Los Angeles County
Metropolitan Transportation Authority

Transportation for the 21st Century:
A Plan for Los Angeles County

TECHNICAL APPENDICES

Adopted On
March 22, 1995

MTA Long Range Transportation Plan

Plan Development Methodology

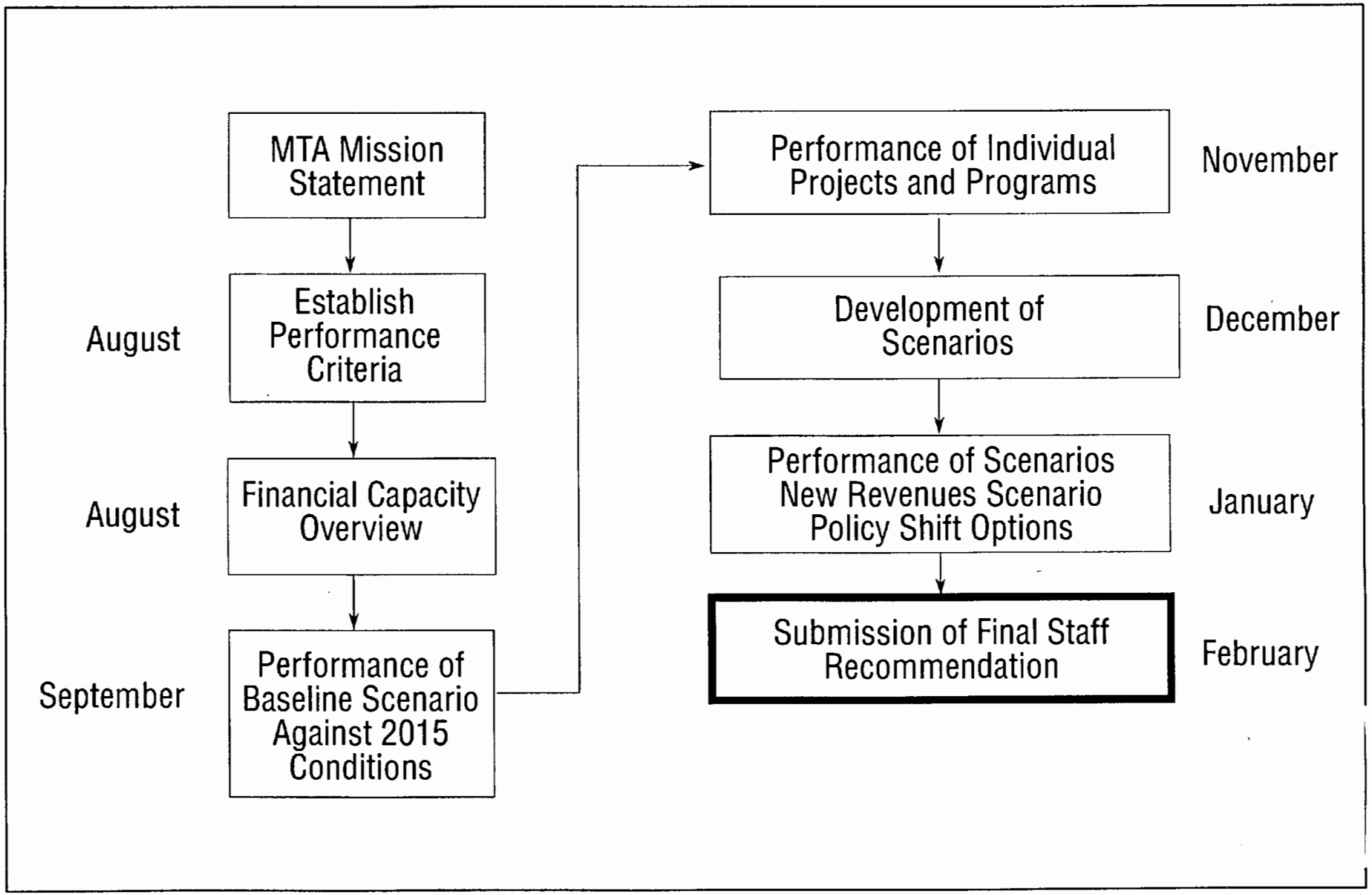

Exhibit T-1

PP-041.2.95.TR

TECHNICAL APPENDIX A:
PROJECT EVALUATION: TRANSPORTATION DEMAND MODELING

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PROJECT EVALUATION: TRANSPORTATION DEMAND MODELING

The development of the Adopted Long Range Transportation Plan was preceded by a rigorous assessment of the analytical tools, assumptions and performance criteria that would be employed in the evaluation of potential Plan alternatives. The primary analysis tool is the MTA travel demand simulation model. This appendix highlights these elements and their application to the alternatives considered for the Long Range Transportation Plan.

MTA TRAVEL DEMAND SIMULATION MODEL

The MTA travel simulation model is an update of the travel forecasting model used in the Metro Red Line Eastern Extension Study. This model uses the traditional four-step process generally employed by travel forecasting models throughout the United States. The four steps include independent modules that perform trip generation, trip distribution, mode choice and network assignment (Exhibit A-1). Each module has been calibrated from observed data, typically from a selected sample of household interviews from which detailed demographic and travel characteristics are collected through written questionnaires and travel logs. The MTA travel simulation model is primarily based on two Los Angeles metropolitan area surveys: the 1967 and 1976 home interview survey that was conducted by Caltrans and SCAG. The trip distribution and mode choice modules were updated using the 1990 Census Transportation Planning Package and the 1991 Household Travel Survey (conducted by SCAG), respectively. The computerized representations of the highway and transit systems have been prepared by Caltrans, SCAG, Orange County Environmental Management Agency and MTA.

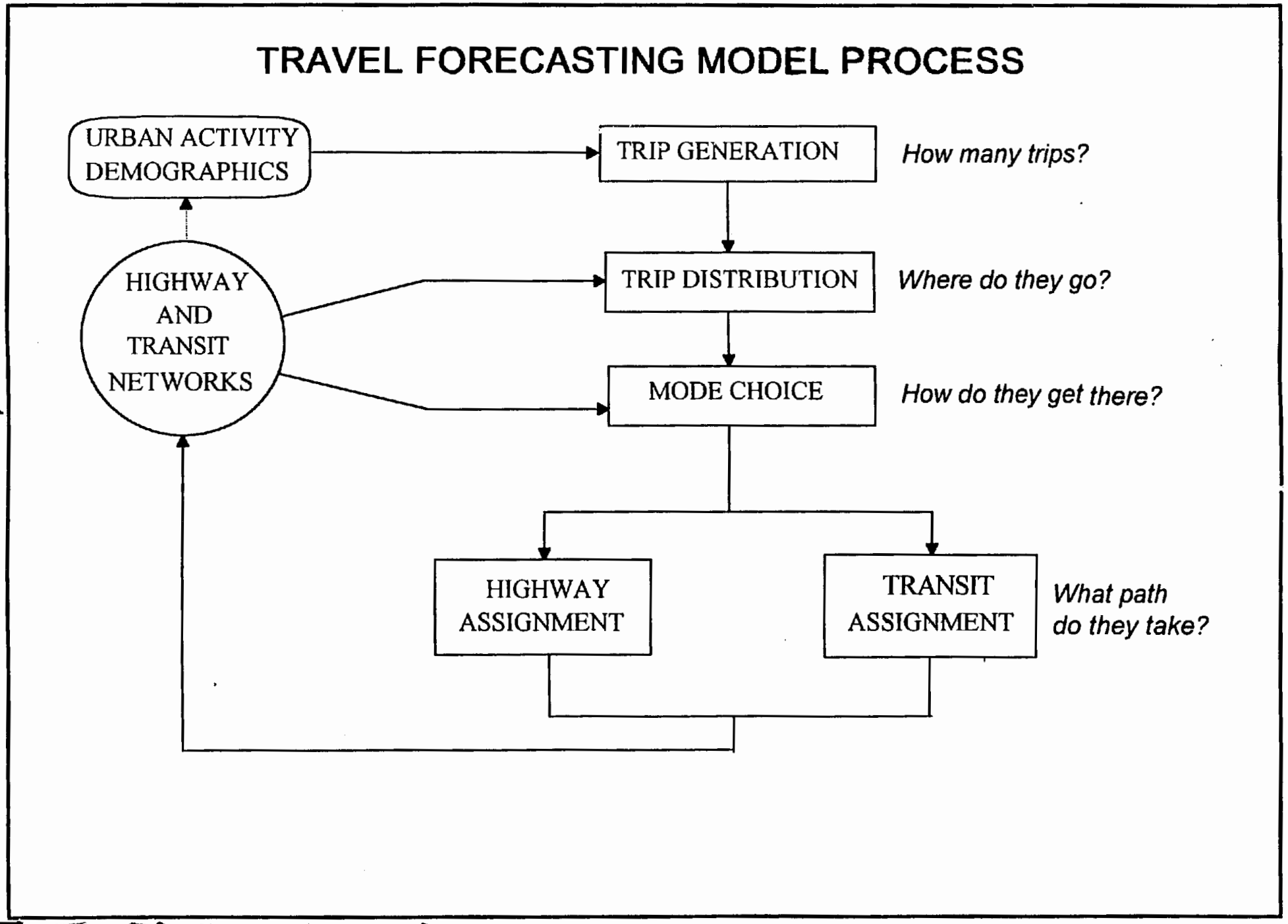
The model was validated for its ability to replicate 1990 travel patterns and conditions using the survey data from which it was calibrated as well as highway vehicular ground counts and transit ridership statistics. The model performed within standard limits for all components including average trip length, mode shares, and comparisons of screenline volumes and transit boardings.

Modeling Assumptions

Each input to the MTA Model is a representation of the characteristics of the trip, the trip maker or the transportation system. This information is usually employed at the census tract level, but may include some distributions of characteristics within the census tract. Consequently, each input is an aggregate assumption for census tract or subdivision of census tract populations. All

Long Range Transportation Plan

Exhibit A-1



inputs for the 1990 validation used empirical data compiled from a variety of sources (Exhibit A-2). Projections for the planning horizon Year 2015 were obtained from many of the same sources. The model then uses its econometric and behavioral formulations to project travel response and transportation system impacts under a variety of transportation system environments and conditions. However, there are several major assumptions upon which the forecasts are based that are either reflect a continuation of existing trends or fall into the policy arena. If the future varies from these assumptions (other than those parameters included as part of an alternative), the projected future year results will likely be different from those projected by the model. These are:

- the SCAG growth forecast (population, employment, demographics) occurs as projected in the various communities of the County;
- the per mile vehicle operating cost does not change in constant dollars (i.e., changes in fuel prices and fuel economy offset one another but rise with inflation);
- the adopted July 1994 transit fare structure is fully implemented and that regular inflationary adjustments are made;
- parking costs rise with inflation and the location and application of parking costs do not change significantly from today (that is, where parking is free and where it is paid, employer subsidies, etc.);
- the need or distribution of travel does not change dramatically due to a major movement to a round-the-clock business day or a major displacement of work trips by telecommuting; and,
- the current highway and transit levels-of-service do not change dramatically from today (except for planned system improvements and the projected congestion effects) due to potential large scale Intelligent Transportation System implementation.

PERFORMANCE CRITERIA

There were three quantitative performance criteria selected to evaluate the various transportation system alternatives. The criteria were based upon the MTA Mission Statement adopted by the MTA Board of Directors in February 1994:

> *The mission of the Los Angeles County Metropolitan Transportation Authority is to design, construct, operate and maintain a safe, reliable, affordable and efficient transportation system that increases mobility, relieves congestion, and improves air quality to meet the needs of all Los Angeles County residents.*

Exhibit A-2

TRAVEL FORECASTING MODEL

Model Component	Input Data	Data Source	Output Data
Urban Activity	General Plans Population Employment Licensed Drivers	Municipalities Census Bureau/Dept of Finance Bureau of Labor Statistics/Dept of Economic Development Dept of Motor Vehicles	Population, employment, household demographic data by Traffic Analysis Zone
Highway & Transit Networks	Highway facilities Transit services	Caltrans and Municipalities Transit Operators	Zone to Zone travel time and cost by time period
Trip Generation	Population, employment, household demographics	Southern California Association of Governments	Trip productions and attractions by Zone
Trip Distribution	Trip productions and attractions by Zone Zone to Zone travel time	Trip Generation Model Transportation Networks	Zone to Zone trip volumes by purpose
Mode Choice	Zone to Zone trip volumes Zone to Zone travel time Zone demographic data Parking costs Fuel/auto operating costs Transit fares	Trip Distribution Model Transportation Networks Urban Activity Model Parking Posted Rate Surveys Cal Energy Commission Transit Operators	Zone to Zone trips by purpose and mode of travel
Network Assignment	Transportation Networks Zone to Zone trips by purpose and mode	Transportation Networks Mode Choice Model	Volumes on highway facilities and patronage on transit services

The analysis conducted for the Plan focuses on three of the elements from the MTA Mission Statement: (1) affordable and efficient, (2) increase mobility, (3) improve air quality. From these objectives, the Mobility, the Air Quality and the Cost Effectiveness Indices were developed (Exhibit A-3). These indices are multimodal — that is, they measure the performance of the alternatives regardless of whether the project is a highway, transit, or other transportation system improvement. The three multimodal performance indices selected for the Plan analyses and the elements they measure are:

- Mobility Index - which measures person flow in the transportation system
- Air Quality Index - which measures the total mobile source pollutant emissions
- Cost-Effectiveness Index - which measures the cost per hour of travel time savings

The mobility index is the equivalent of average vehicle occupancy multiplied by speed. Higher indices are attained by projects that move people in either fewer vehicles or move them faster or both. As this measure is applied to all trips produced in Los Angeles County, the impacts throughout all corridors and all modes in the transportation system are captured.

The air quality index estimates the total weight of carbon monoxide, oxides of nitrogen and reactive organic gases from personal transportation modes. Both the emission factors and the formula that enables the composite index to be calculated are provided by the California Air Resources Board. The emission factors are sensitive to the number, length and speed of vehicle trips. The Year 2015 emission factors take into account projected emission reductions due to such improvements as alternative fuels and electric vehicles.

The cost effectiveness index measures the cost of transportation system improvements associated with travel time savings and pollutant emissions reductions. It is composed the incremental capital, operating and maintenance cost of the proposed improvement. This index uses the travel time savings for ridesharing modes (transit and carpool) as well as for all modes (including single-occupant vehicles). This index has also been calculated for MTA costs as well as the total public cost. The MTA cost takes into consideration various non-MTA funding sources such as federal discretionary funding, state bond funds, and municipal local return or other contributions such benefit assessments and private financing.

These three performance indices provide relative measures benefit that would be achieved from individual and combinations of transportation improvement projects and programs at the county level. The mobility and air quality indices are sensitive to the scale of the improvement, but this is normalized when evaluating the expenditure per unit of benefit as measured by the cost effectiveness of an improvement.

Mobility Index

$$\frac{\text{Person Miles of Travel}}{\text{Vehicle Miles of Travel}} \times \text{Speed}$$

Air Quality Index

$$AQI = ROG + NOx + (CO/7)$$

[Based on countywide total of vehicle trips and vehicle miles traveled]

Cost-Effectiveness Index

$$\frac{\Delta\$ \text{ Capital} + \Delta\$ \text{ O\&M} - \Delta\$ \text{ Non-MTA}}{\Delta \text{ User Benefits}}$$

Where: $\Delta\$$ Capital = Change in Annualized Total Capital Costs

$\Delta\$$ O&M = Change in Annual Operating and Maintenance Costs

$\Delta\$$ Non-MTA = Change in Annualized Non-MTA funding composed of federal, state, municipal and private contributions

Δ User Benefits = Change in hours of transit and HOV travel time savings; Mobility Index units; and, Air Quality Index units

SUMMARY OF RESULTS

Each of the alternatives considered for inclusion in the Plan were analyzed for their contribution to mobility and air quality as well as their cost effectiveness in achieving these objectives. The basis for comparison in each case was the Baseline Scenario. The MTA travel simulation model was applied to each of the major highway and transit projects individually. Each of the programs were evaluated based upon the empirical performance data from the application of similar programs. Scenarios composed of packages of projects, programs and policies were also evaluated using these techniques. The three performance indices were calculated in each case. Additional data summaries from the travel simulation model and assessment of ISTEA Metropolitan Planning Factors implications were also compiled.

Baseline Scenario

The performance of the Baseline Scenario was generally described in Chapter 2. The analysis showed that the transportation system would experience deteriorating performance over the next twenty years if the Baseline Scenario were to be the transportation system of the future. Only the mobility and air quality performance indices can be calculated for the Baseline Scenario. The cost effectiveness index uses the Baseline Scenario as the point of comparison. Consistent with the increasing traffic congestion and declining travel speeds under the Baseline Scenario, the mobility index declines nearly 45% from 42.27 in 1990 to 23.95 in the Year 2015. Largely based upon automotive technological improvements, the air quality index improves by nearly 60% as its value drops from 1,319,714 in 1990 to 544,188 in the Year 2015. These values set the standard against which the performances of the projects, programs, policies and scenarios are measured when added to the Baseline Scenario.

Individual Projects and Programs

There were three categories of projects and programs evaluated during the analysis of Plan components: Call for Projects programs, highway/HOV projects and rail transit projects (Exhibit A-4). Using the Baseline Scenario as the basis for evaluating performance, the mobility, air quality and cost effectiveness performance indices were then estimated.

- Call For Projects Programs - Four categories from the Call for Projects were evaluated. These were the Regional Surface Transportation Improvements (RSTI), Transportation Demand Management (TDM), Local Transportation Systems Management (TSM), and Regional Bikeways. Each of these categories was analyzed at three funding levels to gauge their performance at low, moderate and high funding levels (Exhibit A-5). The low funding level represented the target funding levels in the FY 94-97 Call for Projects, with the exception of Regional Bikeways that were funded at the moderate funding level. The mobility analysis of the Call for Projects programs showed that TSM and RSTI were both highly and equally effective at each corresponding funding level (Exhibit A-6).

MTA LONG RANGE TRANSPORTATION PLAN
Individual Projects and Programs Evaluated

Call for Projects" Categories (Countywide Programs)

- Local Transportation Systems Management (TSM) Program
- Transportation Demand Management (TDM) Program
- Regional Surface Transportation Improvement (RSTI) Program
- Regional Bikeway Program

Rail Projects (Enhanced Baseline/Candidate Corridors)

- Red Line Eastern Extension to Atlantic
- Red Line Western Extension to I-405
- Blue Line Downtown Connector
- Green Line to LAX Lot C/Westchester
- Green Line to Redondo Beach/Torrance
- Exposition Line to USC/West Los Angeles
- Blue Line to Burbank/Glendale
- Blue Line to Duarte
- Route 10/60 Corridor
- Green Line Norwalk Extension
- Crenshaw-Prairie Corridor
- Santa Monica Boulevard Rail Line

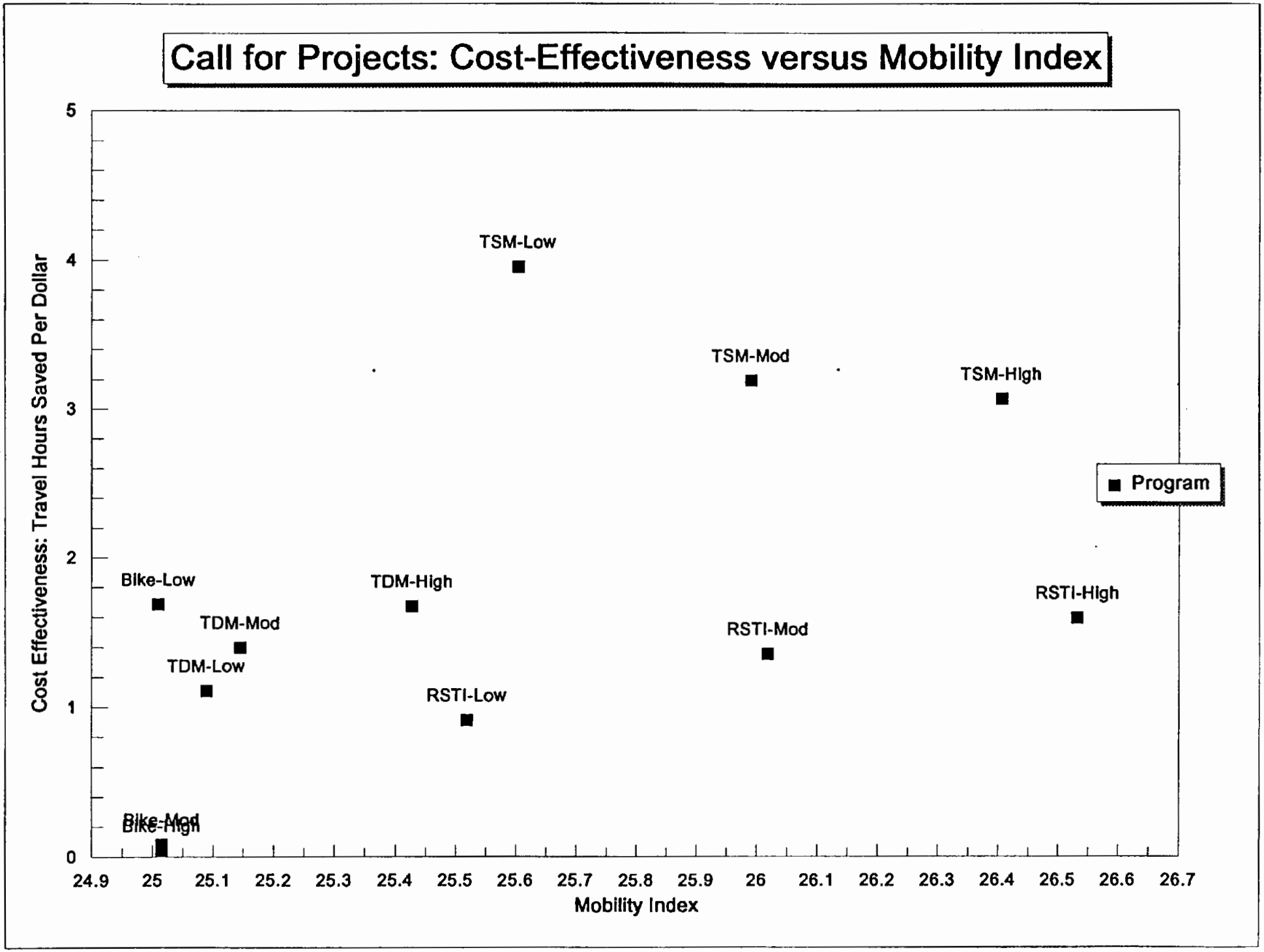
Highway/HOV Projects (Enhanced Baseline)

- Route 5 HOV: Route 10 to Route 14
- Route 5 HOV: Orange County Line to Route 710
- Route 10 HOV: Baldwin to San Bernardino County Line
- Route 14 HOV: Escondido to Avenue P-8
- Route 14 HOV: Route 5 to San Fernando Road
- Route 60 HOV: Route 605 to Route 57
- Route 405 HOV: Route 105 to Route 101
- Route 5 Gap Closure: Orange County Line to Route 710
- Route 138 Widening: Longview to Route 18
- Avenue P-8 Expressway: Route 14 to 47th Street East
- Route 710 Gap Closure
- Route 126 Gap Closure: Route 5 to Route 14

Exhibit A-5

Call for Projects Analysis Procedure

	MTA Annual Funding Alternatives		
	Low	Moderate	High
Local Transportation Systems Management	$15 Million	$30 Million	$45 Million
Regional Surface Transportation Improvements	$25 Million	$32 Million	$40Million
Transportation Demand Management	$12 Million	$20 Million	$40 Million
Regional Bikeways	$0 Million	$10 Million	$20 Million


Call for Projects: Cost-Effectiveness versus Mobility Index
Cost Effectiveness: Travel Hours Saved Per Dollar
Mobility Index
Program
TSM-Low
TSM-Mod
TSM-High
Bike-Low
TDM-High
RSTI-High
TDM-Mod
RSTI-Mod
TDM-Low
RSTI-Low
Bike-Mod
Bike-High
0
1
2
3
4
5
24.9
25
25.1
25.2
25.3
25.4
25.5
25.6
25.7
25.8
25.9
26
26.1
26.2
26.3
26.4
26.5
26.6
26.7

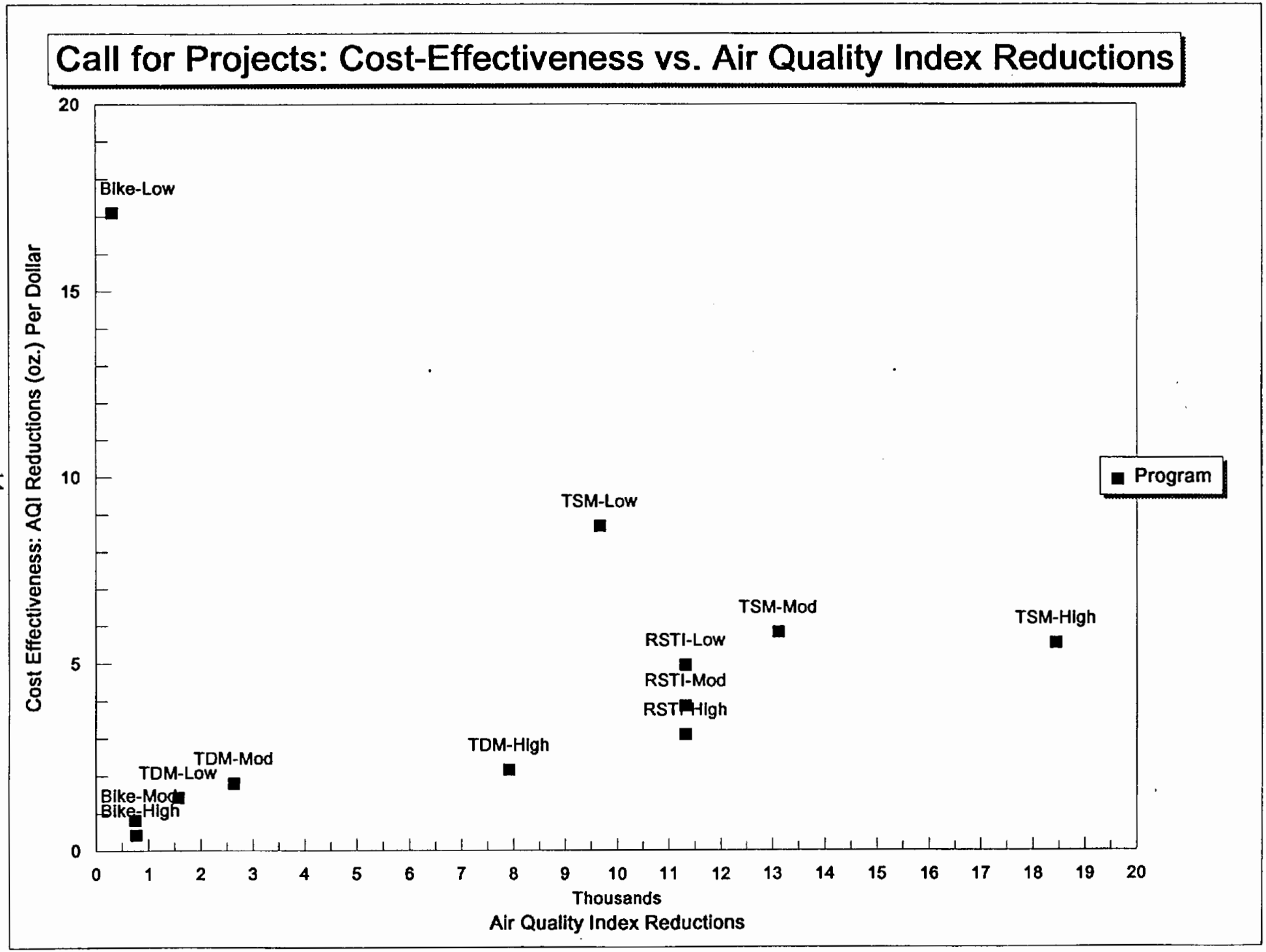
Funding TSM at any of the three funding levels were all more cost-effective than any other program category, but the analysis showed a declining effectiveness as more funds were allocated. Both RSTI and TDM demonstrated increasing effectiveness with increasing expenditures. With the exception of a high level of TDM funding, both TDM and Regional Bikeways exhibited little benefit as measured by the mobility index. Regional Bikeways did not show any significant impact due to its small mode share.

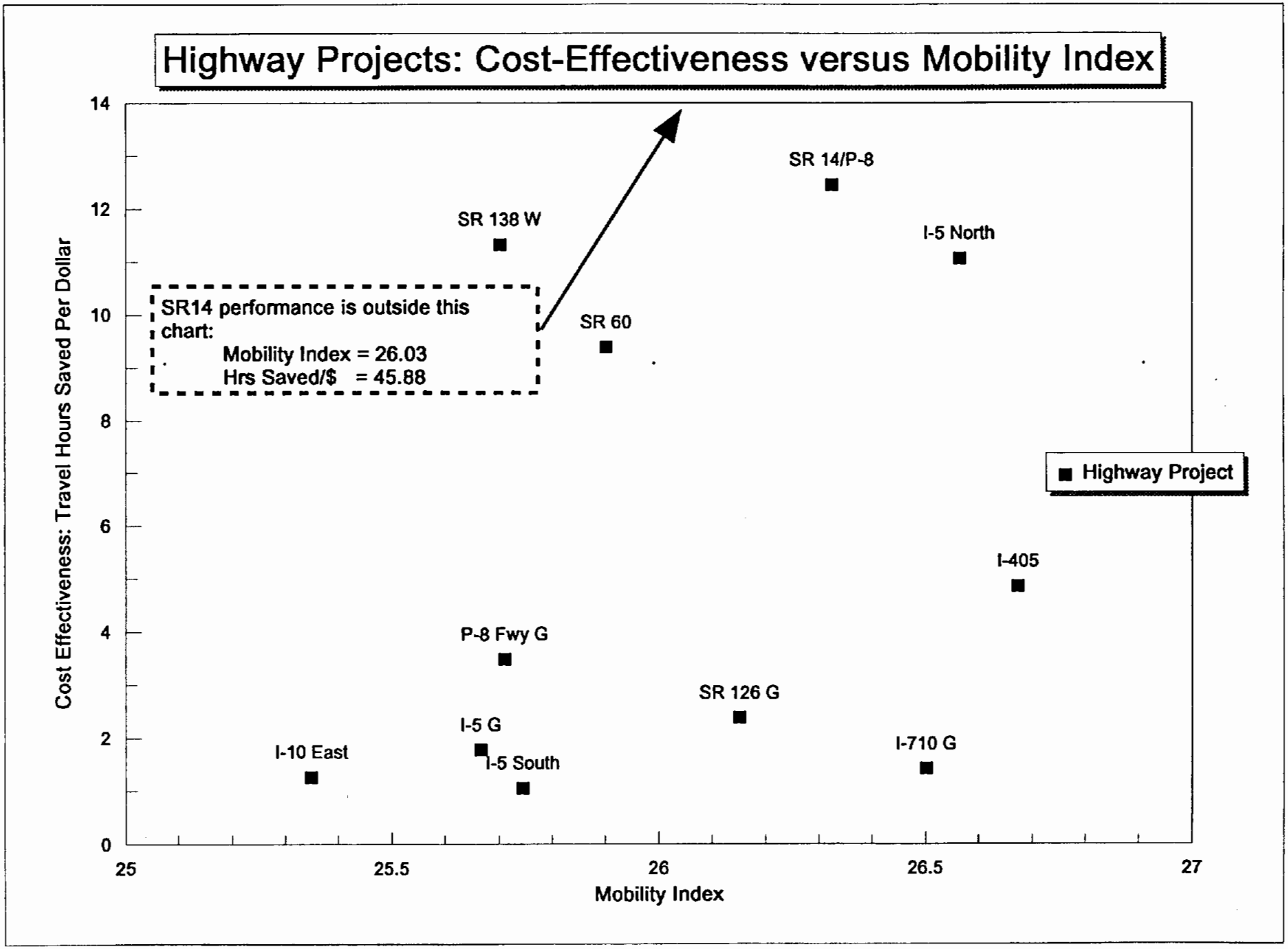
The air quality analysis showed similar impacts with a few differences (Exhibit A-7). Once again, TSM was the best category at all funding levels. The air quality benefit of the RSTI category is largely attributable to the inclusion of Alameda Corridor Project, which was included at all funding levels, and there were no distinguishable air quality improvements at higher funding levels. A high level of TDM funding showed considerable air quality improvement, but was exceeded by all funding levels of TSM and RSTI in both air quality improvement and cost effectiveness. Again, the small market share of bicycling showed minimal air quality impact.

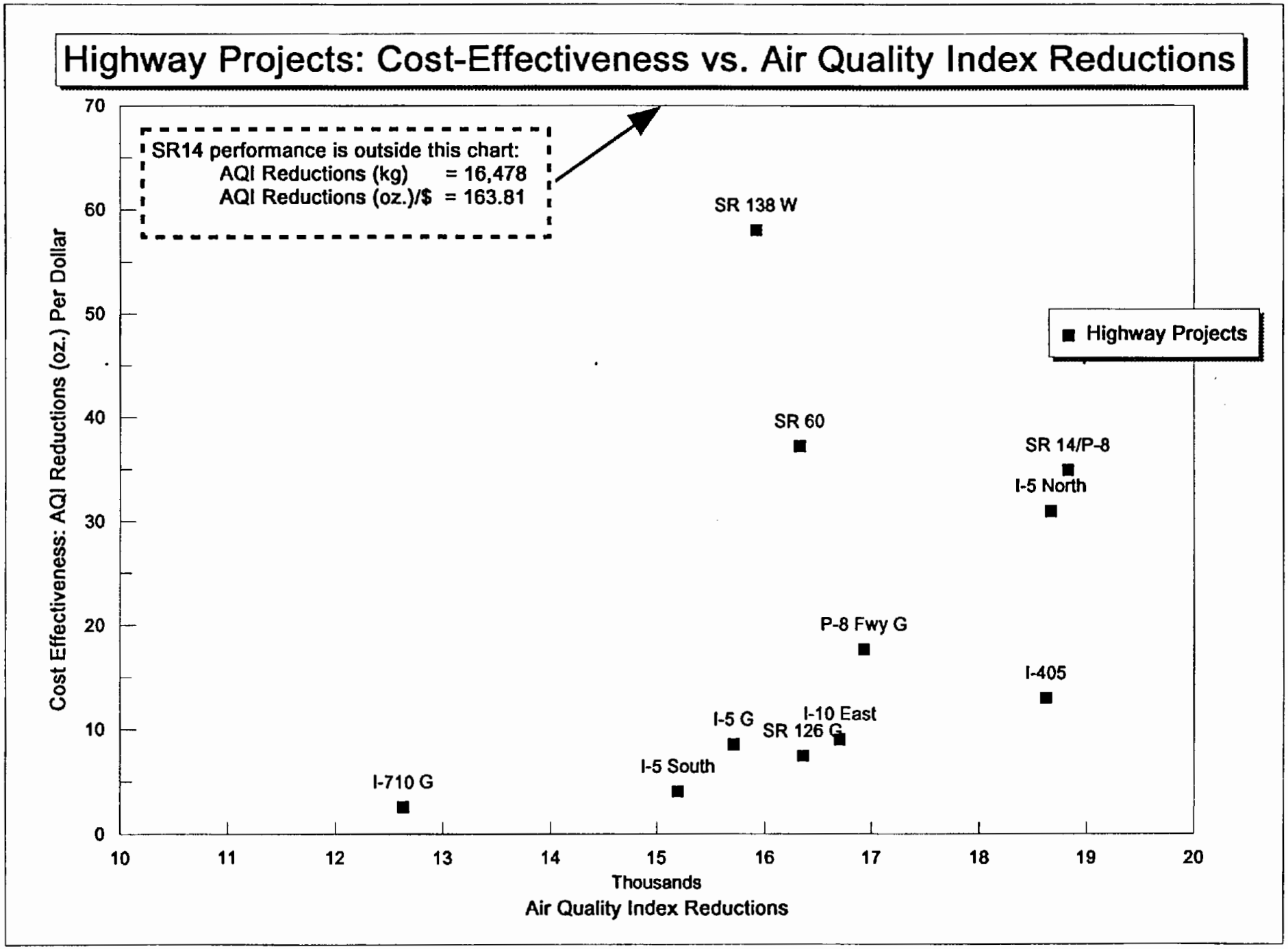
- Highway/HOV Projects - Twelve individual highway projects were evaluated as potential components for the Plan including high-occupancy vehicle facilities, gap closures and major roadway widenings. In general, the highway projects that showed the greatest mobility improvement were those that provide the greatest congestion relief (Exhibit A-8). This includes the HOV projects on the Golden State and San Diego Freeways, and the gap closures of the Long Beach Freeway, State Route 126 and the Avenue P-8 Expressway. Many of the North County highway and HOV improvements (I-5 North, SR 14/P-8, SR 14, SR 138) together with the Pomona Freeway HOV were the most cost effective mobility improvements. This is largely due to the availability of right-of-way for the improvement.

  The projects that were most effective in improving air quality were generally those that provided the most congestion relief (Exhibit A-9). However, the I-710 gap closure, while reducing congestion, provides the least air quality benefit among the projects evaluated. The I-10 East HOV provided the least mobility benefit, but is among the leaders in air quality benefits. The same group projects that had high mobility cost effectiveness also have high air quality cost effectiveness.

- Rail Transit Projects - Fourteen individual rail transit projects were evaluated. Several of the rail projects are extensions of other rail projects that were analyzed. These were Metro Blue Line extensions to USC and then out the Exposition Right-of-Way; and, Metro Green Line extensions to LAX Lot C and then on to Westchester. Whenever this occurred, the performance of the further extension was considered together with the shorter segment. The rail projects that provided the greatest mobility benefit were the Santa Monica Boulevard, CBD Blue Line Connector, USC Blue Line, Exposition ROW Blue Line, Red Line East to Atlantic, 10/60 Corridor Blue Line, and Red Line West to Westwood (Exhibit A-10). The most cost effective were the USC Blue Line, the Duarte rail-bus extension, and the CBD Blue Line Connector. The projects demonstrating low mobility


Call for Projects: Cost-Effectiveness vs. Air Quality Index Reductions
Cost Effectiveness: AQI Reductions (oz.) Per Dollar
20
15
10
5
0
Bike-Low
TSM-Low
TSM-Mod
TSM-High
RSTI-Low
RSTI-Mod
RSTI-High
TDM-High
TDM-Mod
TDM-Low
Bike-Mod
Bike-High
Program
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
Thousands
Air Quality Index Reductions


Highway Projects: Cost-Effectiveness versus Mobility Index
Cost Effectiveness: Travel Hours Saved Per Dollar
Mobility Index
SR14 performance is outside this chart:
Mobility Index = 26.03
Hrs Saved/$ = 45.88
SR 14/P-8
SR 138 W
I-5 North
SR 60
I-405
P-8 Fwy G
SR 126 G
I-5 G
I-10 East
I-5 South
I-710 G
Highway Project
0
2
4
6
8
10
12
14
25
25.5
26
26.5
27


Highway Projects: Cost-Effectiveness vs. Air Quality Index Reductions
SR14 performance is outside this chart:
AQI Reductions (kg) = 16,478
AQI Reductions (oz.)/$ = 163.81
Cost Effectiveness: AQI Reductions (oz.) Per Dollar
Thousands
Air Quality Index Reductions
Highway Projects
SR 138 W
SR 60
SR 14/P-8
I-5 North
P-8 Fwy G
I-405
I-5 G
I-10 East
SR 126 G
I-5 South
I-710 G
0
10
20
30
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70
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11
12
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16
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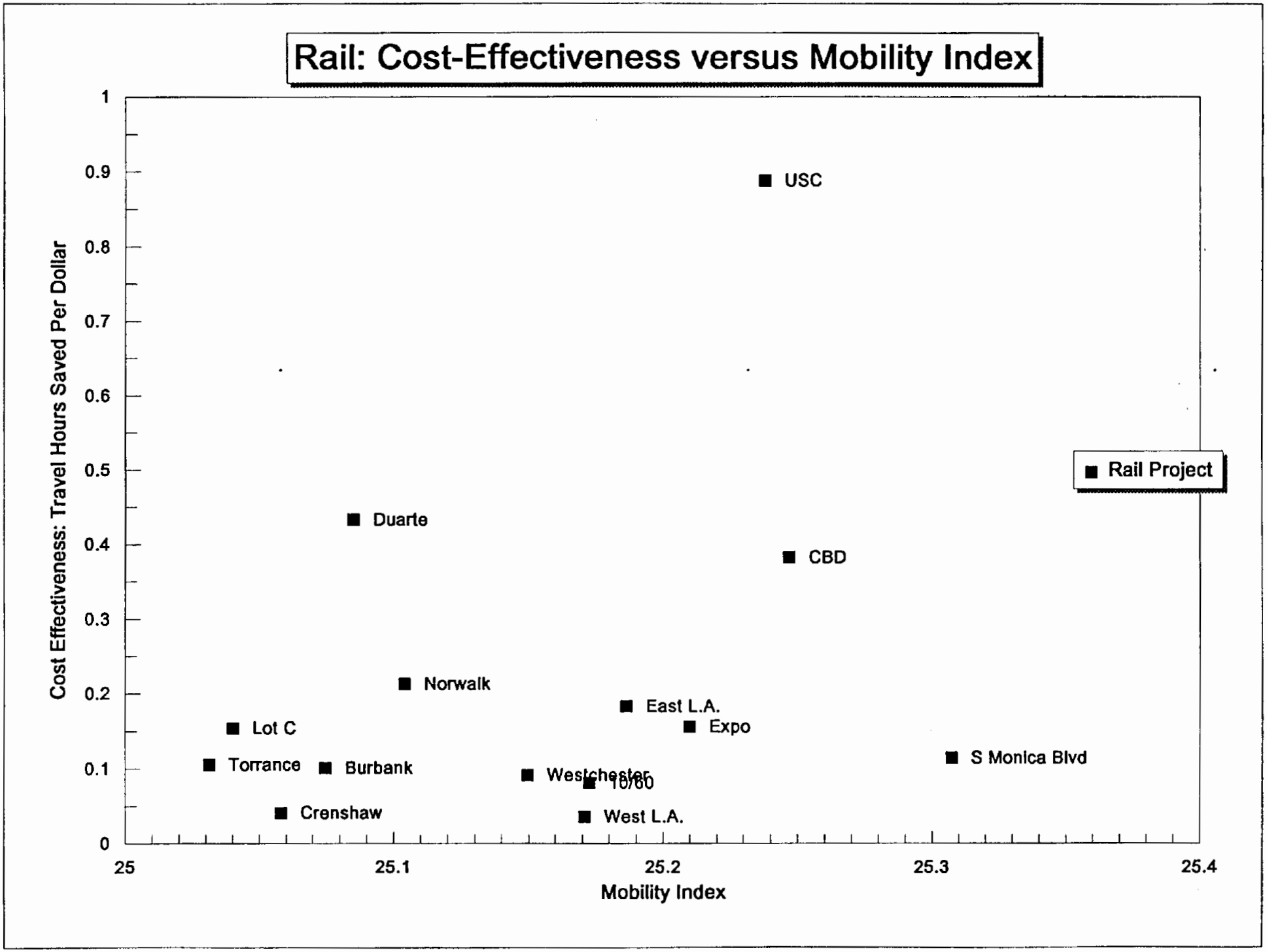
18
19
20


Rail: Cost-Effectiveness versus Mobility Index
Cost Effectiveness: Travel Hours Saved Per Dollar
Mobility Index
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
25
25.1
25.2
25.3
25.4
USC
Duarte
CBD
Norwalk
East L.A.
Expo
Lot C
Torrance
Burbank
Westchester
10/60
S Monica Blvd
Crenshaw
West L.A.
Rail Project

benefits were either those that provide a substitute transit service in a corridor with good existing transit service or those in areas that do not currently have a substantial transit market. Some projects (Red Line East and West, Burbank/Glendale, CBD) will perform significantly better when part of an expanded system since the Baseline Scenario provides relatively sparse accessibility compared to the highway system.

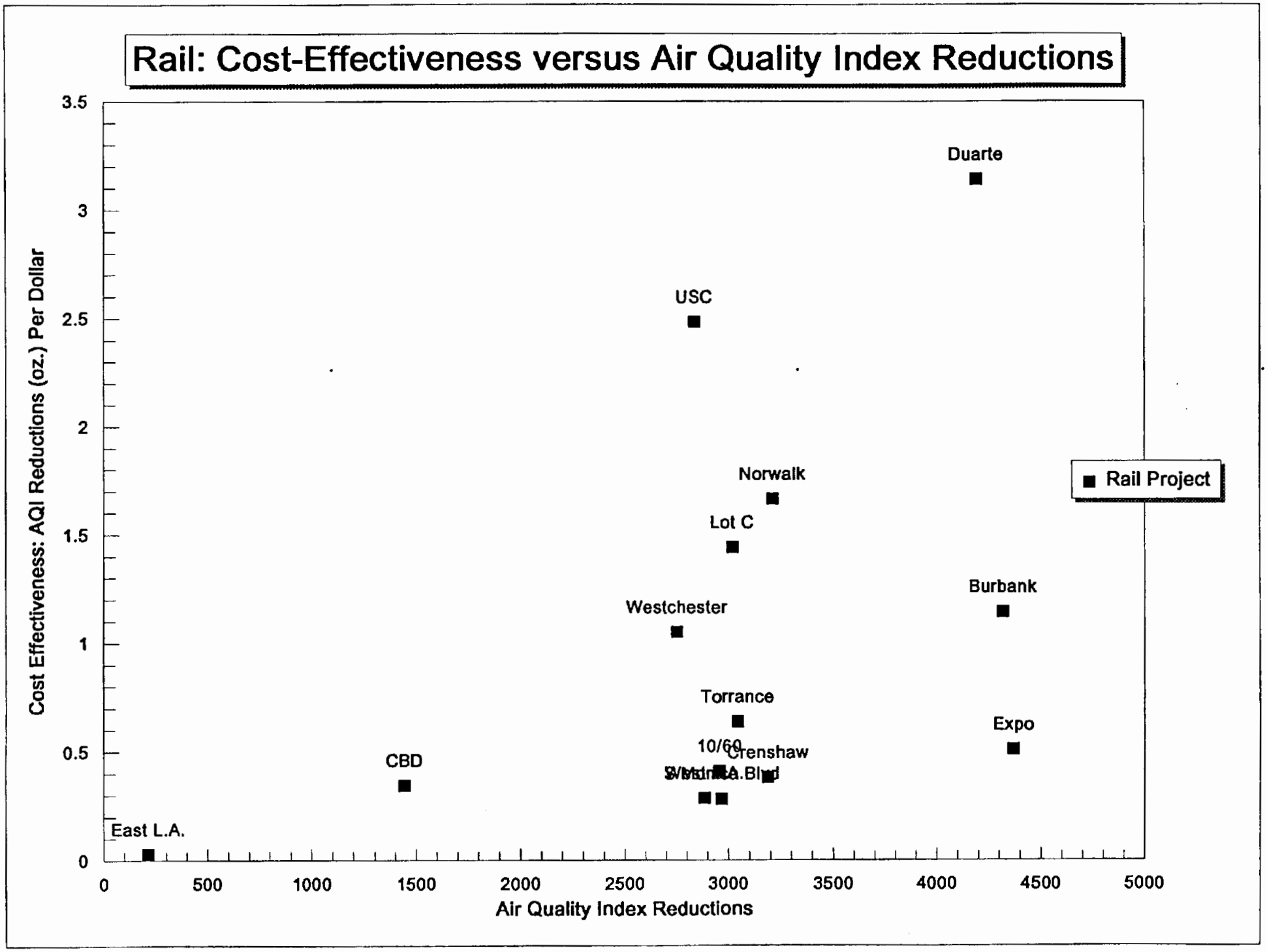
Air quality performance was highest among the projects that encourage a mode shift from long auto trips such as the Duarte rail-bus, Glendale/Burbank Blue Line and Exposition ROW Blue Line (Exhibit A-11). The Metro Red Line East and CBD Blue Line Connector had the lowest air quality benefit because most patrons are already transit riders and a large mode shift does not occur. The Duarte, USC, Norwalk, Lot C and Burbank/Glendale projects were the most cost effective from an air quality perspective.

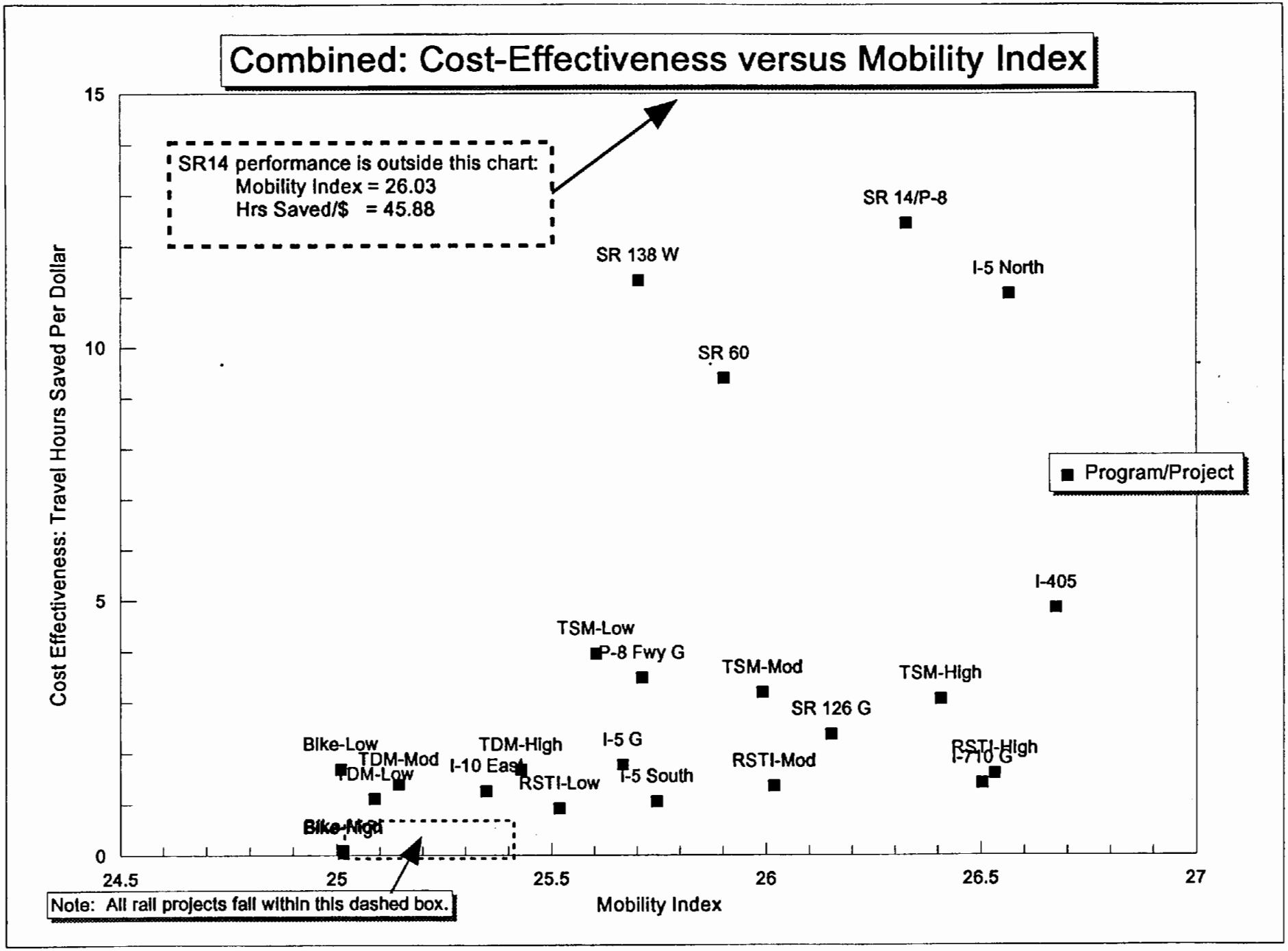
- Combined Analysis of Projects and Programs - The highest performing highway/HOV projects were the best mobility performers when considering all projects and programs together (Exhibit A-12). The lowest performing category was generally the rail projects where the small market of transit does not provide a substantial overall contribution to countywide mobility. In contrast, the Call for Projects programs include improvements countywide and the highway/HOV projects provide significant travel time benefits to all modes in those corridors. Transit, TDM and Regional Bikeways will provide greater mobility benefits as part of a system and environment of supportive regulatory policies and economic incentives that "level the playing field" with the hidden subsidies of auto travel.

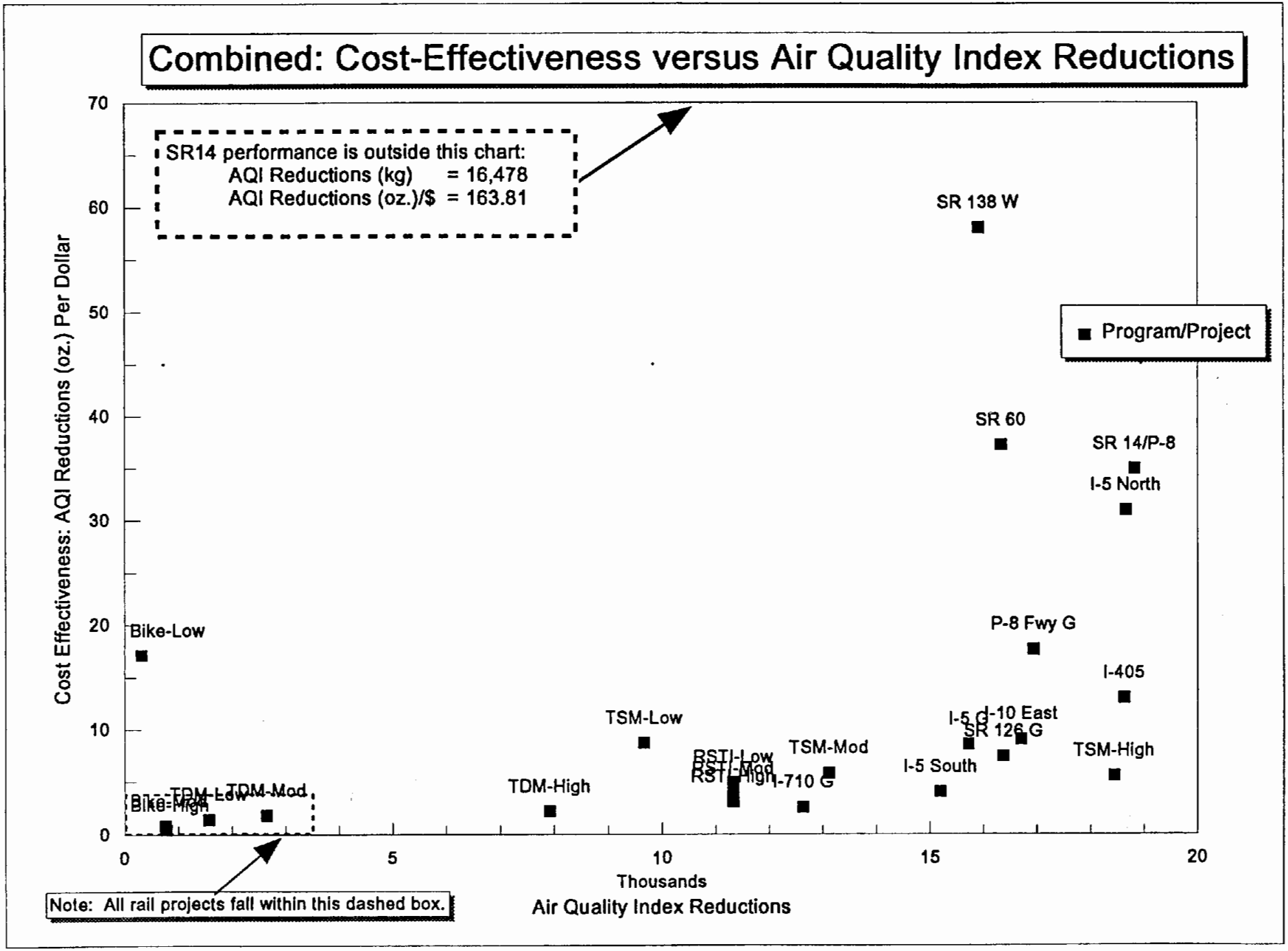
  The combined evaluation of air quality for the projects and programs showed that the highway projects were generally more cost effective in improving air quality than other projects and programs (Exhibit A-13). The most effective air quality performance was made by the Transportation Systems Management program category and several of the highway projects that provide considerable congestion relief (I-5 North, I-405, SR 14/P-8). The rail projects did not do well largely due to the fact that most of the rail ridership is composed of people who were already transit users. Similar to the mobility analysis for some projects and programs, a package of these projects and programs will likely provide more benefit than the sum of their individual contributions.

Planning Scenarios

Three planning scenarios were evaluated to measure the benefits of combinations of rail, bus, highway and HOV projects. The components of each planning scenario was added to the Baseline Scenario in the same manner as the individual projects and programs were analyzed. These scenarios have several common program category improvements such as arterial bus lanes and other transportation systems management actions (Exhibit A-14). The highway and program


Rail: Cost-Effectiveness versus Air Quality Index Reductions
Cost Effectiveness: AQI Reductions (oz.) Per Dollar
Air Quality Index Reductions
0
0.5
1
1.5
2
2.5
3
3.5
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
Duarte
USC
Norwalk
Lot C
Burbank
Westchester
Torrance
Expo
10/60
Crenshaw
CBD
East L.A.
Rail Project


Combined: Cost-Effectiveness versus Mobility Index
SR14 performance is outside this chart:
Mobility Index = 26.03
Hrs Saved/$ = 45.88
SR 14/P-8
SR 138 W
I-5 North
SR 60
I-405
TSM-Low
P-8 Fwy G
TSM-Mod
TSM-High
SR 126 G
I-5 G
Bike-Low
TDM-Mod
TDM-High
I-10 East
TDM-Low
RSTI-Low
I-5 South
RSTI-Mod
RSTI-High
I-710 G
Bike-High
Program/Project
Cost Effectiveness: Travel Hours Saved Per Dollar
Mobility Index
0
5
10
15
24.5
25
25.5
26
26.5
27
Note: All rail projects fall within this dashed box.


Combined: Cost-Effectiveness versus Air Quality Index Reductions
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Air Quality Index Reductions
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Program/Project
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I-10 East
SR 126 G
I-5 G
TSM-High
I-5 South
TSM-Mod
I-710 G
RSTI-Low
RSTI-Mod
RSTI-High
TSM-Low
TDM-High
TDM-Mod
TDM-Low
Bike-High
Bike-Low
Note: All rail projects fall within this dashed box.

Elements Common to All Scenarios

- At least 300 additional buses for fixed route services.
- Reallocation of fixed route service from areas of low transit demand to areas with high transit demand to relieve overcrowding.
- A Mobility Allowance that would provide alternative forms of transit service (for example, subscription services, shared-ride taxis, smart shuttles, jitneys) to substitute for reallocated services.
- Substitution of Mobility Allowance services in all areas during periods of low demand such as late night and weekend services.
- Reallocation of express services from routes parallel to rail lines to feeder services and additional service in areas of high transit demand.
- Acquisition of higher capacity buses for linehaul services such as the El Monte and Harbor Transitways.
- Implementation of 130 miles of reserved arterial bus lanes.
- Provision of traffic systems management improvements on all major arterials
- Construction of freeway carpool lanes and freeway gap closures.
- A funding contribution to the Alameda Corridor Project.

category elements were included in all scenarios with the only exception being the inclusion of the Golden State Freeway HOV facility only in Scenario 1. The primary differences between scenarios were offsetting increases of bus service and rail extensions within the constraints of the available capital and operating funding.

The primary differences among the three scenarios were:

- Scenario 1 — 300 buses were added, countywide, to the Baseline Scenario peak fleet together with the East-West Valley Rail, and Red Line Extensions to Westwood and to Atlantic. This scenario also included an HOV lane on the Golden State Freeway from Route 134 to the San Bernardino Freeway.

  (Scenario 1 is the Adopted MTA Long Range Transportation Plan.)

- Scenario 2 — 627 buses were added to the Baseline Scenario peak bus fleet together with the East-West Valley Rail Line.

- Scenario 3 — 500 buses were added to the Baseline Scenario peak bus fleet together with the East-West Valley Rail and the Western Extension to Westwood.

The application of the MTA travel simulation model indicated that Scenario 1 will generate the highest transit mode share (9.2%), the highest carpool mode share (13.5%) and lowest drive alone mode share (77.3%) for commuter travel in Los Angeles County (Exhibit A-15). This transit mode share represents a 12% increase over the today's mode share. The analysis shows that as more buses are added (in Scenarios 2 and 3), transit declines. This is attributable to the fact that bus transit can move people at no more than half the speeds offered by rail transit — particularly in the Metro Red Line corridor to the east and west.

The Metro Red Line Extensions to the west and east, when run individually, were among the top three in all categories of rail ridership per mile of line in terms of transit boardings and new transit patrons (Exhibits A-16 and A-17). Working together in a system with improvements to bus transit, they provide improved mobility through what is, certainly, the highest transit demand corridor as well as one of the most congested travel corridors in the county. Based on the transit mode share and the mobility performance of Scenario 1, It is apparent that this scenario provides the best balance of bus and rail improvement. Other scenarios with more buses and less rail did not perform as well, despite the application of arterial bus lanes in the Red Line West and East corridors that were designed to increase bus travel speeds.

The mobility index, an indicator of the average countywide transportation system speed, is also highest in Scenario 1 (Exhibit A-18). Since the Mobility Index measures how well the transportation system moves people, This is due to the speed advantage of the rail system in Scenario 1 as compared to the bus system that would otherwise serve those corridors.

MTA LONG RANGE TRANSPORTATION PLAN

Home-to-Work Trip Mode Shares

	Transit		Carpool		Drive Alone	
	Person Trips	Percent	Person Trips	Percent	Person Trips	Percent
1990	419,610	8.25%	809,520	15.92%	3,856,471	75.83%
Baseline Scenario	498,468	7.28%	947,848	13.85%	5,399,386	78.87%
Scenario 1 - Adopted Plan	631,167	9.22%	921,317	13.46%	5,293,172	77.32%
Scenario 2	606,278	8.86%	911,309	13.31%	5,328,111	77.83%
Scenario 3	616,099	9.00%	909,077	13.28%	5,320,566	77.72%

* All estimates are for Los Angeles County and for the Year 2015 except as noted.

MTA LONG RANGE TRANPORTATION PLAN

Exhibit A-16

YEAR 2015 RAIL RIDERSHIP ESTIMATES

Rail Project	Daily Boardings: Total Number	Total Rank	Per Station Number	Per Station Rank	Per Mile Number	Per Mile Rank	Stations	Distance in Miles
Red Line East	27,781	6	6,945	1	9,260	1	4	3.0
CBD Connector	17,140	8	3,428	5	7,791	2	5	2.3
Red Line West	47,240	2	6,749	2	6,056	3	7	7.8
USC-Exposition Park	14,099	9	2,820	6	4,653	4	5	3.0
Exposition ROW	69,900	1	4,369	3	4,539	5	16	15.4
Santa Monica Blvd	31,341	3	3,918	4	3,918	6	8	8.0
Crenshaw	31,306	4	2,408	8	2,820	7	13	11.1
10/60 Corridor	30,838	5	2,570	7	2,002	8	12	15.4
Norwalk	5,390	11	1,797	10	1,996	9	3	2.7
Burbank-Glendale	21,001	7	2,100	9	1,628	10	10	12.9
Torrance	5,421	10	774	11	743	11	7	7.3
Green Line Lot C	1,479	14	493	13	672	12	3	2.2
Westchester	1,858	12	465	14	664	13	4	2.8
Duarte	1,793	13	598	12	299	14	3	6.0

* Rail boarding estimates are based upon an Improved Baseline, which adds 150 buses to the Constrained Baseline

Exhibit A-17

MTA LONG RANGE TRANPORTATION PLAN

YEAR 2015 RAIL RIDERSHIP ESTIMATES

Rail Project	New Daily Transit Trips: Total Number	Total Rank	Per Station Number	Per Station Rank	Per Mile Number	Per Mile Rank	Stations	Distance in Miles
Red Line West	20,881	1	2,983	1	2,677	1	7	7.8
Red Line East	5,441	6	1,360	2	1,814	2	4	3.0
Lot C	2,164	9	721	6	984	3	3	2.2
Santa Monica Blvd	7,855	4	982	4	982	4	8	8.0
Exposition ROW	11,752	2	735	5	763	5	16	15.4
Burbank-Glendale	9,841	3	984	3	763	6	10	12.9
Westchester	2,117	10	529	7	756	7	4	2.8
CBD Connector	1,499	11	300	14	681	8	5	2.3
USC-Exposition Park	1,271	12	318	13	553	9	4	2.3
Crenshaw	5,844	5	450	9	526	10	13	11.1
Torrance	3,687	8	527	8	505	11	7	7.3
Norwalk	1,132	14	377	12	419	12	3	2.7
10/60 Corridor	4,928	7	411	10	320	13	12	15.4
Duarte	1,150	13	383	11	192	14	3	6.0

* New transit trips are based upon an Improved Baseline, which adds 150 buses to the Constrained Baseline

MTA LONG RANGE TRANSPORTATION PLAN

Mobility & Cost Effectiveness

	Mobility Index	MTA Cost Per Hour Saved		Total Cost Per Hour Saved	
		Transit & HOV	All Travel	Transit & HOV	All Travel
1990	42.27	NA	NA	NA	NA
Baseline Scenario	24.40	NA	NA	NA	NA
Scenario 1 - Adopted Plan	28.39	$2.65	$1.35	$3.87	$1.98
Scenario 2	28.29	$2.53	$1.37	$3.50	$1.90
Scenario 3	28.31	$2.54	$1.37	$3.50	$1.90

* All estimates are for Los Angeles County and for the Year 2015 except as noted.
* The Mobility Index is indicative of average systemwide speed; specifically it is:
  Average Vehicle Occupancy x Average Person Speed
* The decline in the Mobility Index from 1990 to Year 2015 reflects increasing highway congestion.
* All Cost Per Hour Saved measures are calculated relative to the Baseline Scenario.

In evaluating cost effectiveness to the MTA, Scenarios 2 and 3 were marginally better than Scenario 1 for transit and carpool travel time savings. However, Scenario 1 was marginally better in total public cost effectiveness when all travel was considered (that is, transit, carpool, and drive alone trips). This is because federal funding can be highly leveraged for Metro Red Line extensions, thereby reducing local infrastructure costs, even though there is a high public cost associated with more rail. The mode shift induced by placing rail in the corridors where it is most effective reduces vehicular (bus and auto) travel on the highway system for the benefit of all trips (as exhibited by the high Scenario 1 mode share).

Scenario 1 was also the best performer in air quality improvement (Exhibit A-19). However, once again, this improvement is marginal compared to emissions reductions anticipated by the Year 2015 from technology improvements to the automobile.

Over the next 20 years, increasing congestion will cut Los Angeles County arterial street, freeway and carpool lanes speeds in half (Exhibit A-20). Bus transit speeds, using those roadways, will also decline (both as projected from the observed trend of the past 15 years and from the travel forecasting model). By the year 2015, the rail system will be the fastest means of travel, even exceeding the speeds on carpool lane facilities that will likely become congested under current occupancy requirements. Each scenario reduces congestion and improves speeds for all modes of travel compared to the Baseline Scenario. This is due to the HOV projects, Call-For-Projects programs, and transit improvements evaluated in the scenarios that largely shift auto travelers to ridesharing. The reduction of the speed differential between auto and transit modes leads to the increased transit and carpool mode share demonstrated in the three scenarios.

The improvement in door-to-door travel speeds for the transit mode is even more dramatic (Exhibit A-21). The 1990 all-bus system door-to-door speed (which includes walking and waiting time) is measured at 9.2 m.p.h. This compares to 32 m.p.h. for auto travel. The Baseline Scenario shows that the average door-to-door transit speed improves to 9.7 m.p.h. (due to the Baseline rail program) while auto speeds decline to less than 17 m.p.h. The HOV and highway projects in the scenarios improve auto speeds to over 20 m.p.h. The three rail lines in Scenario 1 improve transit speeds to 12 m.p.h. This represents a 32% increase over today's door-to-door transit travel speed. Scenarios 2 and 3 (with less rail) provide a lesser speed improvement.

Based on the Plan analysis, Scenario 1 apparently strikes the best balance between bus and rail improvements. With the increases in transit mode share, auto and transit speeds, and the mobility index, the most cost-effective mobility improvements are contained Scenario 1. Scenario 1, with rail development in the highest demand corridors, will provide more mobility than bus improvements in those corridors.

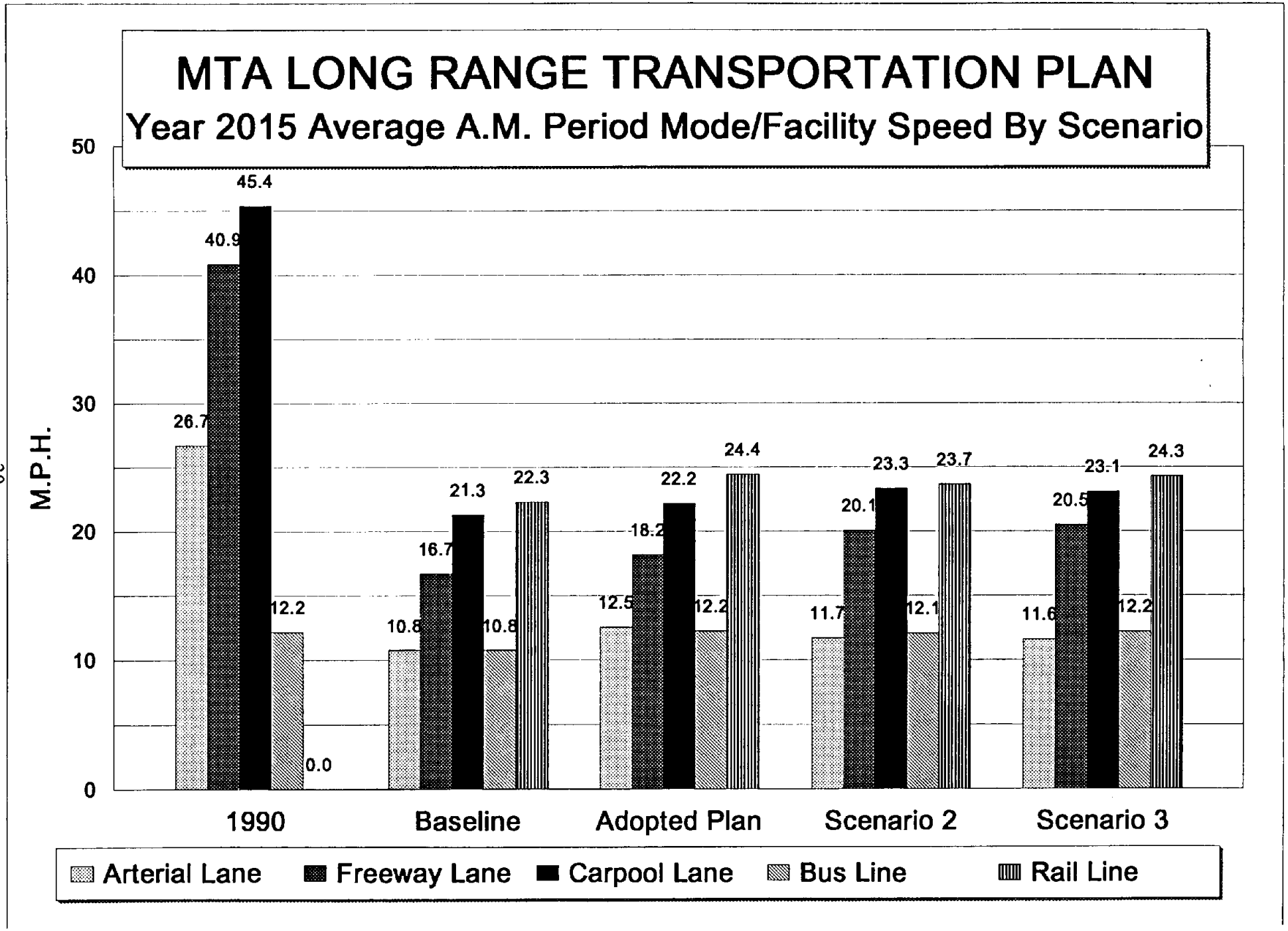
Exhibit A-19

MTA LONG RANGE TRANSPORTATION PLAN

Air Quality & Cost Effectiveness

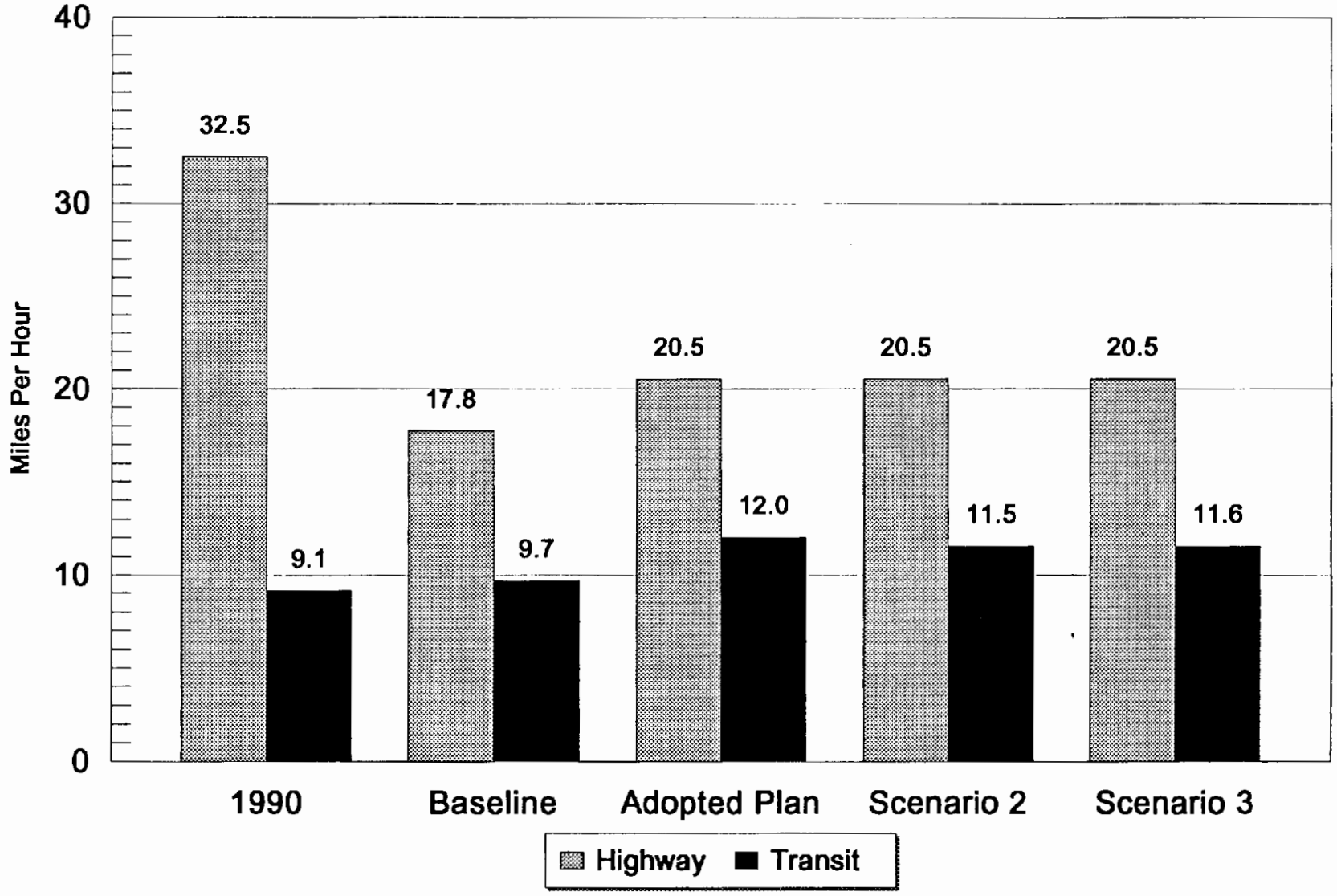
	Air Quality Index	Pollutant Emissions Reduced	
		MTA Cost/Oz.	Total Cost/Oz.
1990	1,319,714	NA	NA
Baseline Scenario	550,330	NA	NA
Scenario 1 - Adopted Plan	510,670	$1.17	$1.71
Scenario 2	518,990	$1.37	$1.90
Scenario 3	513,545	$1.18	$1.63

* All estimates are for Los Angeles County and for the Year 2015 except as noted.
* The improvement in the Air Quality Index from 1990 to Year 2015 scenarios is largely due to automotive technological improvements.
* Costs and emissions reductions are relative to the Baseline Scenario.


MTA LONG RANGE TRANSPORTATION PLAN
Year 2015 Average A.M. Period Mode/Facility Speed By Scenario
M.P.H.
50
40
30
20
10
0
45.4
40.9
26.7
12.2
0.0
10.8
16.7
21.3
10.8
22.3
12.5
18.2
22.2
12.2
24.4
11.7
20.1
23.3
12.1
23.7
11.6
20.5
23.1
12.2
24.3
1990
Baseline
Adopted Plan
Scenario 2
Scenario 3
Arterial Lane
Freeway Lane
Carpool Lane
Bus Line
Rail Line

MTA LONG RANGE TRANSPORTATION PLAN

Year 2015 Average Door-to-Door Speed by Scenario



Policy Options

The analysis of the scenarios demonstrated that the allocation of available funds to transportation improvements will only partially address future transportation system deficiencies. Despite the severe congestion on the highway system, the preferred mode of travel for the majority of tripmakers will continue to be the automobile. With this as the case, there is insufficient available funding to increase highway system capacity and maintain current travel speeds to accommodate the demographic growth projected to occur in the County. The sole remaining recourse is to make greater use of the existing transportation infrastructure by encouraging people to get out of their cars and rideshare — either by transit or carpool.

Several options designed to encourage this behavioral shift were evaluated. The modeling of these behavioral policy options requires a representation of changes to the temporal or economic characteristics of travel. Consequently, the following policy alternatives were analyzed:

- Common to all policy alternatives was an increase in telecommuting to 10% commuter trips;
- Policy Alternative 1 increased the HOV minimum vehicle occupancy requirement to three or more persons;
- Policy Alternative 2 included a 20% surcharge on all commercial parking (50% commercial parking surcharge within ½-mile of a rail transit station);
- Policy Alternative 3 added a 0.3¢ per mile fee on vehicle miles of travel (this alternative was not simulated due to the negligible effect on mode choice);
- Policy Alternative 4 added a 5¢ per mile fee on vehicle miles of travel;
- Policy Alternative 5 was a combination of Policy Alternatives 1 and 2; and,
- Policy Alternative 6 was a combination of Policy Alternatives 2 and 4.

The Adopted Plan served as the basis for evaluating the additional benefits of the policy alternatives. These policy alternatives are only representative of the policy options that may be implemented as they could also embody many other strategies as described in the transportation policy element of the Adopted Plan. The policy alternatives considered in this analysis were evaluated to measure their potential effectiveness in further improving transportation system mobility and air quality.

In the analysis, each policy alternative was built upon the Adopted Plan (Scenario 1 from the modeling analysis). Common to all policy alternatives was an increase in telecommuting from 4.3%, in the Adopted Plan, to 10.4% of all potential commuter trips. This had a beneficial impact

upon transportation system performance. Los Angeles County home-based work vehicle trips declined by at least 370,000 under each policy scenario. The vehicle trip reduction increased average highway network speeds by at least two miles per hour. As a result, both the mobility and air quality indices improve due to decreasing traffic congestion.

Further improvements in the work trip transit mode share were noted in the analysis of policy alternatives (Exhibit A-22). The results ranged from no significant change with the increase in the HOV-lane occupancy requirement (Policy 1) to a nearly 10 percent mode share under a combination of parking surcharges and VMT fees (Policy 6). The most effective single policy alternative was the implementation of the 5¢ per mile VMT fee (Policy 4), which increased the work trip transit mode share from 9.2 percent to over 9.5 percent.

Even more significant was the reduction in the drive-alone mode share from 77.3 percent of home-based work trips in the Adopted Plan to 75.8 percent in Policy 6. This is the equivalent of removing more than two million cars from Los Angeles County streets everyday. All but one of the policy alternatives reduced vehicular travel. The exception was Policy 1, which prohibits 2-person carpools from HOV facilities and thereby discourage two-person carpool formation, resulting in the work trip mode share for all carpools declining from 13.5 percent to 13.3 percent. A corollary to Policy 1 which could improve travel for all tripmakers would be to provide access to the HOV lanes for a fee by those who would not otherwise qualify.

The highest mobility index observed among the individual policy alternatives was the Policy 4 (VMT fees). Together with the increase in telecommuting that was common with all policy scenarios, Policy 4 increased the mobility index to 32.55 (Exhibit A-23). This is a 15 percent increase over the Adopted Plan (28.39) and 33 percent over the Baseline Scenario (24.40). Policy 4 reduced total daily vehicle trips by nearly 1.5 million and increased average vehicle occupancy which led to the increased mobility index. Both combination policy scenarios, Policy 5 (HOV 3+ and Parking Tax) and Policy 6 (Parking Tax and VMT Fee), had the highest mobility indices at 32.79 and 32.75, respectively. While the parking tax was the lowest of the individual policy alternatives, it was very effective in generating a high mobility index when combined with another policy alternative. The policy strategies that increase auto costs to discourage auto travel by that mode were the most effective in improving highway network speed and the mobility index.

The analysis of the impact of policy scenarios on air quality improvement showed that alternatives with the VMT fee (Policies 4 and 6) were the most effective in improving air quality (Exhibit A-24). This is largely attributable to the reduction in vehicle trips and associated vehicle-miles-of-travel in these alternatives. The VMT fee can reduce the air quality index by 14 percent compared to the Adopted Plan without the VMT fee.

Exhibit A-22

MTA LONG RANGE TRANSPORTATION PLAN

Home-to-Work Trip Mode Shares

	Transit		Carpool		Drive Alone	
	Person Trips	Percent	Person Trips	Percent	Person Trips	Percent
Adopted Plan	631,167	9.22%	921,317	13.46%	5,293,172	77.32%
Policy 1 (HOV 3+)	592,195	9.23%	854,055	13.31%	4,968,192	77.45%
Policy 2 (Park Tax)	601,748	9.38%	864,304	13.47%	4,948,308	77.14%
Policy 4 (VMT Fee)	612,104	9.54%	904,412	14.10%	4,897,934	76.36%
Policy 5 (HOV & Park)	621,990	9.70%	863,707	13.47%	4,928,738	76.84%
Policy 6 (Park & VMT)	635,149	9.90%	916,924	14.29%	4,862,351	75.80%

* All estimates are for Los Angeles County and for the Year 2015.

Exhibit A-23

MTA LONG RANGE TRANSPORTATION PLAN

Mobility & Cost Effectiveness

	Mobility Index	MTA Cost Per Hour Saved		Total Cost Per Hour Saved	
		Transit & HOV	All Travel	Transit & HOV	All Travel
Adopted Plan	28.39	$2.65	$1.35	$3.87	$1.98
Policy 1 (HOV 3+)	32.13	$1.08	$0.69	$1.58	$1.01
Policy 2 (Park Tax)	30.96	$2.07	$1.06	$3.02	$1.55
Policy 4 (VMT Fee)	32.55	$1.72	$0.92	$2.51	$1.35
Policy 5 (HOV & Park)	32.79	$1.16	$0.79	$1.70	$1.16
Policy 6 (Park & VMT)	32.75	$1.68	$0.91	$2.46	$1.33

* All estimates are for Los Angeles County and for the Year 2015.
* The Mobility Index is indicative of average systemwide speed; specifically it is:
  Average Vehicle Occupancy x Average Person Speed
* All Cost Per Hour Saved measures are calculated relative to the Constrained Baseline Scenario.

Exhibit A-24

MTA LONG RANGE TRANSPORTATION PLAN

Air Quality & Cost Effectiveness

	Air Quality Index	Pollutant Emissions Reduced	
		MTA Cost/Oz.	Total Cost/Oz.
Adopted Plan	510,670	$1.17	$1.71
Policy 1 (HOV 3+)	476,746	$0.63	$0.92
Policy 2 (Park Tax)	465,130	$0.54	$0.79
Policy 4 (VMT Fee)	438,711	$0.42	$0.61
Policy 5 (HOV & Park)	472,604	$0.60	$0.87
Policy 6 (Park & VMT)	451,628	$0.47	$0.69

* All estimates are for Los Angeles County and for the Year 2015.
* Costs and emissions reductions are relative to the recommended Plan.

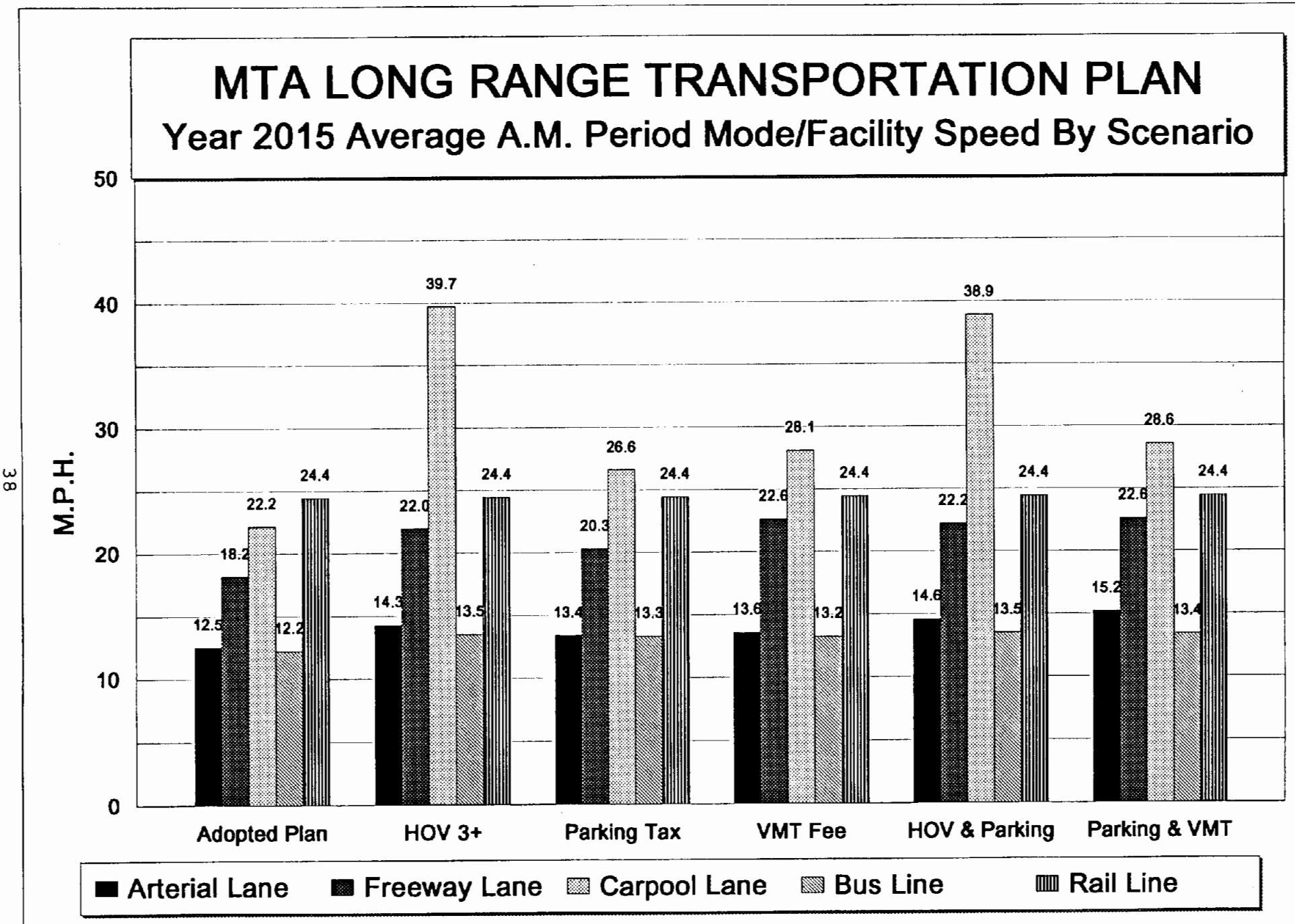
Due to the reduction in auto travel encouraged by the policy scenarios, there was a still further increase in morning peak period speeds compared to the Adopted Plan (Exhibit A-25). Improvements of over 20 percent were recorded in several of the policy scenarios for arterial, freeway mixed-flow and carpool lane speeds. Bus transit speeds were also increased, but generally only 11 percent due of the arterial bus lane improvements to increase bus speeds already included in the Adopted Plan. Policy 1 and Policy 5, which increased the minimum carpool lane occupancy requirement to three or more, generated carpool lane speed improvements of at least 75 percent — nearly returning carpool lane speeds to their 1990 speed levels. Without the 3+ carpool occupancy requirement, the other policy scenarios still increased carpool lane speeds by nearly 30 percent.

The speed improvements for facilities and modes was also observed in the door-to-door travel times (including walking, waiting and parking time) for highway and transit trips (Exhibit A-26). All policy scenarios generate door-to-door speed improvements of 9-15 percent for the highway trips and 3-8 percent for the transit trips. The combination of HOV 3+ and parking taxes (Policy 5) appear to have a more significant synergistic effect for both highway and transit trips than the combination of parking taxes and VMT fees (Policy 6).

Modeling Peer Review Panel

The travel demand simulation model used in the Plan analyses is an update of the model approved by the Federal Transit Administration for use in the Metro Red Line Eastern Extension Study. Upon completion of that study, the federal Peer Review Panel (composed of modeling experts from Portland, Seattle, Denver, Houston and Baltimore) suggested several refinements for future implementation. For the Long Range Transportation Plan, this Peer Review Panel was asked to review the improvements incorporated into what is now known as the MTA model. The Panel made the following findings (Exhibit A-27):

- the new MTA Travel Simulation Model incorporates refinements that will produce better travel forecasts than would have been possible using the earlier Red Line Model;
- the evaluation factors produced by the model (mobility, air quality, and cost effectiveness) are useful measures of system performance; and,
- the new MTA Travel Simulation Model is appropriate for analysis of the MTA Long Range Transportation Plan.


MTA LONG RANGE TRANSPORTATION PLAN
Year 2015 Average A.M. Period Mode/Facility Speed By Scenario
M.P.H.
50
40
30
20
10
0
12.5
18.2
22.2
12.2
24.4
14.3
22.0
39.7
13.5
24.4
13.4
20.3
26.6
13.3
24.4
13.6
22.6
28.1
13.2
24.4
14.6
22.2
38.9
13.5
24.4
15.2
22.6
28.6
13.4
24.4
Adopted Plan
HOV 3+
Parking Tax
VMT Fee
HOV & Parking
Parking & VMT
Arterial Lane
Freeway Lane
Carpool Lane
Bus Line
Rail Line

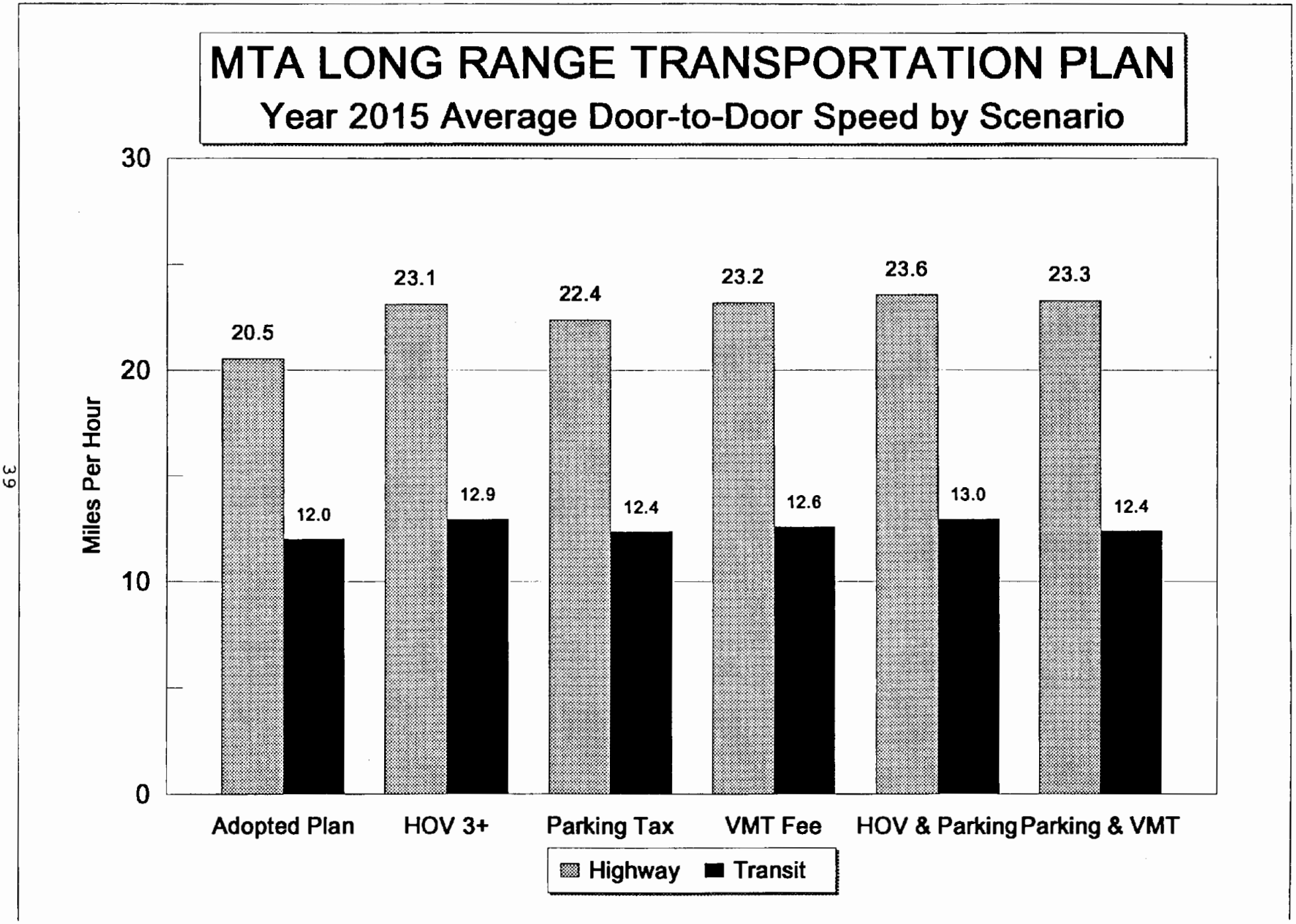

MTA LONG RANGE TRANSPORTATION PLAN
Year 2015 Average Door-to-Door Speed by Scenario
Miles Per Hour
30
20
10
0
20.5
12.0
23.1
12.9
22.4
12.4
23.2
12.6
23.6
13.0
23.3
12.4
Adopted Plan
HOV 3+
Parking Tax
VMT Fee
HOV & Parking
Parking & VMT
Highway
Transit

Exhibit A-27

SG ASSOCIATES, INC.
TRANSPORTATION CONSULTANTS
planning • operations • management • design
4200 DANIELS AVENUE • ANNANDALE, VA 22003 • 703/750-3363

January 19, 1995

Mr. Keith L. Killough
Deputy Executive Officer
Los Angeles County Metropolitan
Transportation Authority
818 W. Seventh Street
Los Angeles, California 90017

SG Ref: 120-94

Dear Keith:

The Peer Review Panel, composed of Frank Spielberg, Jim Bunch, Keith Lawton and Robert Harvey, originally assembled by FTA to review the travel forecasting procedures being used in the Red Line Eastside studies, has reviewed the revised methodologies developed by your staff for the Long Range Transportation Plan Development. The Panel finds that you and your staff have implemented significant improvements to the forecasting procedures including a refined and more detailed zone structure, a more detailed representation of the transit network, better treatment of fare differentials in analysis of transit paths, and linking of bus operating speeds to projected roadway operating speeds. The refinements should lead to better travel forecasts than would have been possible using the Red Line models.

You and your staff have accomplished a great deal in a short time in both model development and testing of alternatives. Maintaining this capability gives LACMTA the ability to conduct independent assessment of transportation project investments.

The differences in forecasts from previously conducted analyses appear to arise primarily from differences in basic projections of population and employment and in different assumptions about the transportation facilities that can be implemented due to reduced financial resource projections. The evaluation factors -- related to mobility, air quality and cost-effectiveness -- are useful measures of system performance.

The forecasting procedures, as applied, are appropriate for the county-level long range plan analysis. If this model is to be continued to be used for project specific studies, additional refinements related to distributional effects of capacity improvements, roadway capacities and the relationships between roadway and bus speeds should be considered.

Yours truly,

F. Spielberg, P.E.
Principal

cc: Jim Bunch
Keith Lawton
Robert Harvey

METROPOLITAN PLANNING FACTORS

In order to qualify for Federal Transportation Funds, projects must be provided for in local short and long term transportation plans. The federal government requires that these transportation plans consider 15 factors. These factors are listed in the following matrix under the column labeled "Metropolitan Planning factors". In developing the Long Range Plan, MTA staff evaluated rail, bus, highway, and other modal categories to assess how strongly projects in these categories would meet the Metropolitan Planning Factors. MTA staff further evaluated rail projects relative to these additional criteria: corridor density, household income, and bus boardings. These results are shown in the matrix. Following the matrix is a narrative explaining how staff determined which projects and programs most strongly met each planing factor.

METROPOLITAN PLANNING FACTORS:

Projects funded with ISTEA funds must be provided for in short and long term transportation plans, and plans must consider 15 factors.

	Red Line East	Red Line West	Downtown Connector	Green Line Lot C	Green Line Westchester	Green Line Torrance	Exposition Park	Expo. to Santa Monica	Burbank/Glendale	Blue Line - Duarte	Route 10/60	Green Line/Norwalk	Crenshaw Corridor	Santa Monica Blvd.	Bus	TSM	HOV	TDM	Comm. Rail/T.C./P&R	Regional Surface	Non-motorized
Efficient Use of Existing Facilities.	x	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Congestion Relief (both reactive and proactive).	x	x	x				x	x	x		x			x	x	x	x	x	x	x	
Effects on Land Use & Consistency with Land Use Plans.	x	x	x				x						x	x	x			x	x		x
Access to ports, airports and intermodal facilties.				x					x		x		x		x				x	x	
Social, Economic, Energy and Environmental Effects.	x	x	x				x		x				x	x	x			x	x		x
Increase Security through effective Capital Investments.	x	x						x							x			x	x		
Connectivity of roads within to roads outside the Metropolitan Area.	Applicable only to roadway projects.																x			x	
Efficient Freight Movement.	Construction of the above projects will have a neutral impact on freight.																			x	
Energy Conservation.	All projects under consideration will conserve energy to the extent that they increase transit mode shift.																				
Inclusion of Enhancement Projects – identifying policies and criteria.	All rail projects will include an enhancement budget.																		x		x
Consideration of all projects to be undertaken, regardless of funding source.	Any project would be considered as part of a county – wide package of projects.																				
Transportation Needs identified through six Management Systems.	These will apply to overall MTA programs.																				
Preservation of Rights – of – Way for future transportation projects.	MTA has already preserved major rail rights – of – way.															x			x		
Use of Life Cycle Cost	Life cycle cost will be used in evaluation of all projects.																				
Methods to Expand and Enhance Transit Services and Increase use.	All projects will examine methods to expand use of transit, including demand management, bus – rail interface, increased bus speeds, etc.																				

OTHER FACTORS CONSIDERED DURING LONG RANGE PLANNING ANALYSIS:	Red Line East	Red Line West	Downtown Connector	Green Line Lot C	Green Line Westchester	Green Line Torrance	Exposition Park	Expo. to Santa Monica	Burbank/Glendale	Blue Line - Duarte	Route 10/60	Green Line/Norwalk	Crenshaw Corridor	Santa Monica Blvd.
Future Population and Employment Density – high density areas near proposed rail lines.	x	x	x				x	x	x				x	x
Household Income – Households below poverty level near proposed rail line.	x						x				x		x	
Bus Boardings – High volume bus service and boardings parallel to proposed rail lines.	x	x	x				x						x	x

Note: All projects identified in this matrix are consistent with ISTEA Metropolitan Planning Factors. An "X" indicates which projects or programs demonstrate direct, substantial or predominate benefit for a factor in comparison to other projects or programs.

EXPLANATION OF THE METROPOLITAN PLANNING FACTORS MATRIX

EFFICIENT USE OF EXISTING FACILITIES

Eastern and Western Extensions to the Red Line were considered to make more efficient use of the MTA's existing high investment by extending the Red Line into high density corridors and increasing ridership on the existing and committed Red Line segments.

Any rail line which utilizes a former or existing railroad right-of-way was given credit for making efficient use of existing transportation facilities and, in some instances, for preserving excess right-of-way capacity for additional transportation uses such as bikeways.

Bus system, TSM, HOV, and regional surface transportation improvements were considered to make more efficient use of existing roadways.

TDM programs encourage ridership on and make more efficient use of all transit and ridesharing facilities.

Non-motorized improvements make highly efficient use of existing streets and sidewalks as well as enhance pedestrian access to rail and bus lines.

CONGESTION RELIEF

Rail lines which serve the most highly congested corridors and/or which have high boardings per station are expected to have a high impact on congestion relief.

Improved bus service, especially targeted to highest demand corridors, is expected to provide congestion relief.

The analysis of the Mobility Indicator for TSM, HOV, TDM and Regional Surface Improvements indicated high congestion relief capabilities.

Commuter Rail improvements attract a high percentage of new transit riders thereby removing cars off of congested freeways during peak hours.

EFFECTS ON LAND USE & CONSISTENCY WITH LAND USE PLANS

Rail lines serving the corridors with highest Year 2010 population and employment densities were considered to be highly consistent with land use plans.

Improved bus service, particularly in the highest demand corridors, will also coordinate bus service with high density land use and also help create a pedestrian oriented "liveable community" atmosphere. Similarly Transit Centers (in the Commuter Rail/Transit Center/

Park & Ride category) can also concentrate transit services and riders in urban centers.

TDM and Non-Motorized improvements can help create a pedestrian oriented, human scale urban atmosphere around transit stations and stops.

ACCESS TO PORTS, AIRPORTS AND INTERMODAL FACILITIES

The Green Line to Lot C, Crenshaw Corridor, and Burbank/Glendale rail lines were given credit for providing direct access to a major airport. The Alameda Corridor project in the Regional Surface Improvements category was given credit for connection to a port. The Route 10/60 rail line was given credit for connecting directly to Union Station/Gateway.

Bus service, Commuter Rail improvements, and Regional Surface improvements to roadways were also considered to provide access to one or more of the above facilities.

SOCIAL, ECONOMIC, ENERGY AND ENVIRONMENTAL EFFECTS

The Red Line East, Downtown Connector, Exposition Park Branch, Burbank/Glendale, and Crenshaw Corridor rail lines were considered to serve the corridors with highest social and economic needs based on household income levels and the presence of adopted redevelopment and economic development areas. The Red Line Western Extension and the Santa Monica Corridor line were given credit for extending rail service into the areas of highest employment concentrations providing access to jobs from other parts of the rail system.

Bus service improvements, especially concentrated to serve highest demand corridors, will also serve areas of greatest social and economic need. This is also true for non-motorized improvements which improve pedestrian access to transit in high transit dependency areas.

TDM and Commuter Rail/Transit Center/Park & Ride categories are also given credit for this factor because of the ability to make significant impacts to air quality/energy through creating new transit riders, ridesharing, and innovative programs such as smart shuttles and jitneys.

INCREASE SECURITY THROUGH EFFECTIVE CAPITAL INVESTMENTS

Rail lines with the highest boardings per station (Red Line East and West, Exposition ROW to Santa Monica) were considered to be the best candidates to increase the efficiency of providing security by concentrating large numbers of riders at the smallest number of stations and vehicles.

Bus and TDM improvements were included because projects such as automatic vehicle locators and smart passenger systems would be funded out of these categories.

CONNECTIVITY OF ROADS WITHIN TO ROADS OUTSIDE THE METROPOLITAN AREA

HOV and Regional Surface Improvements are the only categories that directly impact the connectivity of roads inside the metropolitan area to roads outside the metropolitan areas.

EFFICIENT FREIGHT MOVEMENT

Only the Alameda Corridor project (included in the Regional Surface Improvement category) was considered to have a direct beneficial impact on the efficiency of freight movement. Other projects would be designed to mitigate any adverse impacts on freight movement and would be expected to have a neutral impact.

ENERGY CONSERVATION

This factor calls for consistency of transportation planning with applicable agency conservation programs, goals, and objectives. All Long Range Plan projects and programs would be analyzed for their consistency with regional energy conservation goals and would be expected to have a beneficial impact to the extent that they increase transit usage and rideshare, and/or reduce fuel consumption.

INCLUSION OF ENHANCEMENT PROJECTS

Every rail project meets this factor because the MTA Board adopted a Greenways policy that directs staff to include a small percentage of any rail construction budget for urban design/greenway enhancements.

Commuter Rail/Transit Center/Park & Ride and Non-motorized program categories were also given credit for meeting this factor because money in these categories can be used for pedestrian enhancements and transit center/park and ride lot improvements which enhance use of the transit system.

CONSIDERATION OF ALL PROJECTS, REGARDLESS OF FUNDING SOURCE

This factor states that analysis of all planning factors must include consideration of transportation projects that are funded privately or by quasi-governmental authorities such as private passenger and freight facilities, terminals, and rights-of-way, parking facilities and transfer points. This factor would apply to any project or program being considered as part of this Long Range Plan analysis.

TRANSPORTATION NEEDS IDENTIFIED THROUGH SIX MANAGEMENT SYSTEMS

This factor calls for the analysis of projects to include identification of needs from management systems including pavement, bridges, highway safety, traffic congestion public

transportation and intermodal transportation management. This would apply equally to all projects and programs in the Long Range Plan.

PRESERVATION OF RIGHTS-OF-WAY FOR FUTURE TRANSPORTATION PROJECTS

The MTA has already purchased and thereby preserved many of the available former rail rights-of-way for future use. TSM programs also meets this factor in that exclusive HOV/busway lanes on rights-of-way could be funded out of this category and would preserve the right-of-way for a more intensive rail use in the future.

USE OF LIFE CYCLE COSTS

This factor directs transportation planning agencies to analyze the net present value cost of projects including maintenance over the useful life of the facility. The agency is directed to choose those projects with the lowest life cycle cost unless projects are otherwise justified on overriding environmental, social or energy concerns. This analysis would be conducted on all projects and would be a consideration equally in all project categories.

METHODS TO EXPAND AND ENHANCE TRANSIT SERVICES AND INCREASE USE

This factor directs agencies to analyze all means of improving service including marketing efforts, fare and subsidy structures, opportunities to increase transit ridership, improvements in intermodal facilities, changes in land use patterns and densities and other factors. The MTA would consider and try to maximize these opportunities for any of its projects and programs.

OTHER FACTORS CONSIDERED DURING THE LONG RANGE PLANNING ANALYSIS

FUTURE POPULATION AND EMPLOYMENT DENSITY NEAR RAIL LINES

Rail lines serving the corridors with the highest projected land use densities in the Year 2015 were considered to best meet this factor.

HOUSEHOLD INCOME

Rail lines serving corridors with a preponderance of census tracts containing higher than average numbers of households below the poverty line were considered to best meet this factor.

BUS BOARDINGS

Rail lines within a half mile of high volume (40,000+ daily boardings) and high service frequency (7 minute headways) were given credit for meeting this factor.

TECHNICAL APPENDIX B:
BASELINE PROJECTS AND PROGRAMS

DESCRIPTION OF THE BASELINE SYSTEM

A baseline list of projects was developed as the starting point for the reassessment of the Long Range Plan. It includes those projects currently under construction or having a full funding commitment.

The following list includes all baseline projects and programs, as well as their total costs over the twenty year period. Some rail, high occupancy vehicle (HOV) lane, and gap closure projects had project costs and funding commitments prior to the twenty year period. These prior amounts are included in the totals below.

($ millions escalated)

	Baseline Projects and Programs	Total 20-Year Cost
TRANSIT CAPITAL		
RAIL	RED LINE Segment 1	1,417.9
	RED LINE Segment 2	1,446.4
	RED LINE Segment 3	
	- North Hollywood	1,310.9
	- Westside (Mid City)	491.5
	- Eastern Extension (to Indiana)	979.6
	RED LINE Seg. 2 & Seg. 3 Station Enhancements	100.6
	San Fernando Valley East/West (Right-of-Way Only)	4.1
	PASADENA LINE Union Station to Sierra Madre Villa 1	998.0
	GREEN LINE Norwalk to El Segundo	722.4
	Metrolink	179.2
	LA Car	257.6
	Miscellaneous Rail/Rehabilitation 1	1,635.4
	Environmental Clearance/Study	416.7
BUS	Existing System - Replacement/Maintenance	3,379.4
OTHER	Union Station Gateway Transit Center	149.5
	Subtotal Transit Capital	**13,489.2**
TRANSIT OPERATIONS		
RAIL	MTA Rail Operations and Metrolink	5,347.5
BUS	MTA and Municipal Operators - Existing System	21,271.7
	Subtotal Transit Operations	**26,619.2**
HIGHWAY/MULITMODAL CAPITAL		
HOV	Route 14 - San Fernando Road to Escondido	62.6
	Route 30 - 210 to Foothill	13.7
	Route 57 - Orange County Line to Route 60	21.9
	Route 60 - Brea Canyon to San Bernardino County Line	43.1
	Route 91 - OCL to Route 605	0.7
	Route 118 - Ventura County Line to Route 5	42.0
	Route 134 - Route 101/170 to Route 210	32.1
	Route 170 - Route 101 to Route 5	13.4
	Route 405 - Orange County Line to Route 110	79.8
	Route 405 - Route 101 to Route 5	14.8
	Route 605 - Orange County Line to Route 10	59.0

	Baseline Projects and Programs	Total 20-Year Cost
GAP CLOSURES	Route 30 - Route 66 to San Bernardino County Line	342.2
	Route 126 - Arterial Widening	46.5
	Route 138 - Avenue T to 90th	30.5
	Route 710 - Right-of-Way Preservation Only	5.1
OTHER PROJECTS & PROGRAMS	Alameda Corridor	142.4
	Incident Management (Tow Service)	653.1
	Park and Ride	19.5
	Regional Bikeways	18.0
	Regional Surface Transportation Improvements	167.9
	Transportation Demand Management	21.8
	TSM - Freeway and TOS	75.2
	TSM - Local	69.1
	Transportation Enhancements	48.9
FUNDING PROGRAMS[2]	Retrofit Soundwalls	74.5
	Inter-Regional Roads	230.0
	Freeway Rehab. (SHOPP)	812.1
	SAFE	178.5
	Environmental Enhancement and Mitigation	20.0
OTHER	Highway Staff Support	195.5
	Subtotal Highway/Multimodal Capital	**3,533.9**
OTHER		
	Administrative Overhead (Prop A, Prop C, TDA)	983.6
	Local Return	5,398.1
	Financing Payments	5,430.6
TOTAL BASELINE PROJECTS & PROGRAMS		**55,454.6**

Notes:

1 Includes: Systemwide Rail Costs, Other Projects (ADA, MOW, ART, Safety, Construction security, and rail rehabilitation).

2 These are programs that are funded from their own revenue source.

TECHNICAL APPENDIX C:
RELATIONSHIP TO OTHER PLANNING AND PROGRAMMING DOCUMENTS

TECHNICAL APPENDIX C: RELATIONSHIP OF LONG RANGE PLAN TO OTHER PLANNING AND PROGRAMMING DOCUMENTS

The Long Range Plan provides a building block for other planning and programming documents. These include the following documents developed by the Southern California Association of Governments (SCAG), the officially designated regional planning agency:

- The SCAG Regional Mobility Element (RME) of the Regional Comprehensive Plan
- The SCAG Air Quality Management Plan (AQMP)
- The SCAG Regional Transportation Improvement Program (RTIP)

The following plans and programs are required by statute to be developed by the MTA and must be consistent with the SCAG Regional Mobility Element and SCAG Air Quality Management Plan in order to obtain state and federal funding:

- The MTA Congestion Management Program (CMP)
- The MTA Los Angeles County Transportation Improvement Program (TIP)
  - Includes MTA TIP Call for Projects
- The MTA Short Range Transit Plan (SRTP)

The following MTA plans and programs are not required by statute and therefore do not have an explicit statutory requirement to conform to the SCAG planning documents. However, projects and programs included in these documents can only be funded and implemented if they are included in the MTA documents listed above, and in conformance with SCAG planning documents:

- MTA Long Range Transportation Plan
- MTA Annual Budget

STRATEGIC FRAMEWORK: The Long Range Plan provides the MTA with a strategic framework, in addition to the SCAG RME and AQMP, to guide the development of the MTA CMP and TIP for submission to SCAG and the implementation of mobility strategies. The Long Range Plan also will be used to evaluate the financial impact of projects and programs.

SEPARATE ACTION REQUIRED: The Long Range Plan does not replace separate MTA action required to fund and implement projects and programs nor MTA action required for the development and approval of the MTA CMP and TIP for submission to SCAG. These strategic plans will be instrumental for input to the SCAG updates of the air quality plan (AQMP) and Regional Mobility Element (RME).

LONG RANGE PLAN EXEMPTION FROM CEQA: When the 30-Year Plan was adopted in 1992, it was recommended that the LACTC file a Notice of Exemption to the California Environmental Quality Act (CEQA) because the Plan is a funding feasibility study which involves no actions, nor commits the parties to any actions affecting environmental resources, until the environmental suitability of each project's objectives has been certified by the appropriate agencies. Because the Long Range Plan is a revision to the 30-Year Plan, the CEQA exemption would still apply.

The Long Range Plan is exempt from CEQA, the California environmental law, under:

- Section 15262 and 15306 as it is characterized by data collection, research, feasibility studies, and resource evaluation activities, which do not result in serious or major disturbances to an environmental resource, and is a funding study to guide possible future actions which the MTA has not yet approved, adopted, or funded; and

- Section 15061.b.3 under the general rule that CEQA applies only to projects which have the potential for causing a significant effect on the environment. As it can be seen with certainty that there is no possibility that this project (the Long Range Plan) may have a significant effect on the environment, the project is not subject to CEQA.

The following is a brief description of the plans and programs listed above and how they relate to the Long Range Plan:

SCAG Regional Mobility Element

The Regional Mobility Element (RME) of the Regional Comprehensive Plan is SCAG's major policy and planning statement on the region's transportation issues and goals. It is comprised of a set of long-range policies, plans, and programs that outline a vision of a regional transportation system compatible with federal and state mobility objectives. The RME includes the following programs: Regional Transportation Demand Management, Regional Transit, Regional Streets and Highways, Regional Non-Motorized Transportation, Regional Goods Movement and Regional Aviation System. The RME incorporates the transportation measures of the AQMP.

The Long Range Plan was developed in consultation with SCAG to ensure that it was developed consistent with the existing Regional Mobility Element as well as in compliance with ISTEA planning requirements and air quality requirements. This Plan will also be an important building block in the regional planning process and assist SCAG in preparing for future updates of the Regional Mobility Element. In particular, the plan will be important to the regional planning process by providing long-range programming direction ~~recommendations~~ and actions necessary to address mobility and air quality needs in Los Angeles County within reasonably available financial resources. This Plan is not a substitute for the adopted Regional Mobility Element or regional planning process, rather, it is an input into the process.

SCAG Air Quality Management Plan

The SCAG Air Quality Management Plan (AQMP), as required by statute, must be developed and adopted by SCAG and approved by the South Coast Air Quality Management District (SCAQMD). The AQMP is designed to meet all federal and state air quality emissions standards.

The Long Range Plan addresses the following requirements of the AQMP:

- High Occupancy Vehicle (HOV) Facilities
- Transit Improvements
- Traffic Flow Improvements
- Non-recurrent Congestion
- Rail Consolidation to Reduce Rail Crossings
- Highway and Freeway Capacity Enhancements
- Trip Reduction Strategies

SCAG Regional Transportation Improvement Program (RTIP)/MTA Los Angeles County Transportation Improvement Program (TIP)

The MTA is required by state statute to develop and approve the Los Angeles County portion (Los Angeles County TIP) of the SCAG Regional Transportation Improvement Program. The TIP and RTIP include all transportation projects which potentially receive state and federal funds. The TIP is financially constrained based on reasonably available funding sources. The MTA TIP must conform to the SCAG Regional Mobility Element (RME) and is submitted for approval to SCAG, who also determines the RTIP's consistency with the Regional Mobility Element.

The Los Angeles County portion of the RTIP includes a transit portion funded with Federal Transit Administration (FTA) funds. This transit TIP is approved by SCAG and then transmitted to the FTA. The Los Angeles County TIP also includes a state funded rail transit capital program and a state and federally funded highway improvements program which is approved by SCAG and then submitted to the California Transportation Commission for approval and incorporation into a State Transportation Improvement Program (STIP). The final STIP is then included in the SCAG RTIP and submitted to the Federal Highway Administration for approval.

The MTA Transportation Improvement Program projects must be drawn from and be consistent with the SCAG Regional Mobility Element, as highlighted above. The Long Range Plan will incorporate TIP decisions made at the MTA, SCAG, CTC and federal levels.

MTA Short Range Transit Plan (SRTP)

The SRTP is a 3 to 5 year federally-required short range planning document for bus and rail transit projects and programs. The MTA develops a county-wide SRTP which incorporates SRTP's from all the Los Angeles County's transit operators. The capital improvements and operating costs component of the SRTP is considered for inclusion in the MTA TIP. Once included in the MTA TIP, SRTP-generated projects will be incorporated in the Long Range Plan.

MTA Congestion Management Program (CMP)

The Congestion Management Program is a state requirement which requires counties to develop a planning process which addresses congestion relief in a coordinated manner. The MTA is the designated Congestion Management Agency (CMA) for Los Angeles County. The CMP links transportation, land use and air quality decisions under one program. Through the development of a sophisticated database, the CMP evaluates capital projects of the Long Range Plan to determine if they are consistent with meeting the goals of the CMP.

MTA TIP Call for Projects

The MTA is required to program revenues in the TIP across all transportation modes, based on the planning requirements of the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991. The MTA accomplishes this mandate by planning and programming funds on a multimodal basis through the TIP Call for Projects, as well as through other programming documents such as the SRTP and the STIP. The Call for Projects is a process by which the MTA programs local, state and federal discretionary revenues to projects from a variety of transportation modes throughout the County. The Long Range Plan provides direction and an overall framework for the Call for Projects.

MTA Annual Budget

The Long Range Plan is a strategic document that provides overall direction for the MTA's annual budget process. It does not replace specific budgetary action to fund and implement projects. The Long Range Plan is updated each year to reflect all budgetary actions.

All of the plans and programs listed above, including the Long Range Plan, are part of a continuing, coordinated and comprehensive planning and programming process within the SCAG region. The Long Range Plan provides the MTA with an additional strategic tool through which to accomplish its mission to improve mobility in Los Angeles County.

TECHNICAL APPENDIX D:
FUND SOURCES

PRIMARY REVENUE SOURCES

LOCAL REVENUES

Proposition A

Proposition A is revenue generated from a 1/2 cent sales tax approved in 1980 by voters in Los Angeles County. Revenue projections are based on the UCLA Sales Tax forecast. Revenues from Proposition A are apportioned to the following programs: Local Return Program (25%); Rail Program (35%); and Discretionary Programs (40%).

Proposition C

Proposition C is revenue generated by a Los Angeles County 1/2 cent sales tax for transit approved by the voters in November 1990. Revenue from Proposition C is apportioned to the following programs: Rail & Bus Security (5%); Commuter Rail/Transit Centers (10%); Local Return (20%); Transit Related Improvements to Freeways & Streets (25%); and Discretionary Programs (40%).

Fare Revenues

Fare revenue is generated by ridership from existing transit operations by means of cash in farebox and prepaid sales (i.e., passes, tokens, etc.). This includes special transit fares which is revenue earned through subsidies received by external agencies or organizations for regular and/or special transit services.

Other Local Agency Funds

These funds are provided by local municipalities to support public transportation programs. Local municipalities generally provide a percent match for discretionary proposition C revenues applied to Local projects.

Service Authority for Freeway Emergencies (SAFE)

The SAFE revenue is based on a $1 annual surcharge on each motor vehicle registration in Los Angeles County for the Metro Callbox System. Cost estimates and assumptions are based on the SAFE ten-year Financial Plan and are divided into capital and operations/maintenance categories.

Special Benefit Assessments

Revenue generating Special Benefit Assessment Districts are authorized by state legislation to levy special benefit assessments for needed public rail transit facilities and/or services on the property which benefits from those facilities and/or services. Assessments are calculated annually based on either the square footage of the parcel or the square footage of the assessable improvements, whichever is larger. Benefit Assessment Districts have been established around the Metro Redline Segment 1 and 2 station areas. Similar districts are in the process of being created around future segments. Properties subject to assessment include offices, commercial, retail, hotels and motels.

Transportation Development Act (TDA) - Article 4

Transportation Development Act (TDA) establishes two major funding sources for public transportation: *Local Transportation Fund* and *State Transit Assistance Fund.* An LTF is created in each county for transportation purposes specified in the Act which are derived from a 1/4 cent of the 6-cent retail sales tax collected statewide. Allocations under Article 4 are available to operators throughout the State for the support of "public transportation systems." Other transit services, including services provided exclusively for elderly and handicapped persons, may be funded under Article 4.5 (not subject to apportionment).

Other Local Revenues

HOV Lane Violation Fund

Penal Code 1463.26, effective January 1, 1989, entitles LACMTA to collect up to one-half of fines and forfeitures collected in Los Angeles County from the violations of Vehicle Code Sections 21655.5 (Vehicle Occupancy Levels) and 21655.8 (Crossing Over Double Parallel Solid Lines). The LACMTA receives one-third of the fines if violations occur within city limits and one-half of the fines if violations occur in an unincorporated area of the county. The HOV Violation fund is allocated to the Freeway Incident Management Program Freeway Service Patrol.

STATE REVENUES

Proposition 111 State Gas Tax

Many state programs are funded by the Proposition 111 state gas tax of five cents ($.05) per gallon that was effective on August 1, 1990 and a one cent ($.01) per gallon additional increase that was effective on January 1, of each of the next four years (1991 to 1994), for a total of a nine cent ($.09) increase. The measure enacted a fifty-five percent (55%) increase in truck weight fees for commercial trucks over 4,000 pounds, effective August 1, 1990, and another ten percent (10%) increase effective January 1, 1995. Proposition 111 also exempts from the GANN expenditure limit the revenues generated by these increases, so that the new funding can be spent for congestion relief and mass transit.

The increases in sales tax revenues resulting from higher fuel taxes would be deposited in the State Transportation Planning and Development Account and be use for transportation purposes. Funds in the Transportation Planning and Development Account would go first toward the planning activities of the California Department of Transportation and the California Transportation commission.

Environmental Enhancement & Mitigation Funds

These funds are generated from Proposition 111 State Gas tax allocating $10 million annually for 10 years for projects directly or indirectly related to the environmental impact of modifying existing transportation facilities for the design, construction, or expansion of new transportation facilities. Local, state and federal agencies including nonprofit entities may apply for and receive grants not to exceed $5 million.

State Transportation Improvement Program (STIP)

The STIP is the adopted plan of the California Transportation Commission for the allocation of funds to specific projects in future years. Programs identified in the STIP are funded through state and federal gas taxes. The STIP serves as a programming policy for revenues in the State Highway Account and from the Passenger Rail Bond Fund. The major programs include:

Flexible Congestion Relief (FCR)

The FCR is a statewide capital program for highway and fixed guideway capacity improvements composed of state and federal gas tax revenues. Guidelines are developed by Caltrans and adopted by the California Transportation Commission. FCR Funds are appropriated to major gap closures, backbone arterials, carpool lanes, and some fixed guideway uses.

Inter-Regional Roads

The Inter-Regional Road program was established for the purpose of improving inter-regional traffic on state highways outside urban limit lines from revenues composed of state and federal gas taxes. Projects eligible for this program are nominated by Caltrans for the STIP. These funds count toward meeting county minimums in whatever counties they are programmed. The federal share of this revenue source is assumed to increase every five years by the CPI through the end of the Plan. All unallocated Inter-regional Road revenues are transferred to the FCR fund annually.

State Highway Operation and Protection Program (SHOPP)

The State Highway Operation and Protection Program is established for the maintenance and operational integrity and safety of the State highway system. It includes rehabilitation and safety projects, operational improvements, and other work necessary to maintain system integrity.

State Rail Bonds

Proposition 108

Propositions 108 was passed by the voters on June, 1990 authorizing the State to sell $1 billion in general obligation bonds to provide funds for rail capital outlay. Eligible projects must be located on routes and corridors specified in the measure, or future statutes enacted by the Legislature with at least 15 percent of the total bond funds to be spent for inter-city rail.

Proposition 116

Proposition 116 was passed by the voters of June, 1990 authorizing the State to sell $1 billion in general obligation bonds to provide funds for mostly rail capital outlay allocating certain amounts to specified state and local entities through a grant program administered by the California Transportation Commission. Funds are used primarily for passenger and commuter rail systems, with limited funds available for public mass transit guideways, paratransit vehicles, bicycle and ferry facilities, and railroad technology museum. This program requires matching funds from local entities.

Transportation Planning & Development (TP&D)

TP&D revenues are generated from sales tax on diesel fuel, sales tax due to state tax on gasoline above nine cents per gallon, and "spill over" sales tax (4.75% tax on taxable goods, including gasoline, in excess of revenue generated from 5% state sales tax on all taxable goods, except gasoline).

State Transit Assistance (STA) Program

The STA program is a source of funding for transportation planning and mass transportation purposes as specified by the California Legislature derived from 50 percent of TP&D revenues.

Transit Capital Improvement (TCI) Program

TCI is an annual state program funded by the California Transportation Commission with Transportation Planning & Development and Article XIX (state gas tax) funds. Eligible uses include: abandoned railroad rights-of-way acquisition; bus rehabilitation; fixed guideway/rolling stock for commuter rail, urban rail and intercity rail; grade separation; intermodal transfer stations serving various transportation modes ferry projects - ferry vessels & terminals; and short-line railroad rehabilitation.

Transportation Systems Management (TSM)

TSM is a funding program for projects designed to make better use of existing transportation rights-of-way. Revenues in this program are generated from the Proposition 111 State Gas tax authorizing $1 billion for a 10-year period which is targeted for ready-to-go TSM projects on an annual basis.

FEDERAL REVENUES

Federal Highway Demo Projects

These revenues include federally authorized funding for projects designated in the 1991 Intermodal Surface Transportation Efficiency Act. The funds may be used for project development, right-of-way, and construction for projects designated in the ISTEA.

Intermodal Surface Transportation Efficiency Act (ISTEA)

ISTEA was signed by the President of the United States on December, 1991 providing $155 billion in revenues. This new flexible funding is authorized for both highway and transit use which is distributed under eligible criteria for the following programs: **Surface Transportation Program (STP)**, Minimum Allocation, Donor State Bonus, Interstate Maintenance, Bridge Replacement and Rehabilitation, National Highway System, Substitute Highway, and **Congestion Mitigation and Air Quality Improvement (CMAQ)** Programs.

ISTEA - CMAQ

Congestion Mitigation and Air Quality Improvement program (CMAQ) funds are apportioned to States which have ozone and/or carbon monoxide nonattainment areas (based on the nonattainment classification factor). Such projects are used to attain national ambient area air quality standards with funding of $6 billion. Projects must contribute to the reduction of air pollutants by implementing Transportation Control Measures (TCM), such as carpool lanes, Transportation Demand Management (TDM) measures and transit (transit-related project or program contained in an approved SIP). Other projects and programs may qualify if, after consultation with the Environmental Protection Agency, FHWA determines that they are likely to contribute to the attainment of a National Ambient Air Quality Standard.

ISTEA - STP

Surface Transportation Program is a new block grant type program that may be used by the states and localities for any roads (including NHS) that are not functionally classified as local or rural minor collectors. Such roads are now collectively referred to as Federal-Aid roads. Uses also include transit capital projects. Total funding for the STP is authorized over the 6-year period allowing the level to be augmented by the transfer of funds from other ISTEA programs and equity funds.

ISTEA Federal Transit Act Amendments of 1991

These revenues are generally administered by the Federal Transit Administration through transit formula and discretionary programs to achieve such objectives as transit and highway funding flexibility and identical matching shares, rail modernization funding by formula, increased use of the trust fund, and expanded research. Revenues from these programs are authorized over a 6 year period of the Act and consist of 58 percent from the Mass Transit Fund of the Highway Trust Fund.

Section 3 Discretionary and Formula Capital Program

The Section 3 program is authorized over the 6 year period. Funds are split 40 percent for Rail New Starts, 40 percent for Rail Modernization, and 20 percent for bus and other.

Rail New Starts

These discretionary funds require that projects be based on specific criteria for project justification and local financial commitment. Funds are generally earmarked by congress to specific projects and are programmed in the TIP based on current and projected congressional earmarks and FTA grant applications.

Rail Modernization

Similar to Rail New Starts, funds are used for rail transit capital improvements which are allocated by formula rather than on a discretionary basis to existing system improvements. Statutory percentages are used to allocate funds between historic rail cities and 1/2 to all cities with fixed guideways at least 7-years old on the basis of the Section 9 Tier formula factors.

Section 9 Formula Grant Program

Revenues are appropriated by Congress from the General Fund which are restricted to Bus and Rail capital expenses. Funds are allocated on a formula basis to each urbanized area in the nation. Funds may be used for highway projects in "Transportation Management Areas" (all areas over 200,000 and any other areas which the Governor requests), if all needs related to the Americans with Disabilities Act are met, the MPO approves, and there is a balanced local approach to funding highways and transit.

TECHNICAL APPENDIX E:
GLOSSARY

GLOSSARY

ASI	Access Services Inc. A non-profit corporation created to provide the complementary paratransit program required by the ADA.
AA/DEIS	Alternatives Analysis/Draft Environmental Impact Statement.
accessibility	A measure of the ability or ease of all people to travel among various origins and destinations.
ADA	Americans with Disabilities Act. A comprehensive civil rights measure signed into law July 1990, to ensure persons with disabilities receive equal access to transportation and other services.
ADT	Average Daily Traffic
AQMP	Air Quality Management Plan
ATU	Amalgamated Transit Union. The union representing the MTA's mechanics and other maintenance employees.
BAD	Benefit Assessment District. A limited area around public transportation stations in which non-residential property owners are taxed for benefits derived from proximity to the system.
bond	An interest-bearing promise to pay a specified sum of money -- the principal -- due on a specified date.
busway	A special roadway designed for exclusive use by buses. It may be constructed at, above, or below grade and may be located in separate rights-of-way or within highway corridors.
Caltrans	California Department of Transportation
capital costs	Nonrecurring or infrequently recurring costs of long-term assets, such as land, guideways, stations, buildings, and vehicles. These costs often include related expenses, for example, depreciation and property taxes. See also *operating costs*.
carpool	An arrangement in which two or more people share the use, cost, or both of traveling in privately owned automobiles between fixed points on a regular basis. See also *vanpool*.
carpool lane	A highway or street lane intended primarily for carpools, vanpools, and other high-occupancy-vehicle, either all day or during specified periods. It may be used by other traffic under certain circumstances, such as while making a right turn.
CBD	Central Business District
CFP	multi-year Call For Projects. A primary process for the MTA to select projects for funding with discretionary federal, state, and local revenues.
CHP	California Highway Patrol

CMAQ	Congestion Mitigation and Air Quality Improvement. A source of federal ISTEA funds.
CMP	Congestion Management Program. A countywide program enacted by the state to improve traffic congestion in California's urbanized areas.
CMS	Congestion Management System. One of nine management systems required under the Federal Intermodal Surface Transportation Efficiency Act.
CNG	Compressed Natural Gas
COG	Council of Governments
commuter rail service	Short-haul rail passenger service operated within metropolitan and suburban areas.
corridor	In planning, a broad geographical band that follows a general directional flow or connects major sources of trips. It may contain a number of streets and highways and transit lines and routes.
CPI	Consumer Price Index
CTC	California Transportation Commission.
CTS	Commuter Transportation Services. A nonprofit corporation which provides information and marketing services to aid the formation of ridesharing. Also known as "Commuter Computer."
CTSA	Consolidated Transportation Services Agency. The ASI has been designated as the CTSA for Los Angeles County, to coordinate all paratransit services to ensure compliance with the Americans with Disabilities Act (ADA). This effort has been organized under the MTA's subsidiary, Access Services Incorporated.
DMU	Diesel Multiple Unit
ECHO	federal Electronic Clearing House Operations Payment System.
EIR	Environmental Impact Report. A detailed report prepared under the California Environmental Quality Act (CEQA) describing and analyzing the significant environmental effects of a project and discussing ways to avoid or mitigate the effects.
EIS	Environmental Impact Statement. The same as an EIR, except prepared under (federal) National Environmental Policy Act.
EPA	federal Environmental Protection Agency.
express bus service	Bus service with a limited number of stops, either from a collector area directly to a specific destination or in a particular corridor with stops en-route at major transfer points or activity centers. Express bus service usually uses freeways or busways where they are available.
expressway	A divided arterial highway for through traffic. An expressway has full or partial control of access and generally has grade separations at major intersections.

FAP	Formula Allocation Program. Administered by the MTA, the FAP is the adopted method for allocation of federal, state and local transit operating subsidies to Los Angeles County bus operators. The current formula allocates funds as follows: 50% based on vehicle service miles and 50% based on "fare units." Allocations are made using audited performance data.
FCR	state Flexible Congestion Relief Program (refer to Appendix D, Fund Sources).
FFGA	Full Funding Grant Agreement. A grant agreement with the FTA currently for Metro Rail segments.
FHWA	Federal Highway Administration
fixed costs	A cost that remains relatively constant irrespective of the level of operational activity; expenditure that do not vary with output (e.g., land, guideways, rent).
fixed route transit	Regularly scheduled services operating repeatedly over the same street or highway pattern on a determined schedule.
flexible work hours	A work schedule in which employees can schedule the required number of work hours as they wish. It differs from staggered work hours in that it is the employee, not the employer, who sets the starting and ending times. Also known as *flextime*.
FONSI	Finding of No Significant Impact
FSP	Metro Freeway Service Patrol
FTA	Federal Transit Administration (*formally Urban Mass Transportation Administration - UMTA*)
FTIP	Federal Transportation Improvement Program
FY	Fiscal Year
GRH	Guaranteed Ride Home Program
guideway	In transit systems, a track or other riding surface (including supporting structure) that supports and physically guides transit vehicles especially designed to travel exclusively on it.
HCM	Highway Capacity Manual
HOV	High Occupancy Vehicle. See also *carpool.*
ISTEA	federal Intermodal Surface Transportation Efficiency Act of 1991 is a federal program that includes funds to continue the FAU program and additional funds for congestion mitigation and air quality improvement.
ITS	Intelligent Transportation System, formerly IVHS, combines modern technology to improve transportation.
JPA	Joint Powers Transit Authority

LACMTA	Los Angeles County Metropolitan Transportation Authority. Created in 1993 by Assembly Bill 152, the LACMTA is a 14-member board overseeing the merged entities of the former Los Angeles County Transportation Commission (LACTC) and Southern California Rapid Transit District (SCRTD). Also known as MTA.
LOS	Level of Service. A measure of traffic congestion level on a highway facility based primarily on the comparison between the facility's capacity and the traffic volume it carries. Increasing levels of congestion are designated along a scale from A to F where A is for best operation (low volume, high speed), and F is for worst conditions.
LRT	Light Rail Transit
LRTP	Long Range Transportation Plan
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding. A formal contractual agreement between two or more public agencies.
MPO	Metropolitan Planning Organization
MTA	Los Angeles County Metropolitan Transportation Authority
NAAQS	National Ambient Air Quality Standards
NHS	National Highway System
NTP	Notice to Proceed
operating costs	The sum of all recurring costs (e.g., labor, fuel) that can be associated with the operation and maintenance of the system during the period under consideration. See also *capital costs*.
origin-destination study	A study of the origins and destinations of the trips of vehicles or travelers. It may also include trip purposes and frequencies.
paratransit	Public or privately operated, regularly or dispatched on demand (delayed or real-time) providing "curb to destination" transit service. Normally used in specialized applications with user eligibility limitations (e.g., elderly and/or handicapped) or where demand is not sufficient to support fixed route service.
PIR	Project Information Award
Prop A	Proposition A (refer to Appendix D, Fund Sources)
Prop C	Proposition C (refer to Appendix D, Fund Sources)
PS&E	Plans, Specifications, and Estimates
PSR	Project Study Report
PUC	Public Utilities Code

RME	Regional Mobility Element. The Southern California Association of Governments' major policy and planning statement on the region's transportation issues and goals. It is comprised of a set of long-range policies, plans, and programs that outline a vision of a regional transportation system compatible with federal and state mobility objectives. Formally called the Regional Mobility Plan (RMP).
ROW	Right-of-Way
RSTI	Regional Surface Transportation Improvement
RTIP	Regional Transportation Improvement Program. This plan is required in order for the region to qualify for federal funding, which is the basis for Los Angeles County input into the State Transportation Improvement Program (STIP).
SAFE	Service Authority for Freeway Emergency. Created by the MTA, as permitted by state law, to receive one dollar from each vehicle registration within Los Angeles County. Funds are used to provide expanded and improved emergency call box services along the freeways. The activities are accounted for in a Special Revenue Fund.
SCAG	Southern California Association of Governments. The Metropolitan Planning Organization for the Counties of Imperial, Los Angeles, Orange, Riverside, San Bernardino and Ventura.
screen line	An imaginary line, usually following such physical barriers as rivers or railroads, that split a study area into parts and along which traffic counts and interviews may be conducted and compared.
SCRRA	Southern California Regional Rail Authority
SHOPP	State Highway Operation and Protection Program
SIP	State Implementation Plan. A planning document required by the Clean Air Act (CAA) which serves as a State's commitment to actions which will lead to the attainment of National Ambient Air Quality Standards.
SLTPP	State/Local Transportation Partnership Program
smart shuttle	Flexible routed vehicle assisted by modern technology, such as Automated Vehicle Locator, real-time scheduling, etc.
SOV	Single Occupancy Vehicle
SRTP	Short Range Transportation Plan. A five year business plan, completed every three years, which is used for internal planning by operators and the MTA, and is required to be submitted to several governmental entities.
STA	State Transit Assistance fund. A Special Revenue Fund used to account for the revenue received by the MTA from the sales tax on gasoline used for transit purposes. The STA fund was created as an amendment to the Transportation Development Act of 1976.
STIP	State Transportation Improvement Program. Adopted by the California Transportation Commission (CTC), and serves as the primary vehicle for programming funds for highway projects.

STP	Surface Transportation Program - ISTEA
TAC	Technical Advisory Committee
TCI	state Transit Capital Improvement Program
TCM	Transportation Control Measure
TDA	state Transportation Development Act
TDM	Transportation Demand Management
TIP	Transportation Improvement Program. A program document which establishes allocation of funding for Los Angeles County highways and transit.
TMA/TMO	Transportation Management Association/Transportation Management Organization
TP&D	Transportation, Planning, and Development
TPM	Transit Performance Measurement. A program, adopted by LACTC in 1981 in accordance with state law, to monitor system performance of transit operators who receive federal and state transit operators who receive federal and state formula-driven funds (such as STA, TDA, Section 9).
transit dependent	Individual(s) dependent on public transit to meet private mobility needs (e.g., unable to drive, not a car owner, not licensed to drive, etc.)
TSM	Transportation System Management. A program of operational strategies such as improved communications, surveillance, synchronization, and control systems to maximize the person-carrying efficiency and usage of the existing transportation network.
VMT	Vehicle Miles Traveled. 1. On highways, a measurement of the total miles traveled by all vehicles in the area for a specified time period. It is calculated by the number of vehicles time the miles traveled in a given area or on a given highway during the time period. 2. In transit, the number of vehicle miles operated on a given route or line or network during a specified time period.