

THE EL MONTE BUSWAY: A TWENTY-YEAR RETROSPECTIVE

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I. OVERVIEW

The El Monte Busway, which links Downtown Los Angeles with eastern communities in the San Gabriel Valley, has been frequently cited as one of this nation's most successful HOV facilities. Since opening in January 1973, the El Monte Busway has made a significant contribution to promoting transit use and mitigating traffic congestion in the I-10 San Bernardino Freeway corridor. The number of Busway users currently exceeds 6,000 during the peak hour, in the peak direction (approximately 3,400 bus riders and 3,200 carpoolers/vanpoolers--see Figures 1 & 2). To put this in perspective, nearly 40 percent of the total number of the Interstate 10 (I-10) Freeway users (approximately 17,000 persons--HOV plus mainline lanes) passing the checking location during the peak hour in the peak direction are travelling on the Busway.

This paper briefly reviews various aspects of the Los Angeles County Metropolitan Transportation Authority's (LACMTA) transit operations on the El Monte Busway during the past twenty years. In addition to chronicling the major routing and service changes that have occurred since the facility opened in 1973, the paper also: 1) describes the configuration of the El Monte Busway, with its special features designed to facilitate bus operations; and 2) examines transit ridership trends on the Busway, with particular attention paid to the impact that converting the El Monte Busway to an HOV facility in the mid-1970s had on bus ridership. The paper concludes with a summary of the key lessons learned from the LACMTA's twenty-year experience with scheduling and operating transit services on the Busway.

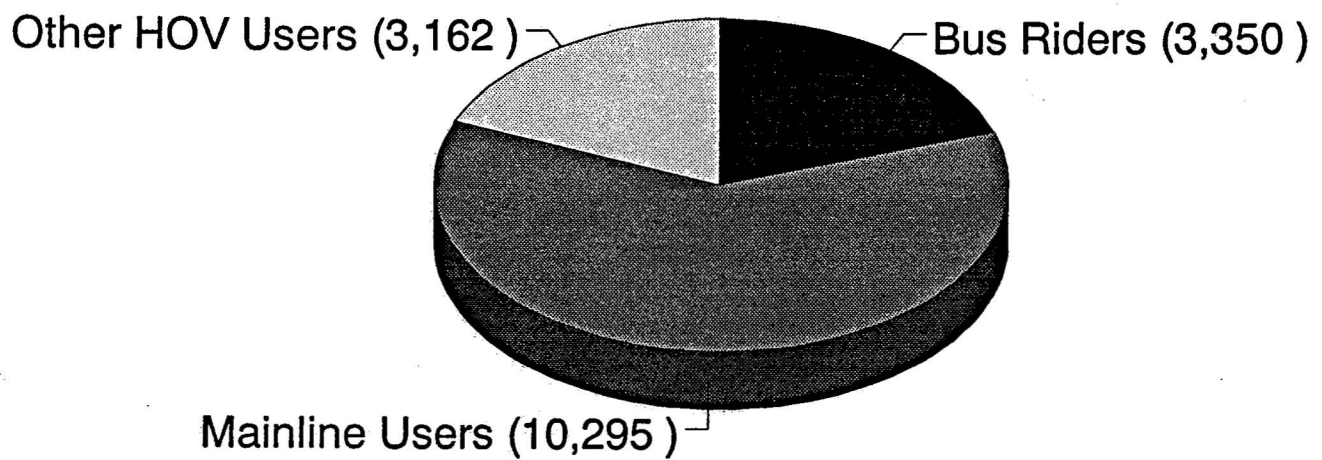
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Figure 1

I-10 BUSWAY PEAK HOUR UTILIZATION

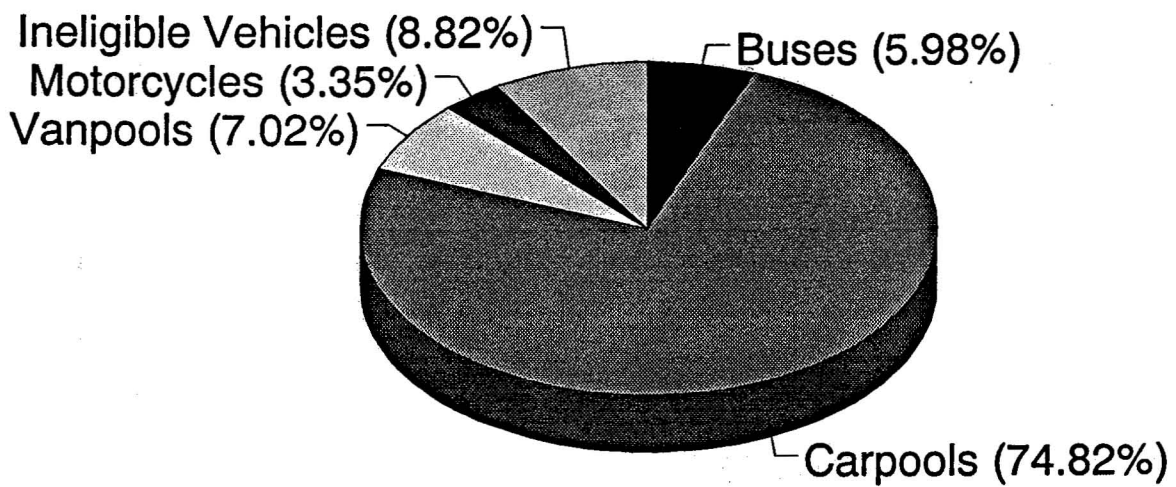
(No. of Persons Westbound AM)



Based on 7/13/93 facility count.
Figures courtesy of Caltrans.

Figure 2

EL MONTE BUSWAY MODAL SPLIT (Westbound AM Peak Hour)



Average percentages of 1993 facility counts.
Figures courtesy of Caltrans.

II. BUSWAY CONFIGURATION AND OPERATING FEATURES

Project Start-up

The El Monte Busway project began in the late 1960s as a part of the Southern California Association of Governments' (SCAG) Short Range Transportation Plan. This plan included regional transportation strategies aimed at improving air quality and conserving energy. The Busway represented a viable transit option that would both mitigate traffic congestion and comply with new EPA clean-air mandates.

The El Monte Busway was specifically designed to provide transit service to most of the San Bernardino Freeway Corridor, which can be roughly defined as the area bounded by the Los Angeles River on the West, by the communities of Riverside and San Bernardino on the East, by Mission Road, Huntington Drive and Interstate 210 (I-210) on the North and by the Pomona Freeway on the South (see Figure 3). Funding for the \$57 million Busway project (the initial 11 miles) came from several sources, with the Federal Highway Administration (FHA) providing 65% of the total. Other funding sources were: the Federal Urban Mass Transportation Administration (UMTA), 17% of the cost; the California Department of Transportation (CALTRANS), 8%; LACMTA (formerly, the Southern California Rapid Transit District or SCRTD), 8%; and the Southern Pacific Transportation Company, 2%.

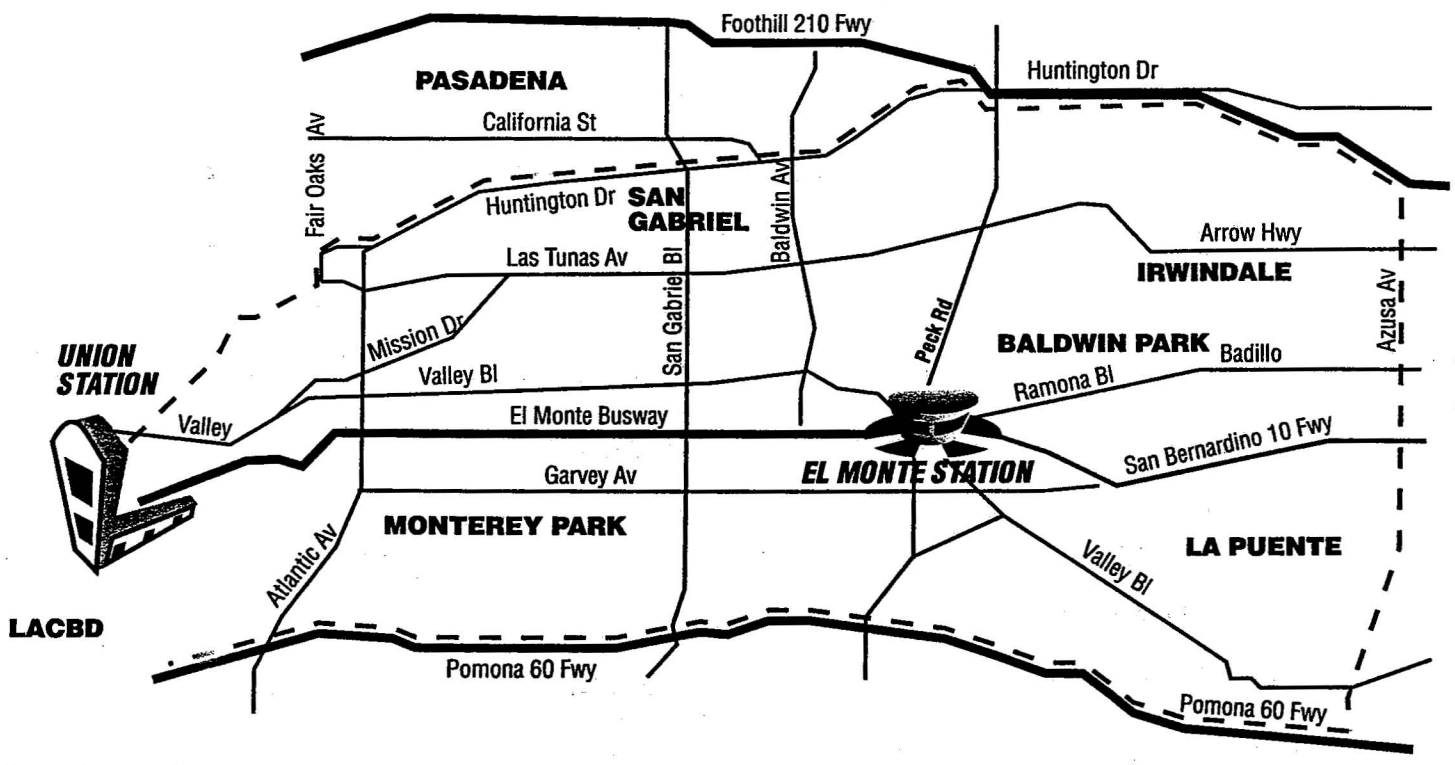
Phase I (1973-76)

The eastern half of the El Monte Busway facility opened in January 1973. This segment consisted of a seven-mile long "buses only" roadway starting at Santa Anita Avenue in El Monte and terminating at what is currently the Interstate-710 Freeway (or "Long Beach Freeway"). The Long Beach Freeway is approximately four miles east of the LACBD.

Later in 1973, the El Monte Bus Station opened. This station has always been critical to the LACMTA's Busway operation because it serves both as a park-and-ride facility (with 700 parking spaces initially) and a major transfer point for suburban routes that feed lines destined for the LACBD. Buses travelling from El Monte Station to Downtown Los Angeles enter a comparatively wide freeway median

Figure 3

SAN BERNARDINO FREEWAY BUSWAY CORRIDOR



--- Corridor Boundary

for the seven mile segment. The median consists of two bi-directional "buses only" lanes, separated by a railroad track. The bus lanes are physically separated from the other freeway lanes by concrete and flexible barriers (note, however, that most of the flexible barriers no longer exist).

By January 1975, the four-mile western segment was finished. Taken together (i.e., the eastern and western segments combined), 11 miles of the El Monte Busway was operable by the first part of 1975 (El Monte Station to Mission Road near the LACBD). Two on-line stations, located at the Los Angeles County-USC Medical Center (Hospital Station) and at California State University, Los Angeles (University Station), were completed in November, 1974 and February 1975, respectively. Each of these stations have special features that have been described elsewhere (see, for example, Crain & Associates, 1978).

The configuration of the four-mile western segment of the Busway is different from the eastern segment in that, following a special flyover from the median, the bus lanes are adjacent to the north side of the I-10 Freeway and the direction of traffic flow is opposite to the normal right-side convention. This configuration enables the two on-line stations to be served. Because of this configuration, however, it is not possible for buses to enter or leave the Busway lanes along this segment (i.e., there is no direct access to the mainline freeway lanes).

Phase II (1976-present)

The basic configuration of the El Monte Busway has remained largely the same since the late 1970s, with two notable exceptions. First, a 500-space parking structure, which opened in 1987, was built at El Monte Station (with restriping, a total of 563 spaces were created). These additional spaces were made available to enhance both "park-and-pool" and "park-and-ride" activity at the station. Second, a one-mile extension in the downtown Los Angeles area, which spans the Los Angeles River, was completed in 1989. The new downtown entrance and exit to the Busway, which is adjacent to Union Station, made access to the Busway more convenient for both buses and carpools.

In addition to these two changes, the El Monte Busway is in the process of being extended east along the I-10 Freeway from the El Monte Bus Station to the Interstate-15 Freeway (I-15). When this 28-

mile extension opens around the year 2000, the total length of the facility will be approximately 40 miles (LACBD to the I-15).

In sum, the I-10 El Monte Busway is the oldest HOV facility in Los Angeles. At the time of its construction in the 1970s, it was the most complete system of its kind in the country. The facility currently features:

- Two on-line stations (Cal State Los Angeles and LA County-USC Medical Center)
- One off-line station (El Monte) with parking facilities (currently, more than 2,000 parking spaces) and significant feeder service
- Two direct-access/egress bus ramps (Del Mar Av. and the Long Beach Freeway)
- Remote park-ride facilities served by direct express bus lines
- A connection to a downtown reserved contra-flow lane
- A capability to be converted to fixed guideway operation, if necessary

The design of the El Monte Busway, as it relates to transit operations, is nearly optimal. Perhaps the fact that it was designed to operate as a "buses only" facility helped to ensure that many desirable HOV features (e.g., wide lanes and barriers, special access/egress ramps, and so forth) were necessarily incorporated.

III. LACMTA BUS OPERATIONS (1973-1993)

The El Monte Busway is operated by the California Department of Transportation (CALTRANS). Much of the responsibility for providing transit services on the Busway, however, has historically resided with the LACMTA (formerly, the Southern California Rapid Transit District or SCRTD). Table 1 presents a brief chronology of the major events that have impacted LACMTA transit operations on the El Monte busway during the past twenty years. Among the events are a bus strike in 1974 and the one-mile western extension of the Busway in 1989. Table 2 summarizes the LACMTA routes that have operated on the El Monte Busway at various times since the facility opened.

Table 1

EL MONTE BUSWAY: CHRONOLOGY OF KEY OPERATIONAL EVENTS (1973-1992)

DATE	EVENT
7/73	El Monte Station Opened
8/74-10/74	SCRTD strike (carpools temporarily allowed on Busway)
11/74	Hospital Station opened
2/75	University Station opened
4/76	Expanded San Gabriel Valley bus service implemented
10/76	Conversion to HOV (3+ carpools allowed on busway)
11/88	Transfer of some Busway lines to other operators begins
2/89	Western extension of Busway in LACBD opens
10/92	Metrolink San Bernardino Line begins

Table 2

LACMTA EL MONTE BUSWAY ROUTES (1973-PRESENT)

DATE	ROUTES	SUBURBAN TERMINUS
January 1973	53L 60	Pomona E, F - San Bernardino G - Upland
January 1975	52F 53F 60 63F 401 402 403 404 405 760 764 768	Arcadia - Monrovia El Monte E, F - San Bernardino G - Upland El Monte Pomona Pomona Rowland Heights Arcadia Temple City West Covina Pomona Duarte
January 1984	480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498	Pomona Pomona Pomona Altadena Ontario Altadena Industry (Puente Hills Mall) Sierra Madre Glendora Sierra Madre Diamond Bar - Fullerton Sierra Madre San Dimas Monrovia Glendora Diamond Bar San Bernardino Montclair Azusa
Present	483 484 485 487 489 490 491 497	Altadena Pomona - Ontario Altadena Sierra Madre Sierra Madre Diamond Bar - Fullerton Sierra Madre Pomona - Montclair

In general, the LACMTA's strategy for providing transit service on the Busway has been to:

- 1) schedule regular service (peak and off-peak);
- 2) provide "feeder" transit service from outlying communities to El Monte Station;
- 3) provide sufficient bus connections at the on-line stations;
- 4) operate service that takes advantage of the special design features (e.g., have routes that enter the busway via on-ramps at Del Mar and the I-710 Freeway); and
- 5) operate equipment that is well-maintained and reliable.

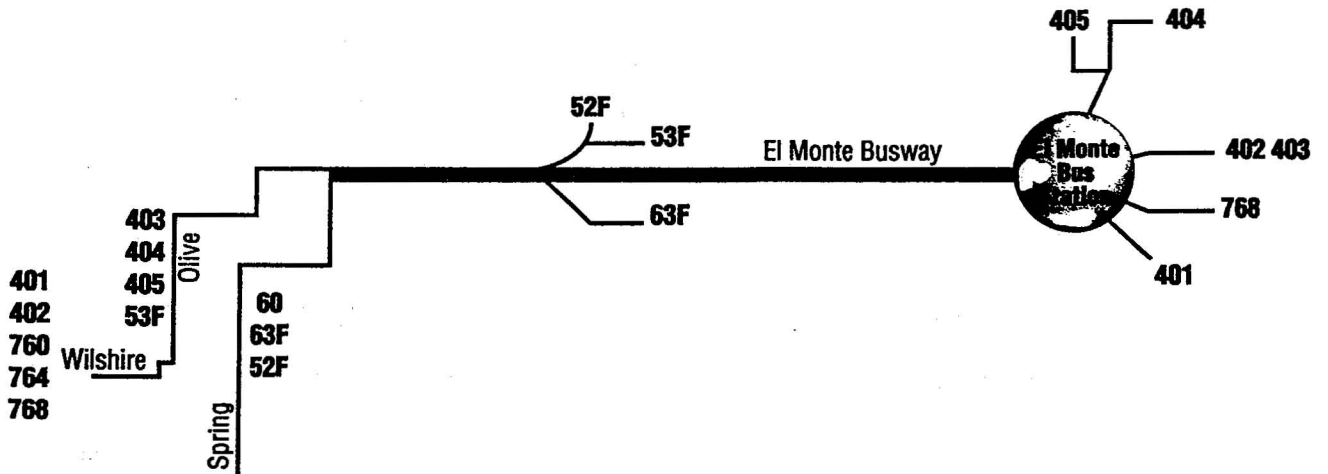
Prior to the opening of the El Monte Busway, the LACMTA operated two bus lines (Lines 53L and 60) along the I-10 San Bernardino Freeway into Downtown Los Angeles. When the eastern half of the Busway initially opened between El Monte and Long Beach Freeway in January 1973, these two lines were modified to utilize this portion of the Busway. A total of 30 peak trips and 42 off-peak trips were operated. Initial running-time checks indicated that using the Busway required 35% less running time than pre-Busway times.

With the completion of the El Monte Station in July 1973, three more bus lines were added (Lines 403, 404 and 405). Moreover, Line 53L was redesignated as Line 401 and Line 53A was converted to Line 402. In October 1973, when the Del Mar Avenue access ramps were completed, a "Freeway Flyer Service", which utilized these ramps, was implemented. The specific lines comprising this service were Line 52F, 53F, and 63F. By the end of 1975 (three years after start-up), the number of bus trips increased to 268 peak and 223 off-peak. Figure 4 depicts the full complement of LACMTA bus routes operating on the El Monte Busway at the end of 1975.

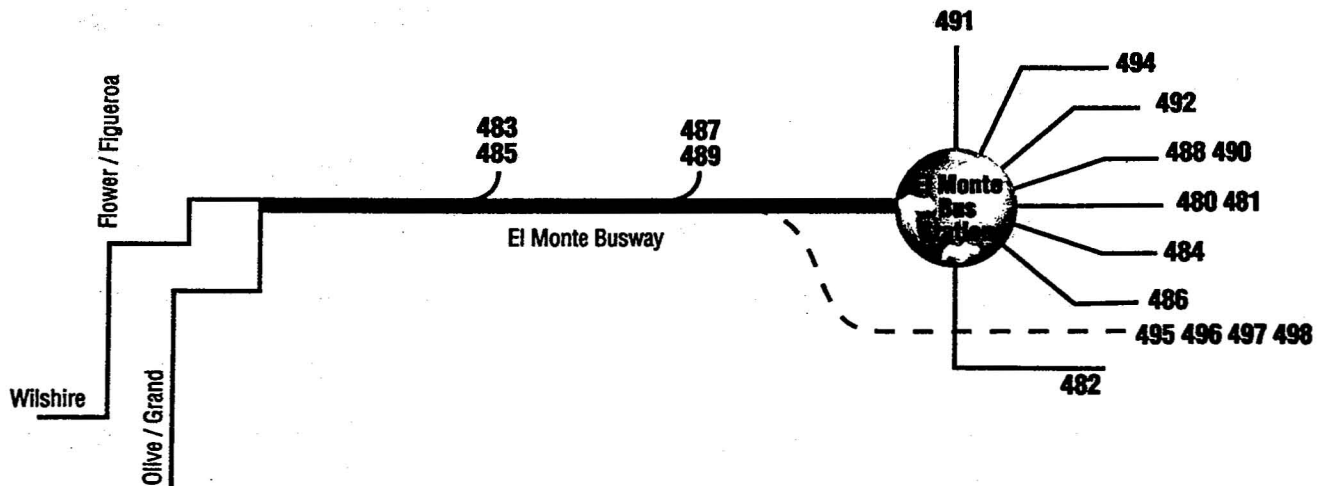
In 1976, the LACMTA introduced a major bus service expansion program to its El Monte Busway operation. This was in response to both ridership demand and the desire to increase transit usage. The number of peak trips increased 23 percent to 330, while off-peak service more than doubled to 495 trips daily, or a 122 percent increase. Several route changes necessarily accompanied the service expansion program. In April, 1976, the "Freeway Flyer" lines were canceled as two new lines were initiated (Lines 487 and 489). Concurrently, Lines 483 and 485, which serve the Pasadena area, were started. Lines 483 and 485 entered the Busway via the Long Beach Freeway ramp.

Figure 4

EL MONTE BUSWAY SERVICE IN 1975



EXISTING EL MONTE BUSWAY SERVICE



In October 1976, the El Monte Busway "buses only" operation was converted to a mixed-mode HOV facility. Vehicles with three or more riders (i.e., carpools and vanpools) were permitted to use the Busway. Interestingly enough, as Table 3 shows, the impact of converting the Busway to a mixed-mode HOV facility on bus running time (from El Monte Station to the LACBD), was minimal. Moreover, despite the conversion, major reductions in service levels were not required because a large majority of bus riders continued to use public transit to travel from El Monte to the LACBD following the change (see discussion of ridership trends below).

Between 1977-1988, both service levels and transit routes on the Busway remained relatively stable. It should be noted, however, that even during this period of stability, alternative routing strategies and service levels were considered. For example, in 1984, the LACMTA conducted an "El Monte Busway Line-Haul Study" that sought to determine whether Busway service could be operated more efficiently than was currently the case (i.e., at that time). It was determined that 45 percent of all passengers (at that time) using the Busway between the El Monte Bus Station and the LACBD actually transferred at the station. Because bus service was scheduled largely to meet the demand between El Monte and the LACBD, it was felt that there must be an over supply of service east of the El Monte Station amounting to 45 percent.

Although the higher-than-required level of service on the feeder portion of many of the El Monte Busway transit lines likely contributed to their utilization, some felt that the Busway system could be operated more efficiently if the trunk and feeder service were separated and scheduled on the basis of individual demand for each. In brief, the findings from this "Line-Haul" study showed that by using high-capacity equipment (viz., articulated buses), separating trunk service from feeder service would be more efficient. The negative impact of this service strategy on the 55 percent of El Monte Station Busway riders who ride through the station without transferring was not explicitly incorporated in this finding. This line-haul strategy on the El Monte Busway was never implemented due to, among other things, an

Table 3

**AVERAGE BUS RUNNING TIMES:
PRE VS. POST MIXED-MODE USE**

DATE	WESTBOUND AM PEAK		EASTBOUND PM PEAK	
	MINUTES	AVG. SPEED	MINUTES	AVG. SPEED
9/76 (pre)	13.5	49.0	14.0	47.2
11/76 (post)	13.4	49.1	14.3	46.2
5/78 (post)	13.6	48.8	13.5	49.0
3/94 (post)	14.7*	49.0	16.0*	44.9

* Estimated. 3/94 running times are not directly comparable due to increased busway length.

inadequate supply of high capacity buses at the LACMTA at that time (see "El Monte Busway Line-Haul Study, SCRTRD, 1984).

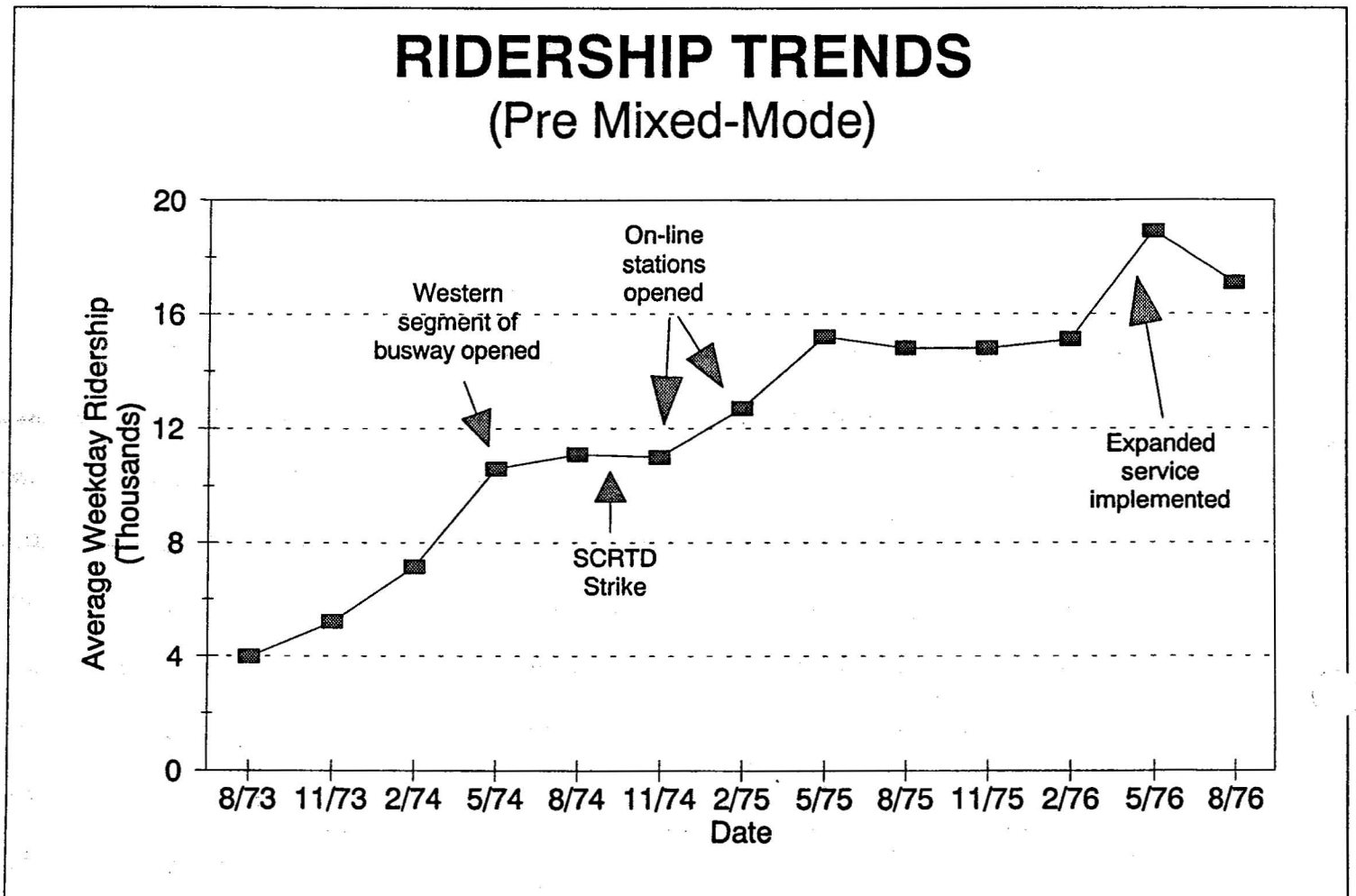
Several service and route changes were, in fact, implemented in 1989, coincident with the opening of the one-mile extension in Downtown Los Angeles. Certain El Monte Busway express lines were rerouted in the LACBD to better serve the expanding financial district in the Downtown area. Moreover, during the period 1988-1992, nine of the express lines operated by the LACMTA were transferred to the Foothill Transit Zone and one line was transferred to Omnitrans and the Riverside Transit Authority. This necessarily resulted in a 56% reduction in LACMTA El Monte Busway service. Of the eight LACMTA routes currently operating on the Busway, only three now enter from the off-line station in El Monte. Line 497, which travels in mixed traffic on the I-10, enters the busway via a lane cross-over. Four other LACMTA lines (Lines 483, 485, 487, 489), which serve communities west of the El Monte off-line station, enter the busway via the special on-ramps at Del Mar Avenue or the Long Beach Freeway. All LACMTA lines continue to serve the two on-line stations (see Figure 4). Although Busway transit operations are now shared with other carriers, including the Foothill Transit Zone, the LACMTA continues to provide a significant amount of Busway service (approximately 28 million passenger miles annually).

IV. EL MONTE BUSWAY TRANSIT RIDERSHIP TRENDS (1973-1993)

During the early months of the Busway operation, average weekday transit ridership was between 3500-4000 persons. In October 1973, the Del Mar Avenue access ramps were completed and were accessed by the aforementioned "Freeway Flyer" rush-hour service (Lines 52F, 53F, and 63f). By the end of 1973, ridership grew to approximately 5,600 persons per day. After three years of operation, peak-period LACMTA bus ridership was approximately 11,000 passengers (15,000 total passengers daily).

In the early years of operation, transit ridership on the El Monte Busway grew steadily. There were 29 months of sustained growth from the Busway's inception in January 1973 through mid-1975. As Figure 5 shows, the pattern of growth exhibited a long-term, linear trend during the first three years

Figure 5



of operation. By mid-1975, however, the El Monte park-and-ride facility was filled to capacity and ridership ceased growing (see Crain & Associates, 1978).

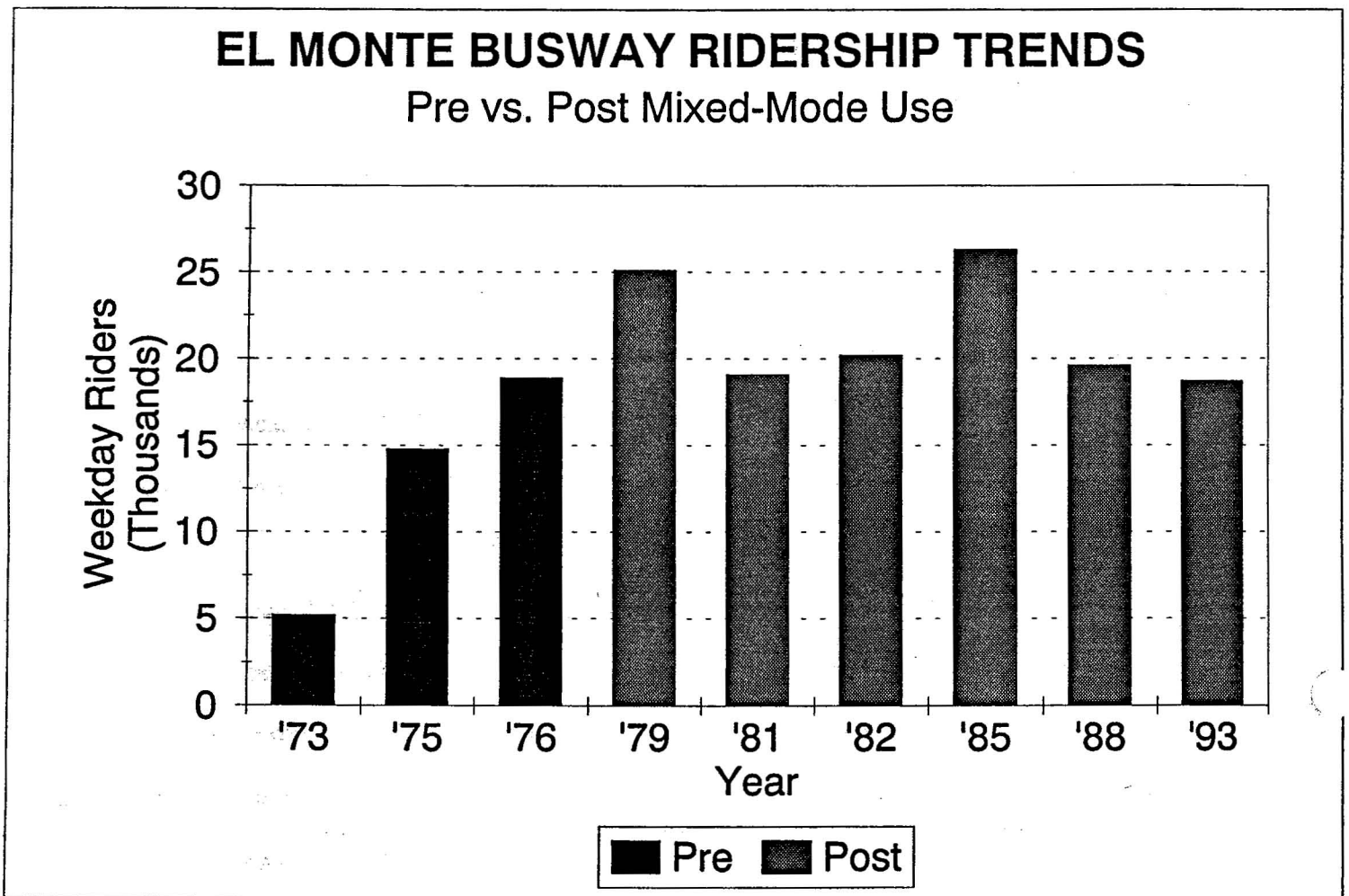
When the final element of the El Monte Busway project was completed in 1976 (i.e., when 700 more permanent parking spaces were made available at the El Monte station), and the service-expansion program was implemented, ridership reached 19,000 per day. In July 1976, the bus fare for a trip from El Monte to downtown Los Angeles increased from \$.50 to \$.85, resulting in some reduction in ridership. Later in that same year (October), carpools were permitted to share the Busway lane with buses during peak hours. Although there was some initial mode shifting from buses to carpools, by mid-1977, daily bus ridership had returned to the mid-1976 level (Crain & Associates, 1978).

In 1979, in part due to the second major gasoline crisis in the 1970s, daily ridership on the Busway reached 25,000 passengers per day, or a 32% increase from 1976. As the 1979 gasoline crisis began easing, daily ridership started to decline (see Figure 6). In 1981, with the total of 18 different LACMTA bus routes operating on the Busway, daily ridership was between 19,000-20,000 per day.

During the period July 1, 1982-July 1, 1985, the LACMTA implemented a voter-approved one-half cent sales tax referendum, referred to locally as Proposition A (Prop A). Fare levels were set in accordance with Prop A guidelines. The LACMTA's base fare was lowered by 41 percent, from \$.85 to \$.50. Consistent with what occurred systemwide, daily ridership on the El Monte Busway started to grow again during this period. By April 1985, with Proposition A fares still in effect, daily ridership reached 26,000, the highest ridership ever recorded on the El Monte Busway. As expected, when Prop A fares ended in July 1985, daily ridership began declining. By the end of 1988, there were 14 buses lines operating on the El Monte Busway with average daily ridership between 19,000-20,000. At present, transit ridership on the Busway is estimated at between 17,000-18,000 (LACMTA, FTZ, and Omni/RTA combined).

In sum, despite the conversion of the busway to an HOV facility in the mid-seventies, nearly 18,000 bus riders use the El Monte Busway daily. Also, it would appear that Foothill Transit Zone lines

Figure 6



have retained bus ridership levels since the transfer. The effects of competing transit modes through the I-10 San Bernardino Freeway corridor (i.e., the effects of Metrolink) are still being studied.

V. CONCLUSION AND LESSONS LEARNED

LACMTA operations on the El Monte busway have been largely successful during the past two decades. The LACMTA's El Monte Busway bus operation continues to evolve as efforts are underway to expand the busway further east and to link the El Monte Busway with the soon-to-be-opened (1996) Harbor Transitway. Among the key lessons learned in the past twenty years, from an operational perspective, are:

- Operate regular service, if possible (i.e., all day)
- Users of bus services operating on an HOV facility often have modal choice options-- therefore:
 - operate equipment that is desirable and comfortable
 - operate service that is reliable
 - make bus-to-bus transfers convenient via on-line and off-line stations and feeder lines
 - make bus-to-car or car-to-bus transfers convenient by providing adequate park-ride facilities
 - establish routes that minimize the need for additional transfers
 - collect ridership, origin-destination, and customer satisfaction data on a regular basis to ensure riders' needs are being met and to discover possible problems with the HOV bus operation in a timely manner
- Inter-agency cooperation is paramount to a successful busway operation

REFERENCES

Crain & Associates. "San Bernardino Freeway Express Busway--Evaluation of Mixed-Mode Operations", Final Report (1978).

Southern California Rapid Transit District. "El Monte Busway Line-Haul Study", Draft Report, (September 1984).