

DRAFT ENVIRONMENTAL

IMPACT REPORT ON POSSIBLE INCREASES IN FARES AND TARIFFS

THAT MAY BE REQUIRED FOR SCRTD
SERVICES FOR FISCAL YEAR 1978-79

MARCH 23, 1978

Prepared by the Planning Department

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I. SUMMARY AND PURPOSE OF THIS DOCUMENT

The purpose of this document is to describe what is likely to happen if the Southern California Rapid Transit District is forced, because of inadequate public funding support, to raise fares for the fiscal year beginning July 1, 1978.

At the current time, there appears to be a possibility that local, state and federal governments may not, for one reason or another, provide the level of financial support to public transit previously planned on for the 1978-1979 fiscal year.¹ If this were to happen, a serious shortfall in the budget of the Southern California Rapid Transit District (RTD) will occur. The size of this shortfall can only be estimated at this time, but it is thought to be on the order of \$20 million.

Of all the options available to the RTD, a moderate increase in fares is estimated to have the least long-term adverse impact upon transit patrons. For that reason, it is proposed that, if a significant budget shortfall does occur, a fare increase play a major role in resolving a shortage of revenue.

The RTD has no taxing authority of its own. Public funds to meet a prospective shortfall would have to be provided through the taxing powers of local or state governments. Although RTD does receive federal financial assistance, additional local matching funds are required to utilize this funding source to a greater extent than at the present.

The Los Angeles County Transportation Commission has the power to place a tax increase for transit on the ballot. Whether this will happen and how the electorate would vote is very uncertain.

The RTD has strenuously pursued internal and service economies over the past 18 months. RTD has cut out over 1,000 jobs, including drivers, public information personnel, technical, professional and management staff, as one of many austerity measures. These measures have had serious negative impacts in themselves and the opportunity for significant additional economies is very limited.

Unit costs since the last fare increase on July 1, 1977, have, of course, increased. But of equal or greater impact is that the relative share of funding support

being made available to RTD that supported continued service improvements in the past is diminishing. RTD must share a subvention from the state sales tax with all other public transit operators in Los Angeles. In just the past year alone, the number of municipally-owned bus systems in Los Angeles County has doubled to 18. As a result, the RTD's share of the sales tax fund has been reduced to 69% of the County total--yet RTD carries 84% of the County's transit passengers.

The only courses of action open to the RTD, should a budget shortfall actually occur, is to obtain additional revenue through an increase in fares or substantially cut services. Fares might be raised in a variety of ways. Each approach has particular adverse impact; each involves trade-offs. This report describe a number of fare increase alternatives that are designed to frame the feasible range of choices and combinations.

It is important to keep in mind that there appears to be no "null" or "no action" alternative. Either, in all likelihood, additional revenues are going to have to be generated, or substantial reductions in costs are going to have to be made, or some combination of both of these. "Doing nothing" is not a workable alternative.

As a draft document, the primary purpose of this document is to stimulate public discussion. The RTD solicits comments from any concerned individual or organization on the alternative courses of action before the RTD Board. Written comments should be addressed to the attention of the Environmental Coordinating Officer (E.C.O.). Comments will be accepted for the official record for approximately 40 days after the publication date of this document.

The RTD will also be holding a public hearing in order to take oral testimony on the issues discussed in this document. The public hearing will be before RTD Board of Directors and is tentatively scheduled for Saturday, April 29, 1978. Interested individuals and organizations are invited to contact the Office of the Secretary to the Board (972-6526) to schedule an appearance.

Both written and oral comments will be summarized in a final version of this document. RTD will formally respond to comments in this document and, during the month of June, the final version of this document will be made available to the public. THE RTD BOARD OF DIRECTORS WILL CAREFULLY REVIEW THE AVAILABLE ALTERNATIVES AND THE FINAL DOCUMENT BEFORE MAKING A DECISION ON IF AND HOW FARES MUST BE INCREASED. A fare increase would not occur if the necessary public financial

support can be secured in the meantime.

This document has been prepared, in part, to comply with Division 13 of State Public Resources Code (the California Environmental Quality Act with proposed and adopted amendments). Copies are available at cost from the Office of the Secretary to the Board of Directors, RTD, 425 South Main Street, Los Angeles, California 90013.

II. DESCRIPTION OF THE POSSIBLE ACTION

This report seeks to describe and characterize the least negative course of action available to the RTD, should a significant shortfall of local, state and federal financial support occur this coming fiscal year. The preliminary financial plan for RTD's fiscal year 1979 has a total budget requirement of \$272 million. Preliminary projections indicate, however, that revenues will fall short of this total by an amount on the order of \$20 million or as much as \$30 million.

It is important to point out that the funds sought for a fare increase will not in themselves resolve RTD's possible budget shortfall if adequate public funding is not secured. That portion of a budget shortfall not met by public funding support and farebox revenues will have to be met by additional reductions in RTD's bus service.

In the recent past, a major source of special, public financial support for public transit has been the County of Los Angeles. Many of the significant improvements in public transportation in Los Angeles County in recent years were made possible in part by substantial contributions by the County from its revenue sharing funds and other sources. In recent years, however, the County has felt it necessary to severely curtail its contributions to RTD. The County remains, however, the only local government making a contribution (currently on the order of \$5 million annually) to help pay for general RTD operations.

Of those actions that may be required to meet the potential disparity between costs and revenue, a fare increase often generates the most public controversy. To aid public discussion, RTD staff has developed six alternative fare increase plans. There are many possible combinations of fares, each with its own characteristics and impacts. The six alternatives described in the following section are an attempt, however, to illustrate the range of reasonable and feasible fare increase plans.

III. DESCRIPTION OF POSSIBLE ALTERNATIVE FARE INCREASE PLANS

In 1977, the fare structure as well as the fare levels were evaluated in development of alternative fare plans. The major criteria used were:

- increase equity (the fares charged should be proportional to the costs of serving a particular type of trip)
- minimize patronage loss
- reduce collection costs (fares should be as easy and simple to collect as possible)
- minimize the complexity of fares to the user

These same criteria were observed in the development of the six possible fare increase plans. Each plan responds to some criteria better than others. The prices and revenues involved are shown in the chart labelled Figure 1.

The primary variables for developing possible alternative fare plans for FY 1978-79 would be (1) the basic amount of a possible increase in fares and (2) the relative amount of privilege that can be afforded to special groups such as the elderly, the handicapped and students. Concessions here must be balanced against the service eliminations that would be required to make up the remaining difference between costs and revenues (including public financial support).

As mentioned before, none of the alternative fare increase plans described is projected, in itself, to cover the total possible shortfall that might be in the next RTD budget. Other factors are expected to make a contribution also. Some factors, such as additional public funds, are extremely uncertain and probably will not be known until after elections in June, 1978. What portion of the shortfall is not covered by additional fare revenues and public funds, however, will have to be largely met through reduction in bus service.

Because of the great number of variables involved and the uncertainty surrounding many of them, it is possible to describe the general choices that might be involved only in a tentative, hypothetical way. If the possible shortfall in RTD's budget were to

occur, however, some very gross generalizations might be made about the various alternatives:

- No Fare Increase: The probability would be very high that at least ten percent of the currently existing service would have to be eliminated;
- Alternatives One and Two: The probability would be very high that on the order of five percent of the currently existing service would have to be eliminated;
- Alternatives Five and Six: The probability would be high that few, if any, services would have to be eliminated;
- Alternatives Three and Four: The probability would be that some service reductions would be required but these reductions would be significantly less than would be involved in Alternatives One and Two.

FIGURE 1

ALTERNATIVE PLANS FOR A POSSIBLE FARE INCREASE

<u>Cash Fare Per Ride</u>	<u>Current Fares</u>	<u>Possible Alternative Fare Increase Plans</u>					
		<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>
Regular base fare	40¢	45¢	45¢	45¢	45¢	50¢	50¢
Express "step" charge	20¢	20¢	20¢	20¢	20¢	20¢	25¢
Elderly/handicapped	10¢	10¢	Free, off-peak only	20¢	20¢	20¢	20¢
 <u>Monthly Pass Cost</u>							
Regular base	\$18	\$18	\$18	\$18	\$20	\$20	\$20
Additional express "steps"	\$ 6	\$ 8	\$ 8	\$ 8	\$ 8	\$10	\$10
Elderly/handicapped	\$ 4	\$ 4	No Pass	\$ 8	\$ 8	\$ 8	\$ 8
Students	\$12	\$13	\$13	\$14	\$14	\$16	\$16
Estimated Additional Revenue Generated (in millions)	\$ 0	\$5.7	\$4.0	\$8.6	\$9.8	\$15.1	\$15.9
Potential Remaining Shortfall to be met by other means (in millions)	\$20.0	\$14.3	\$16.0	\$11.4	\$10.2	\$5.0	\$4.2

- NOTES: 1) Express "steps" are charged for each four miles a bus travels uninterrupted on a freeway; one can travel unlimited distances on a bus on surface streets for the regular base fare.
- 2) "Shortfall" is assumed to be on the order of \$20 million for discussion purposes. "Other means" would include service reductions, contributions from the County of Los Angeles, possible charges in allocation formulas for certain federal funds, etc.

IV. DESCRIPTION OF THE ENVIRONMENTAL SETTING THAT WOULD BE IMPACTED BY A POSSIBLE FARE INCREASE

The environmental setting that may be impacted by the proposal to increase fares includes the entire City of Los Angeles and the southern, urbanized portion of the County of Los Angeles. RTD also offers limited services in Riverside, San Bernardino and Orange Counties. RTD's service area of over 2,200 square miles is larger than the areas of Baltimore, Atlanta, Washington D.C., and San Francisco combined. The region is as varied as it is large. For purposes of economy, only a few features of the region that appear to directly relate to transportation are mentioned here.

- A. Geography. The southern, urbanized portion of Los Angeles County is strongly delineated by mountains and foothill ranges. The broad, flat basins between these ranges, on the other hand, have tended to foster rapid, unstructured urbanization that now extends even well into the foothills.

Because this urbanization has been increasingly meeting its natural boundaries, urban area densities (Los Angeles and Orange Counties combined) have been increasing at a phenomenal rate--approximately 15% every decade.

The Los Angeles Urbanized Area is now estimated to be the second most dense urbanized area in the United States. Only the New York Metropolitan Urbanized Area has a greater concentration of persons per square mile.

Planned density offers substantial efficiencies in reduced energy consumption, reduced air and water pollution and increased convenience.² However, because Los Angeles' growth has historically been so unstructured, public services and facilities have often been unable to take advantage of the potential economies of intensified land use. For instance, each of the four metropolitan areas mentioned earlier have substantially lower densities than Los Angeles. Yet each area either has or is constructing major rapid transit systems ("subways", etc.) allowing them to take advantage of the economies of scale and operation (to say nothing of convenience) that rapid transit can typically offer.

Los Angeles has, instead, invested almost exclusively in huge, multi-laned freeways.

Despite the enormous investment in the many miles of freeways and major streets, traffic congestion continues to be a serious and growing problem, especially at peak hours. The public transportation system in Los Angeles is presently limited to buses which are forced to compete with all other traffic. Because Los Angeles has had to rely exclusively upon buses for its public transportation, transit has been kept an inherently inferior mode of travel.

- B. Climate and Meteorology. The foothills and mountain ranges that are so prominent in Southern California substantially impede local ventilation. One major portion of RTD's service area, the San Fernando Valley is virtually cut off from costal breezes even though it is very close to the ocean. Other areas more distant from the ocean such as the Pomona Valley, San Gabriel Valley and the Pasadena areas are often much worse off than the San Fernando Valley. Even the Central Los Angeles basin can usually expect a change of air only once every 24-hours.

In itself, the lack of ventilation would not be a serious concern. But combined with Southern California's naturally hot, arid climate and the relatively high levels of local automobile use, the Los Angeles Urbanized Area has developed the nation's most severe photochemical oxidant ("smog") problem.³ As of February, 1978, Los Angeles was one of the few cities that did not meet even the minimum federal air quality standards for any major pollutant except sulfur dioxide--and, the minimum sulfur dioxide standard will not be met in the future.⁴

During 1976, State of California standards on minimum acceptable visibilities were not met for 283 days in the Metropolitan Area. The number of days that ozone and nitrogen dioxide standards are not being met appears to be increasing. The ozone (one-hour) standard was not met for as many as 187 days at some points in the Metropolitan Area; the nitrogen dioxide (one-hour) standard was exceeded for as many as 55 days in the Metropolitan Area. Carbon

monoxide, showing a slight decrease in 1976 over 1975, still exceeded the one-hour standard, 93 days in some parts of the Metropolitan Area.

- C. Demography. The young, the elderly, the handicapped, and all those who cannot afford automobiles or for various reasons are unable to drive, are classed as transit dependent. While many generally assume that virtually everyone in Los Angeles has ready access to an automobile, this is not at all the case: 17% of households in Los Angeles County do not own or have access to an automobile and 31% have only one automobile. Almost a million and a half people are either totally or partially dependent on public transit.

For many, the RTD bus system and the numerous municipal bus carriers are their primary or sole means of mobility. Without the bus system, severe mobility restrictions would be experienced by many of the transit dependent members of the population. Shown in Figure 2 are some general population characteristics available from the 1970 U.S. Census that bear upon transit dependency:

Education and the ready access to it is a critical part of an urban area's social and economic health. In 1970, the typical urban adult in the Los Angeles metropolitan area had completed 12.4 years of formal education. Yet a substantial portion of the jobs available today require some higher education beyond high school. Public transportation plays a critical role in providing students with affordable access to opportunities for higher education. (The RTD typically sells 35,000 or more student passes a month, but a substantial additional number of students are estimated to pay cash fares.)

Similarly, the very important advantage of a large, diversified urban labor pool is lost if workers do not have a variety of efficient, affordable ways to get to places of employment. Good public transportation is closely intertwined with any meaningful effort to moderate or reduce unemployment, to reduce welfare dependence and to generally mitigate isolating, alienating effects of a large urban area.

FIGURE 2

POPULATION CHARACTERISTICS

2a. Los Angeles County Population by Age in 1970

The median age of residents is 30.6 years, with males averaging 29.4 years and females averaging 31.7 years.

Under 1 year	2%
1 -- 9 years	15%
10 -- 19 years	17%
20 -- 29 years	16%
30 -- 39 years	12%
40 -- 49 years	12%
50 -- 59 years	11%
60 -- 69 years	8%
70 -- 79 years	5%
80 +	2%
 	<hr/>
TOTAL	100%

2b. Los Angeles County, Population by Ethnic Group in 1970

White	58.8%
Spanish Surname	18.4%
Negro	17.9%
Indian	.3%
Oriental	3.9%
Other	.7%
 	<hr/>
TOTAL	100.0%

2c. Los Angeles County Total Population

	2000
	<u>Projection</u>
<u>1975</u>	
6,947,200	8,045,500

NOTE: 1970 data taken from the U.S. Bureau of the Census; 1975 and 2000 data developed by the State of California Department of Finance.

Health is an important aspect of public transit's role as well. The physically handicapped (particularly those with impaired sight who ride free on the RTD) are often not able to get about by any other means. Almost 3,500 passes are sold to handicapped riders (excluding the blind) every month. In addition to this number, many of the over 32,500 senior citizen passes sold each month go to people whose physical impairments limit their ability to drive an automobile. Curtailing public transit's ability to serve hospitals, medical centers and other health facilities would have severe repercussions upon these segments of the population, and the quality of life in the region.

The RTD is now taking delivery of 200 new buses capable of accommodating wheelchair users as well as able-bodied patrons. As the RTD is able to retire older buses, it is the policy of the Board of Directors that all new buses will be similarly equipped so that all RTD services will eventually be fully accessible to the handicapped.

- D. Economics. As described in other parts of this document, the possible fare increases proposed for consideration would generate between \$4 million and \$16 million a year. On a per capita basis over the RTD's entire service area, that computes to between 57¢ and \$2.30 per year per capita. Averaged over the 312 million annual boardings currently being made on RTD buses, this amount computes to between 1.3¢ and 19.5¢ per boarding.

(In actuality, the economic impact upon individual patrons would vary considerably, depending upon age of the patron and pass usage. Regular patrons would pay over twice as much as senior citizens for a given number of rides; any patron making consistent use of a monthly pass could reduce his or her average trip cost considerably.)

To some, these costs may appear very significant. It is appropriate, then, that the larger context in which these expenditures would have to be made be given some mention.

Because of the long standing identification of Los Angeles with the automobile, there is a

strong tendency to become inured to the tremendous costs the region incurs by its extensive reliance upon the automobile. We are fairly inured, for instance, to the fact that a standard size automobile costs 18-30¢ a mile or more to operate, that this automobile costs an average of \$1,350-\$3,000 a year during the first four years and typically over \$17,800 over the life of the car in out-of-pocket expenses.⁵ That our automobiles now consume 21.4% of the typical family budget (compared with 20.1% for food) we accept without question.

(After the July 1, 1977, fare increase, a bus rider had to pay on the average 6.6¢ per mile of travel. It presently costs a regular pass user \$216 a year for an unlimited number of trips; this might rise to \$240 under the possible fare increase alternatives.)

Beyond these very direct, personal costs, however, are a lot of hidden costs few people are accustomed to recognizing. Unfortunately, there has been little comprehensive, systematic analysis done in this area, and so we are largely limited to more obvious instances and very rough approximations. One example is "free parking," which whether at home, at work or shopping, may actually cost tens of thousands of dollars to provide--and non-auto-users are forced to absorb these costs along with automobile owners. Over-sized streets and freeways for the peak-hour auto commuter actually cost extravagant sums to provide (some estimates have put the figure at \$23,000 per car or more and at several dollars per vehicle-mile). The direct, measurable damage automobile smog causes amounts to over \$1,000 per household per year in the Los Angeles basin.⁶

Contrary to popular belief, the costs of our freeways and streets are not completely paid for in taxes paid by the people that use them. There are many hidden costs (in our property tax bill, higher prices for certain commodities and services, etc.) that are passed on to all of us--regardless of how much we drive or do not drive an automobile. One source estimated that identifiable hidden costs to the Los Angeles County tax payer were on the order of \$1 billion just during 1974 alone. During that year, approximately \$800 million in fuel and

license fees were collected, so combined the public costs for automobile transportation were on the order of \$1.8 billion for 1974. That comes to about \$255 per capita tax support--over \$590 of an average Los Angeles household's taxes--dedicated to the automobile.⁶ (Per capita local tax support for public transit, via a $\frac{1}{4}\%$ state sales tax subvention, peaked in 1975 at \$19.25. In addition to this, some federal monies aid RTD, a portion of which ultimately originates with Los Angeles County taxpayers.)

In addition to this figure, there was between \$7 billion and \$8 billion spent on direct, private costs (excluding taxes) by automobile owners. A small fraction of this is subsidized by oil price supports and regulations which artificially reduce the cost of gasoline. Substantially more serious than these subsidies, however, is the long-term impact of oil imports upon the nation's economy. Now running at \$3.8 billion each month, the money the nation spends on imported oil this year would be enough to subsidize every transit system in the country for almost a quarter of a century. In the near future, oil imports are projected to exceed \$100 billion a year.

If we were actually able to afford this expenditure, that would be one thing. But, plainly, we cannot: the nation has a very serious balance of payments deficit which is directly attributable to our excessive petroleum imports. Because of this, the value of the dollar is continuing to deteriorate on the world market, threatening the viability of our economy and posing renewed ravages from inflation and unemployment.

Automobiles burn about 34% of the total petroleum consumed in the United States represent both the single most wasteful use of oil and the largest single opportunity for energy conservation.

Nations with higher standards of living than our own invariably consume much less energy per capita. Sweden, for instance, only consumes 60% of the U.S. per capita average even though it is a very cold country with substantial amounts of heavy industry. These same nations invest very heavily in high quality public transportation systems as one way to assure that their energy

resources are used efficiently. This is not to say that this would be an easy situation for us to arrive at. Many nations committed themselves to energy-efficient economies a long time ago.

V. PROBABLE IMPACTS OF THE POSSIBLE FARE INCREASE PLANS UPON THE ENVIRONMENT

- A. Patronage Impact Patterns. Most people can appreciate the basic inverse relationship that typifies transit service pricing: the higher the fare is raised, the fewer the passengers that choose to ride. However, there are some very important subtleties to this relationship which must also be recognized, especially when the only available alternative is the elimination of some service altogether.

This important qualifier is the elasticity of demand for transit services. The price elasticity of demand for local transit services is currently estimated to range from .07 (for express surcharges on monthly passes) to .20 (for cash fares for elderly and handicapped). For each 100% increase in the price of a transit fare, between 7% and 20% patrons will be lost, leaving between 80% and 93% of the patronage that previously used transit.⁷

When services are cutback or eliminated, however, the loss of patronage is much greater, with an elasticity of perhaps .70 to over 1.00. When service is eliminated, some people may utilize alternative transit services, so not all of the patrons using the eliminated service are lost. On the other hand, some people riding other transit services may quit riding the bus because they feel the need for "contingency" service or alternative route connections. In such instances, not only may the patrons on the eliminated service be lost, but patrons on other lines are also lost in addition, raising the possibility of a passenger loss of "over 100%."

Another factor is that time, especially during the periods of high inflation, quickly moderates the effect of a fare increase upon patronage. It is estimated any patronage decline associated with most of the possible six alternative fare plans described would disappear within three months after the initiation of the fare increase. Patronage between the third and sixth month of an increased fare would be expected to stabilize. Hopefully, by the sixth month, it might be once again possible for ridership gains to be made.

The only significant, available alternative to a fare increase, should a budget shortfall occur, would be substantial cutbacks in transit service. As described in Section XII, the medium-term adverse impact of such service cutbacks may be on the same order as the impact of a fare increase. The longer term, cumulative impacts of a major service cutback are much more severe, however. During the first year of implementation, a service cutback alternative to a fare increase would result in almost three times as much total transit patronage being lost as would be lost with a fare increase.

- B. Comparative Patronage Impacts of the Alternative Fare Increase Plans. In Figure 1, the revenue gains (and shortcomings) for each of the possible alternative fare increase plans was described. In Appendix A, the alternatives are described in much greater detail, showing both revenue and patronage impacts forecast by passenger category.

As noted in Figure 1, first year revenue gains range from \$4.0 million (Alternative 2) to \$15.9 million (Alternative 6). Conversely, Appendix A shows that patronage losses in the first year range from 2.63 million boardings (Alternative 1) to 15.37 million boardings (Alternative 6).

Because of the different demand elasticities for different categories of fares, the ratio between revenue gain and patronage loss varies. The only alternative with a ratio greater than unity (1.00) is Alternative 1; this alternative, however, has one of the lowest revenue yields (\$5.7 million in FY 78-79). The next best ratio is that of Alternative 6, which has the highest revenue yield (\$15.9) of any alternative. This alternative also has the highest patronage loss (although, as stated previously, the patronage impacts from any of the plans are projected to stabilize within the first six months after a fare increase).

In Figure 3, each of the alternatives is ranked in the order it satisfies these three criteria. It must be recognized that these rankings are not weighted (e.g. Rank 2 may be much worse proportionately from Rank 1 than Rank 3 is from Rank 2) within a category or between the different criteria.

FIGURE 3

UNWEIGHTED RANKINGS OF POSSIBLE ALTERNATIVE
FARE PLANS ON THREE CRITERIA

	<u>Possible Alternative Fare Increase Plans</u>					
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>
Maximum Total Revenue Gain	5	6	4	3	2	1
Minimum Total Patronage Loss	1	2	3	4	5	6
Best Ratio of Revenue Gain to Patronage Loss	1	4	5	4	3	2

- C. Air Quality Impacts. The largest total projected patronage loss is 15,370,000 boardings. It is estimated that, overall, there are 1.4 boardings for every transit trip. This ratio yields approximately a total maximum of 10,980,000 trips lost due to a possible fare increase taking place in July, 1978.

If past experience is an indicator, virtually all the lost patronage would occur within the first six months. If a straight line curve of patronage loss is assumed for that period the mean daily diversion would be approximately 72,230 trips. However, at the outset, the diversion would be approximately double this, or about 144,455 trips diverted daily. This would occur in July, at the height of the smog season.

Assuming an average automobile occupancy of 1.1 persons per vehicle and an average overall trip length of 6.78 miles (for all purposes for all trips), this results in about 890,368 additional automobile vehicle-miles travelled (VMT) each day at the outset of the fare increase.

As a result, an additional 22.7 tons of carbon monoxide (CO) would be dumped into the local atmosphere daily.

About 2.6 tons of nitrogen oxides (NO_x) would be added to the air daily.

About 2 tons combined hydrocarbons (HC_x) would be added to the air daily.

Approximately 0.4 tons (785 pounds) of airborne particulate (dust, soot, etc.) would also be created, along with over 195 pounds of oxides of sulfur (SO_x) each day.

Over the entire course of the projected impact of a possible fare increase there would be over 2,110 tons of additional air pollutants dumped into the air over south Los Angeles County. A breakdown of these impacts is shown in Figure 4; a total daily inventory of the County's air pollutants is shown in Figure 5 for comparison.

As substantial as these impacts may appear to be, the impact of using service cutbacks to substitute for a fare increase is substantially

greater. During the first year of implementation, a strategy of relying entirely upon service cutbacks would create approximately 6,237 tons of additional air pollutants in the air over southern Los Angeles County. Hence, the long run air pollution impact of substituting service cutbacks for a possible fare increase would be almost three times as great as they would be for the fare increase itself.⁸

- D. Energy Conservation. It seems very ironic that because of lack of public tax support the RTD is being forced to consider increased fares at the same time that national policy is calling for an all-out effort in conserving petroleum. For some reason, no support for public transit is presently proposed in the nation's energy conservation program, however.

Using the estimated 1977 auto mix mileage of 14 miles per gallon, the additional 67,676,726 vehicle miles travelled (VMT) compute to as much as an additional 947.5 million gallons of gasoline being consumed during the last six months of 1978, due to travel diverted from transit to automobile transportation in Southern California.

- E. Congestion Effects. Those areas that make the most use of HOV (high-occupancy vehicle) transportation will be the most penalized by the effects of a possible fare increase. Principal among these are major employment centers and central area shopping districts. Well over half of all peak period passenger trips in the Los Angeles Central Business District, for example, are on transit and thus, even minor shifts in transit patronage could have significant effects on local congestion.

- F. Social Impacts. Over 17% of all adults in Los Angeles County do not have access to an automobile. In 1970, 8.2% of the County's households were below poverty level. Of those households headed by senior citizens, approximately 13.7% were below the poverty line in 1970. (Senior citizens, then numbering slightly more than 650,000, constituted 9.3% of the total population in 1970.)

Those too young or too old to drive and those whose limited incomes are already too strained to afford the expenses of an automobile are

C. Air Quality Impacts. The largest total projected patronage loss is 15,370,000 boardings. It is estimated that, overall, there are 1.4 boardings for every transit trip. This ratio yields approximately a total maximum of 10,980,000 trips lost due to a possible fare increase taking place in July, 1978.

If past experience is an indicator, virtually all the lost patronage would occur within the first six months. If a straight line curve of patronage loss is assumed for that period the mean daily diversion would be approximately 72,230 trips. However, at the outset, the diversion would be approximately double this, or about 144,455 trips diverted daily. This would occur in July, at the height of the smog season.

Assuming an average automobile occupancy of 1.1 persons per vehicle and an average overall trip length of 6.78 miles (for all purposes for all trips), this results in about 890,368 additional automobile vehicle-miles travelled (VMT) each day at the outset of the fare increase.

As a result, an additional 22.7 tons of carbon monoxide (CO) would be dumped into the local atmosphere daily.

About 2.6 tons of nitrogen oxides (NO_x) would be added to the air daily.

About 2 tons combined hydrocarbons (HC_x) would be added to the air daily.

Approximately 0.4 tons (785 pounds) of airborne particulate (dust, soot, etc.) would also be created, along with over 195 pounds of oxides of sulfur (SO_x) each day.

Over the entire course of the projected impact of a possible fare increase there would be over 2,110 tons of additional air pollutants dumped into the air over south Los Angeles County. A breakdown of these impacts is shown in Figure 4; a total daily inventory of the County's air pollutants is shown in Figure 5 for comparison.

As substantial as these impacts may appear to be, the impact of using service cutbacks to substitute for a fare increase is substantially

greater. During the first year of implementation, a strategy of relying entirely upon service cutbacks would create approximately 6,237 tons of additional air pollutants in the air over southern Los Angeles County. Hence, the long run air pollution impact of substituting service cutbacks for a possible fare increase would be almost three times as great as they would be for the fare increase itself.⁸

- D. Energy Conservation. It seems very ironic that because of lack of public tax support the RTD is being forced to consider increased fares at the same time that national policy is calling for an all-out effort in conserving petroleum. For some reason, no support for public transit is presently proposed in the nation's energy conservation program, however.

Using the estimated 1977 auto mix mileage of 14 miles per gallon, the additional 67,676,726 vehicle miles travelled (VMT) compute to as much as an additional 947.5 million gallons of gasoline being consumed during the last six months of 1978, due to travel diverted from transit to automobile transportation in Southern California.

- E. Congestion Effects. Those areas that make the most use of HOV (high-occupancy vehicle) transportation will be the most penalized by the effects of a possible fare increase. Principal among these are major employment centers and central area shopping districts. Well over half of all peak period passenger trips in the Los Angeles Central Business District, for example, are on transit and thus, even minor shifts in transit patronage could have significant effects on local congestion.

- F. Social Impacts. Over 17% of all adults in Los Angeles County do not have access to an automobile. In 1970, 8.2% of the County's households were below poverty level. Of those households headed by senior citizens, approximately 13.7% were below the poverty line in 1970. (Senior citizens, then numbering slightly more than 650,000, constituted 9.3% of the total population in 1970.)

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Those too young or too old to drive and those whose limited incomes are already too strained to afford the expenses of an automobile are

among those that are heavily dependent upon transit. Possible increases in transit fares would take a disproportionately larger bite out of most of their incomes than out of the income of the average household head.

FIGURE 4

POLLUTANTS ESTIMATED TO BE ADDED TO THE
AIR AS A CONSEQUENCE OF INCREASED AUTO USE
after a possible increase in transit fares in July, 1978*

	<u>Maximum Daily Impact (in tons)</u>	<u>Projected Total Impact (in tons)</u>
Carbon monoxide	22.7	1,723.3
Nitrogen oxides	2.6	201.4
Combined hydrocarbons	2.0	149.2
Particulates	0.4	29.8
Sulfur oxides	0.1	7.5
	<hr/>	<hr/>
TOTALS	27.8	2,111.2

* Adopted from "Energy Use Emission Factors," published by the Southern California Air Pollution Control District, July, 1976. Assumes vehicle mix projections developed by the State of California Air Resources Board. Factors derived from U.S. Environmental Protection Agency AP-42 document for automobiles and light trucks under 6001 pounds in weight.

FIGURE 5

ESTIMATED DAILY INVENTORY OF MAJOR AIR
POLLUTANTS IN LOS ANGELES COUNTY FROM JULY 1974
THROUGH JUNE 1975*

<u>Pollutants by Category</u>	<u>Total Tons Added Daily</u>
Carbon monoxide	4,220
Nitrogen oxides	900
Sulfur oxides	290
Particulates	140
Combined hydrocarbons	1,015
	<hr/>
Total estimated pollutants added daily	6,570 Tons

*Most recent data available.

VI. TRANSIT PATRONS' OPINIONS AND CONCERNS

Many different trade-offs present themselves with the possibility of a fare increase. As part of the impact evaluation for a possible fare increase, RTD Marketing staff have begun a number of surveys. One major survey will attempt to collect "before" and "after" data profiles on RTD patrons so as to better pinpoint the effects of service cutbacks and fare increases. A second, involving the general population, deals with underlying issues of the public's perception of transit service. A third effort, of particular importance here, has been particularly designed to provide patron opinion data for this draft report.

Conducted by an independent market research firm experienced in transit issues, an initial report⁹ provides some useful qualitative information about how RTD patrons feel:

- "many . . . view themselves as being in the position where they will be forced to pay higher prices for poorer service" (a reference to concomitant "economy" reductions in service that are likely).
- riders are "angry because they do not see any end in sight to escalating fares and because they don't really understand why fares are (might be) raised."
- riders "are concerned about the seriousness of the situation, that they are faced with yet another potential fare increase and . . . service cuts."
- ". . . service was far and away the most important issue to riders . . . they did express a general willingness to pay higher fares for improved service."
- although RTD is a public entity under the control of elected officials, most panelists have difficulty accepting budget limitations (the "deficit") as they would with fire, police and other public entities. They tend to see "RTD itself as being responsible" somehow for shortcomings in financial support from other taxing authorities.

Overall, however, the most acceptable combination of trade-offs was "a moderate fare increase" without service reductions.

In the process of evaluating riders' sentiments, attention was given to the various options available to RTD to meet its budget shortfall. Among those options receiving strong comments were:

- reductions in weekend and/or evening service: "People would have open rebellion." "Most destructive for every bus rider." "Hurts weekend workers and people who work late."
- magnitude of fare increase: "They should raise it to 15 cents if possible and improve the service." "I'd rather pay extra . . . and along with the service, improve the equipment, too." "I'd rather pay more and have dependable service."
- service reductions in general: "I'm going back to my car . . . with the rudeness of the bus drivers, the long wait, standing in buses, now it's going to be even worse." "Cutting down on services is not just waiting time. It means not keeping the buses clean, using a different type of driver. It means cutting down on all services." "Service is important. It you want to get there you don't consider a nickel or a dime. You just want to get there." "We can take an increase in fare but not a reduction in service."
- senior citizen fares: "Should not raise their fare." "They worked hard to get where they are." "We owe it to senior citizens." "Even a nickel increase isn't fair." "They have fixed incomes." There was a minority of riders who felt the elderly should share proportionately in any fare increase.
- handicapped fares: There was almost complete support for not increasing fares for the handicapped.
- student fares: This subject evoked considerable controversy. A majority appeared to support continuation of student pass (now priced at \$12 a month); a vocal minority felt students should share in a fare hike or even pay full fare. A major distinction for many was needed between those who could work and drive and those that

generally could not. "A 15-year old can't work."
"Some students have jobs, wealthy parents."
"Life isn't easy; students have to learn that."

- smaller buses, fewer stops: Smaller buses were often thought to be a viable economy measure. In one way or another, many suggested that "unnecessary" stops be eliminated.

(Unfortunately, smaller or "mini" buses are actually substantially more costly to operate than standard-size diesel buses. On a "per-seat" basis, they are also more expensive to purchase.)

- private sector assistance: Some felt that businesses should subsidize transit trips for their employees and customers in the same way that such businesses subsidize or "validate" parking.
- more aggressive marketing: Some felt that if the RTD "advertised how good it is" and "how they're going to save us money," more riders would be attracted and financial problems would be solved.

(Unfortunately, additional travel demands do not in themselves solve transit's problems. While each additional rider may cost a little less to serve than the one before, meeting additional travel demands still require additional public funding even though the public funding per rider should diminish as transit usage grows.)

- improve efficiency of bus routes: "Study the flow of traffic." "Rework routes." Get an efficiency expert."

(RTD has in the past and currently employs nationally prominent consultants to audit management effectiveness and productivity. In the past three years, RTD staff has undertaken massive "sector studies" which have overhauled the routing and scheduling in many areas of the County. These efforts, in areas such as the San Fernando Valley, East Los Angeles, South Central Los Angeles, the South Bay, the Mid-Cities area and the San Gabriel Valley, strive to make bus routings more efficient and easier to use. These sector improvement programs were in part successful, however, because public resources were then available to improve service where it

was appropriate as well as to economize on service where it is under-utilized. Continuing to "tune-up" the bus system's routing and scheduling is currently the priority concern of the RTD's Planning Department.)

VII. PROBABLE ADVERSE EFFECTS WHICH CANNOT BE AVOIDED IF
THE POSSIBLE PROJECT IS IMPLEMENTED.

None of the effects discussed above can be substantially avoided by reasonable and feasible means if a fare increase is implemented.

The project is being considered, notwithstanding these effects, because the SCRTD does not have the means to raise sufficient additional revenue from other sources and because the only other significant alternative of reducing service further will have greater negative effects.

VIII. MITIGATION MEASURES PROPOSED TO MINIMIZE THE EFFECT OF THE PROJECT

As stated in the description of the proposed action, there is a substantial cost-revenue shortfall that is projected as a possibility for the 1978-79 fiscal year. The RTD recognizes that to attempt to close this gap entirely with additional fare revenues would seriously erode transit patronage. This might set in motion a downward patronage trend which, given fixed service commitments, would raise costs and reduce productivity. Very large fare increases, then, would probably be counterproductive, both from the standpoint of long-term economy and from the standpoint of user welfare.

For these reasons, the District is committed to utilizing every reasonable available mitigating measure to minimize the extent and the effect of any prospective fare increase. Some of the mitigating measures which have been identified and implemented in the past year are:

- A. Reductions in Staff and Personnel. Since August, 1976, RTD has eliminated the jobs of over 1,020 of its employees, approximately 13½% of RTD's total workforce. As a result, RTD may have ranked as one of the region's larger contributors to the ranks of the unemployed during the past 18 months.

Although clearly necessary at a time when significant reductions in service are having to be made, recent layoffs have limited RTD's pool of younger, motivated and often better educated employees. Although the impact of fewer bus drivers, with whom the public has direct contact, is clear, the effects of staff cutbacks in management, planning, marketing and passenger services are less immediately obvious to the general public but equally serious. In a large variety of ways, these cutbacks have generally limited RTD's ability to manage its operations as efficiently and effectively as they should be and to satisfactorily respond to rider's concerns and needs.

- B. Service Economies and Cutbacks. RTD must, of course, constantly survey the performance of its services and make judicious decisions as to whether some services should be trimmed or eliminated because, relative to the system's overall goals and productivity, such services cannot be justified.

RTD's increasingly constrained financial resources have intensified this activity considerably. Between June, 1976 and July, 1977, approximately 8% of RTD's service was eliminated. Within the limitations of available staff and data resources, RTD has been continuing this pace of service economies and reductions.

As a result of these service eliminations, RTD's service no longer meets its own service policy guidelines. In the opinion of RTD staff, RTD's services are no longer effectively reaching a significant portion of non-transit dependent market and much of the transit system's potential for growth has been removed. Somewhat unattractive service frequencies, among other factors, now substantially limit RTD's ability to attract new riders.

Nonetheless, measures such as eliminating much night and/or weekend service are likely to have to be considered this summer, perhaps even before June, when a decision will have to be made on the need for a fare increase. The timing and severity of these service cuts will be dependent upon how much or how little additional revenue becomes available from the fare-box and/or other sources.

- C. Reductions in New Facilities. Last year, RTD postponed renovations and improvements to four of its maintenance yards in order to minimize the need for a fare increase. RTD also delayed consideration of two new maintenance yards in the San Fernando Valley to replace the present facilities.

RTD is also considering the possibility of closing one of its maintenance yards, although adjacent facilities will be too crowded to accommodate the buses that would be displaced for some period of time to come.

At the present time, however, construction of the two new San Fernando Valley maintenance facilities is being actively pursued because of the substantial savings that will accrue by closing the obsolete and poorly located existing yards. RTD has also found it impractical to further delay renovation and reconstruction projects at its existing maintenance yards. Many of these programs are necessary to assure the basic structural safety of buildings--some

over half a century old--that have become very deteriorated and are unable to meet minimum earthquake and safety requirements.

- D. Reductions in Bus Equipment. The RTD has not acquired any new buses for over two years. The current average age of RTD's buses is over 11 years, the oldest of any major transit operator in the country. As a result, RTD's ability to provide comfortable and reliable service has become increasingly compromised.

The excessive age of RTD's buses has adverse impacts upon the performance of the bus system. Because RTD only has a limited number of mechanics, older equipment means that more buses have to be held out of service longer awaiting repairs. As a result, RTD is forced to increasingly substitute older, dilapidated buses when the limited number of newer buses RTD has are side-lined awaiting maintenance. Also as a result, excessively noisy buses (with faulty exhaust systems, etc.), buses with dirty exhausts (caused by improper injector timing, etc.) and simply dirty or broken-down buses do not get the attention that they should.

In a bid to reverse this costly decline in the quality of RTD's equipment, the RTD Board of Directors is currently seeking local funds and matching federal funds for the purchase of over 1,000 new buses. The local (RTD) contribution for the purchase of most of these buses will hopefully be made possible by the sale of a unique bond issue. The primary revenue source that would secure these bonds would be the substantial savings that are projected if RTD had newer, more efficient, less trouble-prone buses.

RTD is currently considering taking delivery on 200 of the 1,000 new buses proposed which are urgently needed to replace unslightly and unreliable equipment. Specifications are being developed for the prospective purchase of another 230 new buses. Among the RTD's longer term equipment commitments are 30 articulated, high-capacity buses. More productive buses such as these are essential to transit if efficiency is to be

maintained over the long run.

- E. Accident and Insurance Cost Reductions. Even with recent expansions in service, the District has received an increasing number of citations from the National Safety Council for the accident-free performance of its operators. The spiraling costs of litigation have, nonetheless dramatically escalated the costs of the District's insurance premiums. All possible steps to reduce these costs are being taken; recent down trends in these costs are a hopeful sign.
- F. Use of a Less Expensive Grade of Fuel. Fueling facilities and procedures have been modified to use number two grade as well as number one grade diesel fuel. Number two fuel is a darker, less expensive grade of fuel. It can only be used in particular coaches equipped with four-cycle diesel engines, however. (Although number two fuel is a "cruder" grade of fuel, it has a higher energy (BTU) content per gallon which, if used properly and in well-maintained buses, will not result in additional air pollution.)
- G. Reduction of Utility Costs. Lighting not essential for the performance of specific functions or services has been turned off in RTD's fixed facilities. Attempts are being made to close down one bank of elevators in the headquarters building during off-peak hours. Most telephones have been assigned to individual employees. These employees must identify and justify all calls made on these telephones and reimburse the District for any non-essential use.
- H. Additional Local Funding Support. All of the above actions, together with the proposed revision of the fare structure, will not close the cost-revenue gap the District faces. Even with a moderate increase in fares, a significant amount of funding will need to be obtained from local governments, perhaps on the order of 15% to 50% of the total cost-revenue gap. The District has established this as a reasonable objective and is vigorously pursuing it. Every city in the RTD's county service area has been approached, as have the County Transportation Commission, the County of Los Angeles and the Southern California Association of Governments (SCAG). Efforts have also been underway in the

State capitol to establish additional sources of revenue for transit.

At the time of this document's preparation, however, the RTD has received no offers of additional support from those jurisdictions with the power to provide funds. In addition, tax initiatives on the June ballot make local governments' own fiscal situations very uncertain.

IX. RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

The direct cumulative or long-term effects of a possible fare increase are minimal. If the circumstances which may create the necessity for a fare increase should change, or if the apparent desirability of maintaining service should change, a fare increase could be withdrawn at any time.

A fare increase is better implemented ahead of less severe options. Postponement of a necessary fare increase would create an even more difficult financial situation in which the District would be forced either to raise fares more or to make service cuts more severe.

X. IRREVERSIBLE ENVIRONMENTAL EFFECTS WHICH WOULD BE INVOLVED
IN THE SUBJECT ACTION SHOULD IT BE IMPLEMENTED

There appear to be two areas of adverse impact with substantial lingering effects:

- deteriorated air quality and the resulting increase in human respiratory ailments,
- escalated consumption of gasoline and the essentially irreplaceable loss of petroleum supplies that results.

A third area of impact is more diffuse but equally serious. That impact is the adverse impact upon efficient, energy conserving forms of urban growth and the de facto encouragement of ex-urban growth that is spawned by the deterioration of the quality of urban life in general and the deterioration of critical urban public services in particular. Deteriorated, congested cities promote movement to areas outside the city, increasing automobile dependence and creating the need for longer and longer commuting trips in order to maintain a broad, diversified labor pool.

These effects are all of secondary and diffuse nature. They are dangerous trends that can be set in motion (or accelerated) by the deterioration of public services such as transit. A possible fare increase would be only part of a cumulation of events that could contribute to such trends over the long-term, however, making it impossible for RTD to precisely define the role that a particular fare increase alone would have.

XI. THE GROWTH-INDUCING IMPACT OF THE PROPOSED ACTION

The irreversible adverse effects discussed above suggest that actions such as an increase in transit fares could play a role in--

- discouraging people from living and working in the established urban areas of the region that can make the most effective use of transit and that stand to be the most adversely impacted by automobile congestion; and, in turn,
- encouraging people to relocate to largely undeveloped areas, far from established centers of activity, thereby increasing their dependence upon long automobile trips and often precluding the effective use of transit.

In the short run, growth may appear to be encouraged by diminishing the attractiveness of public transportation. Inner city locations will be made less attractive, less viable locations since they are more susceptible to congestion and less able to accommodate automobiles (in higher concentrations) than suburban and ex-urban locales. People will, thus, find it more attractive to locate on the edge of or outside of established urban areas, creating pressure for growth into rural and relatively undeveloped areas.

Such short-term growth is likely to be inefficient because it usually is often dependent upon exceptionally long trips to employment centers. Such growth also often lacks the diversity of uses, of more mature urbanization, meaning that trips to other destinations (cultural and shopping opportunities, for instance) are longer, too.

As petroleum resources become more costly and finite, the communities that such growth has created will become particularly difficult and costly to sustain. This latter likelihood of having to maintain over-extended short-term growth which has fallen out of step with our available energy resources might become a significant impediment to the long-term efficiency and viability of the region.

In the long run, real growth (whether of a desirable sort or of an undesirable sort) will probably be retarded by diminishing the attractiveness of public transportation in that limited environmental and energy resources will be spent in a less productive, efficient manner.

XII. ALTERNATIVES TO THE POSSIBLE ACTION

The only alternative to the proposed action within the discretion of the RTD is a very substantial cutback of its current services, perhaps on the order of 10% or more of the existing services. This would result in eliminating service (as opposed to simply raising the cost of service) for on the order of 80,000 of RTD's current trips.

The worst day of the fare plan with the greatest adverse impact (Alternative 6) is estimated to result in the deflection of over 144,400 transit trips. The mean deflection (that is, the typical deflection over an impact period of six months) will be about half of this amount, however, or about 72,200 daily transit trips deflected to other, mostly less efficient modes. Deflection rates for the other alternative fare increase plans would be lower, proportional to the patronage loss figures shown in Appendix A.

The typical, medium-term impact of the most extreme fare increase plan, then, is slightly lower than a strategy relying entirely upon service eliminations.

The cumulative impacts of service eliminations, however, are devastating. Over the first year of implementation, a 10% service cut would result in loss of transit trips on the order of 32.5 million, assuming that there would have been no natural increase of patronage on the eliminated lines. The total maximum impact of any fare increase plan, on the other hand, would be less than 11 million transit trips lost. In other words, the longer-run (first year) impact of service cutbacks is almost three times as severe as that of a fare increase. This discrepancy grows even wider as time goes on.

In all likelihood, a good number of the services eliminated by a no-fare-increase strategy would likely be relatively new services on which patronage is still developing. While inflation lessens the impact of a fare increase as time goes on, outright elimination of services permanently cripples transit patronage and any basis for natural, orderly growth of transit services. Transit patrons may be dismayed at being asked to pay a higher price for RTD's services. To rely exclusively upon the elimination of services to meet budget requirements, however, has the potential for raising even more serious doubts about the future integrity of the transit system in the minds of potential users.

XIII. ORGANIZATIONS AND PERSONS CONSULTED

As stated on Pages 32 and 33, RTD has indicated the problems public transit faces in recent correspondence to each of the cities in its service area, to SCAG and to the Los Angeles County Transportation Commission. Marvin Holen, President of the RTD Board of Directors, provided a detailed assessment of RTD's financial condition on January 5, 1978, concluding that " . . . should funds not be found to meet District's requirements, then the only options available to the District will be increased fares and service reductions."

The RTD has also been actively working with legislative staffs in Sacramento and in Washington D.C. on legislation that would ameliorate public transit's funding problems in Los Angeles County and elsewhere.

As of publication time of this report, there have been no formal responses from these taxing jurisdictions as to how public transit's funding straits can be remedied.

FOOTNOTES

- ¹The Five Year Plan: Operational, Capital and Financial Program, Southern California Rapid Transit District, Fiscal Years 1978-1982.
- ²Recent studies done for the U.S. Department of Housing and Urban Development indicate that more sensitive low density development and activity patterns would consume 30% less energy over typical unplanned sprawl. Well-planned higher density development saves even more energy.
- ³State of California, Business and Transportation Agency, Transportation Control Plan for the Metropolitan Los Angeles Intrastate Air Quality Control Region (South Coast Air Basin), November, 1974, p.i.
- ⁴Bill Drummond, "Los Angeles, Long Beach, Flunk All 5 Clean Air Tests, EPA Says." Los Angeles Times, February 24, 1978, p.1
- ⁴Bill Drummond, "Los Angeles Meets Sulfur Safety Limits Now But Won't in '82, State Says," Los Angeles Times, February 26, 1978, p.15
- ⁵Hertz Corporation figures for a mid-sized, 1977 Sedan, quoted in Los Angeles Times, October 31, 1977, p.4 and from Cost of Owning and Operating an Automobile, 1976, Suburban-Based Operation, U.S. Department of Transportation, 1977. Excludes parking and other "non-direct" costs.
- ⁶Prof. Ward Elliot, Hidden Costs, Hidden Subsidies and Smog and Congestion Tolls, (Claremont Men's College: September, 1974).
- ⁷Elasticity is explained here in a grossly simplified fashion, Variables that actually enter into the trip demand calculations are not treated in depth here. It should be said, however, that because of these processes, revenue and patronage projections for greater fare increases (e.g. Alternatives 5 and 6) have a slightly lower confidence level than for the more minor fare increase plans.
- ⁸Some discount of this figure is in order insofar as reductions in bus service will reduce diesel exhaust emissions by some amount. An accurate estimation of this amount would involve detailed analysis of the operational characteristics of lines that would

FOOTNOTES (continued)

be eliminated and the development of a service cycle emission model. This was not possible within the scope of his report. Using RTD system averages for trip making and occupancy and using gross national (E.P.A.) diesel emission data, it appears that transit service cutback air pollution totals might be discounted by about 20% to arrive at a net air pollution figure. In this instance, that would be 1,247 tons.

⁹"Bus Riders Talk About the RTD: A Qualitative Investigation."
Manpearl/Brown Research , February, 1978.

APPENDIX A

Staff Report on the
Detailed Characteristics
of Six Possible Fare
Increase Plans

DEPARTMENTAL

SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT

425 SOUTH MAIN STREET
LOS ANGELES

STAFF REPORT

DATE: February 13, 1978

Fare Alternatives for Fiscal Year 1979

Of the many possible options for a fare increase for the coming year, six possibilities are covered here. These all follow the existing structure, but have different prices on the component elements. An increase in fares is generally labeled according to the rise in the base fare, which is normally a multiple of a nickel. A large variation in the possible yield is possible, given a specific base fare adjustment, depending on the choices of the prices on the other elements.

With a nickel increase being likely, and a dime increase being possible, four of the six alternatives are based on the nickel increase, two on the dime increase in the base fare. Adjustments were considered in the distance step, elderly and handicapped fares, and pass and stamp price multipliers. The multipliers can be a convenient way to "fine-tune" the fare structure. There has been no tinkering with the distance-step boundaries.

Calculations were based on an assumed state of revenue generation and ridership that would exist in FY 79 if there would be no change in the fare structure or service levels. This is taken to be \$78.5 million and 320 million boardings, and is called Alternative Zero.

Rather than assume a single fare elasticity that would apply to all classes of riders, a judgment was made for each class. As was done last year, with very satisfactory results, elasticity values reflect the impact over an entire year, rather than the immediate (and larger) impact.

Attached hereto is a summary table and the worksheets for each of the six alternatives.

FARE ALTERNATIVES FOR FISCAL YEAR 1979

FARE STRUCTURES

A L T E R N A T E S

	0	1	2	3	4	5	6
CASH							
<i>Base</i>	40¢	45¢	45¢	45¢	45¢	50¢	50¢
<i>Step</i>	20¢	20¢	20¢	20¢	20¢	20¢	25¢
<i>E/H</i>	10¢	10¢	<i>free, off-peak only</i>	20¢	20¢	20¢	20¢
PASS							
<i>Base</i>	\$18	\$18	\$18	\$18	\$20	\$20	\$20
<i>Step</i>	\$6	\$8	\$8	\$8	\$8	\$10	\$10
<i>E/H</i>	\$4	\$4	<i>no pass</i>	\$8	\$8	\$8	\$8
<i>Student</i>	\$12	\$13	\$13	\$14	\$14	\$16	\$16

IMPACTS (in millions)

Boardings	320.0	317.4	314.7	307.9	307.2	304.8	304.6
Revenue	\$78.5	\$84.2	\$82.5	\$87.0	\$88.3	\$93.5	\$94.3
Added Revenue	--	\$5.7	\$4.0	\$8.5	\$9.8	\$15.0	\$15.8

JW-2/13/78

FARE ADJUSTMENT WORK SHEET

Alternate 1

Assumed total initial revenues 78.5

" " " boardings 320

	Category	Present Fare	Proposed Fare	Boarding Fraction	Elasticity	Present Boardings	Future Boardings	Present Revenue	Future Revenue	
Cash										
reg.	1	.40	.45	.319	.15	102.08	100.17	40.83	45.07	
exp.	2	.75	.80	.029	.09	9.28	9.22	6.96	7.38	
EH	3	.10	.10	.069	.20	22.08	22.08	2.21	2.21	
Pass										
reg.	4	.225	.230	.173	.10	55.36	55.24	12.46	12.70	
exp.	5	.700	.780	.012	.07	3.84	3.81	2.69	2.97	
EH	6	.060	.060	.075	.15	24.00	24.00	1.44	1.44	
Student	7	.160	.173	.090	.15	28.80	28.45	4.61	4.92	
Transfer	8	.073	.073	.200	.15	64.00	64.00	4.67	4.67	
Tickets	9	.240	.264	.011	.15	3.52	3.47	.84	.92	
Other	10	.250	.274	.022	.15	7.04	6.94	1.76	1.90	
						320.00	317.37	78.47	84.19	\$ 5.72 M

FARE ADJUSTMENT WORK SHEET

Alternate 1.1

Assumed total initial revenues 78.5

" " " boardings 320

	Category	Present Fare	Proposed Fare	Boarding Fraction	Elasticity	Present Boardings	Future Boardings	Present Revenue	Future Revenue	
Cash										
reg.	1	.40	.45	.319	.15	102.08	100.17	40.83	45.07	
exp.	2	.15	.10	.029	.09	9.28	9.22	6.96	7.38	
EH	3	.10	.15	.069	.20	22.08	19.87	2.21	2.98	
Pass										
reg.	4	.225	.230	.173	.10	55.36	55.24	12.46	12.70	
exp	5	.700	.780	.012	.07	3.84	3.81	2.69	2.97	
EH	6	.060	.100	.075	.15	24.00	21.60	1.44	2.16	
Student	7	.160	.173	.090	.15	28.80	28.45	4.61	4.92	
Transfer	8	.073	.073	.200	.15	64.00	64.00	4.67	4.67	
Tickets	9	.240	.264	.011	.15	3.52	3.47	0.84	0.92	
Other	10	.250	.274	.022	.15	7.04	6.94	1.76	1.90	
						320.00	312.76	78.47	85.68	\$ 7.21 M

FARE ADJUSTMENT WORK SHEET

Alternate 2

Assumed total initial revenues 78.5

" " " Boardings 320

	Category	Present Fare	Proposed Fare	Boarding Fraction	Elasticity	Present Boardings	Future Boardings	Present Revenue	Future Revenue	
Cash										
reg	1	.40	.45	.319	.15	102.08	100.17	40.83	45.07	
exp.	2	.75	.80	.029	.09	9.28	9.22	6.96	7.38	
peak	3	.10	.45	.021		6.72	2.02	.67	.91	
EH off-peak	4	.10	0	.048	.20	15.36	18.43	1.54	0	
Pass										
reg.	5	.225	.230	.173	.10	55.36	55.24	12.46	12.70	
exp	6	.700	.780	.012	.07	3.84	3.81	2.69	2.97	
EH	7	.060	.230	.025		8.00	4.60	0.48	1.06	
	8	.060	0	.050	.15	16.00	18.40	0.96	0	
Student	9	.160	.173	.090	.15	28.80	28.45	4.61	4.92	
Transfer	10	.073	.073	.200	.15	64.00	64.00	4.67	4.67	
Tickets	11	.240	.264	.011	.15	3.52	3.47	.84	.92	
Other	12	.250	.274	.022	.15	7.04	6.94	1.76	1.90	
						320	314.74	78.47	82.51	\$ 4.04 M

FARE ADJUSTMENT WORK SHEET

Alternate 3

Assured total initial revenues 77.5

" " " boardings 320

	Category	Present Fare	Proposed Fare	Boarding Fraction	Elasticity	Present Boardings	Future Boardings	Present Revenue	Future Revenue	
Cash										
reg.	1	.40	.45	.319	.15	102.08	100.17	40.83	45.07	
exp.	2	.75	.80	.029	.09	9.28	9.22	6.96	7.38	
EH	3	.10	.20	.069	.20	22.08	17.66	2.21	3.53	
Pass										
reg.	4	.225	.230	.173	.10	55.36	55.24	12.46	12.70	
exp	5	.700	.780	.012	.07	3.84	3.81	2.69	2.97	
EH	6	.060	.140	.075	.15	24.00	19.20	1.44	2.69	
Student	7	.160	.184	.090	.15	28.80	28.15	4.61	5.18	
Transfers	7	.073	.073	.200	.15	64.00	64.00	4.67	4.67	
Tickets	9	.240	.264	.011	.15	3.52	3.47	0.84	0.92	
Other	10	.250	.274	.022	.15	7.04	6.94	1.76	1.90	
						320	307.86	78.47	87.03	\$8.56M

FARE ADJUSTMENT WORK SHEET

Alternate 4

Assumed total initial revenues 77.5

" " " Boardings 320

	Category	Present Fare	Proposed Fare	Boarding Fraction	Elasticity	Present Boardings	Future Boardings	Present Revenue	Future Revenue	
<i>Cash</i>										
	1	.40	.45	.319	.15	102.08	100.17	40.83	45.07	
	2	.75	.80	.029	.09	9.28	9.22	6.96	7.38	
	3	.10	.20	.069	.20	22.08	17.66	2.21	3.53	
<i>Pass</i>										
	4	.225	.255	.173	.10	55.36	54.62	12.46	13.93	
	5	.700	.790	.012	.07	3.84	3.81	2.69	3.01	
	6	.060	.140	.075	.15	24.00	19.20	1.44	2.69	
	7	.160	.184	.090	.15	28.80	28.15	4.61	5.18	
	8	.073	.073	.200	.15	64.00	64.00	4.67	4.67	
	9	.240	.266	.011	.15	3.52	3.46	.84	.92	
	10	.250	.276	.022	.15	7.04	6.93	1.76	1.91	
						320	307.23	78.47	88.30	\$9.83 M

FARE ADJUSTMENT WORK SHEET

Alternate 4.1

Assumed total initial revenues 78.5

" " " boardings 320

	Category	Present Fare	Proposed Fare	Boarding Fraction	Elasticity	Present Boardings	Future Boardings	Present Revenue	Future Revenue	
Cash										
reg.	1	.40	.50	.219	.15	102.08	98.25	40.83	49.13	
exp.	2	.75	.85	.029	.09	9.28	9.17	6.96	7.79	
EH	3	.10	.10	.069	.20	22.08	22.08	2.21	2.21	
Pass										
reg.	4	.225	.255	.173	.10	55.36	54.62	12.46	13.93	
exp.	5	.700	.790	.012	.07	3.84	3.81	2.69	3.01	
EH	6	.060	.140	.075	.15	24.00	19.20	1.44	2.69	
Student	7	.160	.184	.090	.15	28.80	28.15	4.61	5.18	
Transfer	8	.073	0	.200	.15	64.00	73.60	4.67	0	
Tickets	9	.240	.266	.011	.15	3.52	3.46	0.84	0.92	
Other	10	.250	.276	.022	.15	7.04	6.93	1.76	1.91	
						320.00	319.27	78.47	86.76	\$8.29M

FARE ADJUSTMENT WORK SHEET

Alternate 5

Assumed total initial revenues 77.5

" " " Boardings 320

	Category	Present Fare	Proposed Fare	Boarding Fraction	Elasticity	Present Boardings	Future Boardings	Present Revenue	Future Revenue	
Cash										
	1	.40	.50	.319	.15	102.08	98.25	40.83	49.13	
	2	.75	.85	.029	.09	9.28	9.17	6.96	7.79	
	3	.10	.20	.069	.20	22.08	17.66	2.21	3.53	
Pace										
	4	.225	.260	.173	.10	55.36	54.50	12.46	14.17	
	5	.700	.840	.012	.07	3.84	3.79	2.69	3.18	
	6	.060	.140	.075	.15	24.00	19.20	1.44	2.69	
	7	.160	.194	.090	.15	28.80	27.88	4.61	5.41	
	8	.073	.073	.200	.15	64.00	64.00	4.67	4.67	
	9	.240	.280	.011	.15	3.52	3.43	0.84	0.96	
	10	.250	.290	.022	.15	7.04	6.87	1.76	1.99	
						320	304.75	78.47	93.52	15.05M

FARE ADJUSTMENT WORK SHEET

Alternate 6

Assumed total initial revenues 78.5

" " " Boardings 320

	Category	Present Fare	Proposed Fare	Boarding Fraction	Elasticity	Present Boardings	Future Boardings	Present Revenue	Future Revenue	
Cash										
Reg.	1	.40	.50	.219	.15	102.08	98.25	40.83	49.13	
Exp.	2	.75	.94	.029	.09	9.28	9.07	6.96	8.52	
Ell	3	.10	.20	.069	.20	22.08	17.66	2.21	3.53	
P_{9.00}										
Reg.	4	.225	.260	.173	.10	55.36	54.50	12.46	14.17	
Exp.	5	.700	.860	.012	.07	3.84	3.78	2.69	3.25	
Ell	6	.060	.140	.075	.15	24.00	19.20	1.44	2.69	
Student	7	.160	.194	.090	.15	28.80	27.88	4.61	5.41	
Transfer	8	.073	.073	.200	.15	64.00	64.00	4.67	4.67	
Tickets	9	.240	.280	.011	.15	3.52	3.43	.84	.96	
Other	10	.250	.290	.022	.15	7.04	6.87	1.76	1.99	
						320	304.64	78.47	94.32	15.85M

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