

EVALUATION
OF
NEW SERVICE
IN
MID-CITIES

SOUTHERN CALIFORNIA
RAPID TRANSIT DISTRICT

Prepared by
Surface Planning

May, 1976



Southern California Rapid Transit District
425 South Main St., Los Angeles, California 90013
Telephone: (213) 972-6000

June 17, 1976

TO: Members of the Board of Directors

FROM: Jack R. Gilstrap

SUBJECT: Evaluation of New Services -- Mid-Cities Transit
Improvement Program

The County of Los Angeles and the Southern California Rapid Transit District entered into an agreement for fiscal year 1976 which required the District to implement new and improved bus services in the Mid-Cities Area of the County. As part of the agreement, the District must evaluate and report on the effect of these service improvements by furnishing ridership data, indication of cost effectiveness, specific recommendations regarding continuation of each line, and respective service levels.

The Mid-Cities Transit Improvement Program was implemented on February 22, 1976. The data presented in the attached report reflects early passenger checks taken after eight weeks of operation. The report is intended only to present preliminary ridership and cost information which will afford a base for comparison to the former bus system. More comprehensive information will be developed as the evaluation process continues.

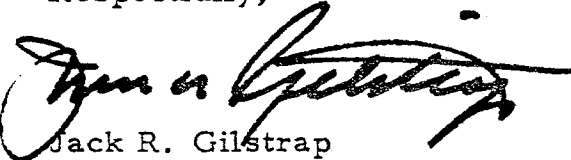
The initial passenger counts have been processed, revealing a substantial increase in weekday ridership. The total boarding passengers within the sector increased by 6,717 -- from 19,816 to 26,533, a gain of 33.8%. Night ridership improved 69% from 722 to 1,219 in response to the extended service with more convenient frequencies.

The gain in ridership is tempered by the loss of productivity of the new service when compared to that of the previous service. Overall productivity has dropped from 21.7 to 16.6 passengers per vehicle hour as a result of increased frequency and extended hours of operation. Of the 21 new lines, only 4 surpass the 20 passengers per vehicle hour criteria established by your Board.


June 17, 1976

It is recommended that service be continued without major changes until additional passenger counts are completed. Staff anticipates rechecking the Mid-Cities lines in August, after six months of operation. In the ensuing period, the District will continue to respond to public concern and review modifications which may improve productivity.

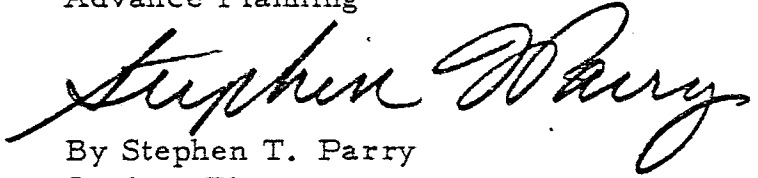
Respectfully,



Jack R. Gilstrap



By Howard C. Beardsley
Assistant Manager of Surface and
Advance Planning



By Stephen T. Parry
Surface Planner

TABLE OF CONTENTS

TABLES	ii
ILLUSTRATIONS	ii
Background	1
Purpose of Report	1
Characteristics of the Area	3
Community Involvement & System Refinements	4
Evaluation	9
Results	15
Productivity	20
Conclusion	23
Recommendations	24

LIST OF TABLES

1.	Objectives & Criteria	9
2.	Pre-Implementation Line Boundaries	12
3.	Post-Implementation Line Boundaries	13
4.	Pre-and Post-Ridership, Foreign Counties	14
5.	Pre-Implementation Ridership	16
6.	Post-Implementation Ridership	17
7.	Pre-Implementation Productivity	21
8.	Post-Implementation Productivity	22

LIST OF ILLUSTRATIONS

1.	Mid-Cities Transit Improvement Program	2
----	---	---

BACKGROUND

The Mid-Cities Transit Improvement Program was implemented on February 22, 1976, in an area roughly bounded by the Los Angeles River, East Los Angeles, Montebello, the Puente Hills, the Orange County line, and the Pacific Ocean. The plan yielded a significant improvement over existing transit services by the addition of 45 buses, a 29% increase; and 16,213 daily miles travelled, a 74% increase.

The new lines of the Mid-Cities Transit Improvement Project interface with the local systems of Long Beach, La Mirada, Santa Fe Springs and Norwalk. A marked increase in frequency, hours of operation and weekend service facilitate convenient use of this system. The 19 new lines create an improved network of surface transit within the 12 municipalities of the Mid-Cities Sector (Figure 1).

PURPOSE OF REPORT

This report presents the preliminary evaluation of the Mid-Cities Transit Improvement Program. After 60 days of service, data has been gathered in order to judge the initial success and effectiveness of the system in accommodating present and expected travel patterns. Specific areas needing refinement have been isolated in response to community requests. Lines have been examined and evaluated in terms of the transit criteria developed by your Board.

Although changes in patronage and general trends are emerging, it would be untimely to draw definite conclusions about this new system until it has been given a reasonable period for growth.

In contrast to the District's responsiveness to external comments and judgments presented by the community, our service evaluation program has focused on internally generated information gathered from analysis of individual lines to determine the effectiveness. However, community comments and judgments are included to present external reaction to the program. Many modifications have been executed as a direct result of these comments, as approved by your Board.

CHARACTERISTICS OF THE AREA

To properly consider the development of the new system, the topographic socio-economic and demographic characteristics of the area must be placed in perspective. The Mid-Cities area of Southeast Los Angeles County encompasses approximately 105 square miles with a population of over 625,000 people -- a density of 6,000 per square mile. The predominantly level topography is interrupted by the Puente Hills area in Whittier and the Los Coyotes Hills in La Mirada, and is separated by Imperial Highway into two grid-like street patterns. While the Mid-Cities population has grown dramatically in the last 25 years, downtown Los Angeles has ceased to be a major work-trip destination. Employment, shopping and other institutions have sprouted within the area. According to the 1970 Census, only 4% of the Mid-Cities work trips were destined to Los Angeles, and only a few census tracts within Mid-Cities attracted more than 2% of the daily work trips made by public transportation. This characteristically dispersed travel pattern was fostered and is sustained by the many new shopping centers, employment generators, civic centers, the extensive street grid pattern, and readily accessible freeways. The new Mid-Cities Transit Program was designed to serve the street arterials and still conveniently link the major transit generators with residential centers.

Another contribution to this diffusion of trip destinations is the demographic homogeneity of the area. There is a narrow distribution of income in which 80% of the population falls within the \$10,000 to \$15,000 family income range (1970 dollars). The poor and elderly which form a major part of the transit dependent population comprise a small segment of the total population. The relatively high proportion of 1.6 autos per household correlates with the population income level and represents an added factor in the general mobility and lack of transit dependency. The area's middle income population, most of whom have access to, and make most of their trips by auto, presents a dramatic challenge to the Mid-Cities Transit Improvement Program.

COMMUNITY INVOLVEMENT & SYSTEM REFINEMENTS

Community Involvement

In order to consider public transit needs, District staff visited municipal governments and civic associations and held community meetings well before the plan was completed in order to apprise the public of the planned system, to solicit their requests, and to acquire approval. This program has continued subsequent to implementation and has proved a valuable tool in assessing and adjusting to the transit necessities of the public. The District's Customer Relations Department, public communications such as newspapers, letters and petitions, and especially our Community Relations and Planning Field Representatives have solicited public opinion and have already initiated significant modifications in District service.

System Refinements

Whittier Area

District field staff recognized the need for service modifications and realignments in the Whittier area. Some patrons had grown accustomed to using the previous transit services and reacted negatively to changes designed to more evenly distribute lines, providing more direct service, for example, on Whittier Boulevard. The public was also sensitive to new lines with more frequent service on neighborhood streets, called for by District's consultant, in an attempt to provide better access to local areas.

When the problem areas emerged, District field staff began the process of evaluating requests, holding community meetings and consulting municipal officials. Changes in routes, costs and schedules were considered before arriving at solutions mutually acceptable to the public, their elected officials, the riding public, and the District. The major modifications can be summarized as follows:

Line 72. Former Line 72 which served the Uptown Whittier shopping area was replaced by Line 820 as the major through line on Whittier Boulevard to Los Angeles. The new line was designed to run more efficiently by routing it through Whittier, by-passing the uptown shopping area. A number of local riders who were accustomed to the former operation of Line 72 in Whittier were not convinced by the changes, and so informed the District. Staff examined the operation of Line 820 and discovered that the congested five-points intersection (Washington Blvd., Pickering Ave., La Cuarta Dr., Santa Fe Springs Rd. & Whittier Blvd.) was a substantial barrier to transferring passengers.

Rerouting the line to Uptown Whittier benefitted the local traveller, although increasing travel time slightly for the Los Angeles bound commuter. Additional and more convenient transferring to other lines was also achieved. Approved by your Board, this Whittier modification became effective on May 9, 1976.

Residential Areas. In other sections of Whittier, entirely new or improved lines with significantly greater frequencies and service to 11:00 p.m. created an unfavorable reaction among local residents. A community meeting was held in Whittier to air residents' concerns, with city officials present who had previously approved the routings in question. Staff's proposals were found mutually acceptable and Lines 821, 822, 827 and 830 underwent minor route modifications which were effective on May 9, 1976, and were subsequently approved by your Board.

South Whittier. In contrast, residents of South Whittier petitioned the District for more service. Line 830 was designed to operate on Mills Avenue, one block from a trailer park at Victoria Avenue and Telegraph Road whose many senior citizen residents found the walk to the new line difficult due to a hilly area and a lack of sidewalks. Line 830 was rerouted on May 15, 1976, to benefit the public and contribute to the success of this line. Further modifications are being studied in the South Whittier Area in order to better serve the public and attract greater patronage.

Downey Area

In the Downey Area the major Lines 800/802, which connect downtown Los Angeles with Orange County via the Santa Ana Freeway, used Gallatin Road to interface with local lines. Gallatin Road is a residential street which proved unsuited for the heavy volume of local line transfers and informal park-and-ride that developed.

District field staff met with Downey representatives in response to residential complaints. While these officials closely monitored local sentiment, a route modification was designed to alleviate the problem and improve the line. On May 2, 1976, Lines 800/802 were altered, with approval by your Board, so that the operation was changed to Florence Avenue and Paramount Boulevard (two non-residential streets); thereby solving the problem and adding transfer opportunities with three more local lines: 826, 827 and 830.

Compton Boulevard

In spite of major service improvements in the Compton-Paramount areas, by the establishment of 30-minute service on Rosecrans Avenue, Alondra and Artesia Boulevards; a service void became apparent on Compton Boulevard which formerly had service. Staff responded to the public request by holding community meetings and conferences with civic officials in order to convey the consultants' explanations for this deletion of service and to arrive at a new plan that would restore service and improve upon the routes of former Lines 113 and 116.

Immediate restoration of service on this route was precluded by the need to write new schedules which would be compatible with the Mid-Cities system. District staff anticipates that new Line 842 which will operate on Compton Boulevard, connecting with industrial parks and employment centers in West Compton, will be implemented in the near future. Additionally, Line 844 will restore through service by a rerouting from Alondra Boulevard to Compton Boulevard as a result of community priorities. This modification has been approved by your Board and will become effective in the near future.

Other System Refinements

- The operation of Lines 821 and 827 in the Los Cerritos Center were finalized with the center management and civic representatives for the improvement of traffic conditions and access; effective, February 28, 1976.
- Line 822 was rerouted from Laurel Avenue to Painter Avenue in response to residents' requests; effective, March 22, 1976.
- A new bus stop was established on Line 826 at Gage Avenue and Sherman Way in order to better accommodate eastbound trips in the City of Bell; effective, March 18, 1976.

Anticipated Refinements

- Line 822 will undergo a minor route modification in the City of La Mirada to facilitate layover conditions.
- Line 844 will be modified in La Mirada and extended into Central Compton.
- The layover zone and turnaround loop of Lines 823, 825 and 832 will be altered in the City of Hawaiian Gardens pending City approval.
- Lines 821 and 830 will be rerouted in South Whittier in order to improve north-south access to the Uptown Business District in the City of Whittier.
- Combination of Lines 824 and 826 in the City of Huntington Park will effect a bridge for riders with origin and destination interests along the alignment of Slauson and Gage Avenues.

Community Relations Program

The Community Relations Program which the District has established to respond to public requests has in the aforementioned instances provided the means for isolating problem areas, airing conflicting opinions and deriving solutions mutually acceptable to all parties. Although many refinements remain to be implemented, and new problems will arise, the planning and evaluation process utilizing community feedback has not only alleviated trouble areas and mitigated inconvenience to interested parties but also led to positive improvements over many routes originally planned and formulated under the consultants' recommendations. The District is confident that this aspect of the overall review process will continue to yield significant positive adjustments in the development of a Mid-Cities Transit System which is truly responsive to community needs and potential public transit patterns.

Major changes, as performed in this sector's implementation, are expected to cause strain on some of the regular riders. By far the most notable achievement of such a program is the pragmatic attitude of the public in responding to change, and allowing the District to modify routes as necessary. The system implementation has created a closer relation between the District and the riding public, allowing for better community relations as proof that the District can respond to the needs of the public.

Transit system/1976/77

EVALUATION

During the planning of the Mid-Cities service improvements, arrangements were made to evaluate the improvements by comparing original conditions with those of the new system. During these preparations it was found that with three contiguous transit improvement projects being implemented between January 25, 1976 and April 11, 1976 very careful data collection, reduction and analysis would be required.

Objectives and Criteria

A major element of staff efforts has been to determine the objectives of the evaluation process and to develop criteria for measuring their accomplishment. The objectives so far developed and the criteria for measurement are presented in Table 1.

Table 1 Evaluation of New Services in
Mid-Cities
Objectives and Criteria

OBJECTIVE	CRITERIA
To determine if the new service has attracted more riders than the previous service.	Passenger totals, day and night, by line, by sector, pre-and-post.
To determine if new service is as productive as previous service.	Passengers in the Sector per vehicle hour assigned to lines or portions of lines in the project Sector, day and night, pre-and-post.
To determine if productivity is adequate to continue service.	Productivity of the line at <u>maturity</u> should exceed 20 passengers per vehicle hour, day and night, by Sector and by line. Transit dependency and system integrity are considered on a subjective basis.

Methodology

In designing the service evaluation program for projects implemented early in 1976, it was felt that all improvement projects should be evaluated the same way so that any one could be compared with another. Project evaluations for recently implemented service in East Los Angeles, Mid-Cities and the San Gabriel Valley should be comparable to the San Fernando Valley and South Central Grid evaluations.

Sector Boundaries

To satisfy this requirement the improvement project sectors would be concisely defined so that projects would be mutually exclusive and passengers would be counted only within the sector regardless of whether the line lay within the sector or partly outside it.

The Mid-Cities Study Sector, for the purposes of evaluation, is bounded by:

- The Pacific Ocean in Long Beach
- Atlantic Avenue from Long Beach to Rosecrans Avenue.
- Garfield Avenue from Rosecrans Avenue to Firestone Blvd.
- Southern limits of Cudahy and Huntington Park.
- Wilmington Avenue from Florence Avenue to Slauson Avenue.
- Slauson Avenue from Wilmington Avenue to the Rio Hondo River.
- Rio Hondo River from Slauson Avenue to Durfee Avenue.
- A line from the Whittier Narrows Dam to Rio Hondo College to Colima Road and Hacienda Boulevard.
- Hacienda Boulevard from Colima Road to the Orange County Line.
- The Orange County Line to the Pacific Ocean (including also the Seal Beach terminal of Line 829).

The portions of old lines included in the Mid-Cities sector are contained in Table 2. The same information for new lines is in Table 3.

Some of the lines serving Mid-Cities operate outside the sector but impose restrictions on boarding and alightings between Mid-Cities and downtown Los Angeles. These lines are considered dedicated to Mid-Cities and passenger totals for the entire line are included in the Mid-Cities evaluation. The old lines include 34, 55, 58 and 72 Express, while new lines 34, 800/802 and 820 are treated in a similar manner.

The evaluation excluded Orange and Riverside County passengers. Service to these Counties has been changed drastically and remains essentially on a contract basis and thereby beyond the scope of the agreement between the District and Los Angeles County. For information, the passenger counts for Orange and Riverside Counties before and after are shown in Table 4.

Table 2

EVALUATION OF NEW SERVICE IN
MID CITIES
PRE-IMPLEMENTATION LINE BOUNDARIES

<u>Line No.</u>	Segment of Line in Sector <u>From</u>	<u>To</u>
34	Terminal	Terminal
38	Terminal	Terminal
46	Slauson & Wilmington	East Terminal
55	Terminal	Terminal
58	Terminal	Terminal
59	Terminal	Terminal
72	Whittier & Garfield	East Terminal
77	Terminal	Terminal
111	Terminal	Terminal
112	Terminal	Terminal
113	Terminal	Terminal
116	Compton & Orange	East Terminal
117	Terminal	Terminal
118	Washington & Garfield	East Terminal
124	Terminal	Terminal
132	Terminal	Terminal
134	South Terminal	Workman Mill & Peck
136	Terminal	Terminal
137	Imperial & Garfield	East Terminal
170	South Terminal	Colima & Hacienda

Table 3

EVALUATION OF NEW SERVICE IN
MID CITIES
POST IMPLEMENTATION LINE BOUNDARIES

<u>Line No.</u>	<u>Segment of Line in Sector</u>	
	<u>From</u>	<u>To</u>
34	Terminal	Terminal
800/802	Terminal	Terminal
801	Terminal	Terminal
820	Terminal	Terminal
821	Terminal	Terminal
822	Washington & Garfield	East Terminal
823	Terminal	Terminal
824	Terminal	Terminal
825	Terminal	Terminal
826	Terminal	Terminal
827	South Terminal	Workman Mill & Peck
828	Slauson & Wilmington	East Terminal
829	South Terminal	Rosemead & Durfee
830	Terminal	Terminal
831	Terminal	Terminal
832	Firestone & Garfield	East Terminal
836	Imperial & Garfield	East Terminal
840	Rosecrans & Atlantic	East Terminal
844	Alondra & Atlantic	East Terminal
846	Artesia & Central	East Terminal
860	Terminal	Terminal

Table 4

EVALUATION OF NEW SERVICE IN
MID-CITIES
PRE & POST RIDERSHIP, FOREIGN COUNTIES

ORANGE COUNTY

Pre				Post			
Line No.	Day	Night	Total	Line No.	Day	Night	Total
45	47	0	47	800/802	876	109	985
55	59	0	59	860	229	13	242
58	1286	60	1346				
59	184	0	184				
72	111	5	116				
124	260	6	266				
	1947	71	2018		1105	122	1227

RIVERSIDE COUNTY

59	217	0	217	860	147	13	160
----	-----	---	-----	-----	-----	----	-----

Ridership Growth With Time

Previous evaluation of the South Central and San Fernando Valley Grid Systems by staff and the Joint Agency Transit Advisory Committee indicated that line ridership of new service increases for some time after implementation. The point at which this growth levels off cannot be specified, because of the demographic variations of areas served by the lines under study and differences in the extent of changes made to different lines. Evaluation of this project and others to follow may allow staff to predict line growth with time. At present we can say that line growth may level off between six and twenty-four months after implementation.

Rider Checks

100% checks. Passengers are counted by District checkers who ride each trip on a line from end to end. In what is known as a 100% check, the checker counts the passengers boarding and alighting at each stop and records the type of fare paid. The 100% check is widely accepted as representative of annual ridership on a line but has limitations because of daily ridership fluctuations of up to 5%. Inclement weather can cause variations of up to 10%. The 100% check is, in reality, a sample and is subject to normal sampling errors when it is used to draw conclusions about the total annual ridership of a line. Nine working days were required to complete the checks for the 21 lines involved in the study. The total sector ridership, therefore, contains some inconsistencies introduced by possible variations between lines checked on different days. The same procedure was followed for pre-implementation checks, except checks were taken over an extended period from October 1975 through February 1976.

Results

Passenger Totals

The passenger counts for the lines existing before implementation are shown in Table 5. During the day there were 19,094 passengers boarding in the sector while 722 rode at night, for a total of 19,816.

The post implementation line riders in the sector are shown in Table 6. During the day there were 25,322 passengers (up by 6,228) boarding in the sector while night ridership increased by 497 to 1,219 (an increase of 68%). Total passengers increased to 26,533, up 6,717, a rise of 33.8%.

Table 5 Evaluation of New Service in
Mid-Cities - Pre Implementation
Ridership

Line No.	Line Name	Total One Way Route Miles	Passengers Boarding In Sector		
			Day	Night	Total
34	Los Angeles-Lynwood-Paramount-Bellflower	18.1	941	52	993
38	Long Bch.-Whittier-El Monte	34.2	63	-	63
46	East Florence-Slauson Ave.	23.8	771	55	826 *
55	Los Angeles-Newport Bch.-Balboa	44.5	712	55	767 **
58	Los Angeles-Santa Ana	41.1	2476	107	2583 **
59	Long Beach-Riverside	63.3	94	-	94 **
72	Los Angeles-Whittier-Fullerton	30.8	4294	166	4460 **
77	Maywood-Bell	7.7	4324	267	4591
111	Bellflower-Huntington Pk.	15.0	1427	-	1427
112	Whittier-Huntington Pk.	14.8	297	-	297
113	Compton-Whittier	21.7	751	-	751
116	Compton-Artesia-La Mirada	15.6	377	-	377 *
117	Whittier Local	8.7	615	-	615
118	Whittier-East Washington Bl.	15.6	83	-	83 *
124	Long Beach-Anaheim-Fullerton	36.6	153	1	154
132	Hawaiian Gardens-Downey-Lakewood	8.5	703	-	703
134	El Monte-Durfee Ave.-Peck Rd.-Whittier	13.3	158	-	158
136	Pico Rivera-Passons Blvd.	5.0	307	-	307
137	Imperial Hwy.-El Segundo-Norwalk	19.9	240	0	240 *
170	Azusa-West Covina-Whittier	22.1	308	19	327 *
			19,094	722	19,816

* Sector Figures Only

** L.A. County Boardings Only

Table 6

Evaluation of New Service in
Mid-Cities - Post Implementation
Ridership

Line No.	Line Name	Total One Way Route Miles	Passengers Boarding In Sector		
			Day	Night	Total
34	Los Angeles-Lynwood-Paramount-	13.4	721	73	794
800/802	Los Angeles-Disneyland-Santa Ana	35.9	1595	111	1706 **
801	Los Angeles-Norwalk Via Santa Fe Springs	16.7	1569	96	1665
820	Los Angeles-Whittier-La Habra-Puente Hills	28.4	5912	266	6178
821	Pico Rivera-Whittwood Ctr.-Cerritos	20.3	502	24	526
822	Los Angeles-La Mirada Via E. Washington Blvd.	19.5	426	6	432*
823	Norwalk-Hawaiian Gardens-Bloomfield Ave.	7.9	46	1	47
824	Huntington Pk.-Bell Gardens	9.9	2651	138	2789
825	Hawaiian Gdns.-Norwalk-Whittier	14.8	760	22	782
826	Huntington Pk.-Downey-Paramount	13.5	2376	129	2505
827	El Monte-Cerritos Center	25.6	458	34	492*
828	Marina Del Rey-Huntington Pk.-Paramount	30.6	3398	123	3521*
829	Lakewood-Rosecrans Blvd.	32.8	1240	62	1302*
830	Whittwood Ctr.-Bellflower	13.5	173	-	173
831	Passons Blvd.-Paramount Blvd.	17.2	881	8	889
832	Manchester Ave.-Firestone Blvd.-Norwalk Blvd.	20.3	461	5	466 *
836	El Segundo-La Habra	27.2	570	30	600 *
840	Rosecrans Ave.	26.3	612	18	630 *
844	Alondra Blvd.	12.7	451	36	487 *

Table 6
Contd.

Evaluation of New Service in
Mid-Cities - Post Implementation
Ridership

Line No.	Line Name	Total One Way Route Miles	Passengers Boarding In Sector		
			Day	Night	Total
846	Redondo Beach-Buena Park	21.3	364	25	389 *
860	Long Beach-Disneyland-Riverside	61.8	148	12	160 **
			25,314	1,219	26,533

*Passengers boarding figures are only for the portion of the line in the Mid-Cities Sector.

** Los Angeles County Boardings Only.

Factors Contributing to the Increase

The increase in ridership in the Mid-Cities area can be attributed to establishment of entirely new routes, alterations in existing routes, and significant improvements in service frequency. The new through service, which replaced fragments of old routes on Firestone Boulevard (Line 832), Rosecrans Avenue (Line 840), Alondra Boulevard (Line 844) and Artesia Boulevard (Line 846), and new Lines 821 and 827, attracted 2,900 new passengers which is 45% of the total increase in Mid-Cities ridership.

New lines which supplant former lines in whole or in part showed increases along with improvements in service. The service improvements on Line 820 over former Line 72, yielded a 39% increase in ridership. The ridership on Line 824 and 828 which replaced former Line 77 and 111A went up 19%. A significant increase of 150% more passengers on Line 836 (Imperial Highway, former Line 137) exemplifies the attraction of riders by improving the frequency and spread of service. The new early morning service on Imperial Highway has become so useful for Mid-Cities patrons that two additional trips have been added between 5:30 and 6:00 a.m. to alleviate overcrowding.

Supporting Factors

Division Revenues. Although the collection of revenue data is not designed to pin-point and substantiate alterations in ridership on specific lines in the Mid-Cities sector, a general increase in farebox revenue is apparent. Divisions 1-11, 2, 4-5, 12 and 18 are the operational facilities which service Mid-Cities. Division 9 is excluded because of the impossibility in differentiating between the results of Mid-Cities and San Gabriel Valley. A comparison of these division revenues in 6 week periods before and after project implementation indicates that average daily farebox revenue has increased approximately 4.2% representing approximately 14,600 daily boardings. Although this revenue increase affects many other lines outside the Mid-Cities area, it substantiates the ridership trend in this sector by comparison with the smaller revenue increase of 3% at Divisions 7, 8 and 15 which were unaffected by recent improvement projects.

Sector Pass Sales. Although pass sales are even more difficult to localize than farebox revenue, sales at two outlets in Whittier and Buena Park may illustrate the general sector activity. Regular pass sales climbed from only six in February to 48 in March, and a total of 92 in May. Overall pass sales increased 13.5% from January/February average to April/May average, which is indicative of additional ridership.

Sector Pass Usage. Pass usage has likewise risen from 4264 passengers (20% of total riders) before implementation to 6296 (23.7%) after Mid-Cities implementation, up 2032 or 3.7 percentage points. These figures further substantiate the 33.8% increase in ridership.

Productivity

To determine whether the productivity of new service was as high as previous service, the passengers per line in the sector were divided by the vehicle hours per line in the sector.

The overall productivity of lines in the Mid-Cities Sector before implementation of the Transit Improvement Program was 21.7 passengers per vehicle hour. Individual line ratios ranged from a high of 57.4 passengers per vehicle hour to a low of 2.7. Table 7 displays the productivity of the Mid-Cities lines before implementation. Corresponding productivity for post implementation lines is presented in Table 8. Overall productivity dropped to 16.6 passengers per vehicle hour, down 5.1 largely because of the impact of adding 683 vehicle hours to the sector. This 75% increase in vehicle hours outweighs even the substantial increase in ridership to show an initial drop in productivity.

Night service can be singled out because of a decline in productivity from 13.8 passengers per hour to 8.4. The healthy 68% gain in ridership was insufficient to achieve the 20 passengers per hour level when offset by a 178% increase in the vehicle hours providing night service (after 7:00 p.m.) to 20 of the 21 affected lines.

Table 7
EVALUATION OF NEW SERVICE IN MID-CITIES
Pre Implementation Productivity

Line No.	Passengers by Sector		Vehicle Hours by Sector		Passengers per Vehicle Hour
	Day	Night	Day	Night	
34	941	52	52.62	8.38	17.9
38	63	-	12.0	-	5.3
46*	771	55	55.53	5.63	13.9
55	712	55	48.20	3.80	14.8
58	2476	107	128.06	12.41	19.3
59	94	-	35	-	2.7
72*	4294	166	118.44	6.66	36.25
77	4324	267	71.23	8.77	60.7
111	1427	-	50.47	.53	28.3
112	297	-	13	-	22.8
113	751	-	41	-	18.3
116*	377	-	19.6	-	19.2
117	615	-	37	-	16.6
118*	83	-	12.9	-	6.4
124	153	1	44.28	1.72	3.5
132	703	-	50	-	14.1
134*	158	-	8.41	.15	18.8
136	307	-	14	-	21.9
137*	240	-	22.36	1.00	10.7
170*	308	19	27	3.05	11.4
	19,094	722	861.10	52.10	22.2
					13.8
					21.7

* Includes Mid Cities Sector Figures only

EVALUATION OF NEW SERVICE IN MID CITIES
 POST IMPLEMENTATION PRODUCTIVITY

Table 8

Line No.	Passengers by Sector		Vehicle hrs. by Sector		Passengers per vehicle hour	
	Day	Night	Day	Night	Day	Night
34	721	73	794	9.00	17.5	8.1
** 800/802	1595	111	1706	6.69	25.4	16.6
801	1569	96	1665	10.36	15.0	9.3
820	5912	266	6178	16.4	15.9	9.0
821	502	24	526	10.13	7.0	2.4
822	426	6	432	1.62	14.5	3.7
* 823	46	1	47	.38	3.3	2.6
824	2651	138	2789	5.35	37.5	25.8
825	760	22	782	7.45	13.3	3.0
826	2376	129	2505	6.87	37.4	18.8
827	458	34	492	12.37	4.2	2.8
* 828	3398	123	3521	6.61	43.0	18.7
* 829	1240	62	1302	13.66	8.9	4.5
830	173	0	173	.78	6.0	0
831	889	0	889	0	12.9	0
* 832	461	5	466	4.97	9.1	1.0
* 836	570	30	600	3.83	11.0	7.8
* 840	612	18	630	4.29	13.1	4.2
* 844	451	36	487	12.65	9.6	2.8
* 846	364	25	389	8.66	7.6	2.9
** 860	148	12	160	3.12	16.8	3.8
	25,322	1211	26,533	145.19	17.4	8.4
					1596.37	16.6

* Includes Mid-Cities Sector figures only

** Los Angeles County figures only.

CONCLUSIONS

The Mid-Cities Service Improvement Program has been well received by previous transit patrons who in some cases were obliged to alter their travel patterns and has attracted new riders by virtue of a significantly new system.

Under the previous service in Mid-Cities, the lack of major trans-sector lines and the discouraging inconvenience in transferring between two lines on hourly frequencies, hindered optimal passenger utilization of the transit network. The new system, however, with significantly improved headways on local lines and the addition of new and improved coverage offers more transit opportunities.

At this early stage of evaluation, it might appear that the ratio between additional ridership and increased vehicle hours is not favorable. However, experience in other sector improvement programs indicates a continuing growth in ridership which, given the opportunity to mature, will yield a cost effective utilization of resources.

The partial Grid pattern of the Mid-Cities sector created an expanded range of origin and destination choices for the residents of the area. There is some evidence that a change to the transit mode of travel is now the choice of many who previously used automobiles. Regular riders of the former system appear to have made the transition from the previous system to the new without major difficulty.

In summary, operating division revenues, sector pass sales and overall pass sales are up. These factors support the observed increase of 6,700 daily boardings and attest to the effectiveness of improved service and better routings in developing an integrated and convenient transit network.

RECOMMENDATIONS

Service should be continued without major change to service levels until six months of operation.

Close scrutiny of operations should continue and adjustments made as required to routes and schedules reflecting further identifiable needs of the community.

Additional rider checks should be made after six months of operation.

That special publicity efforts be oriented toward lines that are below the 20 passenger per hour criteria.

That staff begin developing proposals to achieve greater productivity.