FTA QUARTERLY REVIEW BRIEFING BOOK

March 6, 2000

Submitted By:

Los Angeles County Metropolitan Transportation Authority
One Gateway Plaza
Los Angeles, California 90012

41494532

AGENDA

FTA QUARTERLY REVIEW MEETING

Los Angeles County Metropolitan Transportation Authority

Monday, March 6, 2000 - 12:30 p.m.

Gateway Conference Room - 3rd Floor

		PRESENTER
I.	**OVERVIEW**	
A.	FTA Opening Remarks	Leslie Rogers
B.	MTA Overview	Allan Lipsky
1.	Management Organization	
2.	Strategic Plan	
3.	Legislative Issues	
4.	Legal Issues	
5.	Regional Transit Alternatives Analysis (RTAA)	David Yale
6.	Metro Blue Line Safety Issues	Paul Lennon
II.	**METRO CONSTRUCTION REPORTS** (Presentations should emphasize issues and efforts to resolve them with questions and answers to follow)	
A.	Recent Events	Charles Stark
B.	Metro Red Line Segment 2	Henry Fuks
1.	Contract and Change Order Closeout	Gwen Williams
2.	Grant Closeout	Brian Boudreau
C.	Metro Red Line Segment 3	
•	North Hollywood Extension	Dennis Mori
D.	Segment 1 Thin Tunnel Repair Work Completion Schedule	Henry Fuks
III.	**OPEN ACTION ITEMS**	
A.	FTA (Reference December 1999 PMOC Monthly Report)	Jeff Christiansen
IV.	**OTHER QUARTERLY REPORTS**	
A.	Financial	
1.	Capital and Operating MTA Annual Budget	Richard Brumbaugh
B.	Planning	
1.	Five Year Plan	Wayne Moore
2.	Long Range Transportation Plan	Keith Killough
C.	Bus Operations	
1.	Consent Decree	Michelle Caldwell
2.	Bus Fleet Management Plan	
D.	Year 2000	Don Stiner

V. PROPOSED SCHEDULE AND LOCATION OF NEXT MEETING:

Los Angeles Metropolitan Transportation Authority

Wednesday, May 31, 2000 - 10:00 a.m.

Gateway Conference Room - 3rd Floor

Los Angeles County
Metropolitan Transportation Authority
Management Organization Chart
as of January 4, 2000
Published by Human Resources Dept
(213) 922-7181
TA Central Telephone (213) 922-2000

MTA Board of Directors

Michelle Jackson
Board Secretary
922-4605

County Counsel
(Steve Carnevale)
General Counsel
922-2511

Julian Burke
Chief Executive Officer
922-7401

Arthur Sinai
Inspector General
244-7333

William Lowe*
Ethics & Lobby Registration
922-2981

Office of the CEO
Julian Burke, CEO
Allan Lipsky, Deputy CEO
and Chief Operating Officer
Richard Brumbaugh, Chief Financial Ofcr

Michelle Caldwell
Dep. Executive Officer
New Business Dev.
922-2452

Gary Clark
Director
Board Research Svcs.
922-2226

William Bernsdorf
Managing Director
Mgmt. Audit Svcs.
922-4292

Deborah Guy
Managing Director
Risk Management
922-4297

Claudette Moody
Director
Govt. Relations
922-2237

Paul Lennon
Managing Director
System Safety & Security
922-4418

Marc Littman
Director
Public Relations
922-4609

Tom Webb*
Office of Labor Relations
922-7120

Charles Stark
Executive Officer
Engineering &Construction
922-7220

- reserved — Dep. Executive Officer, Construction Admin, 922-7504
- Henry Fuks — Dep. Executive Officer, Construction, 922-7282
- Jeff Christiansen — Dep. Executive Officer, Program Management, 922-7342
- Joel Sandberg — Dep. Executive Officer, Engineering, 922-7223
- Henry Fuks* — Dep. Executive Officer, Red Line Seg 2, 922-7154
- Dennis Mori — Dep. Executive Officer, Red Line Seg 3- N. Hwd, 922-7238
- William Moore — Director of Quality, 922-7385

Thomas Conner
Executive Officer
Operations
922-4310

- Richard Hunt — Dep. Executive Officer, Maintenance, 922-4901
- Daniel Ibarra — Dep. Executive Officer, Bus Transportation, 922-4414
- Ralph de la Cruz — Dep. Executive Officer, Rail Operations, 922-4322
- Gary Spivack — Director, Transit Oper. Support, 922-4035

Terry Matsumoto
Executive Officer, Finance
922-2473

- Wayne Moore — Dep. Executive Officer, Office of Mgmt & Budget, 922-7355
- Agapito Diaz — Director, Revenue, 922-7663
- Josie Nicasio — Controller, 922-6810
- Terry Matsumoto — Treasurer, 922-2473
- David Champion — Chief Estimator, 922-7376
- Jeanne Kinsel — Director Contract Admin, 922-1476

Gwendolyn Williams*
Executive Officer
Procurement, Labor & Contract Compliance
922-1010

- Ted Montoya — Dep. Executive Officer, Material Management, 922-1020
- Ruthe Holden* — Director Contract Admin, 922-9100
- Larry Kelsey* — Director Contract Admin Construction, 922-7321
- Rudy Leflore — Director Compliance, 922-3699
- Duane Johnson — Director Contract Admin, 922-1083
- Cheryl Broussard *** — Manager Contract & Labor Compliance, 922-2603

Frank Cardenas
Executive Officer
Administration
922-7491

- Elizabeth Bennett — Dep. Exec. Officer (CIO) Information Technology Services, 922-4522
- Warren Morse — Dep. Executive Officer Marketing & Customer Relations, 922-5661
- Brian Soto — Director General Services, 922-4790
- Velma Marshall — Director Real Estate, 922-2415
- Don Stiner — Director Year 2000 Project, 922-7363

James de la Loza
Executive Officer
Regional Transportation Planning & Development
922-3071

- Frank Flores — Dep. Executive Officer Capital Development & Programming, 922-2456
- Keith Killough — Dep. Executive Officer Countywide Planning, 922-2827
- Robert Cashin — Dep. Executive Officer Transp. Development & Implementation, 922-3009
- Dana Woodbury — Dep. Executive Officer Ops Planning & Scheduling Consent Decree Compl. Ofcr, 922-4207

Ray Inge**
Executive Officer
Human Resources
922-7123

- Naomi Nightingale — Director Human Resources, 922-5256
- Herminio Vargas — Manager Equal Employment Opty, 922-2634
- Amy VanderBreggen — Manager Class & Comp, 922-5223
- William Frazier — Manager Employee Relations, 922-4412

Notes:
* Acting/interim appointment

** Ray Inge is also designated Affirmative Action Officer and reports directly to the CEO.

*** Cheryl Broussard is the designated Labor and Contract Compliance Officer and in such role reports directly to the CEO.

GOVERNMENT RELATIONS
1999/00 LOCAL, STATE AND FEDERAL LEGISLATIVE MATRIX
as of January 28, 2000

LOCAL

PROPOSALS/ACTIONS	DESCRIPTION	STATUS
$200 million Agreement with the City of Los Angeles	The MTA and the Los Angeles City Council signed an agreement July 24, 1997, that committed the City to providing the MTA $200 million over eight years to assist with the construction of the MTA's rail program. On September 29, the MTA Board of Directors voted to approve a draft amendment to the Agreement. Discussions between the MTA and the City of Los Angeles are continuing.	The MTA and City of Los Angeles Chief Legislative Analyst (CLA) are currently negotiating the balance of the agreement. On May 4, 1999, the Los Angeles City Council unanimously adopted a resolution to formally direct city staff to amend the current agreement with the MTA. ~~Negotiations between the MTA and the City of L.A. are continuing.~~
Valley Transportation Zone	On August 26, 1998, the Los Angeles City Council approved a motion to explore the feasibility of a transportation zone in the San Fernando Valley.	On February 25, 1999, the MTA Board voted to give the public, municipal transit agencies, transit unions and others an additional month to comment on draft guidelines for proposed new transit zone recommendations. The board will consider this motion at it's April 29, 1999, meeting. On April 29, the MTA Board approved the zone pre-applications but voted to adopt the Local Transit Zone Guidelines. Staff was directed to continue to work with the applicants to revise the guidelines. The board will consider the revised guidelines at it's May 27, 1999, meeting. On May 27, 1999, the MTA Board of Directors approved pre-applications for proposed transit zones filed by Foothill Transit and the Greater San Fernando Valley Transportation Zone. The Board also approved the selection of 36 Metro bus lines as being significant to the region. On January 5, 2000, the Transportation Committee of the City of Los Angeles approved the Chief Legislative Anaylst (CLA) and Department of Transportation (LADOT) reports which recommend that the City enter into an interim Joint Powers Authority (JPA) with eight other cities and the County of Los Angeles, and continue the process of establishing the Zone.

Changes are in bold

	LOCAL	
PROPOSALS/ACTIONS	**DESCRIPTION**	**STATUS**
101 - 405 Freeway Interchange	The Los Angeles City Council established a task force to identify improvements and study solutions that could be in place within five years to relieve the traffic congestion at the interchange.	On November 19, 1998, MTA Board of Directors recommended a list of candidate projects for consideration by Caltrans for inclusion in the Interregional Transportation Improvement Program (ITIP). On January 21, 1999, the MTA Planning & Programming Committee adopted to provide a 20 % match to the $13.1 million proposal to fund improvements for the interchange. On April 29, the MTA Board adopted the Planning & Programming Committee's recommendation to approve the Los Angeles county project list which prioritizes rebuilding 101-405 Interchange. On July 29, the MTA Board adopted the 1999 TIP Call for Projects which includes $8.2 million in funding for two lane additions at the 101-405 interchange. On January 7, 2000, the Los Angeles City Council will consider a motion by Council members Laura Chick and Hal Bernson instructing LADOT, in conjunction with Caltrans, the Metropolitan Transportation Authority and the Southern California Association of Governments, to prepare and present a report to Council, addressing all studies or research currently underway about relieving congestion along the 101 Freeway Corridor, by February 1, 2000.

Changes are in bold

STATE ASSEMBLY			
BILL/AUTHOR	**DESCRIPTION**	**MTA POSITION**	**STATUS**
AB 30 (Pescetti) LA 4/26/99	Appropriates $100 million to the Office of Criminal Justice Planning to fund grants for the salaries and benefits of peace officers previously funded by a federal grant that expires on or before January 1, 2002. This bill could benefit the MTA by providing funding for existing and additional police officers to patrol our transit services.	Support	Held in Assembly Appropriations Committee 2-year bill ***This bill has passed its deadline to be considered for this session***
AB 38 (Washington) LA 8/26/99	Original bill extended the $1 motor vehicle registration fee to the year 2004 for South Coast Air Quality Management District (SCAQMD) projects. Amended bill unrelated to transportation.	Neutral	Vetoed by Governor ***This bill has passed its deadline to be considered for this session***
AB 44 (McClintock) LA 8/16/99	Mandates the re-designation of all existing High Occupancy Vehicles (HOV) as mixed flow-lanes and directs a study be conducted on the efficacy of HOV lanes.	Oppose	**Failed passage in Assembly Transportation Committee, January 10**
AB 102 (Wildman/Hertzberg) LA 8/16/99	Provides 100 percent of the funding necessary to complete construction of the 1989 Retrofit Soundwall List. Issue handled administratively by CTC.	Support Sponsor	Failed Passage in Senate Transportation Committee (4-5) Reconsideration Granted, 8/17 ***This bill has passed its deadline to be considered for this session***
AB 276 (Longville) LA 5/18/99	Directs all sales tax proceeds derived from gasoline sales to the Public Transportation Account (PTA).	Support	Held in Assembly Appropriations Committee ***This bill has passed its deadline to be considered for this session***

Changes are in bold

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Changes are in bold

STATE ASSEMBLY			
BILL/AUTHOR	**DESCRIPTION**	**MTA POSITION**	**STATUS**
AB 308 (Longville) LA 9/3/99	Adds the rehabilitation and reconstruction of rolling stock and transit capital infrastructure to the list of annual fund estimates.	Support	**Vetoed by Governor in previous session** ***This bill has passed its deadline to be considered for this session***
AB 357 (Calderon) LA 5/28/99	Original bill added $45 million to $15 million off the top of State Highway Account funding for grade separation projects throughout the state. Amended bill for a report on the sufficiency of grade separation projects.	No Position	In Senate Transportation Committee ***This bill has passed its deadline to be considered for this session***
AB 521 (McClintock)	Redirects the state share of sales tax on gasoline currently allocated to the general fund to fund the construction and maintenance of mixed flow freeway lanes and increase the share of funding to cities and counties.	Neutral	**Failed passage in Assembly Transportation Committee, January 10**
AB 581 (Firebaugh) LA 8/14/99	Directs a study conducted to assess traffic congestion on Route 710, the Long Beach Corridor. The MTA Board urged the bill be amended to be permissive not a mandate. The bill was amended to make it permissive.	Support with Amendment	In Senate inactive file, 8/25 ***This bill has passed its deadline to be considered for this session***
AB 682 (Margett)	A "spot" bill which currently makes non-substantive changes to MTA law.	Neutral	In Assembly ***This bill has passed its deadline to be considered for this session***

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STATE ASSEMBLY			
BILL/AUTHOR	**DESCRIPTION**	**MTA POSITION**	**STATUS**
AB 958 (Scott) LA 8/17/99	Provides a clearer process for the utilization by local agencies of the design-build procurement authority established in 1996.	Support	In Senate Transportation Committee 2-year bill ***This bill has passed its deadline to be considered for this session***
AB 1425 (Runner) LA 8/16/99	Provides that funding identified as the federal regional surface transportation program funds would not merely be added to the overall STIP for distribution, but rather be apportioned to metropolitan planning organizations, or in Southern California, to county transportation commissions based upon population. Committee amendment added to apportion 20% of the funds to environmental enhancement programs.	Sponsor	Hearing in Senate Appropriations Committee, suspense file, 8/16 ***This bill has passed its deadline to be considered for this session***
AB 1612 (Torlakson) LA 6/22/99	**Creates the Transportation and Congestion relief and local road improvement account and allocates $400 million annually from the General Fund Account.**	**None**	**Amended in Senate on 1/6 Re-referred to Senate Transportation Committee**
AB 1765 (Maddox)	**Makes substantive changes to the LACMTA's benefit assessment districts**	**No position**	**Maybe heard on February 19**
AB 1776 (McClintock)	**Governor to declare a state of transportation "gridlock" emergency.**	**No position**	**May be heard on February 19**

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Note: "Status" will provide most recent action on the legislation and current position in the legislative process.

Changes are in bold

STATE SENATE			
BILL/AUTHOR	**DESCRIPTION**	**MTA POSITION**	**STATUS**
SB 10 (Rainey) LA 4/21/99	Directs $300 million in State Highway Account (SHA) funds for local streets and roads rehabilitation and storm drainage repairs. This measure is identical to AB 1612 (Florez).	Neutral, seek amendments	Held in Senate Transportation Committee ***This bill has passed its deadline to be considered for this session***
SB 14 (Rainey) LA 9/10/99	Requires the Department of Transportation (Caltrans) to complete a study setting forth criteria for determining the "effectiveness" of HOV lanes. Mandates that Caltrans cannot designate or construct any new HOV lanes until study is completed. Amended to a study bill only. **This bill has been amended to a subsection unrelated to the MTA.**	Oppose, unless amended As amended, now neutral	Senate unfinished business 2-year bill
SB 17 (Figueroa) LA 4/29/99	Provides a tax incentive for employers who subsidize transit passes for their employees by granting a tax credit equal to 40% of the employer's cost.	Support	Held in Senate Appropriations Committee ***This bill has passed its deadline to be considered for this session***
SB 65 (Murray) LA 3/23/99	Provides $20 million in funds for transportation programs for CalWORKS recipients.	Support with amendments	Held in Senate Appropriations Committee - Suspense File ***This bill has passed its deadline to be considered for this session***

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STATE SENATE			
BILL/AUTHOR	**DESCRIPTION**	**MTA POSITION**	**STATUS**
SB 315 (Burton/Karnette) LA 9/1/99	Provides that a bond measure be placed on the ballot. Part of a packet of measures, SCA 3 and SR 8, relating to funding for California's transportation capital needs.	Support	Conference Committee 2-year bill
SB 372 (Murray) LA 9/7/99	Previously SB 1101. Provides that transportation zones must assume MTA union agreements for a 4-year period after the creation of the zone. Specifies that transferred MTA employees are zone employees.	Oppose	**Vetoed by Governor** **Veto was sustained**
SB 677 (Polanco) LA 4/21/99	Provides for a partial and temporary exemption of the sales tax specifically for the MTA and its purchase of transit vehicles.	Sponsor	Held in Senate Revenue and Taxation Committee 4/21 ***This bill has passed its deadline to be considered for this session***
SB 851 (Hayden)	Similar to SB 1886, this bill would establish seven transportation planning boards throughout the county to be the "sole and exclusive" planning entities for transportation and capital projects within given geographical areas.	Oppose	Held in Senate Transportation Committee on 4/20 ***This bill has passed its deadline to be considered for this session***
SB 864 (Alpert)	A "spot" bill which currently makes non-substantive changes to MTA law. Author change indicates that this bill will most likely be used on another issue unrelated to MTA.	Neutral	Passed in Senate Transportation Committee, 1/4/00 In Senate Appropriations Committee
SB 1101 (Murray) LA 8/26/99	Designates transportation zones as organizational units of the MTA with its employees to be part of the same collective bargaining agreements as represented by the MTA. Provisions amended into SB 372.	Oppose	In Assembly Refer to SB 372 (Solis) ***This bill has passed its deadline to be considered for this session***

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STATE SENATE			
BILL/AUTHOR	DESCRIPTION	MTA POSITION	STATUS
SB 1102 (Murray) **LA 1/3/00**	**Amended Bill which would apply the AB 89 restrictions to any new transit zones. Amended in Senate Transportation Committee, "held off the floor," to provide that the four-year retroactive provision does not apply to the Transit Zone entities and contractors doing business with those entities.**	**No position**	**Passed in Senate on 1/27** **In Assembly**
SB 1202 (Karnette)	Requires that in resolving issues relating to labor organization representation for the MTA, the State Director of Industrial Relations must define the term "employee" as including individuals employed as supervisors and managers. MTA will work with Karnette's staff to clarify and amend bill to reflect recent MTA actions in this regard.	Oppose unless amended	Senate Industrial Relations Committee
SB 1243 (Murray) LA 5/28/99	Bill creates a construction authority for an undefined project along the Exposition Right-of-Way.	No position	In Senate Transportation ***This bill has passed its deadline to be considered for this session***
SB 1276 (Hayden) LA 8/16/99	Original bill provided that the MTA Board of Directors may not pass any agenda item "with less than seven affirmative" votes. Amended to prohibit MTA from expending any funds until the conditions of a consent decree and subsequent rulings are deemed met by the Special Master. Urgency clause adopted.	Oppose	Failed Passage in Senate Transportation Committee, 8/17 Reconsideration granted ***This bill has passed its deadline to be considered for this session***

Changes are in bold

STATE SENATE			
BILL/AUTHOR	**DESCRIPTION**	**MTA POSITION**	**STATUS**
SCA 3 (Burton) LA 8/16/99	Original measure provided that local transportation sales taxes can be approved by a majority vote, rather than the 2/3rds vote required by state Constitution for tax measures. Amended measure provides for a statewide sales tax with a requirement that "non-transportation sales tax counties" must submit an expenditure plan to voters on a countywide ballot. Current transportation sales tax counties could extend their measures with a vote of the County Transportation Authority Board. This measure as currently written, has no impact on Los Angeles County transportation sales tax measures. Part of a packet of measures, SR 8 and SB 315, relating to funding for California's transportation capital needs.	Support	Failed passage in Assembly, 9/7

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FEDERAL		
BILLS/AUTHOR	**DESCRIPTION**	**STATUS**
	FY 2001 TRANSPORTATION APPROPRIATIONS	
	Information not available at this time.	

Changes are in bold

Metropolitan
Transportation
Authority

One Gateway Plaza
Los Angeles, CA
90012-2952

January 31, 2000

Mr. Leslie Rogers
Regional Administrator
Federal Transit Administration
Region IX
201 Mission Street, Suite 2210
San Francisco, CA 94105

RE: WORKERS COMPENSATION QUARTERLY REPORT

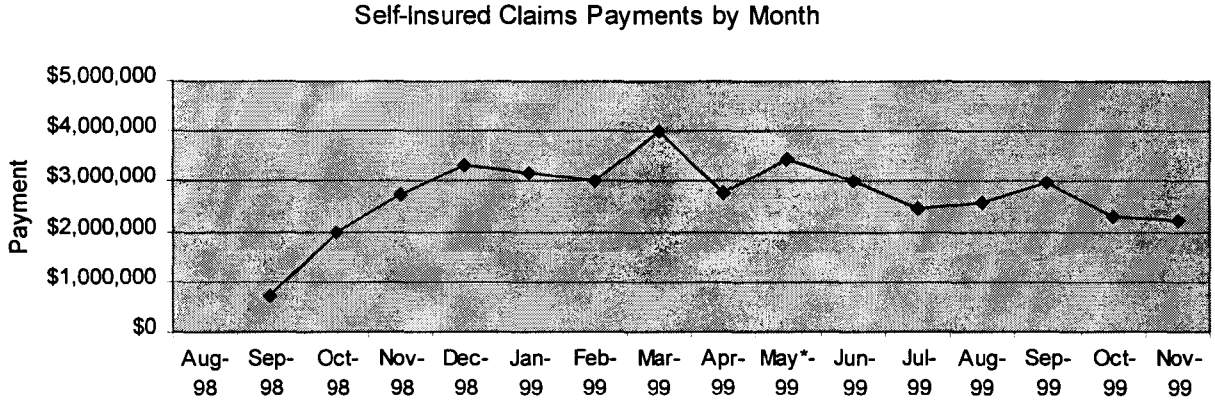
Dear Mr. Rogers:

In an effort to manage and control Operations' workers' compensation costs, the following has been accomplished during the second quarter:

Self-Insured Claims

On September 1, 1998, Travelers Insurance Company received 5,013 MTA self-insured claims for administration. Of those, 3,571 still remain open. This constitutes a 29% reduction in the number of open inventory claims. Travelers and the MTA are committed to the appropriate, expedited resolution of this outstanding liability.

The following chart depicts payment amounts on those claims since 9/1/98.



As indicated above, self-insured claim payments reflect a downward trend. Risk Management is pushing claims to economical conclusion, which may result in future increases in these numbers. Our goal is to equitably close as many claims as possible to alleviate this costly exposure.

Staff was asked to research and report on the percentage of self-insured claims that constitute resolved matters with the only pending exposure that of future medical payments owed. 15% of the pending self-insured claims fall within that category, totaling $13.6 million of our open reserves.

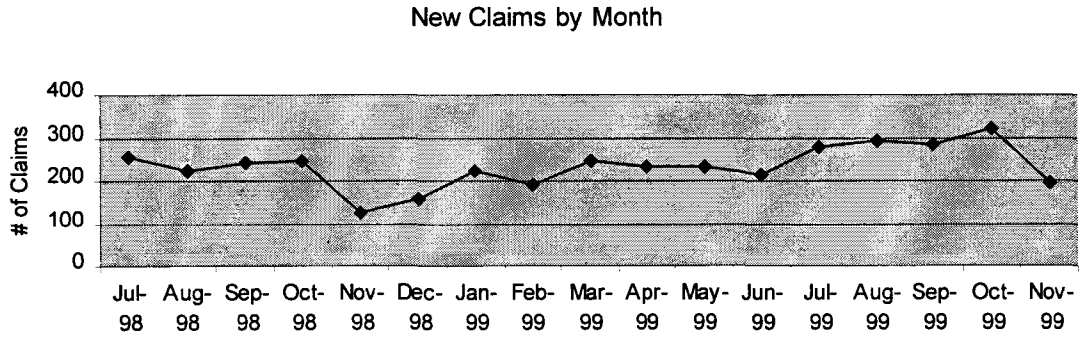
Recurrence Claims

In FY98, the MTA received an average of 145 recurrence claims (claims that are determined to be an exacerbation of an existing claim) every month. Between September 1, 1998 and November 30, 1999, 261 claims were deemed recurrences, an average of 17 per month. This number, and numbers reported in prior reports, includes insured as well as self-insured "re-occs". The number of recurrences has been controlled in both insured and self-insured claims. Recurrences of self-insured claims are down to an average of 14 per month.

These claims are closely monitored by the Risk Management Department to ensure that no claims that belong in the fully insured program are charged as self-insured to the MTA. Travelers provides monthly updates on claims that impact the self-insured program. Risk Management continues its rigorous audit schedule of Travelers' claims to protect the MTA from adverse effects of recurrence claims.

New Claims

An average of 266 new work comp claims per month was reported during the past three months. This is an increase from the 235 monthly average reported last quarter. We experienced a spike in claim frequency in October to 320, resulting in a higher quarterly average than previously reported.



We have implemented training programs and other loss prevention measures, described later in this report, to address our continuing loss frequency problems.

Carve Out Program

Risk Management has worked with Government Relations to research the feasibility and benefits of sponsoring legislation allowing public transit agencies to collectively bargain a "carve out" program, separate from the California workers' compensation system. This alternate system would afford employees speedier access to benefits and alleviate some of the adversarial tendencies inherent in the present workers' compensation system.

These carve outs are currently only available to the construction industry in California. Such programs, which include alternative dispute resolution programs and the use of agreed medical panels to treat injured workers, have proven successful in other places such as Oahu Transit. TheBus (Oahu Transit) reports significant savings as a result of implementing such a program.

In November, the Board approved including legislation allowing public transit agencies to bargain such carve-out agreements in our legislative plan. We have approached our unions for consideration of co-sponsoring the legislation that would afford us the opportunity to negotiate such a program into our new contracts. UTU has expressed interest in the concept but has not yet committed their support. The same is true of ATU.

Cooperation with the OIG—Fraud Control

The OIG, Travelers and Risk Management have formed an alliance to address the issue of fraudulent workers' compensation claims. Regular meetings are held to discuss potentially fraudulent activities and to develop strategies on addressing the problems of fraud and abuse.

As reported last quarter, the 700 files involving "repeaters", individuals who have filed multiple workers' compensation claims, have been reviewed by a team of Travelers Special Investigation Unit personnel for flags indicating fraud. 267 leads were developed from that effort.

Activity checks and surveillance resulted in thirty employees returning to full duty from temporary total disability. Six of these individuals have been identified as having concurrent employment while collecting total temporary disability. Corroborating surveillance evidence has been collected for use in criminal prosecutions of these fraudulent activities.

In October, the Los Angeles County District Attorney's office filed a felony complaint against a retired MTA bus operator for insurance fraud. That individual was arrested and faces prosecution. The Los Angeles County District Attorney accepted another

criminal case for consideration in late October for three counts of violating Section 1871.4(a) of the California Insurance Code, insurance fraud.

Travelers has dedicated six individuals to pursuit of fraudulent MTA workers' compensation claims. That group has submitted four cases to the District Attorney for criminal prosecution. Six additional cases are being prepared for referral to the District Attorney's office. Thirty cases have been referred to the California Department of Insurance's Fraud Bureau. All of those referrals are on self-insured claims.

Travelers has moved a member of the Special Investigation Unit into the Gateway Building to afford greater accessibility to internal personnel. This resource proved useful in a recent situation involving the resignation of an MTA employee after being confronted with fraudulently filing a workers' compensation claim.

The ALTA Analytics Program, mentioned in last quarter's report, is a computer program designed to electronically analyze and integrate claim data to identify fraud warning signs to claims personnel. Travelers is utilizing the program to track recurring references in claims, such as medical providers, that have been flagged as potentially involved in fraudulent activities. We continue to monitor the progress of this new, innovative tool in the fight workers' compensation fraud.

We continue to pursue the costly drain of fraud upon public funds. The continued partnership between Travelers, Staff and the Office of the Inspector General will keep the focus on prevention and accountability for fraud.

Pothole Claims

An in-house investigative program is underway at Divisions to investigate claims of injury resulting from road conditions. In the past, it was difficult to affirm or refute such claims, exposing the MTA to potential fraud. Operations and Risk Management have teamed to immediately and aggressively investigate these claims as soon as they are reported.

Travelers has mapped the claims allegedly resulting from potholes. They have identified the locations of 98 claims. If an actual verified road hazard exists, bus routes should be flagged accordingly to avoid duplicate injuries to other operators and passengers. Potholes will be brought to the attention of the jurisdiction wherein they are located and subrogation claims will be pursued. If no pothole or road hazard can be located, the claim will be aggressively investigated and possibly denied by the administrator.

We will track the progress of this newly incepted program and report periodically.

Transitional Duty Program

An analysis of the components of MTA's historic workers' compensation claims reflects that our claim frequency has remained relatively static, as have payments for medical bills and legal fees. The portion of our claims that has escalated over the past several years is the indemnity paid to employees. Employees are staying away from work longer for injuries than in the past. This is a phenomenon experienced by employers throughout California.

To address a part of these rising indemnity costs, we created a mechanism whereby an employee can return after a work-related injury. The MTA now brings employees back to work, accommodating the individual's temporary medical restrictions for a period of 60 days until the employee can return to normal duties.

The Transitional Duty Program (TDP), which is designed to reduce claim severity, began operation on January 18, 1999. As of November 30, 1999, 295 employees had participated in the TDP. 136 of those employees have returned to their normal duties. TDP participants are returning to normal duties 51% faster than anticipated by treating physicians. A conservative estimate of the savings associated with the Transitional Duty Program since inception is $648,000 (net of salaries paid to employees enrolled in the program).

In July of 1998, 444 MTA employees were out on temporary disability. Through diligent use of the Transitional Duty Program, we have reduced that number to 324. This is a reduction of 11 from last quarter. We expect that the program will expand to accommodate the majority of our injured workers, decreasing temporary disability payments associated with workers' compensation claims. As of November 30, 1999, workers' compensation payments not made as a result of this program totaled $845,000.

As previously reported, the Transitional Duty Program is expected to pay for itself in reduction of future claims. Indemnity payments were fully insured through Travelers from September 1, 1998 through September 1, 1999. Since that date, a cost sharing arrangement has been in place between the MTA and Travelers. Reducing temporary disability and increasing productivity by returning employees to work sooner is now even more important to the MTA. The Transitional Duty Program is one of the most significant measures that the MTA can implement to drive workers' compensation costs down.

First quarter budget savings of approximately $500,000 resulted from a slower than anticipated roll-out of the Transitional Duty Program. Risk Management and Operations have renewed commitments to using this program to return our industrially injured employees to work as soon as possible. Efforts to expand this loss reduction tool have resulted in increased usage of the program, recently to 80% of this quarter's budget.

Loss Prevention Measures

In a concerted effort to control the volume of new industrial injury claims, Operations Safety has committed to undertaking important efforts in injury prevention. 18% of the new claims filed in the past three months relate to back injuries. In January, 2000, Operations Safety will initiate a Safety Lifting Campaign" for all Bus and Rail Maintenance divisions. Safety pamphlets and posters entitled "Practice Safe Lifting at Work" will be delivered to divisions. In February, Operations Safety will train division managers and supervisors with videos, training manuals and handouts describing safe lifting techniques. Division managers and supervisors will then be responsible for the training of maintenance personnel during regular division safety meetings.

As a follow-up to this initial training, a booklet entitled "Back Problems" will be delivered to all maintenance personnel in April 2000.

Ergonomics

Ergonomic and repetitive motion injuries account for 11.9% of our workers' compensation claims valued over $5,000. Operations Safety, in conjunction with Travelers and Risk Management, has held supervisory training in the Gateway Building on proper workstation adjustments to avoid repetitive motion injuries. Subsequent to this training, continued workstation evaluations have been performed by Operations Safety, both at Gateway and at Division 8.

The ergonomics program mandated by Cal/OSHA Title 8 General Industry Safety Orders, Section 5110, has been revised by Operations Safety, incorporating comments from Travelers. This program is designed to identify, correct and control repetitive motion type injuries through training and heightened awareness of ways in which to mitigate exposure to injury.

Injuries due to operator seat movement account for 9.7% of MTA's claims. Transit Operations Office of Central Instruction has agreed to include bus seat orientation, utilization and adjustment in their new operator training program. An Internet-based computerized training program with all OSHA mandated programs' software, including ergonomics, has been ordered. This pilot program will be placed in selected rail, bus and facility locations for employee usage on a one-to one training schedule.

Additionally, Safety, in conjunction with Travelers, has provided input on the current draft "CNG Low Floor Bus Specifications" for the purchase of new buses to assure that operator compartment and whole-body vibration issues had been addressed from an Ergonomic perspective.

Steering Committee

The interdisciplinary steering committee continues to meet to address aspects of workers' compensation and share experiences that assist in loss reduction. A sub-committee of that group is studying fitness for duty issues and the need for review of MTA's return to work physicals to ensure that physicians conducting these examinations understand the physical requirements of an employee's job before that employee is allowed to return to full duty.

Agency-wide Focus

Inherent in reducing the cost of workers' compensation is keeping the agency focused on the problem and recognizing work comp as an agency-wide issue. A partnership has been developed between Operations, Safety, Risk Management and our insurer to address the workers' compensation problems that have plagued the agency. The Professional Pride Program, a partnering effort between the Safety and Security, Operations and Risk Management departments, will recognize top operating employee performers with an eye to safety. In addition to safe driving and customer service goals, the program will focus on loss prevention in an effort to reduce claims and ensure that all employees take ownership to the problem.

We will soon begin our discussions with Travelers about continuing our partnership for a fourth year. Losses have not been significantly reduced yet. Downward trends can, however, be identified and will be emphasized to our insurer. The insurance market in California will not support continued low rates for workers' compensation premiums. With the efforts displayed at the MTA and the resources dedicated to our account by Travelers, we believe that a fourth year of coverage can be obtained. Risk Management will report on progress next quarter.

Sincerely,

Deborah Guy

Deborah Guy, ARM, CPCU
Managing Director, Risk Management

ADVANCED LAND ACQUISITION PROGRAM (ALAP) PARCELS
METRO RAIL PROJECT - MOS-2 and MOS-3
CA-90-0022

STATUS REPORT AS OF 12/30/99

1. **Parcel A1-250/Wilshire Vermont Station**
   Wilshire/Western Station

   The MTA contracted with Keyser Marsten to prepare a Highest and Best Use/Market Analysis of the Wilshire Vermont Station and the Wilshire Western Station. The work began in late October and the report is due in January 2000. Once their reports are submitted, staff will evaluate and determine the next course of action to pursue toward development of the station areas. No specific joint development project is being considered for the Wilshire/Western or Wilshire/Vermont Stations at this time.

2. **B-102 and B-103 - Temple Beaudry**

   Staff is continuing to perform due diligence to determine the environmental and geotechnical condition of the parcels for construction of a new Cash Counting Facility. The Phase II report indicated no significant environmental issues; however, since the site is located across the street from the Belmont High School site, a Phase 2 Study was being obtained. The Phase II report has been submitted and the report identified two environmental issues that would need resolution prior to redevelopment of the property. The report contained recommendations and costs estimates for mitigating the environmental conditions. The recommendations are being reviewed by MTA staff to assess the impact to the cost of constructing the Cash Counting Facility.

3. **A1-300 and A2-301 - Wilshire/Crenshaw**

   The MTA Board of Directors is currently considering the results of the Westside/Mid-City Corridor Study. The study evaluated the alternatives recommended in the Regional Transit Alternatives Analysis (RTAA Study), as well as others that may be identified by the Consultant team or in community scoping meetings. The alternatives to be considered included heavy rail extension, exclusive lane busways, aerial guideways and potentially other transit projects along Wilshire Boulevard between the Wilshire/Western Metro Red Line Station and Wilshire/Fairfax. A number of these alternatives could propose transit stations at Wilshire/Crenshaw. In the interim, the site is leased to the Los Angeles Unified School District on a month to month interim basis.

4. **A2-362 - Wilshire/La Brea**

   The corridor study discussed above included the Wilshire/Labrea site as a potential station for many of the transit alternatives. FTA previously concurred with MTA's decision to issue a Request for Proposal (RFP) for joint development of this parcel. An appraisal of the site has been obtained; however we will not proceed to assign a consultant to study this site until the MTA Board take action on the Study discussed above.

5. **Parcels A4-755, A4-765, A4-767, A4-772, A4-774, A4-761 - Universal City Station**
   C4-815 - North Hollywood Station

   The MTA contracted with Kosmont and Associates to prepare, an analyses regarding the Universal City Station and North Hollywood Station. Kosmont and Associates have begun work and once their reports are submitted, staff will evaluate and determine the next course of action to pursue toward development of the station areas. No specific joint development project is being considered for the Universal City Station and North Hollywood Station at this time.

LACMTA EXCESS REAL PROPERTY
METRO RAIL PROJECT - MOS-1
CA-03-0130

1. **Parcels A1-015, A1-016, and A1-021**

   Parcels A1-015 and A1-016 are still being used in support of Segment 2 and Segment 3 construction and are expected to continue to be used in support of MTA operations. Parcel A1-021 was leased to an adjacent property owner for a one year term ending March 31, 2000. The lease will not be renewed and the property will be returned to use by MTA for support of transit operations.

2. **Parcel A1-209, A1-211, A1-220, A1-221/225, A1-222 and A1-224 - Alvarado Station**

   A contract was issued to Kosmont and Associates, to provide the following analyses regarding the Alvarado Station

   - Prepare a technical memorandum outlining the Highest and Best Use/Market Analysis and a recommendation as to the most appropriate use for the site under current market conditions.

   - Develop a conceptual pro-forma based on the market analysis, with an estimate of potential annual revenue to the MTA.

   - Recommend the most appropriate joint development strategy for the site.

   Kosmont & Associates has concluded their study and has recommended that MTA issue an RFP to solicit competitive proposals from developers. Staff is currently working with Kosmont & Associates in preparing an RFP for release in early 2000.

Los Angeles County
Metropolitan
Transportation
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90012

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Mailing Address:
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February 15, 2000

TO: BOARD OF DIRECTORS

FROM: THOMAS K. CONNER, EXECUTIVE OFFICER - TRANSIT OPERATIONS

SUBJECT: TRANSIT OPERATIONS PERFORMANCE REPORT FOR DECEMBER 1999

December Bus On-Time Pullout performance continued at the highest level since Operations began tracking this indicator (99.32%). Four of the eleven bus divisions equaled or exceeded the goal of 99.50%. Scheduled Revenue Service Hours Lost recorded the lowest amount of lost service since we began tracking this indicator in November 1997. In-Service On-Time Performance improved to 54.49%. However, buses "running hot," i.e. departing the stop more than 15 seconds early, rose to 27.53% -- the highest level since February 1999.

Maintenance performance indicators were mixed in December. Past Due PMP's improved for the fourth straight month and exceeded the goal. However, Miles Between Chargeable Mechanical Failures declined by almost 6% compared to November. Overall, the trend in Miles Between Mechanical Failures continues to be favorable.

The performance data on Load Factor Compliance reported for November showed a decline, primarily due to a change in the sampling methodology. December compliance measurement is consistent with prior periods.

The rate of customer complaints per 100,000 boardings decreased again in December, continuing a trend characteristic of most of 1999. The number of *Pass-up* complaints, which caused concern in November, decreased by 25% in December. Complaint rates rose for all contractor operated service in December. Complaint rates for ATE and Laidlaw continue to be significantly higher than for MTA operated service.

On-Time Pullout performance for Heavy Rail continued at 100% in December and Light Rail OTP rose sharply. Both operated well above the goal. Heavy Rail In-Service On-Time rebounded in December, rising above the goal, while Light Rail In-Service On-Time was below the goal at 97.19%.

December 1999 Highlights:

The Financial Performance section of this report will no longer be provided. The source for Enterprise Fund financial information is the Quarterly Financial Statement prepared by MTA Accounting.

The format and content of this report continue to evolve. Your feedback on the content and format of this report is appreciated. Please contact Josee Larochelle at (213) 922-2231, if you have any questions regarding the information in this report.

Bus Service Performance

- December Bus On-time Pullout Performance exceeded 99.3%. Ten of the eleven bus divisions posted OTP at or above 99.0% and four of those divisions equaled or exceeded the 99.5% goal during December.
- In-Service On-Time Performance improved to 54.49% in December. Early departures ("running hot") increased from 23.9% in November to 27.5% in December.
- Scheduled Revenue Service Hours Lost decreased from 1.3% in November to 1.2% in December.

Rail Service Performance

- Heavy Rail On-Time Pullouts held at 100.00% in December. Light Rail On-Time Pullouts increased from 99.00% in November to 99.40% in December.
- Heavy Rail In-Service On-Time Performance rose from 98.81% in November to 99.20% in December. Light Rail In-Service On-Time Performance decreased from 97.85% in November to 97.19% in December.

Maintenance Performance

- Mean Miles Between Mechanical Failures resulting in service disruptions of more than ten minutes decreased from 6,178 in November to 5,826 in December.
- Past Due Critical PMP jobs decreased for the fifth consecutive month from 0.58 per assigned vehicle in November to 0.35 in December. Major efforts remain underway to keep this indicator at the lowest possible level.

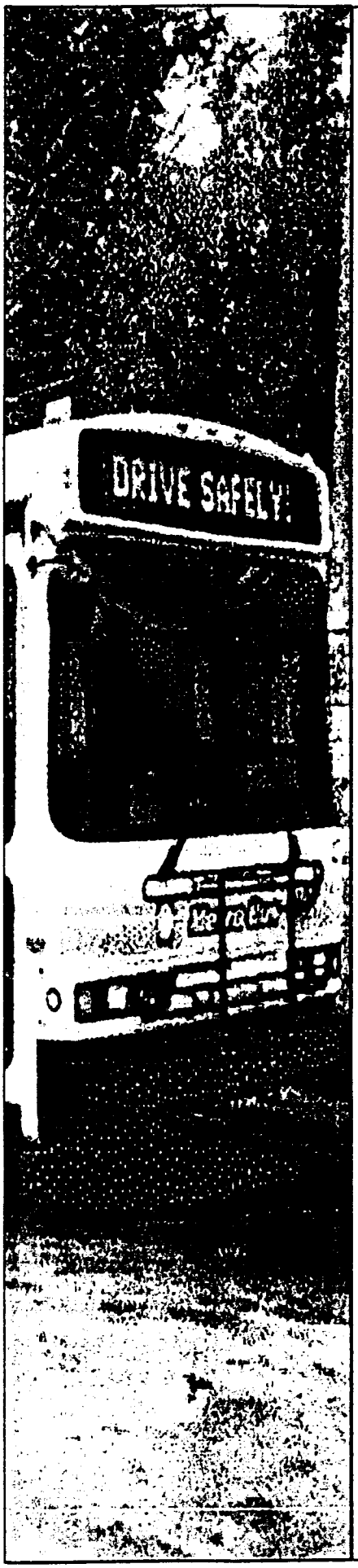
Safety

- Traffic Accidents Per 100,000 Hub Miles increased, from an adjusted 4.10 in November to 4.53 in December. Safety remains a focus of our training, mentoring and monitoring efforts in both the Bus and Rail divisions.

- Year-to-Date Reported Crimes per 100,000 Green Line Boardings decreased slightly from 2.75 in November to 2.65 in December. Red Line reported crimes per 100,000 boardings dropped from 2.72 in November to 2.55 in December. Reported Crimes per 100,000 Boardings for the Blue Line decreased for the third consecutive month from 1.84 in November to 1.77 in December, while Reported Crimes per 100,000 Boardings for the Bus mode decreased from 0.63 in November to 0.62 in December

Customer Satisfaction

- Customer Complaints declined in December. There were 4.8 Complaints per 100,000 Boardings in November. The rate dropped to 4.1 in December. The customer complaint rate for ATE rose slightly in December to 13.0 complaints per 100,000 boardings. Laidlaw's complaint rate rose from 28.4 in November to 29.0 in December. Complaint rates for these two contractors remain significantly above that of MTA-operated service and the service Operated by Charterways.



Transit Operations Performance Report
for
December 1999

Prepared by:

Los Angeles County
Metropolitan Transportation Authority
Transit Operations Division

METRO

Table of Contents

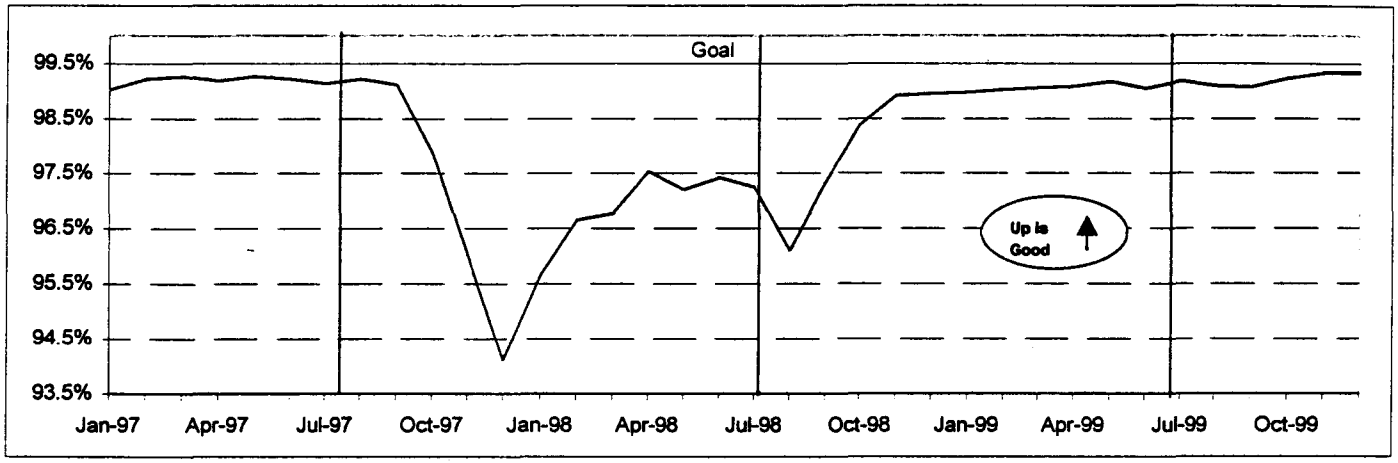
BUS SERVICE PERFORMANCE

ON-TIME PULLOUT PERCENTAGE

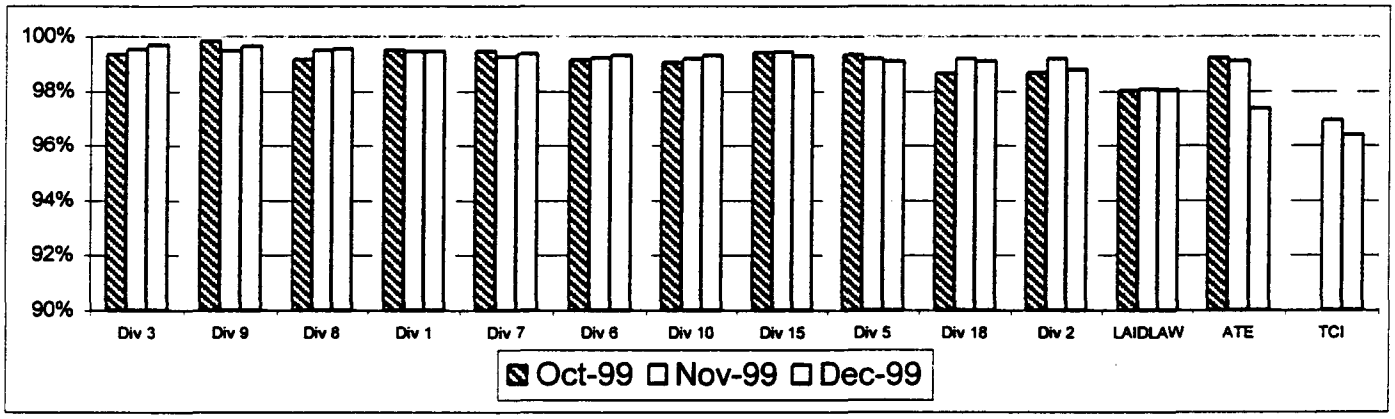
Definition: On-time Pullout Performance measures the percentage of buses leaving the operating division within one minute of the scheduled pullout time. The higher the number, the more reliable the service.

Calculation: OTP% = [(100% minus [(Total late and cancelled runs divided by Total scheduled pullouts) multiplied by 100)]

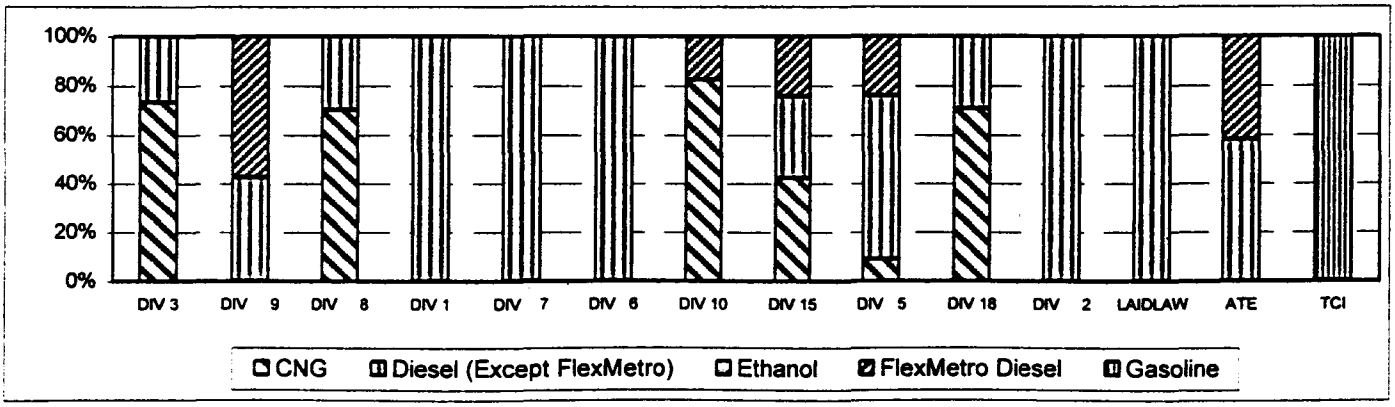
Systemwide Trend



Bus Operating Divisions
October 1999 - December 1999



Fleet Mix by Division - December 1999



Outlates & Cancellations by Division - December 1999

Division	OUTLATES Number	OUTLATES % of Pull-outs	CANCELLATIONS Number	CANCELLATIONS % of Pull-outs	ON-TIME PULL-OUT RATE	REASONS FOR OUTLATES and CANCELLATIONS No Operator Available	Bus Mechanical Failure	Other
1	30	0.5%	0	0.0%	99.5%	3	26	1
2	65	1.2%	1	0.0%	98.8%	4	55	7
3	19	0.3%	0	0.0%	99.7%	1	16	2
5	63	0.9%	0	0.0%	99.1%	1	56	6
6	15	0.7%	0	0.0%	99.3%	1	12	2
7	45	0.6%	4	0.1%	99.4%	4	43	2
8	19	0.4%	0	0.0%	99.6%	2	16	1
9	23	0.3%	0	0.0%	99.7%	1	20	2
10	57	0.7%	2	0.0%	99.3%	6	44	9
15	48	0.7%	0	0.0%	99.3%	2	43	3
18	71	0.9%	3	0.0%	99.1%	12	38	24
TOTAL	455	0.7%	10	0.0%	99.3%	37	369	59

Analysis: On-Time Pullout Performance for December was at the highest rate since we began tracking this performance indicator in January 1997. Four divisions met or exceeded the 99.5% goal. December was the second consecutive month in which OTP equaled or exceeded 99.3%. The increase in this indicator is the result of improvements in fleet quality and maintenance procedures, as well as increased operator availability (OAR>= or >1.16), improved disciplinary procedures and increased yard supervision.

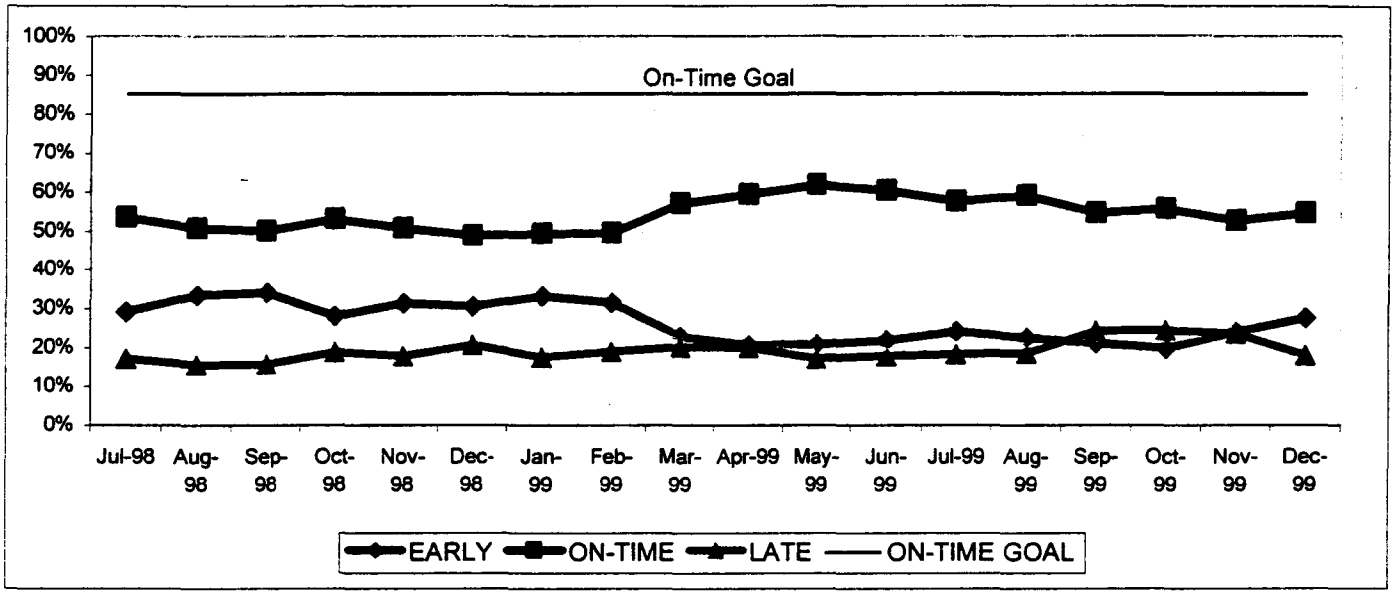
Corrective Action: The Maintenance Department will continue its efforts to reduce outlates and cancellations. The department will continue to replace the older buses in the fleet with new and conversion coaches. The department will also continue to focus on the reduction of past-due critical PMPs to improve the reliability of the bus fleet. Transportation will continue programs to maintain a high level of operator availabilty. In addition, divisions will maintain high levels of supervision and disciplinary oversight. Indications are that January OTP will exceed both November and December performance.

IN-SERVICE ON-TIME PERFORMANCE

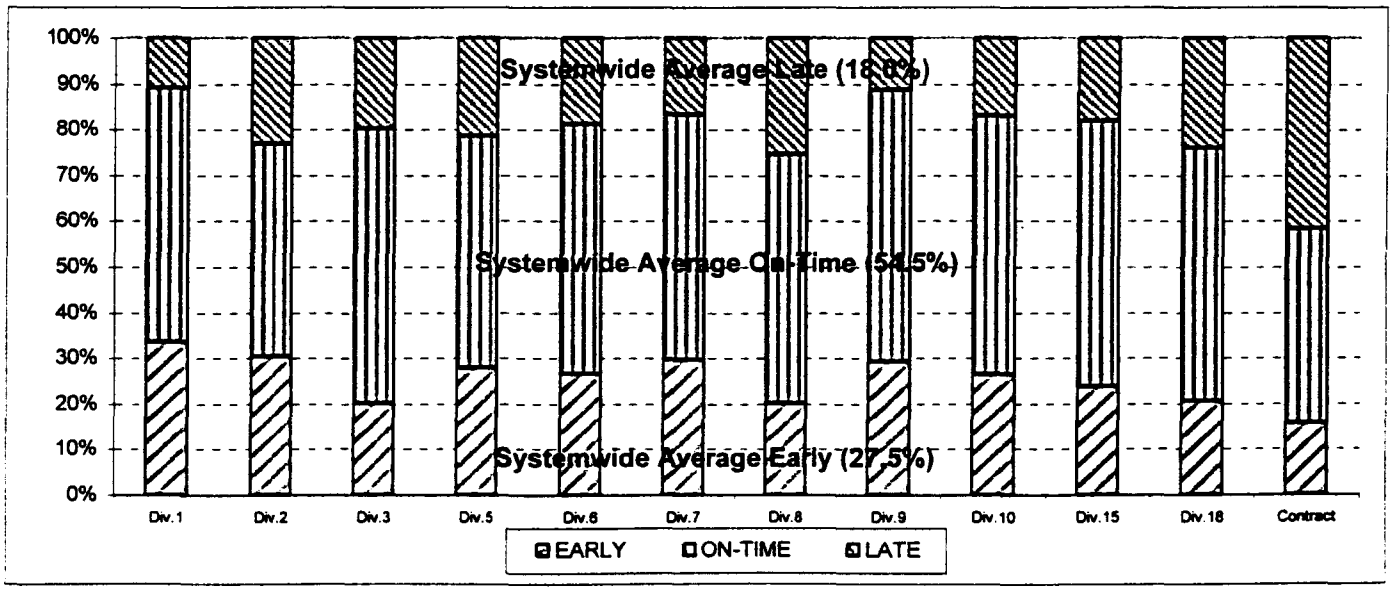
Definition: This performance indicator measures the percentage of scheduled buses that depart selected time points no more than 15 seconds early and no more than five minutes later than scheduled.

Calculation: ISOTP% =1-((Number of buses departing early + Number of buses departing more than five minutes late)/(Total buses sampled))

Systemwide Trend



Bus Operating Divisions
December (15 Second Tolerance)



Analysis: In-Service On-Time Performance improved slightly over November, although it has trended slightly downward throughout FY00. During December, as ISOTP increased and late departures decreased, incidents of "running hot" (early departures) increased. Seven of the eleven transportation divisions posted early departure rates above 25%. In December, contract providers have posted lower levels of early departures, but also had the lowest on-time performance and the highest level of late departures.

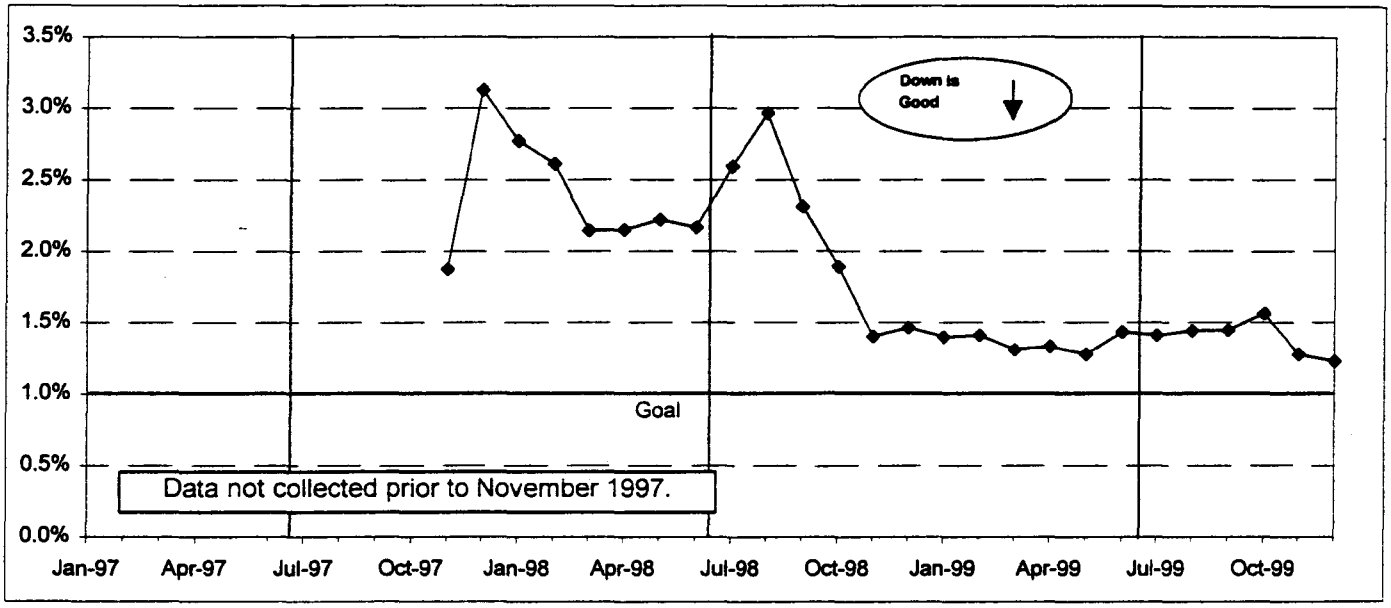
Corrective Action: We are concerned about the two month upward swing on running hot. Lates have decreased while on time performance has increased. On Street supervision have been apprised of this and is concentrating their efforts on the running hot issue.

SCHEDULED REVENUE SERVICE HOURS LOST

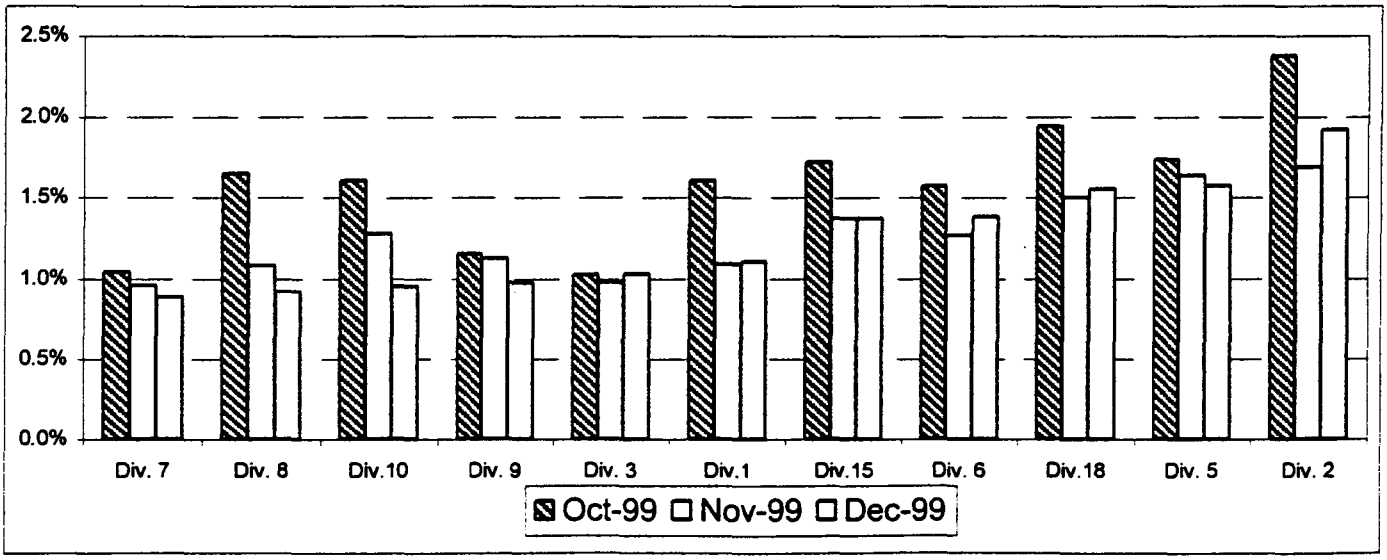
Definition: This performance indicator measures the percentage of scheduled service hours not delivered as a result of cancellations, outlates and in-service equipment failures.

Calculation: SHL% = (Total Service Hours Lost divided by Total Scheduled Service Hours)

Systemwide Trend



Bus Operating Divisions
October 1999 - December 1999



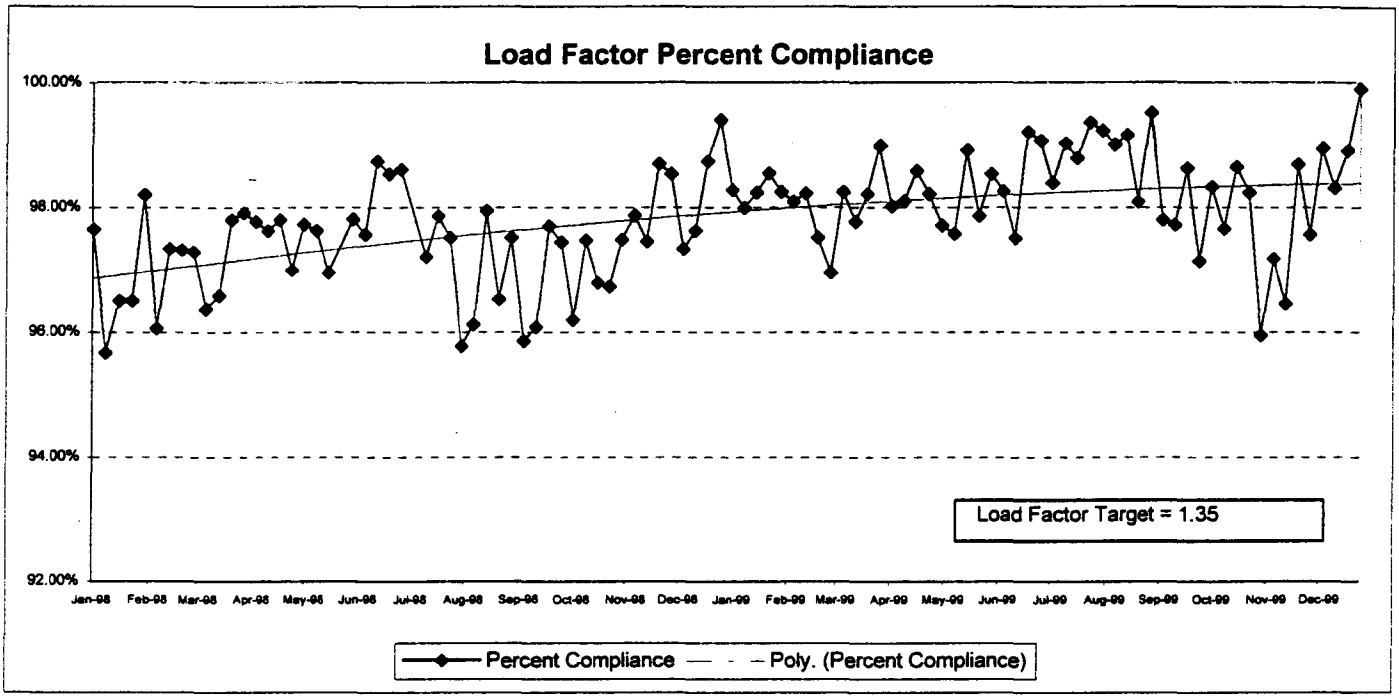
Analysis: Scheduled Revenue Service Hours Lost declined for the second straight months, after having steadily reported between 1.4% and 1.6% for the preceding five months. Scheduled Revenue Service Hours Lost is a function of cancelled and late service, in-service delays and accidents. Cancellations continue to be reported in low numbers (4 in November, 10 in December). Accident prevention is a continuing problem for Transportation and the accident rate continued to rise in December. Significant improvements have been made in preventing mechanical failures that disrupt service and Miles Between Chargeable Mechanical Failures have shown a general, continuous upward trend.

Corrective Action: As Transit Operations focuses on reducing cancellation, accidents and in-service disruptions, a corresponding reduction in Lost Revenue Service Hours will occur.

LOAD FACTOR COMPLIANCE

Definition: As part of the Consent Decree, the MTA set a Load Factor target of 1.35. A 1.35 Load Factor means that the passenger load over any given twenty-minute period, does not exceed more than 135% of the available seats. Load Factor Compliance is the percentage of twenty-minute observations made during Daily operation (excludes Saturdays, Sundays and Holidays) in which the Load Factor does not exceed 1.35.

Calculation: Daily Load Factor Percent Compliance = Daily twenty-minute observations in compliance divided by the total number of Daily twenty-minute observations.

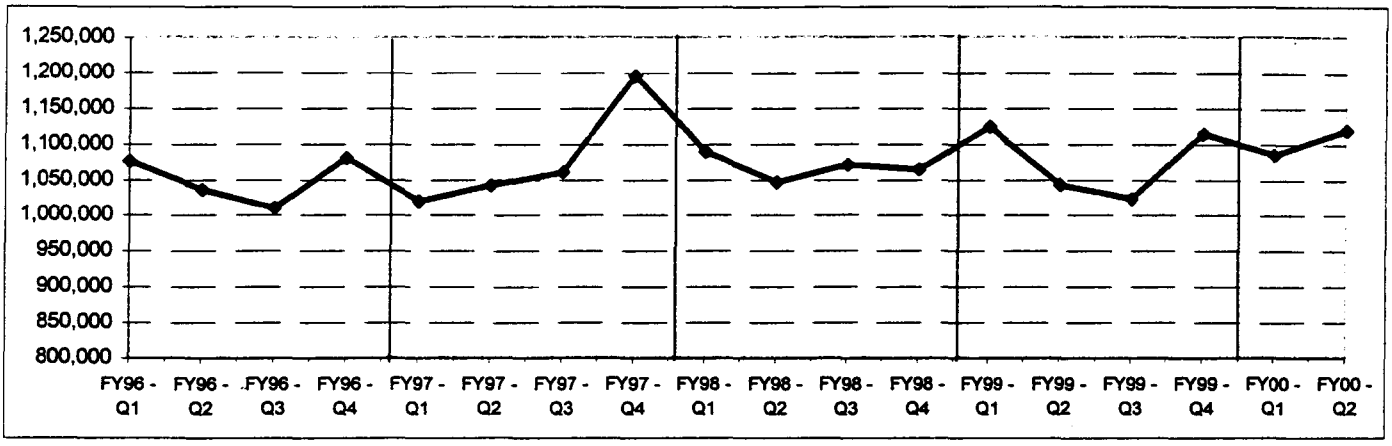


Analysis: The Load Factor point check data indicated low levels of Load Factor Compliance in November. Since that time, Load Factor Compliance measurements have recorded levels posted in August of 1999. The November dip is partly due to the lines sampled. In November, several lines which had previously experienced overcrowding were rechecked. This weighted the sample toward the more crowded lines, rather than a more representative sample of lines across the system.

Corrective Action: The MTA will continue to focus on Load Factor Compliance. As improvements are made in bus reliability, operator availability, and In-Service On-Time Performance, our Load Factor Compliance will also improve. Additionally, 64 peak buses were added to the fleet in December as a part of the bi-annual shake-up.

BOARDINGS

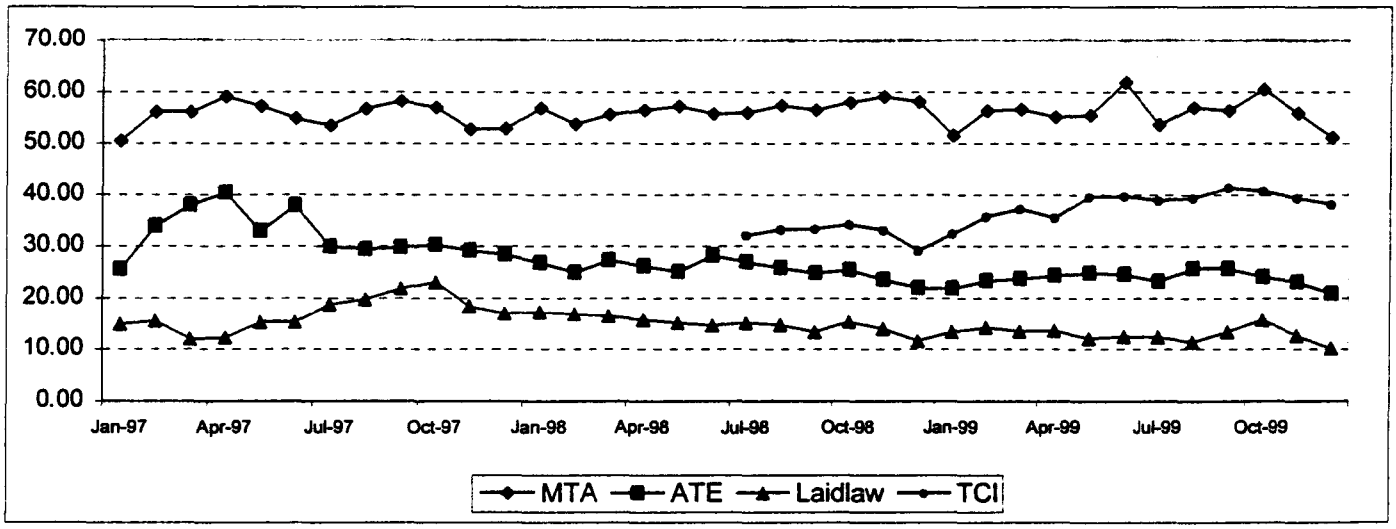
AVERAGE WEEKDAY BOARDINGS - MTA ONLY



BOARDINGS PER REVENUE SERVICE HOUR

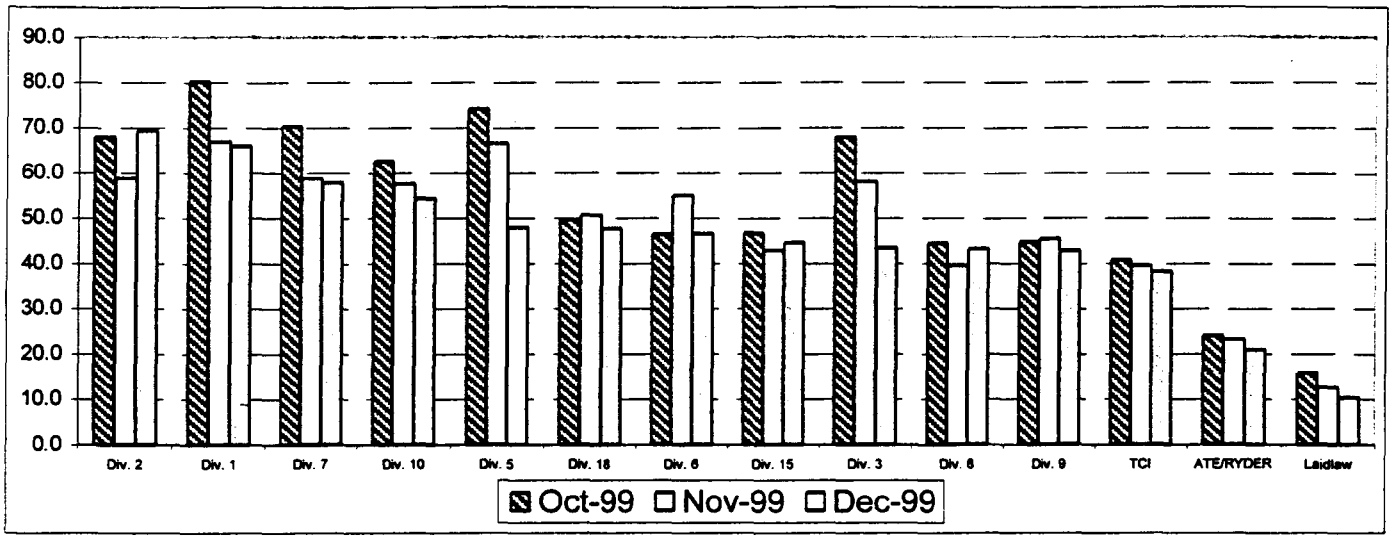
Definition: Boardings per hour is the number of passengers estimated to board during one hour of revenue
Calculation: Boardings/Hour = (Total Passenger Boardings divided by Total Revenue Service Hours)

Systemwide Trend



Analysis: Total boardings for the first six months of FY00 have increased by 1.3% over the same period in FY99. However, the MTA has also added service and the Boardings per Revenue Service Hour have decreased. These data, together with the upward trend in Load Factor Compliance data, indicate a reduction in overcrowding on the bus system.

BOARDINGS PER REVENUE SERVICE HOUR
Bus Operating Divisions
October 1999 - December 1999



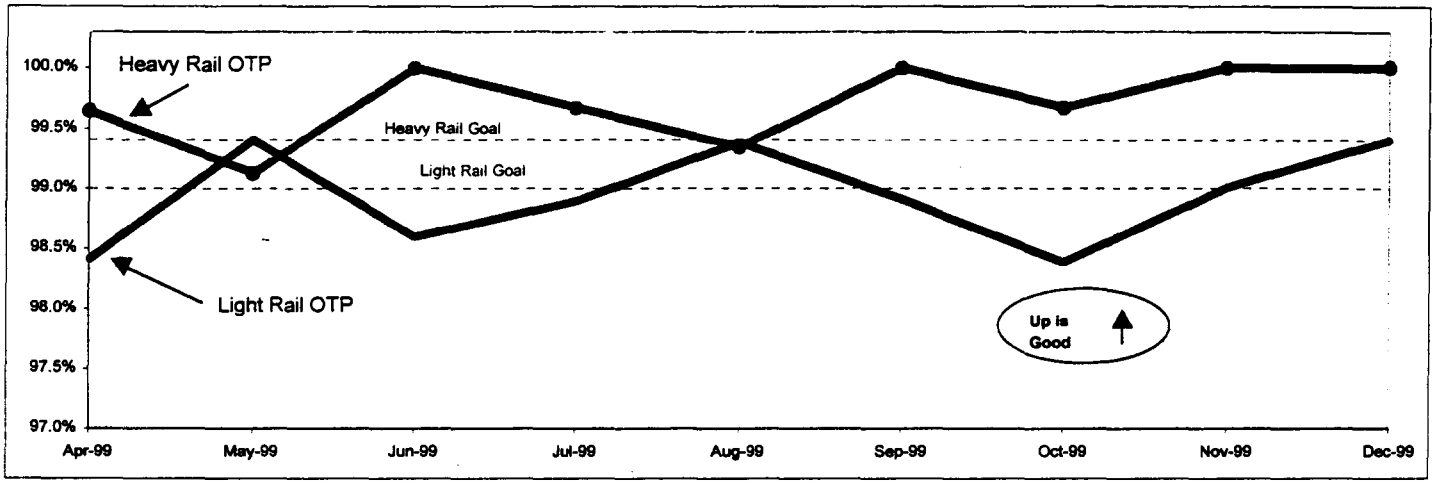
RAIL SERVICE PERFORMANCE

ON-TIME PULLOUTS

Definition: On-time Pullouts measures the percentage of trains leaving the yard within ninety seconds of the scheduled pullout time. The higher the number, the more reliable the service.

Calculation: OTP% = [(100% minus [(Total cancelled pullouts plus late pullouts) divided by Total scheduled pullouts) multiplied by 100)]

On-Time Pullouts



Analysis: For each week in December, the Heavy Rail goal for OTP (99.4%), was exceeded. Three weeks out of the month OTP held steady at 100%, with one of the weeks at 99.72%. Similarly, the Light Rail exceeded its OTP goal of 99%, at 99.4%.

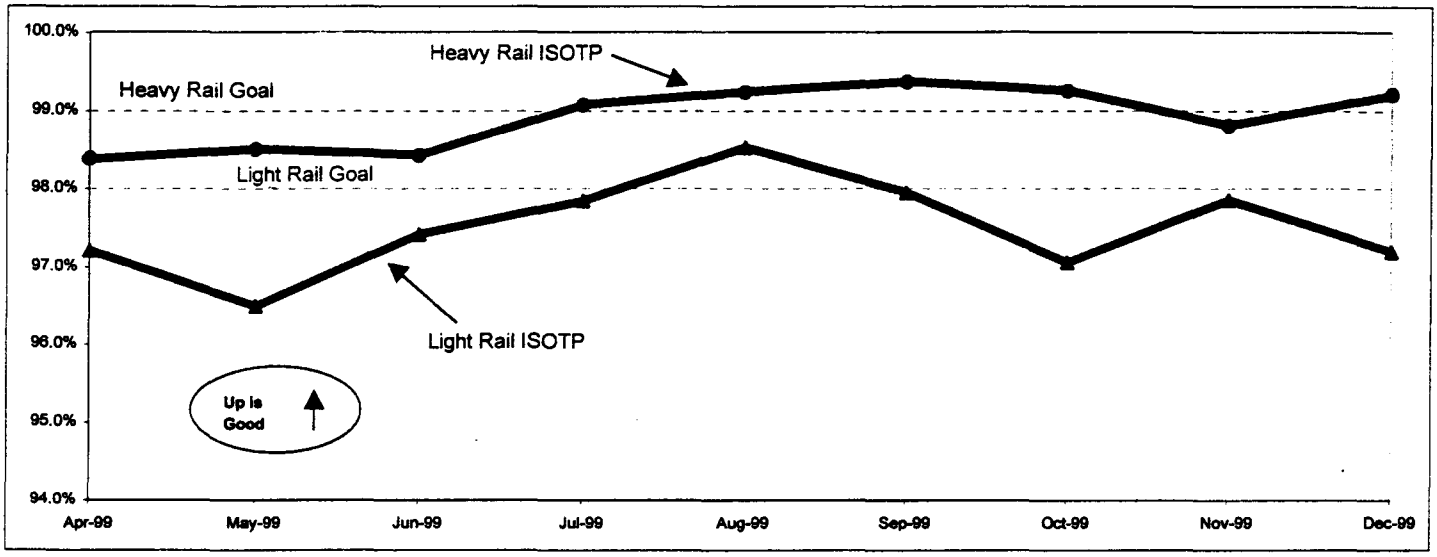
Corrective Action: Rail Operations will continue to focus on the current vehicle and component overhaul schedule, to maximize preventive maintenance thereby eliminating schedule adherence issues.

IN-SERVICE ON-TIME PERFORMANCE

Definition: In-Service On-Time Performance measures the percentage of trains leaving all timecheck points on any run no earlier than thirty seconds, nor later than 5 minutes of the scheduled time. The higher the number, the more reliable the service.

Calculation: ISOTP% = [(100% minus [(Total runs in which a train left any timecheck point either late or early) divided by Total scheduled runs) multiplied by 100)]

In-Service On-Time Performance



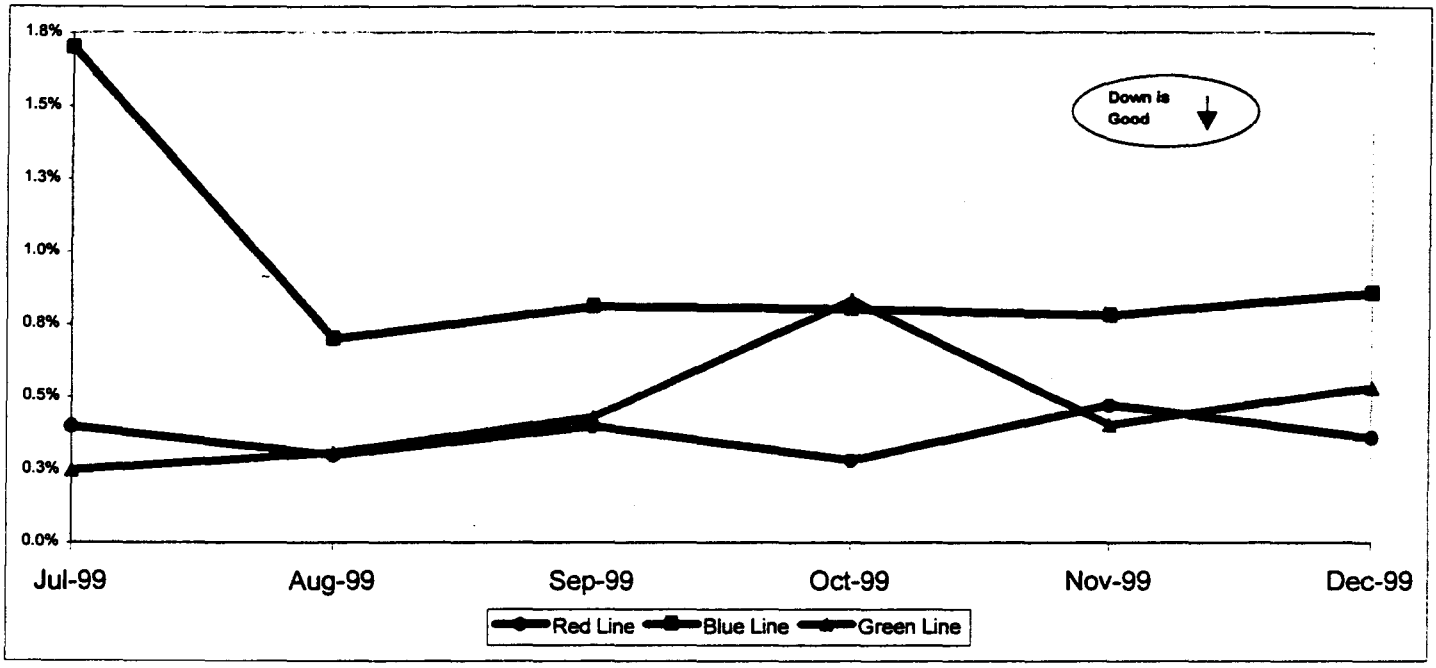
Analysis: Heavy Rail exceeded the ISOTP goal of 99%. Light Rail continued to drop below it's goal of 98% to 97.2%. This was primarily due to incidents on the Blue Line. Eighty-five percent of all late trips on the Light Rail during December occurred on the Blue Line and were due to a damaged Overhead Catenary Systems, requiring repair or an accident (train not involved) blocking the right of way. Late trips on the Green Line occurred as a result of the Blue Line Overhead Catenary Systems problem.

Corrective Action: Rail Operations control will continue to work with the local authorities to investigate and implement methods to reduce accident occurrences. Rail Operations has successfully worked with the Human Resources Department to ensure that the full complement of staff (i.e., CCTV Observers and Maintenance Specialists) exists within the Rail Operations Control center. This staff provides assistance and critical support to supervisory personnel during emergency situations.

Lost Revenue Service Hours by Rail Line

Definition: This performance indicator measures the percentage of scheduled Revenue Service Hours not delivered as a result of cancellations, outlates and in-service delays.

Calculation: SHL% = (Total Service Hours Lost divided by Total Scheduled Service Hours)



Analysis: Lost RSH on the Blue and Green Lines (Light Rail) rose slightly to .9% and .5%, respectively. The Light Rail was impacted by nine incidents which occurred in December. There was one vehicular problem relating to doors; and a damaged Overhead CatenarySystems requiring repair; four Train vs. Auto accidents; a non-train involved accident which blocked the tracks; a bomb threat, and a slow down due to a suspected robber on board.

Lost RSH on the Red Line (Heavy Rail) remained relatively low at 0.4%. There were only two days of incidents including a sick passenger on board and a bomb threat.

Corrective Action: Rail Operations control will continue to work with the local authorities to investigate and implement methods to reduce accident occurrences. Rail Operations has successfully worked with the Human Resources Department to ensure that the full complement of staff (i.e., CCTV Observersand Maintenance Specialists) exists within the Rail Operations Control center. This staff provides assistance and critical support to supervisory personnel during emergency situations.

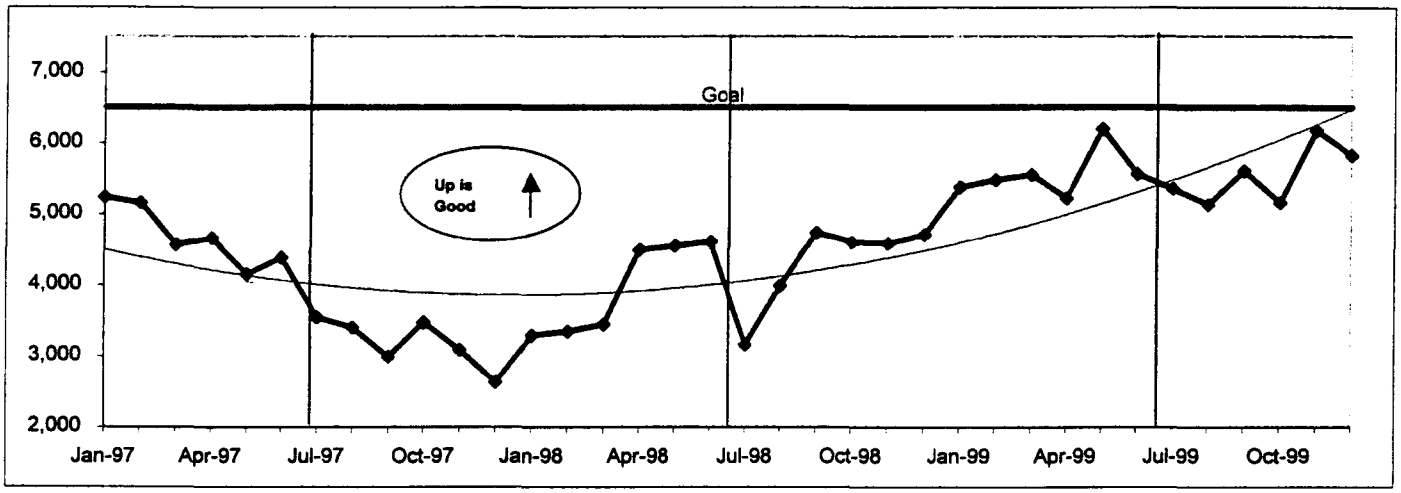
MAINTENANCE PERFORMANCE

MEAN MILES BETWEEN MECHANICAL FAILURES

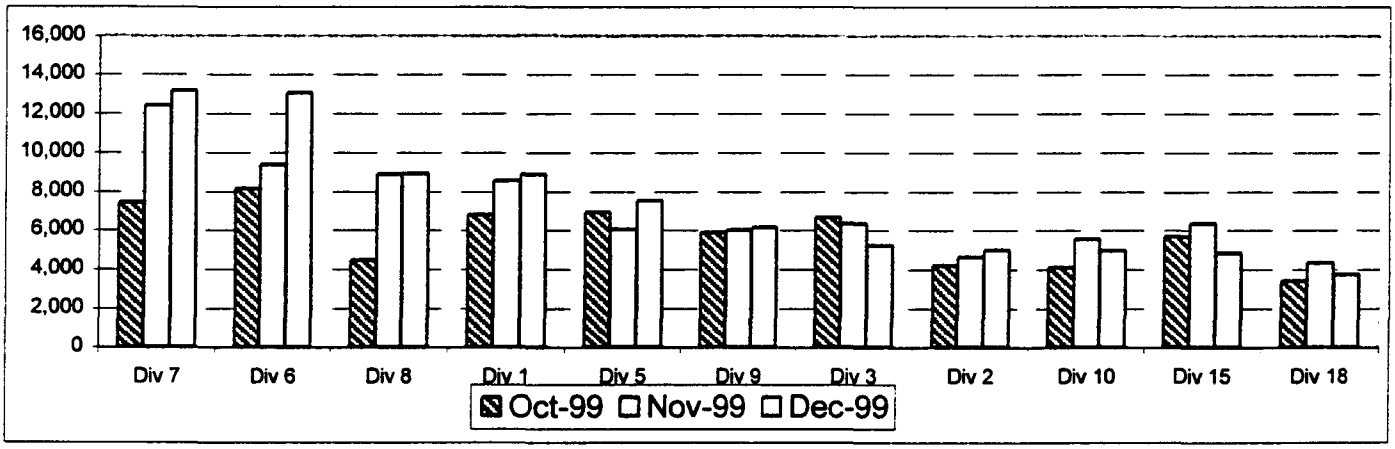
Definition: Average Hub Miles traveled between mechanical problems that result in a service disruption of greater than ten minutes.

Calculation: MMBRC = (Total Hub Miles divided by Chargeable Mechanical Related Roadcalls)

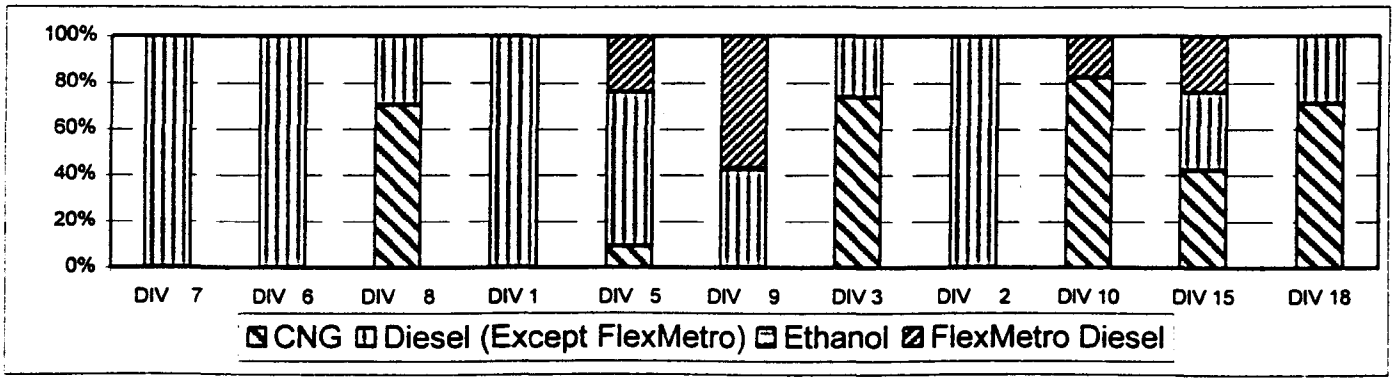
Systemwide Trend



Bus Operating Divisions
October 1999 - December 1999



Fleet Mix by Fuel Type - December 1999



Analysis: The indicator has fluctuated over the past four months while maintaining an overall upward trend. The total number of road calls decreased during December; however, the number of chargeable road calls increased by approximately 7 percent. The increase in chargeable road calls can be partially attributed to an increase in unscheduled maintenance absenteeism during the period.

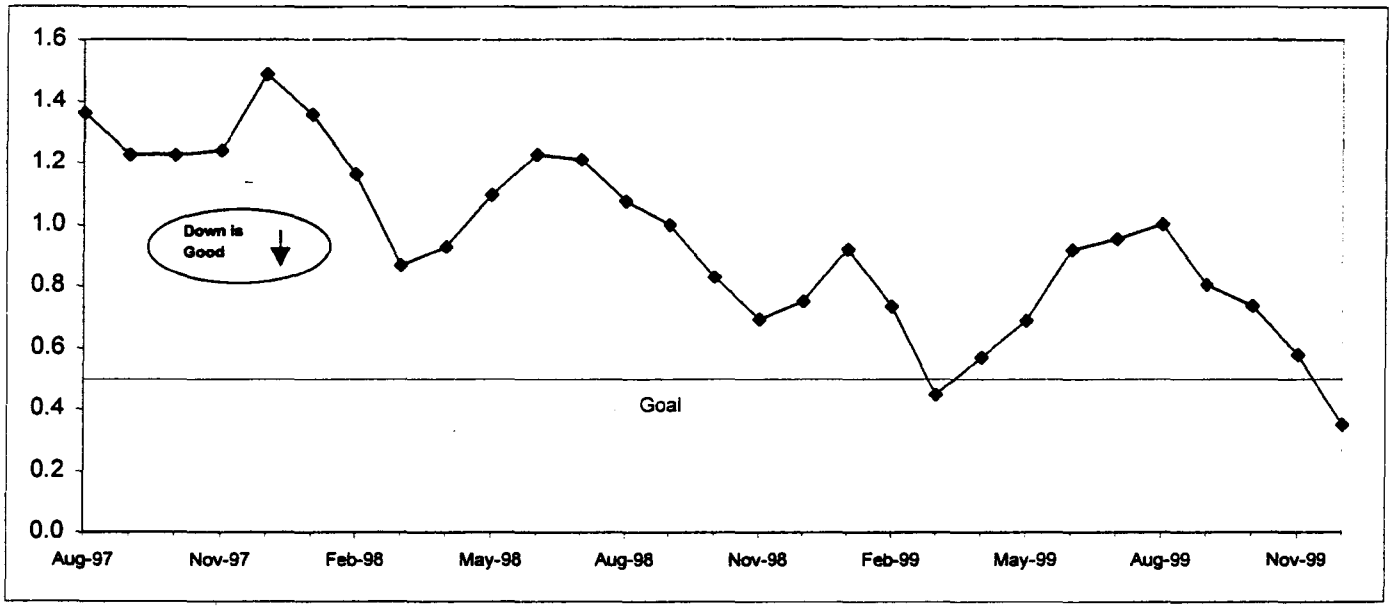
Corrective Action: Management scrutiny and progressive discipline are being implemented within the confines of the Collective Bargaining Agreement to minimize unscheduled employee absences. However, the Family Care and Medical Leave policy has resulted in an increased level of absenteeism in recent years. Maintenance staff will continue to closely monitor attendance.

PAST DUE CRITICAL PREVENTIVE MAINTENANCE PROGRAM JOBS (PMP's)

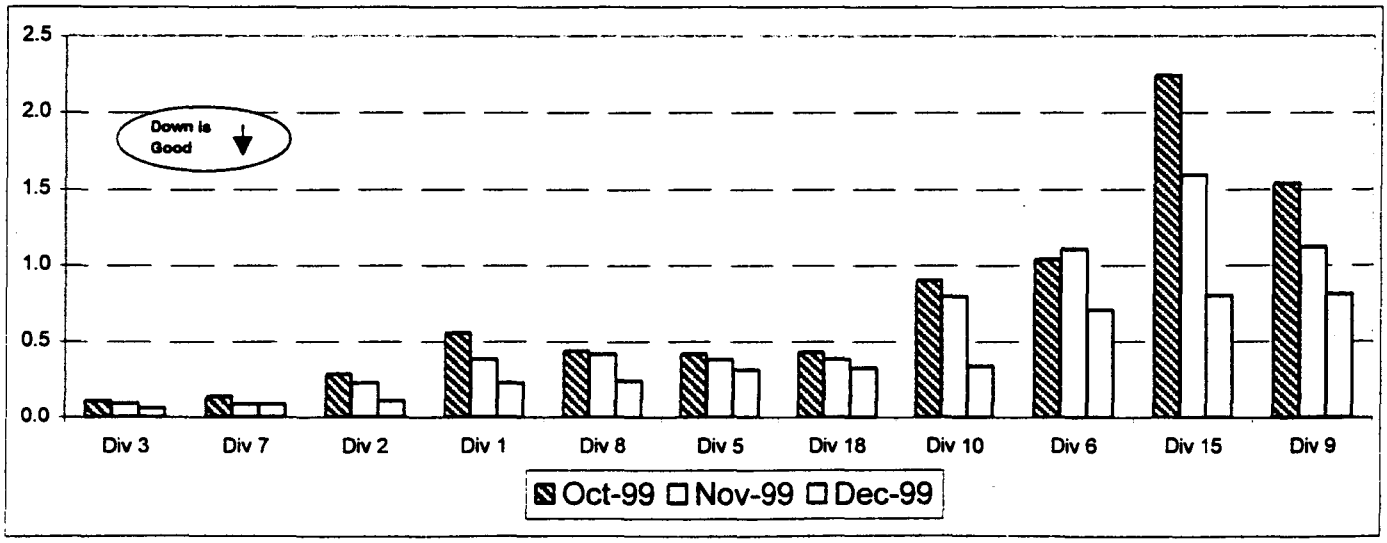
Definition: Average past due critical scheduled preventive maintenance jobs per bus. This indicator measures maintenance management's ability to prioritize and perform critical repairs and indicates the general maintenance condition of the fleet.

Calculation: Past Due Critical PMP's = (Total Past Due Critical PMP's divided by Buses)

Systemwide Trend



Bus Operating Divisions
October 1999 - December 1999



Analysis: The past due critical PMPs continued to decline during the month of December. The average past-due critical PMPs for the month of December was 0.35, which is 30 percent better than the goal of 0.5. The reduction occurred at all operating divisions with significant efforts at Divisions 6, 9, 10 and 15 to eliminate the backlog of PMP repairs.

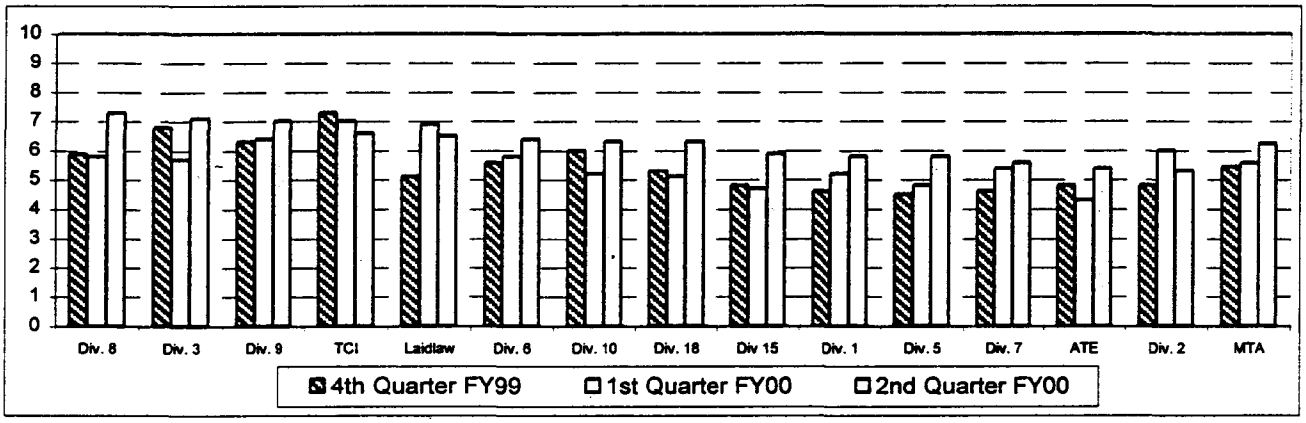
Corrective Action: This performance measure has reached and exceeded its goal. The Maintenance Department will continue its aggressive campaign to reduce past-due critical PMPs at all operating divisions.

BUS CLEANLINESS

Definition: A team of three Quality Assurance Supervisors rates twenty percent of the fleet at each division and contractor per Quarter. Each of sixteen categories is examined and assigned a point value as follows: 1-3= Unsatisfactory; 4-7=Conditional; 8-10=Satisfactory. The individual item scores are averaged, unweighted, to produce an overall cleanliness rating.

Calculation: Overall Cleanliness Rating = (Total Point Accumulated divided by 16)

Bus Operating Divisions
Fourth Quarter FY99 - Second Quarter FY00



Analysis: Division overall cleanliness scores improved an average of 0.8 points between the fourth quarter of FY99 and the second quarter of FY00. 75% of the improvement occurred between the 1st and 2nd quarters of FY00. Divisions 3, 8, 10, 15, 18 and ATE showed the greatest overall improvement during the last quarter. Overall scores currently range between 5.3 and 7.3. All divisions received at least "Conditional" ratings during the last quarter. The increased focus on bus cleanliness has begun to show positive results, as the bus cleanliness improved at ten of the eleven MTA bus operating divisions during the month of December. Divisions 3 and 8 showed a significant amount of improvement, which resulted in those two divisions achieving the highest rating during the period.

Improvement Needed: Overall improvement is needed in the areas of sacrificial window replacement, floor cleanliness/gum removal and passenger seat/insert replacement. Quality assurance is working closely with all divisions and contractors to improve bus cleanliness. The Maintenance Department will continue to focus on improving the cleanliness of the buses. The divisions are replacing window guards and seat inserts as parts become available to improve the exterior and interior appearance of the fleet. The Regional Rebuild Center is testing a new flooring for the Neoplan buses that will be easier to clean and should help to improve the interior cleanliness of the vehicles.

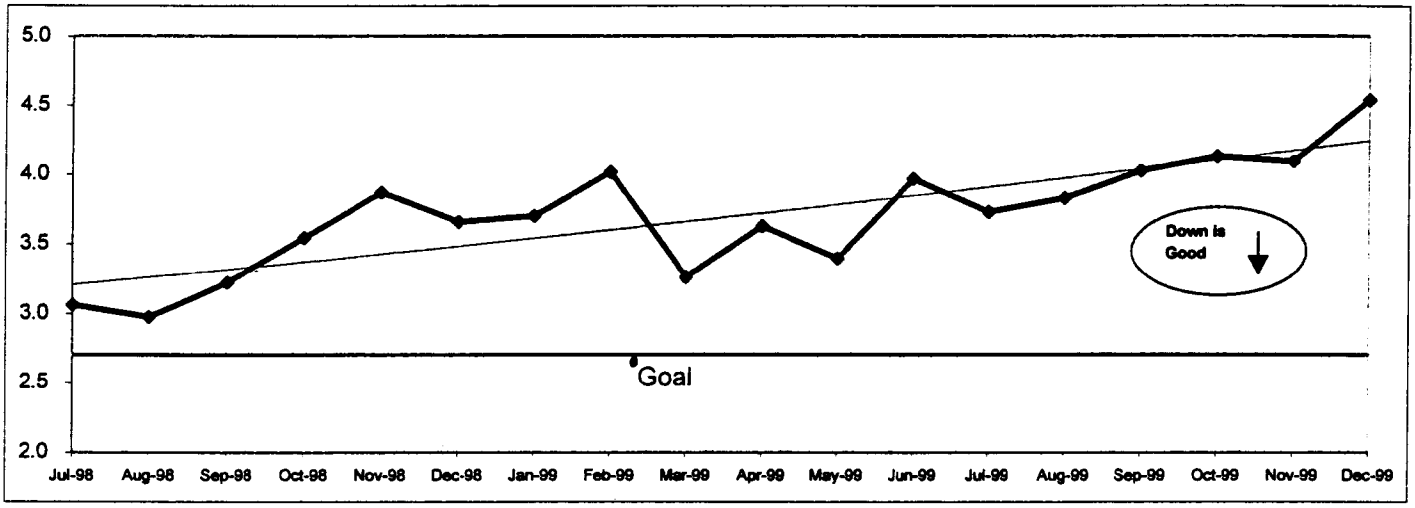
SAFETY PERFORMANCE

TRAFFIC ACCIDENTS PER 100,000 HUB MILES

Definition: Average number of Traffic Accidents for every 100,000 Hub Miles traveled. This indicator measures system safety.

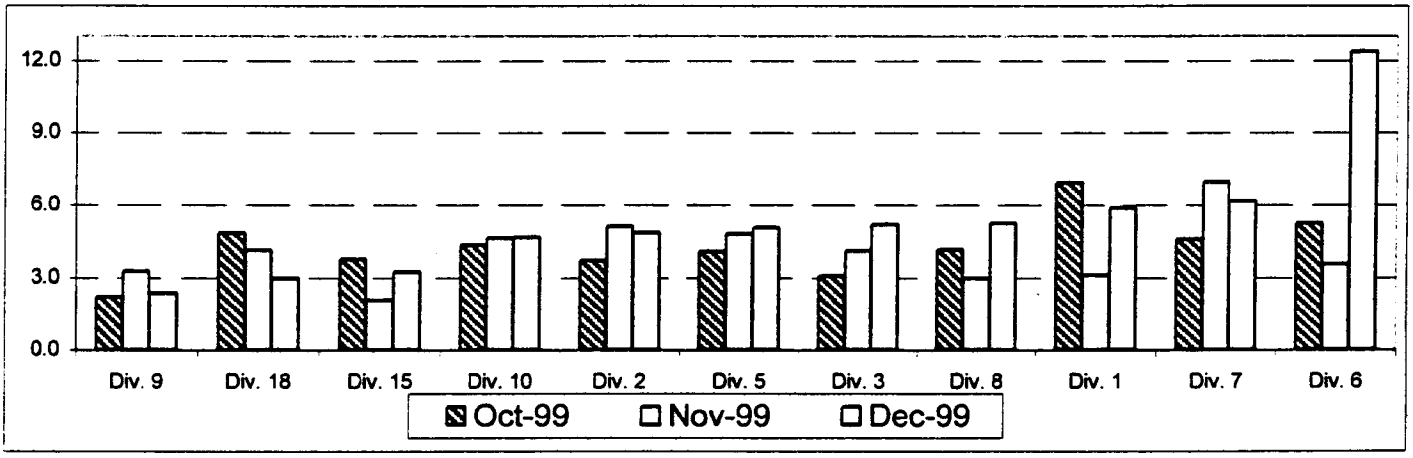
Calculation: Traffic Accidents Per 100,000 Hub Miles = (The number of Traffic Accidents divided by (Hub Miles divided by 100,000))

Systemwide Trend



Note: Beginning with the August 1999 Monthly Performance Report the thirteen months prior to the reporting month are re-examined each month to allow for reclassification of accidents and late filing of reports.

Bus Operating Division
October 1999 - December 1999



Analysis: The first rain of the season occurred on December 7 and accounted for some of the increase in accidents. Further study showed that a full 30% of our Operators have less than two years of service and have a slighter higher than the average number of accidents per employee. This same study also revealed that our Operators with 5-9 years of service have the highest incidence of accidents per employee for the rolling 13 month reporting period ending December 31, 1999.

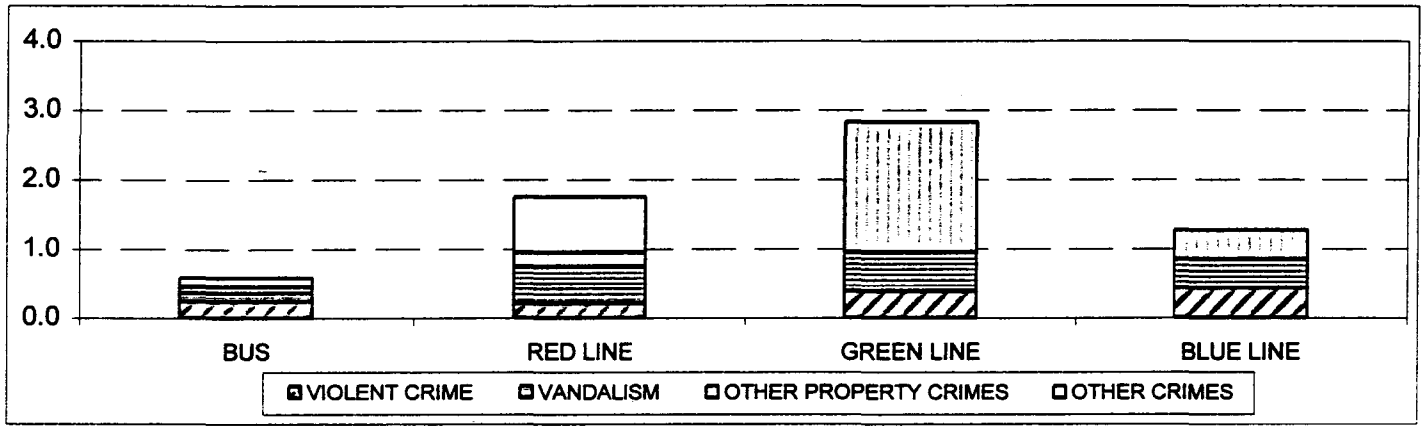
Corrective Action: We are very concerned about the increase in December accidents. We are analyzing the data to establish whether or not changes in the Central Instruction training program have influenced the accident rate. We have trained additional Mentors and are increasing Central Instruction's training emphasis on accident prevention through new bus specific defensive driving lessons, which will be required as part of the VTT training course for all Operators reaching 5 years of service.

REPORTED CRIME PER 100,000 BOARDINGS

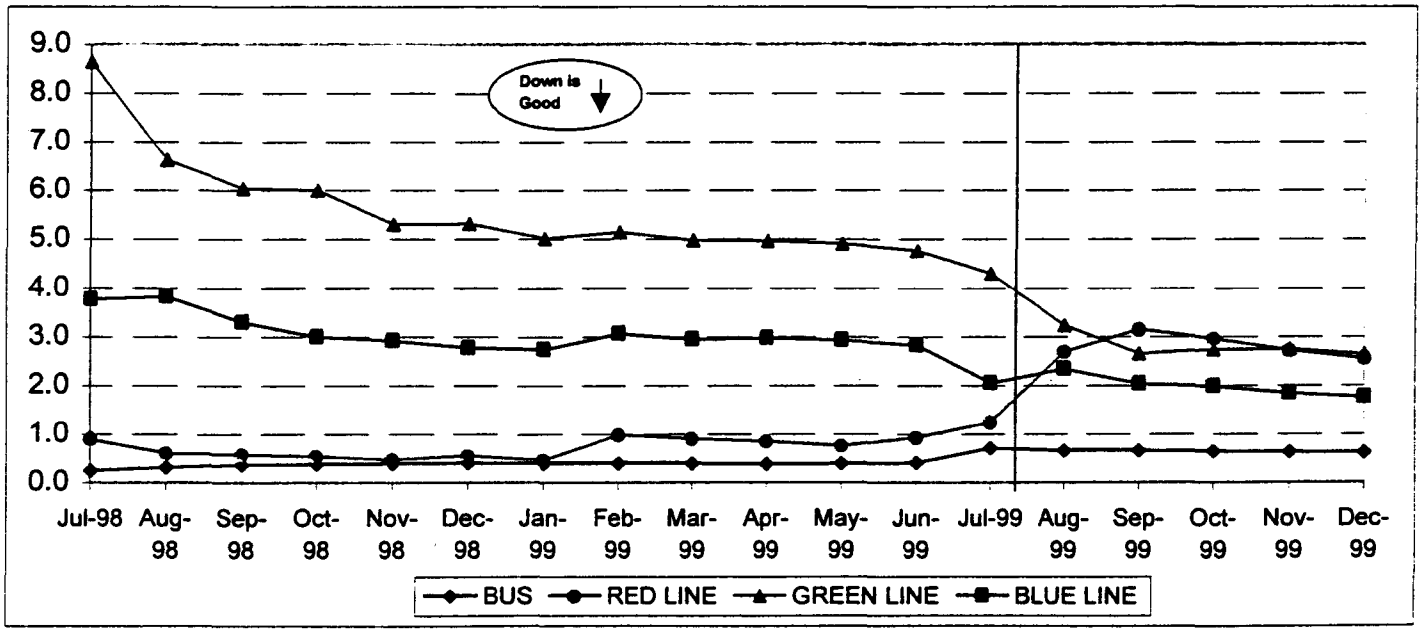
Definition: This indicator presents all crimes reported to either the LAPD or LASD. It is separated by mode and divided into major categories: *Vandalism*; *Other Property Crimes* (burglary, larceny, theft and motor vehicle theft); *Violent Crimes* (homicide, rape, robbery, assault/battery); *Other Crimes* (Sex offenses, weapons violations and miscellaneous)

Calculation: Reported Crimes/100,000 Boardings = Reported Crimes divided by (Boardings divided by 100,000).

December Reported Crime by Class and Mode



Total Crime/100,000 Boardings YTD Trend by Mode



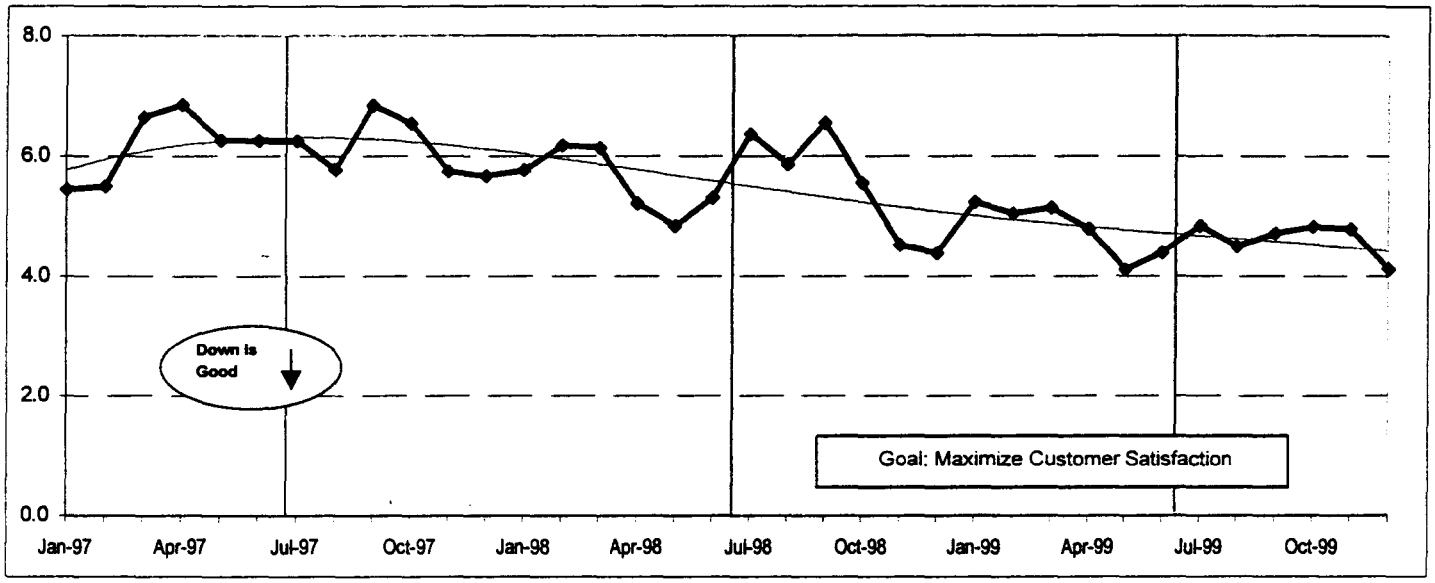
CUSTOMER SATISFACTION

COMPLAINTS PER 100,000 BOARDINGS

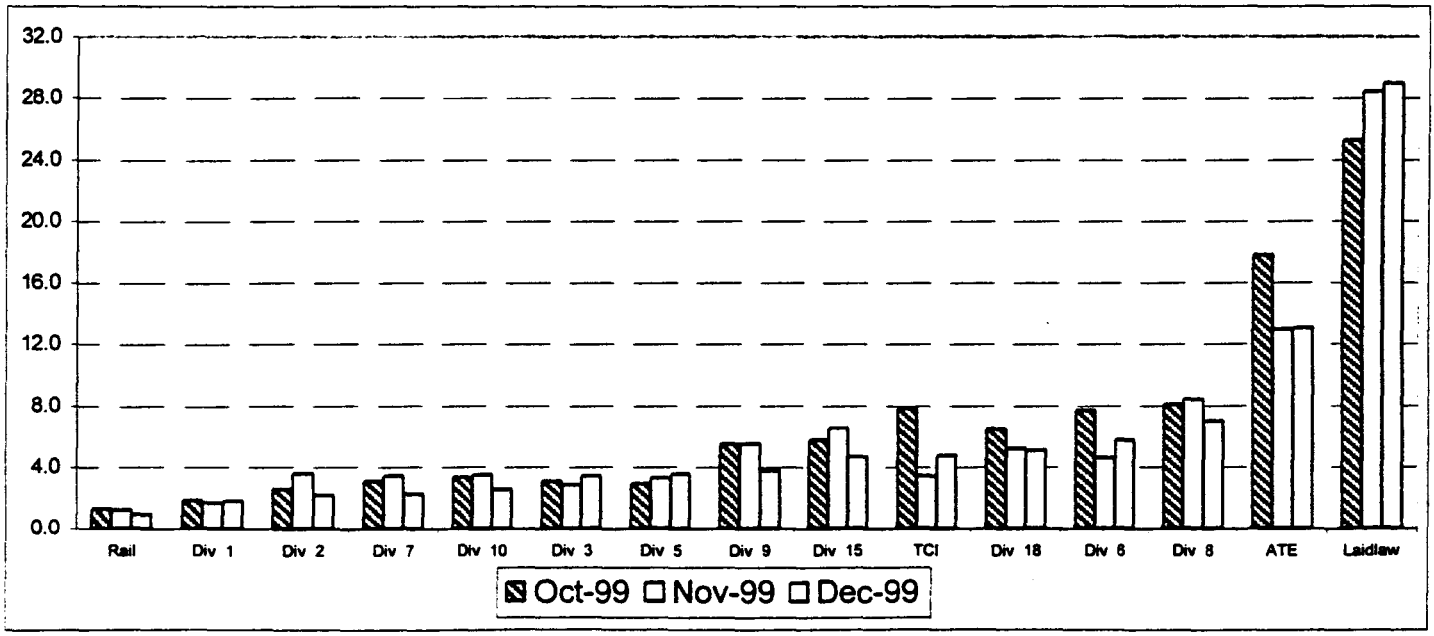
Definition: Average number of customer complaints per 100,000 boardings. This indicator measures service quality and customer satisfaction.

Calculation: Customer complaints per 100,000 Boardings = Complaints/(Boardings/100,000)

Systemwide Trend



Bus Operating Divisions
October 1999 - December 1999



Analysis: We are proud of the progress made in the long term downward trend in customer complaints. We credit this to continued emphasis, better training, follow-up investigations, stronger use of discipline procedures, and a commitment at all levels of Transportation to improving customer service. Customer service complaints are primarily the result of "no shows" and off-schedule arrivals of coaches. On average contract service lines have a headway of thirty minutes or greater and any missed trips or service disruptions cause a high level of inconvenience for our patrons.

Corrective Action: Regarding customer complaints, the Contracted Service staff has been working closely with the manager of each contract in order to drive down the complaints. Each contractor has submitted a plan of action for reducing complaints and will be monitored on a monthly basis Targeted areas include driver courtesy, supervisor ride checks, and vehicle reliability.

COUNTY OF LOS ANGELES

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Reply to:
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January 31, 2000

Renee Marler, Esq.
Regional Counsel, Region IX
FEDERAL TRANSIT ADMINISTRATION
201 Mission Street, Suite 2210
San Francisco, California 94105

Re: Quarterly Update on Status of Key Legal Actions -Revised

Dear Renee:

Attached please find the Los Angeles County Metropolitan Transportation Authority's quarterly update as of December 31, 1999, on the Status of Key Legal Actions Related to Federally Funded Projects.

I have also attached a copy of MTA's recently filed Reply Brief in the consent decree matter. This Brief contains a good summary of MTA's position on the current dispute with the plaintiff's over MTA's load factor compliance.

Please call if you have any questions (213) 922-2528.

Very truly yours,

LLOYD W. PELLMAN
County Counsel

By _____
Nina J. Webster
Principal Deputy County Counsel

NJW:ibm
Attachments

c: Leslie Rogers
Steven Carnevale
Jeff Christiansen
Brian Boudreau
Frank Flores

Los Angeles County Metropolitan Transportation Authority
Status of Key Legal Actions Related to Federally Funded MTA Projects
Date as of December 31, 1999

CASE NAME	C ASE NUMBER	GRANT NUMBER	NARRATIVE	CASE STATUS
Beauchamp, Larry, et al. v. LACMTA, et al.	CV 8 0402 CNB (BQRx)	ALL	Plaintiffs, disabled bus patrons, allege MTA and its contractor, Ryder/ATE, violated the ADA and section 504 of the Rehabilitation Act by failing to maintain bus wheelchair lifts and related equipment. Plaintiffs seek damages and an injunction requiring full and equal access.	Preliminary injunction appealed and appellate court limited scope of injunction to what is required by ADA; discovery continuing.
Engineering Management Consultant ("EMC") v. MTA	BC207617	CA-03-0341, CA-90-X642 and CA-90-X575, CA-03-0392	Breach of contract case. EMC, the designer for the subway system, is suing MTA alleging breach of contract, breach of implied covenant of good faith and fair dealing and requesting declaratory relief on certain contract issues. MTA cross-complained for, among other things, breach of contract by EMC.	Complaint served 03/25/99. Currently in Discovery. Cross-complaint filed 5/99.
Gerlinger (MTA) v. Parsons Dillingham	BC150298, etc.	MOS-1 and CA-03-0341, CA-90-X642	Qui Tam action. Concerns allegations of overbilling by MTA's construction Manager, Parsons-Dillingham ("PD"). County Counsel joined as prosecuting Authority for MTA. MTA has also filed its own lawsuit (BC 179027) against PD for breach of contract, fraud and accounting. April 2000 Trial date.	Discovery Stage
MTA v. Parson Dillingham	BC179027	MOS-1 and CA-03-0341, CA-90-X642	In a related case, MTA filed suit against Parsons Dillingham for fraud and Breach of Contract in the performance of construction management services. April 2000 Trial date.	Discovery Stage

Gonzalez, et al. v. MTA, et al.	CV96-2785JMI	ALL	Plaintiffs. MTA employees allege that the MTA Drug Policy's designation of their positions, pursuant to FTA Regulations, as safety sensitive subject to random testing, violates the US and California Constitutions. On a motion by the MTA, the District Court dismissed the case, holding random testing of safety sensitive employees was constitutional. The Ninth Circuit reversed and remanded the case for further action concluding that more information was necessary before a determination could be made as to whether the FTA Regulations had properly classified the positions. Since Plaintiffs' allegations shifted from a challenge to the MTA's Policy to a challenge to the underlying FTA Regulations, the FTA and DOT were joined as parties.	Plaintiffs stipulated to join DOT & FTA Discovery commencing.
Gonzalez, et al. v. MTA, et al.	CV97-5833JMI	ALL	In a second action, Plaintiff alleges she was discriminated and retaliated against and constructively discharged in violation of Title VII and the ADA because the MTA did not accommodate her religious beliefs and her disability, that she not be subjected to random drug testing. The MTA filed a motion to dismiss asserting, among other defenses, that the doctrine of res judicata barred the action. The District Court agreed and dismissed the action. Plaintiff appealed. Since this case had been dismissed pursuant the doctrine of res judicata, which no longer applies since the first case was remanded, parties agreed it also should be remanded and the District Court should consider the MTA's other grounds for dismissal. The Ninth Circuit agreed and remanded this case to District Court.	Remanded. However, the District Court has not notified parties that it has received this case. Plaintiff's attorney was to prepare a notice to court requesting the status of this case but this has not yet been completed.

Hanneken v. MTA; Universal Hyundai v. MTA; Nhut Dang v. MTA; Hollywood Edgemont v. MTA; Weber v. MTA	BC116625 BC142385 BC153683 BC148113 BC163711	CA-03-0341, CA-90-X642; CA-90-X575, CA-03-0392; CA-03-0341, CA-90-X642; CA-03-0341, CA-90-X642; CA-90-X575, CA-03-0392	These cases involve owners, merchants and tenants who claimed damages caused by MTA construction. All of the property owners in the Hollywood area where the most significant subsidence occurred (6500 Block) have been settled by the MTA's insurance carrier. The remaining cases are being negotiated by the MTA's insurance carrier. Runyon Canyon property owners (Weber)claim a diminution in property values because of the presence of the Red Line Tunnels beneath their properties. The Hollywood Edgemont cases are awaiting trial, arbitration and/or mediation and should be resolved in 2000.	Partially Settled.
Labor/Community Strategy Center v. MTA	CV94-5936TJH	ALL	On October 28, 1996, Federal Judge Terry Hatter approved a Consent Decree reached between the Authority and the class action plaintiffs. The Consent Decree provides for the Authority to: (i) reduce its load factor targets (i.e. the number of people who stand on the bus), (ii) expand bus service improvements by making available a net of 102 additional buses, (iii) implement a pilot project, followed by a Five Year Plan, to facilitate access to County-wide jobs, education and health centers, (iv) not increase cash fares for two years and pass fares for three years beginning December 1, 1996, after which the Authority may raise fares subject to certain conditions of the Consent Decree and (v) introduce a weekly pass and an off-peak discount fare on selected lines.	SETTLED. Parties in dispute over MTA's load factor compliance. MTA has obtained a stay and appealed district court order re load factor compliance to immediately obtain 248 buses on temporary basis.
MTA v. Argonaut; Argonaut v. MTA	BC171636 BC156601	MOS-1, CA-03-0341, CA-90-X642, CA-90-X575, CA-03-0392	MTA is in litigation with its carrier to determine the number of deductibles owed for Argonaut's insurance coverage on the Red Line Project. MTA alleges bad faith by Argonaut in administering MTA's insurance coverage on the Red Line.	Discovery Stage

Obayashi v. MTA	EC024692	CA-90-X575, CA-03-0392	Obayashi, contractor for the Red Line tunnel between Universal City and North Hollywood stations, claims breach of contract for work performed on contract C331. MTA will amend its cross complaint for breach of contract damages to include violations of False Claims Act.	Discovery Stage
Rescue Our Canyons, et al. v. MTA, et al.	CV962078J GD (RMCx)	CA-90-X575, CA-03-0392	On June 26, 1996, the parties entered into a Consent Decree to protect Runyon Canyon Park and private property during the Hollywood Hills subway tunneling. The Consent Decree makes a finding that compliance with the Decree along with the prior MTA environmental documentation constitutes sufficient info. to satisfy state and federal environmental requirements. The MTA is in compliance with the Consent Decree.	SETTLED
Steiny v. MTA	BC145950 BC178939	CA-03-0341, CA-90-X642	These case have been brought by Steiny, an electrical subcontractor and Tutor-Saliba, for breach of contract arising out of the installation of the electrical work on the Vermont Red Line Station. MTA has cross-complained against Steiny as well as the prime contractor Tutor-Saliba alleging inter alia violations of the false claims statutes.	Discovery Stage
Tutor-Saliba-Perini v. MTA	BC123559 BC132998	CA-03-0341, CA-90-X642	These cases have been brought by Tutor-Saliba-Perini, the prime contractor for construction of the Normandie and Western stations, against the MTA for breach of contract. MTA has cross-complained against Tutor-Saliba for several causes of action including false claims. Trial set for January 3, 2000.	Trial pending
Tutor-Saliba-Perini v. MTA	BC193559	CA-03-0341, CA-90-X642	Tutor-Saliba-Perini claims breach of contract relating to the disposal of contaminated soils under to contracts B241 and B261.	SETTLED

UNITED STATES COURT OF APPEALS
FOR THE NINTH CIRCUIT

No. 99-56581

LABOR/COMMUNITY STRATEGY CENTER, *et al.*,
Plaintiffs-Appellees

v.

LOS ANGELES COUNTY
METROPOLITAN TRANSPORATION AUTHORITY, *et al.*,
Defendants-Appellants

APPEAL FROM THE UNITED STATES DISTRICT COURT
FOR THE CENTRAL DISTRICT OF CALIFORNIA
CASE NO. CV 94-5936 TJH (MCx)

APPELLANT LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY'S REPLY BRIEF

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INTRODUCTION AND SUMMARY OF THE ARGUMENT

The brief of the Appellees (hereafter "BRU Br.") misstates the MTA's contentions, the record and the applicable law.

Contrary to the BRU, the Los Angeles County Metropolitan Transportation Authority and Julian Burke (collectively "the MTA") have never contended that the Consent Decree is not an enforceable judgment, nor have they attacked the district court's power to compel compliance with the Decree as correctly construed if a violation had been proved. The MTA has challenged the district court's order because the court's and Special Master Bliss's misinterpretation of the load factor goals led the court to order the MTA to do acts that the MTA never agreed to do in the Decree.

The BRU's arguments are based primarily upon Mr. Bliss's remedial "orders" and his erroneous construction of and additions to the Decree that were not corrected by the district court. Mr. Bliss interpreted the load factor targets as if they were exact performance requisites to be mechanically applied. As properly construed, the load factor targets were performance goals that the MTA promised to use its best efforts to meet. Those targets were imported into the Decree using the MTA's existing

methodology; the targets were used in business and budgeting plans. The Decree expressly preserves the MTA's discretion in deciding how the goals were to be met. It did not commit itself to buy buses if a target was missed. MTA's sole agreement to buy buses is not in the load factor sections of the Decree, but in a very different section that the BRU has not claimed was breached. The MTA never undertook any obligation to perform acts that were impracticable, beyond its fiscal means, or in violation of its statutory obligations to persons other than bus riders who use the County-wide transportation system managed by the MTA.

Nothing in the Consent Decree conferred judicial power on Mr. Bliss. He was a mediator - not an arbitrator or a federal magistrate judge. He was not empowered to issue judicial orders, but only to make findings and recommendations to the district court if he was not successful in settling a dispute among the parties. The district court could remedy only a proved violation of the decree; specific performance is available only to enforce terms of the decree that are themselves specific; and the remedy imposed could not be more intrusive than necessary to enforce its terms. *E.g.*, *Swann v. Charlotte-Mecklenburg Bd. of Educ.*, 402 U.S. 1, 16, 91 S. Ct. 1267, 28 L. Ed. 2d 554 (1971); *Toussaint v. McCarthy*, 801 F.2d 1080, 1085 (9th Cir. 1986), *cert. denied*, 481 U.S. 1069 (1987).

"Substantial compliance" is all that the law requires to establish obedience to a consent decree. *E.g. Gates v. Shinn*, 98 F.3d 463, 468 (9th Cir. 1996); *In Re Dual-Deck Video Cassette Recorder Antitrust Liti.*, 10 F.3d 693, 695 (9th Cir. 1993); *Vertex Distributing, Inc. v. Falcon Foam Plastics, Inc.*, 689 F.2d 885, 891-92 (9th Cir. 1982). Substantial compliance is also the standard in the Decree itself. The MTA produced abundant evidence in the district court that it was substantially complying with the Decree. It also produced uncontradicted evidence that it could not increase its bus fleet beyond its own remediation plan because bus eligible operating funds for further fleet enhancement are not available.

Contrary to the BRU, the MTA has never been in violation of the district court's September 23, 1999 order. Instead, the MTA's directors voted on September 29, 1999 to begin the complex procurement process to acquire the buses as ordered, even though its stay motion was then pending in the district court and was thereafter was granted by this Court.

The BRU's argument that the MTA has misrepresented its obligations under the Decree and failed properly to cite any applicable authorities or record references is refuted by the MTA's opening brief. (Op. Br. at 8-10 [quoting portions of the Consent Decree and citing to the record] at 15-16 [applying contract principles used in construing consent decrees].) The

BRU's attempts to resurrect their civil rights claims and proceedings anteceding the Consent Decree are futile because none is relevant to any issue before the Court.

The MTA is not judicially estopped to challenge the authority of Mr. Bliss or the district court's remedial power because the conditions precedent for such an estoppel never existed.

ARGUMENT

I. The BRU's Brief Misstates the MTA's Contentions.

The BRU's brief says that the MTA contends that "the Federal Courts have no power to enforce the Consent Decree by directing MTA to take corrective actions to come into compliance." (BRU Br. at 2.) The MTA has *never* challenged the district court's power to enforce the Consent Decree. Such decrees are unquestionably injunctions issued by a court in exercise of its equitable jurisdiction. *Gates*, 98 F.3d at 468.

Although consent decrees are judgments, they are construed as contracts, as the BRU has necessarily conceded. (BRU Br. at 25.) Accordingly, no party to a consent decree can be compelled to do any act that it did not agree to do in the consent decree itself. *United States v. Armour & Co.*, 402 U.S. 673, 681-82, 91 S. Ct. 1752, 29 L. Ed. 2d 256 (1971); *Gates*, 98 F.3d at 468; *Vertex*, 689 F.2d at 892.

The district court, Mr. Bliss, and the BRU have disregarded a basic interpretive cannon:

> A contract must receive such an interpretation as will make it lawful, operative, definite, reasonable, and capable of being carried into effect, if it can be done without violating the intention of the parties. Cal. Civ. Code § 1643.

The interpretation given the Decree below and now urged by the BRU violates Section 1643 because that construction is neither reasonable nor capable of being carried into effect. Moreover, if the Decree had purported to require the MTA to use non-bus-eligible funds to acquire and operate buses or to breach its federal and state statutory duties [it did not], the Decree would be *pro tanto* unlawful.

The BRU's arguments likewise disregard *Armour & Co.*, 402 U.S. at 681-82:

> [T]he scope of a consent decree must be discerned within its four corners, and not by reference to what might satisfy the purposes of one of the parties to it. Because a defendant has, by the decree, waived his right to litigate the issues raised, a right guaranteed to him by the Due Process Clause, the conditions upon which he has given that waiver must be respected, and the instrument must be construed as it is written, and not as it might have been written had the plaintiff established his factual claims and legal theories in litigation.

Contrary to the BRU, MTA has not contended that the constraints imposed by the Supreme Court on federal courts in issuing orders to state entities are different depending upon whether the court is enforcing a consent decree or a judgment entered after a merits trial in which a constitutional violation has been found. (BRU Br. at 22.) Federal courts have no greater power to enforce consent decrees than decrees entered after a merits trial. *E.g.*, *Spallone v. United States*, 493 U.S. 265, 276, 110 S. Ct. 625, 107 L. Ed. 2d 644 (1990); *Gates*, 98 F.3d at 471 (citing, *inter alia*, *Turner v. Safley*, 482 U.S. 78, 85, 107 S. Ct. 2254, 96 L. Ed. 2d 64 (1987)). Federal courts cannot grant remedial mandatory injunctions against state entities except in the most extraordinary circumstances. *Rizzo v. Goode*, 423 U.S. 362, 379, 96 S. Ct. 598, 46 L. Ed 2d 561 (1976). No such circumstances exist here.

It is the BRU that argues that the Supreme Court's restraints on federal court remedial powers are inapplicable to the Consent Decree. (BRU Br. at 24, n.217.) That argument again rests on its own misconstructions of the Decree and that of Mr. Bliss and the district court. (BRU Br. at 31-33.) That the BRU and Mr. Bliss did not agree that the MTA's own remediation plan was sufficient to comply with their misinterpretations of the Decree does not change the Supreme Court's

requiring federal courts to respect the discretion of state governmental entities and agencies when issuing remedial orders. *E.g., Spallone*, 493 U.S. at 276 (1990); *Turner*, 482 U.S. at 84-85.

II. The MTA Has Complied With the Court's 1999 Order

The BRU erroneously argues that the MTA has violated the district court's order. In response to the district court's September 23, 1999 order, the MTA Board of Directors voted on September 29, 1999, to procure 297 new buses and directed the MTA staff to commence the procurement process immediately. (ER 367, at 293, ¶ 1.) Those buses represent the full amount of new buses that the MTA was directed to purchase by Mr. Bliss's memoranda, as modified by the district court's September 23, 1999 order. (*Ibid.*) The MTA also formed four separate committees to try to identify whether any operating funds exist that are necessary to put the buses into service. (ER 367, at 294, ¶ 3). It accelerated the hiring and training of personnel needed to service and operate the scheduled 64 new buses. (ER 367, at 295 ¶ 10.) All of these actions were undertaken continue despite

the pendency of the MTA's motion to stay in the district court.[9] This Court later granted the stay.

III. The MTA Has Substantially Complied With The Consent Decree As Properly Construed.

"Substantial compliance" is the standard applicable to the MTA's performance of obligations under the Decree according to the law and the Decree itself. *In Re Dual-Deck Video Cassette Recorder Antitrust Liti.*, 10 F.3d at 695; *National Advertising Co. v. Orange*, 861 F.2d 246, 250 (9th Cir. 1988). *See also, Gates*, 98 F. 3d at 468, n.3. The BRU's argument that "substantial compliance" is confined to the performance of § VIII of the Decree is both mistaken and irrelevant because the law imposes that standard even if a decree says nothing on the subject.

A provision of a consent decree must be very specific to be enforceable by a mandatory injunction or contempt. The district court, Mr. Bliss and the BRU, failed to apply basic principles of equity foreclosing

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[9] Cases cited by the BRU to support its argument that the MTA violated the mandate are inapposite. (BRU Br. at 20, n14.) None of these cases involves a party's commencing efforts to comply with an order while simultaneously appealing and seeking a stay. In *Walker v. Birmingham*, 388 U.S. 307, 318-19, 87 S. Ct. 1824, 18 L. Ed. 2d 1210 (1967), petitioners ignored a TRO, filed nothing to upset the injunction and sought no stay. The court distinguished petitioners' case from those in which an injunction was challenged before disobedience.

specific performance of a contract in which the terms are not definite or are unlawful. Cal. Civ. Code § 3390.[10] *Long Beach Drug Co. v. United Drug Co.*, 13 Cal.2d 158, 164, 88 P.2d 698 (1939); *Eldridge v. Burns*, 67 Cal. App.3d 396, 420, 142 Cal. Rptr. 845 (1978). Uncertain contracts cannot be enforced by mandatory injunctions. (Cal. Civ. Code § 3423.).[11] Federal Courts are not permitted to rewrite terms of a consent decree to make it sufficiently certain to be equitably enforced. *Vertex*, 689 F.2d at 893.

As this Court held in *Gates*, 98 F.3d at 471: "In the absence of a decree 'specific in terms,' the district court would lack the power to decide." *Gates*, 98 F.3d at 471. Because the targeted multi-year goals set forth in § II.A.1 are not and were never intended to be certitudes, and the MTA did not agree to buy buses if it did not meet load factor targets

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[10] In pertinent part, § 3390 provides: "The following obligations cannot be specifically enforced: . . .3. An agreement to perform an act which the party has no power lawfully to perform when required to do so; . . .5. An agreement, the terms of which are not sufficiently certain to make the precise act which is to be done clearly ascertainable."

[11] In pertinent part, § 3423 provides "[a]n injunction may not be granted: (e) To prevent the breach of a contract the performance of which would not be specifically enforced, other than a contract in writing for the rendition of personal services . . . ."

targets;[12] the load factor targets cannot therefore be specifically enforced by ordering the MTA to buy more buses than its own remediation plan contained.

The BRU's response to the MTA's evidence of its financial inability to comply with the district court's order is an irrelevant footnote. (BRU Br. at 30, n.19) The footnote argues that the MTA committed funds to "capital and other projects rather than to reallocate them to meet the requirements of the Consent Decree" after the Decree. (*Ibid.*) No record support is provided because none exists.

The BRU has never recognized that the only funds available to meet obligations that the MTA did assume are "bus-eligible funds realized in excess of funds already specifically budgeted for other purposes." (§ I.F., ER 321 at 3-4.) The BRU's argument also disregards the explicit provisions of the Decree limiting the MTA's duties under the Decree to those which are consistent with the MTA's "other statutory responsibilities and obligations." (*Ibid.*)

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[12] The load factor sections only obliged the MTA to develop a plan to meet targets if it missed a goal. The MTA's own remediation plan fulfilled that obligation.

The BRU is simply wrong in arguing that the MTA's financial plight should be disregarded because that condition is the MTA's own fault. (BRU Br. at 30 n.19.) The MTA's financial dilemma is caused by the district court's erroneously adopting Mr. Bliss's misinterpretation of the Decree, by the court's over-intrusive mandatory injunction and by funding constraints imposed by federal and state law.[13]

IV. The District Court and Mr. Bliss Exceeded Their Powers

The BRU's argument that the MTA agreed to confer power on Mr. Bliss to issue mandatory injunctions and consented to the district court's intrusive remedial order are based solely on misinterpretations of the Decree. (BRU Br. at 31.) Nothing in the Decree conferred judicial powers on Mr. Bliss or gave him the powers of an arbitrator or a federal magistrate judge. Mr. Bliss's power was simply "to facilitate the resolution of disputes arising under any provisions of the Consent Decree." (§ V.A., ER 321 at 10.) The Decree thereafter provided that if a dispute arose that the parties could not resolve informally,

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[13] *W.R. Grace & Co. v. Local Union 759*, 461 U.S. 757, 767, 103 S. Ct. 2177, 76 L. Ed. 2d 298 (1983) cited by the BRU (BRU Br. at 30, n.19) is inapposite. The party in *W.R. Grace* committed itself voluntarily to two conflicting contractual obligations. The MTA, however, voluntarily committed itself to strive to meet targets by certain dates when its ability to do so is within its fiscal means and consistent with its other statutory responsibilities. (§ I.F., ER 321 at 3-4.)

> "the attorneys shall refer the matter to the Special Master for resolution pursuant to procedures set forth by the Special Master. Any matter resolved by or referred to the Special Master may be reviewed by the District Court, along with the recommendations of the Special Master, if any, upon motion by either of the parties." (§ V.Br., ER 321 at 10-11.)

The Decree did nothing more than continue the role that Mr. Bliss had played as a mediator when he assisted the parties in reaching the settlement embodied in the Consent Decree. If all the parties had agreed to his proposed resolution, they would then have been bound by that settlement agreement, just as they are bound to the terms of the settlement they actually made that was incorporated in the Decree. The MTA disagreed with his proposed settlement and sought the very review that the Decree provided.

The Decree does not purport to confer on the district court more power to enforce the decree than the court would have had if the parties had reached that settlement without any assistance by a mediator or the court itself.

The BRU incorrectly argues that constraints imposed on the federal courts by the Supreme Court in issuing remedial orders do not apply the enforcement of consent decrees. (BRU Br. at 34.) The Supreme Court has

applied identical principles to consent decrees and to decrees entered against a state entity after a merits trial in which the defendant has been found guilty of a constitutional violation, and the MTA has not argued otherwise. *E.g.*, *Spallone*, 493 U.S. at 276 (in enforcing a consent judgment, the "federal courts in devising a remedy must take into account the interest of state and local authorities in managing their own affairs, consistent with the Constitution"); *Rufo v. Inmates of the Suffolk County Jail*, 502 U.S. 367,112 S. Ct. 748, 116 L. Ed.2d 867 (1992) (same).

The BRU misconceives the restrictions imposed on federal courts in writing remedial orders arguing that the Decree itself conferred more expansive powers than the district court and Mr. Bliss would otherwise have had. (BRU Br. at 21-22.) The argument cannot withstand scrutiny of the Decree itself. The Supreme Court has required district courts to respect principles of federalism and comity by confining federal courts to the least

intrusive orders necessary to enforce specifically enforceable terms of judgments.[14]

The Supreme Court's observations in *Turner*, 482 U.S. at 84-85 are applicable here, although *Turner* involves remediation of alleged unconstitutional conditions in a state prison:

> Running a prison is an inordinately difficult undertaking that requires expertise, planning, and the commitment of resources, all of which are peculiarly within the province of the legislative and executive branches of government. Prison administration [like the MTA's administration of its complicated transportation system] is, moreover, a task that has been committed to the responsibility of those branches, and separation of powers concerns counsel a policy of judicial restraint. Where a state penal system is involved, federal courts have . . . additional reason to accord deference to the appropriate prison authorities.

The required restraint and deference were not given to the MTA by Mr. Bliss or by the district court.

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[14] *Washington v. Washington State Commercial Passenger Fishing Vessel Assn.*, 443 U.S. 658, 693-96, 99 S. Ct. 3055, 61 L. Ed. 2d 823, *modified on other grounds sub nom. Washington v. United States*, 444 U.S. 816, 100 S. Ct. 34, 62 L. Ed. 2d 24 (1979). (BRU Br. at 33-34.) The sole issue was a conflict between State regulations and regulators and a treaty securing certain fishing rights of Native Americans. The treaty rights prevailed over the State's rights as required by the Supremacy Clause of the Constitution. Respect for the State's sovereignty was therefore irrelevant.

V. The MTA Is Not Judicially Estopped to Challenge Mr. Bliss's and the Court's Powers.

The BRU's judicial estoppel argument rests only on the MTA's earlier erroneous request directed to Mr. Bliss to issue a TRO to stop an impending strike. Mr. Bliss quickly vacated his TRO, and it had no impact on anyone. The judicial estoppel doctrine is inapplicable because the MTA never gained any advantage from its brief and futile invocation of a nonexistent power. *Rissetto v. Plumbers & Steamfitters Local 343*, 94 F.3d 597, 600 (9th Cir. 1996).

CONCLUSION

The MTA substantially performed the only obligations it had with respect to meeting the load factor goals of the Consent Decree. Although its remedial plan included increasing its fleet capacity voluntarily, nothing in the load factor provisions of the Decree obligated it to do so. The MTA produced unrebutted evidence in the district court establishing that it could not buy more buses than its own remedial plan provided because it had no more bus-eligible financial resources with which to operate a fleet larger than its own remediation plan provided.

Because the load factor goal provision did not impose any obligation on the MTA to buy buses, specific performance of that nonexistent

obligation could not be granted. The district court's injunctive powers could not be used to compel the MTA to buy more buses than its own remedial plan provided. Moreover, the load factor goals of the Decree were insufficiently precise to be enforceable by specific performance, and no other breach of the Consent Decree was charged.

WHEREFORE, the MTA respectfully requests that the order of the district court be reversed with directions to vacate its order and to vacate Mr. Bliss's "order."

Respectfully submitted

Dated: January 24, 2000

OFFICE OF THE LOS ANGELES COUNTY COUNSEL

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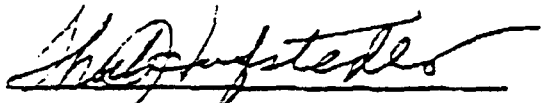
By _____
Shirley M Hufstedler
Attorneys for Defendants-Appellants
LOS ANGELES METROPOLITAN TRANSPORTATION AUTHORITY, et al.

CERTIFICATION OF COMPLIANCE
TO FED. R. APP. 32(A)(7)(c) AND CIRCUIT RULE 32-1
FOR CASE NUMBER 99-56581

I certify that pursuant to Federal Rule of Appellate Procedure 32(a)(7)(c) and Ninth Circuit Rule 32-1, the attached reply brief is proportionately spaced, has a typeface of 14 points or more and contains 4766 words and therefore does not exceed the 7,000 word limitation of a reply brief.

January 24, 2000



Shirley M. Hufstedler

Item # 32

Year 2000 Project

Finance & Budget Committee

January 20, 2000

Project Status Update

- **Current Status**
  - ✓The MTA moved into the Year 2000 without any significant system problems or disruptions
  - ✓Prior to the end of 1999, all non-compliant systems were either repaired, replaced, or a workaround was implemented
  - ✓ Further, tests were conducted on all mission critical systems to ensure proper operation and functionality of each system

Project Status Update

- **Rollover**
  - ✓
  - ✓EOC Manager activated the EOC at 6:00 p.m. on Dec. 31, 1999
  - ✓
  - ✓Ridership was light and we rolled into Year 2000 with only a few minor problems
    - A rain related bus accident
    - A down cable on the Blue Line
    - A section of the Red Line maintenance track lost power
    - None of these problems were Y2K related
  - ✓
  - ✓

Project Status Overview

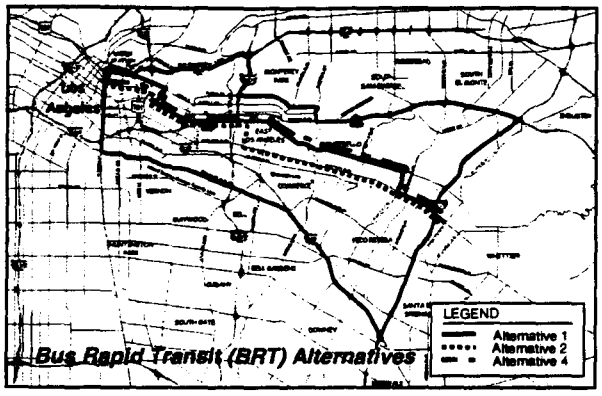
- **Look Ahead**

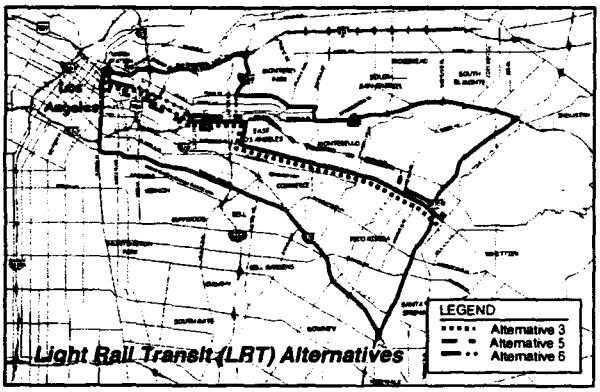
There's still work that remains to be done to non-mission critical elements of:

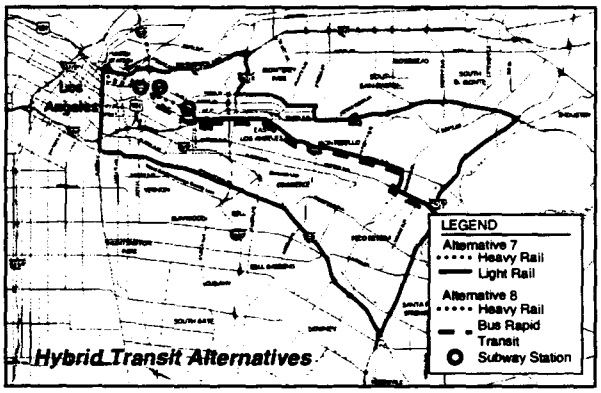
- ✓ **Application System**-TOTS
- ✓ **Rail Systems**-SCADA and Variable Message Signs
- ✓

PROJECT STATUS OVERVIEW:

- ✓**Infrastructure**-Telephone System and Personal Computer Upgrades
- ➢
- ➢**Y2K Issues are not over-**
  next trigger dates
  2/29/00 3/01/00







Eastside Transit Corridor Study

Los Angeles, California

Re-Evaluation/ Major Investment Study (MIS)

Draft Executive Summary

Prepared for:
Los Angeles County
Metropolitan Transportation Authority

Prepared by:
Eastside Corridor Transit Consultants

February 24, 2000

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Executive Summary
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I. Need for Action

Description of the Study Corridor

The Eastside Corridor study area extends from Alameda Street in Central Los Angeles east through the Boyle Heights community in the City of Los Angeles and the City Terrace, Belvedere and East Los Angeles communities of unincorporated Los Angeles County. South and east of the East Los Angeles area, the corridor study area includes major portions of the cities of Montebello, Pico Rivera and Commerce, and areas that include portions of Monterey Park, Downey, Santa Fe Springs and Whittier (Figure 1).

Regional Context

Work on planned Eastside and Westside extensions of the Metro Red Line subway was suspended by the Los Angeles County Metropolitan Transportation Authority (MTA) in January 1998 due to financing difficulties. The MTA Restructuring Plan adopted in May 1998 called for the MTA to study "viable and effective options" for all parts of Los Angeles County, with an emphasis on the corridors in which rail projects has been suspended. Within the Eastside and Westside corridors, this necessitated the examination of alternative fixed guideway options to the heavy rail subway projects.

Based on the results of the November 1998 draft Regional Transit Alternatives Analysis (RTAA Study), the MTA Board approved the concept of a rapid bus plan in March 1999, which included a rapid bus demonstration project on the Eastside. The Board also reaffirmed its commitment to fund fixed guideway transit improvements beyond rapid bus in the suspended rail corridors. The Board subsequently authorized the preparation in June 1999 of this Re-Evaluation/Major Investment Study and Draft and Final Supplemental Environmental Impact Statement/Environmental Impact Report (SEIS/SEIR) for the suspended Metro Red Line Eastside Transit Corridor Project.

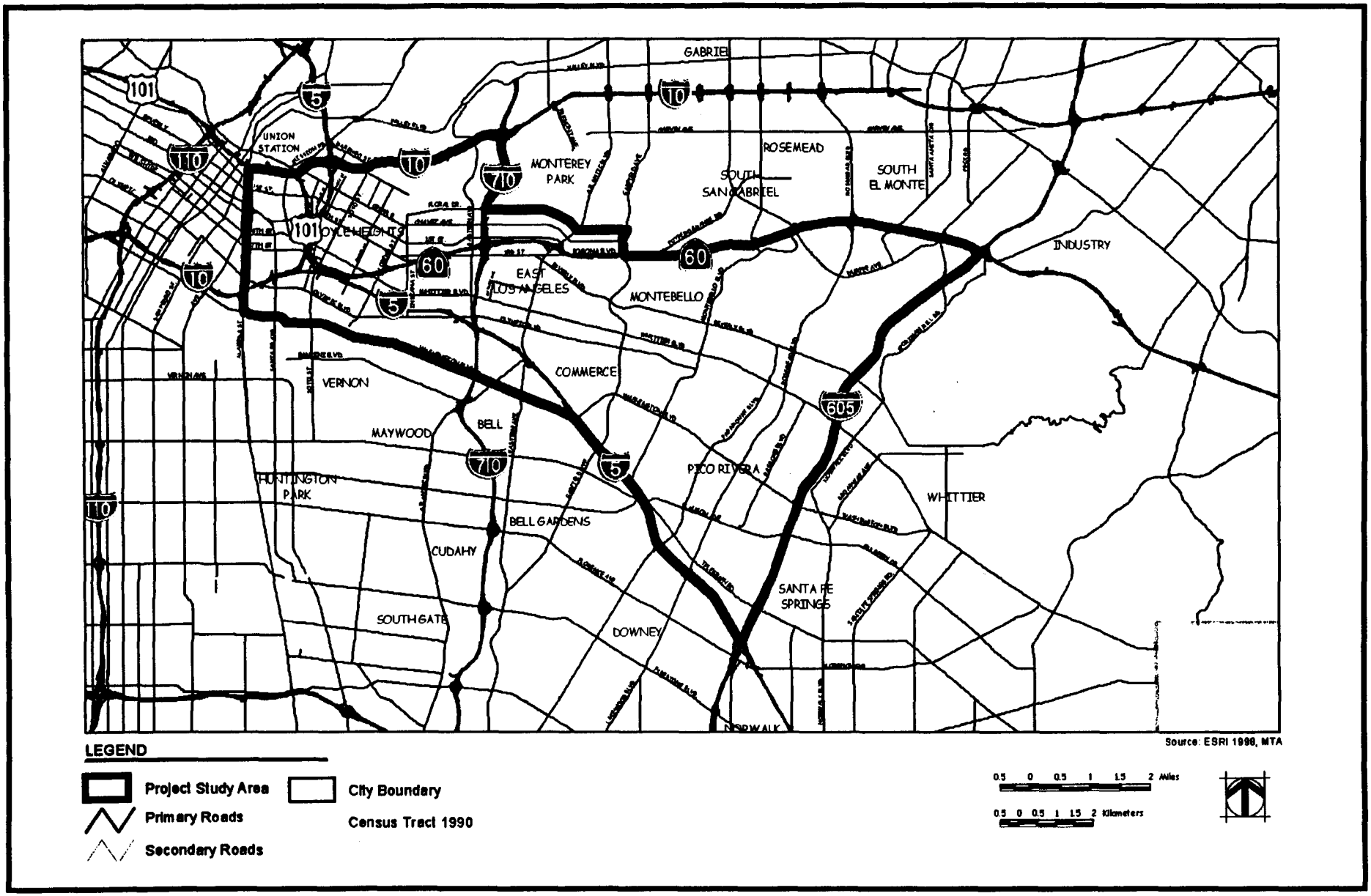
Roadway Conditions

The Eastside Corridor study area is served by several freeways that connect to neighboring communities and other parts of the Southern California metropolitan region.
Freeways include the San Bernardino Freeway (I-10), the Long Beach Freeway (I-710), the Santa Ana Freeway (I-5), Pomona Freeway (SR-60), and US-101 Freeway.

The major arterial and neighborhood collect streets include:

- East-West – Cesar Chavez Avenue, 1st Street, 4th/3rd Streets, Beverly Boulevard, Whittier Boulevard and Olympic Boulevard

- North-South - Soto Street, Eastern Avenue, Atlantic Boulevard, Garfield Avenue, Montebello Boulevard, and Rosemead Boulevard. The older western sections of the corridor (Boyle Heights and East Los Angeles) have narrower streets and greater levels of congestion than the more suburban eastern section (Montebello and Pico Rivera).



Eastside Transit Corridor Study

Project Study Area

Eastside Corridor Transit Consultants

Figure 1

Transit Systems

The Eastside Corridor has one of the most extensive networks of bus routes in the County. The corridor's transit routes generally follow a grid pattern and include many express and local routes and one limited service route. Six public agencies operate bus services in the Eastside Corridor. The include:

- Los Angeles County Metropolitan Transportation Authority
- Montebello Transit
- Whittier Transit
- Norwalk Transit
- City of Monterey Park
- City of Commerce

Most of the heavily used routes are those that run in an east-west direction. Severe overcrowding occurs regularly on many of these routes during peak periods. Although north-south travel is constricted into two main through bus lines on Soto and Atlantic, the predominant flow of transit passengers in the corridor is in an east-west direction.

Community Factors

The Eastside Corridor study area contains a low-to moderate-income population, which is expected to grow by over 25 percent to 625,000 in 2020. The Eastside corridor contains a dense concentration of households, particularly in the western portion of the study region.

Access to employment opportunities is one of the major mobility problems that affect Eastside Corridor residents. The 1990 Census analysis of the study area work force revealed a breakdown of home-based work trips generated from the Eastside Corridor area. Nine percent of work trips were destined for the Los Angeles CBD, 36 percent for areas north and west of the CBD, 13 percent for the South Bay region of the County, 24 percent for locations within the corridor and 18 percent for areas in the remainder of the County.

Forecast date for the year 2020 show an increase in the number of trips generated in the Eastside Corridor study area as the population grows. The forecast results indicate that there will be less reliance on the Los Angeles CBD and a greater number of trips being made to other sub-areas of the Los Angeles region. Thereby increasing the need for Eastside residents to have quality transit service to all parts of the region.

Goals and Objectives

The goals and objectives of the Eastside Transit Corridor Study have been developed out of the extensive corridor and systems planning studies carried out over the past ten years, including the Eastside Alternative Analysis/DEIS/DEIR process and public reviews leading to selection of the Locally Preferred Alternative.

Based on these planning and community involvement activities, the following goals and objectives were developed. They are based on established transportation and land use goals and objectives of the major government jurisdictions along the corridor, including the City of Los Angeles and the County of Los Angeles. These goals and objectives will be utilized in the development and evaluation of Eastside Corridor transit alternatives.

1. Improve access and mobility for residents, employees, and visitors to the Eastside Corridor.
2. Support land use and development goals as stated in the City of Los Angeles and County of Los Angeles plans.
3. Achieve local consensus by ensuring that the process is responsive to the community and policy-makers.

4. Provide a transportation project that is compatible with and enhances the physical environment wherever possible.
5. Provide a transportation project that minimizes adverse impact on the community.
6. Provide a transportation project that is reasonably within budget constraints for both capital and operating expenses.

Mobility Problem Summary

Travel demand forecasts prepared by SCAG and the MTA over the past decade have identified the need for major transit improvements in the Southern California region, especially in Los Angeles County, to meet the mandates of the Federal Clean Air Act and address the increasing mobility needs of the region. Current freeway and surface arterial street facilities cannot be expanded sufficiently to handle the forecasted demand for mobility. The latest regional forecasts for the year 2020 estimate that person trips will increase by over 40 percent in the region and by almost 30 percent in Los Angeles County.

All major freeways serving the Eastside Corridor area are currently operating above their design capacities during peak periods and for significant durations during the off-peak periods. No major improvements to existing freeways in the study area are identified in the current SCAG Regional Transportation Plan except for the extension of the I-710 freeway north to Pasadena. During previous project scoping and community meetings, residents of the Eastside Corridor expressed their desire for improved transit services because many are transit-dependent and need improved access to the region's educational, employment and cultural opportunities. Current meetings with Eastside Corridor elected officials have confirmed the need for improved transit service and connections to the regional system, especially in light of community initiatives for revitalization, employment opportunities, and economic development on the Eastside.

The Role of the Re-Evaluation/MIS

Two objectives of this Re-Evaluation/MIS study are to (1) develop alternatives to the Suspended Project, and (2) to identify the corridor long term transportation needs to be addressed in the MTA Long Range Plan. This Re-Evaluation/MIS Report will provide the public and MTA Board of Directors the technical information needed in order to make an informed decision related to selecting an alternative or alternatives that satisfy the needs of the Eastside Corridor. The selected alternatives will then be subject to the next phase of analysis which is the preparation of a Supplemental Draft Environmental Impact Statement/Supplemental Draft Environmental Impact Report (SDEIS/SDEIR).

Based on the SDEIS/SDEIR the MTA Board of Directors could select the Eastside fixed guideway project that would be subject to Preliminary Engineering and Final Environmental Impact Statement/Final Environmental Impact Report (FEIS/FEIR). The final actions before final design and construction could begin would be a Record of Decision by the Federal Transit Administration and an agreement on a financing plan between the FTA and LACMTA. The above process from the time a decision is make by MTA on this Report until a Record of Decision and financing plan is agreed upon would be approximately eighteen months to two years. After that time final design and subsequent construction activities could begin.

II. Alternatives Considered

Screening and Selection Process

The first task undertaken to select alternatives for the study was to compile and review all alternatives identified in prior studies for any of the three modes identified for the Eastside: Bus Rapid Transit (Busway), Light Rail Transit and Heavy Rail Transit.

The following six studies were identified:

1. Regional Transit Alternatives Analysis, November 1998, MTA.
2. East Los Angeles Study for 1st District, October 1998, ACG Environments.
3. 1998 RTP Transit Restructuring Evaluation, East Los Angeles, Transit Corridor Technical Report, July 1998, SCAG.
4. Los Angeles East Side Extension, FEIS/FEIR, September 1994, MTA.
5. Route 10/60 Corridor Preliminary Planning Study, June 1993, MTA.
6. Los Angeles Eastside Corridor, AA/DEIS/DEIR, April 1993, MTA.

From these six studies, as well as from input from the public and staff, 47 alternatives were identified. The goal was to reduce the alternatives to eight fixed guideway alternatives for analysis along with the three potential modes. In addition to studying the eight fixed guideway alternatives, the study team was charged with studying a No-Build alternative as well as an alternatives consisting of Transportation System Management (TSM) techniques.

The process of "scoping" was also undertaken pursuant to Federal and local environmental procedures. Working in cooperation with the Federal Transit Administration (FTA), the Federal Notice of Intent was published on August 13, 1999 and the California Notice of Preparation on August 10, 1999. Interested individuals, organizations and agencies were invited to provide input in the selection of alternatives as part of the scoping process. Included at this stage were meetings conducted in the most impacted communities in the Corridor.

Working closely with MTA staff, the study team developed a list of 32 criteria by which each of the alternatives could be assessed. After applying the criteria to the 47 alternatives, 15 alternatives were selected for further consideration. These 15 were subsequently reduced to the eight alternatives to be studied based on considerations of the prior studies, the need to include all three fixed guideway modes and the identification of logical termini points.

Once the eight alternatives were identified, the criteria and measures that would be used in making the analysis were developed. The major categories of criteria were:

1. Costs
2. Effectiveness or Transportation System Performance
3. Efficiency or Cost-Effectiveness
4. Potential Environmental Issues and Concerns
5. Environmental Justice Issues
6. Community Consensus

Description of Each Alternative

The following description of each Alternative provides additional background information on the thorough process that went in to each Alternative selection. Of the eight fixed guideway alternatives, three alternatives (1, 2, and 4) are exclusively Bus Rapid Transit (BRT), three alternatives (3, 5, and 6) are exclusively Light Rail Transit (LRT), and two alternatives (7 and 8) are hybrids using Red Line Heavy Rail Transit (HRT) from Union Station connecting to either LRT or BRT technologies for the

remainder of the Corridor to Whittier and Norwalk Boulevards. Figures 2, 3, and 4 show the eight alternatives grouped by the three categories of BRT, LRT, and HRT/Hybrid alternatives. All the alternatives have the same termini; Union Station on the west and Whittier and Norwalk Boulevards on the east. In addition, a No Build and Transportation System Management (TSM) Alternatives are required by local and Federal regulations in order to compare the eight fixed guideway alternatives. The description of each of the these baseline alternatives are also presented.

Alternative 1 – BRT on Cesar Chavez, 4th, 3rd, Beverly and Whittier

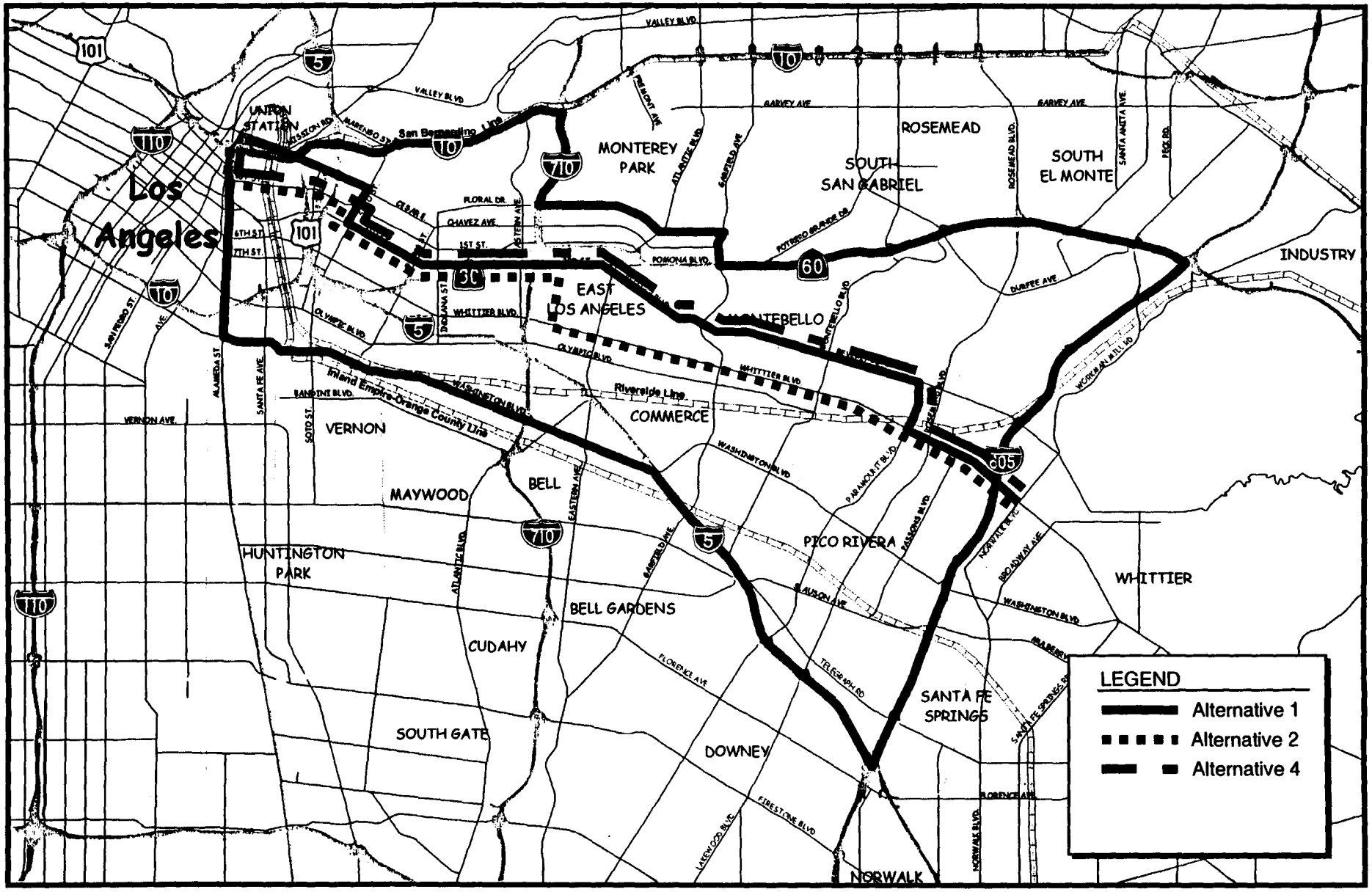
This alternative introduces the BRT mode to the Eastside Corridor. The following discussion is applicable to all BRT oriented alternatives and not just to Alternative 1. The BRT fixed guideway concept would dedicate a travel lane on the chosen alignment that is adjacent to the parking lane and would provide for generally BRT stations on the far side of intersections. All BRT concepts would operate on existing arterial streets and would require the removal of one general purpose travel lane in each direction. That travel lane would be reconstructed and converted to a dedicated Bus Rapid Transit fixed guideway.

The operation of the BRT will be a new and unique operating and traffic arrangement for the Eastside Corridor alignments. Both local buses and BRT buses (dedicated service route along the bus lane as well as special BRT routes serving areas adjacent to the dedicated bus lane) would operate in the dedicated Bus Rapid Transit Lane. The BRT and local buses would stop at the special BRT Stations shown (usually a far bus stop). The BRT Station stop (approximately 180 feet long) would entail extending the sidewalk the width of the parking lane so that the buses would not have to leave the dedicated lane when loading and unloading passengers. The buses will make other stops between the BRT Stations and would move to the curb lane just as they do today. It is also assumed that the buses operating on these dedicated lanes will have traffic signal preemption to allow them to operate at the posted speed limits between stops. It is expected that from 30 to 75 buses would operate in one direction in the peak hours depending on the location within the Eastside Corridor (less buses per hour the further east you go). The BRT buses would be completely a new style (40' to 60') attractive bus. These new style buses are much more attractive to the neighborhoods, easier to load (low floor accessibility), and would met MTA's clean fuel policy.

Automobiles and delivery vehicles will operate in a much different fashion than they do now. Parking spaces will be enlarged to make parking easier. It is expected that a number of on-street spaces will be lost with these alternatives and replacement parking would have to be provided within the immediate area. The frequency of parking entries and exits may eventually affect the operating speed of the dedicated bus lane. Over time more off-street parking may have to be developed to maintain a quality operation on the dedicated bus lane.

Private vehicles making right turns must move into and cross the dedicated bus lane as they approach the intersection. Also when turning onto the dedicated bus lane portion of the street the driver will need to be sure to enter into the proper travel lane which will not be the standard right lane. It is also expected that the streets with the dedicated bus lane will become more "transit" oriented and through traffic will be reduced and directed to other streets within the corridor. On the narrower streets left-turns may have to be restricted at certain intersections during portions of the day (peak morning and evening periods) because of the lack of space for a dedicated left turn pocket. The reduction of one traffic lane in each direction will impact the level of service and possible ease of access to commercial businesses and other public activities. It is expected over time that traffic would re-orient itself because most of the streets in the western portion of the Eastside Corridor have some available capacity and might accept more traffic and still be acceptable.

Alternative 1 is the first of three exclusive BRT alternatives identified for study. The alignment of Alternative 1 is shown in Figure 2. Alternative 1 is approximately 13.2 miles long with 18 stations from



Eastside Transit Corridor Study

Bus Rapid Transit Alternatives

Eastside Corridor Transit Consultants

Figure 2

1st/Alameda through Union Station and to Whittier and Norwalk Boulevards via Cesar Chavez, Soto, 4th, 3rd, Beverly, Paramount and Whittier.

The BRT operating plan is designed to maximize the use of the dedicated bus lane and to optimize the operating characteristics and flexibility of a bus system operation. The operating plan was also designed to provide an equivalent capacity to the LRT at-grade alternatives that are being studied. The BRT operating plan for this Alternative and the other BRT alternatives is comprised of three components. These are:

1. A major BRT Trunk lane operating between Whittier/Norwalk Boulevards and 1st/Alameda with 4 minute peak service and 10 minute off-peak service;
2. Ten BRT connecting routes operating with 15 minute peak service and 30 minute off-peak service – these routes provide a one-seat ride for example from Washington/Rosemead (BRT Connector Route 3) to all points west of Whittier/Rosemead; and
3. Local bus connecting routes to all stations along the BRT line. The BRT running time using dedicated bus lane with stops at each station is estimated to be 34 minutes from Whittier/Norwalk to 1st/Alameda.

The Wilshire/Whittier Rapid Bus line is included in this and all the Build alternatives, but the peak period service frequency has been reduced to 7 minutes and the off-peak frequency to 12 minutes.

Alternative 2 – BRT on Alameda, 1st, 4th, 3rd, Arizona and Whittier

Alternative 2 is the second of three exclusive BRT alternatives identified for the study. The alignment of Alternative 2 is shown in Figure 2. Alternative 2 is approximately 13.1 miles long with 19 stations from Union Station and to Whittier and Norwalk Boulevard via Alameda, 1st, Soto, 4th, 3rd, Mednik, Arizona and Whittier.

The BRT operating plan is designed to maximize the use of the dedicated bus lane and to optimize the operating characteristics and flexibility of a bus system operation. The operating plan was also designed to provide an equivalent capacity to the LRT at-grade alternatives that are being studied. The BRT operating plan for this Alternative and the other BRT alternatives is components. These are:

1. A major BRT Trunk line operating between Whittier/Norwalk Boulevards and Union Station with 4-minute peak service and 10-minute off-peak service;
2. Ten BRT Routes operating with 15-minute peak service and 30 minute off-peak service – these routes provide a one-seat ride for example from Washington/Rosemead to all points west of Whittier/Rosemead; and
3. Local bus connecting routes to all stations along the BRT line. The BRT running time using the dedicated bus lane with stops at each station is estimated to be 35 minutes from Whittier/Norwalk to Union Station.

The Wilshire/Whittier Rapid Bus line is included in this and all Build alternatives, but the peak period service frequency was reduced to 7 minutes and the off-peak frequency to 12 minutes.

Based on the assumed operating plans described above the number of buses per hour in the peak direction on the dedicated bus lane would vary from 24 buses at Passons and Whittier to approximately 77 buses at 1st and Chicago.

Alternative 3 – Light Rail Transit (LRT) on Alameda, 1st, 4th, 3rd, Arizona and Whittier

This alternative introduces the Light Rail Transit (LRT) mode to the Eastside Corridor. The following discussion is applicable to all LRT oriented alternatives and not just Alternative 3. The LRT fixed

guideway concept would operate in a dual track configuration in the center of the selected streets and provide what are called low platform center station arrangements. LRT is electrically powered (similar to the Long Beach Blue Line and the Green Line) and receives its electric power from overhead power lines within the street right-of-way. All the LRT concepts would operate at-grade (street level) on existing arterial streets (or in a subway for a portion of Alternative 6) and would require the removal of one general purpose travel lane in each direction. This design configuration would allow for the retaining of a majority of the on street parking on arterial streets. The center section of all arterial streets on the LRT route would require major reconstruction in order to accommodate the LRT.

The operation of the LRT will be a new operating and traffic arrangement for the Eastside Corridor alignments but is not new to transit users in Los Angeles County and is similar to existing operations throughout the United States and the world. LRT Station would entail constructing a 270 foot long platform (allows for a maximum of 3-car trains) along with pedestrian walkways to allow for safe passage to crosswalks for arriving and departing passengers.

The LRT operating speeds for the Eastside Corridor would be much different than are speeds on other light rail lines currently in operation in Los Angeles. Because of the placement of the LRT track and stations at-grade in arterial streets, the maximum speed of operation would be limited by the street speed limit (varies from 25 to 35 mph) with a 35 mph maximum speed allowed under all circumstances by State PUC regulations. Based on experience with the Long Beach Blue Line operations, the lower speed at-grade operation has less fatalities than high-speed (55 mph) operations even though the number of minor accidents are greater with the in-street operations proposed for the Eastside Corridor alternatives.

The LRT is assumed to operate at 5-minute frequencies in the peak periods and at 12-minute frequencies in the off-peak periods and stop at all stations. Because the individual cars can be "trained" together, the train lengths can vary from 1 to 3 cars depending on the demand and the time of day. The LRT vehicle proposed would be a completely new style (low floor LRT vehicles) rail vehicle for Los Angeles. In addition, local buses with local stops would continue to operate along the same arterial streets as the LRT but would be at lower service frequencies. This will allow transit patrons to access areas that are not directly serviced by the LRT station stops.

Automobiles and delivery vehicles will operate in a much different fashion than they do now. In order to maximize the safety of the LRT operation and to minimize private vehicles conflicts with the LRT trains, it is recommended that left turns and crossings of the LRT train track be limited and possibly restricted to only major intersecting streets where advanced traffic and train control systems can be implemented. Between major intersections, a 6-inch curb next to the travel lane would protect the LRT track section and therefore driveways and minor or secondary streets would be limited to right-turns in and out. Private vehicles would not be able to make left-turns across the LRT tracks or cross from one side to the other. Private vehicles left turns at designated intersections would be controlled and all safety measures would be taken.

As discussed with the BRT mode concept, it is also expected that the streets with the LRT mode concept will become more "transit" oriented, and through traffic will be reduced and directed to other streets within the corridor. On the narrower streets left-turns may have to be restricted at certain intersections during certain portions of the day (peak morning and evening periods) because of the lack of space for a dedicated left turn pocket. The reduction of one traffic lane in each direction will impact the level of service and possibly ease of access to commercial businesses and other public activities. It is expected over time that traffic would re-orient itself because most of the streets in the western portion of the Eastside Corridor have some available capacity and might accept more traffic and yet maintain acceptable levels of service.

Alternative 3 is the first of three exclusive LRT alternatives identified for study. The alignment is shown in Figure 3 and is approximately 12.8 miles long with 19 stations from Union Station to Whittier and Norwalk Boulevard via Alameda, 1st, Soto, 4th, 3rd, Mednik, Arizona and Whittier.

The LRT operating plan for this Alternative and other LRT alternatives is comprised of two components. These are (1) the LRT operating line between Whittier/Norwalk Boulevards with 5 minute peak service and 12 minute off-peak service; and (2) local bus connecting routes to all stations along the LRT line. The LRT running time while making stops at each station is estimated to be 32 minutes from Whittier/Norwalk to Union Station.

Based on the assumed LRT operating plan described above the number of trains per hour in the peak direction on the LRT track would be 12 and in the off-peak would be 5.

Alternative 4 – Bus Rapid Transit (BRT) on Alameda, 1st, 4th, 3rd, Beverly and Whittier

Alternative 4 is the third of three exclusive BRT alternatives identified for study. The alignment of Alternative 4 is shown on Figure 2. Alternative 4 is approximately 13.0 miles long with 19 stations from Union Station to Whittier and Norwalk Boulevards via Alameda, 1st, Soto, 4th, 3rd, Beverly, Paramount and Whittier. The BRT operating plan is deigned to maximize the use of the dedicated bus lane and to optimize the operating characteristics and flexibility of a bus system operation. The operating plan was also designed to provide an equivalent capacity to the LRT at-grade alternatives that are being studied. The BRT operating plan for this Alternative and the other BRT alternatives is comprised of three components. These are:

1. A major BRT Trunk line operating between Whittier/Norwalk Boulevards and Union Station with 4-minute peak service and 10-minute off-peak service;
2. Ten BRT Routes operating with 15-minute peak service and 30-minute off-peak service – these routes provide a one-seat ride for example from Washington/Rosemead to all points west of Whittier/Rosemead; and
3. Local bus routes to all stations along the BRT line. The BRT running time using the dedicated bus line with tops at each station is estimated to be 34 minutes from Whittier/Norwalk to Union Station.

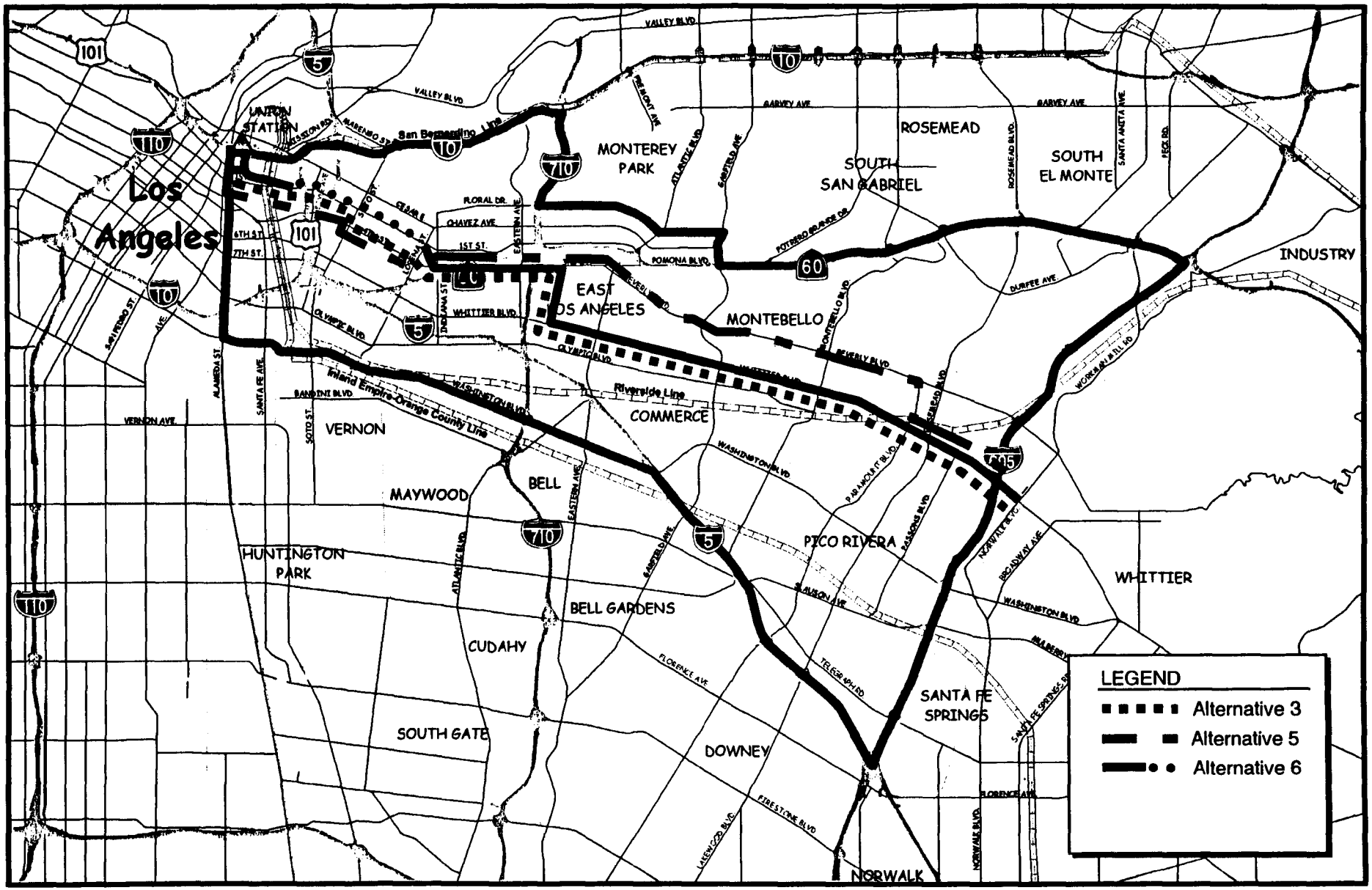
The Wilshire/Whittier Rapid Bus line is included in this and all Build alternatives, but he peak period service was reduced to 7 minutes and the off-peak frequency to 12 minutes.

Based on the assumed operating plans described above the number of buses per hour in the peak direction on the dedicate bus lane would vary from 24 at Passons and Whittier to approximately 77 at 1st and Chicago.

Alternative 5 – Light Rail Transit (LRT) on Alameda, 1st, 4th, 3rd, Beverly and Whittier

Alternative 5 is the second of three exclusive LRT alternatives identified for study. The alignment is shown in Figure 3. Alternative 5 is approximately 12.6 miles long with 19 stations from Union Station to Whittier and Norwalk Boulevards via Alameda, 1st, Soto, 4th, 3rd, Beverly, Paramount and Whittier.

The LRT operating plan for this Alternative and the other LRT alternative is comprised of two components. These are (1) the LRT operating line between Whittier/Norwalk Boulevards with 5 minute peak service and 12 minute off-peak service; and (2) local bus connecting routes to all stations along the LRT line. The LRT running time with making stops at each station is estimated to be 32 minutes from Whittier/Norwalk to Union Station.



Eastside Transit Corridor Study ***Light Rail Alternatives***

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Figure 3

Based on the assumed LRT operating plan described above the number of trains per hour in the peak direction on the LRT track would be 12 and in the off-peak would be 5.

Alternative 6 – Light Rail Transit (LRT) on Alameda, 1st, Indiana, 4th, 3rd, Arizona and Whittier

Alternative 6 is the third of three exclusive LRT alternatives identified for study. The alignment is shown in Figure 3. Alternative 6 is approximately 12.6 miles long with 16 stations from Union Station to Whittier and Norwalk Boulevards via Alameda, 1st, Indiana, 4th, 3rd, Mednik, Arizona, and Whittier.

Alternative 6 is significantly different from the other at-grade LRT and BRT exclusive alternatives in that a subway or underground section is assumed below 1st Street from just west of the I-5 Freeway to Lorena. An undergound station is assumed at 1st/Boyle and a partially underground station is assumed at 1st/Lorena. The LRT underground stations are approximately 2/3rds the size of the Metro Red Line underground stations (270 foot platforms versus 450 platforms) that had been proposed as part of the previous Locally Preferred Alternative and the Suspended Project for the Eastside communities.

This alternative was chosen for comparison to and analysis with other LRT alternatives because of the potential impacts of an at-grade LRT operation through the most dense and narrow street areas of Boyle Heights. This alternative does reduce the number of stations in Boyle Heights significantly from 5 to 3.

The LRT operating plan for this Alternative and the other LRT alternatives is comprised of two components. These are (1) the LRT operating line between Whittier/Norwalk Boulevards with 5 minute peak service and 12 minute off-peak service; and (2) local bus connecting routes to all stations along the LRT line. The LRT running time with making stops at each station is estimated to be 29 minutes from Whittier/Norwalk to Union Station.

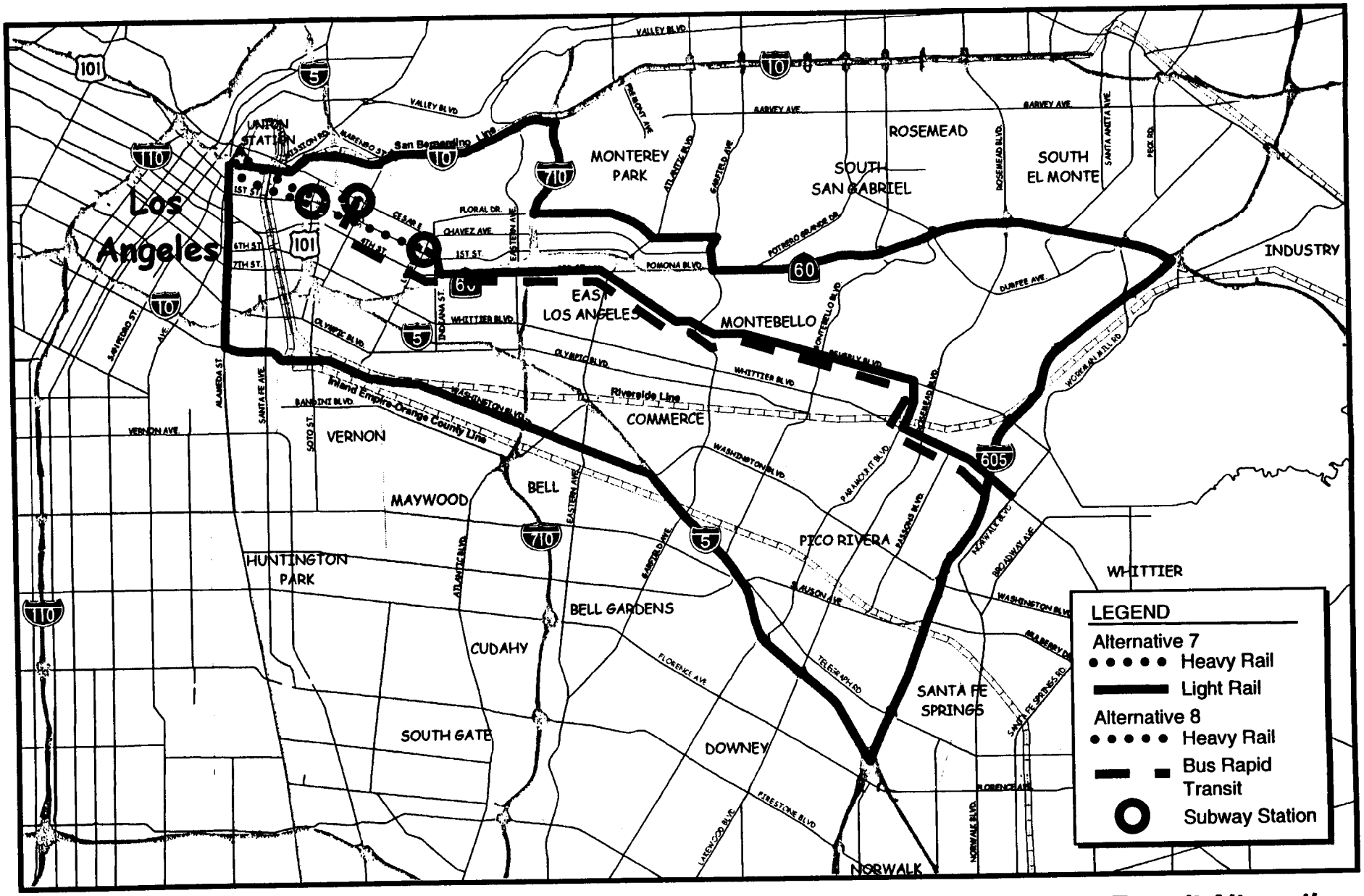
Based on the assumed LRT operating plan described above the number of trains per hour in the peak direction on the LRT track would be 12 and in the off-peak would be 5.

Alternative 7 – Heavy Rail Transit (HRT) – Union Station to 1st/Lorena and Light Rail Transit on 1st, Indiana, 4th, 3rd, Beverly and Whittier

Alternative 7 is the first of two hybrid modal fixed guideway alternatives for the Eastside Corridor. This alternative combines two modes: (1) Heavy Rail Transit that is an extension of the current Metro Red Line mode and technology from Union Station to the Eastside Corridor; and (2) At-grade Light Rail Transit that is the same as described in Alternatives 3, 5 and 6.

The first component of the Alternative 7 is the extension of the Metro Red Line in subway from Union Station to 1st/Lorena with subway stations at 1st/Boyle and 1st/Lorena. These are two of the stations that were part of the suspended project and substantial right-of-way has been purchased at those sites for access to the station and other related construction activities. At 1st/Lorena, the transit patron would proceed to grade level and access a LRT vehicle to continue the trip to Whittier/Norwalk Boulevards. This Alternative is being evaluated similar to Alternative 6 to assist in the judging the impacts of at-grade fixed guideway operations through Boyle Heights. This Alternative as well as Alternative 8 does not provide any access to the Little Tokyo/Arts District community as the other six alternatives do.

The alignment is shown on Figure 4 and is approximately 11.9 miles long with 15 stations. The Heavy Rail Transit subway component beginning at Union Station is approximately 2.6 miles long with two subway stations as an extension of the two operating Red Line subway lines. The Light Rail Transit component is approximately 9.3 miles long with 12 stations. The LRT alignment from 1st/Lorena would use Indiana, 4th, 3rd, Beverly, Paramount and Whittier.



Eastside Transit Corridor Study

Hybrid Transit Alternatives

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Figure 4

The Heavy Rail Transit operating plan assumes the extension the Red Line operation to the Eastside. The operating plan would provide direct service on two lines from 1st/Lorena to the North Hollywood station and to the Wilshire/Western station. Each Line would operate with 4-minute peak service and 8 minutes off-peak service. This operation would provide for a Red Line train to leave the Eastside community at 1st/Lorena every 2 minutes in the peak and every 4 minutes in the off-peak.

The Light Rail Transit operating plan would provide 5-minute peak service and 12 minute off-peak service between 1st/Lorena and Whittier/Norwalk Boulevards. Local bus connecting routes to all stations along the Heavy Rail Transit and Light Rail Transit segments would be provided similar to those shown in Alternatives 3, 5 and 6. Based on the assumed LRT operating plan described above the number of trains per hour in the peak direction on the LRT track would be 12 and in the off-peak would be 5. The total combined travel time from Whittier/Norwalk to Union Station would be approximately 28 minutes.

Alternative 8 – Heavy Rail Transit – Union Station to Chavez/Soto and Bus Rapid Transit on Soto, 4th, 3rd, Beverly and Whittier

Alternative 8 is the second of the two hybrids model fixed guideway alternatives for the Eastside Corridor. This alternative combines two modes: (1) Heavy Rail Transit that is an extension of the current Metro Red Line mode and technology from the Union Station to the Eastside Corridor, and (2) At-grade Bus Rapid Transit that is the same as described in Alternatives 1, 2 and 4.

The first component of Alternative 8 is the extension of the Metro Red Line in subway from Union Station to Chavez/Soto with subway stations at 1st/Boyle and Chavez/Soto. These are two of the stations that were part of the suspended project and substantial right-of-way that has been purchased at these sites for access to the stations and other related construction activities. This Alternative is being evaluated similar to Alternative 6 to assist in judging the impacts of at-grade fixed guideway operations through Boyle Heights. This Alternative as well as Alternative 7 does not provide any access to the Little Tokyo/Arts District community as the other six alternatives do.

Alternative 8 is approximately 12.3 miles long with 18 stations (Figure 4). The Heavy Rail Transit subway component beginning at Union Station is approximately 1.1 miles long with two subway stations as an extension of the two operating Red Line subway lines. The Bus Rapid Transit component is approximately 11.2 miles long with 15 stations. The BRT alignment from Chavez/Soto would use Soto, 4th, 3rd, Beverly, Paramount and Whittier.

The Heavy Rail Transit operating assumes the extension of the Red Line operations to the Eastside. The operating plan would provide direct service on two lines from Chavez/Soto to the North Hollywood station and to the Wilshire/Western station. Each Line would operate with 4-minute peak service and 8 minute off-peak service. This operation would provide for a Red Line train to leave the Eastside community at Chavez/Soto every 2 minutes in the peak and every 4 minutes in the off-peak. The total combined travel time from Whittier/Norwalk to Union Station would be approximately 33 minutes.

The BRT operating plan for this Alternative is comprised of three components. These are (1) a major BRT Trunk line operating between Whittier/Norwalk Boulevards and Chavez/Soto with 4 minute peak service and 10 minute off-peak service; (2) Eight BRT connecting routes operating with 15 minute peak service; and (3) local bus connecting routes to all stations along the BRT line. Based on the assumed operating plans described above the number of buses per hour in the peak direction on the dedicated bus lane would vary from 24 at Passons and Whittier to approximately 62 at Chavez/Soto.

No Build

The No Build Alternative as defined by FTA should represent the baseline case consisting of existing and committed elements of the region's transportation plan, excluding the proposed fixed guideway transit investments for the study corridor. The No Build Alternative was defined for all three corridor studies to be the same and includes all highway and transit projects and operations that the region and MTA expect to be in place by the year 2020. These include improvements to the local bus systems and the completion and operation of the Red Line to North Hollywood, the Pasadena Blue Line to Sierra Madre Villa in Pasadena, and the Centerline Rail Project in central Orange County.

The forecast year is 2020 for all the alternatives and SCAG's current demographic forecasts for that year were used in all the analyses. This provides for comparisons and consistency to the current Regional Transportation Plan efforts conducted by SCAG.

The existing transit fare structure was also retained for the MIS study to allow for comparative analysis of the alternatives and to be consistent with regional planning efforts by SCAG.

Transportation System Management (TSM)

The Transportation System Management (TSM) Alternative is defined by the Federal Transit Administration (FTA) as the no build alternative plus lower cost transit capital and operational improvements that are intended to enhance the performance of the transportation system within the study corridor. Compared with the "build" alternatives the TSM Alternative should be a relatively low cost approach to addressing the transportation problems. It should be represent the best that can be done to improve transit mobility in the corridor without the construction of major new transit facilities.

The TSM alternative for the Eastside Corridor includes additions in bus service frequencies to the major east-west and north-south existing transit routes as well as the implementation of the Whittier/Wilshire Rapid Bus line from Whittier and Garfield (Montebello) to Colorado and Ocean (Santa Monica). This Rapid Bus Line has been approved for implementation in June 2000 and would provide a combined operating frequency of 1.75 minutes during the peak periods and 5 minutes during the off-peak periods. There are 24 stops along the route with six on the stops within the Eastside Corridor study area. This service would provide a strong linkage (no transfers) between a portion of the Eastside Corridor study area to Downtown, Mid-Wilshire, and the far westside of Los Angeles.

Increased service frequencies (lower headways) are assumed for MTA Routes 30/31 (Pico/1st/Floral), 65 (Olympic/Indiana/Gage), 250/251 (Soto), 253 (Evergreen/Euclid), 254 (Lorena), 255 (Rowan), 256 (Ford/Eastern), 258/259 (Arizona/Eastern), 262 (Garfield), 265 (Paramount), 266 (Rosemead), and improvements to services operated by Commerce, Montebello, and Whittier.

In addition the two Metro Red Lines (North Hollywood to Union Station and Wilshire/Western to Union Station) were assumed to operate 4 minute frequencies in the peak and 8 minute frequencies in the off-peak. This would provide 2-minute peak frequencies between Vermont/Wilshire and Union Station. This is almost twice the level of service provided today. This service frequency for the Metro Red Line would stay the same for the eight build alternatives in order to properly compare the proposed fixed guideway transit investments in the Eastside Corridor.

III. Transportation Issues and Analysis

Introduction

This section begins by summarizing the major transportation issues associated with each alternative according to the evaluation criteria that was considered. The major observations of the comparative evaluation of the alternatives are next presented. In the event that it is decided to construct the project in phases, a comparison of the potential traffic and parking impacts of two smaller segments of each alignment is also presented. The two segments are: Union Station to Lorena Street and Union Station to Atlantic Boulevard. No ridership forecasts were prepared for the two smaller segments; therefore, the criteria focus only on the traffic and parking impacts. Table 1, found at the conclusion of this section, consists of a matrix that compares the criteria considered for each alternative throughout the total length of each alignment (Union Station to Norwalk Boulevard). Table 2 compares the criteria for each alternative for the portion of the study area between Union Station and Lorena Street, and Table 3 presents this information for the section of the study area between Union Station and Atlantic Boulevard.

Comparison by Alternative

No-Build Alternative

Implementation of the No-Build Alternative would result in the lowest ridership (1,985,936 daily regional transit trips and 149,100 daily such trips within the Eastside Transit Corridor) of all of the alternatives. With regard to numbers of congested roadway segments, this alternative ties with the TSM Alternative and LRT Alternative 7 for the fewest congested segments (12). Congestion is defined as any segment operating at a level of service LOS E or F. It also results in the fewest congested intersections (5). The No-Build Alternative would not require displacement of any existing on-street parking spaces.

TSM Alternative

The second lowest daily patronage would be achieved with implementation of the modest transit improvements associated with the TSM Alternative (2,005,798 regional trips and 165,300 corridor trips). Although this alternative would produce 19,862 new regional transit trips each day as compared to the No-Build Alternative, it would still produce 7,383 fewer new trips than the build alternative with the lowest ridership (BRT Alternative 2) and 14,470 fewer new trips than the alternative with the highest patronage (Heavy rail/LRT Alternative 7). With regard to congested roadway segments, this alternative ties with the No-Build and LRT Alternative 7 for the fewest congested (12). It ties with Alternatives 3 and 8 for the second fewest congested intersections (6). Like the No-Build Alternative, the TSM Alternative would not require displacement of any existing on-street parking spaces.

Alternative 1

BRT Alternative 1 ranks second to last of the build alternatives with regard to regional ridership (2,014,520 daily trips) and ties with Alternative 2 for lowest corridor ridership (174,500 daily trips). However, it still creates 28,584 additional regional trips over the No-Build Alternative and 8,722 additional regional trips over the TSM Alternative. Of the build alternatives, Alternative 1 results in the second fewest fixed guideway boardings within the corridor (11,500 daily).

Alternative 1 ties with Alternatives 4 and 6 regarding numbers of congested roadway segments (13). All three alternatives have one more congested segment than the No-Build and TSM Alternatives and

Alternative 7. Alternative 1 also ties with Alternatives 2, 4, 5, and 7 in the numbers of congested intersections (7) ranking third behind the No-Build and TSM Alternatives, respectively.

This alternative may result in the loss of 339 on-street parking spaces to accommodate the stations. The stations are the only areas where on-street parking would be removed for any of the build alternatives. This alternative ranks in the middle range of all build alternatives in terms of numbers of spaces lost. As with all of the BRT alternatives, the losses are more or less spread throughout the study area in the vicinity of all of the stations and are not concentrated in any particular location.

Alternative 2

BRT Alternative 2 produces the lowest daily ridership of the build alternatives (2,013,181 regional trips and 174,500 corridor trips). However, it still creates 27,245 additional trips over the No-Build Alternative and 7,383 new trips over the TSM Alternative. It ranks sixth with regard to fixed guideway boardings within the corridor (12,400 each day), but it results in the most boardings of the alternatives employing only BRT.

This alternative ranks worst with regard to congested street segments (16). Alternative 1 ties with Alternatives 1, 4, 5, and 7 in the numbers of congested intersections (7) ranking third best behind the No-Build and TSM Alternatives, respectively.

A total of 365 on-street parking spaces may be lost in the vicinity of the stations throughout the study area. This alternative ranks third highest in number of spaces lost.

Alternative 3

LRT Alternative 3 ranks mid-range with regard to patronage compared to all of the build alternatives. Of the alternatives employing LRT, it produces the lowest daily ridership (2,017,685 regional trips and 178,700 corridor trips). A comparison to the No-Build and TSM Alternatives reveals that Alternative 3 produces 31,749 and 11,887 more daily transit trips, respectively. It creates 17,000 fixed guideway boardings which also ranks it mid-range of all the build alternatives, but lowest of the alternatives employing LRT.

This alternative ranks next to worst with regard to congested street segments (15). However, Alternative 3 ties with the TSM Alternative and Alternative 8 for second least numbers of congested intersections (6).

On-street parking losses are ranked highest of all the alternatives (402 spaces). For all of the LRT alternatives, station parking impacts would be concentrated at station locations in Boyle Heights, and fewer parking losses would be required at the other stations as compared to the BRT alternatives.

Alternative 4

BRT Alternative 4 ranks sixth with regard to daily patronage compared to all of the build alternatives. However, it produces the highest ridership of the alternatives that employ only BRT (2,014,992 regional trips and 174,900 corridor trips). It results in an additional 29,056 regional transit trips each day compared to the No-Build Alternative and 9,194 more such trips than the TSM Alternative. Alternative 4 ranks lowest with regard to daily fixed guideway boardings (11,300).

This alternative ties with Alternatives 1 and 6 regarding numbers of congested roadway segments (13). All three alternatives have one more congested segment than the No-Build and TSM Alternatives and

Alternative 7. It also ties with Alternatives 1, 2, 5, and 7 in the numbers of congested intersections (7) ranking third behind the No-Build and TSM Alternatives, respectively.

A total of 352 on-street parking spaces may be lost, ranking Alternative 4 about middle range in terms of losses. Like the other BRT alternatives, the losses are more or less spread throughout the study area in the vicinity of all of the stations and are not concentrated in any particular location.

Alternative 5

LRT Alternative 5 ranks second highest in terms of daily ridership producing 2,019,707 regional trips and 180,350 corridor trips. It results in an additional 33,771 regional trips each day compared to the No-Build Alternative and 13,909 more such trips than the TSM Alternative. This alternative also ranks second highest in daily fixed guideway boardings (18,000).

This alternative ties with Alternative 8 ranking them both third fewest in numbers of congested roadway segments (14). It also ties with Alternatives 1, 2, 4, and 7 in the numbers of congested intersections (7) ranking them third behind the No-Build and TSM Alternatives, respectively.

On-street parking losses are ranked second highest of all the alternatives (396 spaces). For all of the LRT alternatives, station parking impacts would be concentrated at station locations in Boyle Heights, and fewer parking losses would be required at the other stations as compared to the BRT alternatives.

Alternative 6

LRT Alternative 6 consists of a mostly at-grade alignment with a subway segment through a portion of Boyle Heights. It ranks third highest in terms of daily ridership producing 2,018,185 regional trips and 179,550 corridor trips. Compared to the No-Build and TSM Alternatives, Alternative 6 creates an additional 32,249 and 12,387 daily transit trips, respectively. It also results in the third largest number of daily fixed guideway boardings (17,800).

This alternative ties with Alternatives 1 and 4 regarding numbers of congested roadway segments (13). All three alternatives have one more congested segment than the No-Build and TSM Alternatives and Alternative 7. However, Alternative 6 has the highest numbers of congested intersections (8) of any of the alternatives. It results in three more congested intersections than the No-Build Alternative, which has the fewest such intersections. Note that the level of service analysis (LOS) that was used to evaluate congestion for the roadways and intersections does not take into account pedestrian safety issues and potential parking conflicts associated with a surface LRT or BRT system running through the narrow streets in Boyle Heights. The subway segment of Alternative 6 eliminates the need to remove lanes along Soto Street (the street segment most severely impacted by a surface transit system in Boyle Heights) and provides a subway profile through most of that community also minimizing potential pedestrian safety problems. Boyle Heights contains the highest pedestrian activity within the study area.

A total of 236 on-street parking spaces may be lost in the vicinity of the stations ranking it second in terms of lowest such losses of the build alternatives. Like the other LRT alternatives, the parking impacts would be concentrated at station locations in Boyle Heights, and fewer impacts would occur at the other stations as compared to the BRT alternatives.

Alternative 7

This hybrid alternative consists of a heavy rail subway segment and an at-grade LRT segment. Alternative 7 achieves the highest daily patronage of all of the alternatives (2,020,268 regional trips and 180,750 corridor trips). Compared to the No-Build and TSM Alternatives, this alternative produces 34,332 and 14,470 additional trips each day, respectively. It also creates the highest daily fixed guideway boardings (18,700).

With regard to congested roadway segments, this alternative ties with the No-Build and TSM Alternatives for the fewest congested (12). It also ties with Alternatives 1, 2, 4, and 5 in the numbers of congested intersections (7) ranking them third behind the No-Build and TSM Alternatives, respectively. As noted in the discussion of Alternative 6, the LOS analysis that was used to evaluate congestion for the roadways and intersections does not take into account pedestrian safety issues and potential parking conflicts associated with a surface LRT or BRT system running through the narrow streets in Boyle Heights. Like Alternative 6, the subway segment of Alternative 7 eliminates the need to remove lanes along Soto Street (the street segment most severely impacted by a surface transit system in Boyle Heights) and provides a subway profile through most of that community also minimizing potential pedestrian safety problems.

Alternative 7 requires the least loss of on-street parking (172 spaces). Like the other LRT surface alternatives, the parking impacts would be concentrated at station locations in Boyle Heights, and fewer impacts would occur at the other stations as compared to the BRT alternatives. Of the LRT alternatives, Alternative 7 has the lowest losses in Boyle Heights because of the tunneled segment that traverses a portion of that community.

Alternative 8

This hybrid alternative consists of a heavy rail subway segment and an at-grade BRT segment. Alternative 8 ranks fifth highest in terms of daily ridership (2,015,967 regional trips and 177,150 corridor trips). Compared to the No-Build and TSM Alternatives, this alternative produces 30,031 and 10,169 additional daily trips, respectively. Alternative 8 also creates the fifth highest daily fixed guideway boardings (14,000). Note that this alternative results in the highest ridership and fixed guideway boardings of any of the alternatives employing BRT.

Alternative 8 ties with Alternative 5 ranking them both third fewest in numbers of congested roadway segments (14). However, Alternative 8 ties with the TSM Alternative and Alternative 3 for second least numbers of congested intersections (6).

Alternative 8 ranks third in fewest number of parking spaces lost (320). The spaces would be lost in the vicinity of the BRT stations throughout the study area and are not concentrated in any particular location.

Conclusions

The major observations of the alternatives being considered with regard to ridership, traffic impacts, and parking losses are discussed below.

Ridership

In terms of ridership, the BRT alternatives (Alternative 1, 2, 4, as well as Alternative 8 which also includes a heavy rail subway segment) result in the lowest ridership of the build alternatives. However, Alternative 8 achieves the highest ridership of those alternatives employing BRT. Although BRT Alternative 2 has the lowest ridership of any of the build alternatives, it still produces more daily regional

transit trips than the No-Build and TSM Alternatives (an additional 27,245 and 7,383 such trips, respectively). The heavy rail/LRT hybrid Alternative 7 has the highest ridership of any of the alternatives producing 34,332 more regional trips than the No-Build Alternative and 14,470 more trips than the TSM Alternative. Alternative 7 also produces 7,087 more regional trips than the build alternative with the least ridership (Alternative 2). Within the corridor, the build alternatives also result in increased daily transit trips as compared to the No-Build and TSM Alternatives. The increases over the No-Build Alternative range from 25,400 trips for Alternatives 1 and 2 to 31,650 trips for Alternative 7. A comparison to the TSM Alternative shows the numbers of daily corridor trips increase by 9,200 under Alternatives 1 and 2 and by 15,450 under Alternative 7.

Like total daily transit trips, the BRT alternatives result in the fewest fixed guideway boardings, while the rail alternatives have the highest boardings. Of the BRT alternatives, Alternative 8 produces the highest number of daily boardings (14,000); however, as previously noted, this alternative also includes heavy rail subway along a portion of its alignment. Even with the heavy rail segment, 3,000 to 4,700 fewer daily boardings are expected with Alternative 8 as compared with any of the other rail alternatives. The heavy rail/LRT Alternative 7 results in the highest number of boardings (18,700), and a comparison with the alternative having the lowest boardings (BRT Alternative 4) shows that Alternative 7 would produce 7,400 more boardings each day.

Traffic

The major findings regarding potential impacts on roadways and intersections are presented below.

Roadways

As a rule, traffic impacts where lanes are reduced on arterial streets would be greater than the impacts that occur on other streets where lanes are not removed for the proposed transit systems in Alternatives 1 through 8. A good example of this is Soto Street between 1st and 4th Streets where the level of service (LOS) degrades from D in the No-Build and TSM Alternatives to LOS F in Alternatives 1 through 5 and 8. In Alternatives 6 and 7, where a subway segment replaces the need to remove lanes of traffic on Soto, Soto Street remained at LOS D. Due to the lack of through north-south arterials in Boyle Heights and the existence of many east-west alternate routes, there is a far greater traffic impact on Soto Street (the principal north-south arterial in Boyle Heights) than on the east-west streets when lanes of traffic are removed on these arterials. East-west arterials, such as Cesar Chavez Avenue in Alternative 1, and 1st and 4th streets in Alternatives 2 through 8, are impacted more when combined with pedestrian safety and parking impacts in the narrow streets of the community. LOS degraded from LOS A in the No-Build and TSM Alternatives to LOS B in the alternatives where lanes were removed for these streets. A degradation from LOS A to LOS B is not an impact that is significant for traffic.

Although the traffic LOS calculations reveal a minor degradation in traffic conditions (or none at all) with the introduction of a transit system within street rights-of-way, it is important to recognize the conditions of the streets in Boyle Heights. Street widths in Boyle Heights are very narrow (most have a curb-to-curb width of 60 feet) and only allow for one lane of traffic in each direction when light rail or a busway occupy the remaining two traffic lanes. Besides adversely affecting intersections where turning movements are permitted, LOS will be degraded due to the maneuvering of motorists wishing to park in the on-street parking spaces along the streets where a BRT or LRT system will be running. Significant delays could be realized when there is conflict between through traffic and traffic wishing to use on-street parking spaces. These two operational problems are exacerbated by the narrow conditions of the streets in Boyle Heights.

Pedestrian safety is another concern, especially in areas with narrow street rights-of-way. The introduction of a new transit system will realign traffic rights-of-way closer to the pedestrian realm.

Boyle Heights has the greatest pedestrian activity of any of the communities along the Eastside Corridor. The proximity of pedestrians to potentially fast-moving traffic poses a safety threat, especially at station locations. There are six such situations in LRT Alternatives 3 and 5. There are only two of these situations at station locations in Alternative 6, and only one such situation in Alternative 7. The enhanced pedestrian safety of Alternatives 6 and 7 is a direct result of their containing subway segments through Boyle Heights. A simple LOS calculation does not take into account the issues of parking and pedestrian safety in Boyle Heights.

From a LOS analytical perspective, the East Los Angeles community incurs greater traffic impacts than those in Boyle Heights because of the elimination of alternative east-west streets east of Atlantic Boulevard. As was true for Boyle Heights, the issue of pedestrian safety must be recognized in the Whittier Boulevard business corridor west of Atlantic Boulevard where the street is narrow. At the screenline east of Atlantic Boulevard, LOS deteriorates significantly on streets where lanes were removed in the build alternatives. Whittier Boulevard goes from LOS B in the No-Build Alternative to LOS F in Alternatives 2, 3, and 6 where lanes were removed. Beverly Boulevard in the No-Build Alternative already operates at LOS F. When traffic lanes are removed in Alternatives 1, 4, 5, 7, and 8, the volume to capacity (V/C) ratio increases from approximately 1.02 to 1.57, which constitutes a serious worsening of LOS F on Beverly. The other build alternatives have Beverly Boulevard operating at an LOS F that is comparable to that found in the No-Build Alternative. North-south arterials in the East Los Angeles area do not have their service levels degraded by any significant amount in any of the build alternatives. Because the streets are wider in the areas of the corridor east of Indiana Street, pedestrian safety issues are of lesser concern. Traffic will not be using the far curb lanes where street space is occupied for a light rail station in Alternatives 3, 5, 6, and 7.

Because there are a lesser number of alternative surface arterials there, the eastern portion of the Eastside Corridor experiences greater traffic impacts on Beverly and Whittier Boulevards. Traffic impacts increase as one moves west to east through the cities of Montebello, Pico Rivera, and Whittier Boulevard. At the screenline west of Montebello Boulevard, Beverly Boulevard operates at LOS F and Whittier Boulevard operates at LOS D in the No-Build and TSM Alternatives. When traffic lanes are removed from Whittier Boulevard in Alternatives 2, 3, and 6, the street operates at LOS F with a V/C ratio of approximately 1.32. When lanes are removed from Beverly Boulevard in Alternatives 1, 4, 5, 7, and 8, the LOS F significantly worsens from a V/C ratio of approximately 1.36 to 2.31. At the screenline west of Rosemead Boulevard in the City of Pico Rivera, both Beverly and Whittier Boulevards operate at LOS F in the No-Build and TSM Alternatives. Each build alternative worsens the LOS F on Whittier Boulevard from a V/C ratio of approximately 1.34 to 1.69. In each of the build alternatives, Washington Boulevard appears to pick up some of the traffic from Whittier Boulevard. Washington Boulevard is a southern alternative arterial street to Whittier Boulevard. Washington Boulevard operates at LOS E in the No-Build and TSM Alternatives and operates at LOS F in all eight build alternatives. Most north-south arterial streets in the Montebello/Pico Rivera area of the Corridor are not impacted in any of the build alternatives. In Alternatives 1, 4, 5, 7, and 8 where lanes are removed from Paramount Boulevard in Pico Rivera, there is a significant degradation of service (LOS A to F). Paramount Boulevard declines from LOS A in the No-Build and TSM Alternatives to F in those alternatives.

Whereas the removal of lanes in each of the alternatives in the Boyle Heights and East Los Angeles areas generally results in a minor shift in traffic volumes and a minor degradation of service that is not of great significance except for Soto Street, the removal of lanes on major arterial streets in the eastern portion of the Eastside Corridor (east of Atlantic Boulevard) results in a significant degradation of service. Alternatives 6 and 7 have the least impact on traffic in Boyle Heights because they are in a subway through this area and do not remove lanes from Soto Street as do the other alternatives. These two alternatives also remove lanes on Whittier Boulevard instead of Beverly Boulevard east of Arizona Avenue, which creates less of a traffic impact than those alternatives that remove lanes on Beverly

Boulevard. Alternatives 6 and 7 also minimize pedestrian safety problems in the Boyle Heights community by their providing a subway profile through most of the community. The narrowness of the streets in Boyle Heights combined with curbside traffic lanes, intersection delays, and parking conflicts makes the traffic and pedestrian impacts greater than those we can measure through a simple level of service analysis.

Table 1 summarizes the numbers of congested street segments by alternative. Comparison of the build alternatives shows that the highest number of congested roadway segments (16) would occur under Alternative 2, while the fewest (12) would occur under Alternative 7. The No-Build and TSM Alternatives both would have 12 congested street segments, and Alternative 7 is the only build alternative that does not increase that number.

Intersections

Most of the intersection analysis focuses on the western portion of the study area (west of Atlantic Boulevard) due to the limited traffic count data available in the eastern portion of the study area. Of the 14 intersections evaluated, the No-Build Alternative would result in five intersections operating at an unacceptable LOS (i.e., LOS E or F). The TSM Alternative would result in six intersections operating at an unacceptable LOS. Of the eight build alternatives, Alternatives 3 and 8 would have the least number of intersections (6) operating at an unacceptable LOS, and Alternative 6 would have the greatest number of intersections (8) operating at an unacceptable LOS.

Parking

With regard to on-street parking losses, the highest losses would be associated with LRT Alternatives 3 and 5 (approximately 400 spaces in both cases). As with all of the LRT alternatives, most of the impact would be concentrated in Boyle Heights (282 spaces lost under either alternative). Alternative 7 would have the least impact on parking in Boyle Heights (58 spaces lost) because the subway segment extends through a large portion of Boyle Heights; it also has the least overall impact on parking throughout the study area (172 spaces lost). Alternative 8 has the second lowest impact in Boyle Heights (73 spaces lost) because of the subway segment and the BRT at-grade configuration from Chavez/Soto to 4th/Indiana. Of the subway alternatives, LRT Alternative 6 has the highest impact in Boyle Heights (116 spaces lost). This is because of the requirements for the LRT at-grade configuration in the narrow street rights-of-way in Boyle Heights. Alternative 6 would result in somewhat higher losses than the two at-grade BRT Alternatives 2 and 4 in Boyle Heights (105 spaces lost under each alternative).

Comparison of Alternatives by Shorter Segments

Union Station to Lorena Street

Table 2 summarizes the traffic and parking impacts for this segment of the alternatives. Of the roadway segments evaluated for congestion, the alternatives range from two segments (No-Build Alternative) to four segments (Alternatives 2, 4, 5, and 6) that would be congested. With regard to congested intersections, the No-Build Alternative would have the fewest (2) while Alternatives 2, 4, 5, and 6 would have the most (4).

As previously noted, the LOS analysis used to evaluate congestion does not take into account pedestrian safety issues and potential parking conflicts associated with a surface LRT or BRT system running through the narrow streets in Boyle Heights. The subway segments of Alternatives 6 and 7 eliminate the need to remove lanes along Soto Street (the street segment most severely impacted by a surface transit system in Boyle Heights) and provides a subway profile through most of that community also minimizing

potential pedestrian safety problems. Boyle Heights contains the highest pedestrian activity within the entire study area.

In terms of impacts on existing on-street parking, no spaces would be lost under the No-Build or TSM Alternatives. Of the build alternatives, Alternative 7 would result in removal of the fewest spaces (58), while Alternatives 3 and 5 would require displacement of the highest number of spaces (282 each). All of the other alternatives range from 73 to 116 spaces removed, depending on the alternative selected for comparison.

Union Station to Atlantic Boulevard

The traffic and parking impacts for this segment of the alternatives are presented in Table 3. The numbers of congested roadway segments range from three segments (No-Build and TSM Alternatives and Alternatives 6 and 7) to five segments (Alternatives 2 through 5 and 8). Alternative 1 had four congested segments. With regard to congested intersections, the No-Build Alternative had the fewest (4), while Alternative 6 had the most (7).

As previously noted, the LOS analysis used to evaluate congestion does not take into account pedestrian safety issues and potential parking conflicts associated with a surface LRT or BRT system running through the narrow streets in Boyle Heights and a portion of Whittier Boulevard in East Los Angeles. As just noted, the subway segments of Alternatives 6 and 7 eliminate the need to remove lanes along Soto Street and provide a subway profile through most of that community also minimizing potential pedestrian safety problems. The at-grade alignments of Alternatives 1, 4, 5, 7, and 8 all avoid the narrow roadway section of Whittier Boulevard, while Alternatives 2, 3, and 6 do not.

In terms of impacts on existing on-street parking, no spaces would be lost under the No-Build or TSM Alternatives. Of the build alternatives, Alternative 7 would again result in removal of the fewest spaces (94), while Alternative 3 would require displacement of the highest number of spaces (330). Alternative 5 has slightly fewer space removal requirements (318) than Alternative 3. All of the other alternatives range from 151 to 209 spaces removed, depending on the alternative selected for comparison.

TABLE 1
COMPARISON OF ALTERNATIVES – TRANSPORATION ISSUES
(Union Station to Whittier/Norwalk)

Criteria	Alternative									
	No-Build	TSM	1 BRT	2 BRT	3 LRT	4 BRT	5 LRT	6 LRT (subway)/ LRT	7 Heavy rail (subway)/ LRT	8 Heavy rail (subway)/ BRT
	Ridership									
Regional Daily Transit Trips	1,985,936	2,005,798	2,014,520	2,013,181	2,017,685	2,014,992	2,019,707	2,018,185	2,020,268	2,015,967
Corridor Daily Transit Trips	149,100	165,300	174,500	174,500	178,700	174,900	180,350	179,550	180,750	177,150
Corridor Daily Fixed Guideway Boardings	N.A.	N.A.	11,500	12,400	17,000	11,300	18,000	17,800	18,700	14,000
Daily New Transit Trips compared to the No Build	N.A.	19,862	28,584	27,245	31,749	29,056	33,771	32,249	34,332	30,031
Daily New Transit Trips compared to the TSM	N.A.	N.A.	8,722	7,383	11,887	9,194	13,909	12,387	14,470	10,169
	Traffic									
Number of congested intersections	5	6	7	7	6	7	7	8	7	6
Number of congested street segments[1]	12	12	13	16	15	13	14	13	12	14
	Parking									
On-street parking spaces displaced	0	0	339	365	402	352	396	236	172	320

[1]Assumes an approximate one-mile segment based on the screenline analysis.

TABLE 2
COMPARISON OF TRAFFIC AND PARKING IMPACTS OF THE ALTERNATIVES
(Union Station to Lorena Street)

Criteria	Alternative									
	No-Build	TSM	1 BRT	2 BRT	3 LRT	4 BRT	5 LRT	6 LRT (subway)/ LRT	7 Heavy rail (subway)/ LRT	8 Heavy rail (subway)/ BRT
Number of congested intersections	2	3	3	4	3	4	4	4	3	3
Number of congested street segments[1]	0	0	1	1	1	1	1	0	0	1
On-street parking spaces displaced	0	0	92	105	282	105	282	116	58	73

1Assumes an approximate one-mile segment based on the screenline analysis.

TABLE 3
COMPARISON OF TRAFFIC AND PARKING IMPACTS OF THE ALTERNATIVES
(Union Station to Atlantic Boulevard)

Criteria	Alternative									
	No-Build	TSM	1 BRT	2 BRT	3 LRT	4 BRT	5 LRT	6 LRT (subway)/ LRT	7 Heavy rail (subway)/ LRT	8 Heavy rail (subway)/ BRT
Number of congested intersections	4	5	6	6	5	6	6	7	6	5
Number of congested street segments[1]	3	3	4	5	5	5	5	3	3	5
On-street parking spaces displaced	0	0	170	209	330	183	318	164	94	151

1Assumes an approximate one-mile segment based on the screenline analysis.

IV. Environmental Issues

Introduction

This section begins by summarizing the major environmental issues associated with each alternative according to the evaluation criteria that was considered. The major observations of the comparative evaluation of the build alternatives are next presented. Table 4, found at the conclusion of this section, consists of a matrix that compares the criteria considered for each alternative throughout the total length of each alignment (Union Station to Norwalk Boulevard). In the event that it is decided to construct the project in phases, a comparison of two smaller segments of each alignment is presented in Tables 5 and 6. Table 5 compares the criteria for each alternative for the portion of the study area between Union Station and Lorena Street, and Table 6 presents this information for the section of the study area between Union Station and Atlantic Boulevard.

Comparison by Alternative

No-Build Alternative

The No-Build Alternative assumes that no project would be constructed and would result in no impacts with regard to the following: acquisition of additional property to accommodate park-and-ride facilities; increases of impacts on the visual environment, noise/vibration, wetlands, floodplains, cultural and paleontological resources, parks and recreation facilities, and utilities; potential for liquefaction or inundation from possible dam failures during an earthquake; and potential to encounter pre-existing contaminated sites during construction.

The No-Build Alternative also would not create opportunities, beyond those currently projected for the region, for additional short-term jobs during construction and permanent jobs once the transit system becomes operational. It also has no effect on the plans and policies of the local communities and would maintain the status quo in this regard. Opportunities for enhanced mobility and access to low-income and minority areas as well as to some of the existing redevelopment and special revitalization zones in the study area also would be foregone. The air quality impacts of the No-Build Alternative would be greater than any of the build alternatives with respect to anticipated criteria pollutant/precursor emissions from volatile organic compounds (VOC), carbon monoxide (CO), and particulate matter (PM_{10}). However, there would be some decreases in nitrogen oxides (NO_x) emissions as compared to three of the eight build alternatives. This alternative ranks mid-range with respect to carbon dioxide (CO_2, a greenhouse gas) emissions.

TSM Alternative

This alternative involves an increase in the frequency of bus service only and the addition of bus routes in the study area. Construction of additional facilities would be minimal. Therefore, the TSM Alternative would also result in no additional impacts in most of the same categories cited for the No-Build Alternative. There may be slight increases in noise levels in locations where bus service is substantially increased.

Some short-term jobs would be created due to construction of the minimal facilities associated with this alternative. However, it is estimated that more than four times as many short-term jobs would be created with implementation of the lowest cost build alternative and more than fourteen times as many such jobs would be created with the highest cost build alternative. Some permanent jobs would also be created to support the additional bus service, but the number of such jobs would be 2.5 to 3.5 times less depending on the build alternative selected for comparison. Also, the TSM Alternative would have little effect on

the plans and policies of the local communities and would maintain the status quo in this regard. Enhanced mobility and access to low-income areas, minority areas, and existing redevelopment and special revitalization zones would likely be provided in the vicinity of some of the increased bus service; however, not to the extent offered under any of the build alternatives. With regard to air quality, the TSM Alternative results in the highest criteria pollutant/precursor emissions and also in CO_2 emissions of any of the alternatives under consideration.

Commonality of the Build Alternatives

Some of the environmental issues evaluated would be the same for all of the build alternatives. All are generally compatible with the local plans and policies of the surrounding communities. The only potential conflict noted would be in the vicinity of the Whittier/Norwalk Station at the eastern terminus. The City of Whittier General Plan's land use designation near the proposed transit station is for single-family residential, greenspace, and general commercial along Whittier Boulevard. Future amendments or revisions to the general plan could consider modifications to the land use designations to allow intensification of land use in the area. The unincorporated Southwest Whittier Community has no adopted community plan at this time. However, the zoning in the vicinity of the station is for low-density residential uses. To promote compatibility with the proposed transit station, the County of Los Angeles could modify zoning patterns, as appropriate, when a community plan is prepared.

At this time, it appears that none of the build alternatives would require the displacement of any residences or businesses for the alignments or stations. There is a possibility that additional land may be needed to accommodate the cut-and-cover process of constructing the heavy rail station box area at 1st/Boyle (Alternatives 7 and 8) and at 1st/Lorena (Alternative 7). This will be further investigated if one of these alternatives is selected and when its design is further refined. No additional land will be needed in the subway station areas of LRT Alternative 6. All build alternatives will require additional land for park-and-ride facilities. This is discussed in more detail below. With regard to transportation-related energy consumption, there are no substantial differences between any of the build alternatives. However, all will have somewhat lower energy requirements than the TSM Alternative ranging from 32,424 (Alternative 8) to 243,321 (Alternative 6) fewer BTUs per year. In terms of barrels of oil saved annually as compared to the TSM Alternative, the build alternatives range from 243,321 barrels saved (Alternative 6) to 32,423 barrels saved (Alternative 8).

All of the build alternatives will serve several (from seven to ten depending on alternative) existing redevelopment or special revitalization zones. This is discussed in more detail below. An improved transit system could assist in the revitalization of these projects by providing improved access and mobility. All build alternatives will also serve minority and low-income populations and will result in an increase in numbers of transit trips in the corridor, but to somewhat varying degrees. All alternatives would also result in creation of additional jobs; visual and noise impacts unless mitigation is provided; and utility impacts. Again, there are differences in the extent of impacts anticipated depending on the alternative selected.

Although about 35 to 43 percent of all the alignments is designated as having a potential for liquefaction based on generalized liquefaction hazard maps, results of prior site-specific investigations indicate that the potential for liquefaction along all the alternative alignments is low to very low. Because prior investigations did not address subsurface conditions at the Rio Hondo area, the liquefaction potential of this area will require evaluation. However, because all the alignments are at grade and have similar segment lengths across the Rio Hondo area, comparative analyses to select a preferred alternative will likely not be influenced by the liquefaction potential of the Rio Hondo area. Accordingly, liquefaction has not been included as a criterion for the selection of the preferred alternative.

In addition, all alignments would be in proximity of pre-existing contaminated sites, cultural resources, and parks and recreation facilities, but to varying degrees. Three of the alternatives (Alternatives 1, 7, and 8) would cross the Coyote Pass Escarpment, an area of surface deformation believed to be a result of fault movement along the Elysian Park Thrust Fault. The remaining discussion in this section focuses on the differences between the build alternatives. Discussion of possible mitigation options for adverse impacts was presented in the previous sections of this chapter.

Alternative 1

This BRT alternative would require an additional 28 acres of land for park-and-ride facilities based on preliminary estimates of parking needs. This is one of the alternatives with the lowest requirements for additional property. At this conceptual level of design, only general locations of park-and-ride facilities (i.e., vicinity of some of the station areas east of I-710) are known. Specific site locations will be determined as the design advances to later stages of project development. The possibility of constructing parking structures (instead of surface lots) at some locations will also be determined later for the selected alternative. If structures were built, the additional land requirements would be reduced.

The numbers of accidents that may potentially occur were estimated based on historical statistics for similar bus operations and on similar arterial streets. An estimated 170 to 225 bus accidents and 385 automobile accidents are projected to occur annually. Alternative 1, as well as all of the other BRT alternatives, is forecasted to result in higher numbers of accidents involving a transit vehicle than those alternatives employing at-grade LRT. All of the BRT alternatives are projected to result in similar numbers of bus accidents. However, Alternative 8 would result in the least accidents of the BRT alternatives (165 to 215 bus accidents) because of the subway segment. This alternative is estimated to result in the next to least number of automobile accidents of all of the build alternatives. Alternatives 4, 5, 7, and 8 are estimated to result in the fewest auto accidents (380 annual accidents).

Alternative 1 ties with Alternatives 4 and 5 in directly serving the highest number of existing redevelopment or special revitalization zones (they each serve ten). However, this alternative ranks next to lowest in numbers of short-term jobs created (25,222 direct and indirect jobs). Only Alternative 2 ranks lower (24,857 such jobs). Although Alternative 1 ranks lowest of the build alternatives in numbers of permanent jobs created (3,748 direct and indirect jobs), it would still create 2.5 times as many permanent jobs as the TSM Alternative. In terms of highest numbers of low-income families served within 1/2 mile of the transit stations, Alternative 1 ranks third (31,583 families). The alternative is second in terms of minority populations served within the same distance of the stations (127,817 persons). All of the station areas for all of the build alternatives serve high concentrations of minority populations. Like Alternatives 4, 5, 7, and 8, this alternative also serves high concentrations of low-income families within 1/2 mile of all of the stations, with the exception of those at Beverly/Wilcox, Beverly/Montebello, Beverly/4th, and Whittier/Norwalk. Alternative 1 also ranks second in numbers of zero-car households (8,587 households) and in workers using public transportation to get to work (7,585 persons) within 1/2 mile of the stations. Alternative 1 ties with Alternative 2 in providing the fewest corridor daily transit trips (174,500) of the build alternatives. However, both alternatives would still provide more transit trips than either the No-Build or TSM Alternative (25,400 and 9,200 more trips each day, respectively).

With regard to potential visual impacts, this alternative would potentially affect the highest number of sensitive receptors of all alternatives (541 residences, schools, parks, bicycle trails, and/or cemeteries). However, this alternative includes a bus guideway. Overall impacts of this mode are expected to be less than a light rail mode because light rail would necessitate removal of median landscaping (where it already exists) and installation of an overhead catenary system. The BRT mode does not have these requirements. Alternative 1 would have the highest numbers of noise-impacted buildings and parks (554) of the alternatives. Because this mode involves buses, vibration would not be an issue.

This alternative ranks mid-range with regard to estimated pollutant criteria/precursor emissions. It ranks fourth best with regard to CO_2 emissions.

Alternative 1 crosses about 300 feet of the Coyote Pass Escarpment However, it is anticipated that this at-grade alternative would be affected less severely than the subway alternatives crossing the escarpment (Alternatives 7 and 8) in the event of future seismic activity along the escarpment.

This alternative has the lowest potential for concern with regard to possibly encountering pre-existing hazardous substance sites during construction. The BRT mode would involve only limited subsurface construction activity. In general, the major areas of concern for encountering contaminated sites under any of the build alternatives exist in the western portion of the study area between Union Station and Indiana Street.

Of the totally at-grade alternatives, the lowest numbers of potential cultural resources and sites listed on the State and National Registers (124) were identified in proximity of Alternative 1. However, all of the alternatives involving subway (Alternatives 6, 7, and 8) have fewer (75, 48, and 109, respectively). In general, the area between about Boyle Avenue and Indiana Street has the highest concentrations of such resources for all of the alternatives considered. Fewer potential resources were identified further east within the study area. Because of the limited subsurface construction activity associated with Alternative 1, there is no potential for encountering fossil sites and remains during construction.

A total of nine park and recreation facilities were identified within 300 feet of the alignment. This is the distance considered in the evaluation as the area where potential impacts are possible. All of the build alternatives are in proximity of between eight and 11 such resources; therefore, this alternative falls in the middle-range in the ranking of this criterion.

The final criterion evaluated is the potential impacts on utilities during construction. Alternative 1, as well as all of the other totally at-grade alternatives, would have the highest impacts because relocation of utilities buried within the street or on overhead poles above the street is expected to some degree.

Alternative 2

This BRT alternative, along with Alternatives 3 and 6, has the highest requirements for additional land (35 acres) to accommodate park-and-ride facilities according to preliminary estimates of parking needs. An estimated 170 to 225 bus accidents and 430 automobile accidents are projected to occur annually. Alternative 2, as well as all of the other BRT alternatives, is forecasted to result in higher numbers of accidents involving a transit vehicle than those alternatives employing at-grade LRT. All of the BRT alternatives are projected to result in similar numbers of bus accidents. This alternative is also tied with Alternatives 3 and 6 for the highest number of estimated automobile accidents of all of the build alternatives. The total accidents (both bus and auto) are estimated to be the highest of all of the build alternatives.

Alternative 2 also serves nine existing redevelopment or special revitalization zones tying with Alternatives 3 and 6 for second highest number of such zones served. Alternative 2 ranks lowest in numbers of short-term jobs created (24,857 direct and indirect jobs) as a result of construction of the project. It ranks second to lowest in numbers of permanent jobs created (3,770 direct and indirect jobs). Only Alternative 1 ranks lower (3,748 such jobs).

Alternative 2 ties with Alternative 3 for having the highest numbers of both low-income families (36,967 families) and minority populations (141,353 persons) served within 1/2 mile of the stations. As

previously mentioned, all of the station areas for all of the build alternatives serve high concentrations of minority populations. Like Alternatives 3 and 6, this alternative also serves high concentrations of low-income families within 1/2 mile of all of the stations, with the exception of the one at Whittier/Norwalk. Alternative 2 also ties with Alternative 3 in having the highest numbers of zero-car households (9,553 households) and workers using public transportation to get to work (8,521 persons) within 1/2 mile of the stations. This alternative ties with Alternative 1 in providing the fewest corridor daily transit trips (174,500) of the build alternatives. However, both alternatives would still provide more transit trips than either the No-Build or TSM Alternative (25,400 and 9,200 more trips each day, respectively).

With regard to potential visual impacts, this alternative ranks about middle range in terms of numbers of sensitive receptors potentially affected (427 residences, schools, parks, bicycle trails, and/or cemeteries). This alternative again ties with Alternative 3 with regard to numbers of receptors. However, overall impacts are expected to be less than the light rail mode proposed for Alternative 3 because it does not require removal of median landscaping or installation of an overhead catenary system. This alternative (like Alternative 3) again ranks in about the middle with regard to potential noise impacts (483 noise-impacted buildings and parks). Because this mode involves buses, vibration would not be an issue.

Alternative 2 ranks third best with regard to reductions in estimated pollutant criteria/precursor emissions. It ranks third best with regard to CO_2 emissions.

This alternative (like Alternatives 3 through 6) does not cross the Coyote Pass Escarpment. Therefore, potential ground deformation hazards are not a concern of this alternative. Alternative 2 is ranked second with regard to lowest potential concern for possibly encountering pre-existing hazardous substance sites during construction. The BRT mode would involve only limited subsurface construction activity.

Alternative 2 also ties with Alternative 3 in highest numbers of potential cultural resources and listed sites in proximity of the alignment (158). However, there is no potential for encountering fossil sites and remains during construction of this alternative. The fewest park and recreation facilities (8) of all the build alternatives are located close to the alignment of Alternative 2. Like the other at-grade alternatives, this alternative would have the highest impacts on utilities during construction.

Alternative 3

This LRT alternative follows the same alignment as Alternative 2 and shares many of the same impacts. Impacts on land requirements for the park-and-ride facilities, redevelopment and revitalization areas served, cultural resources, and utilities would be the same. The numbers of low-income and minority populations, zero-car households, and workers using public transportation to get to work that would potentially be served are also similar.

However, some differences are evident due to the different mode. The number of corridor daily transit trips is projected to be higher with this alternative (178,700) than with Alternative 2 (174,500), ranking it fourth highest in terms of ridership. The same numbers of sensitive receptors would be affected by noise as Alternative 2, but the LRT mode also introduces the potential for vibration impacts on those receptors. Also, similar numbers of sensitive receptors would possibly be affected by visual impacts as Alternative 2. However, the overall impact would be greater since the LRT mode will require removal of existing landscaping in medians and installation of an overhead catenary system.

Alternative 3 ranks second best with regard to reductions in estimated pollutant criteria/precursor emissions and with regard to CO_2 emissions.

An estimated 50 to 65 light rail vehicle accidents and 430 automobile accidents are projected to occur annually. Alternative 3 ties with Alternative 5 in highest projected numbers of light rail vehicle accidents. However, all of the LRT alternatives would result in fewer accidents involving a transit vehicle than those alternatives employing at-grade BRT. This alternative is tied with Alternatives 2 and 6 for the highest number of estimated automobile accidents of all of the build alternatives.

Alternative 3 nearly ties with Alternative 5 in estimated short-term jobs created (43,378 for Alternative 3 and 43,362 for Alternative 5). Both rank mid-range in numbers of such jobs. Alternative 3 also ranks mid-range in numbers of permanent jobs created (4,202 direct and indirect jobs).

The potential for concern with regard to possibly encountering pre-existing contaminated sites is somewhat higher than Alternative 2 because this mode will require some additional subsurface construction activity as compared to BRT. Construction of aerial structures associated with the Baseline and Evergreen Options for connecting to Union Station may require mitigative actions in contaminated areas. Also, one additional park (for a total of 9 facilities) would be in close proximity of this alternative if the Alameda Option for connection to Union Station were selected. If the Baseline or Evergreen Options were selected to connect to Union Station, then there would be potential for encountering fossil sites and remains during construction of the elevated segments. There is no such potential if the Alameda (at-grade) Option were selected.

Alternative 4

This BRT alternative would require an additional 28 acres of land for park-and-ride facilities according to preliminary estimates. This is one of the alternatives with the lowest requirements for additional property. An estimated 170 to 220 bus accidents and 380 automobile accidents are projected to occur annually. Alternative 4, as well as all of the other BRT alternatives, is forecasted to result in higher numbers of accidents involving a transit vehicle than those alternatives employing at-grade LRT. All of the BRT alternatives are projected to result in similar numbers of bus accidents. However, this alternative ties with Alternatives 5, 7, and 8 for the fewest projected auto accidents.

In terms of highest numbers of low-income families served within 1/2 mile of the stations, Alternative 4 ranks second (31,586 families) tying with Alternative 5. It ranks fourth highest, along with Alternative 5, in numbers of minorities served within the same distance of the stations (124,194 persons). Alternative 4 ranks third highest and fourth highest, respectively, in numbers of zero-car households (8,530 households) and in numbers of workers using public transportation (7,347 persons) within 1/2 mile of the stations. Again, this alternative is tied with Alternative 5 for these two criteria. However, Alternative 4 ranks second to last with regard to number of corridor daily transit trips (174,900).

Alternative 4, along with Alternatives 1 and 5, directly serve the highest number of existing redevelopment or special revitalization zones (ten). An improved transit system could assist in the revitalization of these projects by providing improved access and mobility. However, Alternative 4 ranks third from the bottom in numbers of short-term jobs created (25,520 direct and indirect jobs) and in numbers of permanent jobs created (4,003 direct and indirect jobs). With regard to potential visual impacts, this alternative would potentially affect the second highest number of sensitive receptors (490 residences, schools, parks, bicycle trails, and/or cemeteries). This is the same number potentially affected by Alternative 5. As mentioned before, the overall impacts are expected to be less, however, than a light rail mode (as in Alternative 5) because no landscaping would need to be removed in the medians, and no overhead catenary system would need to be installed. A total of 504 buildings and parks would be affected by noise, which is also similar to Alternative 5. However, vibration would not be an issue for this BRT mode.

Alternative 4 achieves some of the fewest pollutant criteria/precursor emission reductions compared to the No-Build Alternative of any of the build alternatives (ranking from sixth to eighth depending on the type of emissions considered). It ranks one of the lowest of the build alternatives with regard to CO_2 emissions and also results in higher such emissions than the No-Build Alternative.

This alternative (like Alternatives 2, 3, 5, and 6) does not cross the Coyote Pass Escarpment. Therefore, potential ground deformation hazards are not a concern of this alternative. Alternative 4 has the third lowest potential for concern with regard to possibly encountering pre-existing hazardous substance sites during construction. The BRT mode would involve only limited subsurface construction activity.

This alternative also ties with Alternative 5 for second highest number of potential cultural resources and listed sites identified in proximity of the alignment (132). Because of the limited subsurface construction activity associated with Alternative 4, there is no potential for encountering fossil sites and remains during construction.

A total of ten park and recreation facilities were identified within 300 feet of the alignment, ranking it second highest in terms of numbers of such facilities within close proximity. Like the other at-grade alternatives, Alternative 4 would have the greatest impact on utilities during construction.

Alternative 5

LRT Alternative 5 follows the same alignment as Alternative 4 and shares many of the same impacts. Impacts on land requirements for the park-and-ride facilities, redevelopment and revitalization areas served, cultural resources, and utilities would be the same. The numbers of low-income and minority populations, zero-car households, and workers using public transportation to get to work that would potentially be served are also similar.

However, some differences are evident due to the different mode. The number of corridor daily transit trips is projected to be higher with this alternative (180,350) than with Alternative 4 (174,900), ranking it second highest in terms of ridership. The same numbers of sensitive receptors would be affected by noise as Alternative 4, but the LRT mode also introduces the potential for vibration impacts on those receptors. Also, similar numbers of sensitive receptors would possibly be affected by visual impacts as Alternative 4. However, the overall impact would be greater since the LRT mode will require removal of existing landscaping in medians and installation of an overhead catenary system.

Alternative 5 achieves some of the fewest pollutant criteria/precursor emission reductions compared to the No-Build Alternative of any of the build alternatives (ranking from seventh to eighth depending on the type of emissions considered). It ranks worst of the build alternatives with regard to CO_2 emissions, but it still has fewer such emissions than the TSM Alternative.

An estimated 50 to 65 light rail vehicle accidents and 380 automobile accidents are projected to occur annually. Alternative 5 ties with Alternative 3 in highest projected numbers of light rail vehicle accidents. However, all of the LRT alternatives would result in fewer accidents involving a transit vehicle than those alternatives employing at-grade BRT. This alternative is tied with Alternatives 4, 7, and 8 for the least number of estimated automobile accidents of all of the build alternatives.

Alternative 5 nearly ties with Alternative 3 in estimated short-term jobs created (43,378 for Alternative 3 and 43,362 for Alternative 5). Both rank mid-range in numbers of such jobs. Alternative 5 provides the third highest number of permanent jobs (4,568 direct and indirect jobs).

The potential for concern with regard to possibly encountering pre-existing contaminated sites is somewhat higher than Alternative 4 because this mode will require some additional subsurface construction activity as compared to BRT. Construction of aerial structures associated with the Baseline and Evergreen Options for connecting to Union Station may require mitigative actions in contaminated areas. Also, one additional park (for a total of 11 facilities) would be in close proximity of this alternative if the Alameda Option for connection to Union Station were selected. If the Baseline or Evergreen Options were selected to connect to Union Station, then there would be a potential for encountering fossil sites and remains during construction of the elevated segments. There is no such potential if the Alameda (at-grade) Option were selected.

Alternative 6

This LRT alternative includes a subway segment from about US 101 (east of the Los Angeles River) to 1st/Lorena. It is tied with Alternatives 2 and 3 for the highest requirements for additional land (35 acres) to accommodate park-and-ride facilities, according to preliminary estimates of parking needs. An estimated 45 to 60 light rail vehicle accidents and 430 automobile accidents are projected to occur annually. This alternative is estimated to result in slightly fewer light rail accidents than the totally at-grade LRT alternatives because of the subway segment. However, as noted previously, all of the LRT alternatives would result in fewer accidents involving a transit vehicle than those alternatives employing at-grade BRT. This alternative is tied with Alternatives 2 and 3 for the highest number of estimated automobile accidents of all of the build alternatives.

Alternative 6 serves nine existing redevelopment or special revitalization zones tying with Alternatives 2 and 3 for second highest number of such zones served. This alternative creates the third highest number of short-term jobs (55,379 direct and indirect jobs). With regard to permanent jobs, Alternative 6 ranks fifth in numbers of jobs created (4,084 direct and indirect jobs). Only the BRT alternatives would create fewer such jobs.

In terms of numbers of low-income families served within 1/2 mile of the stations, Alternative 6 ranks fourth lowest (31,523 families). The alternative is the next to the lowest in terms of minority populations served within the same distance of the stations (122,522 persons). It ranks fourth lowest in numbers of zero-car households (8,120 households) and also ranks the next to the lowest in numbers of workers using public transportation to get to work (6,733 persons) within 1/2 mile of the stations. However, Alternative 6 ranks third highest with regard to daily transit trips within the corridor (179,550).

Alternative 6 would potentially visually affect the lowest number of sensitive receptors (296 residences, schools, parks, bicycle trails, and/or cemeteries). However, overall impacts would be greater in the areas affected than a BRT mode because of the need to remove landscaping in the medians and install an overhead catenary system. This alternative also would have the least number of noise-impacted buildings and parks of all the build alternatives (358 affected by wayside noise for the at-grade segments and 50 affected by ground-borne noise for the subway segment). However, the LRT mode would introduce the potential for vibration impacts on those receptors. The possible vibration impacts of the at-grade portion of the alternative would, however, be less than the subway portion because of the lower operating speed required along the at-grade segment.

Alternative 6 achieves the best reduction in pollutant criteria/precursor emissions of any of the alternatives under consideration. This also holds true with regard to CO_2 emissions.

This alternative (like Alternatives 2 through 5) does not cross the Coyote Pass Escarpment. Therefore, potential ground deformation hazards are not a concern of this alternative. Alternative 6 has the third highest potential for concern with regard to encountering pre-existing contaminated sites since the major

areas of concern are not in the tunnel segment. It is likely that the proposed subway segment, and possibly the elevated segment of the Baseline and Evergreen Options for connecting with Union Station (proposed in this alternative as well as LRT Alternatives 3 and 5), would encounter some subsurface contamination related to historical industrial activities.

The second fewest potential cultural resources and listed sites were identified in the vicinity of this alternative (75). Both the subway segment of this alternative and the elevated segment of the Baseline and Evergreen Options for connecting with Union Station have a potential for encountering fossil sites and remains during construction. The at-grade segments have no potential since limited subsurface construction activity would occur.

A total of eight park and recreation facilities were identified within 300 feet of the alignment assuming the Alameda Option is selected for connection to Union Station. Only seven such facilities are in close proximity of this alternative if the other two options are selected. Note that the alternative is located within a subway segment near one of the facilities (LANI Park). No impacts on that park would be expected as a result of this alternative. Potential impacts on parks would be among the lowest of all the alternatives depending on which alternative is selected for connecting to Union Station. Like Alternatives 7 and 8, Alternative 6 would have the least impacts on utilities because of the subway segment. However, impacts are still likely in the vicinity of the subway station excavation areas.

Alternative 7

This hybrid alternative consists of a heavy rail subway segment from Union Station to 1st/Lorena and a LRT at-grade segment from 1st/Lorena east to Whittier/Norwalk. It is tied with Alternatives 1, 4, 5, and 8 for the lowest requirements for additional land (28 acres) to accommodate park-and-ride facilities, according to preliminary estimates of parking needs. An estimated 35 to 50 light rail vehicle accidents and 380 automobile accidents are projected to occur annually. This alternative is estimated to result in fewer light rail accidents than all of the LRT alternatives because it contains the longest length of subway segment where accidents would not be an issue. This alternative is also tied with Alternatives 4, 5, and 8 for the lowest number of estimated automobile accidents of all of the build alternatives. Overall, Alternative 7 ranks best in terms of fewest anticipated total accidents (light rail vehicle and auto).

In terms of numbers of low-income families, minority populations, zero-car households, and workers using public transportation to get to work within 1/2 mile of the stations, Alternative 7 ranks the lowest with 23,312 families, 100,294 persons, 6,024 households, and 5,100 workers, respectively. It also would directly serve the fewest redevelopment or special revitalization zones (seven) of any of the build alternatives. However, it would provide the highest number of corridor daily transit trips (180,750) and would create the most short-term jobs (79,141 direct and indirect jobs). It is estimated that this alternative would create more than 20,000 additional such jobs than Alternative 8 which ranks second highest in this category. Alternative 7 would also create the most permanent jobs (5,108 direct and indirect jobs).

Alternative 7 would potentially visually affect the second lowest number of sensitive receptors (300 residences, schools, parks, bicycle trails, and/or cemeteries). This is only four more than affected under Alternative 6. However, overall impacts would be greater in the areas affected than a BRT mode because of the need to remove landscaping in the medians and to install an overhead catenary system. The noise impacts would affect the second lowest number of buildings and parks (378 affected by wayside noise for the LRT at-grade segments and 68 affected by the ground-borne noise for the heavy rail subway segment). There would also be a potential for vibration impacts on those receptors due to both modes. However, such impacts would be less for the at-grade portions than the underground portion because of the lower speeds required for the street-running operation.

This alternative ranks about mid-range with regard to pollutant criteria/precursor emission reductions compared to the No-Build Alternative of any of the build alternatives (ranking from fourth to fifth depending on the type of emissions considered). It also ranks mid-range with regard to CO_2 emissions.

Approximately 800 feet of proposed tunnel segment of Alternative 7 crosses the Coyote Pass Escarpment. Alternative 7 also has the highest potential for concern with regard to encountering pre-existing contaminated sites west of the Los Angeles River. Alternatives 7 and 8 will involve extensive subsurface excavation in the vicinity of contaminated sites. Both of these subway alternatives are located through industrially developed property that has historically contained oil and gas production wells. High levels of methane gas and hydrogen sulfide are potential concerns associated with the tunneling. Previous studies in the vicinity of Union Station, conducted as a part of the previous Red Line study effort, have found groundwater to be contaminated with hydrocarbons, hydrogen sulfide gas, and various volatile organic compounds, and semi-volatile organic compounds. Two former coal-gasification sites are also located in the study area. Another major source of concern is the former site of six large gasoline above ground storage tanks (currently under demolition and being taken off-site) located near the Friedman Bag Company at the northwest corner of Ducommun and Vignes Streets.

The lowest number of potential cultural resources and listed sites were identified in the vicinity of this alignment (48). There is a potential to encounter fossil sites and remains during construction of the subway segment. A total of 9 park and recreation facilities are located in close proximity of the alignment. Note that the total parks nearby included two (Pecan Park and LANI Park) within the subway segment. No impacts on those parks would be expected as a result of this alternative. Like Alternatives 6 and 8, Alternative 7 would have the least impacts on utilities because of the subway segment. However, impacts are still likely in the vicinity of the subway station excavation areas.

Alternative 8

This hybrid alternative consists of a heavy rail subway segment from Union Station to Chavez/Soto and a BRT at-grade segment from Chavez/Soto east to Whittier/Norwalk. It is tied with Alternatives 1, 4, 5, and 7 for the lowest requirements for additional land (28 acres) to accommodate park-and-ride facilities, according to preliminary estimates of parking needs. An estimated 165 to 215 bus accidents and 380 automobile accidents are projected to occur annually. Alternative 8, as well as all of the other BRT alternatives, is forecasted to result in higher numbers of accidents involving a transit vehicle than those alternatives employing at-grade LRT. All of the BRT alternatives are projected to result in similar numbers of bus accidents except that Alternative 8 would have slightly fewer such accidents (approximately five less each year). This alternative ties with Alternatives 4, 5, and 7 for the fewest projected auto accidents.

Alternative 8 serves some of the fewest existing redevelopment or special revitalization zones (eight). Only Alternative 7 serves fewer such zones (seven served). It would create the second highest number of short-term jobs (58,611 direct and indirect jobs) and also the second highest number of permanent jobs (4,718 direct and indirect jobs).

In terms of numbers of low-income families served within 1/2 mile of the stations, this alternative ranks next to last (30,919 families) for fewest numbers served. It ranks third highest in numbers of minorities served within the same distance of the stations (126,496 persons). Alternative 8 again is next to last for fewest zero-car households served (7,918 households) and third highest in numbers of workers using public transportation to get to work (7,430 persons) within 1/2 mile of the stations. With regard to corridor daily transit trips, this alternative ranks fifth (177,150).

With regard to potential visual impacts, this alternative would potentially affect the third highest number of sensitive receptors (482 residences, schools, parks, bicycle trails, and/or cemeteries). However, the visual impacts are confined to the area where the BRT mode would operate. Overall impacts of this mode are expected to be less than a light rail mode due to reasons previously stated. Alternative 8 has the second highest numbers of noise-impacted buildings and parks of all of the build alternatives (538 affected by wayside noise for the BRT at-grade segments and 45 affected by the ground-borne noise for the heavy rail subway segment). There would also be a potential for vibration impacts on the receptors located in the vicinity of the heavy rail subway segment. The bus mode would result in no vibration impacts.

Alternative 8 achieves some of the fewest pollutant criteria/precursor emission reductions compared to the No-Build Alternative of any of the build alternatives (ranking from sixth to seventh depending on the type of emissions considered). It ranks worst with regard to CO_2 emissions of the build alternatives, but it still results in fewer such emissions than the TSM Alternative.

Alternative 8 has the longest length of crossing of the Coyote Pass Escarpment (800 feet of proposed tunnel segment and 300 feet of proposed at-grade busway). This alternative has the second highest potential for concern with regard to encountering pre-existing contaminated sites. The discussion of Alternative 7 identifies the major areas of concern.

The third lowest number of potential cultural resources and listed sites were identified in the vicinity of this alignment (109). However, this alternative has the highest number of such resources of the alternatives involving a subway segment. There is a potential to encounter fossil sites and remains during construction of the subway segment. A total of 9 park and recreation facilities are located within 300 feet of the alignment. Note that the total parks nearby included one (Pecan Park) within the subway segment. No impacts on this park would be expected as a result of this alternative. Like Alternatives 6 and 7, Alternative 8 would have the least impacts on utilities because of the subway segment. However, impacts are still likely in the vicinity of the subway excavation areas.

Conclusions

Selection of an alternative for implementation will require consideration of tradeoffs. Some of the major observations of the comparative evaluation are discussed in this section.

The numbers of accidents anticipated to occur each year were estimated for each of the build alternatives based on historical data for similar bus, light rail, and automobile operations. With regard to accidents involving a transit vehicle, all of the at-grade BRT alternatives are estimated to result in substantially more accidents (more than three times) than the at-grade LRT alternatives. However, the number of estimated automobile accidents is related more to the segment that is traversed than the mode of transit being offered under each alternative. Alternatives 2, 3, and 6 would likely result in the highest number of auto accidents (an estimated 430 per year), while the other build alternatives would result in a projected 380 to 385 auto accidents each year. Based on historical statistics provided by MTA's Operations Safety Department for similar types of operating segments of the Metro Blue Line for light rail and by FHWA and Caltrans for automobile accidents on similar types of arterial streets, the following observations were noted. Only about five percent of the light rail accidents involved pedestrians. The majority of the accidents related to private vehicle conflicts with the LRT vehicle. Most of the automobile accidents involved property damage only; however, the remainder involved some type of personal injuries.

Because the portion of the study area west of Lorena Street has generally higher population densities, families with higher numbers of children, and higher transit usage than the eastern portion of the study area, the probability of accidents occurring in the western area is higher for the totally at-grade

alternatives. The subway segments associated with Alternatives 6 through 8 would substantially reduce the probability of accidents in the Boyle Heights area where the tunneled sections would be located.

BRT Alternative 2 and LRT Alternative 3 would both serve the highest numbers of low-income (36,967 families) and minority populations (141,353 persons) within 1/2 mile of the stations. They also would serve the highest numbers of zero-car households (9,553 households) and workers using public transportation (8,521 workers) within 1/2 mile of the stations. These two alternatives follow the same alignment. Alternative 7 would serve the fewest of these populations (23,312 low-income families, 100,294 minorities, 6,024 households, and 5,100 workers, respectively). However, with regard to numbers of corridor daily transit trips, Alternative 7 would provide the highest number (180,750), followed closely by Alternative 5 (180,350). Alternatives 1 and 2 would result in the lowest number of such trips of the build alternatives (174,500 each). It is important to note that higher numbers of transit trips are anticipated for all of the build alternatives as compared to the No-Build and TSM Alternatives. The increase in corridor daily transit trips for the build alternatives range between 31,650 (Alternative 7) and 25,400 (Alternatives 1 and 2) as compared to the No-Build Alternative. A comparison to the TSM Alternative shows that projected increases for the build alternatives range from 15,400 additional trips (Alternative 7) to 9,200 additional trips (Alternatives 1 and 2).

Alternative 7 would result in creation of the highest number of short-term and permanent jobs (79,141 and 5,108 jobs, respectively). Alternative 2 would result in creation of the fewest short-term jobs (24,857), and Alternative 1 would result in creation of the fewest permanent jobs (3,748). Note that the alternatives employing heavy rail or LRT all would result in creation of more short-term and permanent jobs than any of the alternatives employing only the BRT mode.

Research of transit systems in other cities indicates that rail transit investment (similar to that associated with Alternatives 3, 5, 6, 7, and a portion of Alternative 8) offers greater possibility to support community development and revitalization efforts than implementing BRT (similar to that associated with Alternatives 1, 2, 4, and a portion of Alternative 8). However, it appears that the location, type, and success of development is often contingent on other factors as well such as market forces, public policy initiatives, and financing scenarios, particularly in less affluent communities.

With regard to air quality impacts, all of the build alternatives would result in criteria pollutant/precursor emissions reductions as compared to the TSM Alternative and would also result in reductions as compared to the No-Build Alternative except in the case of NO_x where three of the alternatives (Alternatives 4, 5, and 8) would produce higher emissions. Alternative 6 would achieve the greatest reductions among the build alternatives while Alternative 5 would generally result in the fewest reductions. Greenhouse gas emissions (measured in terms of tons of CO_2), from all of the build alternatives would be less than the TSM Alternative. Five of the build alternatives (Alternatives 1, 2, 3, 6 and 7) would also achieve reductions of greenhouse gas emissions as compared to the No-Build Alternative. Alternative 6 would again achieve the greatest reductions.

A comparison of potentially noise-impacted buildings shows that BRT Alternative 1 would have the greatest impact while LRT at grade/subway Alternative 6 would have the least impact. Buses, in general, are noisier than light rail vehicles because they result in wayside noise impacts at greater distances from an alignment than light rail vehicles. However, it is expected that both at-grade modes would still have an adverse impact on the first row of buildings because of the close proximity of the buildings to the streets. The extent of impact on the first row buildings would generally be more severe with buses than with a light rail vehicle. Sound walls are considered the most effective noise control measure for at-grade systems. However, to be effective, they must block the direct view of the noise source and must be solid with minimal openings. Installation of sound walls is not feasible for any of the at-grade LRT or BRT

alternatives being considered because they would interfere with normal traffic movements and would restrict emergency vehicle access.

Noise levels from underground operations of either LRT or heavy rail (ground-borne noise) are normally heard as a low level rumbling sound on the inside of buildings and is not perceptible on the outside of a building. In general, even with closed windows, noise levels from underground operations (as with the subway segments of Alternatives 6, 7, and 8) would result in lower interior noise levels than BRT or LRT at-grade operations. Also, the outside at-grade rail noise levels would be significantly higher than ground-borne noise from underground operations which are generally not perceptible outdoors. With regard to vibration, no impacts would be expected from buses because they are rubber tired vehicles. However, such impacts are possible with both LRT and heavy rail. The potential vibration impacts from at-grade LRT operations would be less than from underground operations because of the lower speeds required for the street-running operation. However, mitigation techniques are available to minimize both potential ground-borne noise and vibration impacts.

With regard to potential visual impacts, both the number of sensitive receptors near an alignment and the mode itself should be considered. The mode, however, is probably a more important factor than the number of receptors located near an alignment when considering overall impact. An at-grade LRT would have the greatest impact because it would necessitate the removal of landscaping in the street medians and the installation of an overhead catenary system. A BRT mode has no such requirements. Although BRT Alternative 1 would be in close proximity of the highest number of sensitive receptors (541), LRT Alternative 5 would likely have the highest overall impact. It would affect the greatest number of receptors (490) of the LRT alternatives. Alternatives 6 and 7 (both involving subway segments) would affect the fewest such receptors (296 and 300, respectively). However, both of these alternatives incorporate LRT in the at-grade segments. Alternative 2 would affect the fewest receptors (427) of the alternatives employing BRT. It fares better than Alternative 8, which involves both a heavy rail subway segment and a BRT at-grade segment. The at-grade portion of Alternative 8 passes by more residences than Alternative 2.

Any alternative involving subway would have the least overall visual impact on the surrounding community because most of the facilities would be located underground. Therefore, Alternatives 6, 7, and 8 would have the least impact on the Boyle Heights community where the subway segments are located. As noted in Table 5, Alternatives 6 and 7 would potentially affect only 33 and 14 receptors, respectively, in the portion of the study area between Union Station and Lorena Street because these two alternatives operate mostly underground. These numbers compare with more than 200 receptors for each of the other at-grade alternatives in the same study area. Although Alternative 8 includes a subway segment, this alternative potentially affects 199 receptors in this portion of Boyle Heights due to the at-grade BRT portion that operates from Chavez/Soto to 4th Street/Lorena.

Regarding proximity to cultural resources, all of the alternatives will need to deal with both historic structures and subsurface remains in the Union Station/Alameda area. Note that, overall, the subway alternatives generally fare best of the build alternatives because they pass underground beneath the highest concentration of resources in Boyle Heights. Alternatives 6, 7, and 8 pass by 75, 48, and 109 such resources, respectively. Of the at-grade alternatives, BRT Alternative 1 passes by the fewest resources (124). The other at-grade Alternatives 2 through 5 each pass by the highest number of such resources (between 132 and 158, depending on the alternative). On the other hand, the at-grade alternatives have the least potential for encountering fossil sites and remains during construction since no major subsurface excavation activity is required. The subway segments of Alternatives 6 through 8 and the elevated segments (associated with the Baseline and Evergreen Options for connection with Union Station) of LRT Alternatives 3, 5, and 6 have the highest potential for encountering these resources.

The extensive subsurface excavation associated with Alternatives 7 and 8 also rank these subway alternatives the highest in terms of potential for concern for encountering existing contaminated sites during construction. Alternative 6 ranks the third highest in terms of potential concern since it has a shorter subway segment than Alternatives 7 or 8 and because the subway segment is east of the Los Angeles River where there is less of a concern for encountering hydrogen sulfide and other contaminants. Although there is still a concern for encountering hazardous substances along Alternative 6, most of the contaminated areas identified are located in the western portion of the study area between Union Station and Indiana Street and are, therefore, in the vicinity of the subway segments of Alternatives 7 and 8. Mitigation measures to address construction and operation of subway segments through contaminated ground, specifically the western portion of the study area, had been developed and incorporated into the design of the suspended Metro Red Line Eastside Extension project. Similar measures could be employed as needed for this project. The BRT alternatives have the lowest potential for concern for encountering contaminated sites followed by the at-grade LRT alternatives. Both types of alternatives would involve only limited subsurface construction activity.

Three of the build alternatives (Alternatives 1, 7, and 8) cross the Coyote Pass Escarpment that is associated with the Elysian Park Thrust, a buried thrust fault that underlies portions of the western study area. It is anticipated that the at-grade alternatives would be affected less severely than the subway alternatives in the event of future seismic activity along the escarpment. Alternative 8 has the longest length of crossing of the escarpment (about 800 feet of tunnel segment and 300 feet of at-grade segment). Special steel tunnel liners to mitigate the effects of deformation with added ductility had been incorporated into the design of the tunnel segments crossing the escarpment for the suspended Metro Red Line Eastside Extension project.

The impacts on utilities during construction would likely be greater for the totally at-grade alternatives than those alternatives involving subway segments (Alternatives 6 through 8) since relocation of some utilities buried within the street or on overhead poles above the street will be required. The depth of the tunneling will mostly avoid utilities. However, impacts are still likely in the subway station excavation areas.

TABLE 4
COMPARISON OF ALTERNATIVES –ENVIRONMENTAL ISSUES
(Union Station to Whittier/Norwalk)

Criteria	Alternative									
	No-Build	TSM	1 BRT	2 BRT	3 LRT	4 BRT	5 LRT	6 LRT (subway)/ LRT	7 Heavy rail (subway)/ LRT	8 Heavy rail (subway)/ BRT
Compatibility with local plans and policies	Maintains status quo.		Generally compatible except in vicinity of Whittier/Norwalk Station. An amendment to Whittier General Plan and revisions to Southwest Whittier Zoning may be needed.							
Redevelopment/ Revitalization areas served	Current trends and market conditions would prevail.		10	9	9	10	10	9	7	8
Potential for Economic Development[1]	Baseline Condition	Low	Low	Low	Good	Low	Good	Good	Good	Heavy Rail – Good BRT – Low
Short-term/ permanent jobs created	0/0	5,453/1,464	25,222/3,748	24,857/3,770	43,378/4,202	25,520/4,003	43,362/4,568	55,379/4,084	79,141/5,108	58,611/4,718
Potential residences and businesses displaced for alignment and stations[2]	0	0	0	0	0	0	0	0	0	0
Estimated acres needed for park-and-ride facilities[3]	0	0	28	35	35	28	28	35	28	28
Low-income families within 1/2 mi. of stations No./% of total	N/A	N/A	31,583/24%	36,967/26%	36,967/26%	31,586/25%	31,586/25%	31,523/25%	23,312/23%	30,919/24%
Minority populations within 1/2 mi. of stations No./% of total	N/A	N/A	127,817/93%	141,353/94%	141,353/94%	124,194/92%	124,194/92%	122,522/93%	100,294/91%	126,496/93%
Zero-car households within 1/2 mi. of stations No./% of total	N/A	N/A	8,587/24%	9,553/25%	9,553/25%	8,530/24%	8,530/24%	8,120/24%	6,024/21%	7,918/23%

TABLE 4
COMPARISON OF ALTERNATIVES –ENVIRONMENTAL ISSUES
(Union Station to Whittier/Norwalk)

Criteria	Alternative									
	No-Build	TSM	1 BRT	2 BRT	3 LRT	4 BRT	5 LRT	6 LRT (subway)/ LRT	7 Heavy rail (subway)/ LRT	8 Heavy rail (subway)/ BRT
Workers using public transportation within 1/2 mi. of stations No./% of total	N/A	N/A	7,585/15%	8,521/16%	8,521/16%	7,347/15%	7,347/15%	6,733/15%	5,100/13%	7,430/15%
Corridor daily person trips	3,532,600	3,540,900	3,542,600	3,542,900	3,546,100	3,542,800	3,546,500	3,546,700	3,546,000	3,544,400
Corridor daily transit trips	149,100	165,300	174,500	174,500	178,700	174,900	180,350	179,550	180,750	177,150
Corridor daily transit mode share	4.2%	4.7%	4.9%	4.9%	5.0%	4.9%	5.1%	5.1%	5.1%	5.0%
Increased daily transit trips as compared to:										
-No-Build		16,200	25,400	25,400	29,600	25,800	31,250	30,450	31,650	28,050
-TSM		N/A	9,200	9,200	13,400	9,600	15,050	14,250	15,450	11,850
Potential visually affected receptors[1]	0	0	541	427	427	490	490	296	300	482
Change in regional emissions (tons per year) compared to No-Build	Baseline									
-VOC		+9	-14.08	-23.36	-27.60	-3.62	-2.08	-40.84	-13.87	-.3.71
-CO		+150	-329.83	-509.82	-571.77	-131.48	-83.48	-825.65	-309.71	-130.03
-NO_x		+38	-25.51	-52.59	-70.59	+6.31	+5.82	-110.04	-29.30	_+5.15
-PM_{10}		+1	-2.69	-4.20	-4.75	-1.02	-0.64	-6.88	-2.54	-1.01
-CO_2		+42,363	-3,319	-24,339	-36,261	-22,363	-24,505	-67,613	-944	+23,512
EPA regional air quality designation										
-O_3	Extreme	Extreme	Extreme	Extreme	Extreme	Extreme	Extreme	Extreme	Extreme	Extreme
-CO	Serious	Serious	Serious	Serious	Serious	Serious	Serious	Serious	Serious	Serious
-PM_{10}	Serious	Serious	Serious	Serious	Serious	Serious	Serious	Serious	Serious	Serious
-NO_x	Attainment	Attainment	Attainment	Attainment	Attainment	Attainment	Attainment	Attainment	Attainment	Attainment

TABLE 4
COMPARISON OF ALTERNATIVES –ENVIRONMENTAL ISSUES
(Union Station to Whittier/Norwalk)

Criteria	Alternative									
	No-Build	TSM	1 BRT	2 BRT	3 LRT	4 BRT	5 LRT	6 LRT (subway)/ LRT	7 Heavy rail (subway)/ LRT	8 Heavy rail (subway)/ BRT
Potential sensitive receptors affected by noise and vibration[5] (xx) applies to ground-borne noise in subway segment.	Baseline	Added bus service could result in slight increases in noise levels at some locations.	554	483	483	504	504	358/(50)	378/(68)	538/(45)
Portion of alignment that crosses Coyote Pass Escarpment (feet) -at grade -subway	N/A	N/A	 300 0	 0 0	 0 0	 0 0	 0 0	 0 0	 0 800	 300 800
No. contaminated sites nearby Potential for concern[6]: High Moderate Low	N/A	N/A	 1 9 5	 1 11 3	 1 15 6	 1 14 4	 4 11 8	 9 10 40	 17 8 44	 15 4 8
No. water crossings	N/A	N/A	3	3	3	3	3	3	2	2
Acres of floodplain affected[7]	0	0	0	0	0	0	0	0	0	0
Acres of wetland affected[7]	0	0	0	0	0	0	0	0	0	0

TABLE 4
COMPARISON OF ALTERNATIVES –ENVIRONMENTAL ISSUES
(Union Station to Whittier/Norwalk)

Criteria	Alternative									
	No-Build	TSM	1 BRT	2 BRT	3 LRT	4 BRT	5 LRT	6 LRT (subway)/ LRT	7 Heavy rail (subway)/ LRT	8 Heavy rail (subway)/ BRT
Energy consumption (Change in annual BTUs) compared to: No-Build TSM		110,877 N/A	17,331 -93,545	-29,301 -140,178	-61,649 -172,525	76,194 -34,682	75,963 -34,914	-132,445 -243,321	19,352 -91,525	78,453 -32,424
Potential cultural resources Nearby	0	0	109	137	137	116	116	54	34	98
National/State Register cultural resource sites[8]	0	0	14	21	21	14	14	20	14	9
Potential for fossil sites and remains being encountered during construction[8]	None	None	None	None	Potential in elevated segment (Baseline and Evergreen Options)	None	Potential in elevated segment (Baseline and Evergreen Options)	Potential in elevated segment (Baseline and Evergreen Options) and in subway segment	Potential in heavy rail (subway segment)	Potential in heavy rail (subway segment)
Parks and recreation facilities nearby[8,9]	0	0	9	8	9	10	11	8	9	9
Utility impacts	None	None or minimal	Alternative is at-grade. Will have the highest impact on utilities.					Fewer impacts expected for the subway segment than the at-grade segments. However, impacts still likely in subway station excavation areas.		
Expected Annual Bus Accidents on the BRT Alignment [10]	N.A.	N.A.	170 to 225	170 to 225	N.A.	170 to 220	N.A.	N.A.	N.A.	165 to 215
Expected Annual LRT Accidents on the LRT Alignment[10]	N.A.	N.A.	N.A.	N.A.	50 to 65	N.A.	50 to 65	45 to 60	35 to 50	N.A.

TABLE 4
COMPARISON OF ALTERNATIVES –ENVIRONMENTAL ISSUES
(Union Station to Whittier/Norwalk)

Criteria	Alternative								
	No-Build	TSM	1	2	3	4	5	6	7	8
			BRT	BRT	LRT	BRT	LRT	LRT (subway)/ LRT	Heavy rail (subway)/ LRT	Heavy rail (subway)/ BRT
Expected Annual Automobile Accidents along the Fixed Guideway Alignments[10]	N.A.	N.A.	385	430	430	380	380	430	380	380

Notes to Table 4:

[1]The success of any economic development depends also on other factors in addition to the provision of a transit system. Examples of other factors include: implementation of appropriate public policies to encourage development; local market forces; subsidies; innovative financing scenarios; and land use and zoning changes to encourage transit-oriented development.

[2]Additional land may be needed to accommodate the cut-and-cover process of constructing the heavy rail station box area at 1st/Boyle (Alternatives 7 and 8) and at 1st/Lorena (Alternative 7). This possibility will be further investigated if one of these alternatives is selected, and the design is further refined.

[3]Only general locations of park-and-ride facilities are known at this conceptual level of analysis. Therefore, numbers of residences and businesses that could potentially be displaced cannot be determined. The land requirements are, therefore, reported in acres and are based on preliminary estimates of parking needs.

[4]This quantitative analysis does not take into account the differences in visual impacts due to the various transit modes. For example, LRT has an overhead catenary system associated with that mode, while BRT does not. Totals for each alternative may increase once specific park-and-ride facility locations and height (i.e., if a parking structure rather than a surface lot is constructed) information becomes available.

[5]Vibration is not an issue for the BRT alternatives.

[6]The assignment of a low to high potential for concern is based on the presumed construction activity for completion of the alternative when compared to historical, regulatory, and field reconnaissance information.

[7]At the current conceptual level of design, the existing crossings of the Los Angeles, Rio Hondo, and San Gabriel Rivers would not need to be widened nor would new support piers be required. If it is determined at an advanced design stage that bridge widening or additional piers may be required, then impacts are possible.

[8]Slight differences in total numbers expected for LRT Alternatives 3, 5, and 6 depending on which option is selected for connecting to Union Station.

[9]For Alternatives 6 and 8, the subway segment passes underneath or in close proximity to one recreational resource. For Alternative 7, the subway segment passes underneath or in close proximity to two recreational resources. Adverse impacts are unlikely.

[10]Based on historical data provided by MTA's Operations Safety Department for similar bus and light rail operations and by Caltrans and FHWA for similar arterial streets.

TABLE 5
COMPARISON OF ALTERNATIVES – ENVIRONMENTAL ISSUES
(Union Station to Lorena Street)

Criteria	Alternative									
	No-Build	TSM	1 BRT	2 BRT	3 LRT	4 BRT	5 LRT	6 LRT (subway)/ LRT	7 Heavy rail (subway)/ LRT	8 Heavy rail (subway)/ BRT
Compatibility with local plans and policies	Maintains status quo.		Generally compatible.							
Redevelopment/ Revitalization areas served	Current trends and market conditions would prevail.		6	6	6	6	6	6	4	4
Short-term/permanent jobs created	0/0	N.A./N.A.	11,486/886	11,814/868	19,449/889	11,561/906	19,762/981	31,271/829	42,765/855	43,025/951
Potential residences and businesses displaced for alignment and stations[1]	0	0	0	0	0	0	0	0	0	0
Estimated acres needed for park-and-ride facilities[2]	0	0	0	0	0	0	0	0	0	0
Low-income families within 1/2 mi. of stations No./% of total	N/A	N/A	16,959/31%	16,959/33%	16,959/33%	16,963/33%	16,963/33%	11,606/36%	8,635/33%	16,295/31%
Minority populations within 1/2 mi. of stations No./% of total	N/A	N/A	58,306/96%	54,672/96%	54,672/96%	54,690/96%	54,690/96%	36,073/94%	30,599/95%	56,985/97%
Zero-car households within 1/2 mi. of stations No./% of total	N/A	N/A	5,038/35%	4,980/37%	4,980/37%	4,981/37%	4,981/37%	3,568/30%	2,478/36%	4,369/33%

TABLE 5
COMPARISON OF ALTERNATIVES – ENVIRONMENTAL ISSUES
(Union Station to Lorena Street)

Criteria	Alternative									
	No-Build	TSM	1 BRT	2 BRT	3 LRT	4 BRT	5 LRT	6 LRT (subway)/ LRT	7 Heavy rail (subway)/ LRT	8 Heavy rail (subway)/ BRT
Workers using public transportation within 1/2 mi. of stations No./% of total	N/A	N/A	4,809/24%	4,570/25%	4,570/25%	4,572/25%	4,572/25%	2,823/26%	2,339/25%	4,654/24%
Potential visually affected receptors[3]	0	0	260	212	212	212	212	33	14	199
Potential sensitive receptors affected by noise and vibration[4] (xx) applies to ground-borne noise in subway segment.	Baseline	Added bus service could result in slight increases in noise levels at some locations.	230	180	180	180	180	19(51)	0(69)	169(45)
Portion of alignment that crosses Coyote Pass Escarpment (feet)	N/A	N/A								
-at grade			300	0	0	0	0	0	0	300
-subway			0	0	0	0	0	0	800	800
No. contaminated sites nearby Potential for concern[5]:	N/A	N/A								
High			1	1	1	1	2	6	9	9
Moderate			6	5	8	7	8	7	5	2
No. water crossings	N/A	N/A	1	1	1	1	1	1	0	0
Acres of floodplain affected[6]	0	0	0	0	0	0	0	0	0	0

TABLE 5
COMPARISON OF ALTERNATIVES – ENVIRONMENTAL ISSUES
(Union Station to Lorena Street)

Criteria	Alternative									
	No-Build	TSM	1 BRT	2 BRT	3 LRT	4 BRT	5 LRT	6 LRT (subway)/ LRT	7 Heavy rail (subway)/ LRT	8 Heavy rail (subway)/ BRT
Acres of wetland affected[6]	0	0	0	0	0	0	0	0	0	0
Potential cultural resources Nearby	0	0	94	107	107	101	101	5	6	84
National/State Register cultural resource sites[7]	0	0	3	6	6	6	6	5	5	2
Potential for fossil sites and remains being encountered during construction[7]	None	None	None	None	Potential in elevated segment (Baseline and Evergreen Options)	None	Potential in elevated segment (Baseline and Evergreen Options)	Potential in elevated segment (Baseline and Evergreen Options) and in subway segment	Potential in heavy rail (subway segment)	Potential in heavy rail (subway segment)
Parks and recreation facilities nearby[7,8]	0	0	2	3	4	3	4	3	2	2
Utility impacts	None	None or minimal	Alternative is at-grade. Will have the highest impact on utilities.					Fewer impacts expected for the subway segment than the at-grade segments. However, impacts still likely in subway station excavation areas.		

Notes to Table 5:

[1]Additional land may be needed to accommodate the cut-and-cover process of constructing the heavy rail station box area at 1st/Boyle (Alternatives 7 and 8) and at 1st/Lorena (Alternative 7). This possibility will be further investigated if one of these alternatives is selected, and the design is further refined.

[2]Only general locations of park-and-ride facilities are known at this conceptual level of analysis. Therefore, numbers of residences and businesses that could potentially be displaced cannot be determined. The land requirements are, therefore, reported in acres and are based on preliminary estimates of parking needs.

[3]This quantitative analysis does not take into account the differences in visual impacts due to the various transit modes. For example, LRT has an overhead catenary system associated with that mode, while BRT does not. Totals for each alternative may increase once specific park-and-ride facility locations and height (i.e., if a parking structure rather than a surface lot is constructed) information becomes available.

[4]Vibration is not an issue for the BRT alternatives.

[5]The assignment of a low to high potential for concern is based on the presumed construction activity for completion of the alternative when compared to historical, regulatory, and field reconnaissance information.

[6]At the current conceptual level of design, the existing crossings of the Los Angeles, Rio Hondo, and San Gabriel Rivers would not need to be widened nor would new support piers be required. If it is determined at an advanced design stage that bridge widening or additional piers may be required, then impacts are possible.

[7]Slight differences in total numbers expected for LRT Alternatives 3, 5, and 6 depending on which option is selected for connecting to Union Station.

[8]For Alternatives 6 and 8, the subway segment passes underneath or in close proximity to one recreational resource. For Alternative 7, the subway segment passes underneath or in close proximity to two recreational resources. Adverse impacts are unlikely.

TABLE 6
COMPARISON OF ALTERNATIVES – ENVIRONMENTAL ISSUES
(Union Station to Atlantic Boulevard)

Criteria	Alternative									
	No-Build	TSM	1 BRT	2 BRT	3 LRT	4 BRT	5 LRT	6 LRT (subway)/ LRT	7 Heavy rail (subway)/ LRT	8 Heavy rail (subway)/ BRT
Compatibility with local plans and policies	Maintains status quo.		Generally compatible.							
Redevelopment/ Revitalization areas served	Current trends and market conditions would prevail.		7	7	7	7	7	7	5	5
Short-term/permanent jobs created	0/0	N.A/N.A.	15,248/1,441	16,954/1,604	31,196//1,755	15,509/1,502	28,731/1,714	43,748/1,706	58,713/1,746	47,435/1,693
Potential residences and businesses displaced for alignment and stations[1]	0	0	0	0	0	0	0	0	0	0
Estimated acres needed for park-and-ride facilities[2]	0	0	3.75	10	10	3.75	3.75	10	3.75	3.75
Low-income families within 1/2 mi. of stations No./% of total	N/A	N/A	24,508/30%	28,516/30%	28,516/30%	24,511/31%	24,511/31%	23,081/31%	16,143/30%	23,750/30%
Minority populations within 1/2 mi. of stations No./% of total	N/A	N/A	86,746/97%	97,475/97%	97,475/97%	83,123/97%	83,123/97%	78,688/96%	58,908/97%	85,110/97%
Zero-car households within 1/2 mi. of stations No./% of total	N/A	N/A	6,615/31%	7,415/31%	7,415/31%	6,558/32%	6,558/32%	5,983/32%	4,046/30%	5,940/30%

TABLE 6
COMPARISON OF ALTERNATIVES – ENVIRONMENTAL ISSUES
(Union Station to Atlantic Boulevard)

Criteria	Alternative									
	No-Build	TSM	1 BRT	2 BRT	3 LRT	4 BRT	5 LRT	6 LRT (subway)/ LRT	7 Heavy rail (subway)/ LRT	8 Heavy rail (subway)/ BRT
Workers using public transportation within 1/2 mi. of stations No./% of total	N/A	N/A	6,304/21%	6,896/21%	6,896/21%	6,066/21%	6,066/21%	5,110/20%	3,799/20%	6,129/21%
Potential visually affected receptors[3]	0	0	334	404	404	286	286	225	88	273
Potential sensitive receptors affected by noise and vibration[4] (xx) applies to ground-borne noise in subway segment.	Baseline	Added bus service could result in slight increases in noise levels at some locations.	331	396	396	281	281	221(51)	88(69)	270(45)
Portion of alignment that crosses Coyote Pass Escarpment (feet) -at grade -subway	N/A	N/A	 300 0	 0 0	 0 0	 0 0	 0 0	 0 0	 0 800	 300 800
No. contaminated sites nearby Potential for concern[5]: High Moderate	N/A	N/A	 1 7	 1 7	 1 10	 1 8	 3 9	 8 9	 12 6	 10 3
No. water crossings	N/A	N/A	1	1	1	1	1	1	0	0
Acres of floodplain affected[6]	0	0	0	0	0	0	0	0	0	0

TABLE 6
COMPARISON OF ALTERNATIVES – ENVIRONMENTAL ISSUES
(Union Station to Atlantic Boulevard)

Criteria	Alternative									
	No-Build	TSM	1 BRT	2 BRT	3 LRT	4 BRT	5 LRT	6 LRT (subway)/ LRT	7 Heavy rail (subway)/ LRT	8 Heavy rail (subway)/ BRT
Acres of wetland affected[6]	0	0	0	0	0	0	0	0	0	0
Potential cultural resources Nearby	0	0	105	126	126	112	112	55	29	93
National/State Register cultural resource sites[7]	0	0	7	10	10	8	8	9	7	4
Potential for fossil sites and remains being encountered during construction[7]	None	None	None	None	Potential in elevated segment (Baseline and Evergreen Options)	None	Potential in elevated segment (Baseline and Evergreen Options)	Potential in elevated segment (Baseline and Evergreen Options) and in subway segment	Potential in heavy rail (subway segment)	Potential in heavy rail (subway segment)
Parks and recreation facilities nearby[7,8]	0	0	3	3	4	4	5	3	3	3
Utility impacts	None	None or minimal	Alternative is at-grade. Will have the highest impact on utilities.					Fewer impacts expected for the subway segment than the at-grade segments. However, impacts still likely in subway station excavation areas.		

Notes to Table 6:

[1]Additional land may be needed to accommodate the cut-and-cover process of constructing the heavy rail station box area at 1st/Boyle (Alternatives 7 and 8) and at 1st/Lorena (Alternative 7). This possibility will be further investigated if one of these alternatives is selected, and the design is further refined.

[2]Only general locations of park-and-ride facilities are known at this conceptual level of analysis. Therefore, numbers of residences and businesses that could potentially be displaced cannot be determined. The land requirements are, therefore, reported in acres and are based on preliminary estimates of parking needs.

[3]This quantitative analysis does not take into account the differences in visual impacts due to the various transit modes. For example, LRT has an overhead catenary system associated with that mode, while BRT does not. Totals for each alternative may increase once specific park-and-ride facility locations and height (i.e., if a parking structure rather than a surface lot is constructed) information becomes available.

[4]Vibration is not an issue for the BRT alternatives.

[5]The assignment of a low to high potential for concern is based on the presumed construction activity for completion of the alternative when compared to historical, regulatory, and field reconnaissance information.

[6]At the current conceptual level of design, the existing crossings of the Los Angeles, Rio Hondo, and San Gabriel Rivers would not need to be widened nor would new support piers be required. If it is determined at an advanced design stage that bridge widening or additional piers may be required, then impacts are possible.

[7]Slight differences in total numbers expected for LRT Alternatives 3, 5, and 6 depending on which option is selected for connecting to Union Station.

[8]For Alternatives 6 and 8, the subway segment passes underneath or in close proximity to one recreational resource. For Alternative 7, the subway segment passes underneath or in close proximity to two recreational resources. Adverse impacts are unlikely.

V. Cost

This section summarizes the capital and operating and maintenance (O&M) costs for each alternative and for the capital costs for the shorter segments to Lorena Street and Atlantic Boulevard.

Capital Costs

A summary of total capital costs for each alternative from Union Station to Whittier/Norwalk (full length alternative) is shown in Table 7 below.

The BRT alternatives range from $394.4M to $415.1M for the three full length alternatives. In general, these estimates reflect a lower level of technology, construction complexity, and overall cost than the LRT and HRT alternatives. Therefore, the cost-per-mile is less than the other modes.

The LRT alternatives range from $748.7M to $936.2M for the three full length LRT alternatives. The highest estimate is associated with utilization of tunneling technology and both a subway station and a partially depressed station. On a cost-per-mile basis, these estimates are consistent with historical light rail project experience.

The two hybrid alternatives, which include a heavy rail technology, range from $848.8M for the HRT/BRT full length alternative to $1,178.0M for the HRT/LRT full length alternative. These alternatives reflect the cost associated with tunnel work, below-grade stations, and additional vehicle and systems costs for heavy rail.

The capital cost for the Transportation System Management (TSM) Alternative is estimated at $53 million.

For purposes of this analysis, consideration was given to the potential for a "phased" construction approach. A phased approach, which might result from cash flow, funding, or other reasons, would result in the construction of an abbreviated alignment (with the potential of future extension to the full alignment length).

Also presented in Table 7 are the capital costs for each alternative if the alignments extend only from (A) Union Station to Lorena St. and (B) Union Station to Atlantic Blvd. No provision has been made for possible economies-of-scale adjustments, construction inefficiencies, or other considerations in this regard.

Table 7 Summary of Capital Costs			
Alternative	**Union Station to Lorena Street, millions 1999 $**	**Union Station to Atlantic Boulevard, millions 1999 $**	**Union Station to Whittier/Norwalk, millions 1999 $**
TSM	$53.0	$53.0	$53.0
1 – BRT	$179.6	$238.5	$394.4
2 – BRT	$187.4	$268.9	$415.1
3 – LRT	$286.8	$460.0	$764.6
4 – BRT	$180.0	$241.5	$405.3
5 – LRT	$288.7	$419.7	$748.7
6 – LRT	$452.0	$632.4	$936.2
7 – HRT/LRT	$603.5	$828.5	$1,178.0
8 – HRT/BRT	$516.1	$681.6	$848.8

Special Discussion of Tunneling Issues and Impacts

Tunneling conditions and alternative tunneling technologies were explored extensively during the design of the suspended Metro Red Line Eastside Extension alignment. This alignment, referred to as the suspended project, would have extended the Red Line from Union Station to First and Lorena Streets, via Little Tokyo. Specifically, mitigation measures for tunneling impacts were developed to address ground surface settlement, tunneling through contaminated ground, and tunneling through the Coyote Pass Escarpment. These measures were incorporated into an essentially complete final design prior to project suspension, and would be directly applicable for alternatives 6, 7, and 8. It should be noted that Alternative 6 would require significantly less mitigation for contaminated ground conditions as the alignment is at grade in the area west of the Los Angeles River, where most of the ground contamination exists. Tunneling conditions and the appropriate mitigation measures for the new proposed alternatives with tunnel sections are expected to be similar to those of the suspended project. The capital cost estimates took into account the latest knowledge of the tunneling issues and the expected construction costs.

Ground Surface Settlement

Geologic conditions for most of the alignment are sands, clays and gravels, which in tunneling terms are described as "soft ground." During tunneling, some ground loss will occur, producing surface settlement. The amount of settlement measured at the surface will be a function of the tunnel depth, size, tunneling techniques, and geology. To reduce surface settlement, pressure-face Tunnel Boring Machines (TBM) and pre-cast, bolted, gasketed lining systems were proposed for the suspended project. The pressure-face technology maintains positive fluid or soil pressure on the tunnel face which decreases the potential for ground loss and soil instability (sloughing, caving) at the tunnel face, which in turn reduces soil movement and surface settlement. In combination with the face pressure, grout is installed immediately behind the TBM to fill the annular space between the installed precast concrete liners (tunnel rings) and the ground. This technology provides an additional measure to reduce surface settlement. An additional benefit of the pressure-face TBM is the ability to tunnel below the groundwater table without requiring dewatering or lowering of the groundwater table.

Coyote Pass Escarpment

Approximately 800 feet of the proposed tunneled segments of Alternatives 7 and 8 cross the Coyote Pass escarpment. This potentially active buried thrust fault has been documented extensively during investigations by the MTA for the suspended project. As opposed to surface fault offset occurring during

an earthquake, the buried (blind) thrust fault produces an escarpment or hill feature. A relatively flexible steel tunnel liner in the portion crossing the Coyote pass was developed to accommodate bending at the crossings. A similar design could be used for Alternatives 7 and 8.

Ground Contamination

The proposed tunnel segments will traverse two inactive oil fields and contaminated ground. These conditions are most prevalent in the area between Union Station and the Los Angeles River, where previous industrial activity has occurred. As for existing Metro Red Line tunnels, there is documented subsurface methane gas. Between Union Station and the Los Angeles River, hydrogen sulfide exists in the groundwater as well as free oil and tar. To address the environmental issues discussed above, a closed-system of transporting cuttings and special tunnel liners (providing a secondary gasket) were proposed for the suspended project. Using the pressure-face TBM (in combination with the gasketed lining system), excavated soil can be transported through a closed system to a separation plant at the surface where special ventilation and mitigation measures can be implemented to contend with contaminated soil. Treatment methods for neutralizing the hydrogen sulfide within the spoil disposal system have also been developed. These or similar measures would be required for Alternatives 7 and 8. Alternative 6 is less likely to encounter hazardous gas and may not require such mitigation measures for contaminated ground.

Operating and Maintenance Costs

The MTA operating and maintenance costs for each of the alternatives were developed in a consistent manner for each of the corridor studies. Tables 8, 9, and 10 presents the annual operating and maintenance costs in millions of 1999 dollars for each of the alternatives by segment (Tables 8 and 9) and for the full length of the alternative (Table 10) and compares the incremental cost of each alternative compared to the No Build and Transportation System Management (TSM) Alternatives.

Table 8
Operating and Maintenance Cost Estimate Summary
Union Station to Lorena

Alternative, Union Station to Lorena	Annual Operating and Maintenance Cost (millions, 1999 $)*	Annual O&M Costs Compared to the No Build (millions, 1999 $)	Annual O&M Costs Compared to the TSM (millions, 1999 $)
No Build	$848.4	N.A.	N.A.
TSM	$863.7	$15.3	N.A.
1 – BRT	$873.2	$24.7	$9.5
2 – BRT	$873.2	$24.8	$9.5
3 – LRT	$873.6	$25.2	$9.9
4 – BRT	$873.8	$25.4	$10.1
5 – LRT	$874.9	$26.5	$11.3
6 – LRT	$873.2	$24.7	$9.5
7 – HRT/LRT	$878.3	$29.9	$14.7
8 – HRT/BRT	$880.5	$32.0	$16.8

* Cost for full operation of the MTA system, not just the alternatives

Table 9 Operating and Maintenance Cost Estimate Summary Union Station to Atlantic (Phase I)			
Alternative, Union Station to Atlantic	**Annual Operating and Maintenance Cost (millions, 1999 $)***	**Annual O&M Costs Compared to the No Build (millions, 1999 $)**	**Annual O&M Costs Compared to the TSM (millions, 1999 $)**
No Build	$848.4	N.A.	N.A.
TSM	$863.7	$15.3	N.A.
1 – BRT	$877.3	$28.8	$13.6
2 – BRT	$877.4	$29.0	$13.8
3 – LRT	$879.0	$30.6	$15.4
4 – BRT	$878.6	$30.1	$14.9
5 – LRT	$881.1	$32.7	$17.4
6 – LRT	$878.4	$29.9	$14.7
7 – HRT/LRT	$885.3	$36.8	$21.6
8 – HRT/BRT	$886.1	$37.7	$22.5

* Cost for full operation of the MTA system, not just the alternatives

Table 10 Operating and Maintenance Cost Estimate Summary Full Length Alternatives			
Alternative, Full Length	**Annual Operating and Maintenance Cost (millions, 1999 $)***	**Annual O&M Costs Compared to the No Build (millions, 1999 $)**	**Annual O&M Costs Compared to the TSM (millions, 1999 $)**
No Build	$848.4	N.A.	N.A.
TSM	$863.7	$15.3	N.A.
1 – BRT	$887.4	$39.0	$23.7
2 – BRT	$887.7	$39.3	$24.0
3 – LRT	$892.2	$43.8	$28.5
4 – BRT	$890.1	$41.7	$26.4
5 – LRT	$896.0	$47.6	$32.3
6 – LRT	$890.9	$42.5	$27.2
7 – HRT/LRT	$901.6	$53.2	$37.9
8 – HRT/BRT	$897.5	$49.1	$33.8

* Cost for full operation of the MTA system, not just the alternatives

VI. Evaluation of Alternatives

This section compares the eight build alternatives using various evaluation criteria, the analyses presented in sections III, IV, and V, and identifies the significant tradeoffs between the alternatives being considered.

Costs

The initial capital and annual operating and maintenance costs are summarized in Table 11 for the full-length alternatives. Also shown in Table 11 are the estimated capital costs for the Phase I segments to Atlantic Boulevard. All costs are in 1999 dollars. The capital costs include all engineering, design, construction, facilities, rolling stock, and contingency costs required to implement the alternative. The annual operating and maintenance costs include all the costs related to the fixed guideway component and the support bus service component of each alternative. The annual operating and maintenance costs are those over and above the cost to operate and maintain the No Build alternative.

Table 11
Summary of Capital and Operating and Maintenance Costs

Alternative	Capital Cost, millions 1999 $, full length alternative	Annual Operating and Maintenance Cost (above the No Build), millions 1999 $, full length alternative	Capital Cost, millions 1999 $, Phase I segment, Union Station to Atlantic
No Build	N.A.	N.A.	N.A.
Transportation Systems Management (TSM)	$53	$15.3	$53
1 – BRT	$394	$39.0	$238
2 – BRT	$415	$39.3	$269
3 – LRT	$765	$43.8	$460
4 – BRT	$405	$41.7	$242
5 – LRT	$749	$47.6	$420
6 – LRT	$936	$42.5	$632
7 – HRT/LRT	$1,178	$53.2	$828
8 – HRT/BRT	$849	$49.1	$681

Effectiveness in Improving Mobility

This section is a summary of the benefits of the alternatives on improving mobility for the residents and businesses in the Eastside Corridor. Sections III and IV discuss the impacts in more detail and this section highlights four basic criteria related to improving mobility. These include (1) daily new transit trips compared to the No Build Alternative, (2) daily new transit trips compared to the TSM Alternative, (3) daily fixed guideway boardings, and (4) daily automobile vehicle miles saved compared to the TSM Alternative. Table 12 presents the data for the four criteria discussed above.

Table 12 Summary of Effectiveness Criteria				
Alternative	**Daily New 2020 Transit Trips Compared to the No Build Alternative**	**Daily New 2020 Transit Trips Compared to the TSM Alternative**	**Daily Fixed Guideway Transit Boardings**	**Annual Vehicle Miles Saved Compared to the TSM Alternative**
No Build	N.A.	N.A.	N.A.	N.A.
Transportation Systems Management (TSM)	19,900	N.A.	N.A.	N.A.
1 – BRT	28,700	8,700	11,500	1,276,000
2 – BRT	27,200	7,300	12,400	1,769,000
3 – LRT	31,700	11,800	17,000	1,977,000
4 – BRT	29,100	9,200	11,300	725,000
5 – LRT	33,800	13,900	18,000	629,000
6 – LRT	32,300	12,400	17,800	2,677,000
7 – HRT/LRT	34,300	14,400	18,700	1,252,000
8 – HRT/BRT	30,000	10,100	14,000	727,000

Efficiency (Cost-Effectiveness)

The efficiency or cost-effectiveness analysis provides a means of comparing the benefits of the alternatives being considered relative to the costs of the alternatives. Two measures or criteria are used: (1) operating cost per passenger mile; and (2) the incremental cost per new transit trip in the forecast year of 2020.

One measure of efficiency is the change or improvement in the operating cost per passenger mile in the forecast year of 2020 compared to the TSM alternative. The other measure of efficiency or cost-effectiveness is the incremental cost per new transit trip in the forecast year of 2020. This measure, expressed in 1999 dollar values, is based on the annualized total capital investment and annual operating costs divided by the forecast change in annual transit trips, compared to the TSM Alternative. This cost-effectiveness index measures the cost per new transit trip attracted to transit as a result of the alternative's improvements. This reflects benefits to existing transit users (making more trips), attraction of new transit trips, and the cost-efficiency of the improvements proposed. It can be interpreted as the ratio between the necessary capital and operating investment, and the return on that investment in terms of new transit trips being made. The TSM Alternative is used as the comparison baseline, since it incorporates a modest expansion in MTA bus services for the Eastside Corridor, and represents a low-cost approach to addressing the transportation needs in the corridor, without the construction of major new facilities. The TSM Alternative therefore provides a baseline against which to isolate the added costs and added benefits resulting from a major investment, such as the fixed guideway alternatives proposed for the Eastside Corridor. The incremental cost per new trip may also be measured against the No Build Alternative.

Table 13 presents the operating cost per passenger mile for each alternative compared to the TSM Alternative. The lower the incremental cost per passenger mile the more attractive the alternative is. The LRT alternatives have the lowest incremental operating cost per passenger.

Table 13 Operating Cost per Passenger Mile Compared to the TSM Alternative			
Alternative	**Incremental Annual Operating and Maintenance Cost (1999 dollars, millions)**	**Incremental Annual Transit Passenger Miles, millions**	**Incremental Operating Cost/Passenger Mile**
Transportation Systems Management (TSM)	N.A.	N.A.	N.A.
1 – BRT	$23.77	24.99	$0.95
2 – BRT	$23.99	15.46	$1.55
3 – LRT	$28.49	33.18	$0.86
4 – BRT	$26.42	22.20	$1.19
5 – LRT	$32.29	40.79	$0.79
6 – LRT	$27.26	37.37	$0.73
7 – HRT/LRT	$37.91	36.10	$1.05
8 – HRT/BRT	$33.86	24.54	$1.38

Table 14 presents the annualized capital costs of each alternative. The annualization is based on the Federal Transit Administration's (FTA) recommended discount rate of seven percent, and the FTA suggested useful economic lives of capital components.

Table 14 Annualization of Capital Costs			
Alternative	**Total Capital Costs, millions 1999 $**	**Annualized Cost, millions 1999 $**	**Incremental Annual Cost Compared to TSM Alternative, millions 1999 $**
No Build	N.A.	N.A.	N.A.
Transportation Systems Management (TSM)	$53	$6.1	N.A.
1 – BRT	$394	$39.4	$33.3
2 – BRT	$415	$41.2	$35.1
3 – LRT	$765	$65.7	$59.6
4 – BRT	$405	$40.7	$34.6
5 – LRT	$749	$64.4	$58.3
6 – LRT	$936	$79.4	$73.3
7 – HRT/LRT	$1,178	$99.3	$93.2
8 – HRT/BRT	$849	$75.6	$69.5

Table 15 presents the year 2020 annualized cost and benefit values and resulting cost-effectiveness for the eight build alternatives compared to the TSM Alternative. Alternative 1 and Alternative 5 are the most

cost-effective related to this measure. The hybrid alternatives (Alternatives 7 and 8) are the least cost-effective related to this measure.

Table 15
Cost-Effectiveness: Incremental Cost per Incremental Transit Trip Compared to the TSM Alternative

Alternative	Incremental Annualized Capital Cost (1999 dollars, millions)	Incremental Annual Operating and Maintenance Cost (1999 dollars, millions)	Incremental Total Annualized Cost (1999 dollars, millions)	Incremental Annual Transit Trips in 2020, millions	Cost-Effectiveness (Incremental Cost per New Transit Trip)
1 – BRT	$33.27	$23.77	$57.04	2.75	$20.74
2 – BRT	$35.09	$23.99	$59.08	2.33	$25.36
3 – LRT	$59.62	$28.49	$88.11	3.74	$23.56
4 – BRT	$34.60	$26.42	$61.02	2.90	$21.04
5 – LRT	$58.34	$32.29	$90.63	4.38	$20.69
6 – LRT	$73.29	$27.26	$100.55	3.90	$25.78
7 – HRT/LRT	$93.22	$37.91	$131.13	4.56	$28.76
8 – HRT/BRT	$69.46	$33.86	$103.32	3.20	$32.29

Table 16 also presents the year 2020 annualized cost and benefit values and resulting cost-effectiveness for the eight build alternatives compared to the No Build Alternative.

Table 16
Cost-Effectiveness: Incremental Cost per Incremental Transit Trip Compared to the No Build Alternative

Alternative	Incremental Annualized Capital Cost (1999 dollars, millions)	Incremental Annual Operating and Maintenance Cost (1999 dollars, millions)	Incremental Total Annualized Cost (1999 dollars, millions)	Incremental Annual Transit Trips in 2020, millions	Cost-Effectiveness (Incremental Cost per New Transit Trip)
TSM	$6.10	$15.24	$21.34	6.26	$3.41
1 – BRT	$39.38	$39.00	$78.38	9.00	$8.71
2 – BRT	$41.20	$39.23	$80.43	8.58	$9.37
3 – LRT	$65.72	$43.72	$109.44	10.00	$10.94
4 – BRT	$40.71	$41.65	$82.36	9.15	$9.00
5 – LRT	$64.45	$47.53	$111.98	10.64	$10.52
6 – LRT	$79.39	$42.50	$121.89	10.16	$12.00
7 – HRT/LRT	$99.32	$53.15	$152.47	10.81	$14.10
8 – HRT/BRT	$75.56	$49.10	$124.66	9.46	$13.18

Environmental

This section summarizes the significant environmental concerns and differences between the alternatives. The most significant environmental issues and concerns related to the following criteria: (1) traffic

impacts; (2) number of on-street parking spaces lost; (3) number of potential visually affected receptors; (4) number of potentially sensitive receptors affected by noise and vibration; (5) number of potential cultural resources nearby; (6) number of National/State Register cultural resources nearby; (7) compatibility with local plans and policies; (8) number of redevelopment/revitalization areas served; and (9) safety issues as measured by number of possible fixed guideway modes and automobile accidents. These nine issue areas point out differences between the alternatives and represent the most significant areas of concern to the public. Table 17 presents the information for each alternative for the nine critical concern areas listed above.

TABLE 17
Environmental Issues/Concerns

Criteria	Alternative									
	No-Build	TSM	1 BRT	2 BRT	3 LRT	4 BRT	5 LRT	6 LRT (subway)/ LRT	7 Heavy rail (subway)/ LRT	8 Heavy rail (subway)/ BRT
Traffic Impacts	lowest	lowest	highest	highest	highest	highest	highest	moderate	lowest	moderate
Parking spaces lost	0	0	339	365	402	352	396	236	172	320
Potential visually affected receptors[1]	0	0	541	427	427	490	490	296	300	482
Potential sensitive receptors affected by noise and vibration[2] (xx) applies to ground-borne noise in subway segment.	Baseline	Added bus service could result in slight increases in noise levels at some locations.	554	483	483	504	504	358/(50)	378/(68)	538/(45)
Potential cultural resources Nearby	0	0	109	137	137	116	116	54	34	98
National/State Register cultural resource sites[3]	0	0	14	21	21	14	14	20	14	9
Compatibility with local plans and policies	Maintains status quo.		Generally compatible except in vicinity of Whittier/Norwalk Station. An amendment to Whittier General Plan and revisions to Southwest Whittier Zoning may be needed.							
Redevelopment/ Revitalization areas served	Current trends and market conditions would prevail.		10	9	9	10	10	9	7	8
Expected Annual Bus Accidents on the BRT Alignment	N.A.	N.A.	170 to 225	170 to 225	N.A.	170 to 220	N.A.	N.A.	N.A.	165 to 215
Expected Annual LRT Accidents on the LRT	N.A.	N.A.	N.A.	N.A.	50 to 65	N.A.	50 to 65	45 to 60	35 to 50	N.A.

TABLE 17
Environmental Issues/Concerns

Criteria	Alternative									
	No-Build	TSM	1	2	3	4	5	6	7	8
			BRT	BRT	LRT	BRT	LRT	LRT (subway)/ LRT	Heavy rail (subway)/ LRT	Heavy rail (subway)/ BRT
Alignment										
Expected Annual Automobile Accidents along the Fixed Guideway Alignments	N.A.	N.A.	385	430	430	380	380	430	380	380

[1]This quantitative analysis does not take into account the differences in visual impacts due to the various transit modes. For example, LRT has an overhead catenary system associated with that mode, while BRT does not. Totals for each alternative may increase once specific park-and-ride facility locations and height (i.e., if a parking structure rather than a surface lot is constructed) information becomes available.
[2]Vibration is not an issue for the BRT alternatives.
[3]Slight differences in total numbers expected for LRT Alternatives 3, 5, and 6 depending on which option is selected for connecting to Union Station.

Equity

Equity relates to the impacts and benefits to the transit reliant system users and related specials needs groups such as low income and minority populations. A summary of the primary demographics (within one-half mile of the proposed stations) by each alternative is shown in Table 18. Based on the demographics Alternatives 2 and 3 would serve the most transit dependent within walking distance of the fixed guideway stations. Alternatives 1, 4, 5, 6, and 8 are very similar to Alternatives 2 and 3. Alternative 7 would serve the lowest number of transit dependent persons.

TABLE 18
DEMOGRAPHICS SUMMARY BY ALTERNATIVE[1]

Alternative/ Station	Minority Population		Low-Income Families		Workers 16 and Older Using Public Transportation		Zero-Car Households	
	No.	% of Total Pop.	No.	% of Total Families	No.	% of Workers 16 and Older	No.	% of Total Residential Units
Los Angeles County	5,228,442	59.0	1,308,255	15.1	267,210	6.5	333,562	11.2
Study Area	406,865	86.6	89,205	19.7	18,203	10.1	19,414	15.5
No-Build	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TSM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1 - BRT	127,817	92.5	31,583	24.2	7,585	15.1	8,587	23.8
2 – BRT	141,353	93.8	36,967	25.8	8,521	16.2	9,553	25.1
3 – LRT	141,353	93.8	36,967	25.8	8,521	16.2	9,553	25.1
4 – BRT	124,194	92.3	31,586	24.8	7,347	15.2	8,530	24.3
5 – LRT	124,194	92.3	31,586	24.8	7,347	15.2	8,530	24.3
6 – LRT	122,522	93.2	31,523	25.4	6,733	14.9	8,120	24.3
7 – HRT/LRT	100,294	91.4	23,312	22.7	5,100	13.0	6,024	21.1
8 – HRT/BRT	126,496	92.8	30,919	24.0	7,430	15.0	7,918	22.6

[1]Includes the total served within one-half mile of all of the stations included in each alternative.
Source: 1990 U.S. Census Data.

Community Involvement Response

A rigorous public involvement was conducted throughout the study. Listed below are the summary of activities undertaken. The public involvement documentation is summarized in three documents: (1) Scoping Meetings Summary Report, September 24, 1999; (2) Second Round of Community Meetings Summary Report, October 30, 1999; and (3) Third Round of Community Meetings Summary Report, February 2000.

Major activities conducted included the following items:

- Ten major community meetings in August (Scoping) and October 1999 and January 2000 throughout the Eastside Corridor and attended by more than 585 community stakeholders.
- Federal and State community and agency scoping process (August 1999) and published the Notice of Intent in the Federal Register and the Notice of Preparation with the State Clearinghouse.
- Conducted more than 34 meetings with community based organizations.
- Conducted 33 briefings with Eastside elected officials and staff members.

- Combined mailings and flyers distribution to more than 67,500 households, businesses, and community organizations.
- Published meeting notices in the Los Angeles Time, La Opinion, Eastside Sun, Our Times, and Rafu Shimpo.

The community expressed many concerns, especially within the Boyle Heights area related to possible community impacts of at-grade fixed guideway investments. The following is a succinct summary of what the community consensus appeared to be based on the inputs received and actions taken by community groups:

- The Boyle Heights and East Los Angeles communities prefer the previously adopted Locally Preferred Alternative and the Suspended Project due to less environmental impacts and superior quality of service.
- Due to MTA's financial constraints the Boyle Heights community and areas of East Los Angeles would consider Alternative 6 as a viable alternative to consider in the next phase.
- The communities east of Atlantic Boulevard (Montebello, Pico Rivera, and Whittier) are undecided about the fixed guideway transit mode and the specific alignment.

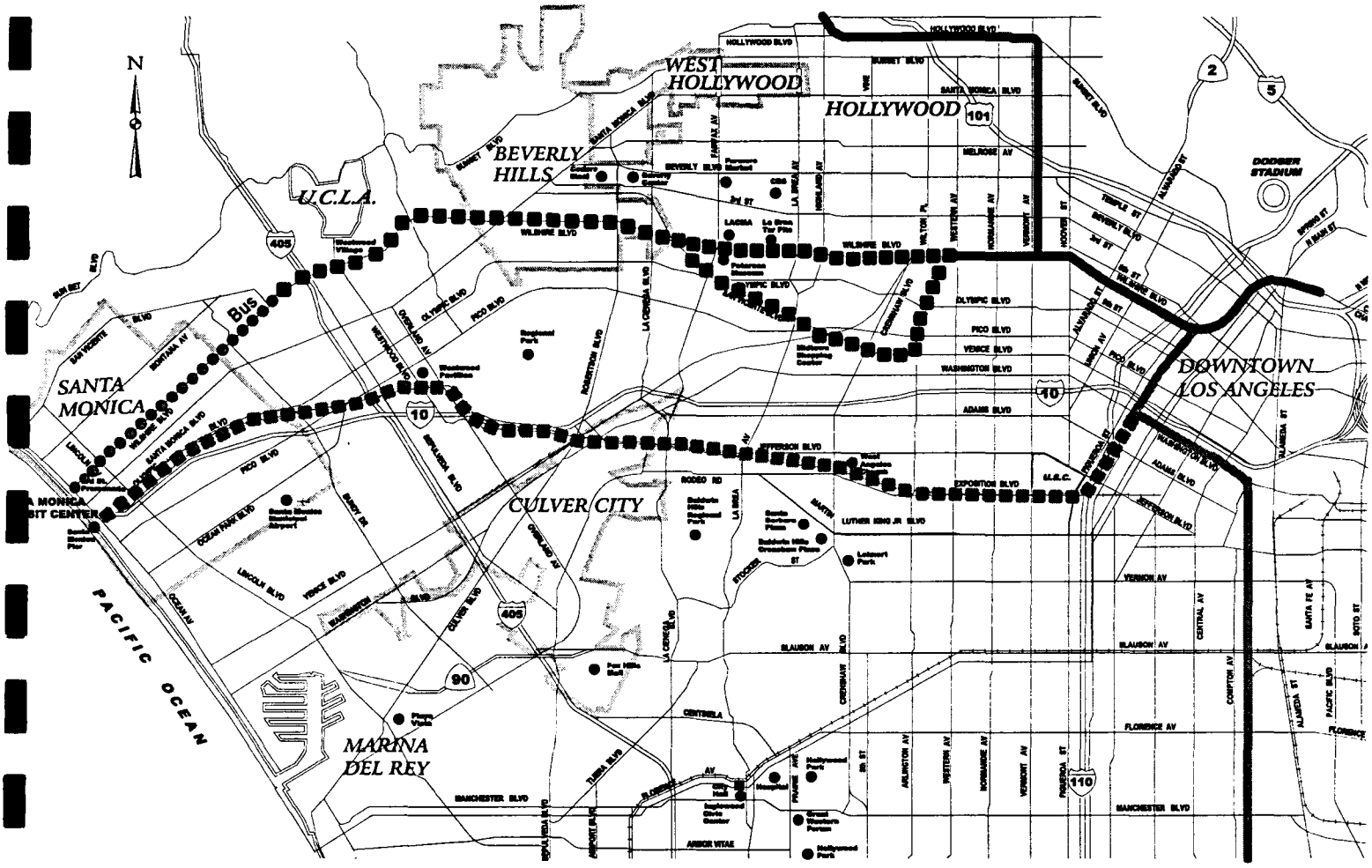
Trade-Offs Between Alternatives

This section highlights key differences and tradeoffs between the alternatives relative to costs, performance, mobility, impacts, and community response to the alternatives. The significant areas of tradeoffs between the alternatives are listed below:

- The full-length alternatives capital costs. From an initial capital cost standpoint the pure BRT alternatives (1, 2, and 4) are by far the lowest initial cost ($400 million). The LRT at-grade alternatives (3 and 5) are the next lowest cost ($750 million). The LRT Alternative 6 with a 1.8 mile tunnel section under Boyle Heights increases the at-grade alternative costs by about $200 million in order to mitigate the adverse impacts and community opposition to an at-grade alternative (either BRT or LRT) through the narrow streets of the Boyle Heights community. Alternatives 7 and 8 are two-station extensions of the Metro Red Line subway to 1st/Lorena or to Chavez/Soto. Alternative 7 connects to an LRT system to the end of the corridor and is by far the most expensive at almost $1.2 billion. Alternative 8 uses BRT to the end of the corridor and has a total capital cost of almost $850 million.
- Proposed Phase I segment capital costs. From an initial capital cost standpoint the pure BRT alternatives (1, 2, and 4) are by far the lowest initial cost ($238 to 269 million). The LRT at-grade alternatives (3 and 5) are the next lowest cost ($420 to 460 million). The LRT Alternative 6 with a 1.8 mile tunnel section under Boyle Heights increases the at-grade alternative costs by about $200 million in order to mitigate the adverse impacts and community opposition to an at-grade alternative (either BRT or LRT) through the narrow streets of the Boyle Heights community. Alternatives 7 and 8 are two-station extensions of the Metro Red Line subway to 1st/Lorena or to Chavez/Soto. Alternative 7 connects to an LRT system as far as Atlantic and is by far the most expensive at $828 million. Alternative 8 uses BRT as far as Atlantic and has a total capital cost of $681 million.
- From the standpoint of annual operating and maintenance costs, Alternatives 1, 2, and 4 (all BRT) perform the best (least cost). Alternative 6 is the lowest cost rail oriented alternative and is only slightly higher than the BRT alternatives. Alternative 7 (HRT/LRT) is the most expensive alternative.
- From a performance and mobility standpoint the BRT alternatives (1, 2, 4, and 8) perform less than the rail-oriented alternatives (3, 5, 6, and 7). Alternatives 5 (LRT) and 7 (HRT/LRT) perform the best.

- The most cost efficient alternatives based on annual operating costs per passenger mile compared to the TSM Alternative are Alternatives 5 and 6.
- The incremental cost per new transit trip compared to the TSM Alternative is the highest for Alternatives 7 and 8. Alternatives 1 and 5 are the most cost-effective alternative followed by Alternatives 4, 3, 2, and 6.
- From an environmental issues and concerns standpoint, the pure at-grade BRT and LRT alternatives (1, 2, 3, 4, and 5) and Alternative 8 (mostly at-grade) have the most potential for adverse environmental impacts, especially in Boyle Heights and sections of East Los Angeles with the older narrow streets and dense residential and business areas. Alternatives 6 and 7 are the best from an environmental impact standpoint.
- From an equity and environmental justice aspect, all the alternatives serve the Eastside communities but the alternatives that provide the most transit service with the least amount of community impacts are the alternatives that would have the best rating in this category. Even though Alternatives 2 and 3 would serve the most persons within ½ mile of the stations, they would have considerable impacts on the community. There is a distinct tradeoff between the service provided and the possible adverse impacts depending on the community and the policy makers.
- From the standpoint of the community and the ten community meetings the following is a synopsis of the collective input received:
  - The Boyle Heights and East Los Angeles communities prefer the previously adopted Local Preferred Alternative (6.8 miles and 7 stations) and Suspended Project (3.7 miles and 4 stations) due to less environmental impacts and superior quality of service but many are willing to accept Alternative 6 in situations of MTA financial hardship
  - The communities east of Atlantic Boulevard are undecided about transit mode and specific alignment
  - The Boyle Heights community and Whittier Boulevard merchants are opposed to the at-grade options regardless of mode

MID-CITY/WESTSIDE TRANSIT CORRIDOR STUDY



Executive Summary

RE-EVALUATION/ MAJOR INVESTMENT STUDY REPORT

Los Angeles County Metropolitan Transportation Authority

February 24, 2000

MID-CITY/WESTSIDE TRANSIT CORRIDOR RE-EVALUATION/MAJOR INVESTMENT STUDY

Executive Summary

February 24, 2000

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Los Angeles County Metropolitan Transportation Authority

SUMMARY

S.1 Status of Current Transit Investments in the Mid-City / Westside Transit Corridor

The Mid-City Segment of the Metro Red Line was adopted as the Locally Preferred Alternative in 1992. This 2.3-mile extension would have extended Metro Red Line service from Wilshire Boulevard and Western Avenue to Pico and San Vicente Boulevards in the "Mid-City" area via a Crenshaw Boulevard alignment. Engineering design work for the tunneling and stations on this project was suspended in 1994 due to concern about hazardous underground gases along Crenshaw and Pico Boulevards and an optional alignment using Wilton Place, Arlington Avenue, and Venice Boulevard was pursued instead. The MTA was in the process of environmentally clearing this revised alignment when work on the Mid-City Segment, the Metro Red Line East Side Extension, and the Pasadena Blue Line were suspended for financial reasons.

Shortly thereafter, Proposition A (which prohibited the use of local sales tax monies for subway construction) was placed on a county wide ballot and was passed by the voters in November 1998. Meanwhile, the Gas Prohibition zone along Wilshire is still in place as is the Consent Decree that mandates specific financial commitments to the existing MTA bus operation. While there have been some major long term transportation investments in the study area such as the Red Line Subway to Wilshire and Western in 1996 and the purchase of the Exposition ROW in 1990, the more immediate focus has been to complete the Westside Transit Restructuring Plan and to proceed with the Metro Rapid Bus Demonstration Project on Wilshire to be implemented in June 2000.

S.2 Purpose of this Study

In light of the current situation, the KORVE team has been tasked with re-evaluating the suspended subway Locally Preferred Alternative (LPA) and comparing it to a set of fixed-guideway transit improvements that have been identified in a number of other studies conducted to date. KORVE has been tasked with recommending to the Los Angeles County Metropolitan Transportation Authority (MTA) a short-term (0-5 years) and long-term (6-20 years) strategy for improving public transit. Based upon the recommended strategy, KORVE will coordinate with MTA to develop a funding program including federal participation as appropriate. The outcome of this re-examination of conditions in the Mid-City / Westside Transit Corridor will be the selection of one or more alternatives that will enter into more detailed environmental analysis during Phase 2. Upon completion of Phase 2, when the draft environmental documents are completed, MTA will be able to adopt a new Locally Preferred Alternative complete final environmental clearance and seek to renegotiate an amended funding agreement with the Federal Transit Administration.

S.3 Purpose and Need for Transit Investment

The central question is whether a significant investment is warranted for transit improvements in the Mid-City/Westside study area. The answer is yes for the following reasons.

1. **The Need for Transit Improvements has been Established in Previous Studies.** Providing high-capacity transit service improvement has been long recognized in the Mid-City/Westside Area. Since the 1970's, the LACMTA and its predecessors (SCRTD, LACTC) have conducted numerous transportation planning and environmental impact

studies that established the need and feasible locations for either bus, light rail and/or heavy rail east-west service in various parts of the study area.

2. **Study Area Contains A Major Concentration of Activity Centers and Destinations.** The area contains the largest concentration of major activity centers and destinations within the Los Angeles metropolitan region. Many of these centers are located within the most congested portion of the study area north of the Santa Monica Freeway (I-10) and east of the San Diego Freeway (I-405).

3. **The "Centers Concept" Land Use Policy is Transit Based.** Land use policies in the Los Angeles metropolitan region have traditionally been founded upon the framework that access to major activity centers would be facilitated through a network of transit connections. The recently completed Los Angeles General Plan Framework reinforced this concept as a continuing policy framework for the City of Los Angeles. New growth is planned and encouraged to occur only in areas that are served by transit.

4. **There is an Existing Concentration of Transit Supporting Land Uses.** The existing activity centers in the study area are a central part of a large concentration of land uses that are considered to be transit supporting (high-density housing, commercial and retail). In fact, roughly 30 percent of the land area within the study area falls into this category. Patterns of transit supporting land uses are concentrated along the Santa Monica Boulevard/Wilshire Boulevard corridors. A lesser concentration is evident along a southern oriented Venice Boulevard corridor.

5. **High Study Area Population and Employment Densities Support Transit.** Population and employment densities in the study area are the highest within the metropolitan region, averaging approximately 13,883 persons per square mile and 9,167 employees per square mile.

6. **There is a History of Transit Usage in the Study Area.** Existing transit usage within the study area is proportionally higher than any other area in Los Angeles County (13.64 percent for the study area versus 6.8 percent for the County). Because there is a large base of existing transit service and transit patrons, increasing the transit mode share through increased service would represent a natural extension of existing patterns and trends.

7. **There is a Significant Transit Dependent Population in the Study Area.** Part of the underlying reason for high transit usage in the study area is that a significant number of households do not own an automobile and have low incomes. According to the 1990 Census, approximately 18.33 percent of households did not have a vehicle compared to 10.90 percent for the County. The majority of these households are concentrated in the eastern and northeastern portion of the study area. In addition, in 1990, 20.91 percent of the population of the study area was below poverty status compared to 14.76 percent in the County.

8. **Apparent Lack of East-West Transit Service Impairs Mobility for a Significant Proportion of the Study Area Population.** Travel to work time comparisons of various communities within the study area strongly suggests that communities in the Mid-City

portion of the study area (eastern half) are not served by an efficient transit system. Travel to work times are longer than travel to work times in the Westside portion of the study area. This differential strongly suggests that socioeconomic mobility is greatly impaired for residents in the eastern portion of the study area because they cannot conveniently access (via transit) jobs, educational facilities, cultural facilities, and services that are largely concentrated in the western portion of study area.

9. **The Study Area Is Expected to Continue to Capture a Large Share of Regional Population and Employment Growth.** Population and employment forecasts to the year 2020 adopted by the Southern California Association of Governments clearly suggest that the study area will capture a large share of growth over the next 20 years. This growth will place further demands on transit service and well as result in increasing congestion on local roadways and regional highways serving the study area.

10. **Continued Growth in the Business Services Sector (Entertainment and Media Related) Underlies the Future Development Potential in the Study Area.** Growth in the study area will continue to be fueled by the fact that entertainment and media-related businesses are concentrating in the western part of the corridor. Currently, the study area is the center of approximately 1/3 of all new office construction underway in LA County, which makes it the largest office market in Los Angeles. Real estate analysts expect that the demand for production and creative spaces will continue to be robust. The industries and businesses that are attracted to the study area are those that are expected to be the foundation of the local and regional economy for many years into the future.

11. **There are Substantial East-West Travel Patterns that are Not Currently Served by a High Capacity Transit System.** Travel patterns currently indicate that the study area is a primary attraction for work trips with origins in the West and East San Fernando Valleys. A simplified "spider network" of travel patterns derived from origin-destination data in the LACMTA Travel Model suggests north-south travel patterns from the San Fernando Valley convert to east-west demand within the study area. The spider network for 1997 and 2020 conditions both indicate there is strong east-west travel demand along major east-west corridors: Santa Monica Boulevard, Wilshire Boulevard, Santa Monica Freeway and Exposition/Venice Boulevards. None of these corridors are currently served by a high capacity transit system.

12. **Peak Hour Congestion on Study Area Roadways Underlies Need for Transit Improvements.** There is substantial peak hour congestion in the northern portion of the study area. Vehicular travel to the East and West San Fernando Valleys must ultimately pass through the Sepulveda or Cahuenga passes. Access patterns to these routes are congested during the peak travel hours as motorists attempt to pass northward at either the western or eastern ends of the study area.

13. **Local Policies are Oriented Toward Demand Management and Transit Solutions rather than on Physical Roadway Improvements.** Because of the level of buildout and density within the study area, local jurisdictions have generally determined through their local policies that congestion relief improvements should focus on travel demand management rather than on physical improvements such as widening and new roadways.

In a number of cases, local communities desire to eliminate cut through and neighborhood traffic or to support more livable downtown or commercial areas, are supporting initiatives to limit roadway capacity or further slow traffic flow; thus leaving transit improvements as one of the only viable remaining alternatives to reduce traffic volumes and congestion-related delays.

S.4 Corridor Recommendations

Based on the "spider network" analysis (1997 & 2020), there are at least three major east-west corridors:

1. The *Wilshire Corridor* extends 14 miles generally along Wilshire Boulevard from the current Metro Red Line station at Wilshire / Western to downtown Santa Monica.

    a. In the long-term, the recommended strategy is to incrementally extend the Metro Red Line subway westerly from Wilshire / Western. This proposal will require lifting the gas prohibition zone and rescinding Prop A or devising an alternative funding strategy. Based on technical investigations by the KORVE team and those of the Tunnel Advisory Panel, it is technically feasible to safely construct a tunnel for heavy rail transit service through the gas zone.

    b. In the short-term, Bus Rapid Transit (BRT) should be vigorously pursued during Phase 2 of this Study to San Vicente Boulevard when environmental consequences of the selected alternatives will be thoroughly analyzed. In Phase 3, the Final Environmental Documentation will be completed, as well as the Preliminary Engineering. If the Wilshire BRT still looks promising at that point, the final implementation decision should await the final results from the Metro Rapid Bus Phase 1 & 2 Demonstration Project. At the current time, the KORVE team does not have sufficient information to accurately discern the benefits of BRT vis-à-vis Metro Rapid Bus. In other words, are the speed and ridership increases great enough to warrant a permanent transformation of the use, appearance, and function of Wilshire Boulevard, which will occur if BRT is implemented?

2 The *Exposition Corridor* represents a distinct corridor from either the Santa Monica Boulevard Corridor or the Wilshire Corridor, based on investigations to date: it traverses extensive areas targeted by local jurisdictions for economic revitalization; is projected to experience higher than average population and employment growth; and suffers from comparatively poor transit service. It is recommended that both LRT and BRT full-length options be carried forward into Phase 2 with considerations of Minimal Operable Segments to Crenshaw, La Cienega and Venice/Robertson. Initial ridership estimates indicate either option has similar potential, based upon the following key underlying assumptions:

    - Full signal pre-emption at north-south cross streets (for railroad ROW portion of route).

- Top speed of 55 mph in certain segments of the route that are wide and protected.

Key issues to be resolved in Phases 2 & 3 are:

1. How to protect at-grade crossings for buses traveling at up to 55 mph?

2. How to mitigate traffic congestion caused by full signal pre-emption strategy for the LRT and BRT?

3. How to deliver a cost-effective project while avoiding or minimizing localized impacts, such as night-time noise and pedestrian/vehicular safety concerns?

3 *Santa Monica Boulevard Corridor* has long-term merit as a potential transit corridor. The corridor exhibits high travel demand and is lined with transit-supportive land uses. It is recommended that the Santa Monica Boulevard Corridor be further investigated as part of the LRP update.

S.5 Overall Study Area Implementation Strategy

Assuming that the Metro Rapid Bus Project is successful and that Wilshire BRT represents significant benefits above and beyond Metro Rapid Bus, it is anticipated that BRT would be implemented in phases:

1. Wilshire/Vermont to Wilshire/San Vicente (to easterly boundary of Beverly Hills);

2. Beverly Hills westerly boundary (LA Country Club) to Wilshire/Centinela (Santa Monica easterly boundary);

3. Beverly Hills segment; and

4. Santa Monica segment, Centinela to Wilshire/Ocean.

In the long-term (if and when the subway is extended) a decision would have to be made regarding continuation and/or modification of the BRT service.

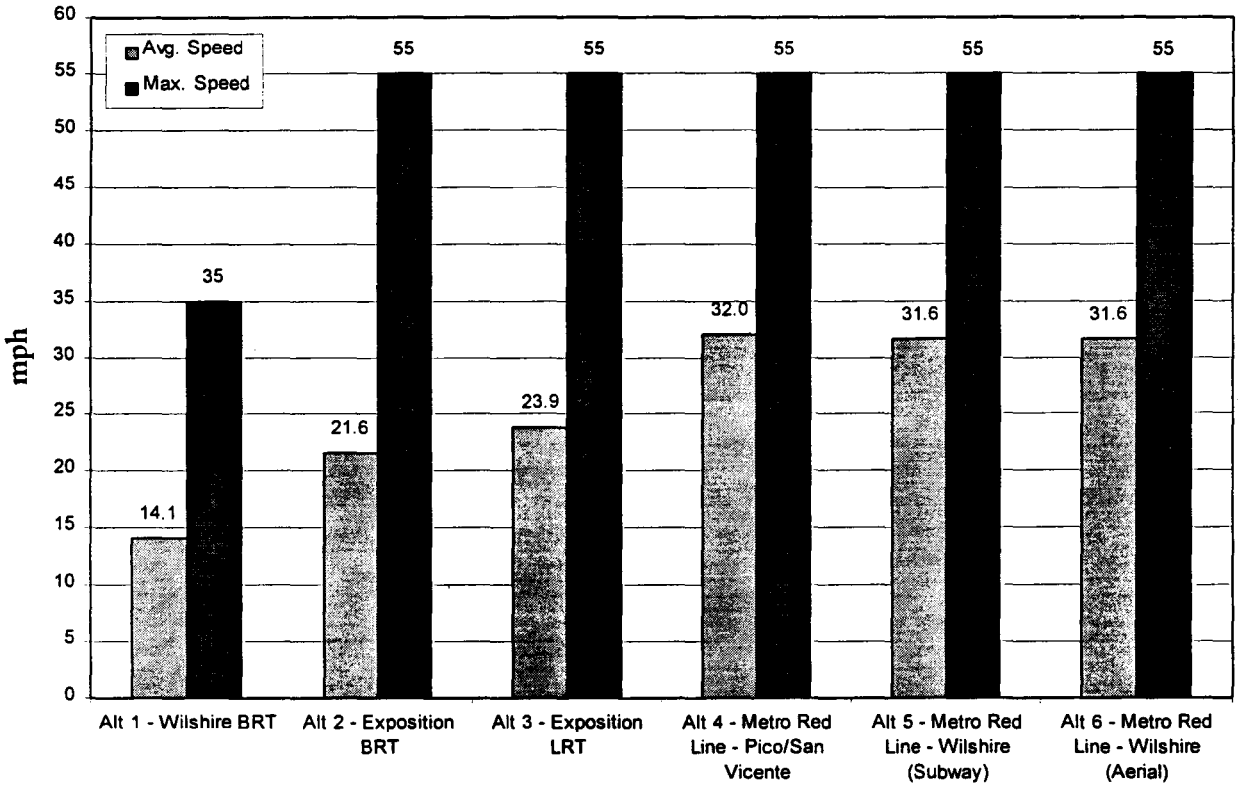
With regard to the Exposition Corridor, the results of Phase 2 – in conjunction with overall MTA funding capability – will provide sufficient information to decide between BRT and LRT. The choice of either alternative will potentially represent both the short and long-term solution, since both represent major investment commitments.

For the mid-term (6-10 years), the combination of the Wilshire BRT with either the Exposition BRT or LRT (choice to be determined in Phase 2), may provide the most cost-effective improvement strategy for the study area.

S.6 Technical Overview

Alternatives Considered. In addition to the required No Action and Transportation System Management Alternatives, this MIS examines six fundamental transit proposals to serve the Mid-City/Westside Study Area. As noted previously, these alternatives have evolved from previous studies, primarily the 1992 Re-evaluation Report/Final SEIS/SEIR for the Mid-City Segment; 1994 Metro Red Line Segment 3/Mid-City Extension Reassessment Study; 1996 Mid-City Alternative Alignment Gas Explorations Study; and the 1998 Regional Transit Alternatives Analysis. This MIS is re-evaluating and refining these earlier identified alternatives. The alternatives vary in route, technology, and vertical alignment. A comparison of peak travel speeds is shown graphically in Figure S.1. The route layouts for each alternative are provided below in Figures S.2 through S.7.

Figure S.1
Average and Maximum Speeds



* Note: Average speed calculated for Exposition BRT and LRT were calculated for speeds along the Exposition ROW Corridor plus values for on-street, mixed flow travel in Santa Monica and Downtown Los Angeles.

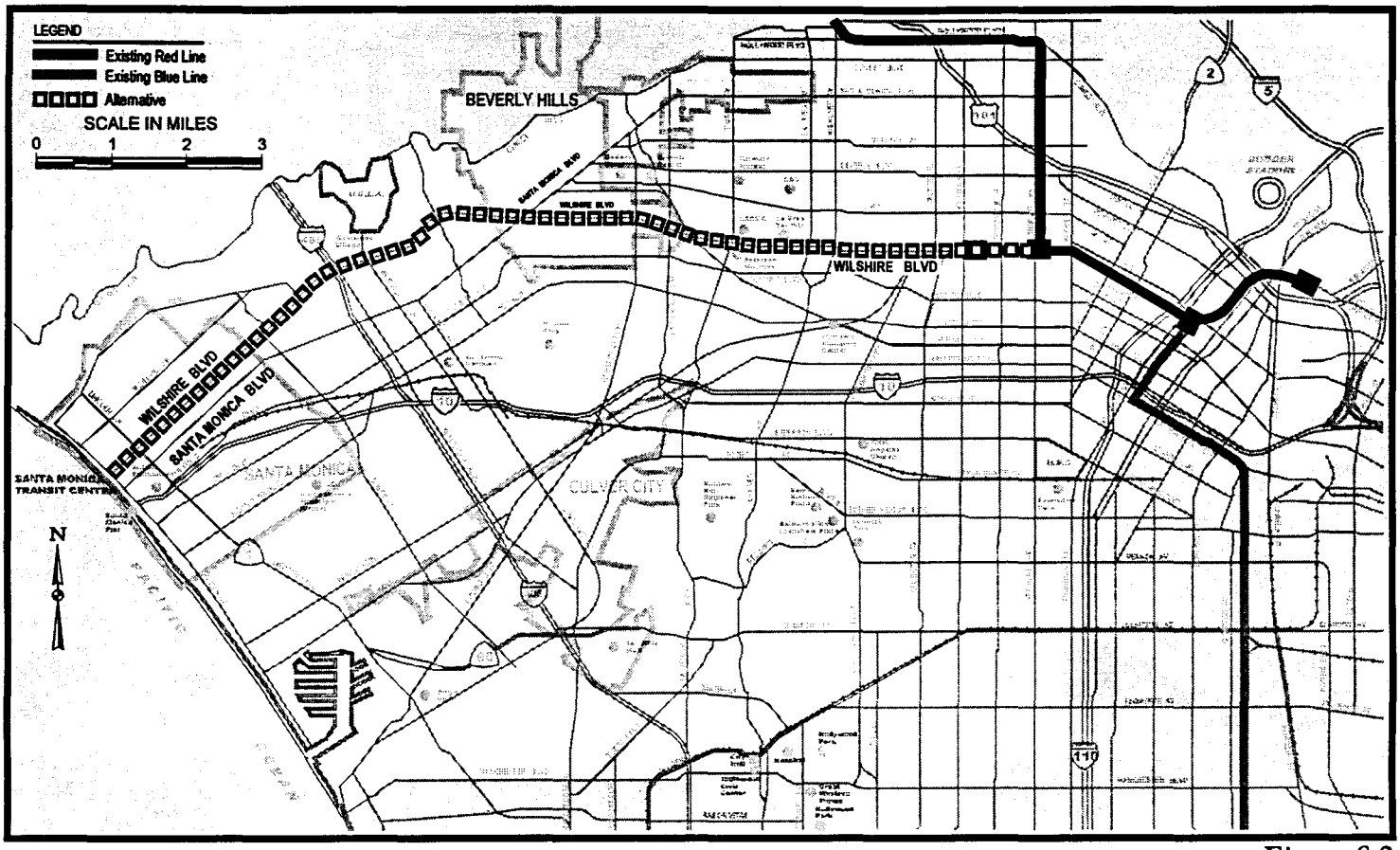


Figure S.2
Alternative 1-Wilshire BRT

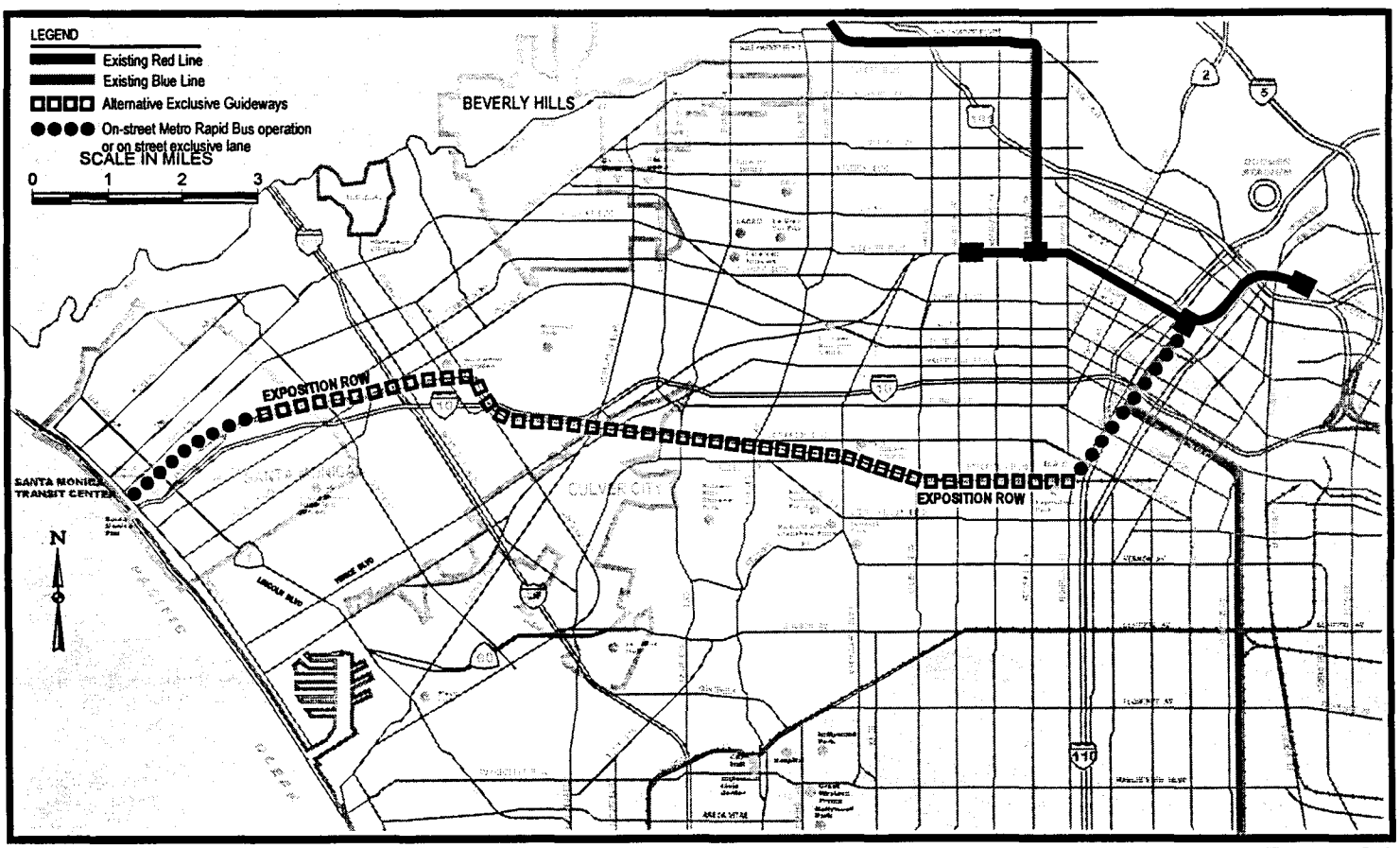


Figure S.3
Alternative 2-Exposition BRT

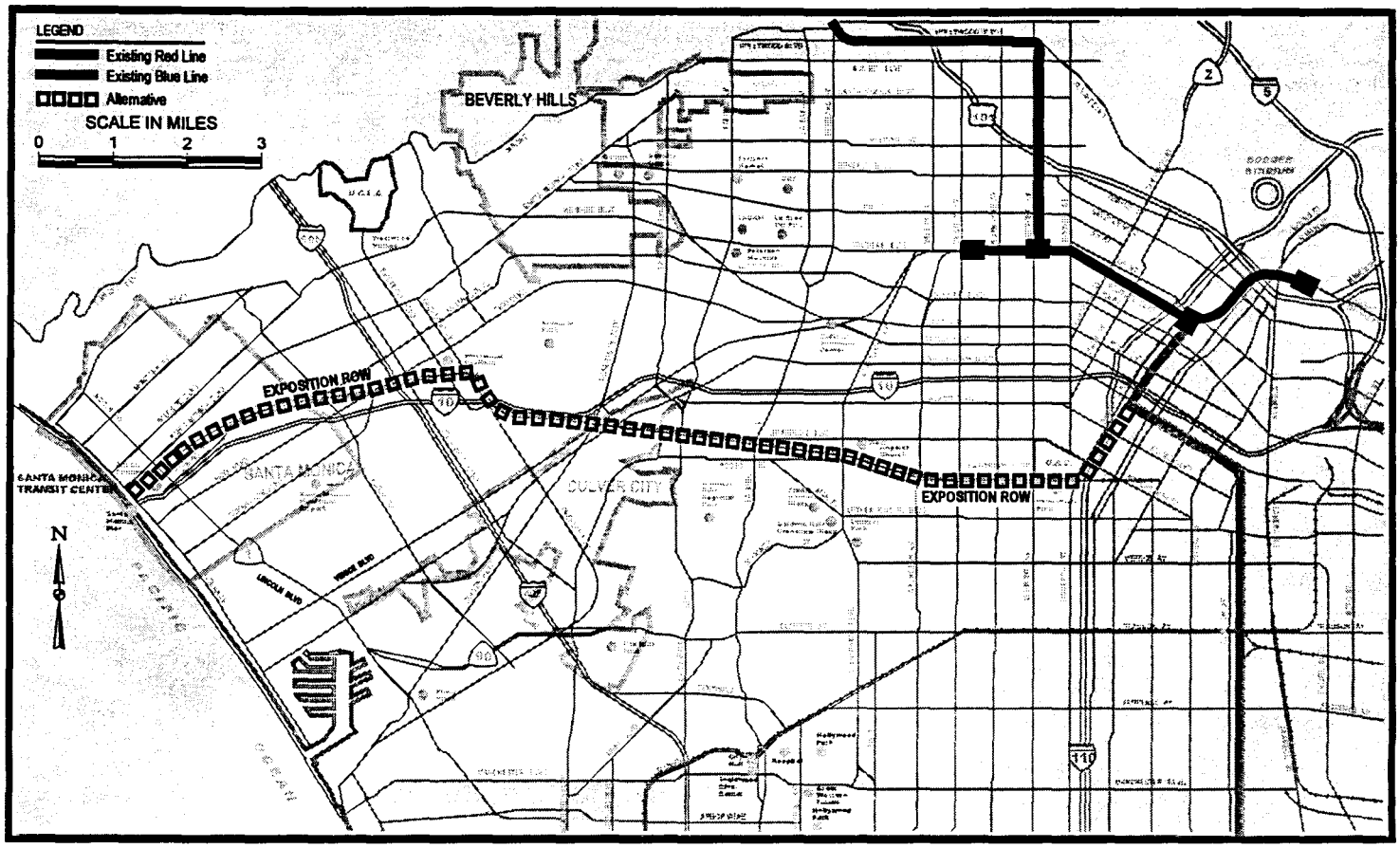


Figure S.4
Alternative 3-Exposition LRT

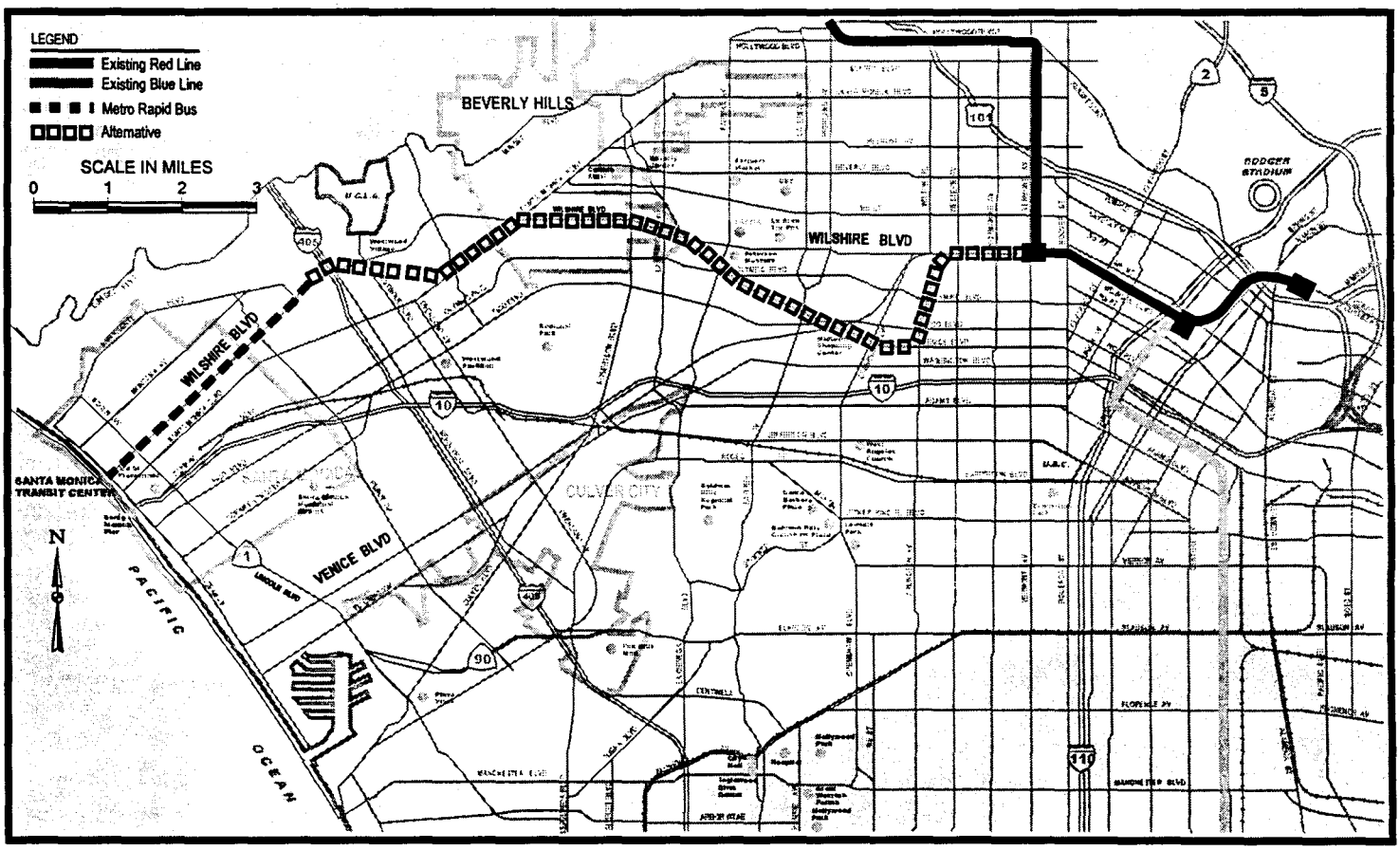


Figure S.5
Alternative 4-Mid-City HRT via Pico/San Vicente

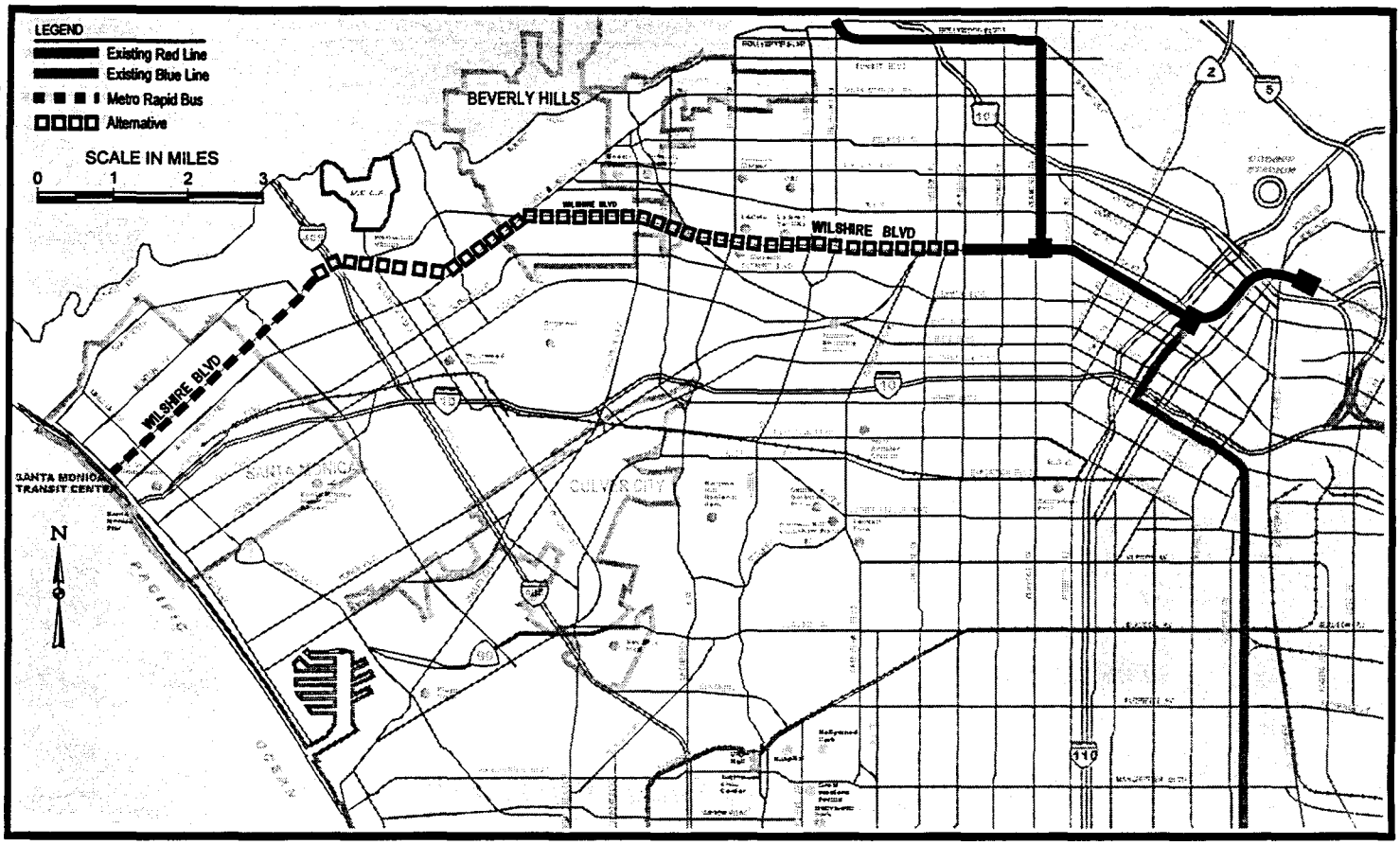


Figure S.6
Alternative 5-Metro Red Line along Wilshire (Subway)

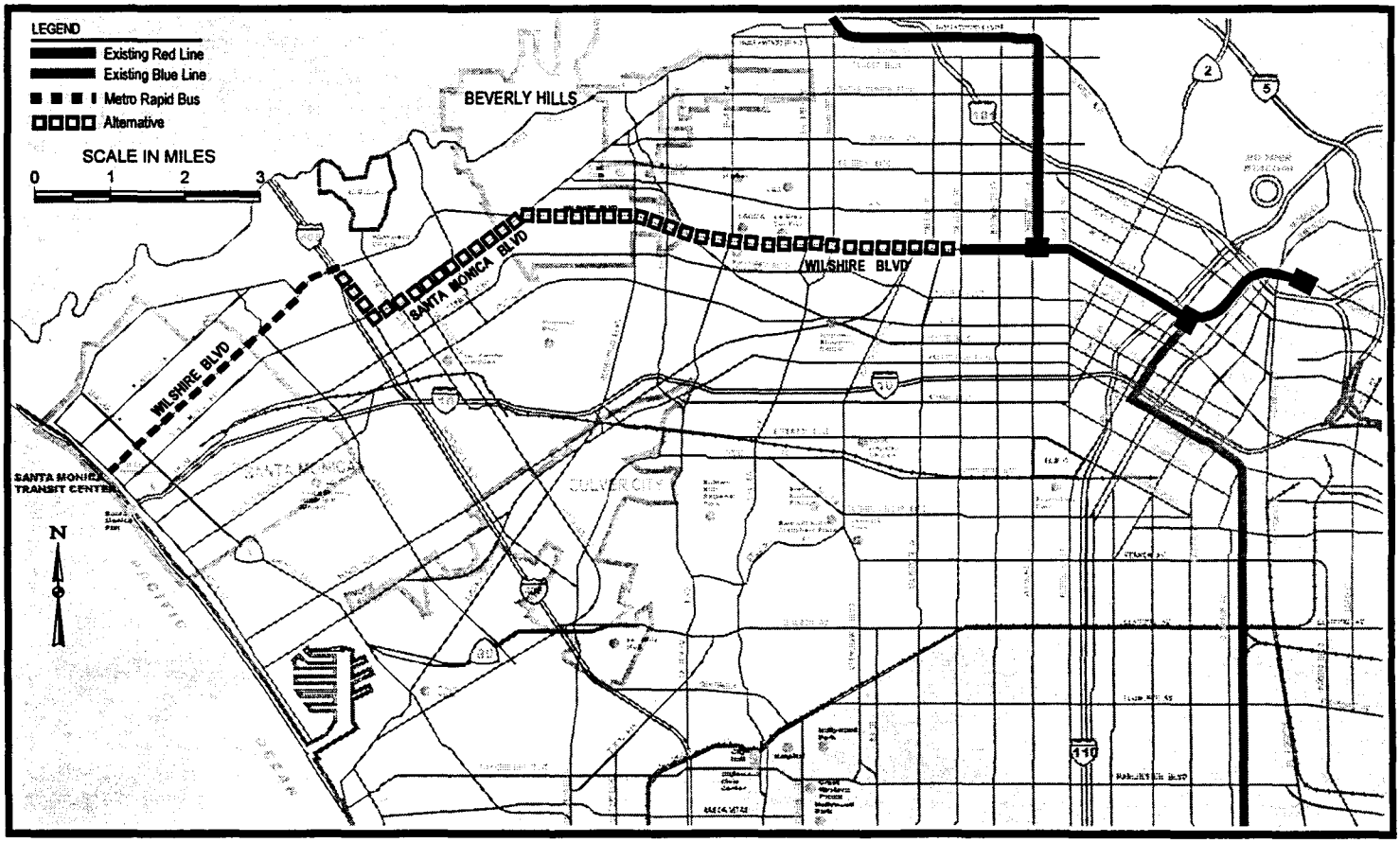


Figure S.7
Alternative 6 - Wilshire (Aerial) HRT

S.7 Evaluation

The alternatives have been evaluated from three distinct perspectives: engineering, environmental, and community response/perception. Findings from each of these perspectives are presented in Table S.1. In addition, Table S.2 presents a summary matrix that compares and contrasts the alternatives (including TSM) for the following key operating costs:

- Capital Cost (full-length and alternative length options);
- Annual Operating Cost;
- New Daily Transit Trips;
- Daily Fixed Guideway Boardings;
- Annualized Cost per New Daily Transit Trip;
- Average and Maximum Speed;
- Travel Time (downtown Los Angeles to downtown Santa Monica);
- Environmental Issues (Qualitative Summary Indicator); and
- Community Concerns (Qualitative Summary).

Table S.1
Evaluation of Considered Alternatives

Alternatives	Engineering	Environmental	Community Response/Perception
#1 Wilshire BRT	• Requires removal of traffic lane in each direction and/or parking • Minimal investment in new traffic signals • Possible reconstruction of median required • Each station requires two separate platforms	• Loss of traffic lanes in Wilshire • Interference/delays to north-south traffic • Some loss of street trees in median possibly required • Highly responsive to transit-supportive land uses	• Poor image as less clean and safe, compared to rail technologies • Traffic diversion into residential neighborhoods from reduced mixed flow lanes • Reconfiguration and reconstruction of landscaped median • Potential to merely shift ridership from current buses
#2 Exposition BRT	• Relatively simple grading and paving required • Fits within existing right-of-way • Several grade separations would need to be built • Maintenance of buses could be spread to several existing facilities	• Interference/delays to north-south traffic • Loss of some street trees in median • Potential impacts to adjacent land uses • Supportive of targeted redevelopment/economic revitalization areas	• Poor image as less clean and safe, compared to rail technologies • Safety concerns near schools and homes and at major intersections • Potential to merely shift ridership from current buses • Bus does not provide adequate capacity compared to LRT

			• Bus more flexible because it can detour around sensitive areas • General environmental concerns including noise, crime, traffic at stations
#3 Exposition LRT	• Fits within existing ROW for majority of route. On-street sections (i.e. at western terminus) would require removal of traffic lane • Several aerial structures would need to be built • A light maintenance yard could be built on MTA property serving both Exposition and Long Beach Blue lines	• Interference/delays north-south traffic • Loss of some street trees in median • Change to visual setting due to overhead lines and support poles • Potential impacts to adjacent land uses • Changes to local circulation due to safety fencing along ROW • Supportive of targeted redevelopment/economic revitalization areas	• Safety concerns for pedestrians and opposing traffic • Noise impacts on nearby residents especially from horns • Vibration effects on nearby residents • Perception that LRT is more appealing than BRT in attracting new riders • LRT needed to provide capacity for ridership • General environmental concerns including noise, crime, traffic at stations
#4 Wilshire HRT - Pico/San Vicente	• Longer alignment than the Wilshire HRT alternative • More wear and tear due to tight turning radii • Additional ventilation required at stations for H_2S and Methane gases • Use of Advanced Tunnel Boring Machine with a full faced cutting wheel would facilitate placement of tunnel sealer	• Potential vibration, ground-borne noise and settlement effects • Exposure to hazardous gases, but can be mitigated • Potential interference with underground utilities • Highly responsive to transit-supportive land uses	• Not worth studying because of: - gas hazards - federal referendum - Proposition A • If pursued, would cause Wilshire traffic and parking impacts
#5 Wilshire HRT - Subway	• Construction potentially close to major buildings along route • Additional ventilation required at stations for H_2S and Methane gases • Use of Advanced Tunnel Boring Machine with a full faced cutting wheel would facilitate placement of tunnel sealer	• Potential vibration, ground-borne noise and vibration effects • Exposure to hazardous gases, but can be mitigated • Potential effect on la Brea Tar Pits and paleontological resources • Potential interference with underground utilities	• Not worth studying because of: - gas hazards - federal referendum - Proposition A • If pursued, would cause Wilshire traffic and parking impacts

		• Highly responsive to transit-responsive land uses	
# 6 Wilshire HRT - Aerial	• Significantly cheaper to build than subway • Would require some reconfiguration of streets at stations • Would require property displacements on both sides of Wilshire Blvd. in station areas.	• Loss of street trees in median • Significant alteration of visual setting, streetscape, and pedestrian experience due to scale, mass, and shadows in impacts • Alteration of views and visual encroachments for building occupants facing Wilshire	• No support • Limited support for an aerial monorail. Some opposition to this concept as well, monorail has same impacts as HRT in areas of property displacement, median reconstruction, loss of left turns. Visual impacts are somewhat less due to smaller guideway structure.

S.8 Conclusion

Basis for Recommendations

Alternative 1 - Wilshire Bus Rapid Transit (BRT)

- Has potential as interim solution to feed Metro Red Line and serve high veolume Wilshire Corridor at low cost.
- Allows faster speeds than Metro Rapid Bus in future as congestion grows
- Further detailed analysis warranted to see how inpacts can be mitigated

Alternative 2 - Exposition Bus Rapid Transit (BRT)

- Offers significant long-term transportation benefits of community impacts can be resolved
- Connection to Downtown Los Angeles, USC, Exposition Park and Harbor Freeway Transitway from key centers in Santa Monica, West Los Angeles and Culver City
- Achieves similar ridership to LRT at less cost

Alternative 3 - Exposition Light Rail Transit (LRT)

- Offers significant long-term transportation benefits of community impacts can be resolved
- Direct connection via Blue Line to Downtown Los Angeles, USC, Exposition Park and Harbor Freeway Transitway from key centers in Santa Monica, West Los Angeles and Culver City

- Less frequent disruption of intersections and adjacent properties than BRT
- Has capacity to serve post-2020 demand

Alternative 4 - Wilshire Heavy Rail Transit (HRT) via Pico/San Vicente

- Not currently feasible due to funding restrictions
- Longer route to Westside than Wilshire Corridor
- Lower density and fewer activity centers served than Wilshire Corridor

Alternative 5 - Wilshire Heavy Rail Transit (HRT) Subway

- Not currently feasible due to funding restrictions and Methane Gas Prohibition Zone
- Underground gas issue may have technical solutions that would permit construction of a subway
- Further analysis of this alternative should be undertaken in Long Range Plan due to high densities and transit use

Alternative 6 - Wilshire Heavy Rail Transit (HRT) Aerial

- Achieves same ridership at lower cost than subway alternative, but would alter the character of Wilshire Boulevard in a permanent and unaccpetable manner
- Considered in 1987 and deleted from further consideration due to visual impacts and intense community opposition
- Monorail option would have similar negative environmental consequences and would attract fewer riders than HRT. No acceptable site has been identified for the necessary storage and maintenance yard

Recommendations

1. Wilshire Corridor

- Carry forward BRT into environmental clearance to San Vicente
- Further consideration of Wilshire subway in Long Range Plan

2. Exposition Corridor

- Carry forward both BRT and LRT into environmental clearance to Santa Monica, with consideration of phased lengths to Crenshaw, La Cienega and Venice/Robertson

ALTERNATIVE	CAPITAL COST (MILLIONS IN 1999 DOLLARS)				ANNUAL OPERATING COST (MILLIONS IN 1999 DOLLARS)		NEW DAILY TRANSIT TRIPS		DAILY FIXED GUIDEWAY BOARDINGS	ANNUALIZED COST PER NEW DAILY TRANSIT TRIP	
	FULL LENGTH	ALTERNATIVE LENGTH OPTION			COMPARED TO NO BUILD	COMPARED TO TSM	COMPARED TO NO BUILD	COMPARED TO TSM		COMPARED TO NO BUILD	COMPARED TO TSM
TSM	$92	N/A	N/A	N/A	$24	N/A	6,600	0	N/A	$16	0
1 Wilshire BRT	$169 To Santa Monica	$62 To San Vicente	N/A	N/A	$41	$17	8,300	1,700 [10,600]	11,000 [34,000]	$24	$60
2 Exposition BRT	$188 To Santa Monica	$76 To La Cienega	$87 To Venice Blvd	N/A	$32	$7	12,400	5,800	23,000	$14	$13
3a Exposition LRT (Baseline)	$589 To Santa Monica	$178 To Crenshaw	$312 To La Cienega	$398 To Venice Blvd	$45	$21	15,300	8,700	38,600	$21	$25
3b Exposition LRT (Minimum Grade Separations)	$431 To Santa Monica	$135 To Crenshaw	$209 To La Cienega	$227 To Venice Blvd	$45	$20	15,300	8,700	38,600	$18	$20
4 Wilshire Blvd HRT Subway (Via Pico/ San Vicente)	$2,643 To Federal	$673 To Pico / San Vicente	N/A	N/A	$29 (Pico/ San Vicente)	$5 (Pico/ San Vicente)	10,400 (Pico/ San Vicente)	3,700 (Pico/ San Vicente)	11,400 (Pico/ San Vicente)	$28 (Pico/ San Vicente)	$50 (Pico/ San Vicente)
5 Wilshire Blvd HRT Subway (Via Wilshire Blvd)	$2,469 To Federal	$891 To Fairfax	N/A	N/A	$41	$17	15,300	9,200	33,500	$50	$75
					$31 (Fairfax)	$7 (Fairfax)	8,800 (Fairfax)	2,200 (Fairfax)	15,800 (Fairfax)	$40 (Fairfax)	$114 (Fairfax)
6 Wilshire Blvd HRT Aerial (Via Wilshire Blvd)	$1,269 To Sepulveda	$543 To Fairfax	N/A	N/A	$41	$17	15,300 (Est)	9,200 (Est)	33,500 (Est)	$30	$41
					$31 (Fairfax)	$7 (Fairfax)	8,800 (Fairfax)	2,200 (Fairfax)	15,800 (Fairfax)	$29 (Fairfax)	$72 (Fairfax)

NOTE: Brackets [ ] indicate Sensitivity
Model Run results assuming full signal preemption.

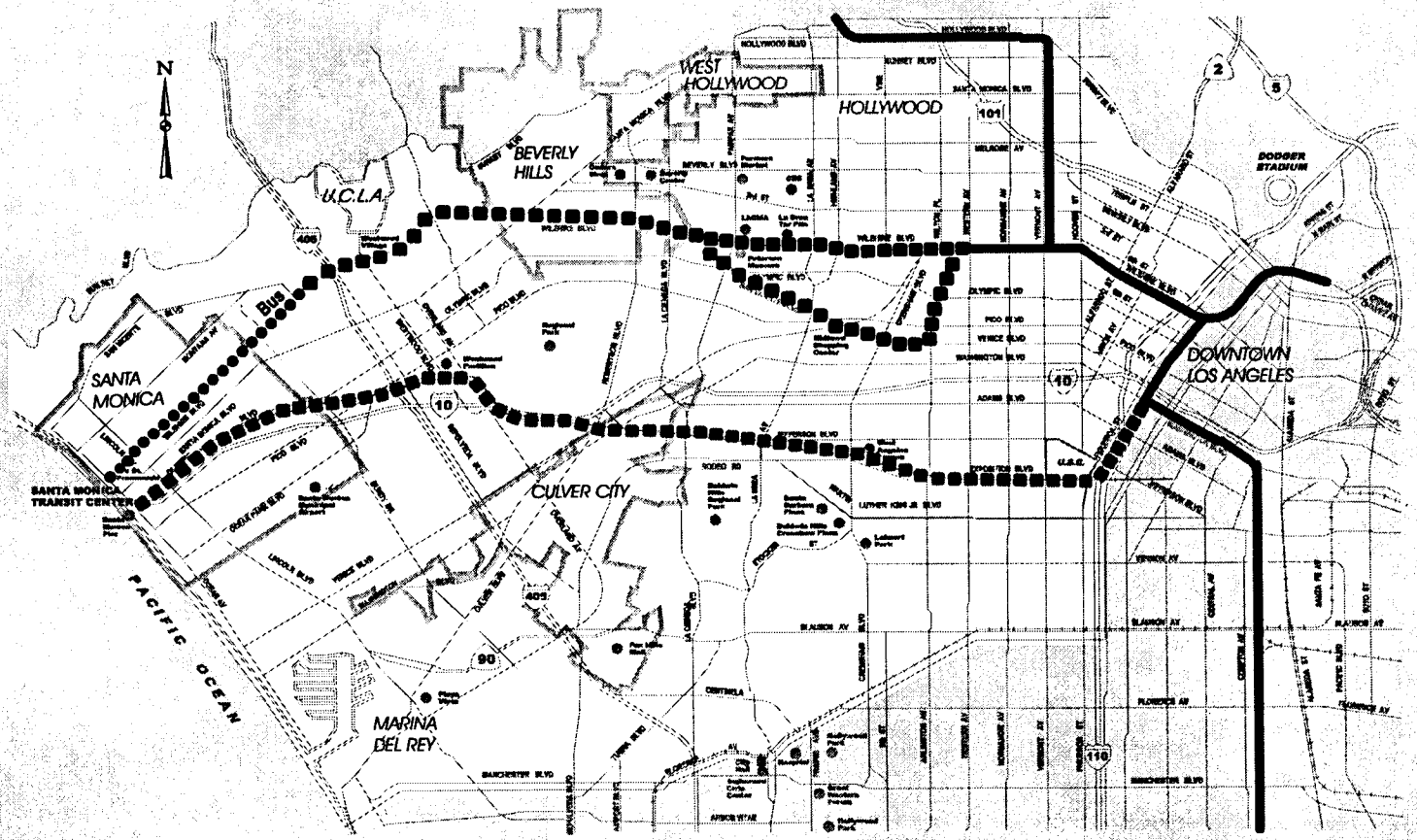
TABLE S.2

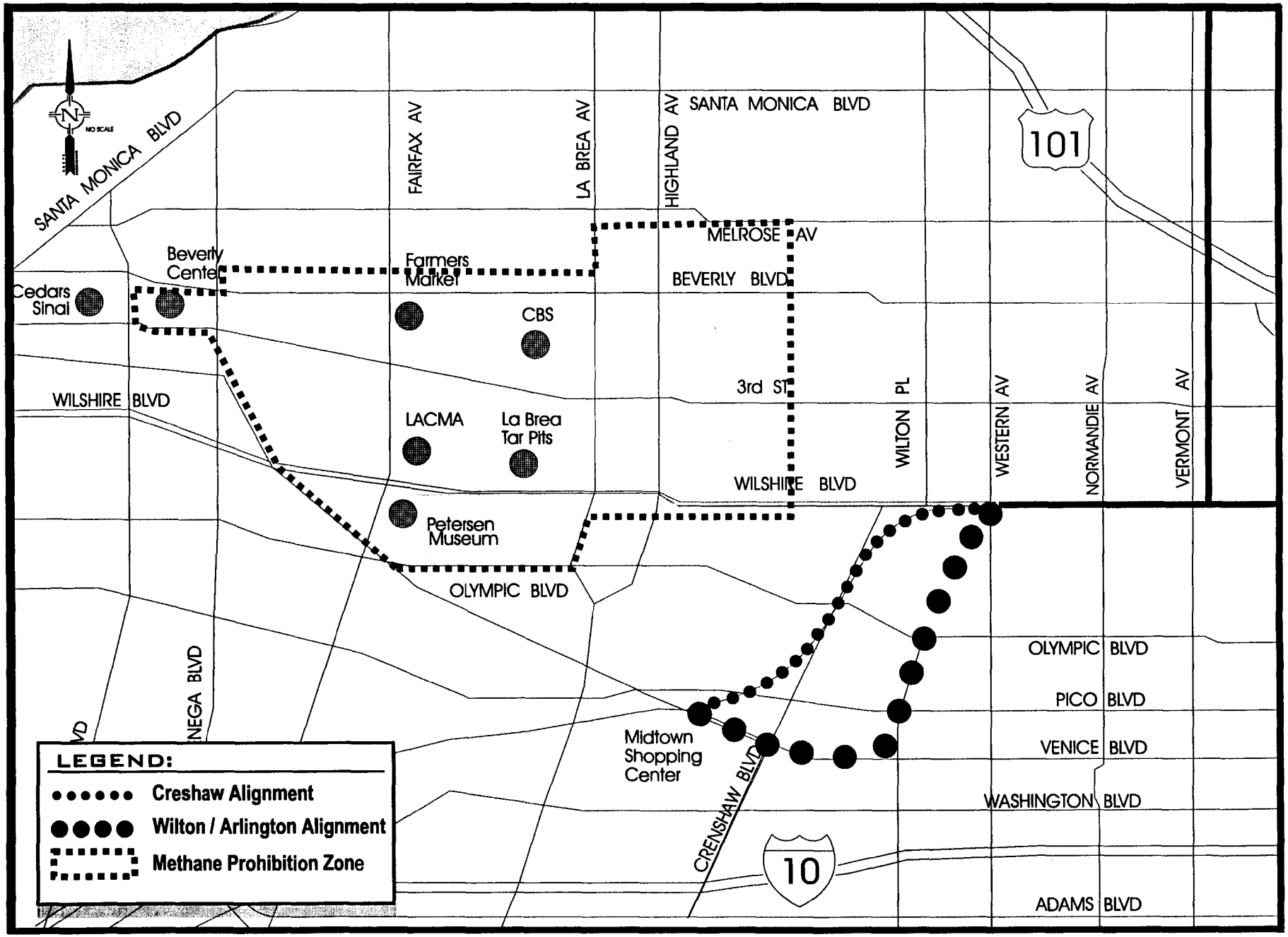
ALTERNATIVES SUMMARY EVALUATION MATRIX

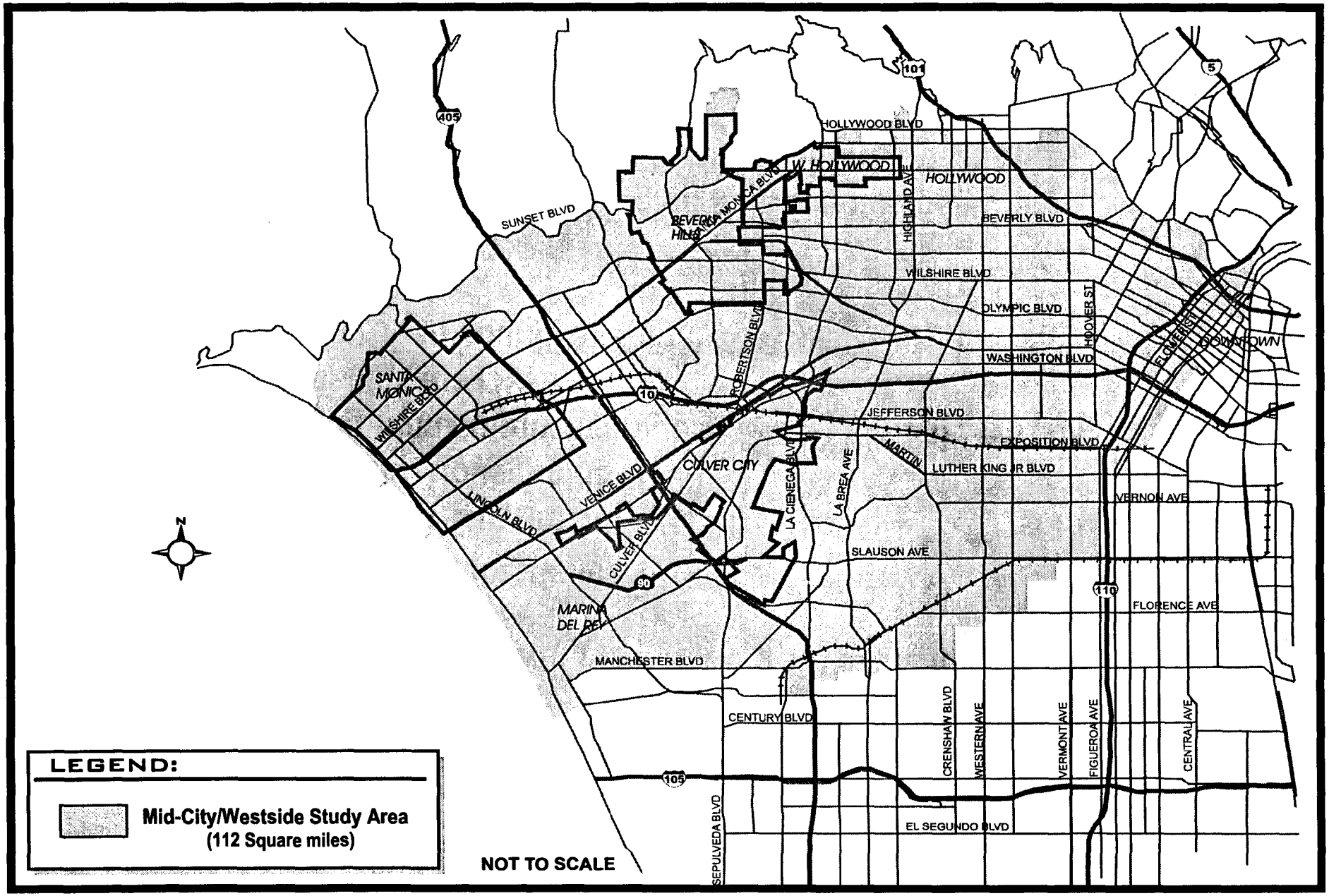
MID-CITY/WESTSIDE TRANSIT CORRIDOR RE-EVALUATION/MAJOR INVESTMENT STUDY SUMMARY OF RESULTS - SLIDE PRESENTATION

Prepared by Korve Engineering, Inc.

February 4, 2000




SANTA MONICA BLVD
FAIRFAX AV
LA BREA AV
HIGHLAND AV
SANTA MONICA BLVD
101
MELROSE AV
BEVERLY BLVD
Beverly Center
Farmers Market
Cedars Sinai
CBS
WILSHIRE BLVD
3rd ST
WILTON PL
WESTERN AV
NORMANDIE AV
VERMONT AV
LACMA
La Brea Tar Pits
WILSHIRE BLVD
Petersen Museum
OLYMPIC BLVD
OLYMPIC BLVD
PICO BLVD
VENICE BLVD
WASHINGTON BLVD
Midtown Shopping Center
CRENSHAW BLVD
10
ADAMS BLVD
LEGEND:
Creshaw Alignment
Wilton / Arlington Alignment
Methane Prohibition Zone

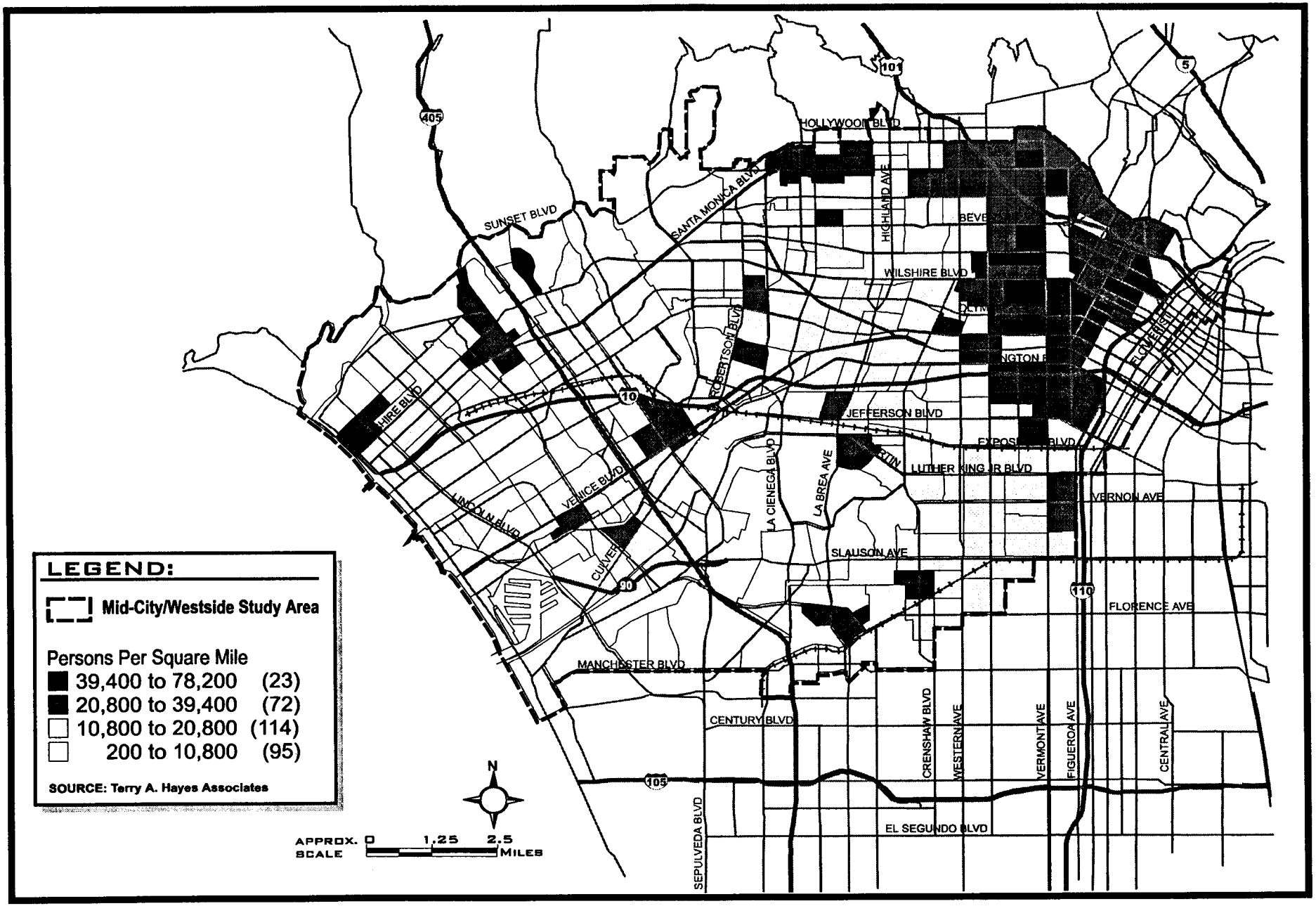

405
101
5
HOLLYWOOD BLVD
W. HOLLYWOOD
HOLLYWOOD
SUNSET BLVD
BEVERLY HILLS
BEVERLY BLVD
WILSHIRE BLVD
OLYMPIC BLVD
WASHINGTON BLVD
JEFFERSON BLVD
EXPOSITION BLVD
LUTHER KING JR BLVD
VERNON AVE
SLAUSON AVE
FLORENCE AVE
MANCHESTER BLVD
CENTURY BLVD
EL SEGUNDO BLVD
SANTA MONICA
CULVER CITY
MARINA DEL REY
ROBERTSON BLVD
LA CIENEGA BLVD
LA BREA AVE
HIGHLAND AVE
HOOVER ST
FIGUEROA
DOWNTOWN
MARTIN
VENICE BLVD
LINCOLN BLVD
CULVER BLVD
WILSHIRE BLVD
SEPULVEDA BLVD
CRENSHAW BLVD
WESTERN AVE
VERMONT AVE
FIGUEROA AVE
CENTRAL AVE
10
90
105
110
N
LEGEND:
Mid-City/Westside Study Area
(112 Square miles)
NOT TO SCALE

PURPOSE & NEED

1. Demographics (1998 & 2020)
   - Population Growth — 1.5 to 1.9 million (27%)
   - Employment Growth — 1.0 to 1.2 million (20%)

2. Transportation Characteristics
   - Home-Work Trip growth (1998-2020) — +41%
   - Zero Auto Households (1990) greater than county average: — 18.3% vs. 10.9%
   - Transit usage (1990) greater than county average: — 13.6% vs. 6.8%

3. Other Key Factors
   - High concentration of region's designated centers
   - No significant East-West transportation improvements committed
   - Existing concentration of transit-supportive land use



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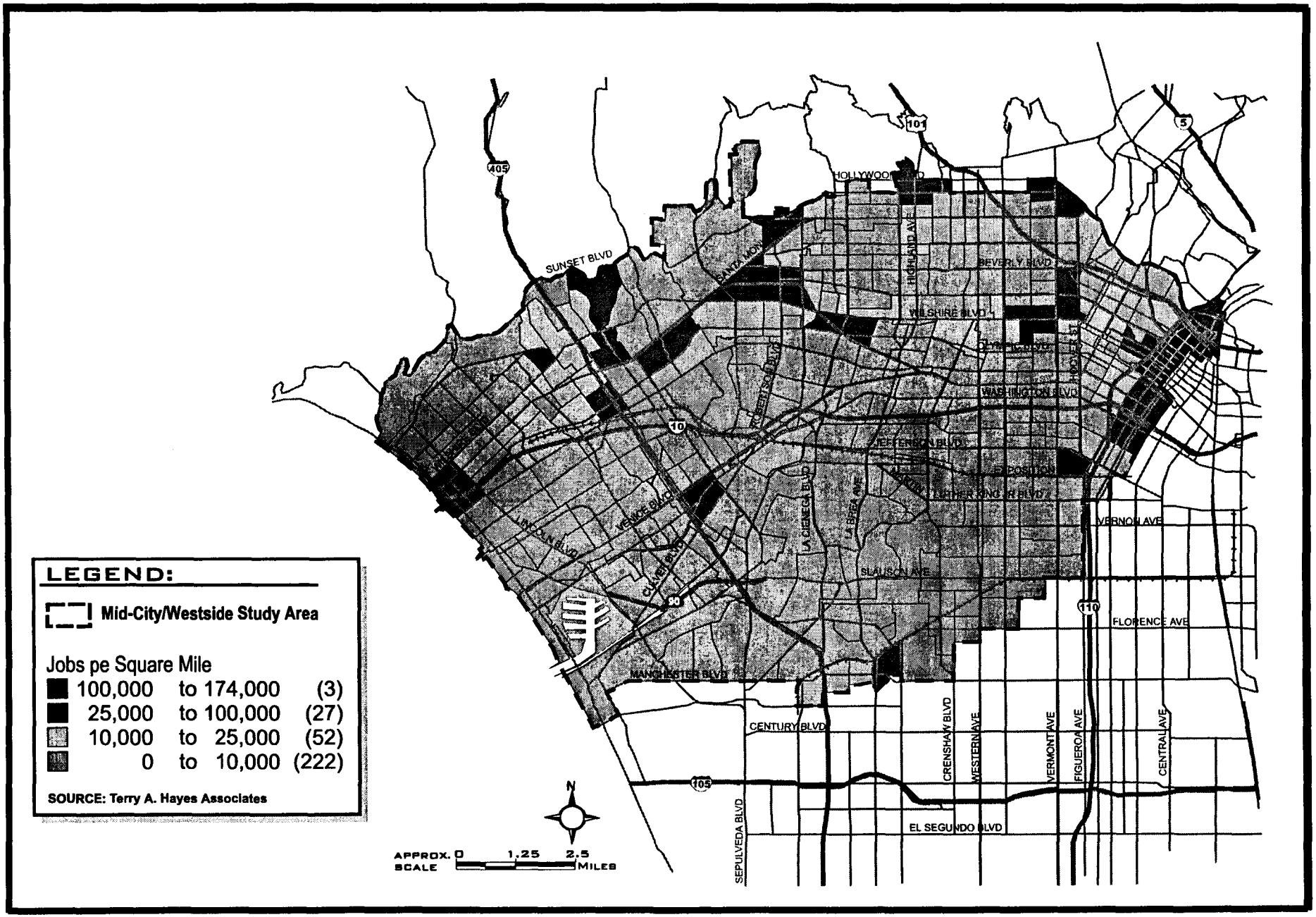
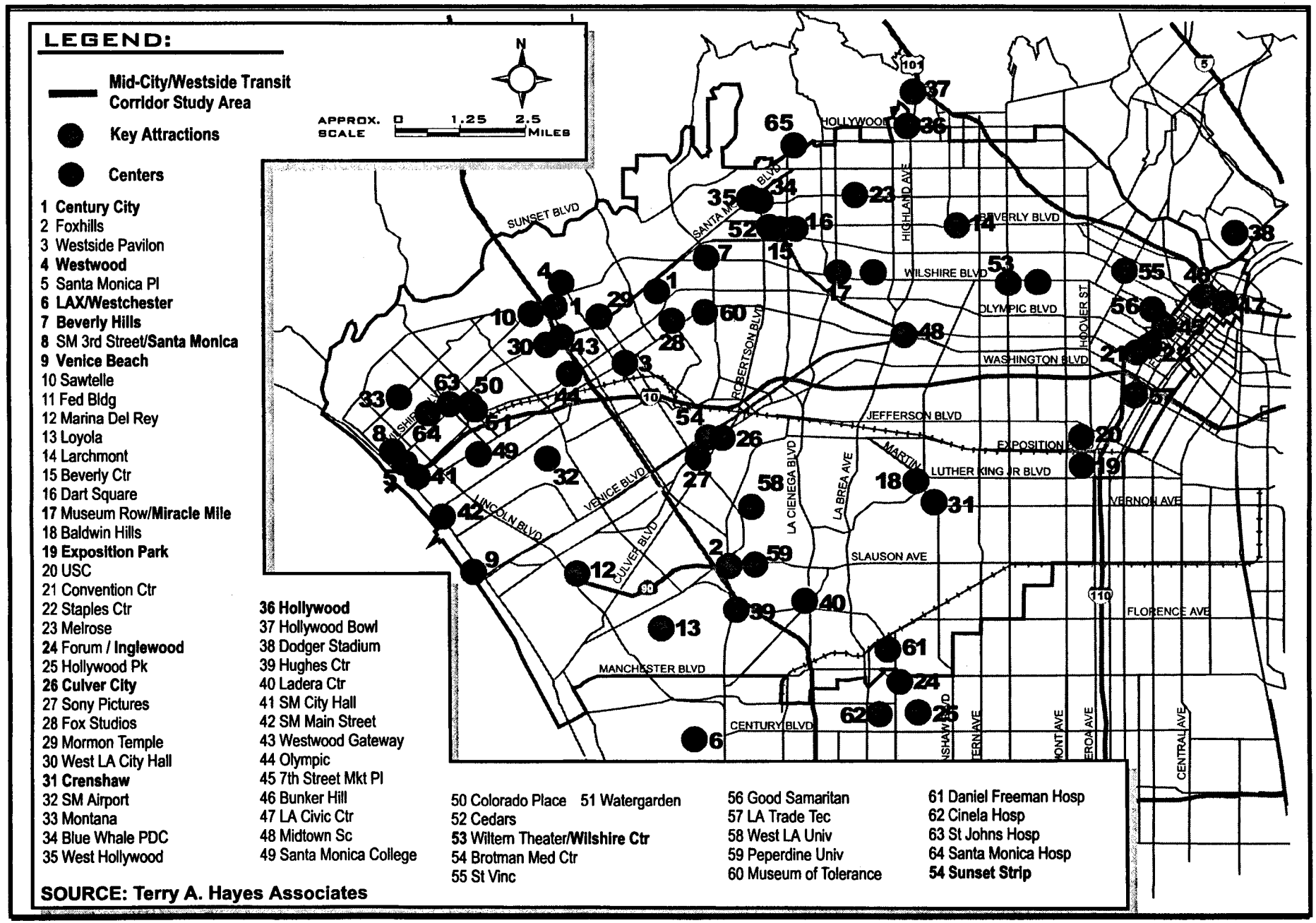
5

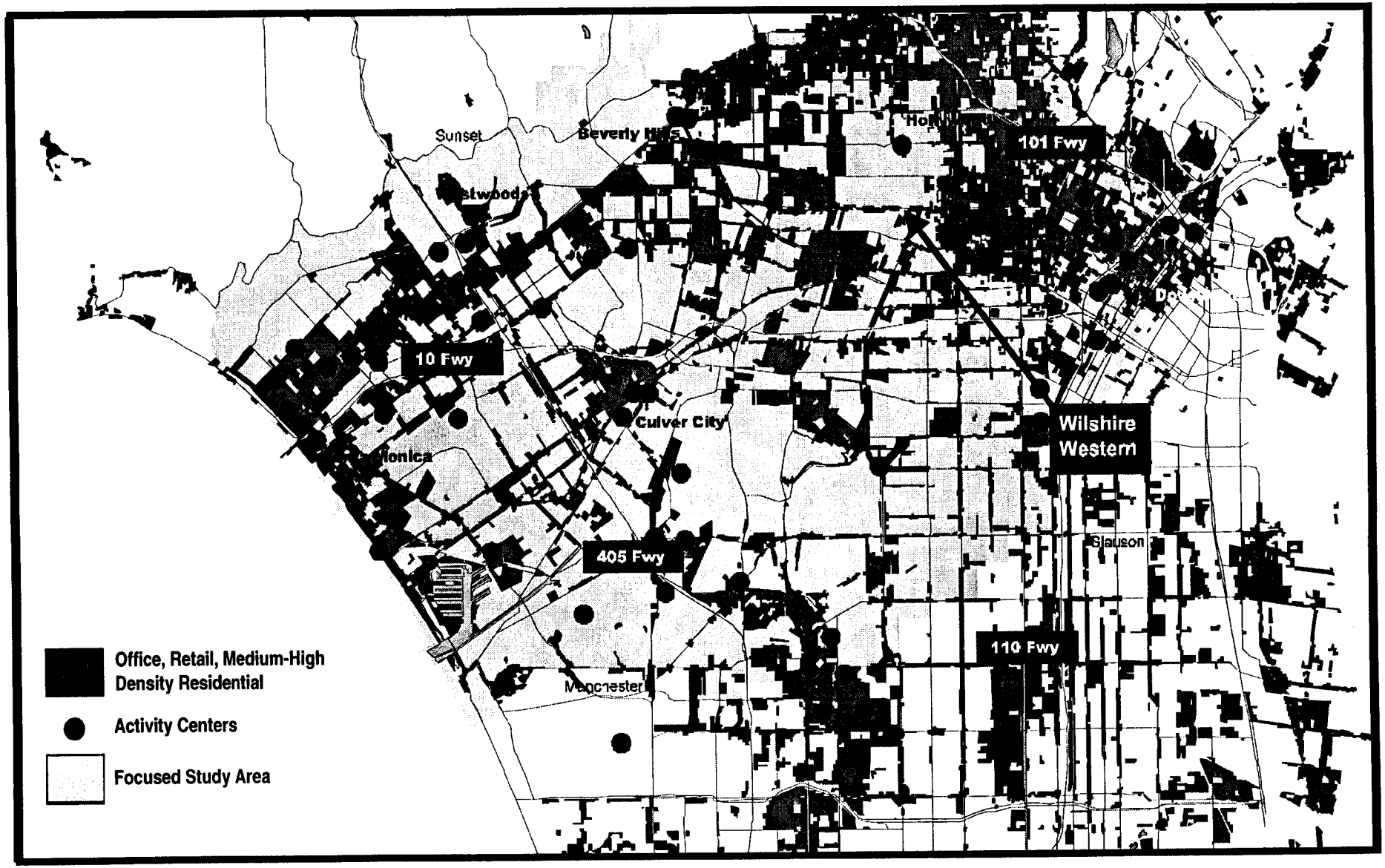
EXISTING POPULATION DENSITY



2/4/2000 6 **EXISTING EMPLOYMENT DENSITY**



CENTERS AND KEY ATTRACTIONS



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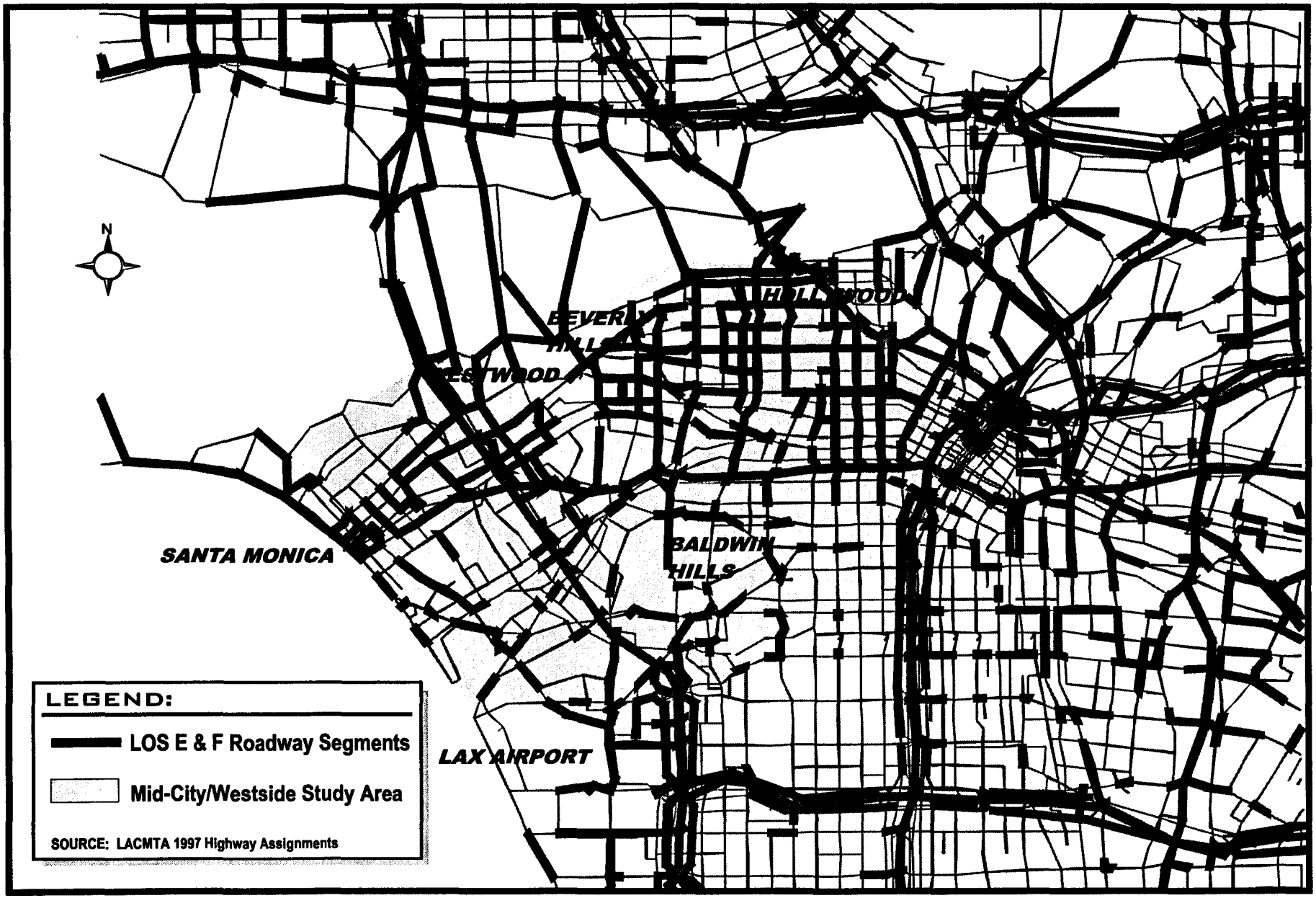
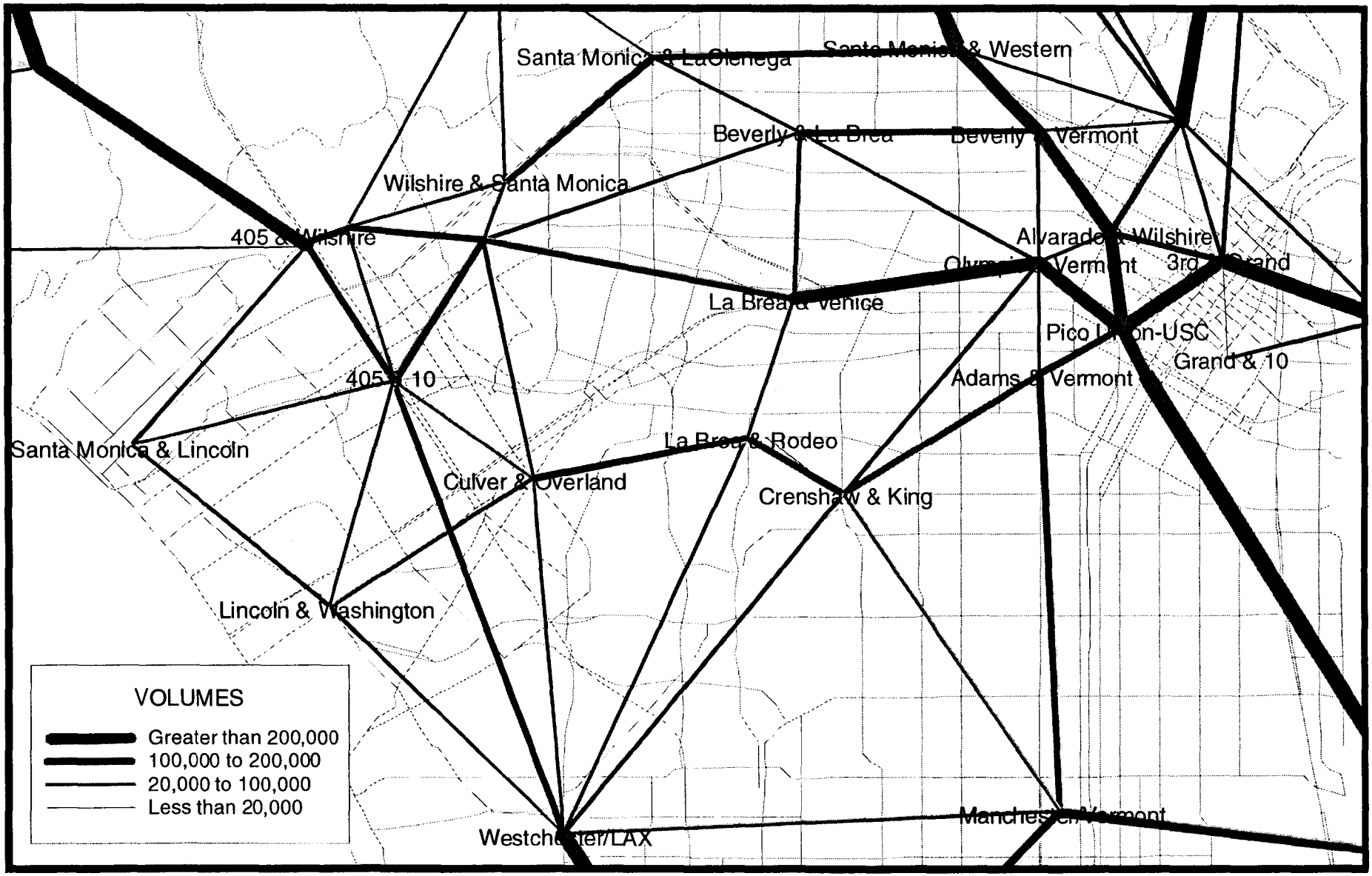
TRANSIT SUPPORTING LAND USES



EXISTING LEVEL OF SERVICE E AND F
ROADWAY SEGMENTS PEAK PERIOD



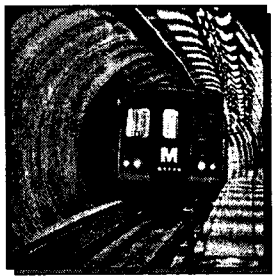
2020 DAILY WORK TRIP VOLUMES ON "SPIDER" NETWORK

Candidate Alternatives

1) Wilshire BRT

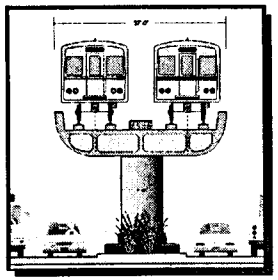
2) Exposition BRT

3) Exposition LRT



4) Wilshire-Pico/ San Vicente HRT Subway

5) Wilshire HRT Subway



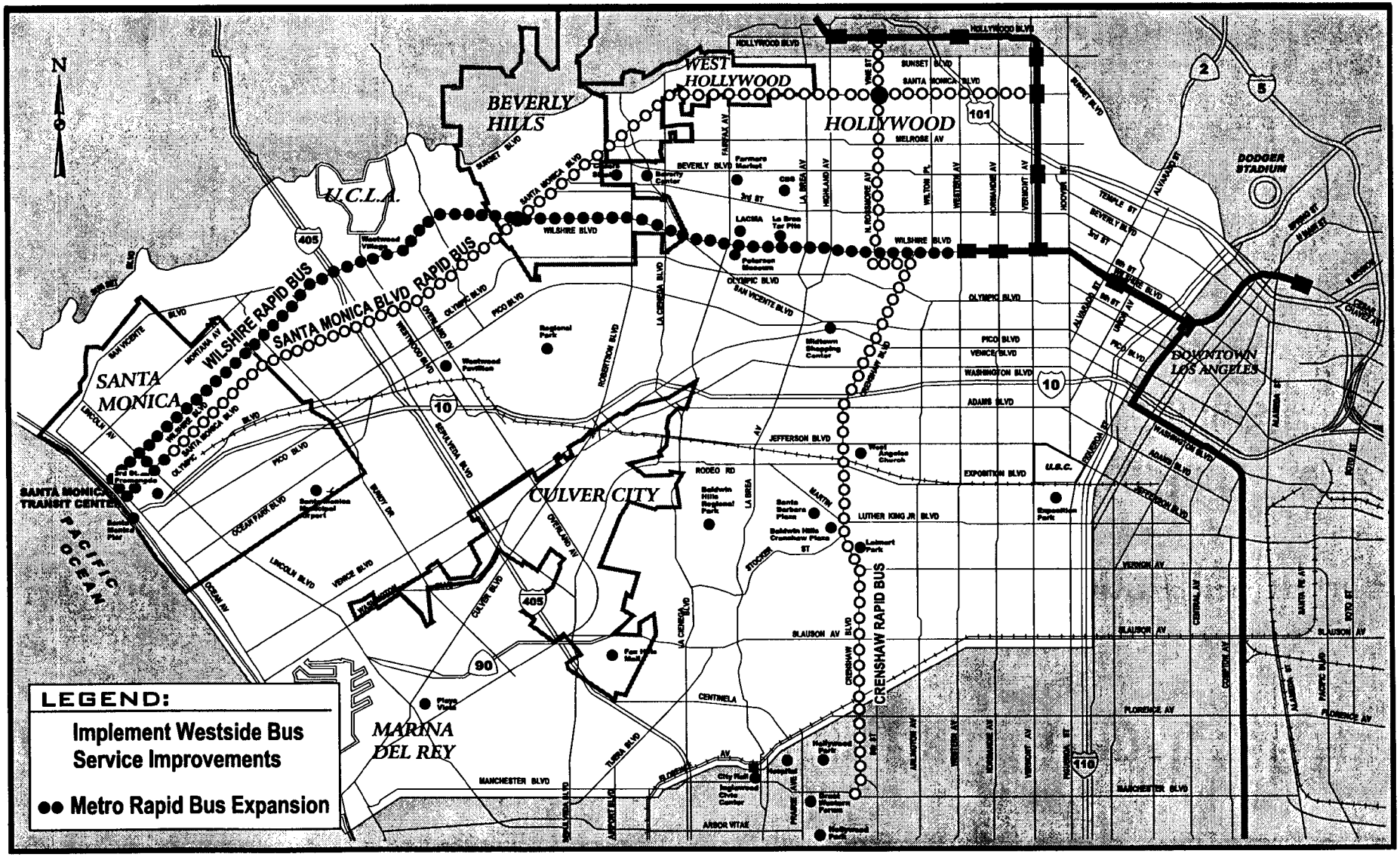
6) Wilshire HRT Aerial Rail

Transportation System Management (TSM) Alternative

Improvement to bus system throughout Study Area

- Complete implementation of Westside Bus Service Improvement Study recommendations

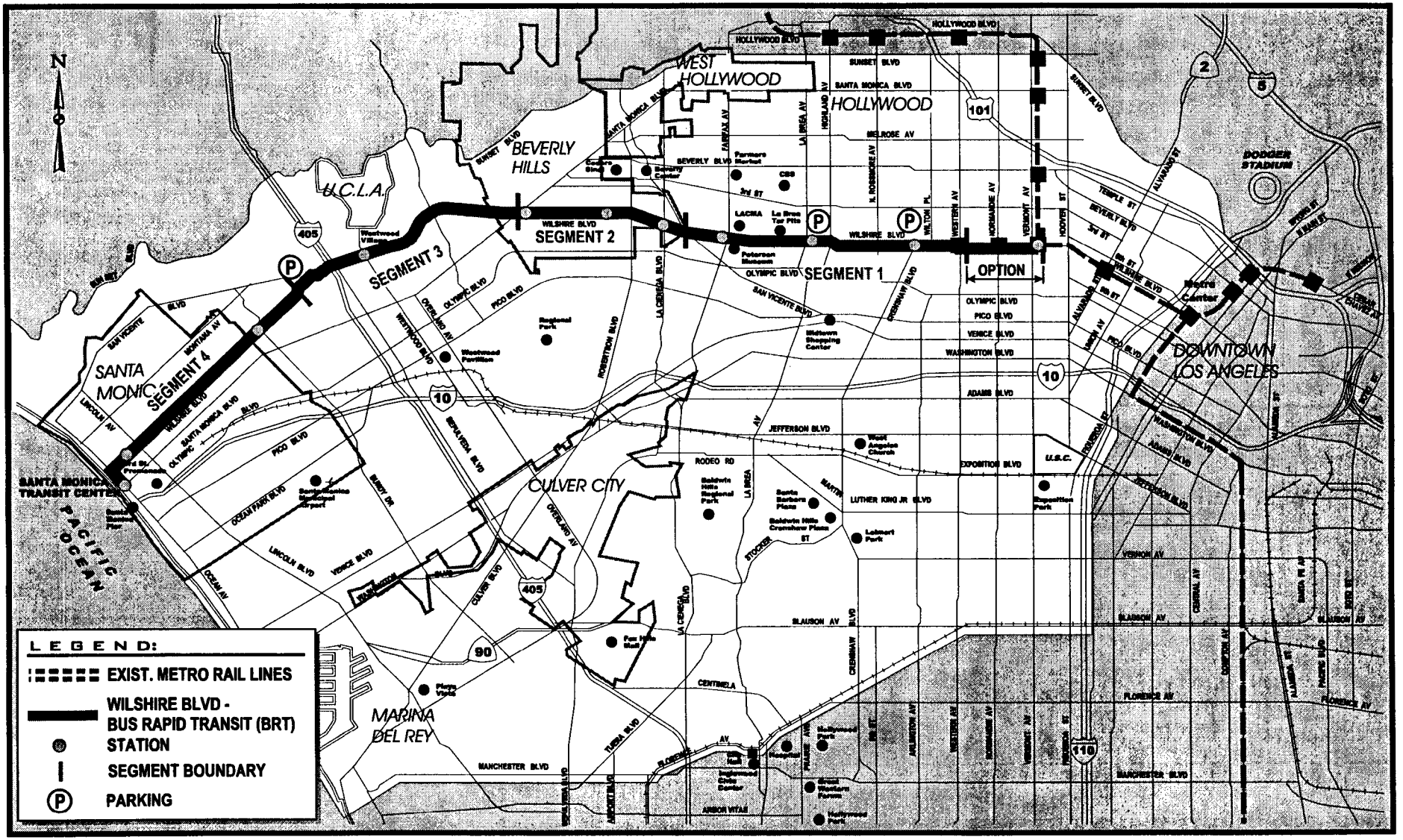
- Three Rapid Bus lines assumed for 2020:
  - Wilshire/Whittier
  - Santa Monica Boulevard
  - Crenshaw Boulevard


N
WEST HOLLYWOOD
BEVERLY HILLS
HOLLYWOOD
U.C.L.A.
DODGER STADIUM
DOWNTOWN LOS ANGELES
SANTA MONICA
CULVER CITY
MARINA DEL REY
SANTA MONICA TRANSIT CENTER
PACIFIC OCEAN
WILSHIRE RAPID BUS
SANTA MONICA BLVD RAPID BUS
CRENSHAW RAPID BUS
LEGEND:
Implement Westside Bus Service Improvements
Metro Rapid Bus Expansion

Alternative 1: **Wilshire Boulevard Bus Rapid Transit (BRT)**

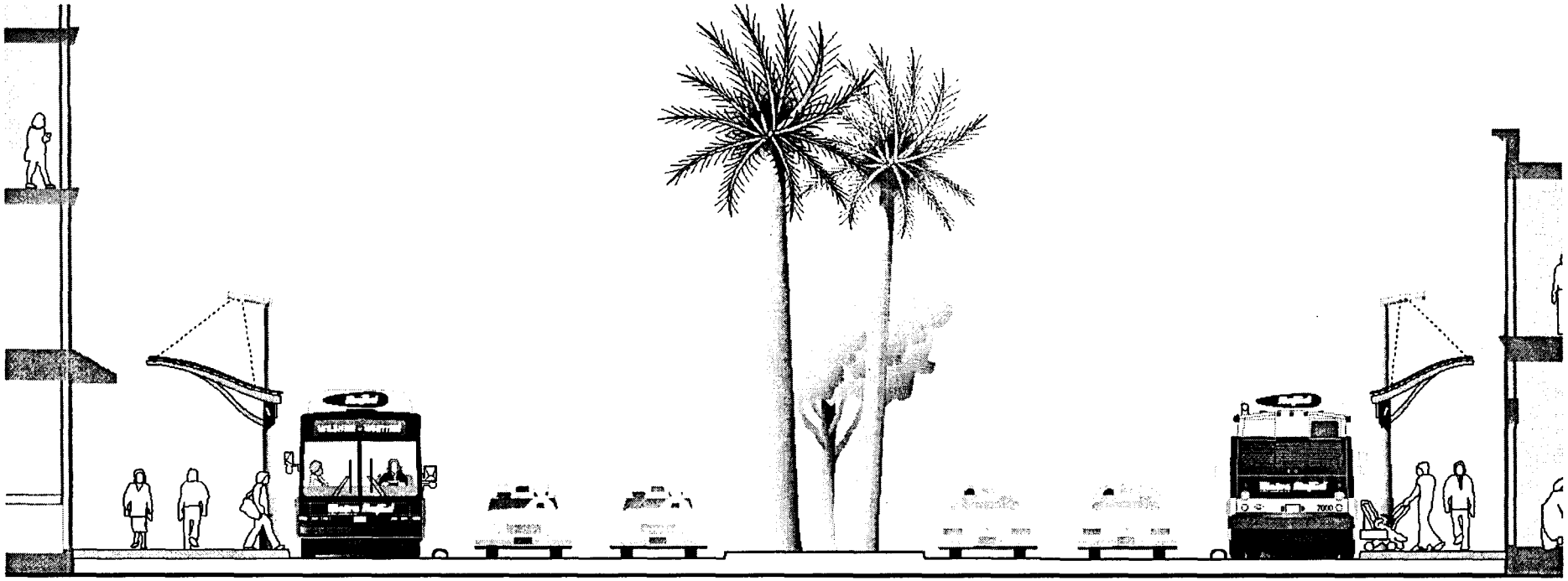
Exclusive bus lane on Wilshire Boulevard (curb or center lane)

- **Full length project from Wilshire/Vermont Metro Red Line subway station to downtown Santa Monica (14.0 miles)**
- **Alternative length to Wilshire/San Vicente (4.9 miles)**

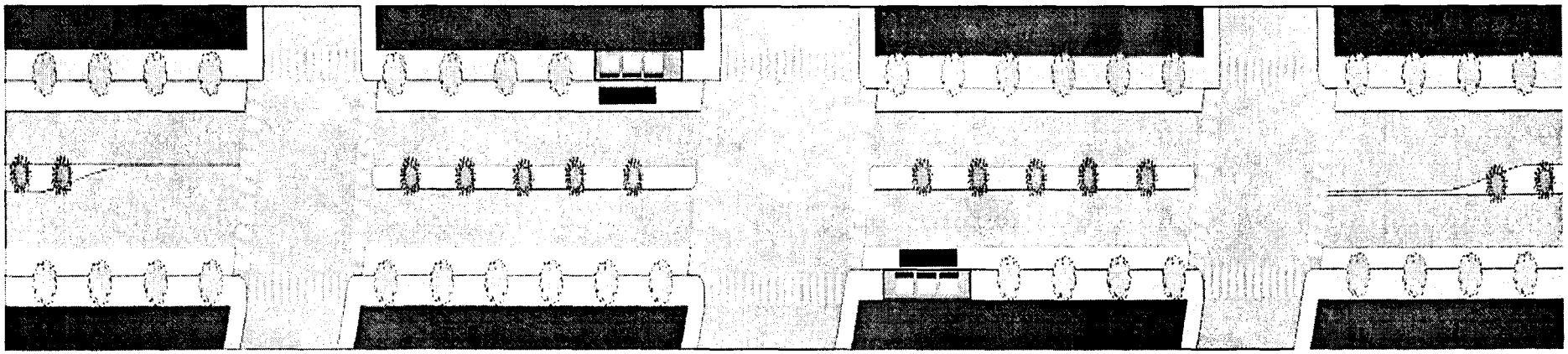


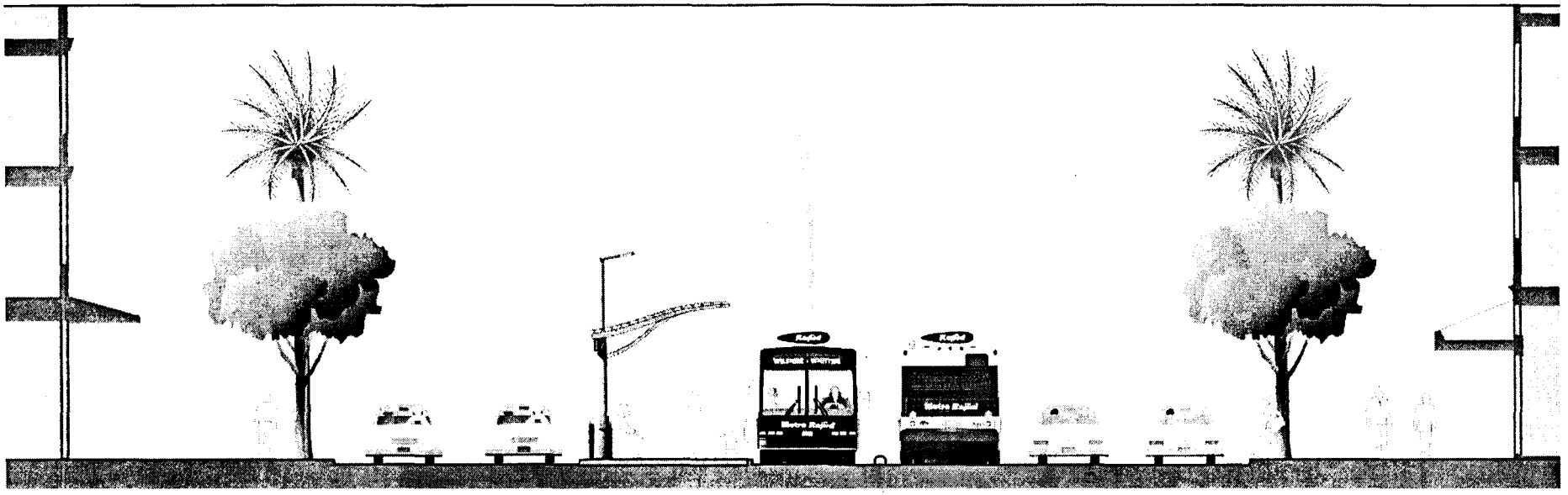
ALTERNATIVE 1

WILSHIRE BOULEVARD (BRT)

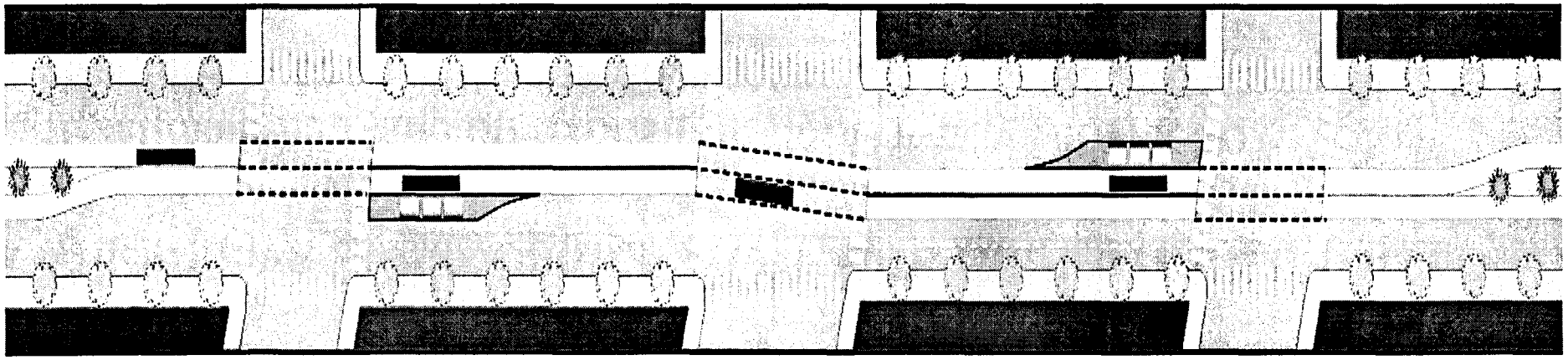


Wilshire Boulevard • BUS STOP ON SIDEWALK (typical)





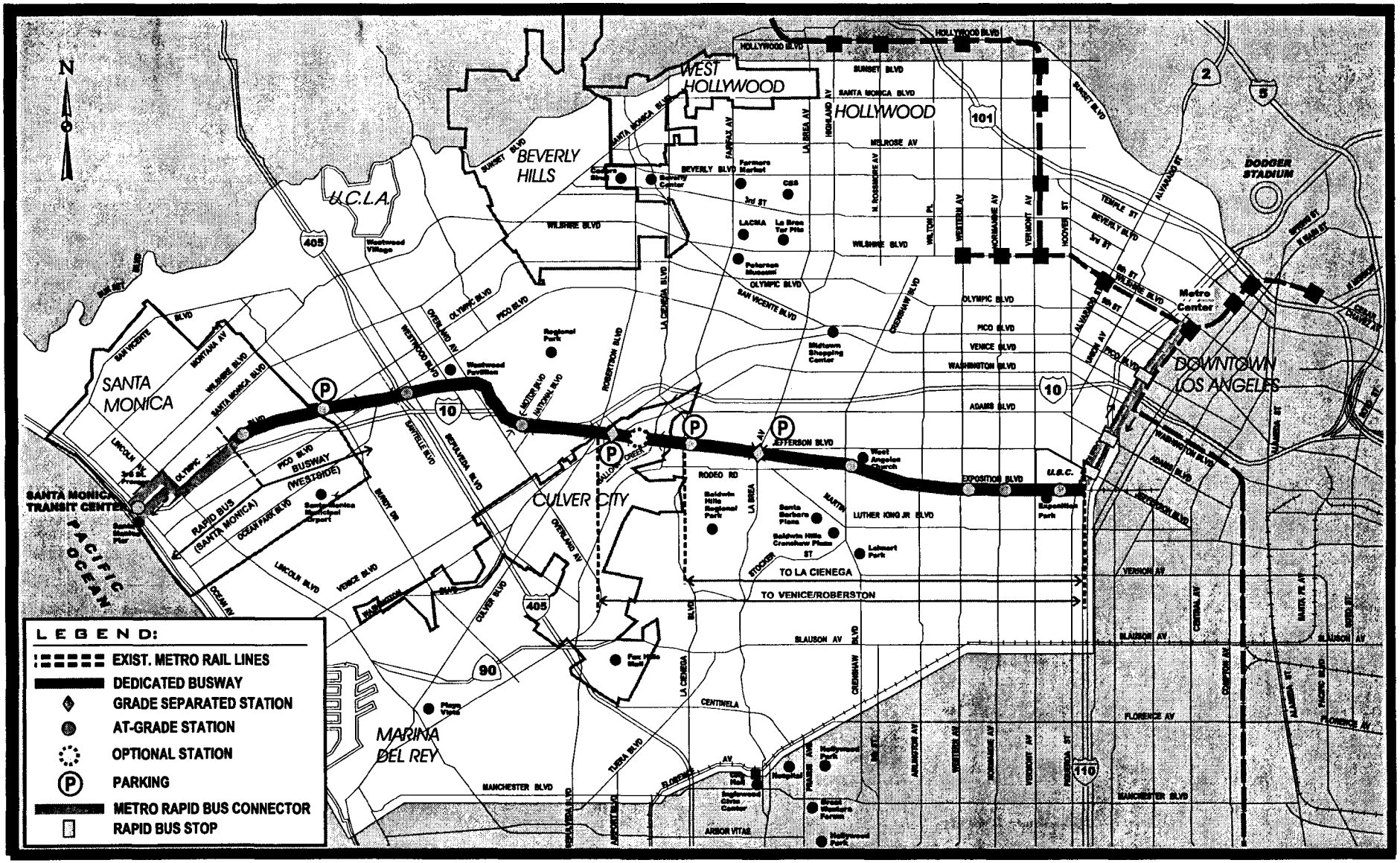
Wilshire Boulevard • BUS STOP ON MEDIAN (typical)



Alternative 2: **Exposition ROW Bus Rapid Transit (BRT)**

Exclusive bus lane on Exposition right-of-way with Metro Rapid Bus connections to downtown Los Angeles and Santa Monica

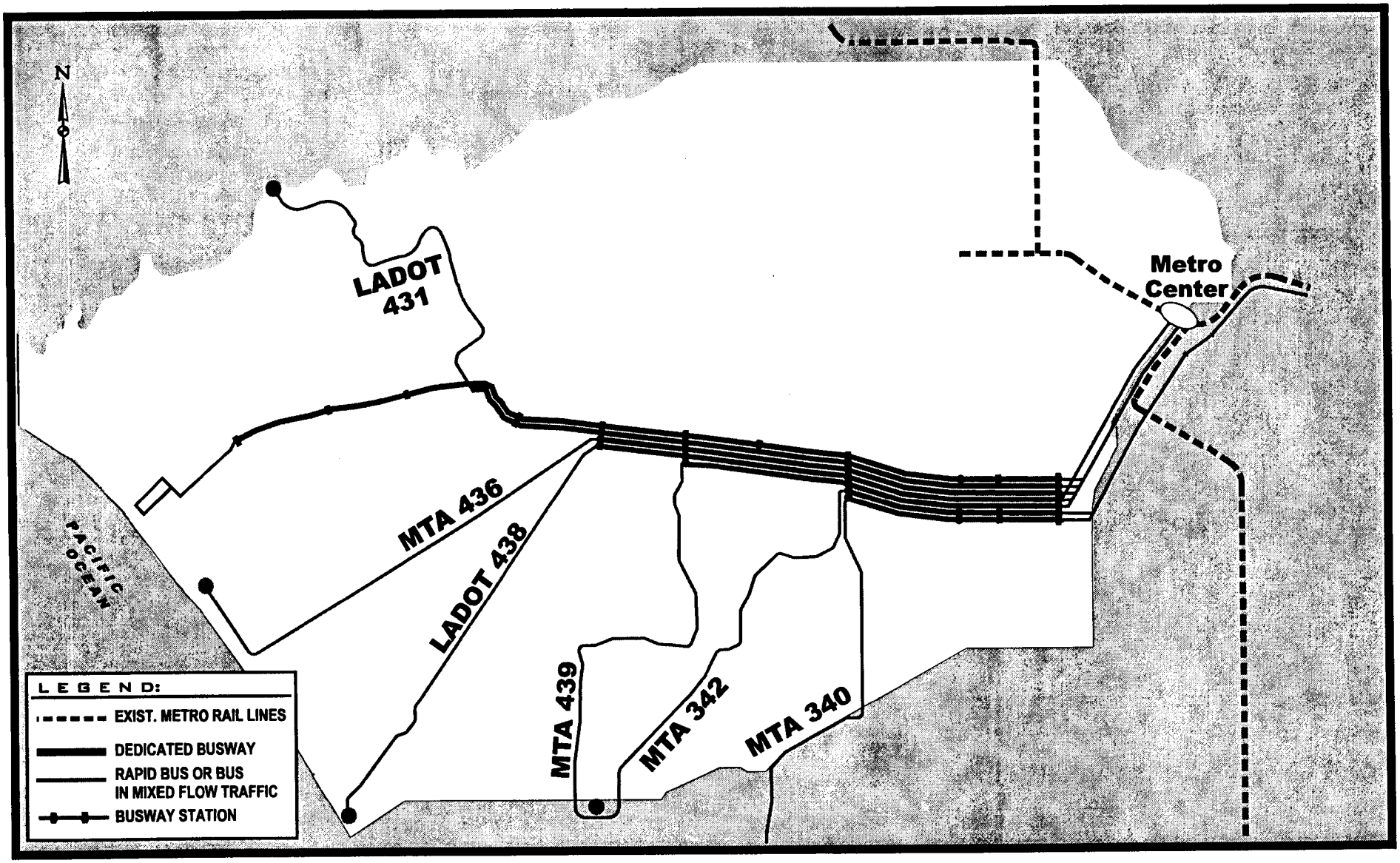
- **Full length project from downtown Los Angeles (7th/Flower to Santa Monica (15.6 miles)**
- **Alternative length to La Cienega Boulevard (7.7 miles)**
- **Alternative length to Venice Boulevard (8.5 miles)**



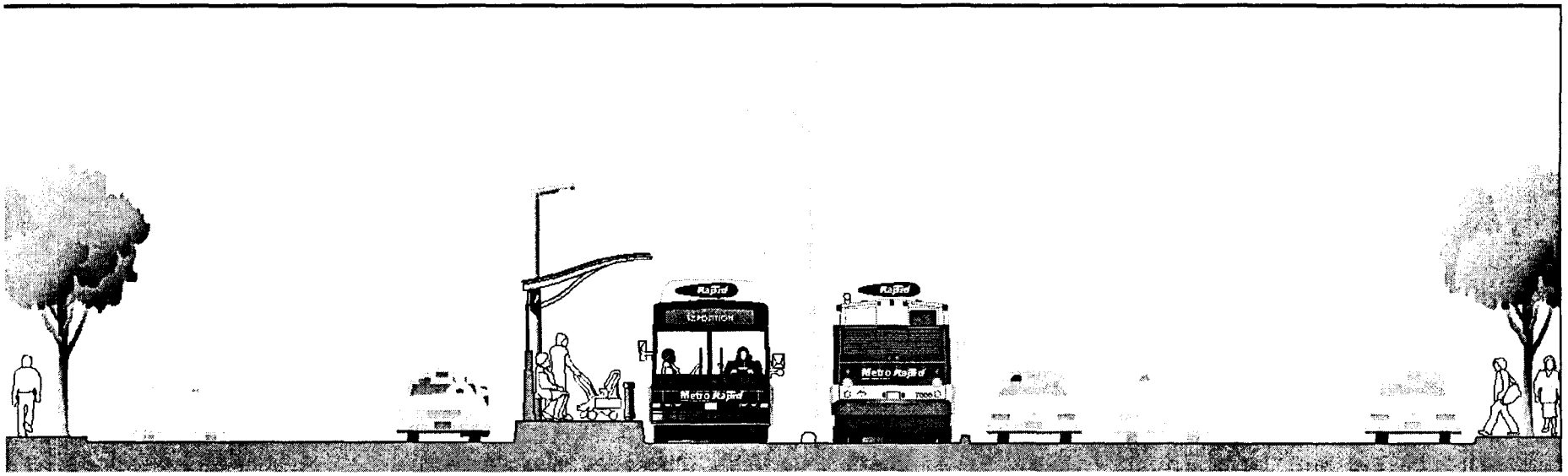
ALTERNATIVE 2

2/4/2000

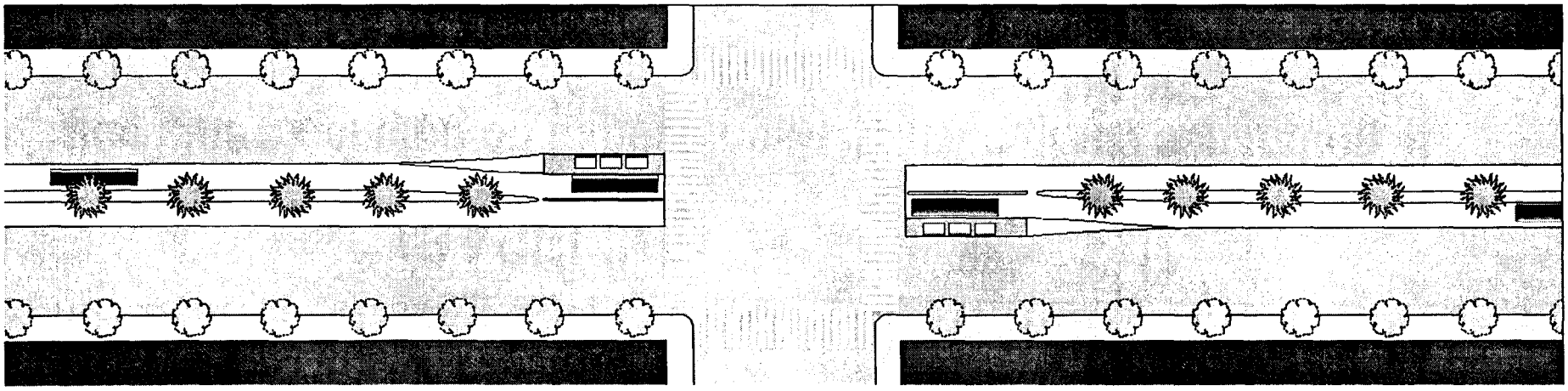
19 EXPOSITION BUS RAPID TRANSIT (BRT)



EXPOSITION BUS RAPID TRANSIT (BRT)
SHOWING EXPRESS FEEDER BUS LINES



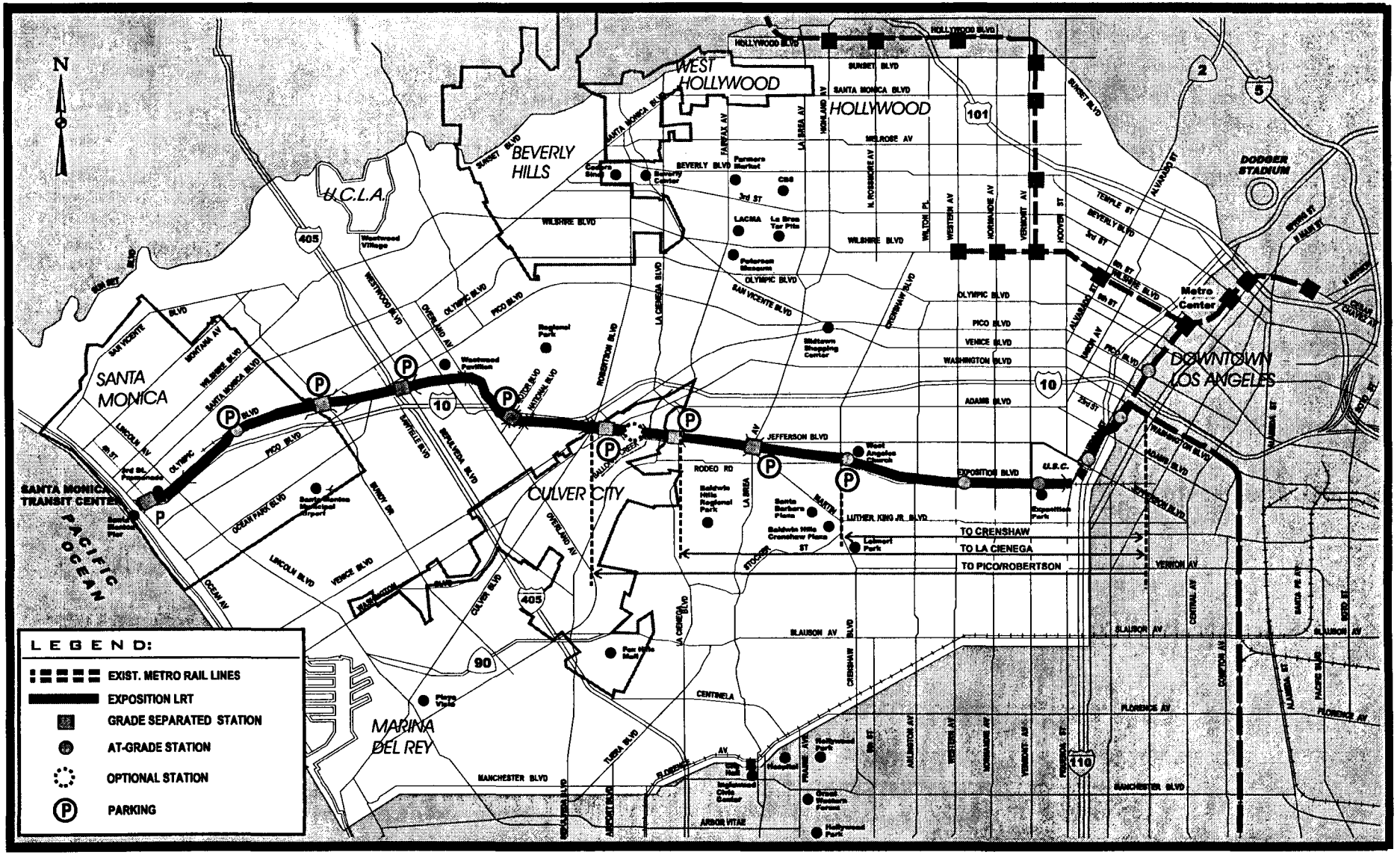
Exposition Boulevard • BUS STOP ON MEDIAN (typical)



Alternative 3a: **Exposition ROW Light Rail Transit (LRT) (BASELINE)**

Blue Line extension on Exposition ROW (with grade separation at 12 major crossings).

- **Full length project from downtown Los Angeles (7th/Flower to Santa Monica (15.1 miles)**
- **Alternative length to Crenshaw Boulevard (5.3 miles)**
- **Alternative length to La Cienega Boulevard (7.7 miles)**
- **Alternative length to Venice Boulevard (8.5 miles)**



ALTERNATIVE 3a

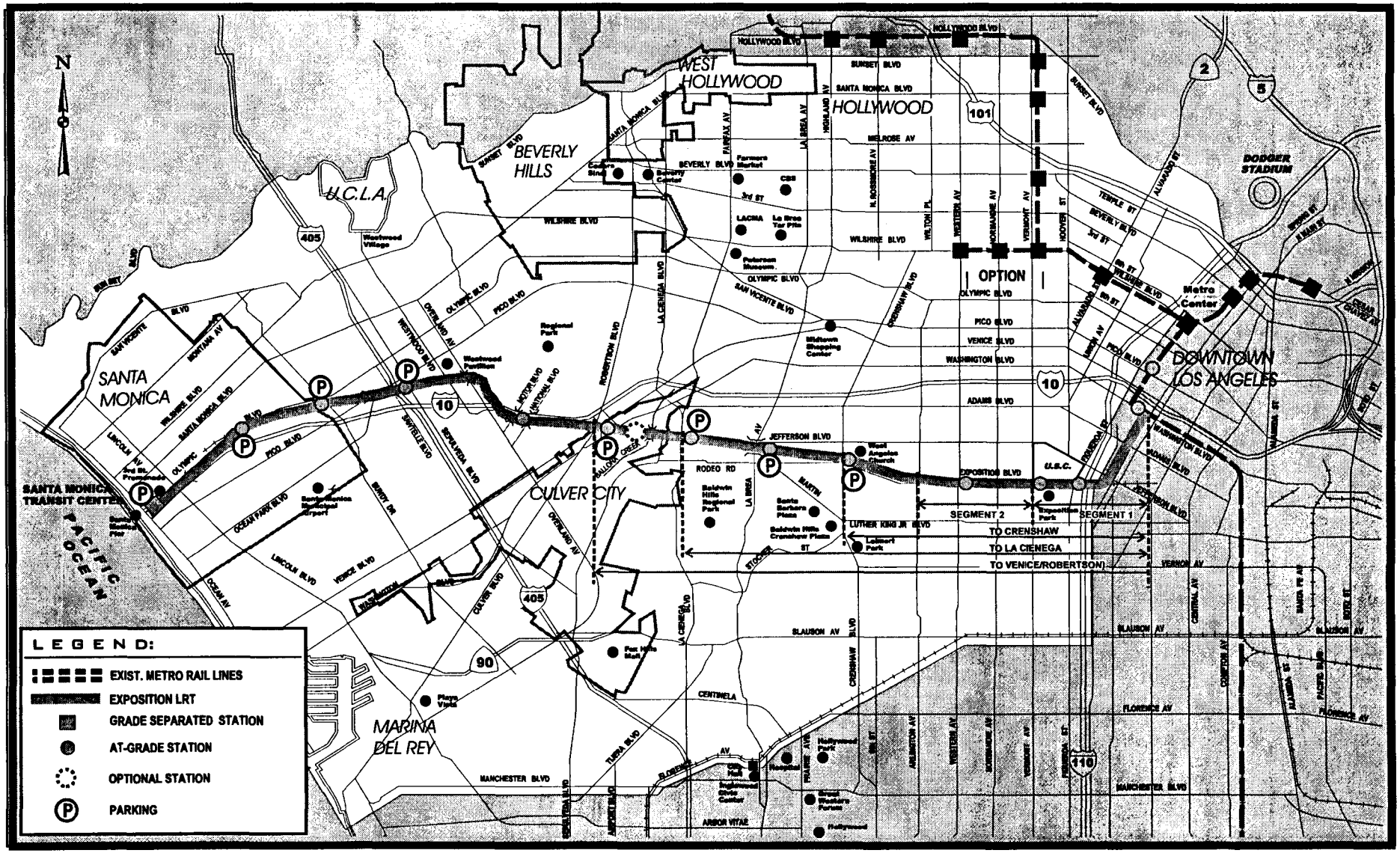
2/4/2000

23 EXPOSITION LIGHT RAIL-TRANSIT (LRT)

Alternative 3b: **Exposition ROW Light Trail Transit (LRT) (MINIMUM GRADE SEPARATIONS)**

Blue Line extension on Exposition ROW (with grade separation at 4 major crossings).

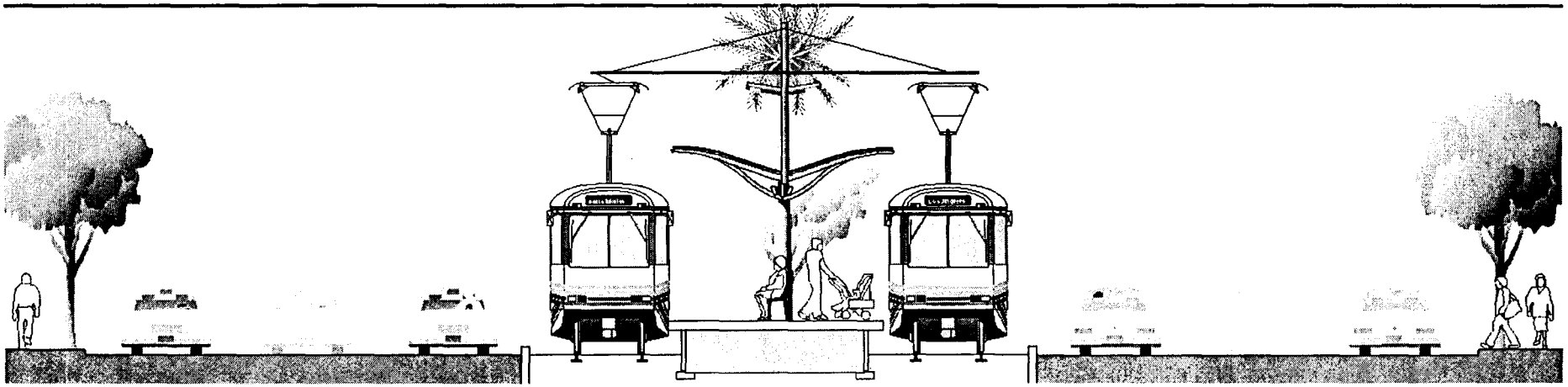
- **Full length project from downtown Los Angeles (7th/Flower to Santa Monica (15.5 miles)**
- **Alternative length to Crenshaw Boulevard (5.6 miles)**
- **Alternative length to La Cienega Boulevard (8.0 miles)**
- **Alternative length to Venice Boulevard (8.8 miles)**



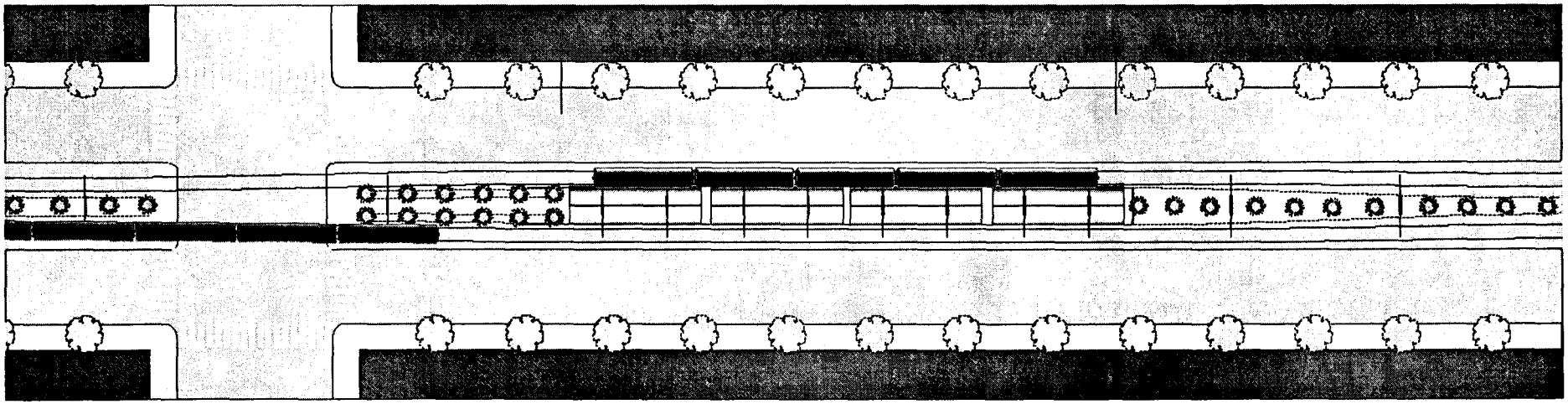
ALTERNATIVE 3b

2/4/2000

25 EXPOSITION LIGHT RAIL-TRANSIT (LRT)



Exposition Boulevard • LIGHT RAIL STATION (typical)

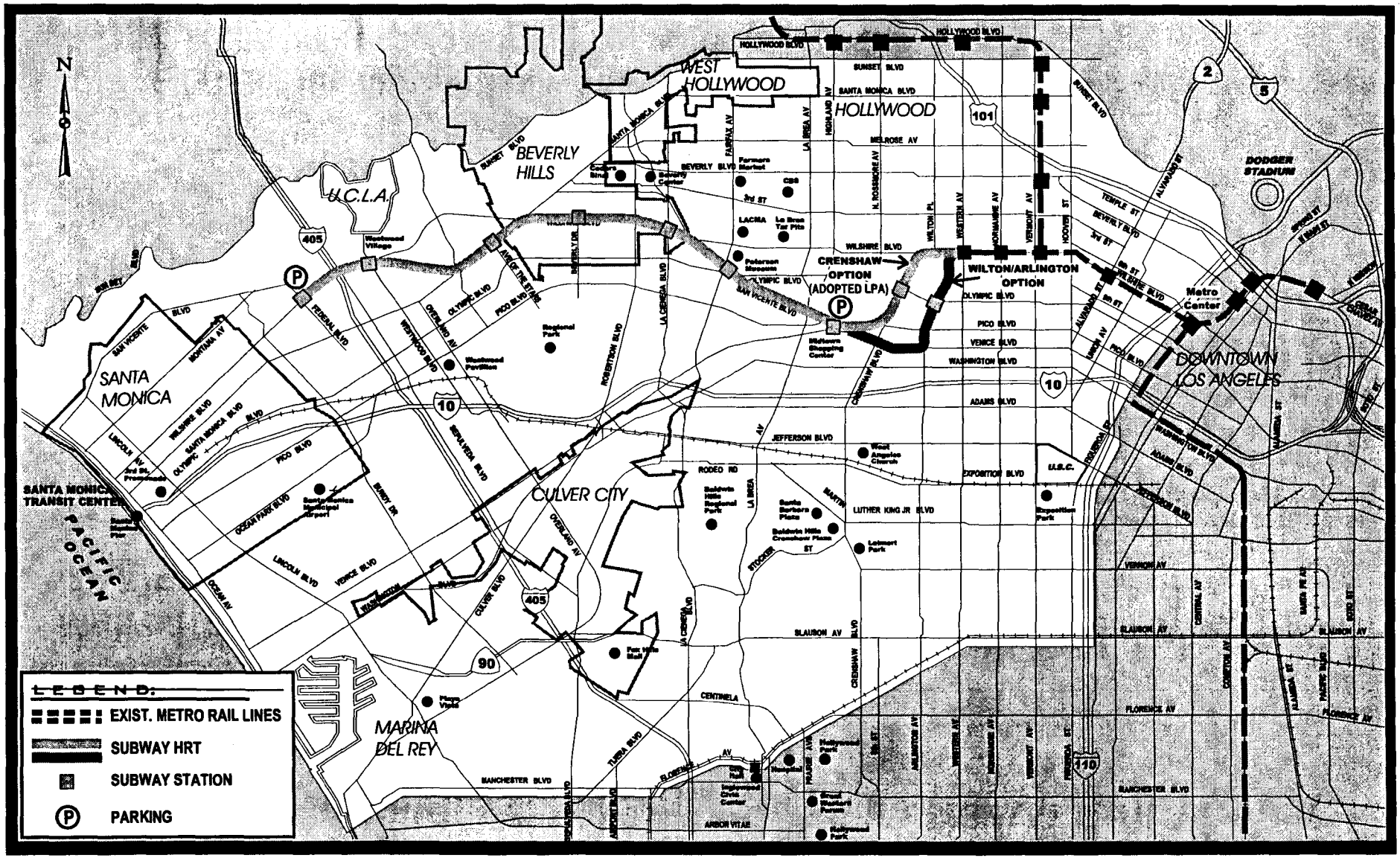


Alternative 4: **Wilshire Boulevard Subway Heavy Rail Transit via Pico/San Vicente**

Metro Red Line subway extension on Wilshire Boulevard via Pico/San Vicente (Wilton/Arlington alignment).

- **Full length project from Metro Red Line Wilshire/Western station to Wilshire/Federal (10.1 miles).**
- **Alternative length Pico/San Vicente (2.6 miles). Adopted LPA.**

NOTE: **This alternative would not be eligible for local sales tax (Proposition A).**



ALTERNATIVE 4

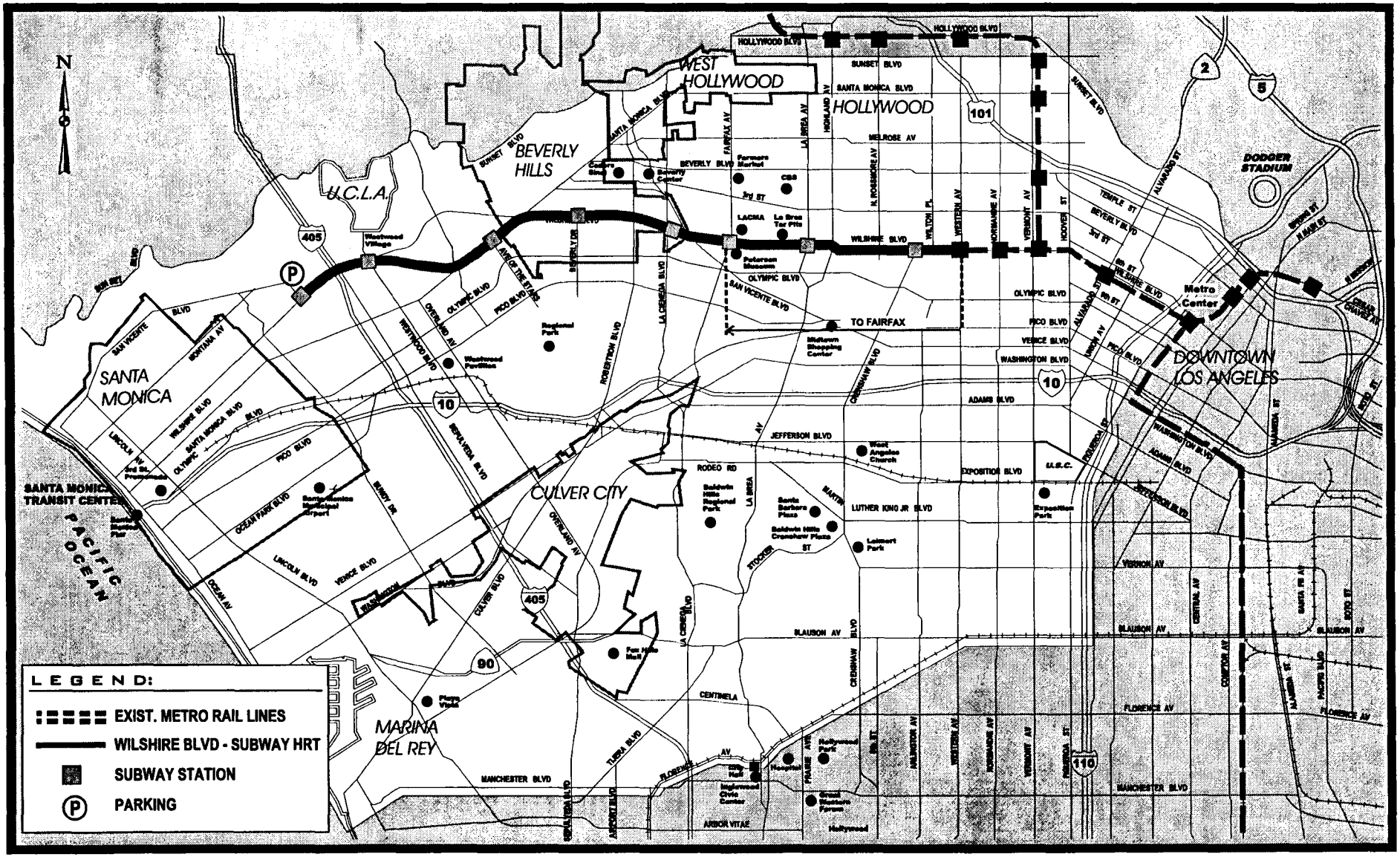
PICO/SAN VICENTE - SUBWAY (HRT)

Alternative 5: **Wilshire Boulevard Subway Heavy Rail Transit via Wilshire**

Metro Red Line subway extension on Wilshire Boulevard

- **Full length project from Metro Red Line Wilshire/Western station to Wilshire/Federal (9.0 miles).**
- **Alternative length Wilshire/Fairfax (3.2 miles).**

NOTE: **This alternative would not be eligible for local sales tax (Proposition A) or federal funding (Methane Zone).**



ALTERNATIVE 5

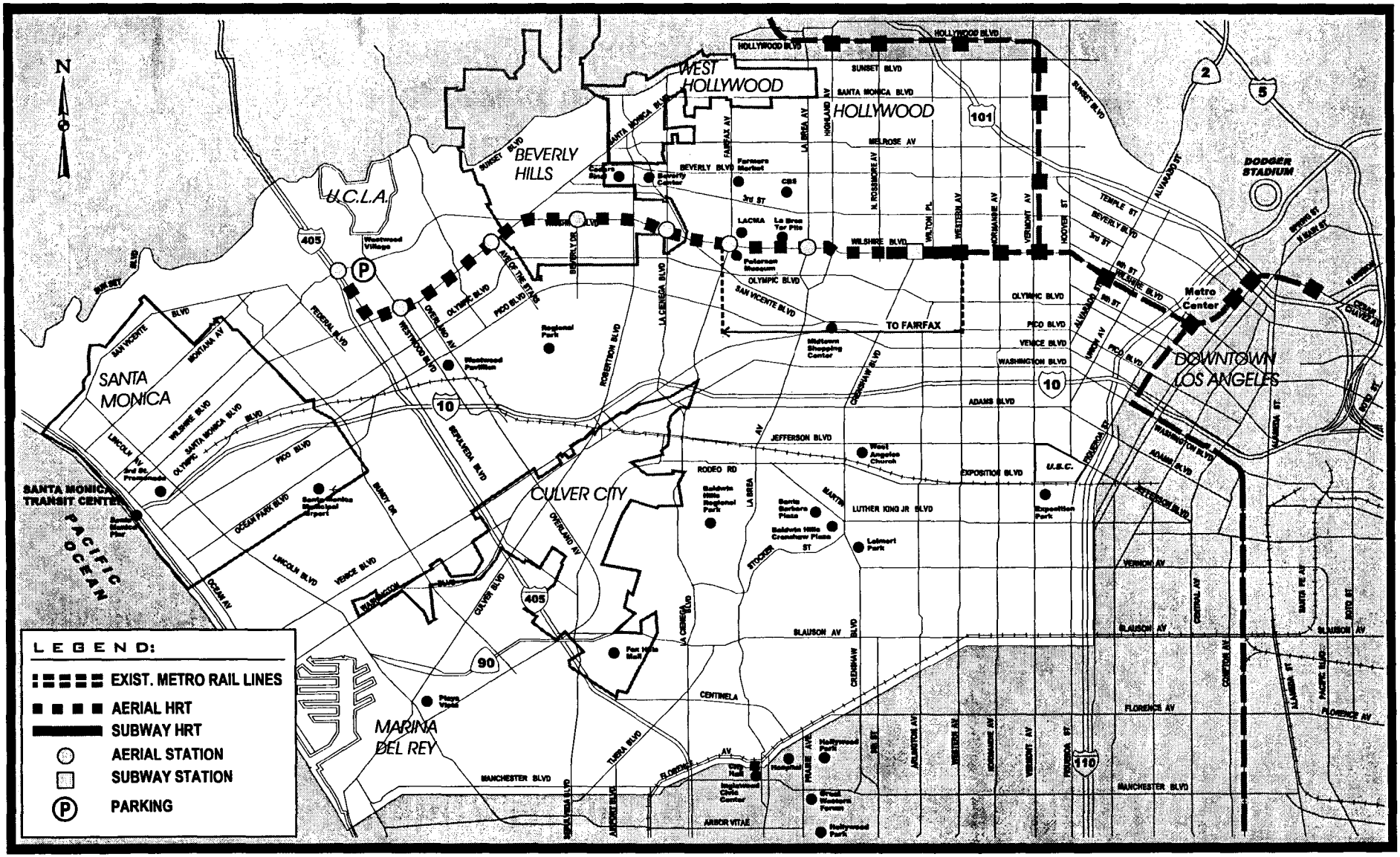
2/4/2000 **30 WILSHIRE BOULEVARD-SUBWAY (HRT)**

Alternative 6: **Wilshire Boulevard Aerial Heavy Rail Transit via Wilshire**

Metro Red Line extension on Wilshire Boulevard with aerial guideway

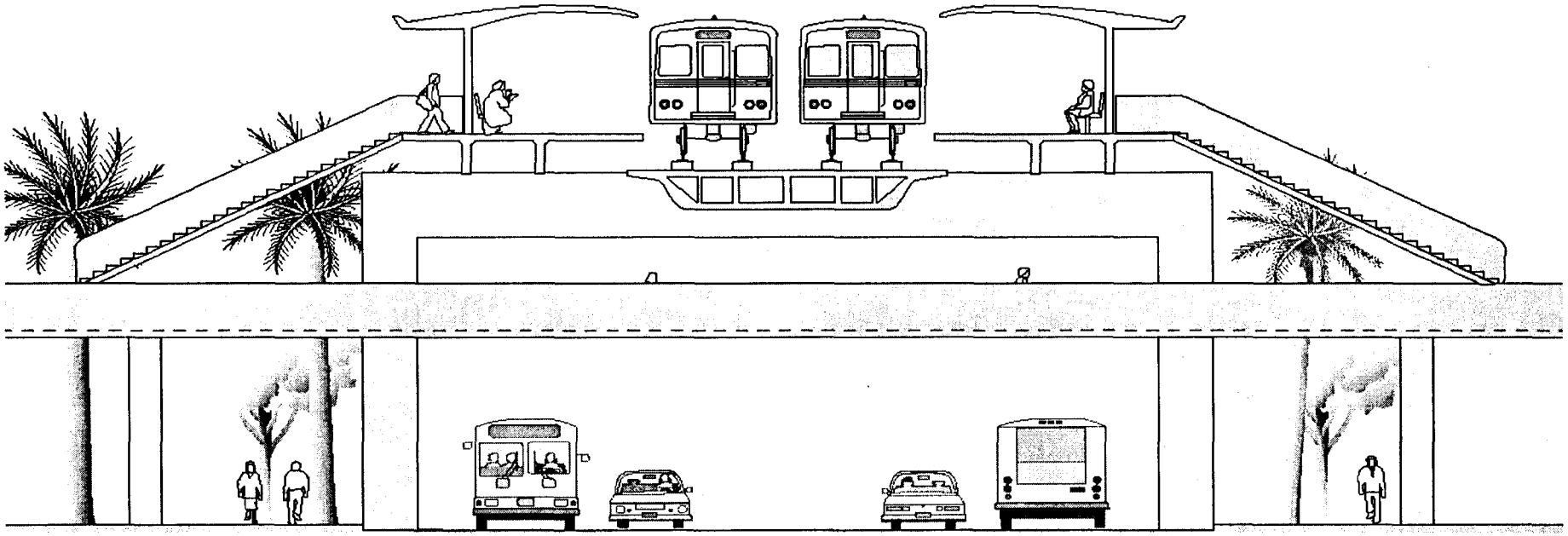
- **Full length project from Metro Red Line Wilshire/Western station to Wilshire/Sepulveda (8.9 miles)**
- **Alternative length Wilshire/Fairfax (3.2 miles)**

NOTE: **Due to federal and local restrictions on subway, aerial rail would represent the only current Metro Red Line extension that is possible to construct on Wilshire Boulevard without changes to existing law or funding restrictions.**

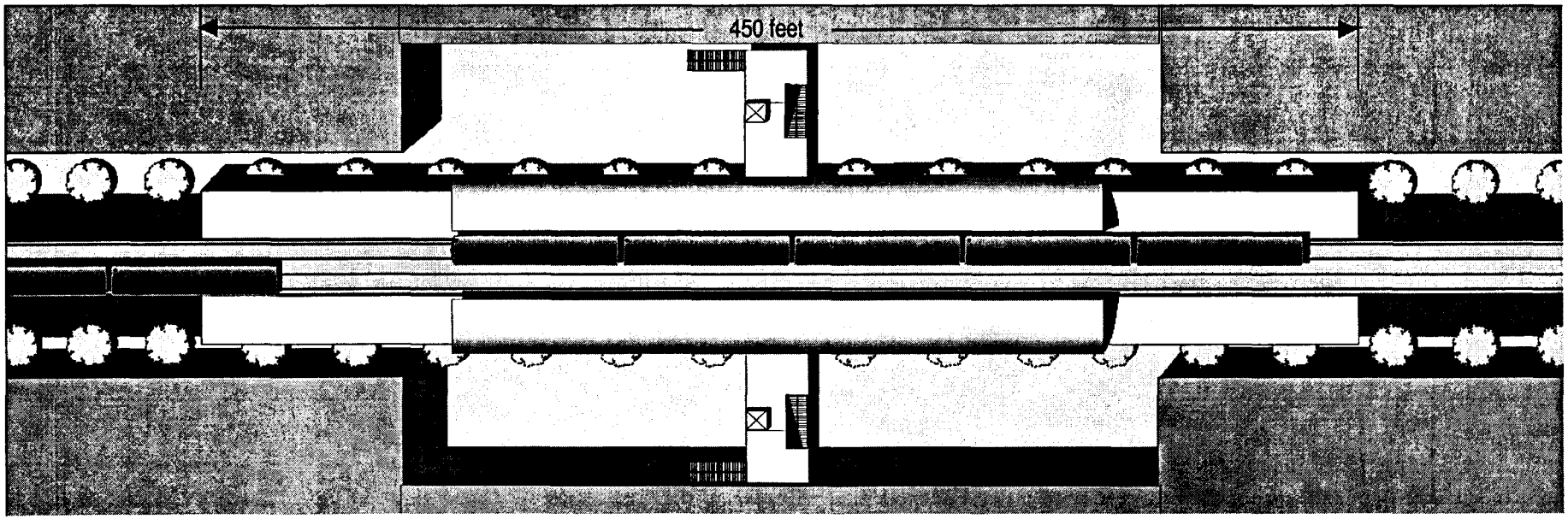


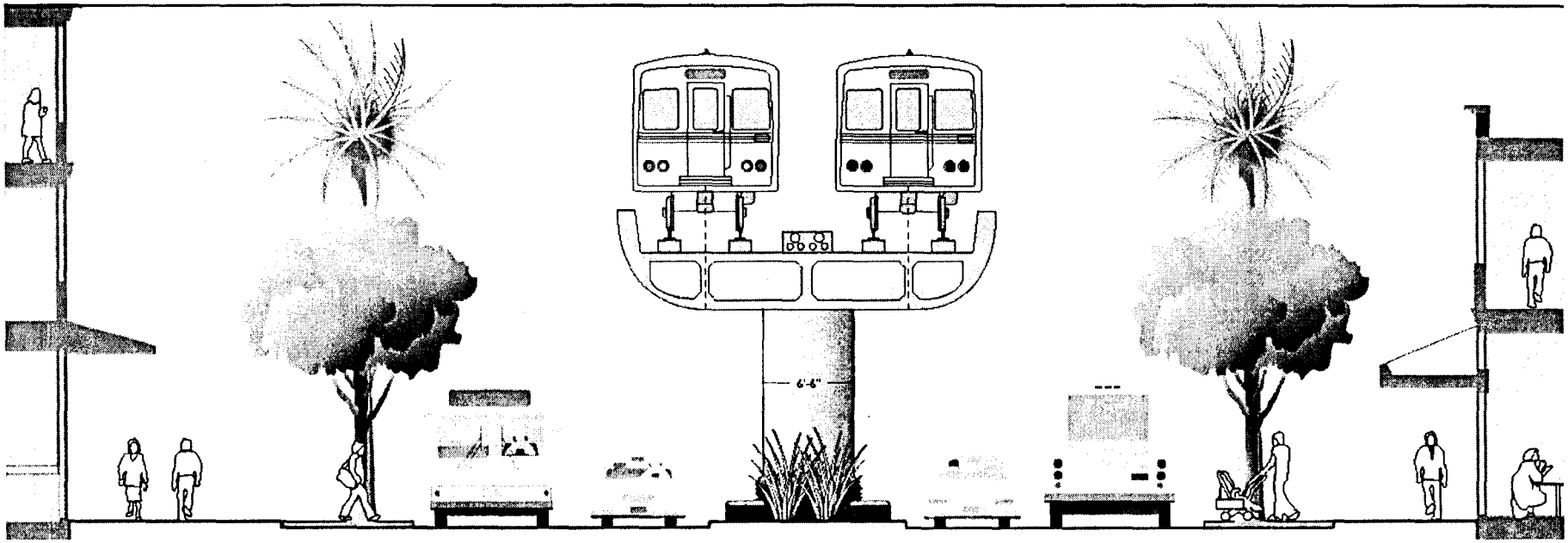
ALTERNATIVE 6

2/4/2000 32 WILSHIRE BOULEVARD - AERIAL (HRT)

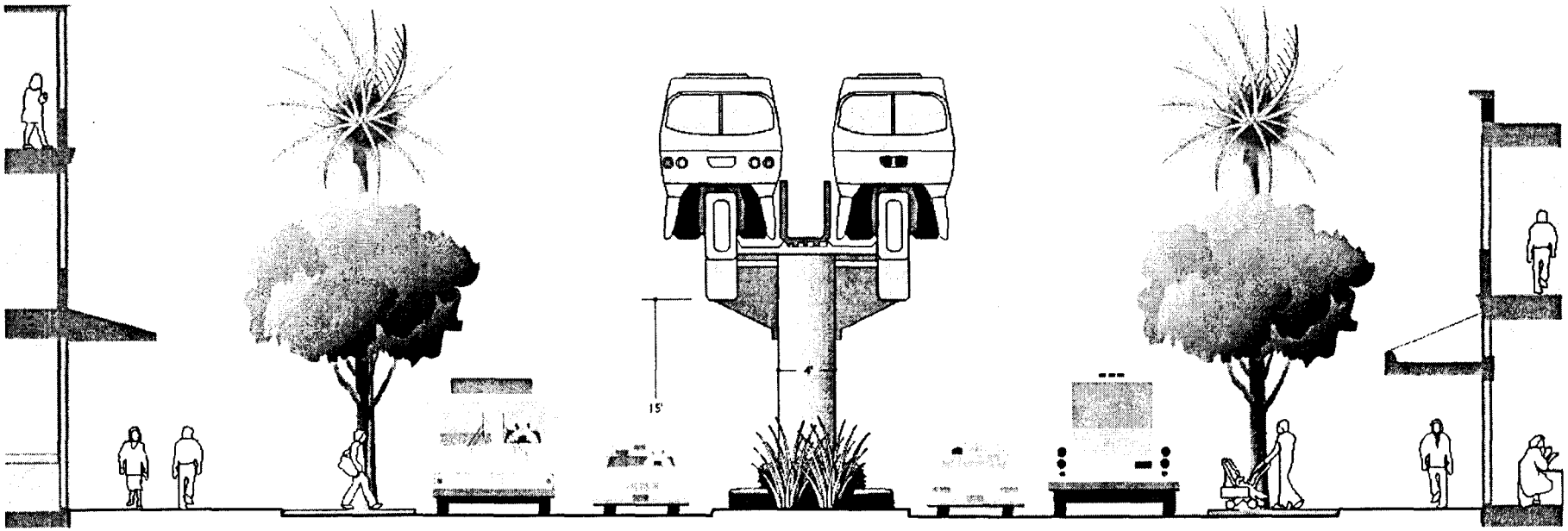


Wilshire Boulevard • AERIAL STATION (typical)





Wilshire Boulevard • AERIAL



Wilshire Boulevard • MONORAIL

Evaluation Criteria

- Costs
- Ridership
- Cost-Effectiveness
- Travel Time Savings
- Environmental Issues
- Community Acceptability

CAPITAL COST

(Millions in 1999 Dollars)

ALTERNATIVE	FULL LENGTH	ALTERNATIVE LENGTH		OPTION
TSM	$92	N/A	N/A	N/A
1 Wilshire BRT	$169 To Santa Monica	$62 To San Vicente	N/A	N/A
2 Exposition BRT	$188 To Santa Monica	$76 To La Cienega	$87 To Venice Blvd	N/A
3a Exposition LRT (Baseline)	$589 To Santa Monica	$178 To Crenshaw	$312 To La Cienega	$398 To Venice Blvd
3b Exposition LRT (Minimum Grade Separations)	$431 To Santa Monica	$135 To Crenshaw	$209 To La Cienega	$227 To Venice Blvd
4 Wilshire Blvd HRT Subway (via Pico/San Vicente)	$2,640 To Federal	$673 To Pico/ San Vicente	N/A	N/A
5 Wilshire Blvd HRT Subway (via Wilshire)	$2,469 To Federal	$891 To Fairfax	N/A	N/A
6 Wilshire Blvd HRT Aerial (via Wilshire)	$1,269 To Sepulveda	$543 To Fairfax	N/A	N/A

ANNUAL OPERATING COST

(Millions in1999 Dollars)

ALTERNATIVE	COMPARED TO NO BUILD (in millions)	COMPARED TO TSM (in millions)
TSM	$24	N/A
1 Wilshire BRT	$41	$17
2 Exposition BRT	$32	$7
3a Exposition LRT (Baseline)	$45	$21
3b Exposition LRT (Minimum Grade Separations)	$45	$20
4 Wilshire Blvd HRT Subway (via Pico/San Vicente)	$29 To Pico/ San Vicente	$5 To Pico/ San Vicente
5 Wilshire Blvd HRT Subway (via Wilshire)	$41 Full Length $31 To Fairfax	$17 Full Length $7 To Fairfax
6 Wilshire Blvd HRT Aerial (via Wilshire)	$41 Full Length $31 To Fairfax	$17 Full Length $7 To Fairfax

DAILY FIXED GUIDEWAY BOARDINGS

ALTERNATIVE	FULL ALLIGNMENT LENGTH
TSM	
1 Wilshire BRT	11,000 [34,000]
2 Exposition BRT	23,000
3a Exposition LRT (Baseline)	38,600
3b Exposition LRT (Minimum Grade Separations)	38,600
4 Wilshire Blvd HRT Subway via Pico/San Vicente)	11,400 (Pico/ San Vicente)
5 Wilshire Blvd HRT Subway (via Wilshire)	33,500 (Full Length) 15,800 (Fairfax)
6 Wilshire Blvd HRT Aerial (via Wilshire)	33,500 [Est] (Full Length) 15,800 (Fairfax)

NOTE : Brackets [ ] indicate sensitivity model run results assuming full signal preemption.

NEW DAILY TRANSIT TRIPS

ALTERNATIVE	COMPARED TO NO BUILD	COMPARED TO TSM
TSM	6,600	N/A
1 Wilshire BRT	8,300	1,700 [10,600]
2 Exposition BRT	12,400	5,800
3a Exposition LRT (Baseline)	15,300	8,700
3b Exposition LRT (Minimum Grade Separations)	15,300	8,700
4 Wilshire Blvd HRT Subway (via Pico/San Vicente)	10,400 (Pico/ San Vicente)	3,700 (Pico/ San Vicente)
5 Wilshire Blvd HRT Subway (via Wilshire)	15,300 (Full Length) 8,800 (Fairfax)	9,200 (Full Length) 2,200 (Fairfax)
6 Wilshire Blvd HRT Aerial (via Wilshire)	5,300 [Est] (Full Length) 8,800 (Fairfax)	9,200 [Est] (Full Length) 2,200 (Fairfax)

NOTE : Brackets [ ] indicate sensitivity model run results assuming full signal preemption.

ANNUALIZED COST PER NEW DAILY TRANSIT TRIP

(1999 Dollars)

ALTERNATIVE	COMPARED TO NO BUILD	COMPARED TO TSM
TSM	$16	N/A
1 Wilshire BRT	$24	$60
2 Exposition BRT	$14	$13
3a Exposition LRT (Baseline)	$21	$25
3b Exposition LRT (Minimum Grade Separations)	$18	$20
4 Wilshire Blvd HRT Subway (via Pico/San Vicente)	$28 (Pico/ San Vicente)	$50 (Pico/ San Vicente)
5 Wilshire Blvd HRT Subway (via Wilshire)	$50 (Full Length) $40 (Fairfax)	$75 (Full Length) $114 To Fairfax
6 Wilshire Blvd HRT Aerial (via Wilshire)	$30 Full Length $29 (Fairfax)	$41 (Full Length) $72 (Fairfax)

Key Environmental Issues

1. Wilshire BRT

- Traffic Diversion - loss of two lanes (one lane each direction)
- Access & Circulation - significant loss of left-turn lanes (minimum of 43 out of 101 to San Vicente)
- Parking - loss of on-street parking (280 spaces to San Vicente)
- Impact to North / South traffic
- Impaired access to local businesses

Key Environmental Issues

(continued)

2. Exposition BRT

- Safety at grade - crossings (27)
- Impact to North / South traffic
- Noise
- Aesthetics

3. Exposition LRT

- At-grade crossing safety concerns (25-35)
- Impacts on North / South traffic flow
- Noise (especially nighttime due to warning bells/horn)
- Aesthetics

Key Environmental Issues

(continued)

4. Mid-City Subway HRT

- Gas-related safety and odor concerns
- Construction impacts
- Interim terminus-related impacts; especially traffic

5. Wilshire Subway HRT

- Gas-related safety and odor concerns
- Construction Impacts

6. Wilshire Aerial HRT

- Permanent and unavoidable alteration of visual environment
- Significant impact on historic properties
- Construction Impacts

SUMMARY OF COMMUNITY SUPPORT

Alternative 1: **Wilshire BRT**

- **Limited support**
- **Community not familiar with alternative**
- **Some business opposition**

Alternative 2: **Exposition BRT**

- **Viewed as creating less impacts than LRT**
- **Limited support**
- **Opposition still significant in adjacent neighborhoods, unless detours considered**

SUMMARY OF COMMUNITY SUPPORT

(continued)

Alternative 3: **Exposition LRT**

- **Several support/advocacy groups**
- **Perceived as more attractive to riders than BRT**
- **Still significant community opposition in adjacent neighborhoods**

Alternative 4: **Mid-City HRT Subway**

- **No Support evident**

SUMMARY OF COMMUNITY SUPPORT

(continued)

Alternative 5: **Wilshire HRT Subway**

- **No strong support for near term**
- **Support as long-term goal if cost, safety and financing impediments removed**

Alternative 6: **Wilshire HRT Aerial**

- **Strong opposition to HRT**
- **Wilshire Center Advocacy Group supports**
- **monorail; other groups oppose**

SAN FERNANDO VALLEY EAST-WEST TRANSIT CORRIDOR

NORTH HOLLYWOOD

LAUREL CANYON

FULTON-BURBANK

WOODMAN

VAN NUYS

SEPULVEDA

WOODLEY

BALBOA

WHITE OAK

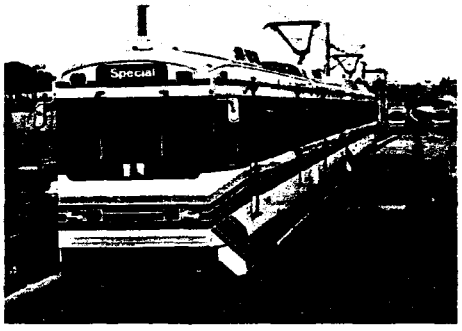
RESEDA

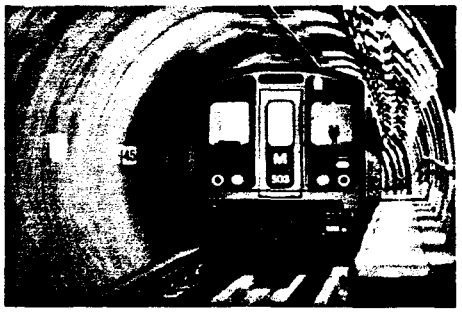
TAMPA

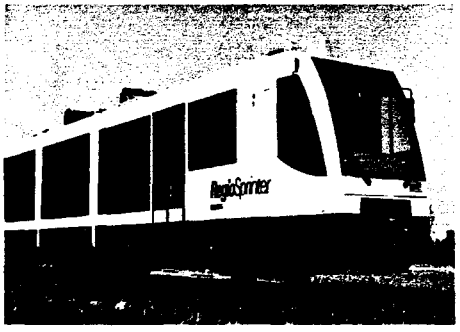
WINNETKA

DE SOTO

WARNER CENTER







EXECUTIVE SUMMARY

MAJOR INVESTMENT STUDY

February 18, 2000

THE LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

SUMMARY

Over the past six months, the Consultant Team, headed by Gruen Associates, and Los Angeles County Metropolitan Transportation Authority (MTA) staff have worked in concert to define, develop, and ascertain the performance of a wide array of potential transportation solutions appropriate to the San Fernando Valley East-West Transit Corridor. This effort has drawn upon past work, as appropriate, to define a set of cost-effective alternatives which will undergo further in-depth analysis through the environmental impact process.

The task was defined as a review of "all feasible alternatives" and the inclusion of lower cost alternatives. Some of the alternatives reviewed follow the existing Long Range Plan and applicable limiting state law (SB 211/Robbins bill). Others are incompatible with these constraints. The recommendations that follow are therefore based on the cost-effectiveness analysis contained in this Major Investment Study and have not undergone in-depth screening against environmental impact or community acceptability criteria. These further steps will be conducted during the environmental documentation phase of the work.

Recommended alternatives on the Southern Pacific Burbank Branch Right-of-Way (SP ROW) to be carried forward in the environmental process are the following:

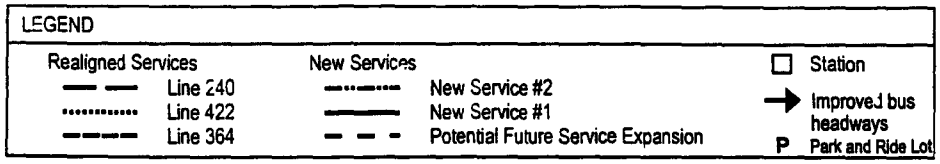
- Alternative 1, Bus Rapid Transit (BRT) from North Hollywood to Warner Center, to be studied in a Draft Environmental Impact Statement / Draft Supplemental Environmental Impact Report. **Figure S-1** depicts the routing plan, stations, and the location of park and ride facilities for Alternative 1.
- A minimum operating segment (MOS), or initial phase, for Alternative 1 from Woodman Avenue to Balboa Boulevard. This initial phase would connect North Hollywood and Warner Center, using Oxnard Street and Victory Boulevard for on-street operations. **Figure S-1** also depicts the configuration of the MOS.

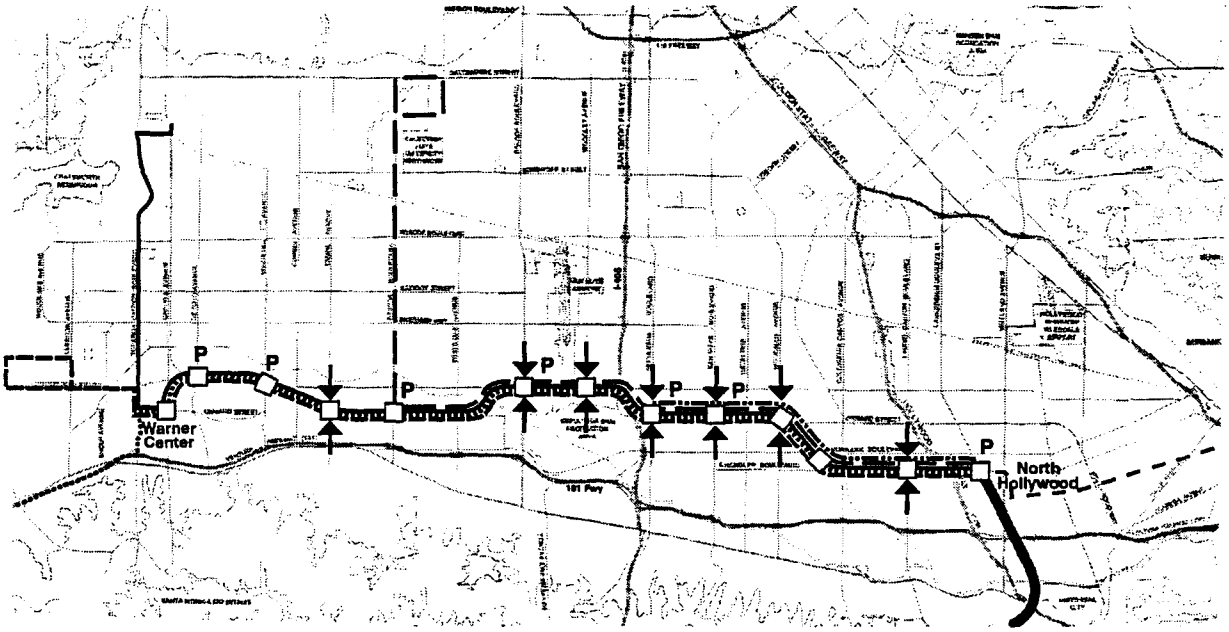
The SP ROW, owned by MTA, is typically 100' wide except within the median of Chandler Boulevard where it is 60' wide. These recommended alternatives consist of an at-grade 26' wide busway in a landscaped environment with thirteen stations spaced approximately one mile apart **(Figure S-2).** At major street crossings buses would be given traffic signal priority over automobiles, facilitating cross valley travel.

S.1 PURPOSE AND NEED FOR THE PROPOSED ACTION

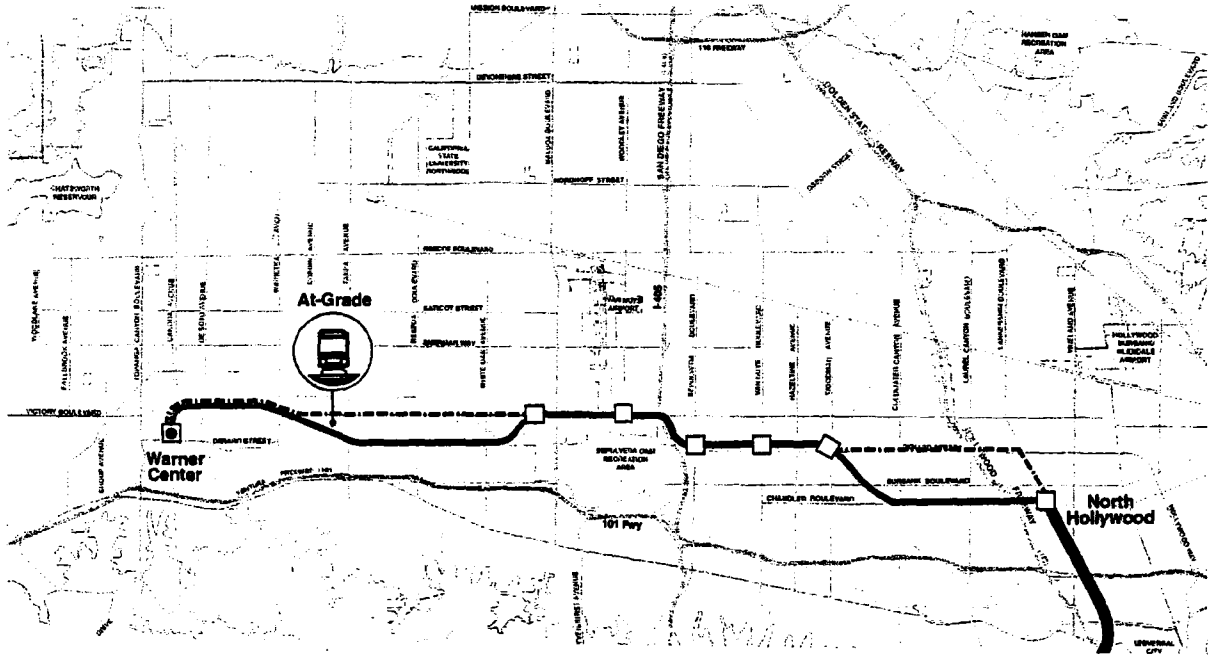
S.1.1 Purpose of the Major Investment Study

The San Fernando Valley East-West Transit Corridor has been a candidate for transit investment since 1980, when it was included in a conceptual rail system approved for development by Los Angeles County voters. Transit studies in this corridor have provided analysis of alternative routes, primarily focusing on potential rail enhancements within the corridor. In 1994, the MTA Board endorsed the SP Burbank Branch Corridor (SP ROW) for the extension of the Red Line subway. The Administrative EIS/SEIR produced for the San Fernando Valley, prepared in 1997, studies ten alternative rail projects.





Bus Routing Plan



Busway Minimum Operating Segment

SOURCE: GRUEN ASSOCIATES

San Fernando Valley
East-West Transit Corridor
Major Investment Study

FIGURE S-1
Recommended Alternative
Bus Rapid Transit (BRT)

Typical Busway (BRT) Between Stations

Van Nuys Boulevard BRT Station

San Fernando Valley
East-West Transit Corridor
Major Investment Study

FIGURE S-2
Urban Design
Bus Rapid Transit (BRT)

In 1998, however, Federal Transit Administration (FTA) consideration of this document was put on hold. The MTA underwent restructuring and committed itself to financially feasible long range transit planning. Part of this restructuring has included a focus on lower-cost improvements, including development of new bus-based transit enhancements.

In 1999, the MTA directed that studies should be undertaken to formulate project implementation decisions in three corridors: the Eastside, the Westside, as well as the San Fernando Valley. The present effort is intended to examine a revised set of alternatives for the San Fernando Valley and publish the results for consideration by the Board, alongside similar MIS documents being prepared for the other two corridors. These documents will reflect the principles to which the MTA committed itself during its restructuring. This will then lead to an intended selection of corridors and technologies for further advancement.

Location of Study Corridor

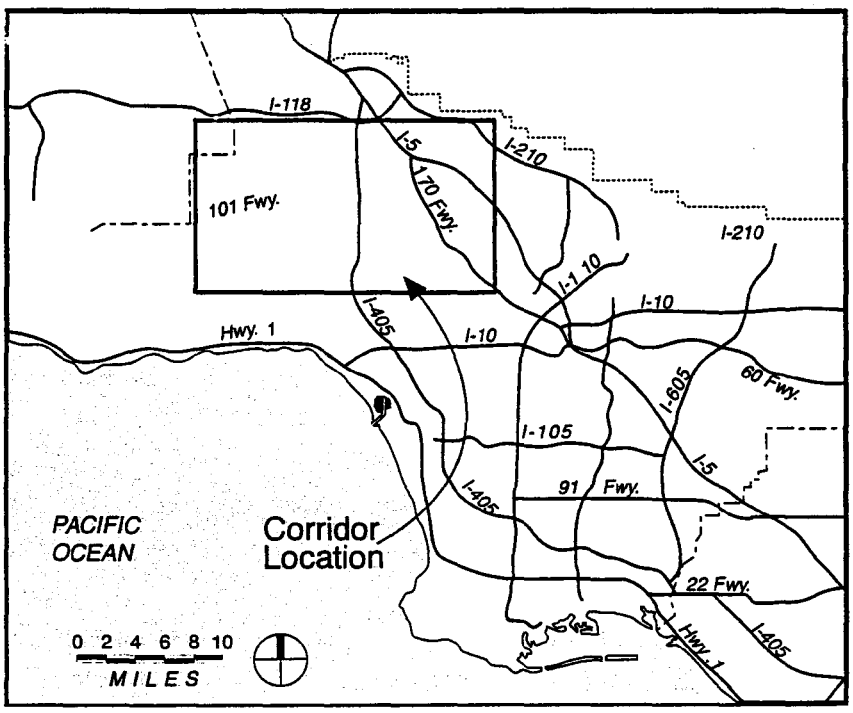
The corridor that is the subject of this study is the San Fernando Valley East-West Transit Corridor, located in the southern portion of the San Fernando Valley. The corridor stretches from east to west across the entire Valley, from the current planned terminus of the Metro Red Line in North Hollywood through Van Nuys, Reseda, and Canoga Park to Warner Center, a distance of approximately 14 miles. The corridor, which varies in width from one to three miles, parallels the heavily-traveled Ventura Freeway (U.S. 101) and connects activity centers such as the North Hollywood Business District, Valley College, the Valley Government Center in Van Nuys, Pierce College, and Warner Center. The location of the study corridor is depicted in **Figure S-3**.

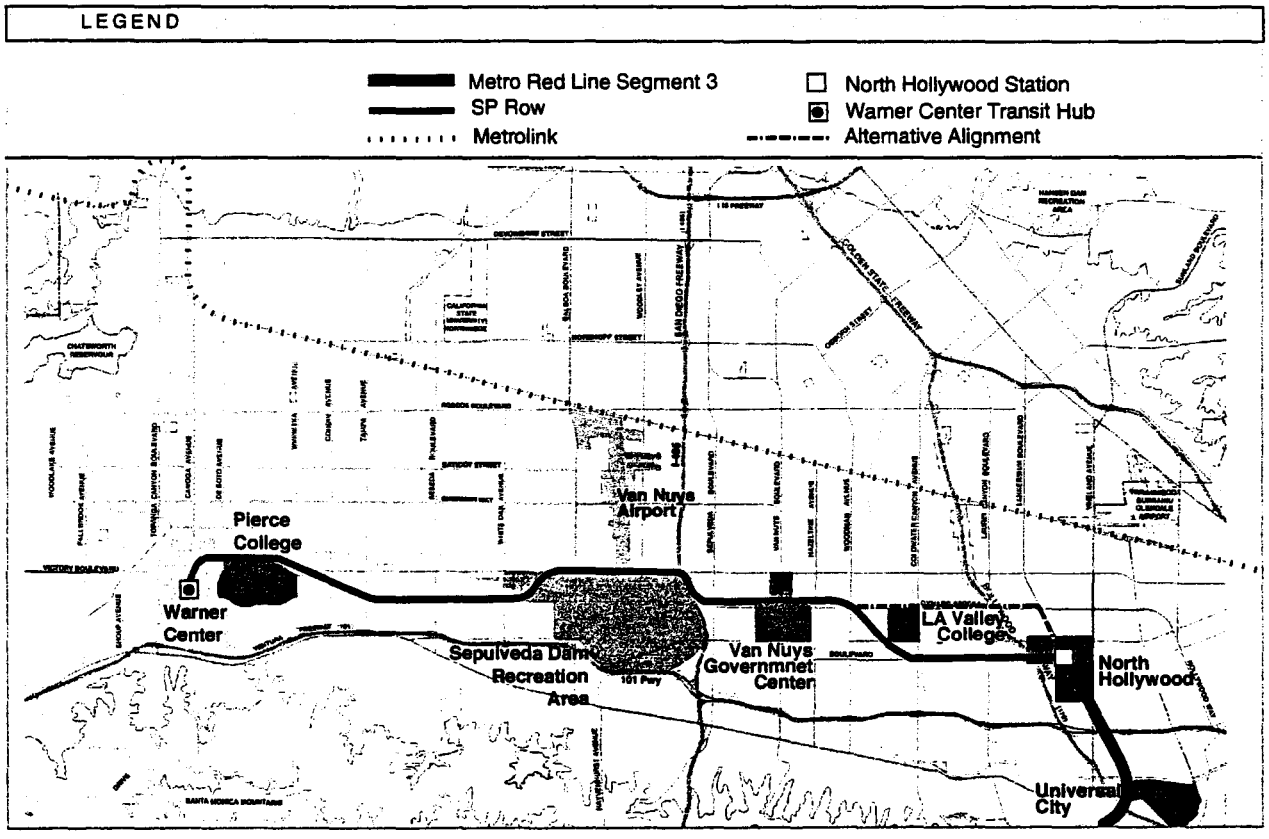
Prior Planning Efforts

Transit planning for the San Fernando Valley has been underway since 1980, when Los Angeles County voters approved a one-half cent sales tax increase dedicated to funding a regional rail system. Evaluation of route alternatives took pace through the 1980's **(Figure S-4)**. Among the alignments studied were:

- Sherman Way,
- Victory Boulevard,
- Ventura Boulevard,
- The Los Angeles River,
- The Southern Pacific Coast Mainline,
- The SP Burbank Branch (SP ROW), and
- The Ventura Freeway.

Technologies under consideration ranged from at-grade and aerial light rail to heavy rail in a deep-bore tunnel. Preliminary analysis led to the removal of the Sherman Way and Ventura Boulevard alternatives. Implementation of a transit system on either of these two streets would have required acquisition of significant numbers of private commercial properties at substantial expense. The remaining alternatives,



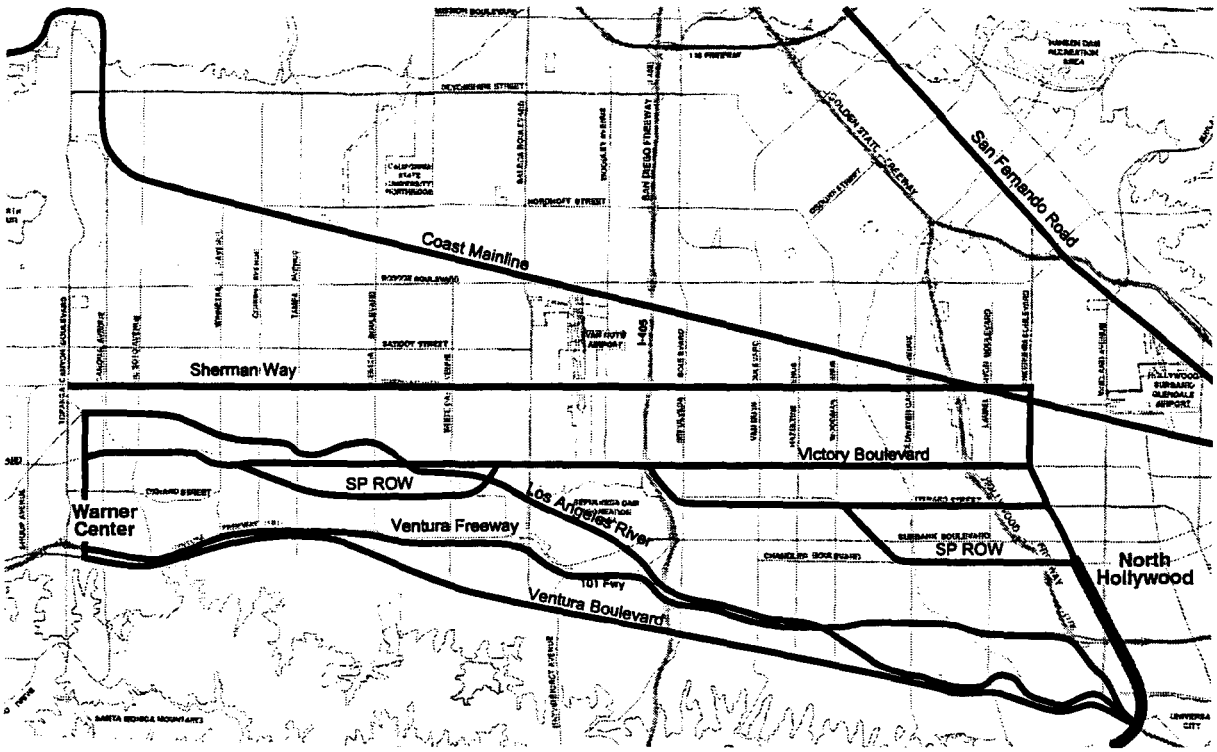


Location of Study Corridor

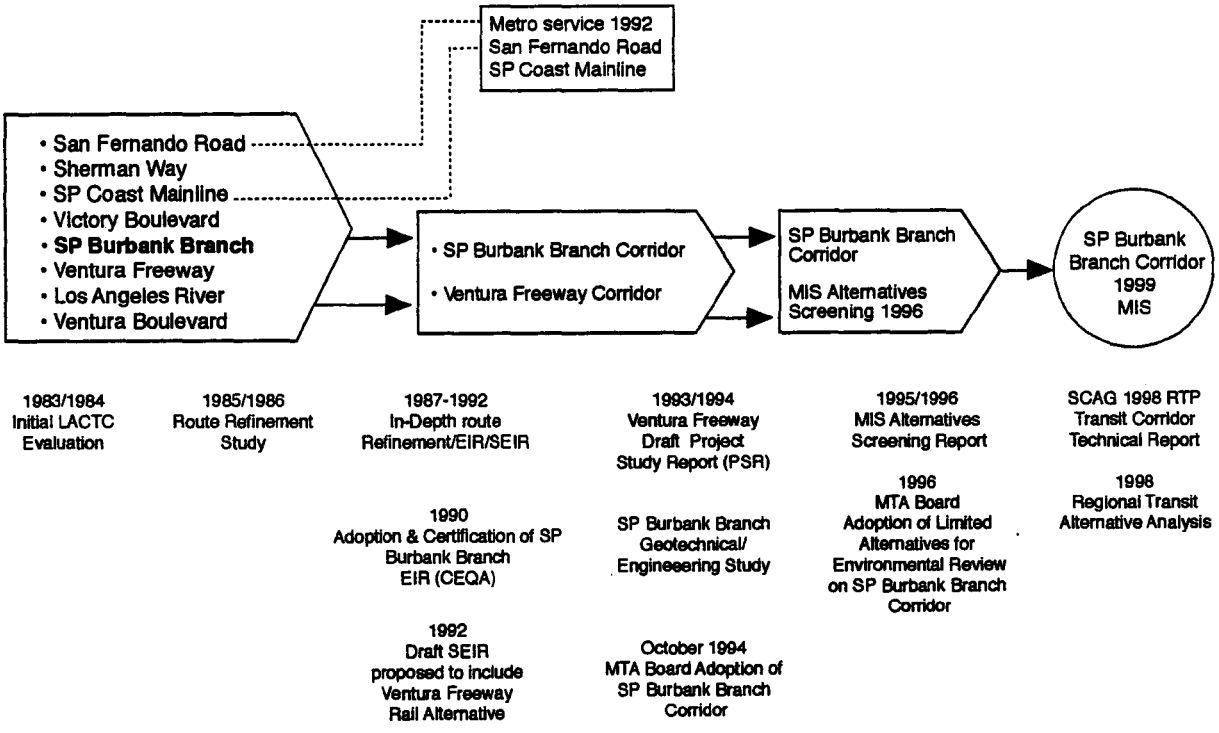
SOURCE: GRUEN ASSOCIATES

San Fernando Valley
East-West Transit Corridor
Major Investment Study

FIGURE S-3
Location of San Fernando Valley
East-West Transit Corridor



Corridor Alternatives



SOURCE: GRUEN ASSOCIATES

San Fernando Valley
East-West Transit Corridor
Major Investment Study

FIGURE S-4
Narrowing of Candidate Alternatives

plus a newly-added Victory Boulevard alignment, were studied in the Initial Alternatives Evaluation Report released in 1987. The Initial Alternatives Evaluation Report discussed the engineering considerations and environmental impacts that would be associated with implementation of light rail transit service along the various alignments being studied. Route refinement and environmental assessment continued until 1990, when the LACTC certified the San Fernando East-West Rail Transit Project Final Environmental Impact Report (EIR) and adopted a predominately deep-bore subway alternative following the SP ROW from North Hollywood to the Warner Center area, a distance of roughly 14 miles. In 1992, a Supplemental EIR was completed, documenting the costs, expected ridership, and environmental impacts of the previously-adopted SP Burbank Branch subway and a newly-considered Ventura Freeway median aerial alignment. Pre-preliminary engineering studies for both of these alternatives were undertaken, and after reviewing revised cost estimates, the Board of Directors of the Metropolitan Transportation Authority (MTA) endorsed the SP ROW in October 1994.

An alternatives screening report was prepared as part of an MIS conducted in 1995/96. The report evaluated the relative cost-effectiveness of a broad range of project alternatives (discussed in detail in Section 2.1.2). Alternatives included all of the previously studied rail transit options included in the 1990 EIR and 1994 Geotechnical/Value Engineering studies. Diesel Multiple Unit (DMU) vehicles, an alternative form of rail transit, were also considered. In 1997, an Administrative Draft EIS/SEIR was completed for submittal to the FTA. However, before the FTA reviewed the Administrative Draft EIS/SEIR, the MTA entered into a financial and organizational restructuring which put all long range planning, including for the San Fernando Valley, on hold.

In 1998, a restructuring plan was prepared to satisfy requirements that the MTA produce a "financially constrained" rail recovery plan, which complies with the Consent Decree for enhanced bus service.[1] The Plan demonstrated to the Federal Transit Administration (FTA) the MTA's financial capability to complete Metro Red Line Segments 2 and 3 to Hollywood and North Hollywood. The Restructuring Plan also assumed the continued suspension of three future rail projects: the Metro Red Line Mid-City and Eastern Extensions, as well as the Metro Blue Line to Pasadena. As a part of the restructuring, the MTA and other regional agencies studied the feasibility of building non-rail (bus) transit enhancements in previous rail corridors. Also as a part of the MTA's new focus on bus transit enhancements, the MTA Board directed staff to proceed with a Rapid Bus demonstration project. The three demonstration project lines include: Eastside, Mid-City/Wilshire, and San Fernando Valley. The purpose of the demonstration program is to address the need for faster travel choices for bus riders, especially the transit-dependent.

Major Investment Study Planning

In June 1999, the MTA initiated a Major Investment Study (MIS) for the San Fernando Valley East-West Transit Corridor. This MIS builds to a large degree on work previously done in this corridor. However, new alternatives and new FTA criteria have necessitated that a large amount of new analysis be produced. As part of the MIS process, the Board of Directors will select a preferred investment strategy for the East-West Transit Corridor. The MIS will be submitted to the Federal Transit

[1] The Consent Decree is a legally-binding agreement made by the MTA to reduce and maintain load factors on its core bus service.

Administration (FTA) in order to make the project eligible for federal transportation funds. Consistent with federal requirements, a range of alternatives within the SP ROW are being evaluated.

The goals of the MIS are outlined below.

1. *Secure Federal Funding*

Federal legislation requires that any local transit project for which federal assistance is sought must complete an MIS, documenting the various costs and ridership projections associated with the proposed project. The evaluation criteria examined in the MIS are intended to provide uniform measures so that projects across the country can be contrasted in terms of their cost-effectiveness and ranked accordingly. The FTA will submit the results of the San Fernando Valley MIS, along with MIS results from projects throughout the nation, to Congress for its consideration as it determines the allocation of federal transportation funds.

2. *Analysis of Cost-Saving Measures*

The MIS must evaluate a range of alternatives for addressing mobility problems within the East-West Corridor. The FTA requires that a transportation system management (TSM) alternative be analyzed, to determine whether low-cost improvements to the existing transportation system can alleviate mobility problems in the corridor at a lower cost than a capital-intensive rail transit project. The TSM alternative would improve bus service within the San Fernando Valley through acquisition of more buses and greater frequency of service on heavily-used routes.

Other cost-saving measures were looked at which would reduce the cost of the Red Line deep-bore subway extension originally planned for the corridor. A bus rapid transit (BRT) fixed guideway busway, light rail transit (LRT), a dual-mode Red Line extension, and Diesel Multiple Unit (DMU) vehicle technology options have been studied as well, to determine if such systems would be more cost-effective than an extension of the Red Line heavy rail system from North Hollywood.

3. *Identification of Environmentally Sound Solutions*

As part of the MIS, the potential environmental impacts of the project alternatives were identified. The alternatives proposed attempt to minimize impacts in sensitive areas, particularly residential neighborhoods. A major part of FTA criteria for transit projects is the degree to which they are integrated with transit supportive land uses. This MIS addresses those criteria. The alternatives selected by the MTA for further development will be subjected to more thorough environmental review in an Environmental Impact Statement/Supplemental Environmental Impact Report.

4. *Assure Community Involvement*

In the months preceding publication of this MIS report, a series of community outreach meetings were held throughout the study corridor area to solicit input from local residents and business

representatives. Two scoping workshops as well as many outreach meetings were held during the previous MIS/EIS/SEIR process. Contact has been maintained with key community groups and their leaders, as well as with elected officials in the Valley during the MIS process. Numerous meetings have been held with representatives of homeowners groups, religious institutions, chambers of commerce, and other civic associations to provide information about the project and to identify the concerns of community members.

Construction of the recommended San Fernando Valley East-West Transit Corridor project will require federal matching funds to supplement local and state funding commitments. Completion of the MIS/EIS/SEIR document is necessary to make the project eligible for these matching funds. To secure federal funding, the alternatives are being evaluated in a Major Investment Study (MIS), as required by the Federal Transit Administration (FTA). Subsequently, an Environmental Impact Statement (EIS) will be prepared pursuant to the National Environmental Policy Act (NEPA). The MTA will also prepare a Supplemental Environmental Impact Report (SEIR), so that the project will comply with the California Environmental Quality Act (CEQA).

S.1.2 Corridor Conditions and Need for Project

Projected Growth

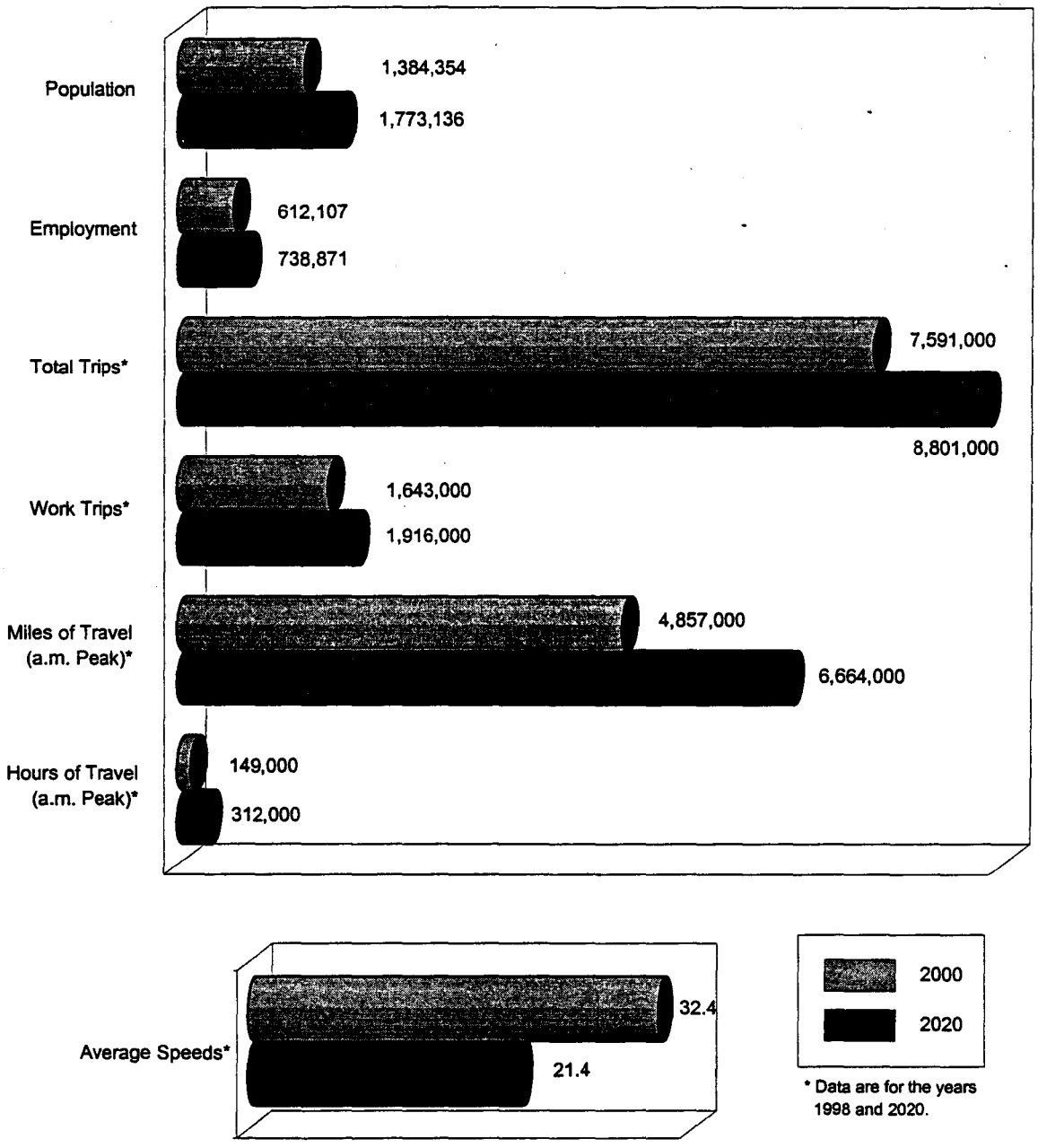
Forecasts prepared by the Southern California Association of Governments (SCAG) predict significant growth in the corridor area over the next 20 years. SCAG estimates the year 2000 population of the San Fernando Valley to be 1,380,000. By 2020, the population is projected to have increased 28 percent, to 1,770,000. Concurrently, employment in the Valley will increase 21 percent and housing 25 percent between 2000 and 2020. These trends reflect larger trends predicted for Los Angeles County as a whole, with population growth slightly higher in the Valley than for the County and employment and housing levels increasing slightly less than for the County as a whole.

Other demographic trends in the San Fernando Valley point to an increasingly transit-dependent population with growing mobility barriers. The population in the Valley below the poverty level increased over thirty-five percent between 1980 and 1990, the last year for which census data is currently available. The minority population increased seventy percent. Additionally, over 40% of Valley households had access to only one or no vehicles in 1990. These trends point towards a region of growing transit-dependence, where residents are less likely to have access to reliable private transportation.

Increasing Travel Demand and Congestion

Population and employment growth in the Valley are expected to lead to significant increases in congestion by the year 2020, in the absence of proposed mobility improvements. Statistics measuring current and future travel demand and congestion are provided in **Figure S-5**. The estimated number of daily trips made by Valley residents in 1998 was 7,591,000. Of these trips, 1,643,000 were work trips. Every day, 290,000 of these work trips were made from the East and West Valley to downtown Los Angeles, the Westside, and southeast Los Angeles. These trips represent travel demand that could be met through implementation of a project within the study corridor. An additional 222,000 non-work

San Fernando Valley Travel Trends



SOURCE: GRUEN ASSOCIATES

San Fernando Valley
East-West Transit Corridor
Major Investment Study

FIGURE S-5
Travel Trends

related trips were made daily between the Valley and the Los Angles Basin. In summary, roughly 7 percent of all trips and 18 percent of work trips to and from the study corridor originate in or are destined for areas that would be served by the MTA's Metro Rail system.

Travel demand is expected to grow significantly from its current levels by the year 2020. The number of daily trips is expected to grow to 8,801,000, an increase of 16 percent. This increase in trips will be most dramatically felt during the morning peak hours of travel, due to a projected surge in work trips to 1,916,000, 17 percent higher than present volumes. Morning peak hour congestion in the study corridor will result in average travel speeds falling from roughly 32 miles per hour today to 21 miles per hour in 2020. Perhaps most telling is the amount of time commuters will spend in delay conditions, i.e. "stuck in traffic". For every hour of travel during the morning peak period, the average commuter will spend 26 minutes in delay, nearly double the current 14 minutes of delay per hour.

S.2 ALTERNATIVES CONSIDERED

S.2.1 Technologies, Profiles, and Alignments

The alternatives defined for evaluation in this MIS employ different combinations of transit technologies, guideway profiles, and alignments that are potentially feasible for use in the San Fernando Valley East-West Transit Corridor. These options are discussed below.

Technologies

Bus Rapid Transit (BRT)

The MTA currently operates an all-bus transit system in the study area. Under the Bus Rapid Transit and TSM alternatives, described later in this chapter, bus service would be improved along selected corridors. While buses are traditionally considered to have lower maximum speeds that rail alternatives, this is largely due to the fact that they normally operate on surface streets subject to traffic congestion. The busway alternatives would eliminate this drawback by putting buses on an exclusive right-of-way, allowing them to reach speeds comparable to rail. Furthermore, bus improvements would be much less expensive than the construction of a rail system. The buses used along a busway could be either traditional 40' buses or longer articulated buses depending on demand. Either bus type would be fueled by compressed natural gas (CNG) or another clean-burning fuel.

Light Rail Transit (LRT)

LRT systems, such as the MTA Blue Line and Green Line, have a higher passenger capacity than buses, and roughly equivalent average speeds when compared to buses on a limited-access guideway. The catenary wires which provide power to light rail vehicles are located safely overhead, allowing light rail to be built without grade separations (unlike heavy rail). Although the freedom to build at grade lowers the cost of light rail compared to other rail options, LRT is still more expensive than a busway to construct.

Heavy Rail (HRT)

Heavy rail, employed by the MTA Red Line, is the fastest transit technology under consideration, and has the greatest passenger carrying capacity as well. To prevent vehicles and pedestrians from coming into contact with the high-voltage "third rail" that powers the trains, a heavy rail system must provide grade separations at all cross streets. These grade separations make construction of heavy rail more expensive than all other transit systems.

Dual-Mode Rail

A dual-mode Red Line extension is also under consideration for the San Fernando Valley East-West Transit Corridor. Dual-mode technology equips heavy rail cars with pantographs, allowing them to also be powered by overhead catenary wires, like light rail vehicles. This ability to switch between third rail and overhead powering systems would allow the Red Line, in subway to North Hollywood, to proceed at grade through the Valley, providing cost savings. Because dual-mode technology is a hybrid of light and heavy rail, its costs would also fall somewhere between those of light and heavy rail.

Diesel Multiple Unit (DMU) Technology

DMU technology employs vehicles that are powered by an on-board internal combustion engine, much like a bus. The vehicles can be operated individually, or linked into trains to increase passenger capacity. Their operating speeds are somewhat slower than light rail. Currently, only diesel-fueled vehicles are available. The environmental cost of running diesel-fueled vehicles in the Valley must be considered. Less polluting types of propulsion systems such as clean diesel, CNG, and fuel cell technology are under development. DMU technology would have similar costs to light rail; however, the lack of overhead wires would reduce its costs.

Profiles

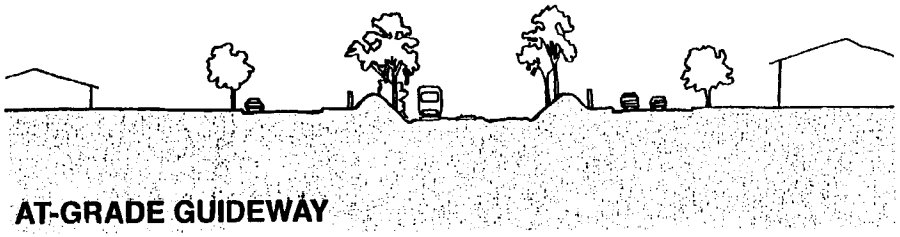
Figure S-6 illustrates the profiles described below.

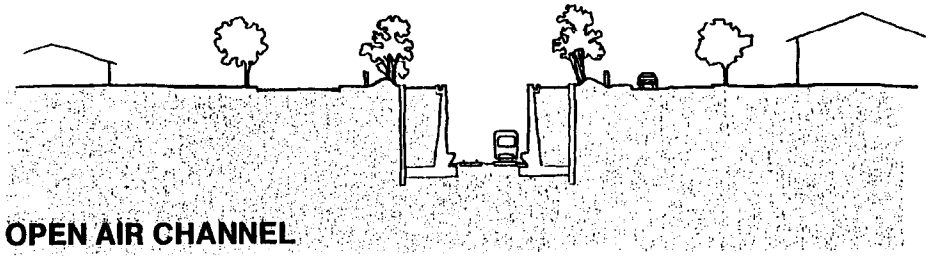
At-Grade Guideway

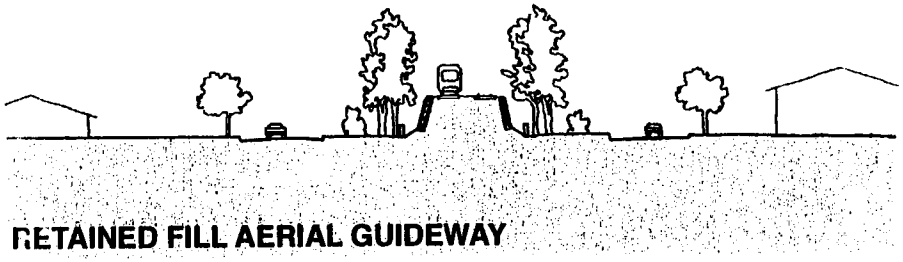
An at-grade transit system operates at ground level, and is the least expensive profile option. Crossing barriers or traffic signal preemption devices are needed to regulate pedestrian and vehicular travel across the guideway.

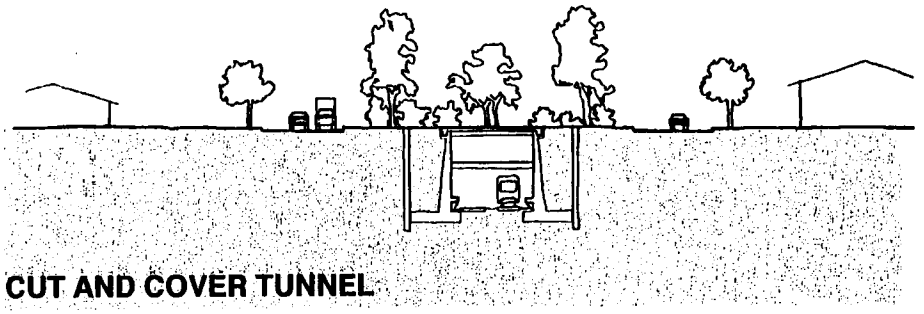
Aerial Guideway

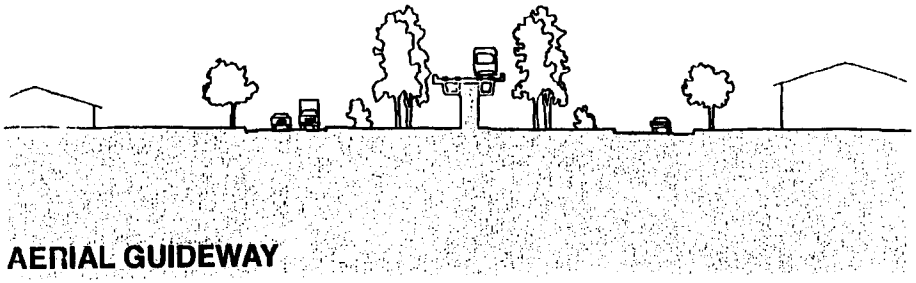
Aerial transit systems operate on an overhead guideway supported by a series of columns. Pedestrian and vehicular traffic can pass safely underneath. Aerial guideways are more expensive than at-grade guideways, but less expensive than underground profiles. Because they block views and sunlight, the environmental impact of aerial structures must be carefully accounted for wherever they are employed.

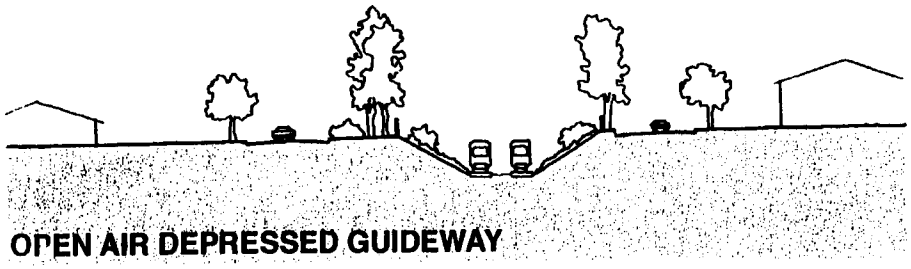


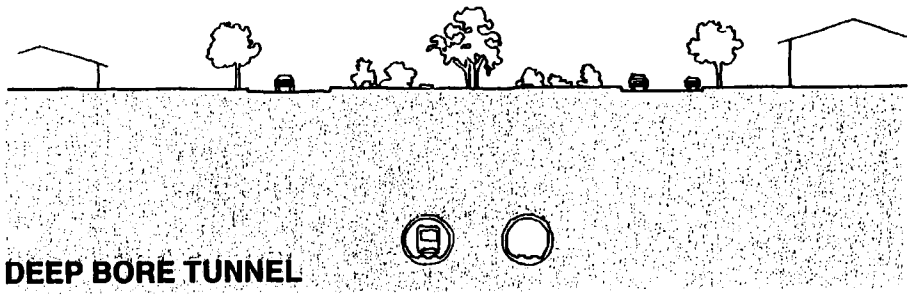












SOURCE: GRUEN ASSOCIATES, 1999

San Fernando Valley
East-West Transit Corridor
Major Investment Study

FIGURE S-6
SP ROW Alignment Profile Options

Deep-Bore Tunnel

A deep-bore subway system operates underground, in a tunnel mined below the earth's surface using boring equipment. Because disruption of surface activities is minimized, this is the technique used for tunneling under existing streets and buildings. The cost of deep-bore tunneling is the highest of all the profiles being considered.

Cut-and-Cover Tunnel

Cut-and-cover subway systems operate in tunnels excavated from the surface, decked over, then re-covered. Cut-and-cover construction could be less expensive than deep-bore tunneling in undeveloped areas. However, in areas that are already developed, such as the San Fernando Valley East-West Transit Corridor, the cost of mitigating cut-and-cover construction makes the method equal to or more expensive than deep-bore tunneling.

Open-Air Depressed Guideway or Channel

An open-air depressed guideway or channel would employ a trench that is excavated from the surface, but remains uncovered after excavation, further reducing construction costs.

Alignments

In this Major Investment Study, only one alignment has been used as the baseline for all of the alternatives considered. The SP ROW, owned by the MTA, extends from Burbank, through North Hollywood along Chandler Boulevard, through Van Nuys paralleling Oxnard Street, and through the West Valley along Oxnard Street and Victory Boulevard to Warner Center. From Warner Center, the SP ROW proceeds north to Chatsworth along Canoga Avenue. As a baseline, only the stretch of right-of-way between North Hollywood and Warner Center is under consideration for all but one of the alternatives in this MIS. Alternative 7, the DMU alternative would extend from Burbank to Chatsworth, the entire length of the SP ROW. The SP ROW is typically 60 to 100 feet wide (narrower in Burbank and up to 250 feet wide in some locations), and could accommodate any of the profile options under consideration. Transit service along this right-of-way would link North Hollywood, Valley College, the Valley Government Center, the Sepulveda Dam Recreation Area, Pierce College, and Warner Center.

Oxnard Street has also been considered as an alternative to the portion of the SP ROW which runs along Chandler Boulevard in North Hollywood. Bus alternatives on Oxnard would simply run on-street. It is unlikely that any of the rail alternatives would be placed on Oxnard because of the disruption this would cause to activities along a relatively narrow right-of-way. Any heavy-rail options would need to be built deep-bore in order to prevent closures during construction and operation of the system.

S.2.2 Alternatives under Consideration

The following set of alternatives were devised for study in the MIS, using different combinations of the technologies and profiles along SP ROW alignment. **Table S-1** compares the attributes of the seven alternatives under consideration. It summarizes length, location and number of stations, station profile,

TABLE S-1
Comparison of Alternative Attributes

	ALTERNATIVES						
	1 Bus Rapid Transit (BRT)	2 Enhanced Bus Rapid Transit (BRT)	3 Light Rail Transit (LRT)	4 Enhanced Light Rail (LRT)	5 Red Line - N. Hollywood to I-405 with BRT to Warner Ctr.	6 Dual-Mode Red Line Extension	7 Diesel Multiple Unit (DMU) - Burbank to Chatsworth
LENGTH	Exclusive lanes: 12.9 miles Mixed flow: 1.3 miles	Exclusive lanes: 12.9 miles Mixed flow: 1.3 miles	Rail: 13.6 miles Shuttle: 0.5 miles	Rail: 13.6 miles Shuttle: 0.5 miles	Exclusive lanes: Rail: 5.6 mi. Bus: 7.4 mi. Mixed flow bus: 1.0 mi.	Rail: 13.8 miles Shuttle: 0.5 miles	Rail: 22 miles
STATIONS							
North Hollywood *	At grade	At grade	At grade	At grade	Existing underground	Existing underground	At grade
Laurel Canyon Blvd.	At grade	At grade	At grade	Open air	Cut and cover or open air, Park and Ride (110 spaces)	Open air Park and Ride (110 spaces)	-
Valley College - Fulton Ave. / Burbank Blvd.	At grade	At grade	At grade	Open air Park and Ride (83 spaces)	Cut and cover, open air, or aerial, Park and Ride (83 spaces)	At grade	-
Woodman Ave.	At grade	At grade	-	-	-	-	-
Van Nuys Blvd.	At grade Park and Ride (1060 spaces)	Aerial Park and Ride (1250 spaces)	At grade Park and Ride (1060 spaces)	Aerial Park and Ride (1250 spaces)	Aerial Bus Facility Park and Ride (1250 spaces)	At grade Park and Ride (1060 spaces)	At grade Park and Ride (1060 spaces)
Sepulveda Blvd.	At grade Park and Ride (1200 spaces)	Aerial Park and Ride (1200 spaces)	At grade Park and Ride (1200 spaces)	Aerial Park and Ride (1200 spaces)	Aerial Bus Facility Park and Ride (1200 spaces)	At grade Park and Ride (1200 spaces)	At grade Park and Ride (1200 spaces)
Woodley Ave.	At grade	At grade	At grade	At grade	At grade	At grade	-
Balboa Blvd.**	At grade Park and Ride (240 spaces)	At grade Park and Ride (240 spaces)	At grade Park and Ride (240 spaces)	Aerial Park and Ride (240 spaces)	At grade Park and Ride (240 spaces)	At grade Park and Ride (240 spaces)	-
White Oak Ave.	-	-	-	At grade Park and Ride (700 spaces)	-	At grade Park and Ride (700 spaces)	-
Reseda Blvd.	At grade Park and Ride (400 spaces)	At grade Park and Ride (400 spaces)	At grade Park and Ride (400 spaces)	Aerial Park and Ride (570 spaces)	At grade Park and Ride (400 spaces)	At grade Park and Ride (400 spaces)	At grade Park and Ride (400 spaces)
Tampa Ave.	At grade	At grade	At grade	At grade	At grade	At grade	-
Winnetka Ave.	At grade Park and Ride (350 spaces)	At grade Park and Ride (350 spaces)	At grade Park and Ride (350 spaces)	Aerial Park and Ride (1040 spaces)	At grade Park and Ride (350 spaces)	At grade Park and Ride (350 spaces)	-
De Soto Ave./ Variel Ave.	At grade (130 spaces)	At grade (130 spaces)	-	-	At grade (130 spaces)	-	-
Victory Blvd. / Owensmouth Ave.	-	-	Aerial	Aerial	-	Aerial	At grade
Warner Ctr. Transit Hub (Promenade Shopping Center)	At grade	At grade	Shuttle to rail terminus	Shuttle to rail terminus	At grade	Shuttle to rail terminus	-

Source: Gruen Associates

* Park and ride lot to be constructed as part of the Metro Red Line. ** LADOT existing park and ride.

and park and ride characteristics for each alternative. Not listed in the table are the No Build and Transportation System Management (TSM) alternatives, described below.

No Build Alternative

The No Build alternative reflects the conditions anticipated for the year 2020, based on SCAG's growth forecast, if no major transit improvement investments are made within the valley's East-West Transit Corridor. This scenario would mean that the SP ROW would not be used for a transit project. All existing highway and arterial facilities are assumed to be in place, but no new roadways nor any major widening of arterial highways in the San Fernando Valley are anticipated under this alternative by 2020. The transit network would include the existing routes, the implementation of the MTA Remediation Plan, and rail-bus interfaces, as applicable. Services are improved on crowded bus lines to maintain reasonable loading standards.

MTA routes will also be revised to implement the Red Line bus-rail interface plans at the Universal City and North Hollywood stations. These changes will include redeployment of some express routes to downtown Los Angeles that would duplicate Red Line service. The No Build alternative is also required by federal and California environmental law and serves as a baseline for comparing the costs and performance of the various transit alternatives in the MIS to be submitted to the FTA in pursuit of federal funds.

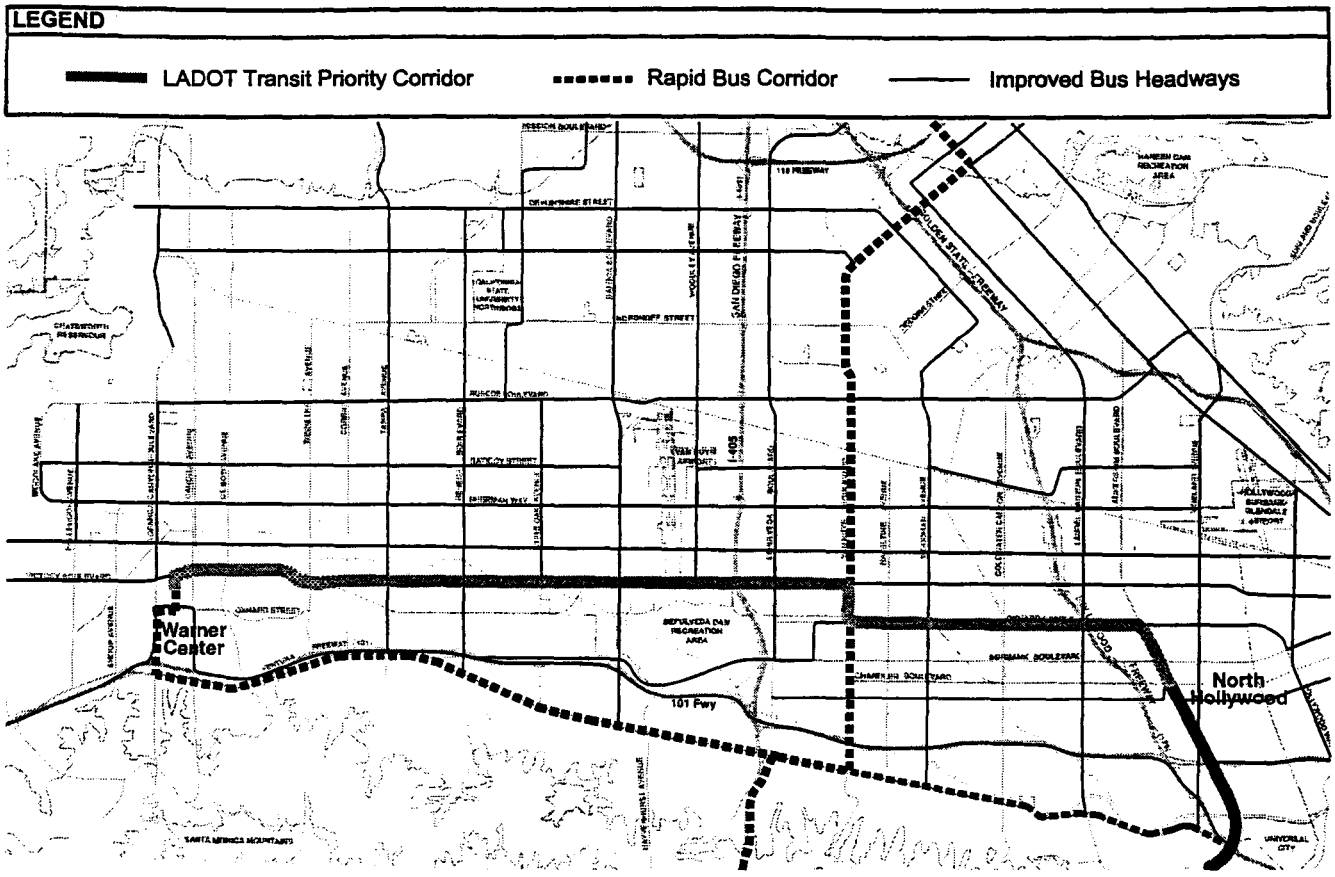
Transportation System Management (TSM) Alternative

The goal of the TSM Alternative is to significantly improve mobility within the San Fernando Valley in general, and the East-West Transit Corridor in particular, through enhancement of the existing bus system rather than construction of a fixed guideway transit project. Major capital expenditures for street widening that would require property displacement, land takings, and relocation of homes and businesses have not been considered. The Transportation System Management Alternative is therefore defined as the optimal level of bus service that could be provided on the existing highway and roadway network (**Figure S-7**). The TSM alternative is required by federal law, and also serves as a baseline for comparing the costs and performance of the various transit alternatives in the MIS to be submitted to the FTA in pursuit of federal funds.

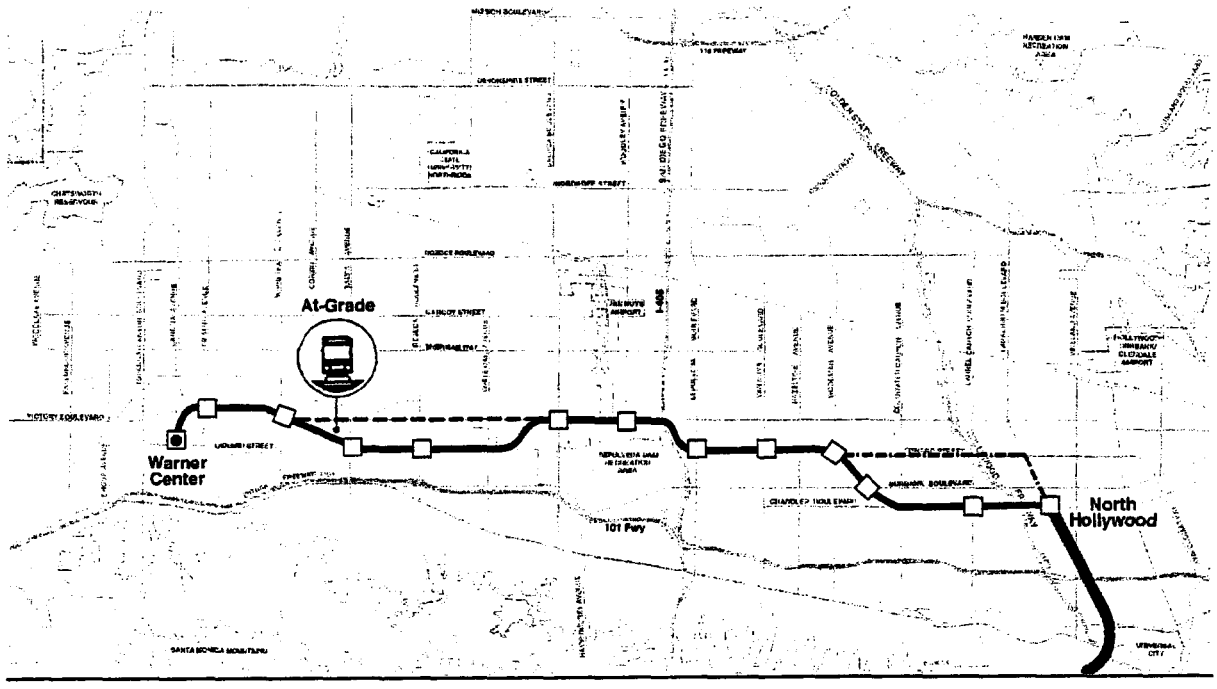
Headways on routes covered by the TSM would be significantly reduced. Services operating on TSM improved corridors will provide 10 minute peak and 20 minute base service, and all other services will provide minimum service levels of 20 minutes during the peaks and 30 minutes during the base on the trunk portion of the route. TSM improvements would include various projects to enhance the performance of bus transit on major arterials, where bus service frequencies would be increased and Rapid Bus Demonstration projects on Van Nuys and Ventura Boulevards.

Alternative 1: Bus Rapid Transit

Bus Rapid Transit (BRT) represents an improvement over conventional in-street bus service (**Figure S-7**). Fixed guideway exclusive bus lanes remove buses from street traffic, eliminating queuing and congestion delays. BRT also increases travel speed by limiting stops and implementing signal priority



Transportation System Management (TSM) Alternative



Alternatives 1 and 2: Bus Rapid Transit

SOURCE: GRUEN ASSOCIATES

San Fernando Valley
East-West Transit Corridor
Major Investment Study

FIGURE S-7
TSM and Bus Rapid Transit (BRT) Alternatives

at intersections. Also, because they do not need overhead electrification, busways are cheaper to build and less visually intrusive than light rail. The design of the busway and its stations can support either typical 40 foot buses or longer articulated buses with increased capacity. A busway in the corridor would emulate characteristics that are traditionally associated with light rail, including an exclusive guideway. The City of Curitiba in Brazil has been a pioneer in the development of exclusive busways. **Table S-2** compares key features of the Curitiba system to the busway planned in the San Fernando Valley.

TABLE S-2
Comparison of Curitiba Busways to San Fernando Valley Planned Busway

Curitiba Busway Feature	San Fernando Valley
1. Simple Route Layout	Yes
2. Frequent Headways	2 ½ to 5 Minutes, Peak Period
3. Less Frequent Stops	Once per mile
4. Level Boarding and Alighting	Low floor buses
5. Color-coded Buses and Stations	Under consideration
6. Station Stops	Yes
7. Signal Prioritization	Yes
8. Exclusive Bus Lanes	Yes
9. Higher Capacity Buses	Under consideration
10. Multiple-Door Boarding and Alighting	Under consideration
11. Fare Prepayment	Under consideration
12. Feeder Network	Yes

The San Fernando Valley busway would run from the North Hollywood Red Line station west to the Warner Center Transit Hub, approximately 14 miles away. Buses would run along an exclusive roadway built within the SP ROW. Stations would be placed approximately every mile along the route, at major cross streets and trip destinations. Buses would be given priority at signals. Headways within the busway would vary between five and two and one-half minutes during peak periods, and the existing Valley bus network would be integrated into the busway, allowing passengers boarding buses off the corridor to enter the busway without a transfer. The entire SP ROW would be landscaped, integrating the busway into the neighborhoods around it. In addition to the busway, enough space is available for a parallel bikeway along the corridor, fenced from the busway for safety. In residential areas, homes would be screened from passing buses by walls and earthen berms (**Figure S-2**).

Alternative 2: Enhanced Bus Rapid Transit

The Enhanced Bus Rapid Transit alternative would operate almost identically to Alternative 1 (**Figure S-7**). The only difference would be grade separating the stations at Van Nuys and Sepulveda Boulevards. The busway and stations would be raised into an aerial profile to cross Van Nuys and

Sepulveda. This would allow busway vehicles to cross two very busy streets without delay and remove the need for installing transit priority signalization across two congested corridors.

Alternative 3: Light Rail Transit (LRT)

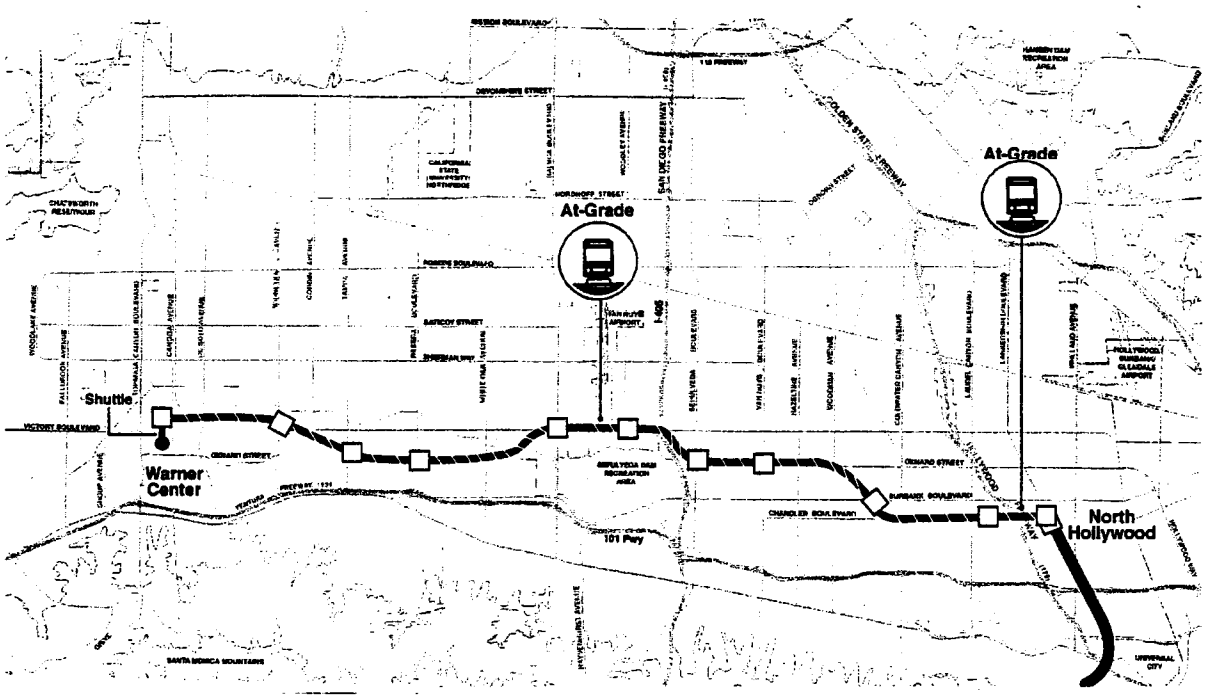
Alternative 3 is an at-grade solution on the SP ROW between the North Hollywood Metro Rail Station and Warner Center (**Figure S-8**). At Warner Center, the light rail line would end in an aerial station at the corner of Victory Boulevard and Owensmouth Avenue. Bus shuttles, such as an LADOT Dash line, could transfer passengers from the station to the Warner Center Transit Hub, about one half mile south of the rail terminus, adjacent to the Promenade Shopping Center. This alternative is not consistent with state law prohibiting above-ground rail in the North Hollywood area but is included for comparison purposes.

The alignment extends from the North Hollywood Metro Rail Station along Chandler Boulevard, entering the SP ROW at Tujunga Avenue. It continues westward in the median of Chandler Boulevard and then parallels Oxnard Street to Sepulveda Boulevard. The alignment crosses under the I-405 in an existing underpass to the West Valley. The alignment continues along the SP ROW, extending along the northern perimeter of the Sepulveda Basin and crossing the Los Angeles River at White Oak Avenue. It then parallels Topham Street and Victory Boulevard. Near De Soto Avenue, the alignment leaves the SP ROW and transitions into an aerial profile as it approaches its terminus at the intersection of Victory Boulevard and Owensmouth Avenue.

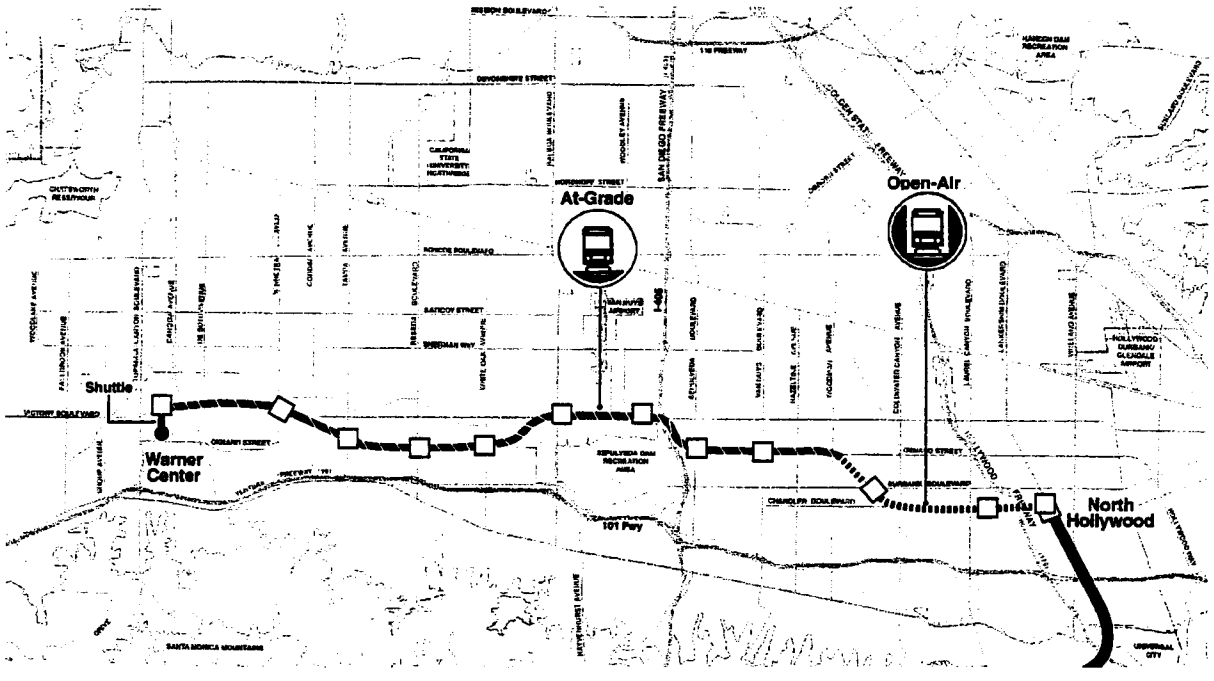
The light rail line would typically be located in the center of the SP ROW. The at-grade rail tracks, including vehicles and pantograph would typically be approximately 30 feet wide, slightly larger than the 26 foot width of the busway. Landscaping would be located adjacent to the edges of the right of way. Earthwork berms within the right of way would act as buffers and allow positive drainage. At cross streets, the at-grade rail vehicles would be given traffic signal priority similar to the busway alternatives. Stations for this alternative would be generally at grade and at locations similar to those in Alternative 1, the busway alternative. Depending on whether low-floor or standard light rail vehicles are chosen, either low- or raised-platform stations could be constructed. Trains would operate with four minute headways during peak periods. Park-and-ride facilities are described in **Table S-1**. Crossing gates would be located at all intersections as required.

Alternative 4: Enhanced Light Rail Transit

Alternative 4 would reduce some of the perceived adverse effects of at-grade rail (Alternative 3) through multiple changes in profile along the alignment. This alternative is based on light rail alternatives previously considered in other studies of the San Fernando Valley East-West Transit Corridor. These profile changes increase the cost of Alternative 4 significantly over the cost of Alternative 3. The basic route alignment is similar to that of Alternative 3 (**Figure S-8**). This alternative runs primarily along the SP ROW between the North Hollywood Metro Rail Station and Warner Center. At Warner Center, the light rail line would end in an aerial station at the corner of Victory Boulevard and Owensmouth Avenue.



Alternative 3: Light Rail Transit (LRT)



Alternatives 4: Light Rail with Multiple Changes in Profile
(Grade separated stations not shown.)

SOURCE: GRUEN ASSOCIATES

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FIGURE S-8
Light Rail (LRT) Alternatives 3 and 4

The profile of Alternative 4 varies considerably from Alternative 3. Alternative 4 would begin with an at-grade station at North Hollywood and proceed westward a short distance past Tujunga Avenue, where it would descend to a cut-and-cover tunnel section. The guideway would continue in cut-and-cover tunnel to Laurel Canyon Boulevard where an open-air station would be built. The guideway would again continue westward in a cut-and-cover tunnel section. It would enter the Valley College station (open-air) at Fulton Avenue and Burbank Boulevard, and after leaving the station, the guideway would begin a rising transition to a open-air depressed guideway. Oxnard Street and Woodman Avenue would pass over the open-air guideway on new bridge structures.

The guideway would rise for a short distance in order to cross Hazeltine Avenue at grade, and then descend again after Hazeltine, finally rising to assume an aerial profile at the Van Nuys Station (at a height of approximately 20 feet to the bottom of the support structure). The alignment would transition again to at grade past Van Nuys, and rising to aerial again after Kester Avenue, reaching the Sepulveda Station in aerial profile. Sepulveda Boulevard would cross beneath the guideway.

After leaving the Sepulveda Station, the guideway would again transition to grade and cross under the I-405 to Woodley Avenue. The alignment would continue at grade, transition to an aerial station at Balboa Boulevard, then return to grade near White Oak Avenue. The line transitions to aerial as it approaches the Reseda Boulevard and Winnetka Avenue stations, returning to grade after leaving those stations. After crossing Winnetka the line would continue at grade to De Soto. Leaving the SP ROW near De Soto Avenue, the line would transition to an aerial profile as it approaches its western terminus at the intersection of Victory Boulevard and Owensmouth Avenue. From the aerial station at Victory and Owensmouth, passengers could transfer to the Warner Center Transit Hub via shuttle bus.

As in all the alternatives, at-grade sections of Alternative 4 would be given signal priority over cross-vehicular and pedestrian traffic, allowing faster runtimes. Trains would operate with four minute headways during peak period. The right-of-way would be landscaped, and walls or berms would be used to screen the guideway from neighboring residential areas. Park and ride facilities and station profiles for Alternative 4 are described in **Table S-1**.

Alternative 5: Red Line Heavy Rail (HRT) to the I-405 with Bus Rapid Transit (BRT) to Warner Center

Alternative 5 would combine a Red Line extension from North Hollywood to the I-405 with a busway spanning the remaining distance to Warner Center. The heavy rail extension to the I-405 has been examined in previous studies of the San Fernando Valley East-West Transit Corridor. The busway segment of Alternative 5 would be similar to the busway described for Alternative 1. By combining this heavy rail segment with the busway in the West Valley, this alternative can be more easily compared with the other alternatives under consideration in this MIS. The heavy rail Red Line extension in the East Valley is the most expensive technology considered in this MIS, particularly when considered on a cost per mile basis.

Because of state law that restricts above-ground rail in the North Hollywood area, four different profile options are considered for the heavy rail segment of Alternative 5. These options are deep-bore tunnel (Alternative 5a), cut-and-cover tunnel (Alternative 5b), open-air channel (Alternative 5c) and aerial

guideway (Alternative 5d). Two of these profiles, deep-bore tunnel and open-air channel, are illustrated in **Figure S-9**. Only these two profiles were considered for capital cost evaluation. All options, 5a through 5d, would begin in a deep-bore tunnel to Laurel Canyon Boulevard. Past Laurel Canyon, each option would proceed at the profile for which it is named, either deep-bore (5a), cut-and-cover (5b), open-air (5c) or aerial (5d). Before reaching Van Nuys Boulevard, all options would transition to an aerial guideway, and proceed in an aerial profile to Sepulveda Boulevard. At Sepulveda, patrons using heavy rail would transfer to the busway. The busway would proceed to Warner Center Transit Hub along an alignment and profile similar to Alternative 1.

The entire right-of-way would be landscaped, and walls and earthen berms would screen residential homes from at-grade portions of the guideway. Red Line trains would operate with four minute headways during peak periods, and buses in the West Valley would operate with headways varying from two and one-half to five minutes during peaks. Park and ride facilities are described in **Table S-1**.

Alternative 6: Dual-Mode Red Line

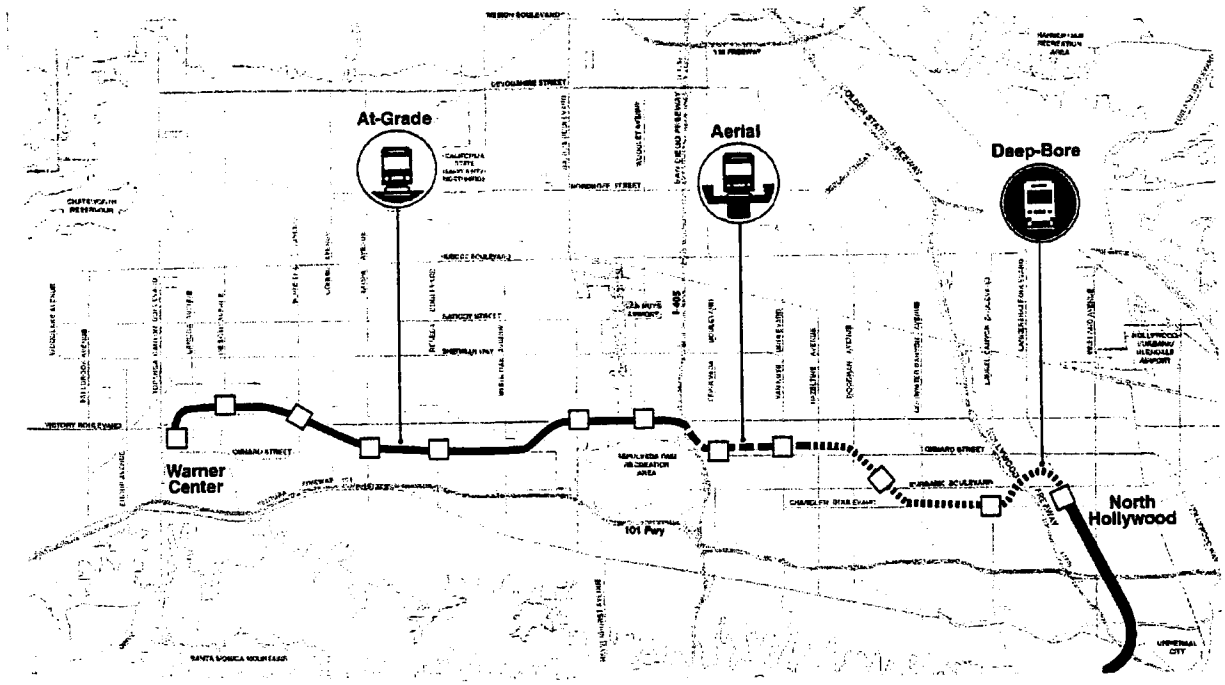
A dual-mode Red Line extension would allow heavy rail cars to operate in a manner similar to light rail cars between North Hollywood and Warner Center (**Figure S-10**). Dual-mode cars are able to use both the third rail and overhead catenary as their power source. Between downtown Los Angeles and North Hollywood, the cars would run as traditional heavy rail vehicles, using the third rail. At North Hollywood, however, they would switch to overhead catenary as their power source. This would allow these vehicles to continue on to Warner Center along an at-grade profile. A dual-mode configuration would eliminate the ridership penalty that requiring a transfer from the Red Line to a separate light rail system would incur. Furthermore, the dual-mode configuration would allow Red Line cars to run at grade, lowering construction costs per mile significantly.

The project would begin at the existing North Hollywood Red Line Station and proceed westerly along the same alignment as Alternative 5 through the East Valley. In the West Valley, this alternative would proceed along the same alignment as Alternative 3, ending in an aerial station over the intersection of Victory Boulevard and Owensmouth Avenue at Warner Center.

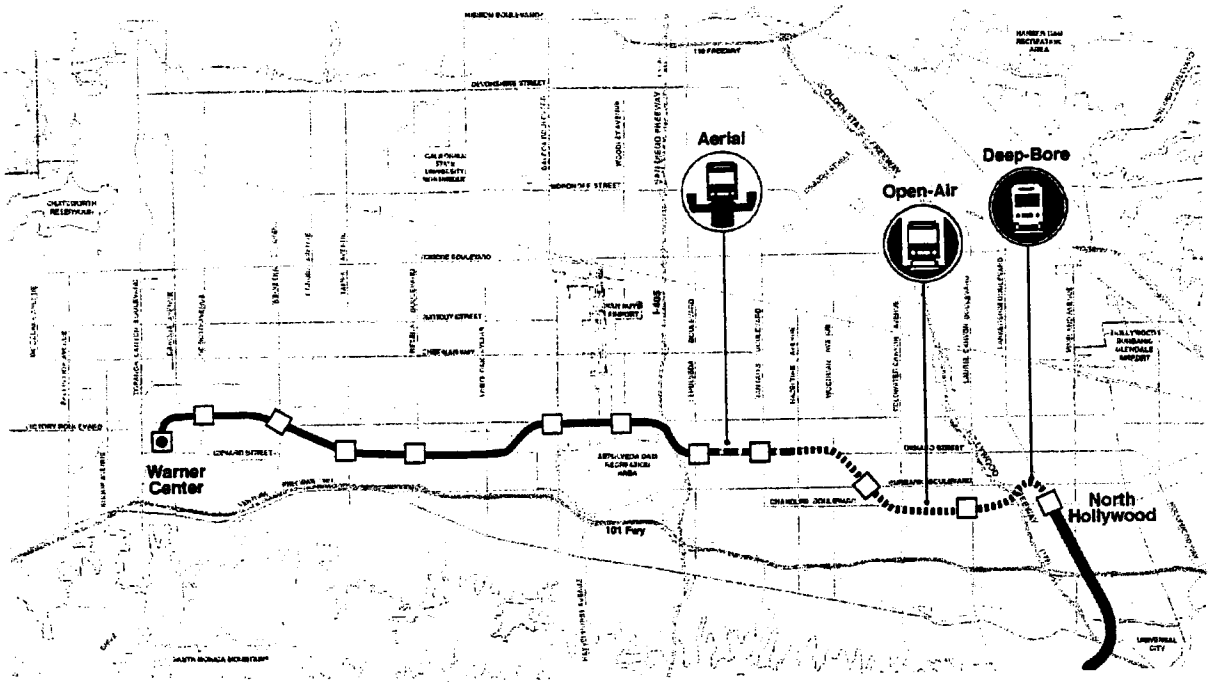
A subway tunnel would be constructed using deep-bore technology from the North Hollywood Red Line station westward to the Laurel Canyon station, where the guideway would emerge to an open-air station at that location. From the Laurel Canyon station, the guideway would proceed westerly in an at-grade configuration. The guideway would proceed entirely at-grade through both the East and West Valleys until reaching Warner Center. At De Soto Avenue, the guideway would leave the SP ROW and transition to an aerial profile as it approaches the terminal aerial station at the intersection of Victory Boulevard and Owensmouth Avenue. The entire right-of-way would be landscaped, and walls and earthen berms would screen residential homes from at-grade portions of the guideway. Red Line trains would operate with four minute headways during peaks. **Table S-1** describes park-and-ride facilities.

Alternative 7: Diesel Multiple Unit (DMU) Vehicles from Burbank to Chatsworth

Alternative 7 was suggested by the community as a cost-saving rail option during the course of this study. Alternative 7 would be similar to the basic light rail concept. However, each individual train car



Alternative 5a: HRT with Deep-Bore Segment
(Busway from I-405 to Warner Center.)



Alternative 5c: HRT with Open-Air Segment
(Busway from I-405 to Warner Center.)

SOURCE: GRUEN ASSOCIATES

San Fernando Valley
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FIGURE S-9
Heavy Rail (HRT) to I-405 / Busway (BRT) to Warner Ctr.

would be powered by a diesel engine. This type of rail transit is known as a "Diesel Multiple Unit" (DMU) vehicle system. DMU cars would make overhead electrification unnecessary. Without the pantograph and overhead wiring of typical light rail, the system would be less visually intrusive, as well as less costly to build and maintain. However, the emissions of the diesel engines would reduce the environmental benefit of this alternative.

Route Alignment

The DMU alternative would not follow the basic North Hollywood to Warner Center route of the other alternatives under consideration in this MIS (**Figure S-10**). Instead, a DMU line would extend from Burbank to Chatsworth, encompassing the entire length of the old SP ROW. From Burbank, trains would proceed west from the existing Burbank Metrolink station. The trains would operate in the median of Chandler Boulevard through Burbank to North Hollywood. At North Hollywood, modifications to the existing Red Line station would be necessary to facilitate the at-grade crossing of Lankershim Boulevard. West of North Hollywood, this alternative would follow the same alignment as Alternative 3. At Warner Center, instead of leaving the SP ROW, DMU trains would remain within the right-of-way past De Soto Avenue. The alignment would turn north beyond De Soto, becoming parallel to Canoga Avenue. The SP ROW would follow Canoga Avenue north, terminating at the existing Chatsworth Metrolink station. The DMU alternative was included as an alternative due to interest from elected officials and members of the public. It is, however, not consistent with state law that prohibits above-ground rail in North Hollywood.

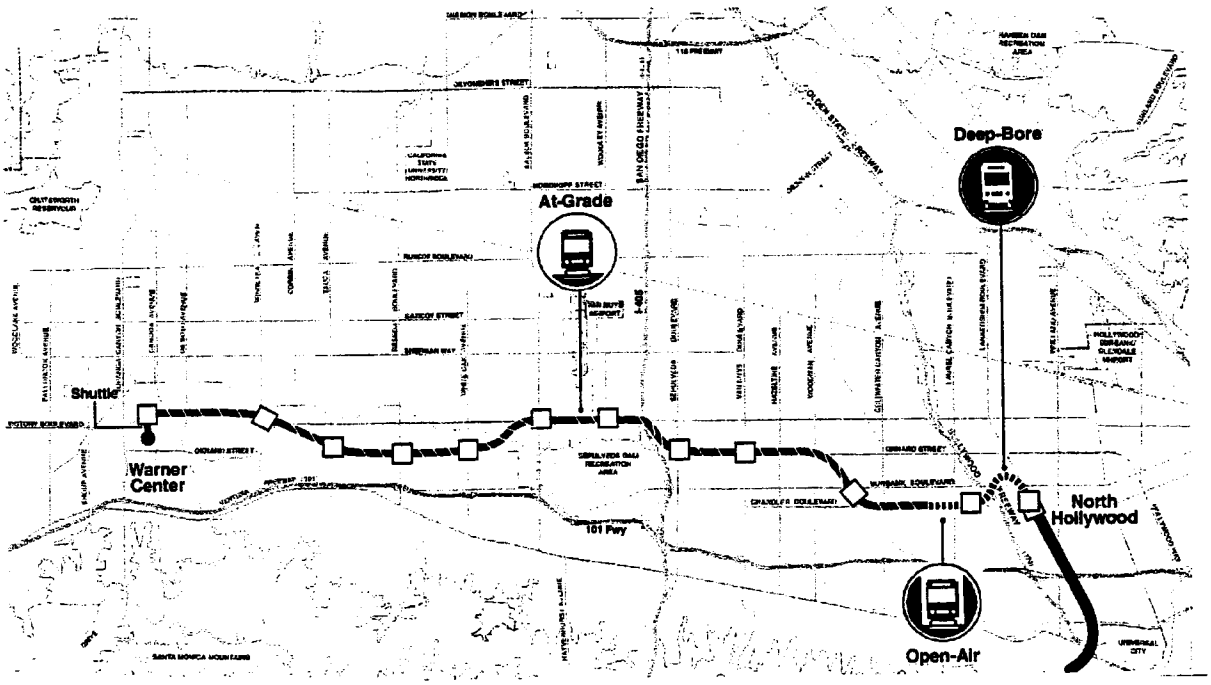
The DMU alternative would operate on a single track, requiring headways no greater than 15 minutes throughout the day. This alternative would operate entirely at grade. Transit priority signalization at major intersections would improve run times. Crossing gates and warning bells would enhance safety along the corridor. The entire right-of-way would be landscaped, and walls and earthen berms would be used to screen the right-of-way from neighboring residential areas. Stations would be limited, stopping only at Burbank, North Hollywood, Van Nuys, Sepulveda, Reseda, Warner Center and Chatsworth. New station design would be similar to existing Metrolink stations. Park and ride facilities would be provided as described in **Table S-1**.

S.2.3 Phasing Strategies

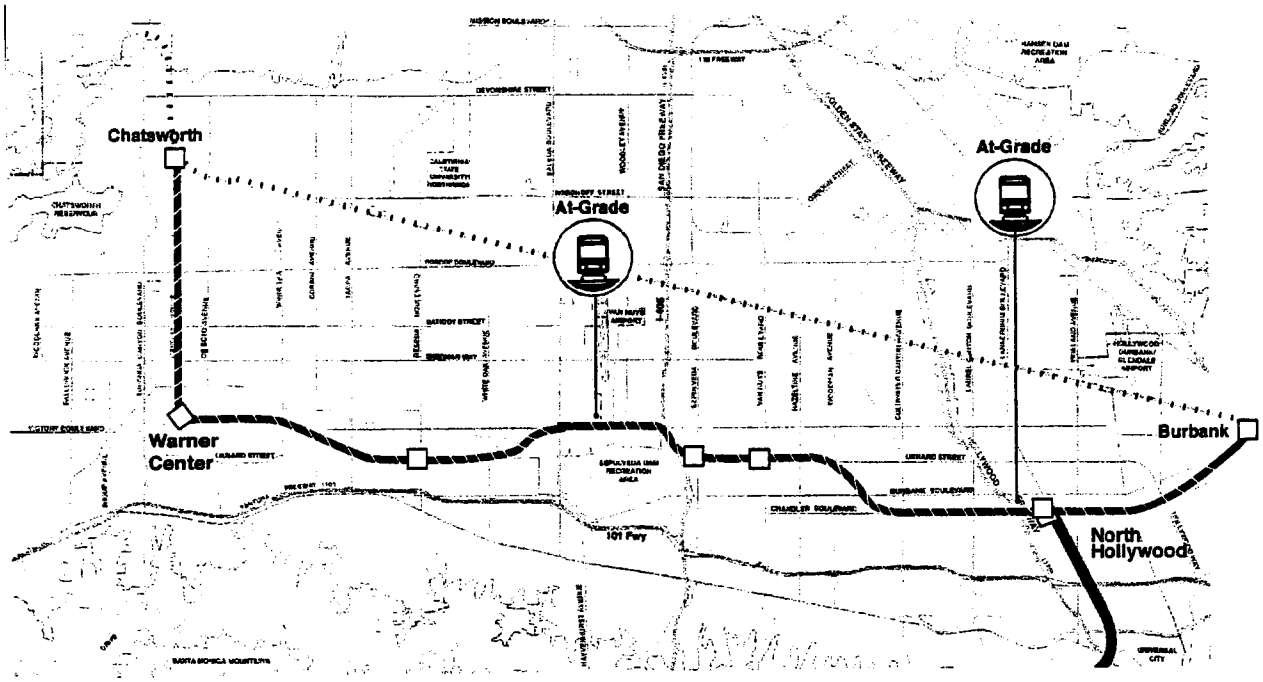
The "phasing" of project implementation will allow alternatives to be built within the constraints of available funding sources, as well as provide the community with an operating transit facility as quickly as possible. In order to ensure that projects are successful, the phases chosen must make sense from logistical, operational, and financial perspectives.

Busway Initial Phase

Two options exist for phasing the construction of Alternatives 1 and 2, the busway alternatives. The first option divides the San Fernando Valley East-West Transit Corridor into two segments through the I-405. The first phase of the busway would be constructed in the East Valley, east of the I-405. This segment would include stations at North Hollywood, Laurel Canyon, Valley College, Woodman, Van Nuys, and Sepulveda. The East Valley segment would provide buses quick access to the North Hollywood Red



Alternative 6: Dual-Mode Red Line Extension



Alternative 7: Diesel Multiple Unit (DMU) Vehicles

SOURCE: GRUEN ASSOCIATES

San Fernando Valley
East-West Transit Corridor
Major Investment Study

FIGURE S-10
Alternatives 6 and 7

Line station through the East Valley. Cross-valley bus routes would still use the East Valley busway, they would just run on-street in the West Valley, possibly using transit priority signalization to improve runtimes. The West Valley segment of the busway would be constructed when funds and timing permit.

Another option for phasing of the busway alternatives involves integration of the busway with bus transit projects already planned in the San Fernando Valley East-West Transit Corridor. The City of Los Angeles Department of Transportation (LADOT) plans to establish a transit priority bus corridor along Oxnard Street and Victory Boulevard within the overall East-West Corridor. The LADOT transit priority corridor follows the San Fernando Valley East-West Transit Corridor closely, providing access to many of the same destinations, including Warner Center, the Van Nuys Government Center, and Lankershim Boulevard. However, unlike the alternatives described in this MIS, the LADOT corridor would travel entirely on-street, along Victory and Oxnard. Between Woodman Avenue and Balboa Boulevard, the stretch of the LADOT corridor that crosses the I-405, traffic congestion is very heavy, negating the benefits of transit priority signalization.

The best way to enable buses to avoid the congestion around the I-405 would be to put them on the SP ROW, away from traffic. A segment of the busway, between Woodman Avenue and Balboa Boulevard, could operate in conjunction with the existing LADOT transit priority corridor along Oxnard and Victory. Buses would enter the busway at Woodman or Balboa and avoid the major congestion around Van Nuys Boulevard, Sepulveda Boulevard, and the I-405. After passing through this congested area, buses would again leave the SP ROW and complete their routes on street, with transit priority. **Figure S-1** illustrates the busway initial phase in the context on the entire SP ROW. This is the minimum operating segment (MOS) recommended for further study in a draft environmental impact study.

East Valley and West Valley Rail Segments

The rail alternatives (Alternatives 3, 4, 5, and 6) could be divided into a first phase in the East Valley with a second phase in the West Valley. A legacy of the previous 1996 Major Investment Study is the division of each alternative into East and West Valley segments. Originally, many of the rail alternatives described in the 1996 MIS were planned only to be built to the I-405, the dividing line between the East and West Valleys.

S.3 EVALUATION OF ALTERNATIVES

The set of preliminary alternatives was evaluated using quantitative measures of capital cost, operating cost, expected ridership, cost-effectiveness and travel time savings. In addition, qualitative evaluations of community concerns and potential environmental impacts were undertaken. The application of these criteria and the evaluation results are discussed below.

S.3.1 Capital Costs

Capital costs are the costs associated with the construction of a transit system, including purchase of right-of-way, construction of guideway structures and stations, provision of parking facilities, purchase of vehicles, and construction of vehicle maintenance facilities. Capital costs have been divided into project construction costs (the costs of building a transit system in the Valley) and vehicle, yard, and

maintenance facility costs. The cost of the previously acquired right-of-way ($159 million) is not included in the evaluation of capital costs below.

Due to variations in the profile of the guideway and the type of rail technology employed, the project alternatives encompass a wide range of capital costs. Project construction costs are least expensive for those alternatives which minimize the use of below-grade profiles and grade separations at cross streets. The most expensive alternatives are those which propose Red Line extensions, using heavy rail technology that requires grade separation along the entire length of the system. In contrast, alternatives employing bus transit have the lowest construction costs, as they were typically defined to operate at grade.

Table S-3 illustrates the range of costs associated with each alternative. The TSM alternative is estimated at $94.6 million and includes 94 additional buses, Rapid Bus on Ventura Boulevard and Van Nuys Boulevard, and a bus maintenance facility cost of $25 million. These buses are deployed in the TSM on major arterial streets to increase headways from 40 minutes or greater to at most 20 minutes. In the next phase of analysis, the TSM alternative will be refined to determine what costs should be included as system costs in each "build" alternative.

TABLE S-3
Capital Cost Estimate Summary of Preliminary Alternatives
(in 1999 $ millions)

Alternative	Project Construction Cost	Vehicles, Yards, Maintenance Facility Costs	Total Capital Costs*	Cost Per Mile*
TSM	$20	$74.6	$94.6	N/A
Alternative 1 - BRT	$146.2	$29.4	$175.6	$13.6
Alternative 2 - Enhanced BRT	$184.8	$29.4	$214.2	$16.6
Alternative 3 - LRT	$483.0	$50.9	$533.9	$39.3
Alternative 4 - Enhanced LRT	$888.8	$50.9	$939.7	$69.1
Alternative 5a - HRT/BRT (deep-bore)	$880.4	$57.2	$937.6	$72.2
Alternative 5c - HRT/BRT (open-air)	$749.0	$57.2	$806.2	$62.0
Alternative 6 - Dual-Mode	$808.8	$49.1	$857.9	$63.5
Alternative 7 - DMU	$380.4	N/A	$462.8	$20.4

* Excludes $159 million in previously acquired right-of-way.

The Bus Rapid Transit and Enhanced Bus Rapid Transit alternatives are both less expensive than any rail transit project, costing $175.6 and $214.2 million, respectively (**Table S-3**). If the cost of the TSM, except the cost of the already funded Ventura Boulevard Rapid Bus, is added to the busway alternatives,

the total capital cost of Alternative 1 is estimated at $260.2 million, and the total capital cost of Alternative 2 is estimated at $298.8 million (**Table S-4**).

TABLE S-4
Capital Cost Estimate Summary of Preliminary Alternatives Including TSM
(in 1999 $ millions)

Alternative	Total Capital Cost	Total Capital Cost including TSM Cost*
Alternative 1 - BRT	$175.6	$260.2
Alternative 2 - Enhanced BRT	$214.2	$298.8
Alternative 3 - LRT	$533.9	$618.5
Alternative 4 - Enhanced LRT	$939.7	$1024.3
Alternative 5a - HRT/BRT (deep-bore)	$937.6	$1022.2
Alternative 5c - HRT/BRT (open-air)	$806.2	$890.8
Alternative 6 - Dual-Mode	$857.9	$942.5
Alternative 7 - DMU	$462.8	$547.4

* Excludes $10 million for Ventura Boulevard Rapid Bus.

The most expensive alternatives are those which make extensive use of above- and below-grade profiles. The costliest alternatives would be Alternative 4 ($939.7 million), Alternative 5a ($937.6 million), and Alternative 6 ($857.9 million). Alternative 4 has a deep-bore tunnel segment from the North Hollywood Red Line station to Woodman Avenue and twelve grade separations at major streets. Alternative 5 has a deep-bore tunnel segment from North Hollywood to Hazeltine Avenue and an aerial profile to the I-405. Alternative 6 has a deep-bore tunnel segment near the North Hollywood Red Line station but runs at grade once it emerges onto the SP ROW.

Table S-5 indicates the capital costs for potential minimum initial phases if funding is not available for the full length project. The busway alternatives are the least costly. For the Alternative 1 busway, two options for an initial phase are shown. One option is a 4.2 mile segment from Woodman to Balboa with a capital cost of $80.0 million and another option is a 5.4 mile segment in the East Valley with a capital cost of $93.9 million. An East Valley segment would be the initial phase for all other alternatives. Alternatives 5a and 5c are the most expensive because the heavy rail portions of these alternatives would be constructed first.

S.3.2 Operating and Maintenance Costs

Operating and maintenance (O&M) costs are the expenses associated with sustaining the day-to-day service provided by a transit system. They include labor costs, fuel for vehicles, vehicle maintenance, and station upkeep. O&M costs for each of the preliminary alternatives are presented in **Table S-6**. The

values shown represent the change in O&M costs associated with implementation of a San Fernando Valley East-West Transit Corridor project as compared to the No Build and TSM alternatives.

TABLE S-5
Capital Cost Estimate Summary of Preliminary Alternatives - Minimum Initial Phase
(in 1999 $ millions)

Alternative	Location of Phase	Project Length	Total Capital Cost*
Alternative 1 - BRT - Option 1	Woodman to Balboa	4.2	$80.0
Alternative 1 - BRT - Option 2	East Valley	5.4	$93.9
Alternative 2 - Enhanced BRT	East Valley	5.4	$129.3
Alternative 3 - LRT	East Valley	5.4	$262.9
Alternative 4 - Enhanced LRT	East Valley	5.4	$593.1
Alternative 5a - HRT/BRT (deep-bore)	East Valley	5.6	$864.0
Alternative 5c - HRT/BRT (open-air)	East Valley	5.6	$730.3
Alternative 6 - Dual-Mode	East Valley	5.4	$426.2
Alternative 7 - DMU	East Valley	9.9	$203.5

* Excludes cost of previously acquired right-of-way - East Valley $79.5 million.

TABLE S-6
Annual Operating and Maintenance Costs of Preliminary Alternatives
(in 1999 $ millions)

Alternative	Cost over No Build	Cost over TSM
TSM	$38	N/A
Alternative 1 - BRT	$48	$10
Alternative 2 - Enhanced BRT	$48	$10
Alternative 3 - LRT	$59	$21
Alternative 4 - Enhanced LRT	$60	$21
Alternative 5a - HRT/BRT (deep-bore)	$58	$20
Alternative 5c - HRT/BRT (open-air)	$59	$20
Alternative 6 - Dual-Mode	$63	$25

O&M costs are related to the length of the project constructed and the type of technology used to provide transit service. The lowest annual O&M costs would be obtained for a bus-based system, under either the BRT or Enhanced BRT alternatives ($48 million over No Build). The rail transit alternatives have

higher O&M costs than the bus alternatives, but these expenses are partially offset by the reductions in bus operating costs that occur as bus service is supplemented or replaced by rail service.

For any given project length, O&M costs are highest for Red Line extensions and somewhat lower for an LRT system. Because the HRT alternatives (Alternatives 5a and 5c) are in conjunction with a busway, all the LRT and HRT alternatives have somewhat similar operating costs ($58-$60 million over No Build) except Alternative 6, Dual-Mode, which has a greater O&M cost ($63 million).

S.3.3 Ridership

For all project alternatives, ridership is a function of travel time and cost. All else being equal, the faster technologies attract more riders. Longer segments have higher ridership because they serve a larger area and incorporate more stations. Alignment choice also affects ridership. The choice of underground versus aerial profiles does not affect ridership, nor does construction method (deep-bore, cut-and-cover, or open-air). At-grade profiles, however, may reduce ridership if transit vehicles do not have signal priority at street crossings, creating longer travel times.

The projected ridership for each alternative is shown in **Table S-7**. The "boardings" column represents the number of passengers expected to use the system *within* the Valley, that is, board and disembark at stations constructed as part of the San Fernando Valley East-West Transit Corridor project. "New transit riders" compares the number of linked trips for each alternative to the No Build and TSM alternatives which serve as the baselines for ridership studies as required by the FTA.

TABLE S-7
Ridership of Preliminary Alternatives

Alternative	Fixed Guideway Daily Transit Boardings	Fixed Guideway New Daily Transit Trips	
		Over No Build	Over TSM
TSM	N/A	25,300	N/A
Alternative 1 - BRT	20,600	30,300	5,000
Alternative 2 - Enhanced BRT	20,600	30,300	5,000
Alternative 3 - LRT	28,000	33,100	7,800
Alternative 4 - Enhanced LRT	28,000	33,100	7,800
Alternative 5a - HRT/BRT (deep-bore)	17,800	28,100	2,800
Alternative 5c - HRT/BRT (open-air)	17,800	28,100	2,800
Alternative 6 - Dual-Mode	19,600	37,500	12,200

Compared to the TSM alternative, the best performing alternative for new transit riders is Alternative 6, the Dual-Mode alternative. This alternative serves the entire Valley from North Hollywood to Warner Center, employs the high-speed/high-capacity technology of Red Line heavy rail cars, and allows

passengers to travel directly to central Los Angeles without transfers. The busway, LRT, and HRT/BRT alternatives are less effective in attracting ridership. The busway alternatives, Alternative 3 (LRT), and the bus portions of Alternative 5 have slower average speeds than the Dual-Mode alternative because their at-grade operation, even with signal priority, leads to stops at traffic intersections, increasing travel time.

S.3.4 Cost-Effectiveness

Cost-effectiveness is a measure used to evaluate how the costs of a transit project (for both construction and operation) compare to the expected benefits (increased transit ridership). Cost-effectiveness is calculated as an index which represents the added cost associated with serving each new transit rider. The smaller the index, the more cost-effective the project alternative. Consistent with FTA requirements, cost-effectiveness for each alternative is measured against the No Build and TSM alternatives. **Table S-8** lists the preliminary alternatives and their cost-effectiveness.

TABLE S-8
Cost-Effectiveness of Preliminary Alternatives
Annualized Cost Per New Daily Transit Trip

Alternative	Over No Build	Over TSM
TSM	$6	N/A
Alternative 1 - BRT	$8	$16
Alternative 2 - Enhanced BRT	$8	$18
Alternative 3 - LRT	$11	$26
Alternative 4 - Enhanced LRT	$14	$39
Alternative 5a - HRT/BRT (deep-bore)	$16	$108
Alternative 5c - HRT/BRT (open-air)	$15	$96
Alternative 6 - Dual-Mode	$12	$24

The most cost-effective alternatives are those which yield a high number of new riders at a low incremental cost. The TSM alternative is very cost-effective, as it attracts approximately 25,300 new transit trips (compared to No Build) while avoiding the large capital costs for guideways and stations that are associated with all of the other alternatives. The Busway is also quite cost-effective, costing less than $8 per new ride compared to the No Build and $16 compared to the TSM.

The only cross-valley rail alternative with a cost-effectiveness below $25 compared to the TSM is the Dual-Mode alternative. Alternative 6 had the largest new ridership and falls within the $20-$25 per new rider cost-effectiveness range.

S.3.5 Travel Time Comparison

Table S-9 compares the runtimes, average speed, station spacing, and headways, for the BRT alternatives, the Light Rail alternatives, the HRT/BRT alternative, and the Dual-Mode alternative. The

alternative with the fastest run time (24.2 minutes) from North Hollywood to Warner Center is Alternative 6, the Dual-Mode alternative, followed by Alternatives 3 and 4, Light Rail (26.0 minutes). The busway alternatives' runtimes are estimated at 28.6 minutes, which is considerably less than the local bus today which takes 55 minutes. The HRT/BRT combination, Alternative 5 would run slight faster than the BRT alternatives but require a transfer at Sepulveda Boulevard. The runtime from Warner Center to Downtown is estimated at 58.6 minutes for the busway, 56.0 minutes for the Light Rail alternatives, 54.1 minutes for HRT/BRT, and 51.2 minutes for the Dual-Mode alternative.

TABLE S-9
Travel Time Comparison for Preliminary Alternatives

	BUS RAPID TRANSIT (BRT) Alts. 1 and 2	LIGHT RAIL (LRT) Alts. 3 and 4	HRT TO I-405 / BRT TO WARNER CTR. Alt. 5	DUAL-MODE HEAVY RAIL Alt. 6
Total Runtimes (Warner Center to North Hollywood)	28.6 minutes	26.0 minutes	27.1 minutes + transfer at Sepulveda (3 min)	24.2 minutes
Total Runtimes (Warner Center to Downtown)	55.6 minutes + transfer at North Hollywood (3 min)	53.0 minutes + transfer at North Hollywood (3 min)	54.1 minutes + transfer at Sepulveda (3 min)	51.2 minutes
Average Speed	29.2 mph	30.4 mph	31.4 mph	33.5 mph
Average Distance between Stations	1.16 miles	1.20 miles	1.26 miles	1.35 miles
Headways	Peak: Varies - 2 ½ min. at N. Hollywood	Peak: 4 minutes Base: 8 minutes	Peak: Varies - 4 min. on HRT 2 ½ - 5 min. on BRT	Peak: 4 minutes Base: 8 minutes

S.3.6 Environmental Effects

The potential environmental impacts of the alternatives under consideration in this Major Investment Study are described in detail in Chapter 4, Affected Environmental and Environmental Analysis. The following summary describes impacts common to all alternatives as well as distinguishing environmental effects of individual alternatives. The Draft MIS/EIR/SEIR prepared in 1997 has provided much of the information being used to complete the environmental analysis in this MIS.

Land Use and Development

All alternatives will connect major activity centers within the San Fernando Valley, including North Hollywood, the Van Nuys Government Center, Warner Center, Valley College, Pierce College, and the Sepulveda Dam Recreation Area. Furthermore, many of the transit stations will be placed alongside "transit supportive" land uses such as schools, commercial facilities, and high-density residential areas.

Acquisitions and Displacements

Some acquisitions and associated displacements will be necessary for all alternatives. Some businesses are currently located within the SP ROW on short-term leases. These will not be renewed as construction commences. A minimal amount of property acquisition will be necessary to facilitate a diagonal crossing of the intersection of Fulton Avenue and Burbank Boulevard in Alternatives 1 and 2. Construction staging areas will be necessary for Alternatives 3 through 6, requiring the acquisition of property at points along the right-of-way, displacing approximately 10 residents and 20 businesses. Park and ride lot acquisition will be necessary for several of the alternatives.

Demographics and Neighborhoods

Alternatives will not adversely affect any particular demographic group. Neighborhoods along the San Fernando Valley East-West Transit Corridor will be screened from the right-of-way through landscaping, walls, and earthen berms.

Community Facilities and Services

All alternatives described in this MIS will improve access to the Van Nuys Government Center, as well as Valley College and Pierce College. Schools, health care facilities, and parks within a quarter mile of the alignment would experience improved access. Potential noise impacts to facilities immediately adjacent to the right-of-way can be mitigated with landscaping, walls, and earthen berms.

Fiscal and Economic Conditions

An estimated 1,040 new regional jobs would be created by the TSM alternative. Alternatives 1 and 2 would require only minor property acquisitions and therefore would not displace employees. These two alternatives would generate an estimated 1,280 regional jobs for operation. Alternatives 3 through 6 could displace upwards of 400 employees could be displaced as result of acquisitions. Employment generated, however, would be from an estimated 1,340 regional jobs (Alternative 6) to 1,450 jobs (Alternative 3).

Visual and Aesthetic Conditions

Aerial stations and alignments, such as those described in Alternatives 2, 4, and 5 (minimal aerial structure is necessary for Alternatives 3 and 6 at Warner Center), will block existing views and shadow buildings along the right-of-way. The overhead wires required for light rail, Alternatives 3, 4, and 6,

will also interfere with existing views. The right-of-way will be landscaped in all alternatives, and walls or earthen berms will screen neighboring residential areas from the new guideway, mitigating its impact.

Air Quality

All of the alternatives would produce reductions in overall emissions because increased transit use would result in reduced private vehicle operation. Alternatives 1, 2, and 5, because of they are bus-based, would result in lower emission reductions than the rail-based alternatives, except for Alternative 7. Alternative 7, the Diesel-Multiple Unit vehicle alternative, would produce localized emissions of diesel exhaust, resulting in lower overall emissions reductions.

Noise and Vibration

Buses in Alternatives 1, 2, and 5 would result in noise impacts which may be mitigated with barriers within the right-of-way. Alternatives 3, 4, 6, and 7 require warning bells at most intersections, constituting a noise impact. For all of the alternatives, any vibration exceeding annoyance levels could be mitigated.

Biological Resources

The Los Angeles River crossing west of the I-405 made by all alternatives encroaches on wetlands of limited value. Any mitigation necessary would be determined at the time of permit application.

Water Resources

Some encroachment into 100- and 500-year floodplains would occur along portions of the corridor. Design of open-air guideways and stations (Alternatives 4, 5, and 6) would include provisions to minimize flood hazards to transit patrons.

Safety and Security

Private auto travel is inherently more accident prone than public transit. However, at-grade crossings of the guideway have an increased potential exposure to accidents caused by transit vehicle/automobile conflicts. This would apply to all alternatives.

Cultural Resources

No alternative would adversely affect cultural resources along the corridor. Alternatives 3, 4, and 7 would re-use the historic Lankershim Depot as a light rail station.

Section 4(f) Issues

No adverse effects have been found for actual or constructive use of parks or recreational areas along the corridor. Temporary uses would occur in the Sepulveda Dam Recreation Area and the Chandler Boulevard On-Street Bicycle Route, but these are permitted under Section 4(f).

S.3.7 Community Outreach

The public outreach component of the San Fernando Valley East-West Transit Corridor study spans four years. The first round of outreach activities occurred between September 1995 - March 1997. The second round of outreach began in October 1999 and continues to date. The second round of outreach focused on the key stakeholders identified during the first round of outreach activities.

Activities

Major activities which were a part of the public involvement program include:

- Stakeholder identification - Through the public involvement program, individuals, community organizations, businesses, homeowner groups, business groups and officials that might be affected were identified. All stakeholders were added to the project database which contains 2000 names.

- Stakeholder outreach - During both rounds of outreach, a total of 124 meetings / briefings have been conducted with various stakeholders throughout the San Fernando Valley to inform them of the study, elicit their feedback and identify issues of concern. A list of these groups and individuals is found in Appendix A.

- Hotline - A telephone hotline has been used to provide the public with immediate access to accurate, up-to-date information. The hotline briefly describes the planning process and the opportunities for public involvement. Callers have the option of leaving their name and address so they can receive additional information by mail or leaving a detailed message so that a staff member can follow-up on their inquiries.

- Station Siting Workshops - From September 1995 to March 1997, small workshops were held conducted with various stakeholder groups who might potentially proposed transit station locations along the corridor study area. At these workshops, community members commented on possible station designs and planning issues related to the stations.

- Update Mailing - In August 1999, a letter to homeowner and business groups throughout the San Fernando Valley was mailed to over 2000 addresses. The letter updated stakeholders about important milestones and the status of the study process. The letter contained information on important decisions made by the MTA Board regarding the study; it included the names and telephone numbers of who to contact, and information on how to access the hotline number. The mailing encouraged everyone's participation and feedback.

Summary of Comments

Comments made in the first round of outreach are found in Appendix A. These comments were made by stakeholders during the second round of outreach.

- Key individuals, elected officials and various community organizations expressed the need to develop an alternative mode of transportation to alleviate the current traffic congestion in the East-West Corridor.

- Community and business leaders seem to favor the dedicated busway (Alternatives 1 and 2) as an alternative. Funding for this alternative is thought to be more viable and would be able to provide wider ridership opportunities throughout the entire Valley. Additionally, some community and business leaders expressed that they would like the system in place corridor-wide (from east to west) all at once, rather than taking a phased approach.

- However, some of the elected officials and community members expressed interest in the light rail system and view the proposed dedicated busway as a temporary solution to the traffic congestion in the San Fernando Valley East-West Transit Corridor. The Robbins legislation (SB211) would need to be amended to make an at-grade rail, dual-mode, or diesel multiple unit system (Alternatives 3, 6, and 7) feasible in the Burbank-Chandler segment of the corridor. Additionally, Proposition A prohibits the use of local funds to construct a heavy-rail subway. Hence, there are two laws that contradict one another, thereby, narrowing technology options to a bus alternative or the more expensive light rail or heavy rail solutions with multiple profile changes.

- There is still community opposition to an above-ground transit solution along Chandler Boulevard, either bus or rail. Generally, a rapid bus alignment along Oxnard Street was seen as a possible route that serves more activity centers with fewer perceived community impacts.

- There are still concerns among stakeholders regarding the potential for an increase in crime at the various stations along the corridor.

- Various stakeholders along the corridor would like to see the SP ROW improved and landscaped. It has been suggested that if the bus alternative is preferred, the MTA should dedicate the ROW as a community park.

- Several public officials are concerned that the project should not delay or affect the planned bikeway within the right-of-way.

S.4 BASIS FOR RECOMMENDATIONS

Table S-10 presents a comparison of the key evaluation criteria pertaining to each of the alternatives under consideration in this MIS. This set of criteria is the basis for the recommendation of alternatives to be carried forward into the environmental phase of this study.

- Alternative 1 - Bus Rapid Transit (BRT): The Bus Rapid Transit alternative has the lowest capital and O&M costs of all the alternatives. Furthermore, it is the most cost-effective alternative per new transit rider. The busway, while slightly slower than the rail alternatives, still provides substantial cross valley travel time savings over local and rapid bus. On its exclusive, landscaped right-of-way, future speeds on the busway will not be affected by future automobile

TABLE S-10
Alternatives Summary Evaluation Matrix

Alternative	Capital Cost, Millions, 1999$		Annual Operating Cost Millions, 1999$		New Daily Transit Trips		Daily Fixed Guideway Boardings	Annualized Cost Per New Daily Transit Trip		Operating Cost per System Boarding Compared to the No Build	Average Speed & Maximum Speed (MPH)	Travel Time (Minutes), North Hollywood to Warner Center	Distinguishing Environmental Issues	Community Support
	Full Length Project*	MOS Project**	Compared to No Build	Compared to TSM	Compared to No Build	Compared to TSM		Compared to No Build	Compared to TSM					
TSM	$95***	N/A	$38	N/A	25,300	N/A	N/A	$6	N/A	$2.48	N/A	N/A	Existing conditions	Medium
1. BRT To Warner Center	$176	$80	$48	$10	30,300	5,000	20,600	$8	$16	$3.11	29.4 Average 55 Maximum	28 ½	Low Visual Impact	Medium
2. BRT To Warner Center	$214	$129	$48	$10	30,300	5,000	20,600	$8	$18	$3.12	29.4 Average 55 Maximum	28 ½	Low Visual Impact	Medium
3. LRT To Warner Center	$534	$263	$59	$21	33,100	7,800	28,000	$11	$26	$3.59	32.3 Average 55 Maximum	26	Medium Visual Impact Warning Bell Noise	Low
4. LRT To Warner Center	$940	$593	$60	$21	33,100	7,800	28,000	$14	$39	$3.61	32.3 Average 55 Maximum	26	Medium Visual Impact	Medium
5a. HRT/BRT Deep-Bore to I-405 & BRT to Warner Ctr.	$938	$864	$58	$20	28,100	2,800	17,800	$16	$108	$5.91	31.4 Average 70 Maximum	27 + transfer time at Sepulveda	Low Visual Impact	High
5c. HRT/BRT Open-Air to I-405 & BRT to Warner Ctr.	$806	$730	$59	$20	28,100	2,800	17,800	$15	$96	$5.97	31.4 Average 70 Maximum	27 + transfer time at Sepulveda	Low Visual Impact	High
6. Dual-Mode Car to Warner Center	$858	$426	$63	$25	37,500	12,200	19,600	$12	$24	$5.41	35 Average 70 Maximum	24	Medium Visual Impact Warning Bell Noise	Low
7. DMU Burbank to Chatsworth	$463	$204	****	****	****	****	****	****	****	****	****	****	Low Visual Impact Diesel Emissions	Low

* - Excludes previously expended right-of-way cost ($159.0 million). All columns, except MOS Project column, reflect Full Project costs.

** - Excludes previously expended right-of-way cost ($79.5 million).

*** - Includes Ventura and Van Nuys Blvds. Rapid Bus, increase in headways on Red Line and bus.

**** - DMU Alternative not modeled. Identified by community during the course of study and could be included for further analysis in later phases of study.