 One Three or more

14. WAS A PRIVATE MOTOR VEHICLE
AVAILABLE TO YOU FOR THIS TRIP?

Yes No

15. IF PUBLIC TRANSIT WAS NOT AVAILABLE
FOR THIS TRIP, WHAT ALTERNATIVE
WOULD YOU CHOOSE?

Auto (driver) Taxi
 Auto (passenger) Dial-A-Ride
 Bicycle Social Service Agency
 Walking Not take trip

16. ARE YOU A LICENSED DRIVER?

Yes No

17. HOW MANY LICENSED DRIVERS LIVE IN
YOUR HOUSEHOLD? (INCLUDE YOURSELF)

None Three
 One More than 3
 Two

18. HOW MANY PEOPLE LIVE IN YOUR HOME?
(INCLUDE YOURSELF)

One Four
 Two Five
 Three Six or more

19. ARE YOU A: (Check all that apply)

Visitor/Tourist Yes No
Member of Armed Forces Yes No
Student Yes No
Employed Yes No
Volunteer Worker Yes No
Homemaker Yes No
Retired Yes No
Handicapped Yes No

20. ARE YOU: Male Female

21. WHAT IS YOUR AGE?

Under 16 years of age 25 - 44 years old
 16 - 18 years old 45 - 59 years old
 19 - 24 years old 60 or over

22. WHAT IS THE TOTAL ANNUAL INCOME OF
THOSE PEOPLE LIVING IN YOUR HOME?

Less than \$5,000 \$20 - \$25,000
 \$5 - \$10,000 \$25 - \$35,000
 \$10 - \$15,000 over \$35,000
 \$15 - \$20,000

Comments _____

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SAN DIEGO TRANSIT CORPORATION
1980

	<u>ROUTE</u>						South Bay
	<u>9</u>	<u>29</u>	<u>32</u>	<u>33</u>	<u>51</u>	<u>100</u>	<u>Total</u>
MODE TO BUS STOP							
Transferred	22.2	10.1	17.8	74.2	62.2	37.6	34.4
Walked	73.2	87.3	76.7	25.7	35.8	55.4	61.9
Drove	1.2	1.1	1.8	0.0	0.7	3.8	1.2
Was Driven	2.3	1.5	3.1	0.2	1.2	3.2	2.1
Bicycled	1.2	0.0	0.4	0.0	0.0	0.0	0.3
Dial-A-Ride	0.0	0.0	0.2	0.0	0.0	0.0	0.1
FARE USED FOR TRIP							
Cash	65.4	82.5	74.3	23.9	38.5	50.1	58.3
Transfer Slip	18.2	7.9	13.0	67.7	48.2	21.1	26.1
Pass	12.3	7.8	8.2	7.0	5.9	17.8	10.3
Transfer Plus Cash	0.2	0.1	0.6	0.8	7.4	7.7	2.1
Single-Fare Ticket	1.7	0.6	1.0	0.2	0.0	0.5	0.8
Ready 10 Ticket	NA	NA	NA	NA	NA	NA	NA
Ready 2 Ticket	NA	NA	NA	NA	NA	NA	NA
Centre City Ticket	NA	NA	NA	NA	NA	NA	NA
ORIGIN OF TRIP							
Home	50.4	52.3	51.9	43.2	42.8	50.2	51.4
Work	27.8	25.9	20.6	22.9	16.1	35.1	24.6
School	4.6	4.5	6.9	11.8	3.7	8.9	5.6
Shopping	3.2	2.3	7.2	6.3	16.4	1.1	4.6
Personal Business	6.7	7.2	10.5	14.4	13.4	3.9	8.4
Other	7.2	7.9	2.9	1.3	7.6	0.8	5.5
MODE FROM BUS STOP							
Transfer	23.9	19.4	25.9	15.3	13.9	49.6	30.1
Walk	73.8	79.5	71.3	84.5	83.4	43.7	67.8
Drive	0.5	0.1	0.7	0.0	0.9	4.9	0.5
Will Be Driven	1.0	1.0	1.9	0.2	1.8	1.7	1.3
Bicycle	0.9	0.0	0.0	0.0	0.0	0.0	0.2
Dial-A-Ride	0.0	0.0	0.2	0.0	0.0	0.0	0.1
DESTINATION OF TRIP							
Home	33.3	35.2	39.8	52.1	42.9	41.9	36.8
Work	32.9	36.2	25.2	12.4	8.8	32.8	30.2
School	6.3	3.3	4.9	5.7	2.0	8.3	5.1
Shopping	3.9	4.4	9.1	4.8	19.7	3.3	6.3
Personal Business	9.2	12.2	16.3	18.0	24.1	7.4	13.4
Other	14.4	8.7	4.8	6.9	2.5	6.2	8.3

SAN DIEGO TRANSIT CORPORATION
1983

	<u>ROUTE</u>				South Bay <u>Total</u>
	<u>13</u>	<u>29</u>	<u>32</u>	<u>33</u>	
MODE TO BUS STOP					
Transferred	27.2	28.5	28.0	52.1	25.4
From Trolley	1.8	5.1	11.8	36.3	9.2
From Other Bus	25.4	23.4	16.2	15.8	16.2
Walked	69.6	67.6	67.4	45.8	70.5
Drove	0.2	0.9	1.6	0.6	1.0
Was Driven	2.9	2.4	3.0	1.2	2.6
Bicycled	0.0	0.1	0.0	0.0	0.1
Dial-A-Ride	0.0	0.5	0.0	0.3	0.3
FARE USED FOR TRIP					
Cash	59.7	61.2	67.5	44.4	62.8
Transfer Slip	15.6	19.9	17.8	34.0	18.0
Pass	22.9	18.5	13.4	20.2	18.3
Transfer Plus Cash	0.3	0.3	0.4	0.0	0.3
Single-Fare Ticket	1.4	0.1	0.4	1.1	0.5
Ready 10 Ticket	0.0	0.0	0.3	0.4	0.1
Ready 2 Ticket	0.0	0.0	0.3	0.0	0.1
Centre City Ticket	0.0	0.0	0.0	0.0	0.0
ORIGIN OF TRIP					
Home	56.0	49.3	54.8	46.4	50.9
Work	12.6	24.7	16.4	23.9	21.5
School	22.5	7.1	9.8	8.2	9.9
Shopping	1.4	2.8	10.5	7.1	4.5
Personal Business	5.8	10.8	5.1	10.3	8.9
Other	1.7	5.3	3.4	4.1	4.2
MODE FROM BUS STOP					
Transfer	39.7	30.5	28.7	34.7	29.8
To Trolley	3.0	3.4	12.2	26.8	7.6
To Other Bus	36.7	27.1	16.5	7.9	22.2
Walk	58.4	67.1	68.6	65.1	67.8
Drive	1.0	0.7	0.5	0.0	0.7
Will Be Driven	0.6	1.3	0.0	0.2	0.9
Bicycle	0.2	0.1	2.2	0.0	0.6
Dial-A-Ride	0.0	0.4	0.0	0.0	0.2
DESTINATION OF TRIP					
Home	37.5	39.9	41.2	50.8	40.6
Work	21.8	26.2	26.3	20.5	25.7
School	22.2	5.7	7.7	4.6	8.0
Shopping	4.2	5.6	11.5	5.6	6.5
Personal Business	9.8	14.7	10.7	11.1	12.8
Other	4.4	8.0	2.6	7.4	6.5

SAN DIEGO TRANSIT CORPORATION
1980

	ROUTES						South Bay
	<u>9</u>	<u>29</u>	<u>32</u>	<u>33</u>	<u>51</u>	<u>100</u>	<u>Total</u>
NORMAL USE OF TRANSIT							
6-7 Days A Week	33.6	33.6	30.5	20.2	25.6	27.7	32.0
4-5 Days A Week	40.5	36.1	33.3	41.1	21.7	50.7	36.7
1-3 Days A Week	12.5	14.6	14.2	15.3	21.5	7.6	13.5
Several Times/Month	4.7	6.4	8.9	7.3	21.6	4.4	7.1
Occasionally	8.7	9.3	13.0	16.1	9.5	9.6	10.7
LENGTH OF TIME AS A BUS RIDER							
Less Than One Month	11.0	13.7	9.7	12.8	5.7	4.3	11.1
One Month to One Year	31.3	37.4	30.6	35.3	40.2	35.1	32.6
One Year to Two Years	15.0	13.9	13.4	13.3	15.4	15.0	14.1
More Than Two Years	42.7	35.0	46.3	38.7	38.6	45.5	42.2
NUMBER OF VEHICLES IN HOUSEHOLD							
None	50.2	53.1	42.8	34.5	38.8	38.2	47.1
One	31.3	31.0	37.1	40.9	24.5	36.2	34.1
Two	14.6	13.4	15.2	18.4	31.0	20.0	14.6
Three or More	3.9	2.5	5.0	6.2	5.7	5.6	4.2
WAS A PRIVATE VEHICLE AVAILABLE FOR THIS TRIP?							
Yes	18.5	16.1	16.2	17.4	7.8	28.4	17.6
No	81.5	83.9	83.8	82.6	92.2	71.6	82.4
WHAT WAS ALTERNATIVE TO TRANSIT FOR THIS TRIP?							
Auto Driver	12.3	10.5	10.6	11.6	5.9	25.0	11.8
Auto Passenger	28.0	26.9	23.7	23.5	15.5	30.2	26.0
Bicycle	6.8	7.2	6.9	6.6	0.0	3.3	6.8
Walking	13.3	18.2	13.9	20.1	35.2	6.4	15.5
Taxi	15.1	17.4	15.1	15.9	18.2	6.6	15.2
Dial-A-Ride	3.6	2.7	4.0	1.8	1.7	5.8	3.3
Social Service	0.2	0.2	1.5	0.3	0.8	0.5	0.7
Not Take Trip	20.7	16.9	24.4	20.3	22.7	22.2	20.7
ARE YOU A LICENSED DRIVER?							
Yes	67.1	67.9	50.6	57.9	37.5	63.1	59.9
No	32.9	32.1	49.4	42.1	62.5	36.9	40.1

SAN DIEGO TRANSIT CORPORATION
1983

	<u>ROUTE</u>				<u>South Bay Total</u>
	<u>13</u>	<u>29</u>	<u>32</u>	<u>33</u>	
NORMAL USE OF TRANSIT					
6-7 Days A Week	28.8	32.4	35.0	24.3	32.0
4-5 Days A Week	48.0	35.4	26.9	36.3	35.1
1-3 Days A Week	9.2	13.5	19.3	18.9	14.7
Several Times A Month	4.3	7.8	10.4	8.4	7.8
Occasionally	9.6	10.8	8.4	12.1	10.3
LENGTH OF TIME AS A BUS RIDER					
Less Than One Month	8.2	9.5	9.7	10.2	9.4
One Month to One Year	22.0	28.7	20.5	33.3	26.7
One Year to Two Years	18.7	14.0	16.1	15.1	15.2
More Than Two Years	51.1	47.8	53.8	41.4	48.7
NUMBER OF VEHICLES IN HOUSEHOLD					
None	32.8	47.5	47.5	32.0	44.5
One	38.1	34.3	34.2	35.4	34.7
Two	20.4	14.2	13.9	24.5	15.9
Three or More	8.6	4.0	4.4	8.0	5.0
WAS A PRIVATE VEHICLE AVAILABLE FOR THIS TRIP?					
Yes	21.4	21.8	20.2	18.5	21.0
No	78.6	78.2	79.8	81.5	79.0
WHAT WAS ALTERNATIVE TO TRANSIT FOR THIS TRIP?					
Auto Driver	24.6	19.2	69.9	23.6	20.1
Auto Passenger	21.9	20.5	26.0	19.3	21.8
Bicycle	4.9	6.1	2.7	5.0	5.2
Walking	14.6	12.7	13.9	16.3	13.3
Taxi	4.2	8.4	8.2	4.6	7.6
Dial-A-Ride	1.6	2.9	2.3	2.2	2.6
Social Service	0.6	0.9	1.3	0.5	0.9
Not Take Trip	10.5	16.5	21.1	12.8	15.9
Multiple Response	17.0	12.7	7.5	15.7	12.6
ARE YOU A LICENSED DRIVER?					
Yes	54.8	58.5	42.9	58.0	55.7
No	45.2	41.5	57.1	42.0	44.3

SAN DIEGO TRANSIT CORPORATION
1980

	<u>ROUTE</u>						South Bay
	<u>9</u>	<u>29</u>	<u>32</u>	<u>33</u>	<u>51</u>	<u>100</u>	<u>Total</u>
HOW MANY LICENSED DRIVERS IN HOUSEHOLD?							
None	17.0	14.8	16.4	9.7	15.0	10.3	15.5
One	32.5	30.3	31.6	33.8	24.6	25.9	31.6
Two	30.1	31.6	31.3	35.7	34.5	42.3	31.7
Three	10.9	11.0	13.3	11.6	11.8	12.7	11.7
More Than Three	9.4	12.3	7.4	9.2	14.1	8.9	9.4
PERSONS IN HOUSEHOLD							
One	22.4	16.6	12.0	7.4	10.4	12.5	15.8
Two	29.0	21.7	20.3	16.8	10.8	19.9	22.7
Three	18.0	19.5	17.3	25.5	21.3	22.7	18.4
Four	11.0	15.2	18.2	19.8	10.9	17.6	15.3
Five	6.5	11.6	13.7	10.2	24.2	14.4	11.7
Six or More	13.2	15.4	18.5	20.2	22.4	12.9	16.1
PASSENGER STATUS							
Visitor or Tourist	4.1	3.3	9.0	7.3	10.1	2.9	5.8
Member of Armed Forces	32.4	40.5	7.3	10.9	1.4	15.5	22.8
Student	15.4	13.9	22.9	36.4	24.3	19.7	18.6
Employed	49.0	45.9	47.5	38.4	36.8	64.8	48.2
Volunteer Worker	2.6	3.1	3.8	3.0	1.4	2.4	3.3
Homemaker	8.5	9.3	17.7	25.2	34.3	10.8	13.0
Retired	8.6	4.6	7.5	3.6	4.3	4.3	6.7
Handicapped	2.3	2.8	3.9	3.3	5.9	0.7	3.2
SEX							
Male	61.8	67.0	48.9	41.7	29.4	54.2	57.0
Female	38.2	33.0	51.1	58.3	70.6	45.8	43.0
AGE							
12-16 Years	1.7	1.4	3.3	4.8	11.1	1.4	2.3
17-18 Years	5.7	6.4	9.5	10.6	8.6	7.4	7.8
19-24 Years	38.9	41.3	26.3	36.0	24.9	26.5	33.5
25-44 Years	30.4	34.8	34.8	35.4	28.7	42.6	33.9
45-59 Years	11.7	9.3	14.0	5.7	17.6	12.6	12.3
60 or Over	11.7	6.8	12.2	7.6	9.1	9.4	10.2
HOUSEHOLD INCOME							
Less Than \$5,000	17.9	16.5	31.0	23.2	22.4	12.9	22.4
\$5,000 - \$10,000	32.6	34.7	28.8	24.0	32.8	22.3	30.9
\$10,000 - \$15,000	15.3	17.9	16.7	27.6	15.4	25.1	17.5
\$15,000 - \$20,000	14.7	14.2	10.4	13.0	6.7	11.7	12.7
\$20,000 - \$25,000	9.0	7.3	6.1	5.2	8.8	13.9	7.3
\$25,000 - \$35,000	5.4	3.8	3.4	2.6	1.4	7.5	4.2
Over \$35,000	5.1	5.7	3.7	4.4	12.5	6.6	4.9

SAN DIEGO TRANSIT CORPORATION
1983

	<u>ROUTE</u>				<u>South Bay Total</u>
	<u>13</u>	<u>29</u>	<u>32</u>	<u>33</u>	
HOW MANY LICENSED DRIVERS IN HOUSEHOLD?					
None	10.4	18.5	21.9	10.7	17.3
One	23.7	30.8	30.0	25.1	29.2
Two	38.0	32.6	27.9	39.3	32.9
Three	19.4	9.5	11.9	14.1	11.8
More Than Three	8.5	8.7	8.3	10.8	8.9
PERSONS IN HOUSEHOLD					
One	8.3	17.6	13.1	7.8	14.8
Two	21.3	23.4	13.6	16.3	20.9
Three	25.1	18.8	21.0	21.1	20.2
Four	20.0	15.8	17.8	18.1	16.6
Five	11.3	9.1	13.2	13.3	10.5
Six or More	14.0	15.3	21.4	23.4	17.0
PASSENGER STATUS					
Visitor or Tourist	3.9	5.2	10.4	5.5	6.2
Member of Armed Forces	3.5	16.1	1.8	7.6	10.9
Student	43.0	20.6	16.3	22.0	23.0
Employed	41.0	46.7	34.1	43.8	43.5
Volunteer Worker	3.2	3.1	2.3	2.5	2.9
Homemaker	15.3	15.4	20.2	18.2	16.2
Retired	5.0	9.4	6.0	4.1	7.7
Handicapped	2.7	2.5	3.9	3.2	2.8
SEX					
Male	40.2	55.1	33.8	48.3	49.6
Female	59.8	44.9	66.2	51.7	50.4
AGE					
12-16 Years	10.4	2.0	1.1	2.8	3.0
17-18 Years	11.6	6.9	9.6	8.9	8.1
19-24 Years	28.9	27.5	24.8	36.5	28.1
25-44 Years	34.0	37.6	35.9	33.7	36.6
45-59 Years	7.8	13.7	16.5	12.2	13.1
60 or Over	7.4	12.3	12.1	5.9	11.2
HOUSEHOLD INCOME					
Less Than \$5,000	21.2	22.0	42.8	23.1	25.4
\$5,000 - \$10,000	20.0	23.3	25.7	18.4	22.6
\$10,000 - \$15,000	13.4	18.6	9.9	13.7	15.8
\$15,000 - \$20,000	14.1	13.0	9.4	15.9	13.0
\$20,000 - \$25,000	9.8	9.6	2.5	10.5	8.6
\$25,000 - \$35,000	10.9	5.6	5.9	8.6	6.7
Over \$35,000	10.5	8.0	3.8	9.9	7.8

SAN DIEGO TROLLEY
1983

	<u>Route 510</u>
MODE TO BUS STOP	
Transferred	19.6
- from SDTC	13.8
- from NC	1.5
- from CV	3.2
- from SEA	1.1
Walked	58.2
Drove	13.8
Was Driven	7.9
Bicycled	0.1
Dial-a-Ride	0.3
FARE USED FOR TRIP	
Cash	31.7
Transfer Slip	6.2
Pass	16.8
Transfer & Cash	7.7
Single Fare Ticket	27.0
Ready 10 Pass	6.4
Ready 2 Pass	2.3
Centre City Ticket	1.8
Other	0.1
ORIGIN OF TRIP	
Home	49.4
Work	23.4
School	6.2
Shopping	5.4
Personal Business	7.8
Other	7.8
MODE FROM BUS STOP	
Transferred	23.1
- to SDTC	16.9
- to NC	2.3
- to CV	3.2
- to SEA	0.7
Walk	60.5
Drive	10.5
Was Driven	5.5
Bicycled	0.2
Dial-A-Ride	0.2

SAN DIEGO TROLLEY
1983

	Route <u>510</u>
DESTINATION OF TRIP	
Home	37.2
Work	23.2
School	6.1
Shopping	8.6
Personal Business	10.4
Other	14.6
NORMAL USE OF TRANSIT	
6-7 Days A Week	18.7
4-5 Days A Week	32.1
1-3 Days A Week	13.8
Several Times A Month	11.3
Occasionally	24.2
LENGTH OF TIME AS BUS RIDER	
Less Than One Month	10.8
One Month to One Year	36.8
One Year to Two Years	22.6
More Than Two Years	29.8
NUMBER OF VEHICLES IN HOUSEHOLD	
None	30.9
One	36.3
Two	21.8
Three Or More	11.0
WAS PRIVATE VEHICLE AVAILABLE FOR TRIP?	
Yes	39.7
No	60.3
ALTERNATIVE TO TRANSIT FOR TRIP	
Auto Driver	37.0
Auto Passenger	21.1
Bicycle	3.2
Walking	9.8
Taxi	6.8
Dial-A-Ride	1.6
Social Service	1.1
Not Take Trip	12.5
Multiple Response	6.9
ARE YOU A LICENSED DRIVER?	
Yes	73.6
No	26.4

SAN DIEGO TROLLEY
1983

	Route <u>510</u>
HOW MANY LICENSED DRIVERS IN HOUSEHOLD?	
None	9.5
One	26.8
Two	36.6
Three	12.9
More Than Three	14.1
 PERSONS IN HOUSEHOLD	
One	10.4
Two	21.3
Three	18.4
Four	16.7
Five	12.9
Six or More	20.3
 PASSENGER STATUS	
Visitor or Tourist	17.6
Member of Armed Forces	15.2
Student	17.6
Employed	41.1
Volunteer Worker	3.2
Homemaker	11.7
Retired	5.9
Handicapped	2.1
 SEX	
Male	60.9
Female	39.1
 AGE	
12-16 Years	1.4
17-18	6.9
19-24	32.3
25-44	36.6
45-59	12.6
60 or Over	10.3
 INCOME	
Less than \$5,000	15.3
\$5,000 - \$10,000	18.6
\$10,000 - \$15,000	17.3
\$15,000 - \$20,000	13.2
\$20,000 - \$25,000	10.4
Over \$25,000	25.2

CHULA VISTA TRANSIT (SCOOT)
1983

	ROUTE						Total
	701	702	703	704	705	706	
MODE TO BUS STOP							
Transferred	27.7	40.4	34.2	30.1	34.8	36.0	31.1
From Trolley	13.1	31.4	26.6	22.9	16.8	25.7	23.0
From Other Bus	14.6	9.0	7.8	7.2	18.0	10.3	8.1
Walked	68.9	57.6	63.1	62.6	58.9	64.0	64.8
Drove	0.9	0.6	2.7	2.9	1.7	0.0	1.5
Was Driven	2.1	0.8	0.0	4.4	4.3	0.0	2.3
Bicycled	0.4	0.0	0.0	0.0	0.0	0.0	0.1
Dial-A-Ride	0.0	0.6	0.0	0.0	0.4	1.4	0.2
FARE USED FOR TRIP							
Cash	61.0	56.6	62.1	62.0	60.6	66.2	61.4
Transfer Slip	12.8	16.5	13.7	11.5	20.4	12.9	13.4
Pass	14.6	18.4	16.5	17.2	12.7	13.2	16.1
Transfer Plus Cash	3.4	0.5	1.4	1.9	2.3	0.0	1.8
Single-Fare Ticket	5.0	4.3	4.0	6.6	2.1	1.4	4.5
Ready 10 Ticket	1.6	3.6	2.3	0.7	1.5	4.9	2.2
Ready 2 Ticket	1.6	0.0	0.0	0.0	0.0	0.0	0.4
Centre City Ticket	0.0	0.0	0.0	0.0	0.0	1.4	0.0
ORIGIN OF TRIP							
Home	54.2	53.8	49.0	48.1	55.7	43.7	52.3
Work	14.5	19.1	20.9	9.3	14.2	24.7	15.7
School	15.3	11.4	20.5	35.9	22.0	7.7	19.6
Shopping	5.5	4.3	4.5	1.7	1.8	13.0	3.9
Personal Business	7.1	10.7	2.5	3.6	3.4	5.7	6.1
Other	3.3	0.6	2.7	1.4	2.9	5.3	2.4
MODE FROM BUS STOP							
Transfer	25.1	36.7	35.6	35.6	31.0	20.1	31.8
To Trolley	6.5	28.1	20.5	20.0	16.0	7.3	17.2
To Other Bus	18.6	8.6	15.0	15.6	15.0	12.8	14.6
Walk	73.8	61.8	64.4	61.4	65.8	78.0	66.5
Drive	1.1	0.0	0.0	0.5	0.9	1.9	0.4
Will Be Driven	0.0	1.5	0.0	2.2	2.3	0.0	1.2
Bicycle	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dial-A-Ride	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DESTINATION OF TRIP							
Home	41.0	35.7	39.2	47.5	36.1	36.4	39.3
Work	21.6	25.2	20.8	12.0	25.7	5.9	19.5
School	9.6	15.7	15.6	30.5	23.7	4.2	18.3
Shopping	10.3	7.0	8.2	4.4	4.9	27.5	8.7
Personal Business	9.5	7.4	10.3	3.0	5.4	17.8	7.8
Other	7.9	9.1	5.8	2.6	4.2	8.1	6.4

CHULA VISTA TRANSIT (SCOOT)
1981

	<u>701</u>	<u>702</u>	<u>ROUTE</u>		<u>705</u>	<u>707</u>	<u>Total</u>
			<u>703</u>	<u>70</u>			
MODE TO BUS STOP							
Transferred	23.8	17.1	37.6	16.6	29.5	20.3	23.3
Walked	73.3	80.8	57.8	81.7	64.5	78.9	73.7
Drove	0.5	0.0	0.0	0.6	0.6	0.0	0.3
Was Driven	1.9	2.1	4.6	1.1	5.4	0.0	2.6
Bicycled	0.5	0.0	0.0	0.0	0.0	0.0	0.1
Dial-A-Ride	NA	NA	NA	NA	NA	NA	NA
FARE USED FOR TRIP							
Cash	86.2	89.4	79.5	86.8	80.7	85.6	86.3
Transfer Slip	9.0	4.9	14.3	6.9	12.0	10.2	9.2
Pass	NA	NA	NA	NA	NA	NA	NA
Transfer Plus Cash	3.7	4.3	5.3	4.6	6.1	1.7	4.4
Pass & Cash	NA	NA	NA	NA	NA	NA	NA
Single Fare Ticket	NA	NA	NA	NA	NA	NA	NA
PURPOSE AT DESTINATION							
Home	50.7	39.3	40.5	48.0	32.5	34.2	41.9
Work	13.2	20.7	6.3	13.7	9.7	16.2	13.6
School	17.2	22.9	41.5	27.4	42.7	28.3	28.8
Shopping	6.5	5.0	3.6	1.2	3.1	4.3	4.0
Personal Business	3.0	6.4	4.5	4.6	6.0	8.6	4.3
Other	9.4	5.7	3.6	5.1	6.0	7.7	6.4
MODE FROM BUS STOP							
Transfer	21.2	37.2	26.6	27.7	21.5	28.4	25.9
NUMBER OF VEHICLES IN HOUSEHOLD							
None	19.6	25.0	20.2	22.0	25.9	30.3	23.5
One	29.3	35.2	33.6	26.2	29.1	34.3	30.8
Two	27.3	25.7	32.7	36.6	22.8	19.2	27.8
Three or More	23.8	14.1	13.5	15.2	22.2	16.2	17.8
WAS A PRIVATE VEHICLE AVAILABLE FOR THIS TRIP?							
Yes	23.7	24.1	21.7	23.3	23.4	17.1	22.6
No	76.3	75.9	78.3	76.7	76.6	82.9	77.4

CHULA VISTA TRANSIT (SCOOT)
1983

	ROUTE					706	Total
	701	702	703	704	705		
NORMAL USE OF TRANSIT							
6-7 Days A Week	21.1	22.5	15.0	23.1	22.3	10.5	20.3
4-5 Days A Week	33.0	43.3	43.0	49.9	44.9	37.7	42.7
1-3 Days A Week	25.1	19.0	26.4	14.2	17.6	27.6	20.3
Several Times A Month	3.2	11.5	7.4	4.9	3.8	11.3	6.4
Occasionally	17.7	3.7	8.2	7.8	11.4	12.8	10.3
LENGTH OF TIME AS A BUS RIDER							
Less Than One Month	9.6	10.3	8.4	7.3	5.1	10.0	7.9
One Month to One Year	31.6	29.0	35.9	25.1	33.0	24.5	29.9
One Year to Two Years	13.3	20.6	25.5	22.7	18.1	18.9	20.3
More Than Two Years	45.5	40.1	30.2	44.9	43.8	46.7	42.0
NUMBER OF VEHICLES IN HOUSEHOLD							
None	26.4	38.4	32.4	26.4	28.8	52.1	32.1
One	41.7	32.1	30.7	31.1	35.3	28.1	34.3
Two	23.1	19.6	24.4	25.7	23.2	14.3	22.0
Three or More	8.8	9.9	12.5	16.8	12.7	5.5	11.6
WAS A PRIVATE VEHICLE AVAILABLE FOR THIS TRIP?							
Yes	23.9	19.7	26.3	19.6	22.2	10.9	21.1
No	76.1	80.3	73.7	80.4	77.8	89.1	78.9
WHAT WAS ALTERNATIVE TO TRANSIT FOR THIS TRIP?							
Auto Driver	18.2	22.8	20.1	16.3	18.7	17.1	18.9
Auto Passenger	22.9	14.3	22.3	29.6	28.7	13.0	23.1
Bicycle	6.4	3.8	8.8	7.0	8.9	2.3	6.0
Walking	23.1	31.1	18.5	9.1	14.2	26.4	19.4
Taxi	6.1	6.6	3.0	3.7	3.6	1.9	4.7
Dial-A-Ride	2.0	0.7	4.6	1.4	2.1	4.2	2.0
Social Service	0.4	0.0	1.4	0.4	0.0	0.0	0.3
Not Take Trip	12.1	15.4	13.2	17.2	14.3	22.2	15.4
Multiple Response	8.8	5.2	8.2	15.4	9.4	13.0	10.2
ARE YOU A LICENSED DRIVER?							
Yes	42.2	51.0	49.5	47.0	48.4	40.6	46.8
No	57.8	49.0	50.5	53.0	51.6	59.4	53.2

CHULA VISTA TRANSIT (SCOOT)
1981

	ROUTE						<u>Total</u>
	<u>701</u>	<u>702</u>	<u>703</u>	<u>70</u>	<u>705</u>	<u>707</u>	
WHAT WAS ALTERNATIVE TO TRANSIT FOR THIS TRIP?							
Auto Driver	16.2	20.0	20.2	17.8	23.4	11.4	18.5
Auto Passenger	14.2	16.2	18.4	19.8	18.6	13.0	16.4
Bicycle	9.5	9.2	4.6	10.2	6.8	4.3	8.0
Walking	30.9	30.0	22.9	12.6	21.0	40.0	25.6
Taxi	5.0	1.5	5.5	4.2	1.9	1.8	3.3
Not Take Trip	11.1	10.8	16.5	18.5	17.9	3.5	13.6
Other	13.1	12.3	11.9	16.8	10.4	26.0	14.7
PERSONS IN HOUSEHOLD							
One	3.9	6.6	12.7	7.7	14.5	9.5	8.7
Two	15.3	14.1	20.6	19.9	14.4	17.9	16.9
Three	18.2	16.5	18.7	19.2	20.8	24.2	19.3
Four	20.4	19.0	14.7	17.3	17.0	15.8	17.7
Five	17.3	19.0	13.7	18.0	16.3	13.7	16.7
Six or More	24.9	24.8	19.6	17.9	17.0	18.9	20.8
PASSENGER STATUS							
Visitor or Tourist	2.1	0.0	1.0	0.6	1.3	1.0	1.0
Member of Armed Forces	0.3	1.6	1.0	4.3	1.3	1.0	1.6
Student	55.2	52.5	76.0	72.7	78.5	61.9	65.4
Employed	38.0	48.4	46.2	45.3	39.2	35.1	42.2
Volunteer Worker	NA	NA	NA	NA	NA	NA	NA
Homemaker	NA	NA	NA	NA	NA	NA	NA
Retired	5.9	5.7	4.8	5.6	4.4	7.2	5.6
Handicapped	NA	NA	NA	NA	NA	NA	NA
SEX							
Male	39.2	41.0	42.7	40.7	39.0	33.3	39.5
Female	60.8	59.0	57.3	59.3	61.0	66.7	60.5
AGE							
12-16 Years	28.3	15.6	9.6	3.1	13.8	19.0	15.1
17-24 Years	37.6	44.5	52.9	59.6	50.3	44.0	48.1
25-44 Years	18.6	18.8	26.9	20.5	20.8	22.0	20.8
45-59 Years	8.5	14.8	6.8	10.0	10.7	7.0	9.9
60 or Over	7.0	6.3	3.8	6.8	4.4	8.0	6.1
HOUSEHOLD INCOME							
Less Than \$5,000	16.2	8.4	22.0	16.3	22.9	29.2	18.1
\$5,000 - \$10,000	24.8	23.2	24.2	27.9	22.1	23.1	24.4
\$10,000 - \$15,000	17.4	17.9	17.5	16.3	20.0	20.0	18.0
\$15,000 - \$25,000	20.8	23.1	18.7	18.6	17.9	20.0	19.9
Over \$25,000	20.8	27.4	17.6	21.0	17.1	7.7	19.6

CHULA VISTA TRANSIT (SCOOT)
1983

	ROUTE					706	Total
	701	702	703	704	705		
HOW MANY LICENSED DRIVERS IN HOUSEHOLD?							
None	14.9	14.6	15.8	8.4	12.3	40.4	15.1
One	25.6	17.3	26.7	24.0	24.6	29.1	24.1
Two	25.5	38.1	30.9	31.1	32.1	22.2	30.3
Three	20.6	16.3	18.5	16.9	19.6	4.3	16.9
More Than Three	13.4	13.7	8.1	19.6	11.4	3.9	13.5
PERSONS IN HOUSEHOLD							
One	9.6	5.8	11.2	6.5	13.0	36.6	10.6
Two	10.2	14.7	13.2	15.8	16.4	27.5	15.4
Three	18.8	18.5	26.0	22.3	18.3	16.2	19.9
Four	21.6	16.9	20.5	15.7	22.5	14.8	19.1
Five	23.5	18.7	15.9	15.9	16.2	4.4	16.4
Six or More	16.3	25.3	13.2	23.9	13.6	6.5	18.5
PASSENGER STATUS							
Visitor or Tourist	4.9	5.5	10.1	1.8	2.4	1.7	4.4
Member of Armed Forces	1.7	5.6	1.1	1.4	1.4	2.7	2.5
Student	28.7	24.0	28.1	69.5	51.3	12.7	38.9
Employed	41.8	37.8	44.4	37.7	46.2	29.8	40.0
Volunteer Worker	1.7	0.9	4.7	2.3	3.3	0.0	1.9
Homemaker	20.9	11.4	14.1	15.4	8.9	21.6	15.3
Retired	8.3	3.7	4.1	2.4	1.9	29.8	6.5
Handicapped	5.2	2.5	4.5	4.9	1.4	3.4	3.8
SEX							
Male	36.6	49.8	45.6	41.0	42.7	53.9	43.6
Female	63.4	50.2	53.4	59.0	57.3	46.1	56.4
AGE							
12-16 Years	13.1	8.1	14.1	4.9	4.4	3.8	8.2
17-18 Years	11.3	18.4	9.8	21.1	22.9	5.9	16.1
19-24 Years	22.1	19.4	14.4	36.5	37.3	13.8	25.9
25-44 Years	28.1	33.7	37.5	24.1	21.5	26.3	28.0
45-59 Years	14.8	13.0	14.8	9.9	10.7	19.7	13.1
60 or Over	10.5	7.3	9.4	3.6	3.2	30.6	8.7
HOUSEHOLD INCOME							
Less Than \$5,000	12.9	26.0	16.3	15.0	21.4	11.1	18.1
\$5,000 - \$10,000	13.1	16.3	12.9	16.4	17.6	26.2	16.3
\$10,000 - \$15,000	11.1	9.1	7.6	17.2	15.2	17.5	12.9
\$15,000 - \$20,000	15.4	21.3	16.2	15.5	13.4	10.3	16.1
\$20,000 - \$25,000	13.5	2.6	12.8	14.1	11.4	7.9	10.7
\$25,000 - \$35,000	20.5	8.6	14.9	10.1	7.8	19.0	12.2
Over \$35,000	13.4	16.1	19.4	11.7	13.2	7.9	13.6

NATIONAL CITY TRANSIT
1980

	ROUTE			Total
	601	602	603	
MODE TO BUS STOP				
Transferred	53.0	54.7	63.8	54.7
Walked	46.0	43.4	34.8	43.8
Drove	0.4	0.8	0.0	0.6
Was Driven	0.6	1.0	1.4	0.9
Bicycled	0.0	0.0	0.0	0.0
Dial-A-Ride	0.0	0.0	0.0	0.0
FARE USED FOR TRIP				
Cash	47.3	42.3	27.8	43.3
Transfer Slip	45.4	48.0	63.3	48.0
Pass	3.4	5.6	2.5	4.4
Transfer Plus Cash	1.1	1.1	0.0	1.0
Single-Fare Ticket	0.4	0.3	0.0	0.3
Ready 10 Ticket	NA	NA	NA	NA
Ready 2 Ticket	NA	NA	NA	NA
Centre City Ticket	NA	NA	NA	NA
ORIGIN OF TRIP				
Home	41.3	46.1	60.1	46.1
Work	18.7	21.9	13.9	20.5
School	28.8	17.2	10.2	19.9
Shopping	5.2	6.4	0.8	5.3
Personal Business	6.5	6.0	15.0	6.8
Other	0.4	2.5	0.0	1.5
MODE FROM BUS STOP				
Transfer	27.2	29.2	62.9	30.1
Walk	72.6	70.4	37.1	69.6
Drive	0.0	0.0	0.0	0.0
Will Be Driven	0.2	0.0	0.0	0.1
Bicycle	0.0	0.0	0.0	0.0
Dial-A-Ride	0.0	0.5	0.0	0.2
DESTINATION OF TRIP				
Home	54.1	51.8	38.3	51.0
Work	13.9	14.1	16.3	14.8
School	16.2	11.5	4.8	13.1
Shopping	3.5	6.5	10.6	5.6
Personal Business	8.2	14.0	24.8	12.4
Other	4.1	2.2	5.2	3.2

NATIONAL CITY TRANSIT
1983

	<u>ROUTE</u>		<u>Total</u>
	<u>601</u>	<u>602</u>	
MODE TO BUS STOP			
Transferred	49.3	33.5	38.4
From Trolley	34.0	21.8	27.7
From Other Bus	15.3	11.7	10.7
Walked	47.1	62.0	57.3
Drove	0.5	0.3	0.4
Was Driven	2.6	3.0	2.9
Bicycled	0.0	0.7	0.4
Dial-A-Ride	0.5	0.6	0.6
FARE USED FOR TRIP			
Cash	56.3	64.2	61.6
Transfer Slip	27.5	13.0'	18.2
Pass	12.1	17.6	15.3
Transfer Plus Cash	0.8	2.1	1.6
Single-Fare Ticket	2.2	2.4	2.4
Ready 10 Ticket	1.2	0.6	0.9
Ready 2 Ticket	0.0	0.0	0.0
Centre City Ticket	0.0	0.0	0.0
ORIGIN OF TRIP			
Home	49.5	59.8	54.9
Work	19.2	15.5	17.2
School	15.2	7.9	11.2
Shopping	6.3	3.4	4.7
Personal Business	7.6	11.3	9.8
Other	2.1	2.1	2.1
MODE FROM BUS STOP			
Transfer	31.0	39.6	36.3
To Trolley	13.5	24.8	20.3
To Other Bus	17.5	14.8	16.0
Walk	67.8	57.3	61.4
Drive	0.0	1.7	1.0
Will Be Driven	1.2	1.0	1.1
Bicycle	0.0	0.0	0.0
Dial-A-Ride	0.0	0.0	0.0
Other	0.0	0.4	0.2
DESTINATION OF TRIP			
Home	47.5	34.9	40.9
Work	17.0	26.1	22.4
School	15.4	9.0	11.1
Shopping	8.5	10.5	9.3
Personal Business	10.2	13.8	12.2
Other	1.5	5.8	4.1

NATIONAL CITY TRANSIT
1980

	<u>ROUTE</u>			<u>Total</u>
	<u>601</u>	<u>602</u>	<u>603</u>	
NORMAL USE OF TRANSIT				
6-7 Days A Week	29.3	32.6	39.4	31.5
4-5 Days A Week	41.8	35.2	28.4	37.4
1-3 Days A Week	12.6	15.3	10.1	14.0
Several Times A Month	4.9	5.5	16.1	6.2
Occasionally	11.5	11.3	6.0	10.8
LENGTH OF TIME AS A BUS RIDER				
Less Than One Month	16.6	10.2	49.5	15.7
One Month to One Year	48.0	46.8	24.0	45.1
One Year to Two Years	15.3	17.2	15.7	16.5
More Than Two Years	20.2	25.8	10.8	22.8
NUMBER OF VEHICLES IN HOUSEHOLD				
None	29.6	42.7	62.0	39.9
One	35.1	36.6	24.9	35.0
Two	25.9	15.6	3.4	18.3
Three or More	9.3	5.1	9.7	6.9
WAS A PRIVATE VEHICLE AVAILABLE FOR THIS TRIP?				
Yes	14.1	9.1	38.8	13.5
No	85.9	90.9	61.2	86.5
WHAT WAS ALTERNATIVE TO TRANSIT FOR THIS TRIP?				
Auto Driver	6.9	4.8	10.1	6.1
Auto Passenger	24.0	23.0	6.6	21.2
Bicycle	3.6	2.2	6.9	3.2
Walking	42.3	40.4	17.8	40.0
Taxi	8.5	14.2	3.0	10.9
Dial-A-Ride	4.1	1.4	41.5	5.5
Social Service	0.0	1.2	0.0	0.7
Not Take Trip	10.7	12.8	14.1	12.4
ARE YOU A LICENSED DRIVER?				
Yes	37.1	36.8	34.0	37.7
No	62.9	63.2	66.0	62.3
HOW MANY LICENSED DRIVERS IN HOUSEHOLD?				
None	11.0	19.2	46.8	18.4
One	22.9	34.8	12.3	28.1
Two	38.7	29.4	32.8	32.9
Three	14.1	11.1	4.7	12.0
More Than Three	13.4	5.5	3.5	8.6

NATIONAL CITY TRANSIT
1983

	ROUTE		<u>Total</u>
	<u>601</u>	<u>602</u>	
NORMAL USE OF TRANSIT			
6-7 Days A Week	23.7	31.4	28.3
4-5 Days A Week	44.7	37.1	39.8
1-3 Days A Week	16.2	14.5	15.2
Several Times A Month	8.8	7.9	8.5
Occasionally	6.6	9.0	8.2
LENGTH OF TIME AS A BUS RIDER			
Less Than One Month	12.5	10.4	10.8
One Month to One Year	31.5	26.1	28.6
One Year to Two Years	16.0	16.9	17.0
More Than Two Years	40.0	46.6	43.7
NUMBER OF VEHICLES IN HOUSEHOLD			
None	36.1	43.6	40.3
One	35.0	33.5	34.6
Two	22.5	17.5	19.3
Three or More	6.4	5.4	5.8
WAS A PRIVATE VEHICLE AVAILABLE FOR THIS TRIP?			
Yes	16.2	18.3	17.5
No	83.8	81.7	82.5
WHAT WAS ALTERNATIVE TO TRANSIT FOR THIS TRIP?			
Auto Driver	16.7	16.5	16.8
Auto Passenger	22.9	20.3	21.2
Bicycle	3.7	5.7	4.6
Walking	26.9	24.8	25.7
Taxi	8.3	9.1	8.8
Dial-A-Ride	0.9	3.0	2.1
Social Service	1.0	0.7	0.9
Not Take Trip	11.5	9.6	10.3
Multiple Response	8.2	10.3	9.6
ARE YOU A LICENSED DRIVER?			
Yes	41.6	48.7	46.2
No	58.4	51.3	53.8
HOW MANY LICENSED DRIVERS IN HOUSEHOLD?			
None	14.2	18.6	16.1
One	28.6	29.2	29.1
Two	31.9	29.8	30.8
Three	13.9	13.1	13.7
More Than Three	11.4	9.3	10.2

NATIONAL CITY TRANSIT
1980

	<u>ROUTE</u>			<u>Total</u>
	<u>601</u>	<u>602</u>	<u>603</u>	
PERSONS IN HOUSEHOLD				
One	8.9	8.3	7.6	8.8
Two	12.1	23.7	26.8	19.8
Three	18.0	21.6	7.6	18.9
Four	18.3	14.4	5.1	15.1
Five	17.0	15.6	37.0	17.2
Six or More	25.6	16.3	15.9	20.2
PASSENGER STATUS				
Visitor or Tourist	3.9	0.8	0.0	2.0
Member of Armed Forces	3.7	4.2	9.6	4.5
Student	52.7	29.8	42.7	38.3
Employed	35.1	39.7	26.7	37.6
Volunteer Worker	4.6	3.3	0.0	3.8
Homemaker	10.4	21.9	20.9	17.6
Retired	3.5	11.8	14.2	8.8
Handicapped	2.2	4.0	11.6	4.1
SEX				
Male	44.1	36.0	23.8	39.0
Female	55.9	64.0	76.2	61.0
AGE				
12-16 Years	15.1	5.5	23.2	9.9
17-28 Years	29.6	14.6	12.1	19.0
19-24 Years	13.6	22.9	8.2	18.9
25-44 Years	22.8	25.4	27.3	25.4
44-59 Years	13.4	16.6	5.3	14.6
60 or Over	5.5	14.9	23.9	12.2
HOUSEHOLD INCOME				
Less Than \$5,000	20.8	33.6	58.3	30.4
\$5,000 - \$10,000	28.0	28.3	6.7	27.0
\$10,000 - \$15,000	17.1	15.4	2.7	15.3
\$15,000 - \$20,000	9.1	7.1	14.5	7.9
\$20,000 - \$25,000	11.5	7.7	11.1	9.3
\$25,000 - \$35,000	6.7	6.0	6.8	6.5
Over \$35,000	7.0	2.0	0.0	3.5

NATIONAL CITY TRANSIT
1983

	ROUTE		Total
	601	602	
PERSONS IN HOUSEHOLD			
One	11.6	13.6	12.4
Two	13.3	17.4	15.6
Three	18.3	20.4	19.5
Four	20.3	14.5	17.4
Five	15.1	17.0	16.2
Six or More	21.5	17.1	18.8
PASSENGER STATUS			
Visitor or Tourist	4.1	2.8	3.4
Member of Armed Forces	3.7	6.4	5.4
Student	32.6	22.2	26.4
Employed	36.8	35.7	36.3
Volunteer Worker	0.6	4.7	2.9
Homemaker	15.8	17.8	17.0
Retired	4.4	7.7	6.5
Handicapped	3.8	3.7	3.7
SEX			
Male	36.6	37.2	37.3
Female	63.4	62.8	62.7
AGE			
12-16 Years	6.9	5.7	6.1
17-18 Years	21.3	8.8	14.0
19-24 Years	24.8	22.8	23.6
25-44 Years	23.6	32.8	29.3
45-59 Years	13.5	12.5	12.9
60 or Over	9.9	17.5	14.2
HOUSEHOLD INCOME			
Less Than \$5,000	26.4	26.7	26.9
\$5,000 - \$10,000	24.0	25.7	24.5
\$10,000 - \$15,000	13.4	18.3	16.4
\$15,000 - \$20,000	10.4	11.4	11.1
\$20,000 - \$25,000	9.0	10.4	9.4
\$25,000 - \$35,000	11.4	4.5	7.7
Over \$35,000	5.3	3.0	4.1

STRAND EXPRESS AGENCY
1983

	<u>Route</u> <u>901</u>
MODE TO BUS STOP	
Transferred	33.7
From Trolley	11.6
From Rt. 29, 32	2.9
From Other Bus	19.3
Walked	59.2
Drove	1.4
Was Driven	3.6
Bicycled	1.4
Dial-A-Ride	0.6
FARE USED FOR TRIP	
Cash	54.3
Transfer Slip	23.7
Pass	19.8
Transfer Plus Cash	1.0
Single-Fare Ticket	1.0
Ready 10 Ticket	0.1
Ready 2 Ticket	0.0
Centre City Ticket	0.0
Other	0.0
ORIGIN OF TRIP	
Home	53.4
Work	26.0
School	7.7
Shopping	2.0
Personal Business	7.1
Other	3.8
MODE FROM BUS STOP	
Transfer	24.0
To Trolley	7.0
To Rt. 29, 32	1.8
To Other Bus	15.2
Walk	70.9
Drive	0.6
Will Be Driven	3.1
Bicycle	0.9
Dial-A-Ride	0.5
DESTINATION OF TRIP	
Home	35.5
Work	31.9
School	5.7
Shopping	6.7
Personal Business	11.9
Other	8.4

STRAND EXPRESS AGENCY
1983

	<u>Route</u>
	<u>901</u>
NORMAL USE OF TRANSIT	
6-7 Days A Week	24.5
4-5 Days A Week	44.3
1-3 Days A Week	12.8
Several Times A Month	6.1
Occasionally	12.3
LENGTH OF TIME AS A BUS RIDER	
Less Than One Month	8.8
One Month to One Year	35.9
One Year to Two Years	14.4
More Than Two Years	41.0
NUMBER OF VEHICLES IN HOUSEHOLD	
None	40.2
One	35.9
Two	18.5
Three or More	5.3
WAS A PRIVATE VEHICLE AVAILABLE FOR THIS TRIP?	
Yes	29.2
No	70.8
WHAT WAS ALTERNATIVE TO TRANSIT FOR THIS TRIP?	
Auto Driver	29.3
Auto Passenger	25.2
Bicycle	5.1
Walking	5.5
Taxi	8.1
Dial-A-Ride	1.6
Social Service	0.8
Not Take Trip	14.0
Multiple Response	10.4
ARE YOU A LICENSED DRIVER?	
Yes	65.1
No	34.9
HOW MANY LICENSED DRIVERS IN HOUSEHOLD?	
None	13.4
One	29.9
Two	35.5
Three	11.5
More Than Three	9.7

STRAND EXPRESS AGENCY
1983

	<u>Route</u> <u>901</u>
PERSONS IN HOUSEHOLD	
One	16.0
Two	31.3
Three	19.1
Four	14.0
Five	9.3
Six or More	10.1
PASSENGER STATUS	
Visitor or Tourist	8.5
Member of Armed Forces	24.3
Student	19.0
Employed	48.0
Volunteer Worker	3.2
Homemaker	13.6
Retired	9.2
Handicapped	3.3
SEX	
Male	59.1
Female	40.9
AGE	
12-16 Years	4.1
17-18 Years	6.3
19-24 Years	27.9
25-44 Years	35.7
45-59 Years	14.0
60 or Over	12.1
HOUSEHOLD INCOME	
Less Than \$5,000	15.0
\$5,000 - \$10,000	18.3
\$10,000 - \$15,000	19.5
\$15,000 - \$20,000	13.0
\$20,000 - \$25,000	13.6
\$25,000 - \$35,000	8.5
Over \$35,000	12.0

Appendix B

MERCHANT'S SURVEY, 1984

Merchants in the Trolley station areas were surveyed to get an indication of the effect of Trolley service on business and to determine the attitudes of the merchants toward the Trolley and Trolley operations. The 1984 survey closely parallels a survey completed in 1980, which was conducted as part of the initial phase of the Guideway Monitoring effort.

The 1984 survey was a self-administered, mail-back survey which was completed in a three step process. The initial step, undertaken in March, was an inventory of businesses in the vicinity of the stations. The inventory included all those businesses facing C Street between Kettner Boulevard and 12th Avenue; those facing 12th Avenue between C Street and the SD&AE right-of-way; those facing San Ysidro Boulevard, south of Beyer Boulevard; and businesses within walking distance (generally one-fourth mile) of the other suburban stations.

Using the inventory, surveyors hand-delivered questionnaires to each establishment. An attempt was made to talk directly to the manager or owner, explaining the purpose of the survey and mail-back procedures. If the manager/owner was not present, the questionnaire, cover letter and postage-free return envelope were left with other employees. The questionnaire and cover letter are included in this Appendix. Because detailed information on rent, number of employees and business volumes was requested, surveyors did not attempt to complete the questionnaire during this visit.

Out of a total of 203 questionnaires distributed on April 27, 48 had been returned by May 7. Subsequently, surveyors telephoned those businesses which had not returned questionnaires. The follow-up effort resulted in 31 additional surveys completed by telephone, and an addition 17 survey forms were mailed to telephone contacts. Ten surveys were returned by mail, subsequent to the follow-up activity. A total of 91 valid questionnaires were completed, with a response rate of 44.8%.

Coding instructions for the survey are also included in this Appendix. A total of 36 respondents made a total of 56 comments in response to question #24. These comments were grouped by subject matter and coded as indicated. The coding scheme for comments was developed based on their content.

The results of this survey are presented in Chapter 3 of this report. The following information is presented in the remainder of this appendix:

- o Cover Letter
- o Survey Instrument
- o List of Businesses in the Station Areas
- o Coding Instructions
- o Tabulation of Questionnaire Responses

**San Diego
ASSOCIATION OF
GOVERNMENTS**

Suite 524 Security Pacific Plaza
1200 Third Avenue
San Diego, California 92101
(619) 236-5300

April 27, 1984

TO: Business Owners and Managers Near Trolley Stations

As a businessperson near the San Diego Trolley, your experience concerning the effects of the Trolley is needed. Since the Trolley began operation in 1981, many changes have occurred in the Centre City and South Bay areas. Most of these changes are not related to the Trolley, but some undoubtedly are.

To determine just what has occurred, the San Diego Association of Governments (SANDAG), in cooperation with the Metropolitan Transit Development Board (MTDB) and San Diego Trolley, Inc., is conducting a study of these changes. Your response to the enclosed questionnaire is a portion of this study.

SANDAG is interested in your opinion about how, if at all, your business has changed because of the Trolley. Please use the comments section of the questionnaire to expand on your answers and to note any specific experience you or your business have had related to Trolley operations. A postage-paid envelope is enclosed for your use.

If you have questions or comments, please call me at 236-5378. Thank you for your cooperation.

Sincerely,



GEORGE FRANCK
Project Manager

GF/rw

Enclosures



SURVEY OF BUSINESSES SAN DIEGO TROLLEY AREA

For office use only

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1. Name of business _____
2. Address _____
3. Type of business _____
4. How long has this business been located at this address?
 ____ Years ____ Months
5. Has there been a change of business ownership since June, 1981?
 ____ Yes ____ No
6. Was the Trolley important to your decision to locate at this address?
 ____ Yes ____ No ____ Located here before the Trolley
7. Is the Trolley important to your business staying at this address?
 ____ Yes ____ No
8. Business hours _____
9. Have you changed your business hours because of Trolley operations?
 ____ Increased ____ Decreased ____ No change
10. How many off-street parking spaces does your business have? _____ spaces
11. Have Trolley operations interfered with automobile or delivery access to your business?
 ____ Yes ____ No If yes, please describe under comments (No. 24)
12. Do you own, lease, or rent your building? ____ Own ____ Lease ____ Rent
13. Gross square footage of floor space _____ sq. ft.
14. Current monthly rental (if applicable): \$ _____
15. Has your rent changed since June, 1981?
 ____ Increased ____ Decreased ____ No change
16. If so, how much has your rent changed? _____ %
17. Has your business volume changed since June, 1981?
 ____ Increased ____ Decreased ____ No change
18. If so, how much has your business volume changed? _____ %
19. Do you attribute a portion of this change to Trolley operations?
 ____ Yes ____ No If yes, describe under comments (No. 24)
20. What were your total sales in 1982? \$ _____
21. Number of employees _____
22. Manager or owner _____
23. Phone _____

Please make comments on reverse.

45

24. Comments: _____

Thank you for taking the time to complete this questionnaire. Please return in the enclosed postage-paid envelope.

BUSINESS INVENTORY - APRIL 1984

CENTRE CITY (San Diego)

<u>Street Number</u>	<u>Business Name</u>	<u>Business Type</u>
<u>West C Street</u>		
* SW Ketner (1050)	AMTRAK	Transportation
* 601	Gerry's Trolley Stop	General Merchandise
NE Kettner	Parking	Parking
NW India	Vacant (Renaissance)	Offices/Retail (Under
	Construction)	
* 580	Copy Depot	Printing
* 550	Czar Hair Design	Beauty Shop
* 540	Club 540	Lounge
* 530	Santa Fe Delicatessen	Restaurant
* 516	Rosslyn Hotel	Hotel
* 508	San Diego Import Collision	
	Specialists	Automobile Repair
* SE India (1061)	Green Tiger Press	Printing/Books
NE Columbia	Vacant (Columbia Court)	Offices/Retail (Under
		Construction)
443	Columbia Professional Building	Offices
* 402	Miguel's Family Restaurant	Restaurant
SW/SE State	Parking	Parking
* 343	Harvey E. Berman & Assoc.	Legal Services
333	Vacant	—
* 310	Trailways Bus Depot	Transportation
222	San Diego County Sheriff	Government
	County Courthouse	
NE Front (1105)	San Diego County Law Library	Library
* 125	Allen Bail Bonds	Legal service
* 119	Greyhound Freight	Transportation
113	Vacant	—
110	Chamber Building	Offices
109	Vacant	—
<u>C Street</u>		
* SE 1st (1057)	National University	Education
* 127	Downtown Travel	Travel Agency
* SW 2nd	Executive Hotel Garage	Parking
* 202	Community Concourse	Government
*	Concourse Shop	General Merchandise
SE 2nd (1055)	Westgate Plaza	Hotel
* 257	World Savings	Financial
* NE 3rd	Ask Mr. Foster	Travel Agency
SE 3rd	U.S. Grant Hotel	Hotel (Under
		Redevelopment)

* Businesses receiving questionnaire.

C Street (Cont.)

* 320	Funky Junk	Jewelry
* 336	Uneeda Market	Groceries
* NW 4th	Heavenly Donuts	Restaurant
* NE 4th	Mrs. Field's	Restaurant
400 North	Vacant	—
* 401	The Big Cheese	Restaurant
* 407	See's Candies	Candy
411	Vacant	—
* 419	One Hour Photo Stop	Photographic services
* NW 5th	IBM Products Center	Electronic Equipment
* SW 5th	Petries	Apparel
* SE 5th (1065	Lerner's	Apparel
* 510	Lynn's	Apparel
* 518	Ritz Camera	Photographic Services
* 522	Christian Science Reading Room	Religious Organization
525	Scripps Building	Offices
* 531	Deak-Perera	Monetary Exchange
532	Vacant	—
* 535	Goodie Shoppe	Restaurant
*	Just an Hour Photo	Photographic Services
*	Vacant	—
* 540	Arby's	Restaurant
* 545	Fireside Thrift	Financial Institution
* 550	Trolley Plaza	Retail/Office
605	Central Camera Repair	Photographic Services
*	Eyeglass Co.	Medical Services
*	John S. Gilbert	Accountant
*	Silk Factory	Apparel
*	Vacant	—
619	Vacant	
* 620	Armed Services Recruiting	Government
	620 Building	Offices/Education
* 630	Guitar Center	Music Store
635	635 Building	Offices
* 636	Cecil Hotel	Hotel
* 637	Joy of Travel	Travel Agent
* 640	Barclay's Bank of California	Financial Institution
* 641	Medicheck	Medical Clinic
* 701	Great Western Savings	Financial Institution
* 702	1st National Bank	Financial Institution
722	Imperial Bank Tower	Offices
* 729	Bank of Commerce	Financial Institution
748	1st National Bank	Financial Institution
* NE 8th (1115)	YMCA	Civic Organization
* 801	Frenchy Marsailles	Restaurant
* 815	Dr. Babes	Restaurant
* 817	Tailor Shop	Personal Services
* 819	Franco's Italian Deli	Restaurant
* 827	Hotel Churchill	Hotel
* 863	Inter-Continental Tours	Travel Agency
* 899	H&R Block (Vacant)	Financial Services

C Street (Cont.)

	NW 9th	Parking	Parking
*	NE 9th (1125)	Pacific Telephone	Offices
*	SE 9th	San Diego Square	Senior Housing
*	928	AAA Credit	Financial Services
*	938	ET&S Associates/PSC	
	SE 10th	Parking	Parking
*	1012	YWCA	Civic Organization
*	1048	Taco Bell	Restaurant
*	11th	Union 76 Car Wash	Automobile Service
*	1101	Hoagy's Corner	Restaurant
*	1110	Jack-in-the-Box	Restaurant

12th Street

	45	San Diego Trolley Inc.	Transportation
*		Concrete Tie of San Diego	Construction Material
*	100	SDG&E	Utility
*	149	Squires Belt Material	Industrial Supplies
	230	SDG&E	Utility
*	240	Global Electronics and	
*		Engineering	Engineering Services
*	SW (1145)	Bert's Coffee Shop	
*	322	PG Auto Parts	Automotive Supply
*	325	Acme Warehousing	Warehousing
*	329	Diesel Electronic Sales	Electrical Equipment
	NE J St.	Vacant	
*	1201 J St.	Autoaircon Parks Co.	Warehousing
*	405	Bob's Truck Service	General Auto Repair
	443	Vacant	
	SW Island (1111)	San Diego Co. Sheriff's Office	Detoxification Center
	NW Island (1120)	Vacant	Warehouse
*	509	Palms Hotel	Hotel
*	SW Market (1147)	Winston Tire Company	Automotive Supply
*	SE Market	Beasley's Friendly Bar	Lounge
*	NE Market	San Diego Restaurant Supply	Merchandise
*	604	Valu Market	Grocery Store
*	616	Villa Garcia Restaurant	Rstaurant
*	622	Mr. Espresso USA	
*	630	UHDE Embossing Co.	Commercial Printing
	632	Vacant	
*	644	Al Restaurant Supplies	Used Merchandise
*	645	Alex Manufacturers	
	646	Vacant	
*	664 Superior	VW Engines and Repair	General Auto Repair
*	NW G St.	Chevron Car Wash	Automotive Service
*	SE G St. (1207)	Johnson's Auto Clinic	Automotive Repair
*	705	Hang Ten International HQ	Offices
*	711	Charles Collabsy	Photographic Services
*		Legal Arts	Legal Services
*		Nanmelto Documents	Legal Services
*	725	Aztec Computer	Computer Services

12th Street (Cont.)

* 727	Desigram, Inc.	Computer Svices
* 734	Max's Deli	Restaurant
737	Vacant	
* 747	Amvets Thrift Store	Used Merchandise
* 770	Farkas Store Fixtures	Furniture
* 774	Thrift Village	Used Merchandise
NW E. St.	Ace Parking Lot	Parking
SE E St. (1201)	SD Comm. College Adult School	Adult Education
812	Vacant	
* NW F St.	Pep Boys	Automotive Supplies
* 900	The Uniform Center	Apparel
NW Broadway	Vacant	
* 901	Salvation Army	Used Merchandise
* 950	NU Hotel	Hotel
* 951	Popular Market	Groceries
* 952	Williams Second Hand Goods	Used Merchandise
* 964	The Uniform Center	Apparel
* 1005	Granada Wigs	Apparel
* 1025	Alpha Plasma Center	Medical Services
* 1139	Tropicana Nite Club	Lounge
* 1040	Autohaus Stuttgart	Automobile Repair
* 1065	Fung Lin	Restaurant
* 1164	Firestone Wholesale Center	Automobile Supplies

8TH STREET STATION (National City)

8th Street

* 408	Industrial Medical Corp.	Medical Clinic
* 416	Neo Enterprises	Office
* 424	Seaward Marine	Machinery Repair
* 436	Maaco Auto Paint	Automobile Repair
* 444	Pacific Marine Industries	—

24th STREET STATION (National City)

24th Street

* 401	Great America Savings	Offices
* 404A	Mad Jacks	Stereo
* 404E	Quick Print	Photographic Supplies
* 404F	The Family Deli	Restaurant
* 424	Denny's	Restaurant

Hoover Street

* 2414	Roberto's Family Restaurant	Restaurant
* 2424D	Accent on Men	Barber
* 2424E	Pizza Galore	Restaurant
* 2424F	Ko Chi Teh	Restaurant

Hoover Street (Cont.)

* 2424G	Southport Travel Center	Travel Agent
* 2424H	Western Union	Telegraph
2424I	Vacant	—
* 2424K	Marilyn's Designer Room	Apparel
* 2434A	IMEC	Office
* 2434E	Ocean Industries	—
* 2434H	Golf R Us	Sporting Goods
* 2434K	Video Library	Entertainment

H STREET STATION (Chula Vista)

H Street

610	Vacant	—
* 625	Casa Salsa	Restaurant
* 627	Day & Night Formal Wear	Apparel
* 627	Zodiac I Hairstyling	Personal Services
* 627	International Camera	Photographic Supplies
* 631	California Bride	Apparel
* 637	Victors Too	Lounge
* 645	C & R Clothiers	Apparel
* 645B	Olan Mills Studios	Photographic Services
* 646	Dorman's Auto Supply	Automobile Supply
* 647	Winston Tire Co.	Automobile Supply
* 652	Accupuncture Clinic	Medical Services
* 655	Pacific Lighing Center	Home Furnishings
* 660	Jim H. Kunuai	Medical Services
* 660	TMC Escrow	Real Estate Services
662	Vacant	—
* 665	Professional Printing	Business Services
*	Solange Hair Stylists	Personal Services
*	Velasco Rustico DMD	—
666	Vacant	—
* 677	Keg N Bottle	Liquor Store
685	Vacant	—
* 689	Prior's BBQ Pit	Restaurant
* 695	Paul's Chevron Service	Gasoline Service Station
* 698	Seven 11 (13766)	Groceries
* 720	Prestige Stations (ARCO)	Gasoline Service Station
* 730	Mann's Texaco	Gasoline Service Station
	Rohr Industries, Inc.	Aerospace Manufacturing

PALOMAR STATION

Palomar Street

* 603	7-11 (#21105)	Groceries
* 607	Coin Laundry	Laundromat
* 613	Zoralino's	Restaurant (Under Construction)
* 765	Satsuma Farms (31)	Produce
780	Vacant	—
* 800	ARCO AM/PM	Gasoline/Groceries
801	Vacant	—

Broadway

* 1206	Straw Hat Pizza Palace	Restaurant
* 1210	Pic N Save	General Merchandise
* 1214	Shoe and Stop	Apparel
1216	Vacant	—
* 1218	Fashion Gal	Apparel
* 1240	Target Stores	General Merchandise
* 1260	Ralph's	Groceries

PALM CITY STATION

Hollister Street

* 642	Carpenter's Local 1440	Union Hall
* 650	Palm City Used Furniture	Used Furniture
* 658	Palm City Upholstery & Tire Service	Automotive Repair
* 668	Needy Souls Mission International	Charitable Organization
674	Vacant	—
* 674	Brindle's Cafe	Restaurant
* 704	El Mango Bar	Lounge
* 704	Palm City Liquor	Automotive Repair
* 730	Castro Radiator Shop	Pet Services
* 768	Margaret's Pet Grooming	Lounge
* 825	Pinto Club	Meat Packing
	Golden West Packing	

Palm Avenue

* 2284	Palm City Carpets & Drapery	Home Furnishings
* 2280	Gator's Auto Aides	Automotive Parts
* 2264	Rafael's Beauty Salon	Beauty Shop
* 2255	Go-Lo Gas	Filling Station

IRIS STATION

Howard Avenue

* 1507 Pepper Tree Farm Nursery School

BEYER STATION

Beyer Blvd.

* 4004 Centro Medico de San Ysidro Medical Clinic

SAN YSIDRO/INTERNATIONAL STATION

San Ysidro Boulevard

* 701	Travelodge Gateway	Motel
* 710	International Advertising Gift Co.	Advertising Agency
* 710	Frontier Photo	Photographic Services/ Monetary Exchange
* 710	Rico Mack Taco Shop	Restaurant
* 710	Transportes Rapido Inc.	Transportation
* 710	Concept Now	Cosmetics
* 710	Pieter D. Speyer	—
* 720	U.S. Border Facility	Federal Agency
* 721	Jack-in-the-Box	Restaurant
* 723	Crocker National Bank	National Bank
* 727	McDonald's	Restaurant
* 747	International Mercado	Misc. Apparel
* 795	Wise Fashions	Misc. Apparel
* 795B	Dino's Discount Outlet	General Merchandise
* 803	Red Cab of San Diego, Inc.	Transportation
* 803	Greyhound Bus Lines	Bus Terminal



SURVEY OF BUSINESSES
SAN DIEGO TROLLEY AREA
April/May 1984

CODING INSTRUCTIONS

- 1/2/3 Survey Number
- 4/5 Station Area
- 01 West C Street
 - 02 C Street
 - 03 12th Ave.
 - 04 Barrio
 - 05 Harborside
 - 06 Pacific Fleet
 - 07 8th Street
 - 08 24th Street
 - 09 H Street
 - 10 Palomar
 - 11 Palm City
 - 12 Iris
 - 13 Beyer
 - 14 San Ysidro Blvd.
- 6 Type of Business
- 1 Retail
 - 2 Office
 - 3 Personal Service
 - 4 Business Service
 - 5 Automotive Service
 - 6 Restaurant/Lounge
 - 7 Hotel/Motel
 - 8 Civic/Fraternal
 - 9 Other
- 7/8 Years
- 9/10 Months
- 11 1 = yes, 2 = no
- 12 1 = yes, 2 = no
- 13 1 = yes, 2 = no
- 14/15/16 Hours + 1/10 hours per weekday
- 17 1 = increased, 2 = decreased, 3 = no change
- 18/19 # of parking spaces, to 95; 99 = over 95
- 20 1 = yes, 2 = no

21 1 = own, 2 = lease, 3 = rent

22/23/24/25 Enter actual sq. ft. to 9900; 9999 = over 9900

26/27/28/29 Enter dollar amount to \$9,900; 9990 = over 9900; 9999 = NR

30 1 = increase; 2 = decrease; 3 = no change

31/32/33 Enter actual percentage

34 1 = increase; 2 = decrease; 3 = no change

35/36/37 Enter actual percentage

38 1 - yes; 2 = no

39/40/41 Enter total sales (in 1,000) to 998; 999 over \$1,000,000

42/43/44 Enter number of employees

45 Comments

- 1 lack of bathrooms
- 2 lack of parking
- 3 noise
- 4 block entrance
- 5 good for employees
- 6 hurts business
- 7 helps business
- 8 lack of change machine
- 9 crime/antisocial behavior

MERCHANT'S SURVEY
 RESPONSE TO QUESTIONNAIRE
 April/May 1984

1. Name of business (n.a.)

Address:	<u>Geographic Area</u>	<u>Number</u>	<u>Percent</u>
Centre City:	West C Street	6	6.6
	C Street	24	26.4
	12th Avenue	16	17.6
National City:	8th Street	5	5.5
	24th Street	6	6.6
Chula Vista:	H Street	15	16.5
	Palomar Street	4	4.4
Palm City		6	6.6
Iris Avenue		1	1.1
San Ysidro:	Beyer Blvd.	1	1.1
	International	7	7.7
Total		91	100.0

3. Type of Business:	<u>Number</u>	<u>Percent</u>
Retail	23	25.3
Office	1	1.1
Personal Service	13	14.3
Business Service	12	13.2
Automotive Service	12	13.2
Restaurant-Lounge	14	15.4
Hotel/Motel	3	3.3
Civic-Fraternal	3	3.3
Other	10	11.0

4. How long has this business been located at this address?

	<u>Number</u>	<u>Cumulative Percentage</u>
Less than one year	9	10.2
One to three years	14	26.1
Three to 6 years	20	48.9
Seven to 20 years	32	85.2
Over 20 years	13	100.0
No response	3	n.a.

5. Has there been a change of business ownership since June, 1981?

	<u>Relative Percentage</u>	<u>Adjusted Percentage</u>
Yes	16.5	17.9
No	75.8	82.1
No response	7.7	n.a.

6. Was the Trolley important to your decision to locate at this address?

	<u>Relative Percentage</u>	<u>Adjusted Percentage</u>
Yes	13.2	13.8
No	27.5	28.7
Located here before the Trolley	54.9	57.5
No response	4.4	n.a.

7. Is the Trolley important to your business staying at this address?

	<u>Relative Percentage</u>	<u>Adjusted Percentage</u>
Yes (positive)	19.8	22.0
Yes (negative)	3.3	3.7
No	67.0	74.4
No response	9.9	n.a.

8. Business hours:

	<u>Number</u>	<u>Adjusted Percentage</u>
Less than 8 hours/day	5	5.6
8-8.5 hours/day	24	27.0
9-11.5 hours/day	33	37.1
12-16 hours/day	15	16.9
24 hours/day	12	13.5
No response	2	n.a.

9. Have you changed your business hours because of Trolley operations?

	<u>Number</u>	<u>Adjusted Percentage</u>
Increased	1	1.1
Decreased	3	3.4
No change	83	95.4
No response	4	n.a.

10. How many off-street parking spaces does your business have?

	<u>Number</u>	<u>Adjusted Percentage</u>
None	42	46.2
1-5	8	8.8
6-10	11	12.1
11-20	15	16.5
25-60	8	8.8
Over 60	7	7.7
No response	0	n.a.

11. Have Trolley operations interfered with automotive or delivery access to your business?

	<u>Relative Percentage</u>	<u>Adjusted Percentage</u>
Yes	34.1	36.9
No	58.2	63.1
No response	7.7	n.a.

12. Do you own, lease or rent your building?

	<u>Relative Percentage</u>	<u>Adjusted Percentage</u>
Own	17.6	18.4
Lease	56.0	58.6
Rent	22.0	23.0
No response	4.4	n.a.

13. Gross square footage of floor space:

	<u>Relative Percentage</u>	<u>Adjusted Percentage</u>
Less than 1,000 sq. ft.	13.2	20.7
1000 - 1400 sq. ft.	11.0	17.2
1800 - 3000 sq. ft.	13.2	20.7
4000 - 7500 sq. ft.	12.1	18.8
Over 9900 sq. ft.	14.3	22.4
No response	36.3	n.a.

14. Current monthly rental (if applicable)

	<u>Relative Percentage</u>	<u>Adjusted Percentage</u>
Under \$500	6.6	16.2
\$500 - \$600	6.6	16.2
\$850 - \$1000	11.0	27.1
\$1150 - \$1900	9.9	24.3
Over \$1900	6.6	16.2
No response	59.3	n.a.

15. Has your rent changed since June 1981?

	<u>Relative Percentage</u>	<u>Adjusted Percentage</u>
Increased	37.4	54.8
Decreased	2.2	3.2
No change	28.6	41.9
No response	31.9	n.a.

16. If so, how much has your rent changed?

	<u>Relative Percentage</u>	<u>Adjusted Percentage</u>
3-5%	6.6	26.1
6-15%	6.6	26.1
20-25%	4.4	17.4
50% or more	7.7	30.4
No response	74.7	n.a.

17. Has your business volume changed since June 1981?

	<u>Relative Percentage</u>	<u>Adjusted Percentage</u>
Increased	35.2	43.8
Decreased	23.1	28.8
No change	22.0	27.4
No response	19.8	n.a.

18. If so, how much has your business volume changed?

	<u>Relative Percentage</u>	<u>Adjusted Percentage</u>
1-10%	6.6	18.8
15-20%	9.9	28.1
25-30%	8.8	25.1
35-50%	6.6	18.8
Over 50%	3.3	9.3
No response	64.8	n.a.

19. Do you attribute a portion of this changed to Trolley operations?

	<u>Relative Percentage</u>	<u>Adjusted Percentage</u>
Yes	25.3	38.3
No	40.7	61.7
No response	34.1	n.a.

20. What were your total sales in 1982?

	<u>Relative Percentage</u>	<u>Adjusted Percentage</u>
Under \$60,000	5.5	21.7
\$120,000 - \$200,000	5.5	21.7
\$270,000 - \$500,000	5.5	21.7
Over \$900,000	8.8	34.9
No response	74.7	n.a.

21. Number of Employees

1-4	36.2	42.9
5-10	24.2	28.5
12-20	8.8	10.4
22-50	13.2	15.6
Over 80	2.2	2.6
No response	15.4	n.a.

Appendix C

INTERSECTION LEVEL OF SERVICE DESCRIPTION

Level of Service	TRAFFIC QUALITY	Nominal Range of ICU (a)
A	<u>Low volumes; high speeds</u> ; speed not restricted by other vehicles; all signal cycles clear with no vehicles waiting through more than one signal cycle.	0.00 - 0.60
B	<u>Operating speeds beginning to be affected by other traffic</u> ; between one and ten percent of the signal cycles have one or more vehicles which wait through more than one signal cycle during peak traffic periods.	0.61 - 0.70
C	<u>Operating speeds and maneuverability closely controlled by other traffic</u> ; between 11 and 30 percent of the signal cycles have one or more vehicles which wait through more than one signal cycle during peak traffic periods; <u>recommended ideal design standard.</u>	0.71 - 0.80
D	<u>Tolerable operating speeds</u> ; 31 to 70 percent of the signal cycles have one or more vehicles which wait through more than one signal cycle during peak traffic periods; <u>often used as design standard in urban areas.</u>	0.81 - 0.90
E	<u>Capacity</u> ; the maximum traffic volume an intersection can accommodate; restricted speeds; 71 to 100 percent of the signal cycles have one or more vehicles which wait through more than one signal cycle during peak traffic periods.	0.91 - 1.00
F	Long queues of traffic; <u>unstable flow</u> ; <u>stoppages of long duration</u> ; traffic volume and traffic speed can drop to zero; traffic volume will be less than the volume which occurs at Level of Service E.	Not Meaningful

(a) ICU (Intersection Capacity Utilization) at various level of service versus level of service E for urban arterial streets.

Source: Highway Capacity Manual, Highway Research Board Special Report 87, National Academy of Sciences, Washington D.C., 1965, page 320.



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