

Council Meeting of
March 27, 2012

Honorable Mayor and Members
Of the City Council
City Hall
Torrance, California

Members of the Council:

SUBJECT: Transit – Approve Memorandum of Understanding for the Countywide Signal Priority System. Expenditure: \$2,875,000.

RECOMMENDATION:

Recommendation of the Transit Director that City Council approve a Memorandum of Understanding with Los Angeles County Metropolitan Transportation Authority (LACMTA) for the implementation of the Countywide Signal Priority System. Expenditure; \$2,875,000.

FUNDING:

Project is fully funded through the attached Memorandum of Understanding with Los Angeles County Metropolitan Transportation Authority.

BACKGROUND/ ANALYSIS:

In 1998, Los Angeles County Metropolitan Transportation Authority (LACMTA) initiated the Countywide Bus Signal Priority (CSP) Pilot Project as part of an effort to design, develop, implement, and evaluate a multi-jurisdictional bus signal priority system as well as develop countywide signal priority guidelines for Los Angeles County. The CSP Pilot Project was a collaborative effort bringing together multiple jurisdictions and transit operators that resulted in the development of a wireless signal priority system for Los Angeles County.

In 2005, LACMTA embarked on the Countywide Metro Rapid Signal Priority Expansion Project, a follow up to the previous successful demonstration pilot and the first phase of an expansion effort to implement signal priority for seven Metro Rapid corridors traversing through twenty-four jurisdictions. In accordance with the Metro Rapid Five-Year Implementation Plan, the first phase focused on providing bus signal priority for four LACMTA Rapid corridors including, Pacific-Long Beach, Soto, Hawthorne, and Florence. Additionally communication enhancements were made to the Crenshaw pilot corridor as part of Phase I. In 2008 Metro initiated work on the second phase of the Countywide Metro Rapid Signal Priority Expansion Project. LACMTA continues to work with other cities and municipal transit operators to expand CSP to other transit corridors.

Because Torrance is ready to participate in the regional Rapid Bus program, our participation in the CSP project is also important. Attached is a copy of the Memorandum of Understanding (MOU) between Torrance and the LACMTA for implementation of the CSP system as part of our participation in the Rapid Bus program. (ATTACHMENT A)

Signal Priority monitors the activities of a particular traffic corridor via electronic transponders located on a vehicle and receivers found within the traffic signal. Contingent upon the nature of service that the vehicle performs, a traffic light or signal can be "held" for a given duration of time to ensure that the vehicle can safely cross the intersection. Emergency services, such as Fire and Police, have the highest priority and vehicles equipped with a transponder can hold a traffic signal for an extended period of time. Transit buses and vehicles are lower in priority and can only extend the length of time of a traffic light for a few seconds. This is beneficial as it enables a bus to hold a "yellow light" signal a few seconds longer and allow the vehicle to safely cross the intersection. It also enhances the services offered by the Rapid Bus program that Torrance is also implementing.

Respectfully submitted,



Kim Turner
Transit Director

CONCUR:

for 

LeRoy J. Jackson
City Manager

Attachments:

- A) Memorandum of Understanding for the Implementation of the Countywide Signal Priority System.

MOU#MOU.MRBCMAQ67

**LACMTA AND CITY OF TORRANCE
COUNTYWIDE SIGNAL PRIORITY SYSTEM
MEMORANDUM OF UNDERSTANDING**

This Memorandum of Understanding (“MOU”) is entered into between the Los Angeles County Metropolitan Transportation Authority (“LACMTA”) and the City of Torrance (“City”) on this date of April 1, 2012.

WHEREAS, the LACMTA Board of Directors, at its September 18, 2002 meeting, approved the Metro Rapid Five-Year Implementation Plan (“Five-Year Plan”) **(Attachment A)**; and

WHEREAS, the Five-Year Plan includes grants to fund 100 percent of the capital costs to acquire and install the Countywide Signal Priority (CSP) System and related communications equipment that is designed to manage deployment of the Metro Rapid service operated by LACMTA and the Municipal Operators as described in the Five-Year Plan for implementation in 27 corridors; and

WHEREAS, the City seeks to implement CSP along the Torrance-Long Beach Rapid corridor as described in the Five-Year Plan, in the cities of Torrance, Carson, Long Beach, Los Angeles, Los Angeles County, and the California Department of Transportation (which are collectively known herein as the “Participating Agencies”) as set forth in the Scope of Work **(Attachment B & B1)**, the Financial Plan **(Attachment C)**, and the Project Schedule **(Attachment D)**, which are collectively referred to herein as the “Project,” and

WHEREAS, the Participating Agencies have agreed that the City will act on behalf of the Participating Agencies to administer the Project and act as liaison with LACMTA for the Project, and

WHEREAS, the funding for the Project pursuant to this MOU is an integral part of the Five-Year Plan; and

WHEREAS, by accepting funding for the Project, the City agrees that it will be responsible for all CSP System operations, maintenance, utility and repair costs for all project buses and at all intersections being implemented under the Scope of Work for a system performance warranty period of three (3) years following final system testing and acceptance; and

WHEREAS, the City desires to modify or replace each of the Participating Agencies’ existing signal control system to support the CSP operation in accordance with the terms of this Agreement and attachments hereto, which are incorporated herein by reference; and

WHEREAS, LACMTA desires to provide the City with a not-to-exceed grant of \$2,875,000 (the "Funds") for the Project.

NOW THEREFORE, the parties agree as follows:

1. CONDITIONS

1.1 The City shall use the Funds, as described below, to complete the Project as described in the Scope of Work (**Attachments B & B1**). The Funds, as granted under this MOU, can only be used towards the completion of this Scope of Work. The City shall not use the Funds to substitute for any other funds or projects not specified in this MOU. The Scope of Work includes a detailed Project description, a description of the Project's location and a Project schedule.

1.2 The City shall use the Funds in accordance with the Financial Plan attached to this MOU (**Attachments C**) and the Project Schedule (**Attachments D**). The Financial Plan shows the Project's cash flow and includes the Project's entire financial commitment including the fiscal year that the Funds will be expended.

1.3 The City understands the Funds are federal funds and Federal Transit Administration (FTA) requirements apply to the use of Funds. All FTA requirements and guidelines, as summarized in the FTA Master Agreement, are incorporated by reference herein as part of this MOU. These requirements include, but are not limited to:

- Assurances of legal authority. Certification of non-debarment, suspension or termination.
- Certification of a drug-free workplace. Intergovernmental review.
- Civil Rights review, including Title VI Program review. Disadvantaged Business Enterprise (DBE) assurances. Disability nondiscrimination (ADA). Office of Management and Budget (OMB) certification. Lobbying certifications. Buy America requirements. NEPA environmental review. Single audit requirements. Circular 9300.1A (Section 5309).
- Circular 5010.1 C (Grants Management).
- Circular 4220.1 E (Third-Party Contracting).

1.4 During the term of this MOU, the City shall submit Monthly Progress Reports (**Attachment E**). The reports shall include monthly and inception-to-date actual expenditures, tasks completed during the reporting period, projected activities for the next quarter and any information that describes the progress of the Scope of Work as well as all appropriate documentation (such as contractor invoices, timesheets, receipts, etc.). The Monthly Reports are due to the LACMTA Project Manager on or before the thirtieth (30th) day of the month. Should the City fail to submit such reports within 10 days of the due dates, and/or submit incomplete reports, LACMTA will not reimburse the City until the completed required reports are received, reviewed, approved and reconciled to the Financial Plan. All supporting documents must include a clear

justification and explanation of their relevance to the Project. If no activity has occurred during a particular month, the City will still be required to submit the Monthly Progress Reports indicating no dollars were expended that month.

1.5 The City is responsible for reviewing and approving the design plans for the Project. The City must get all necessary permits and approvals from the appropriate agencies.

1.6 The City must design the Project to fully comply with the Americans with Disabilities Act (ADA).

1.7 This MOU shall commence on April 1, 2012 and end on June 30, 2014. The last expenditure date is March 31, 2014. Any expenditure incurred after March 31, 2014, shall not be reimbursed under this MOU. The deadline for submitting invoices is June 30, 2014.

1.8 The City will be responsible for all operations, maintenance, utility and repair costs incurred for the Project for a period of three years following final system testing and acceptance, under the terms set forth in the Scope of Work.

1.9 This is a one-time only grant subject to the terms and conditions agreed to herein. This grant does not imply nor obligate any future funding commitment on the part of LACMTA.

1.10 The City shall implement the Project in accordance with the terms of this MOU and the Five-Year Plan as it relates to the corridor alignment, bus service deployment, and attributes. The City shall also implement the Project in accordance with all applicable Federal and State laws, regulations, and rules with respect to contracts entered into in the implementation of the Scope of Work.

1.11 The City shall work in partnership with LACMTA and each of the Participating Agencies to determine and document a set of parameters for the operation of the CSP. These parameters shall maximize, consistent with safe operation of the signal and overall congestion reduction benefit, the amount of priority given Torrance Transit Rapid buses operating along the CSP corridor within the jurisdiction of the Participating Agencies.

The City, in coordination with each of the Participating Agencies, commits to recognize the experience of LACMTA with the deployment of bus signal priority systems and incorporate the lessons learned to-date in order to maximize the benefit of the system within the jurisdiction of the Participating Agencies. The City, in coordination with each of the Participating Agencies, further recognizes that under no circumstances, outside of emergency or crisis response, will the CSP be disabled; however it is expressly understood that from time to time the CSP system in whole or in part may be disabled if necessary for construction activities and for maintenance activities on the CSP system (or maintenance activities on other systems that use CSP equipment in common), in

addition to the emergency and crisis response. In the event the system is disabled, the City, in coordination with each of the Participating Agencies, agrees to give LACMTA a 2-month advance notice. At eighteen (18) months prior to the expiration of the three-year system performance warranty, the City, in coordination with each of the Participating Agencies, and LACMTA shall meet and confer to determine the manner in which the CSP system will be operated, repaired, and maintained after warranty expiration. The City has the option of discontinuing the operation, repair, and maintenance of the CSP system upon expiration of the three-year system performance warranty if the parties are unable to identify project funding. In this event, LACMTA agrees that the City will be held harmless regarding any activities, conditions or events arising out of the discontinuation of the CSP system.

2. TRANSFER OF FUNDS

2.1 To the extent that funds are available, LACMTA shall grant to City an amount up to \$2,875,000 (the "Funds") in Federal funds for the Project subject to the terms and conditions contained herein. These Funds are programmed as follows: \$2,875,000 in FY11. Availability of Funds is subject to annual LACMTA Board of Directors approval of the fiscal year budget.

2.2 LACMTA shall transfer the Funds to the City on reimbursement basis only. No advance of Funds shall be allowed. The City shall submit monthly invoices with supporting documentation to LACMTA identifying work completed and the amount expended by the City. Items eligible for reimbursement are discussed in the Reporting & Expenditure Guidelines **Attachment E1**.

2.3 The City will submit monthly invoices with supporting documentation directly to the LACMTA Project Manager. Monthly invoices may be provided to the Project Manager via e-mail, with original copies mailed to the address indicated in Section 2.7. Upon submission of monthly invoices, LACMTA shall reimburse the City within five (5) business days of receipt of invoices. The City will use the Funds provided by LACMTA each month to pay for services rendered towards the completion of this Scope of Work that occurred during the preceding month. The City will make payment to vendors identified in the monthly invoice within thirty (30) calendar days from the City's receipt of the vendor's invoice, subject to timely reimbursement from LACMTA.

2.4 The invoices submitted to LACMTA shall only relate to approved goods or services provided in accordance with this MOU. The invoice should clearly identify the charges, copies of the invoices, number of the MOU, and the period covered.

2.5 LACMTA shall reimburse the City the fully allowed amount of the invoices as approved by LACMTA and in accordance with this MOU. Should Funds be eliminated, LACMTA will pay the City up to the amount spent before Funds were eliminated.

2.6 The City is responsible for all cost overruns incurred as a result of this Project. Under no circumstance will the total amount of money that LACMTA reimburses the City exceed the amount of the Funds.

2.7 In the event that project bids received by the City for the Scope of Work are in excess of the amount of project funding identified in Section 2.1, the City reserves the right to reject all bids and revise the Scope of Work, in coordination with each of the Participating Agencies and LACMTA.

2.8 Invoices, Monthly Reports and notices to LACMTA shall be mailed to:

Los Angeles County Metropolitan Transportation Authority
 One Gateway Plaza
 MS: 99-23-01
 Los Angeles, CA 90012
 Attn: Michael Richmai, Project Manager

2.9 Payments and notices to the City shall be addressed to:

City of Torrance
 Torrance Transit System
 20500 Madrona Avenue
 Torrance, CA 90503
 Attn: Jim Mills, Administration Manager

3. PENALTIES

LACMTA reserves the right to terminate this MOU and withhold all payments of Funds in the event of City's breach or default of any term or condition contained in this MOU.

4. MISCELLANEOUS

4.1 California law shall govern this MOU. If any provision of this MOU is held by a court of competent jurisdiction to be invalid, void, or unenforceable, the remaining provisions shall nevertheless continue in full force without being impaired or invalidated in any way; unless any of the stated purposes of the MOU would be defeated.

4.2 The City shall not assign this MOU, or any part thereof, without written consent and prior approval of LACMTA Chief Executive Officer or designee, and any assignment without said consent shall be void and unenforceable.

4.3 This MOU and FTA Guidelines constitute the entire understanding between parties, with respect to subject matter herein. This MOU shall not be amended, nor any provision or breach hereof waived, except in writing signed by the parties.

4.4 The covenants and agreements of this MOU shall inure to the benefit of, and shall be binding upon, each of the parties and their respective successors and assigns.

4.5 LACMTA shall have the right to conduct a financial and compliance audit(s) of the Project. City agrees to establish and maintain proper accounting procedures and cash management records and documents in accordance with generally accepted accounting principals. The City shall reimburse LACMTA for any expenditure not in compliance with the Scope of Work and/or not in compliance with other terms and conditions of this MOU and FTA Guidelines. City shall retain all original records and documents related to the work described herein for a period of three (3) years after project close out audit and FTA grant close out. City shall cause all contractors to cooperate fully in complying with this paragraph. The findings of the LACMTA audit are final.

4.6 Neither LACMTA nor any officer or employee thereof shall be responsible for any damage or liability occurring with any work performed by and or service provided by City, its officers, agents, employees, and subcontractors under this MOU or the FTA Guidelines. City shall fully indemnify, defend and hold LACMTA, and its officers, agents and employees harmless from and against any liability and expenses, including without limitation, defense costs, any costs or liability on account of bodily injury, death or personal injury of any person for damage to or loss of risk of property, any environmental obligation, any legal fees and any claims for damages of any nature whatsoever arising of the Project, including, without limitations: (i) misuse of the Funds by City, or its officers, agents, employees, or subcontractors; (ii) breach of the City's obligations under this MOU; or (iii) any act or omission of the City, or its officers, agents, employees or subcontractors in the performance of the work or the provision of the services, including, without limitation, the Scope of Work, described in this MOU.

4.7 City in the performance of the work required by this MOU is an independent contractor and not an agent or employee of LACMTA. City shall not represent itself as an agent or employee of LACMTA and shall have no powers to bind LACMTA in contract or otherwise.

IN WITNESS WHEREOF, the parties have caused this MOU to be executed by their duly authorized representatives as of the dates indicated below:

CITY OF TORRANCE

LOS ANGELES COUNTY
METROPOLITAN TRANSPORTATION
AUTHORITY

BY: _____
Frank Scotto
Mayor

BY: _____
Arthur T. Leahy
Chief Executive Officer

Date: _____

Date: _____

ATTEST:

APPROVED AS TO FORM:

Sue Herbers, City Clerk

ANDREA SHERIDAN ORDIN
County Counsel

JOHN L. FELLOWS III
City Attorney

By: _____
Deputy

By: _____

Date: _____

Date: _____

LACMTA AND CITY OF TORRANCE COUNTYWIDE SIGNAL PRIORITY SYSTEM

Scope of Work

This project is a cooperative effort between the Los Angeles County Metropolitan Transportation Authority (LACMTA) and the City of Torrance to implement the Countywide Signal Priority (CSP) System at various intersections along the Torrance-Long Beach Rapid bus corridor, utilizing LACMTA's wireless signal priority system standards. The wireless CSP technology will provide real-time processing of transit data and advanced bus signal priority signalization. The result of which is a reduction in passenger travel times and more reliable bus service along the corridor.

Eighty (80) traffic signals at intersections and at mid-blocks in the cities of Torrance, Carson, Long Beach, Los Angeles as well as portions of the California Department of Transportation and unincorporated area of Los Angeles County are affected by the this project. The City of Torrance serves as the lead agency representing the aforementioned jurisdictions. This wireless CSP system will be installed along 16.0 miles of the Torrance-Long Beach Rapid bus corridor – consisting of the following street corridors:

- Hawthorne Boulevard (Artesia Boulevard to Carson Street)
- Carson Street (Hawthorne Boulevard to Avalon Boulevard)
- Avalon Boulevard (Carson Street to Pacific Coast Highway)
- Pacific Coast Highway (Avalon Boulevard to Pacific Avenue)
- Pacific Avenue (Pacific Coast Highway to 6th Street)

The CSP wireless system deployment in the City of Torrance and the associated jurisdictions will also require the following modifications to traffic signal control infrastructure:

- Installation of wireless communications equipment to broker communications between intersections and buses.
- Upgrade of twelve (12) traffic cabinets and controllers. Several of the traffic signals in the cities of Torrance and Carson currently have Econolite ASC/2 controllers. The controllers on the Torrance-Long Beach Rapid bus route will be upgraded to the Model 2070 controller which will have CSP modified firmware and will communicate to the wireless CSP network.
- Connection of a remote CSP workstation at Torrance Transit to the LACMTA CSP server.

For wireless CSP communications, a Wireless Local Area Network (WLAN) will be required. A Radio Frequency (RF) coverage survey for each of the signalized intersections is also required to determine the RF propagation characteristics along the

length of the corridor and to identify where the necessary WLAN access points and bridges are to be located. Communications between traffic signals and the Rapid buses as well as between a remote CSP workstation at Torrance Transit and Metro is accomplished as follows:

- Using the on-bus wireless equipment, Metro Rapid buses will transmit three messages with each priority request, two check-in messages and one check-out message. The on-bus system sends a check-in message to the CSP equipped intersections when the bus is an estimated 20 seconds away from the intersection. An updated message is sent to the intersection five seconds later for redundancy and also to provide an updated message of bus arrival. Finally, as the bus enters the intersection, a check-out message is sent allowing the intersection controller to cancel any additional priority strategies.
- All signal priority data will be sent to a remote CSP workstation located at Torrance Transit. A remote Virtual Private Network (VPN) connection with Metro will be set up to transmit real-time data and bus locations.
- Various communications devices will be installed at Torrance Transit, and at traffic signals. This will include but is not limited to Wireless Access Points, Terminal Servers, Ethernet switches, and modems.

Project Location

The TPS system will be installed at the following 80 intersections:

1. Hawthorne Blvd. & Artesia Blvd.	41. Avalon Blvd. & 228 th St.
2. Hawthorne Blvd. & 177 th St.	42. Avalon Blvd. & Bayport St.
3. Hawthorne Blvd. & 182 nd St.	43. Avalon Blvd. & Scottsdale Drive
4. Hawthorne Blvd. & 186 th St.	44. Avalon Blvd. & Sepulveda Blvd.
5. Hawthorne Blvd. & 190 th St.	45. Avalon Blvd. & Lomita Blvd.
6. Hawthorne Blvd. & Talisman St.	46. Avalon Blvd. & Q St.
7. Hawthorne Blvd. & Halison St.	47. Avalon Blvd. & Sandison St.
8. Hawthorne Blvd. & Del Amo Blvd.	48. Avalon Blvd. & Pacific Coast Hwy.
9. Hawthorne Blvd. & Spencer St.	49. Pacific Coast Hwy. & Eubank Ave.
10. Hawthorne Blvd. & Emerald St.	50. Pacific Coast Hwy. & Watson Ave.
11. Hawthorne Blvd. & Torrance Blvd.	51. Pacific Coast Hwy. & Blinn Ave.
12. Hawthorne Blvd. & Fashion Way	52. Pacific Coast Hwy. & Alameda St.
13. Hawthorne Blvd. & Del Amo Circle North	53. Pacific Coast Hwy. & Technology Way
14. Hawthorne Blvd. & Carson St.	54. Pacific Coast Hwy. & Santa Fe Ave.
15. Carson St. & Del Amo Circle	55. Pacific Coast Hwy. & Harbor Ave.
16. Carson St. & Del Amo Circle East	56. Pacific Coast Hwy. & Golden Ave.
17. Carson St. & Madrona Ave.	57. Pacific Coast Hwy. & Magnolia Ave.
18. Carson St. & Maple Ave.	58. Pacific Coast Hwy. & Cedar Ave.
19. Carson St. & Crenshaw Blvd.	59. Pacific Coast Hwy. & Pacific Ave.
20. Carson St. & Plaza Del Amo	60. Pacific Ave. & 15 th St.
21. Carson St. & Manuel Ave.	61. Pacific Ave. & Anaheim St.
22. Carson St. & Arlington Ave.	62. Pacific Ave. & 10 th St.
23. Carson St. & Cabrillo Ave.	63. Pacific Ave. & 8 th St.
24. Carson St. & Abalone Ave.	64. Pacific Ave. & 7 th St.
25. Carson St. & Western Ave.	65. Pacific Ave. & 6 th St.
26. Carson St. & Denker Ave.	66. 6 th St. & Pine Ave.
27. Carson St. & Normandie Ave.	67. 6 th St. & Locust Ave.
28. Carson St. & Harbor/UCLA Hospital	68. 6 th St. & Long Beach Blvd.
29. Carson St. & Vermont Ave.	69. Long Beach Blvd. & 5 th St.
30. Carson St. & 110 Fwy.	70. Long Beach Blvd. & 4 th St.
31. Carson St. & Figueroa St.	71. Long Beach Blvd. & 3 rd St.
32. Carson St. & Moneta Ave.	72. Long Beach Blvd. & Broadway
33. Carson St. & Main St.	73. Long Beach Blvd. & 1 st St.
34. Carson St. & Orrick Ave.	74. 1 st St. & The Promenade
35. Carson St. & Delores St.	75. 1 st St. & Pine Ave.
36. Carson St. & Grace Ave.	76. 1 st St. & Pacific Ave.
37. Carson St. & Avalon Blvd.	77. Pacific Ave. & Broadway
38. Avalon Blvd. & 220 th St.	78. Pacific Ave. & 3 rd St.
39. Avalon Blvd. & 223 rd St.	79. Pacific Ave. & 4 th St.
40. Avalon Blvd. & Watson Center Road	80. Pacific Ave. & 5 th St.

Table 1
TORRANCE METRO RAPID CORRIDOR
SIGNALIZED INTERSECTIONS

AGENCY	NO.	EXISTING TRAFFIC SIGNAL SYSTEM				
		INTERSECTION		TYPE OF SIGNAL CONTROLLER	SIGNAL CABINET TYPE	LOCAL INTERSECTION SOFTWARE
		METRO RAPID ROUTE	CROSS STREET			
Torrance	1	Hawthorne Blvd.	Artesia Blvd.	2070L	Type 332	ATCS(LADOT)
	2	Hawthorne Blvd.	177th St.	2070L	Type 332	ATCS(LADOT)
	3	Hawthorne Blvd.	182nd S.	2070L	Type 332	ATCS(LADOT)
	4	Hawthorne Blvd.	186th St.	2070L	Type 332	ATCS(LADOT)
	5	Hawthorne Blvd.	190th St.	2070L	Type 332	ATCS(LADOT)
	6	Hawthorne Blvd.	Talisman St.	2070L	Type 332	ATCS(LADOT)
	7	Hawthorne Blvd.	Halison St.	2070L	Type 332	ATCS(LADOT)
	8	Hawthorne Blvd.	Del Amo Blvd.	2070L	Type 332	ATCS(LADOT)
	9	Hawthorne Blvd.	Spencer St.	2070L	Type 332	ATCS(LADOT)
	10	Hawthorne Blvd.	Emerald St.	2070L	Type 332	ATCS(LADOT)
	11	Hawthorne Blvd.	Torrance Blvd.	2070L	Type 332	ATCS(LADOT)
	12	Hawthorne Blvd.	Fashion Way/ Village Ln.	2070L	Type 332	ATCS(LADOT)
	13	Hawthorne Blvd.	Del Amo Circle North	2070L	Type 332	ATCS(LADOT)
	14	Hawthorne Blvd.	Carson St.	2070L	Type 332	ATCS(LADOT)
	15	Carson St.	Del Amo Circle	ASC/2S	P	
	16	Carson St.	Del Amo Circle East	ASC/2S	P	
	17	Carson St.	Madrona Ave.	ASC/2S	P	
	18	Carson St.	Maple Ave.	ASC/2S	M	
	19	Carson St.	Crenshaw Blvd.	ASC/2S	P	
	20	Carson St.	Plaza Del Amo	ASC/2	M	
	21	Carson St.	Manuel Ave.	ASC/2S	M	
	22	Carson St.	Arlington Ave.	ASC/2S	P	
	23	Carson St.	Cabrillo Ave.	ASC/2S	P	
	24	Carson St.	Abalone Ave.	ASC/2S	P	
City of Los Angeles	25	Carson St.	Western Ave.	170	332	BiTrans 172.3
	26	Carson St.	Denker Ave.	170	332	BiTrans 172.3
	27	Carson St.	Normandie Ave.	170	332	BiTrans 172.3
County of Los Angeles	28	Carson St.	Harbor/UCLA	170	332	LACO-1R
	29	Carson St.	Vermont Ave.	170 ATC/HC-11	332	LACO-3 HC
	30	Carson St.	110 Fwy.	170 ATC/HC-11	332	LACO-1 HC
Carson	31	Carson St.	Figueroa St.	170	332	
	32	Carson St.	Moneta Ave.	Multisonics 820A	Model No. Econolite 598072G28	
	33	Carson St.	Main St.	170	332	
	34	Carson St.	Orrick Ave.	170	332	
	35	Carson St.	Dolores St.	170	332	
	36	Carson St.	Grace Ave.	Econolite ASC/2S-2100	Model No. Econolite 598141G419	
	37	Carson St.	Avalon Blvd.	170	332	
	38	Avalon Blvd.	220th St.	170	332	
	39	Avalon Blvd.	223rd St.	PSI 170E	Serial No. 117514	
	40	Avalon Blvd.	Watson Center Rd.	PSI 170E	Serial No. 118004	note: These 2 intersections controlled by single cabinet
	41	Avalon Blvd.	228th St.			

Table 1
 TORRANCE METRO RAPID CORRIDOR
 SIGNALIZED INTERSECTIONS

AGENCY	NO.	EXISTING TRAFFIC SIGNAL SYSTEM				
		INTERSECTION		TYPE OF SIGNAL CONTROLLER	SIGNAL CABINET TYPE	LOCAL INTERSECTION SOFTWARE
		METRO RAPID ROUTE	CROSS STREET			
	42	Avalon Blvd.	Bayport St.	170	332	
	43	Avalon Blvd.	Scottsdale Dr.	170	332	
	44	Avalon Blvd.	Sepulveda Blvd.	170	332	

Table 1
TORRANCE METRO RAPID CORRIDOR
SIGNALIZED INTERSECTIONS

AGENCY	NO.	EXISTING TRAFFIC SIGNAL SYSTEM				
		INTERSECTION		TYPE OF SIGNAL CONTROLLER	SIGNAL CABINET TYPE	LOCAL INTERSECTION SOFTWARE
		METRO RAPID ROUTE	CROSS STREET			
City of Los Angeles	45	Avalon Blvd.	Lomita Blvd.	170	337	BiTrans 172.3
	46	Avalon Blvd.	Q St.	170	337	BiTrans 172.3
	47	Avalon Blvd.	Sandison St.	170	337	BiTrans 172.3
	48	Avalon Blvd.	Pacific Coast Hwy.	170	337	BiTrans 172.3
	49	Pacific Coast Hwy.	Eubank Ave.	170	337	BiTrans 172.3
	50	Pacific Coast Hwy.	Watson Ave.	170	337	BiTrans 172.3
	51	Pacific Coast Hwy.	Blinn Ave.	170	337	BiTrans 172.3
	52	Pacific Coast Hwy.	Alameda St.			
Long Beach	53	Pacific Coast Hwy.	Technology Way	2070L	Type 332	ATCS(LADOT)
	54	Pacific Coast Hwy.	Santa Fe Ave.	2070L	Type 332	ATCS(LADOT)
	55	Pacific Coast Hwy.	Harbor Ave.	2070L	Type 332	ATCS(LADOT)
	56	Pacific Coast Hwy.	Golden Ave.	2070L	Type 332	ATCS(LADOT)
	57	Pacific Coast Hwy.	Magnolia Ave.	2070L	Type 332	ATCS(LADOT)
	58	Pacific Coast Hwy.	Cedar Ave.	2070L	Type 332	ATCS(LADOT)
	59	Pacific Coast Hwy.	Pacific Ave.	2070L	Type 332	ATCS(LADOT)
	60	Pacific Ave.	15th St.	170	332	Bi-Tran 233
	61	Pacific Ave.	Anaheim St.	170	332	Bi-Tran 233
	62	Pacific Ave.	10th St.	170	332	Bi-Tran 233
	63	Pacific Ave.	8th St.	170	332	Bi-Tran 233
	64	Pacific Ave.	7th St.	170	332	Bi-Tran 233
	65	Pacific Ave.	6th St.	170	332	Bi-Tran 233
	66	6th St.	Pine Ave.	170	332	Bi-Tran 233
	67	6th St.	Locust Ave.	170	332	Bi-Tran 233
	68	6th St.	Long Beach Blvd.	170	332	Bi-Tran 233
	69	Long Beach Blvd.	5th St.	170	332	Bi-Tran 233
	70	Long Beach Blvd.	4th St.	170	332	Bi-Tran 233
	71	Long Beach Blvd.	3rd St.	170	332	Bi-Tran 233
	72	Long Beach Blvd.	Broadway	170	332	Bi-Tran 233
	73	Long Beach Blvd.	1st St.	170	332	Bi-Tran 233
	74	1st St.	The Promenade	170	332	Bi-Tran 233
	75	1st St.	Pine Ave.	170	332	Bi-Tran 233
	76	1st St.	Pacific Ave.	170	332	Bi-Tran 233
77	Pacific Ave.	Broadway	170	332	Bi-Tran 233	
78	Pacific Ave.	3rd St.	170	332	Bi-Tran 233	
79	Pacific Ave.	4th St.	170	332	Bi-Tran 233	
80	Pacific Ave.	5th St.	170	332	Bi-Tran 233	

Intersections under the jurisdiction of Caltrans are listed in bold



10

PLANNING AND PROGRAMMING COMMITTEE
September 18, 2002

10

Metropolitan
Transportation
Authority

One Gateway Plaza
Los Angeles, CA
90012-2952

SUBJECT: METRO RAPID FIVE-YEAR IMPLEMENTATION PLAN

ACTION: APPROVE IMPLEMENTATION OF THE METRO RAPID FIVE-YEAR IMPLEMENTATION PLAN

RECOMMENDATIONS

- A. Adopt the Metro Rapid Five-Year Implementation Plan report findings and accelerated, phased countywide expansion plan (Attachment A);
- B. Set aside \$92.3 million of future regional funds to complete the Metro Rapid Five-Year Implementation Plan (Attachment A, Table 10);
- C. Amend the FY 2003 Special Revenue budget to include \$3.8 million for Phase II station construction. Funds are included in the FY 2002 Regional TIP for this purpose;
- D. Authorize the Chief Executive Officer to negotiate and execute agreements with the local jurisdictions in each corridor so as to expedite deployment of the Five-Year Implementation Plan.

ISSUE

In February 2002, MTA adopted the Metro Rapid Expansion Program, a conceptual plan for expanding the Metro Rapid Demonstration Program. The Expansion Program recommended implementing countywide Metro Rapid service, and included a selection process for evaluating the merits of candidate corridors. To build on the program's success, the Board requested that staff develop an accelerated deployment plan and return to the Board for consideration.

Staff is presenting a Metro Rapid Five-Year Implementation Plan which recommends dedicating \$92.3 million of regional funds to implement 24 lines on an accelerated schedule by 2008. This recommended funding will be used to construct bus signal priority, stations, and related communications equipment.

This Plan was developed following a rigorous selection process to identify both MTA and Municipal Operator corridors where Metro Rapid Program service would best meet the needs of transit patrons (Attachment A). Corridors were evaluated on the basis of existing success (current transit service), potential success (corridor transit potential), and the need for transit (corridor transit dependence). As a result of the

above process, 24 corridors have been identified for inclusion in the Metro Rapid Five-Year Implementation Plan.

POLICY IMPLICATIONS

The purpose of the Metro Rapid Five-year Implementation Plan is to introduce a new, high quality mode of transit that will offer faster travel choices for bus riders, especially the transit-dependent. The Metro Rapid Program is an integral part of the adopted Long Range Transportation Plan.

OPTIONS

Options considered include (1) continuing to operate Metro Rapid along the two demonstration corridors, but not expanding the Metro Rapid Program beyond these corridors, and (2) expanding the demonstration program with one or two additional corridors and evaluating the results of the expanded demonstration prior to recommending a countywide system expansion of the program. Option 1 is not recommended because of the success of the Metro Rapid Demonstration Program. Passenger travel times and service quality have been improved to the point that they are now noticed and appreciated by the public. Ridership has increased significantly as a result. Option 2 is not recommended because data from the two Demonstration lines was found to be more than adequate to develop reliable and consistent findings and recommendations.

FINANCIAL IMPACT

Operating and capital cost estimates presented in the Implementation Plan are predicated on the following assumptions.

Operating costs – Implementation of the Broadway and Vermont corridors in December 2002 is scheduled at approximately 5,300 revenue service hours (\$1.1 million) more than pre-existing levels during FY 2003. Funds to implement these services are available within the existing FY 2003 budget.

When complete in FY 2008, the Implementation Plan provides a net increase of 15,646 annual revenue hours for the 24 expansion corridors over the pre-existing service levels in those corridors. This increase in service is within the levels assumed in the 10-year forecast. However, based on ridership increases experienced on the two Metro Rapid demonstration corridors, it is likely that additional capacity will be needed beyond the above funding. In such cases, staff will develop for Board consideration corridor-specific plans to cover the increase in operating costs.

Capital Costs – Capital cost estimates are derived from the Metro Rapid Demonstration Program. Given the same design and quality of station construction, the same bus signal priority and “next trip” display technology, and additional equipment to maintain and monitor each corridor, one-time capital costs associated with implementing the entire program are estimated at \$110.5 million, escalated (Five-Year Implementation Plan, Table 10).

Funding for the continued implementation of Phase II is consistent with the 10-year financial forecast and included in the Long Range Transportation Plan but not in the MTA FY 2003 budget. Approval of this action would direct staff to include Phase II capital expenditures and revenues in MTA's Special Revenue budget. Approximately \$4.5 million will be transferred from the MTA Capital budget since the assets constructed will not become MTA property. Additionally, the FY 2003 Budget does not include station construction expenditures and revenues for Phase II of \$3.8 million that were approved by the State after the budget was prepared.

BACKGROUND

The Metro Rapid Demonstration Program has proven successful with the implementation of key attributes, including unique vehicle and station "branding", transit signal priority, special stations with "next trip" displays and information kiosks, and "rail-like" operating characteristics. This has resulted in passenger travel times reduced by approximately 25 percent and a nearly 40 percent increase in ridership, with one-third of the increase new to public transit. Based on this success, staff developed the Metro Rapid Expansion Program and presented it to the Board in February 2002. The Expansion Program identified the corridors which best met the programs' goals and objectives, and recommended a phasing plan designed to construct a network of Metro Rapid service over the next eleven years.

Accelerated Deployment

At the Board's request to accelerate deployment of the Metro Rapid Program, staff developed the Metro Rapid Five-year Implementation Plan (Attachment A). The Implementation Plan identifies the operating and capital costs associated with constructing and operating each corridor, and proposes a five-phase accelerated deployment schedule significantly shorter than that presented in the original Expansion Program. While significant staff work will be needed to refine the Plan as it moves forward to actual implementation, the accelerated schedule is achievable, contingent on resolving the following issues.

A construction and implementation critical path was developed for the initial phase of the Metro Rapid expansion program. Issues considered in the critical path included station design, fabrication, and installation; signal priority design, construction, and testing; vehicle procurement and make-ready; schedule development and operational training; marketing campaigns; and execution of the contracts and agreements necessary to fund the construction program. Two key elements in the critical path were the station construction and signal priority implementation schedules.

While it is unlikely that the station construction contract between the City of Los Angeles and MTA will be executed in time to complete construction prior to the opening of the first two expansion corridors planned for this December (Vermont and Broadway), it is expected that station development will keep pace with the Metro Rapid phased corridor implementation plan after that point.

The critical element in the Metro Rapid expansion schedule is the construction of bus signal priority in the City of Los Angeles, Los Angeles County, and other cities. The City of Los Angeles is currently capable of deploying approximately 20 miles of signal priority per year. The City believes, however, that they can double the current rate of construction *provided* that additional resources are made available either through LADOT in-house staffing or a contractor. Accelerated implementation of the Five-Year Implementation Plan is dependent on LADOT resolving this important issue.

The County of Los Angeles recently began bus signal priority construction along Whittier Boulevard as part of the Wilshire/Whittier Metro Rapid. The City of Beverly Hills will soon begin construction along Wilshire Boulevard, also as part of the Wilshire/Whittier Metro Rapid. Staff will work closely with the cities in each corridor to expedite bus signal priority construction as future corridors are implemented. Table 7 of the Five-Year Implementation Plan presents the accelerated deployment schedule.

Deployment Within Available Revenue

The Five-Year Implementation Plan assumes deployment of all Phase II Metro Rapid corridors within available operating revenues. In order to meet this financial objective, and taking into account the efficiency improvements resulting from both faster operating speeds and restructured operator schedules, the following modifications in Metro Rapid attributes were made. Staff will identify additional operating hours should ridership exceed the added capacity.

- *Seven Day Service* – the policy of providing Metro Rapid service seven days a week has been modified to allow deployment only within available revenue. In some cases, operation of six or seven day schedules is appropriate regardless of operating cost constraints; in other cases expansion to a seven day service is sound only if funds become available. The proposed span of Metro Rapid service recommends that 6 of the 24 Metro Rapid expansion corridors operate seven-days a week, 5 operate weekdays and Saturdays, 6 operate all-day on just weekdays, and 7 operate in just weekday peak periods.
- *Minimum Service Frequencies* – the Metro Rapid program calls for very frequent service as one of the basic attributes, with at least 10-minute peak and 12-minute off-peak service in order to attract riders. However, 19 of the planned 24 Metro Rapid expansion corridors will initially not meet these minimum standard frequencies. The impact of less frequent service will vary from corridor to corridor, but will result in less ridership growth until additional service can be added.
- *Service Capacity* – when implementing the Metro Rapid Demonstration Program, additional capacity was deployed from the outset. On one corridor (Ventura) this capacity was adequate for passenger needs. However, the second corridor (Wilshire/Whittier) has required ongoing increases in capacity to meet ridership growth. Expansion of Metro Rapid service within available operating revenue requires that each line be scheduled as close to existing hours as possible while

allowing the miles to increase due to increased operating speeds and schedule restructuring. It is anticipated that additional operating resources may be needed to meet ridership demand.

NEXT STEPS

Consistent with the proposed phasing plan, and working closely with each Service Sector, agreements will be executed with local jurisdictions to design and construct the signal priority and station elements of the program. To expedite implementation, staff will work with the Municipal Operators to accelerate those corridors which have been prepared for Metro Rapid deployment. Improvements to both the system attributes and operational performance of the program will be made, in part, based on the results of a recent MTA-sponsored Metro Rapid operator/customer survey. Consistent with the survey recommendations, staff will consider implementing one or more of the Metro Rapid attributes on other regional corridors in an effort to expand the program's qualities as quickly as possible. Staff will return to the Board with progress reports as Metro Rapid corridors are implemented.

ATTACHMENT

A. Metro Rapid Five-Year Implementation Plan

Prepared by: Rex Gephart, Project Manager
Long Range Planning & Coordination



James L. de la Loza
Executive Officer
Countywide Planning & Development



Roger Snoble
Chief Executive Officer

Metro Rapid

LOS ANGELES

Five Year Implementation Plan



Prepared by:



August 2002

Metro Rapid

LOS ANGELES

Five Year Implementation Plan

1 Five Year Implementation Plan Background

1.1 Metro Rapid Demonstration

In March 1999 the MTA Board of Directors approved a two-corridor Metro Rapid Demonstration Program based on a purpose and need assessment that followed a visit to the very successful system in Curitiba, Brazil, by some MTA Board members and staff. In June 2000, together with the San Fernando Valley extension of the Metro Red Line, MTA introduced Metro Rapid Lines 720 and 750 serving the Wilshire-Whittier and Ventura corridors, respectively. From the first day, the demonstration has proven successful with the implementation of key Metro Rapid attributes, including unique vehicle and station "branding", transit signal priority, special stations with "next trip" displays and information kiosks, and "rail-like" operating characteristics. This has resulted in passenger travel times reduced by at least 25 percent and a nearly 40 percent increase in ridership, with one-third of the increase new riders to public transit. MTA's Metro Rapid program has become a model for other transit systems in both North American and overseas.

1.2 Expansion Program

Based on this success, staff developed the Metro Rapid Expansion Program and presented it to the Board in February 2002. The Expansion Program identified over 20 corridors which best met the Metro Rapid program goals and objectives, and recommended a phasing plan designed to construct a network of Metro Rapid service over the next eleven years. The Board approved the expansion program for Metro Rapid, but requested an accelerated deployment of the Metro Rapid Program.



2 Accelerated Deployment

Working together with the City of Los Angeles, MTA has prepared an accelerated deployment Five Year Metro Rapid Implementation Plan. The Implementation Plan identifies the operating and capital costs associated with constructing and operating each corridor, and proposes an accelerated deployment schedule significantly shorter than that presented in the original Expansion Program. While significant staff work will be needed to refine the Plan as it moves forward to actual implementation, the accelerated schedule is achievable, contingent on resolving certain issues.



A construction and implementation critical path was developed for the initial phase of the Metro Rapid expansion program. Issues considered in the critical path included station design, fabrication, and installation; signal priority design, construction, and testing; vehicle procurement and make-ready; schedule development and operational training; marketing campaigns; and execution of the contracts and agreements necessary to fund the station construction and signal priority programs. The two key elements in the critical path were the station construction and signal priority implementation schedules.

2.1 Station Construction

It is unlikely that the station construction contract between the City of Los Angeles and MTA utilizing the City's new shelter advertising contractor, Viacom Decaux, will be executed in time to complete construction prior to the opening of the first two expansion corridors currently planned for December 2002. Consequently, it is recommended that implementation of these first two expansion lines move forward with temporary stations, as was done with the demonstration lines. It is expected that station development in the City of Los Angeles will keep pace with Metro Rapid corridor implementation after that point and will not be a further issue.

A second issue centers on construction of Metro Rapid stations in other cities and in the County of Los Angeles. To date, MTA has not constructed stations outside the City of Los Angeles, but is moving ahead with developing the necessary agreements to make this possible. It is anticipated that these agreements will be in place in time to meet station construction schedules for June and December 2003.

2.2 Signal Priority

The second issue in the Metro Rapid expansion schedule was found to be the signal priority construction schedule. To date, LADOT has installed and operated all of the transit signal priority, including certain areas outside of the City of Los Angeles under inter-local agreements. At the same time, MTA has been in the process of developing a test of an alternative transit priority system along a segment of Crenshaw Boulevard for the past several years and is likely to be ready for operational testing in 2003. Regardless, the Five Year Metro Rapid Implementation Plan calls for continued reliance on LADOT's highly successful signal priority system wherever feasible. The LADOT priority system has proven to be very reliable while achieving significant time savings for Metro Rapid without noticeable impact on other traffic and at minimal operating and capital cost.

LADOT is currently capable of deploying approximately 20 miles of signal priority per year. LADOT believes, however, that they can double the current rate of construction to over 40 miles annually provided that





additional resources are made available either through in-house staffing or a contractor. This accelerated rate of construction is anticipated to reduce the Metro Rapid deployment schedule from eleven years to six years (the current fiscal year, plus the next five), recognizing that the City of Los Angeles comprises only 2/3 of the entire 357 miles of planned Metro Rapid service.

2.3 Other Issues

The only other issue that had a possible impact on accelerated deployment was the availability of suitable transit vehicles for Metro Rapid service. Metro Rapid calls for operation of low-floor standard or high capacity buses. MTA has enough NABI low-floor CNG coaches, like those currently in operation of the Metro Rapid demonstration lines, to meet immediate term needs if they are "rebranded" and transferred to Metro Rapid. The high capacity vehicle procurement currently underway will provide the necessary vehicles for the balance of the five-year Metro Rapid implementation.

3 Operational Plan

The successful operation of the Phase I demonstration formed the basis of the operational elements for the Five Year Metro Rapid Implementation Plan. No fundamental changes are proposed.

3.1 Metro Rapid Attributes

Metro Rapid is defined by a number of attributes that contribute to its success, as shown below.

Attribute	Phase I Demonstration	Phase II
1. Frequent Service	Yes	Yes
2. Bus Signal Priority	Yes	Yes
3. Headway-based Schedules	Yes	Yes
4. Simple Route Layout	Yes	Yes
5. Less Frequent Stops	Yes	Yes
6. Integrated with Local Bus Service	Yes	Yes
7. Level Boarding and Alighting	Yes	Yes
8. "Branded" Buses and Stations	Yes	Yes



Attribute	Phase I Demonstration	Phase II
9. High Capacity Buses	No	Yes
10. Exclusive Lanes	No	Yes
11. All-Door Boarding	No	Yes

MTA reviewed the various attributes demonstrated in Phase I and those planned in Phase II to determine their continued viability.

The basic service attributes of frequent service, headway-based schedules, simple route layout, less frequent stops, integration with local bus service, and level boarding and alighting have all clearly resulted in a superior transit service based on customer, operator, and street supervisor reports. The remaining attributes involve additional capital investment by MTA and warrant additional discussion.

- Bus Signal Priority – analysis of LADOT’s bus signal priority system indicates that it has improved running times by some 8-10 percent, while simultaneously improving headway reliability by actively minimizing vehicle bunching. Both faster and more reliable operations are major customer attractors that directly result in increased ridership and revenue. As well, the reduced round trip cycle times attributable to bus signal priority directly reduce operating and capital expenses. For instance, the speed improvement on Line 720 serving Wilshire-Whittier translates into running time savings of 10-12 minutes per round trip, reducing operating expenses by some \$500,000 annually and eliminating the need for 3-5 peak vehicles, saving between \$1.05 and \$1.4 million in capital costs. This makes implementation of bus signal priority a very good return on investment for MTA.
- “Branded” Buses and Stations – MTA’s original model for Metro Rapid was Curitiba, Brazil’s now famous Bus Rapid Transit, which had “branded” services. The vehicle branding results in little capital cost, but requires MTA Operations and Maintenance to have two fleets ready every day, Metro Rapid and local. This has not been an issue as MTA Operations and Maintenance has done an excellent job in delivering the vehicles and service every day without increased cost. The “branded” stations have also received positive response from customers, operators, and street supervisors. The aspects most often cited: clear differentiation from local service, consistent with “rail-like” higher quality service including kiosks and “real-time” passenger information, longer distance visibility, station gates which help pre-queue



passengers for boarding and allow for more precise operator placement of the vehicle thereby minimizing dwell times, and few complaints from adjacent property owners. There also have been suggestions both internally and externally regarding ways to further refine the stations to make them even more effective. This is part of the five year implementation plan.

- High Capacity Buses – MTA commissioned a detailed review of the potential opportunities to use high capacity buses in both regular and Metro Rapid service. The report found that today's 45-foot buses and 60-foot articulated buses were mature cost-effective vehicles and had significant application for MTA in both Metro Rapid and regular operations. While the five year financial plan presented here is based on operation of the current 40-foot transit bus, the Plan will be updated for operation of high capacity vehicles as the availability and cost of these buses becomes known (MTA has just released a vehicle procurement for these buses).
- Exclusive Lanes – MTA in concert with the City of Los Angeles is initiating a test of exclusive lanes for Metro Rapid along Wilshire Boulevard in West Los Angeles. While it is clear that exclusive lanes will greatly help speed Metro Rapid service in congested areas, their benefit is less clear in areas of less or no congestion. While the Five Year Metro Rapid Implementation Plan presented here does not include exclusive lanes, the Plan will be updated based on the findings of the Wilshire test.
- All-Door Boarding – the MTA Universal Fare system includes the capability for boarding passengers with Smart Cards through the rear door(s). While expectations are that all-door boarding will reduce station dwell times, the benefit depends on passenger volumes. The Plan presented here does not include this capacity, but it will be considered once testing is undertaken. If there are significant benefits, then the Plan will be refined to include this capability for all-door boarding.

3.2 Metro Rapid Service Providers

The Phase II Metro Rapid program calls for expansion of the service area to much of Los Angeles County. While most of the planned Metro Rapid services fall within MTA's historic service corridors, four lines do not and would be potential candidates for operation by municipal operators. The lines and likely operators are:

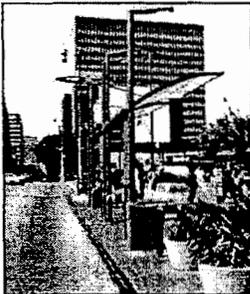


- Pico Santa Monica Municipal Bus Lines
- Sepulveda Culver City Municipal Bus Lines
- Torrance-Long Beach Torrance Transit
- Lincoln Santa Monica Municipal Bus Lines

This Plan calls for the same attributes, operating protocols, and branding to ensure a consistent "product" for the customer regardless of operator. MTA will be continuing to work closely with these Municipal operators regarding Metro Rapid implementation.

3.3 Deployment Within Available Revenue

Previous Board action provided funds for capital requirements, but did not include additional operating funds. Consequently, the Metro Rapid Implementation Plan assumes a deployment of Phase II corridors that is funded with available operating revenues. In order to meet this financial requirement, and taking into account the efficiency improvements resulting from both faster operating speeds and restructured operator schedules, the following modifications in Metro Rapid attributes were made:



- Seven Day Service – the policy of providing Metro Rapid service seven days a week has been modified to allow deployment only where appropriate from an operating cost standpoint. In some cases, operation of six or seven day schedules is appropriate regardless of operating cost constraints; in other cases expansion to a seven day service is sound only if funds become available. The proposed span of Metro Rapid service recommends that 6 of the 24 Metro Rapid expansion corridors operate seven-days a week, 5 operate weekdays and Saturdays, 6 operate all-day on just weekdays, and 7 operate in just weekday peak periods.
- Minimum Service Frequencies – the Metro Rapid program calls for very frequent service as one of the basic attributes, with at least 10-minute peak and 12-minute off-peak service in order to attract riders. However, 19 of the planned 24 Metro Rapid expansion corridors will not meet these minimum standard frequencies as currently proposed. The impact of less frequent service will vary from corridor to corridor, but will result in less ridership growth compared with the demonstration corridors which met the minimum requirements on opening day.
- Service Capacity – the Metro Rapid Demonstration Program deployed additional capacity from the outset. On one corridor (Ventura) this capacity was adequate for passenger needs. However, the second corridor (Wilshire/Whittier) has required ongoing increases in capacity to meet ridership growth.



Expansion of Metro Rapid service within available operating revenue requires that each line be scheduled as close to existing hours as possible while allowing the miles to increase due to increased operating speeds and schedule restructuring. It is anticipated that additional operating resources may be needed to meet ridership demand.

Implementation of Metro Rapid service attributes as originally adopted in the Long Range Transportation Plan (LRTP) will require additional resources. Given the need to work within existing budget limitations, the most likely source of these additional resources will be through service restructuring efficiencies achieved in conjunction with the Service Sectors and Area Teams.

3.4 Development of Corridor Service Plans

The expansion of Metro Rapid service calls for developing corridor service plans that efficiently utilize vehicle and labor resources in order to maximize service growth within existing operating revenue. To achieve this efficiency, the development of service plans for each corridor involves several essential steps:

- Review corridor ridership and characteristics to identify preliminary corridor alignment, station locations, and terminal sites.
- Continue policy whereby all station maintenance costs are funded through advertising and/or local jurisdictions.
- Review current service spans, frequencies, and running times
- Identify service periods during which Metro Rapid service would be provided (e.g., weekday peak, weekday midday, later evenings, Saturdays, and Sundays)
- Develop specific service frequencies by time of day and running times for both Metro Rapid and local services
- Prepare "pilot" Metro Rapid and local operating schedules for costing purposes (these will need considerable refinement for actual implementation)
- Determine service hours, miles, and peak vehicles by corridor and service type
- Determine additional TOS and BOC needs; plan calls for one dedicated TOS in the field during Metro Rapid operations and each BOC staff to handle 5-6 Metro Rapid lines when implementation is completed (*the investment in BOC/TOS support*)



has proven to improve cost efficiency through the ability to maintain reduced running times and decreased vehicle bunching).

The service plans provided the basis for determining Metro Rapid operating and capital costs.

4 Proposed Metro Rapid Services

The proposed corridor services are those presented in the February 2002 Metro Rapid Expansion Program with three modifications based on continued refinement in developing the Implementation Plan.

- South Broadway
- Vermont
- Florence
- Van Nuys
- Soto
- Crenshaw-Rossmore
- Pico (*two branch line consolidated onto only the Pico corridor*)
- Santa Monica
- Hawthorne
- Long Beach Ave
- Hollywood-Fairfax-Pasadena
- Western
- Beverly
- Vernon-La Cienega
- Atlantic
- Central
- San Fernando-Lankershim (*San Fernando split into two lines*)
- West Olympic
- Garvey-Chavez
- Manchester
- San Fernando (south) (*San Fernando split into two lines*)
- Sepulveda (south)
- Torrance-Long Beach
- Lincoln

4.1 Corridor Characteristics and Phasing

The proposed corridor characteristics including length of the Metro Rapid line, number and type of stations, and average station spacing are presented in Table 1.

Table 1 also presents the Metro Rapid implementation groups in five phases. The phase groupings were based on:



- Phase IIA Expand the network by introducing key connections
- Phase IIB Introduce Metro Rapid on some of the region's heaviest corridors while continuing development of the network
- Phases IIC-IIE Continue network development while focusing on major corridors

4.2 Proposed Service Levels

The proposed Metro Rapid service is tailored to the current corridor needs while staying within available operating revenue. The proposed service spans and days of operation are presented in Table 2.

Table 3 presents the proposed service frequencies on each corridor. The frequencies shown are the combined local and Metro Rapid service and provide an indication of planned corridor capacity with Metro Rapid.

5 Metro Rapid Corridor Costs

Metro Rapid corridor operating and capital costs have been estimated based on the planned services and the facilities, vehicles, and staff needed to support the operation.

5.1 Service Requirements



Table 4 presents the estimated service trips, revenue hours and miles, and peak vehicles required for the corridor, including both local and Metro Rapid services in comparison with current services. As well, Table 4 provides a breakout of peak and total Metro Rapid buses required by line.

The introduction of Metro Rapid will result in almost no change in peak vehicles and revenue hours, while providing a 9-10 percent increase in both service trips and revenue miles. This is the result of Metro Rapid's faster running.

5.2 Operating Costs

Table 5 indicates the estimated annual operating costs for each of the Metro Rapid corridors based on the most recent available MTA cost allocation model for marginal costing. The incremental operating cost of implementing Metro Rapid over the current service operation is also included, as well as the estimated cost of operations support staff, including bus operations control center and transit operations supervision.

Metro Rapid will result in an increase of approximately \$11.6 million in additional annual costs for the 24 expansion lines. This will be offset by an additional \$6.5 million in estimated new passenger revenue.



5.3 Capital Costs

Table 6 presents the estimated capital costs for Metro Rapid, including stations, signal priority, revenue and non-revenue vehicles, and expansion of the Bus Operations Control Center. The overall capital cost of \$101.9 million is just over \$250,000 per mile for the additional 357 miles included in the Metro Rapid expansion program.

6 Metro Rapid Implementation Phasing

The Metro Rapid corridor implementation was phased based on both network expansion needs and the goal of expediting deployment of Metro Rapid on the heaviest corridors. The expansion of the LADOT bus signal priority system also influenced the phasing by limiting the number of line miles installed annually. Table 7 presents the proposed Metro Rapid five year implementation phasing.

7 Metro Rapid Financial Plan

Based on the planned Five Year Implementation Plan for Metro Rapid, a financial plan was prepared.

Table 8 presents the annual operating costs.

Table 9 presents the annual capital costs.

Table 10 presents the annual funding requirements.

8 Metro Rapid Implementation

This Five Year Implementation Plan provides the initial groundwork for developing the full network of Metro Rapid services. There is much additional work and refinement that will take place prior to the actual startup of services:

- Finalize alignments, station locations, and end-of-line terminals, including station layouts
- Refine the original station design to improve effectiveness, increase deployment opportunities, and reduce operating and capital costs; develop final station construction plan
- Identify opportunities for exclusive lane segments
- Finalize signal priority and passenger information display technology throughout the system
- Construct stations and any exclusive lane segments



- Install signal priority and passenger information display technology
- Refine of draft operating schedules
- Secure and prepare the Metro Rapid fleet, including consideration of upcoming high capacity buses for Metro Rapid operation
- Select and train operations staff
- Secure all necessary agreements required for implementation

The schedule for implementation of Metro Rapid Phase IIA is at present:

- December 2002 – South Broadway and Vermont
- June 2003 – Florence and Van Nuys
- December 2003 – Soto and Crenshaw-Rossmore

Throughout the implementation process will be close coordination among MTA's Metro Rapid group, MTA's Service Sectors, municipal operators, and local jurisdictions.

Table 1
Metro Rapid Corridor Characteristics

	Metro Rapid Line	Line Miles	Station Pairs	Average Station Spacing (miles)
PHASE II A	South Broadway	10.5	16	0.66
	Vermont	11.9	17	0.70
	Florence	10.3	13	0.79
	Van Nuys	21.4	20	1.07
	Soto	10.0	15	0.67
	Crenshaw-Rossmore	18.8	22	0.85
PHASE II B	Pico	17.3	27	0.64
	Santa Monica	20.2	27	0.75
	Hawthorne	18.7	23	0.81
	Long Beach Blvd	15.3	23	0.67
PHASE II C	Hollywood-Fairfax-Pasadena	21.5	27	0.80
	Western	13.1	19	0.69
	Beverly	11.0	16	0.69
	Vernon-La Cienega	16.5	23	0.72
PHASE II D	Atlantic	25.1	27	0.93
	Central	10.6	13	0.81
	San Fernando-Lankershim	9.9	10	0.99
	West Olympic	12.1	21	0.58
PHASE II E	Garvey-Chavez	14.7	22	0.67
	Manchester	13.5	15	0.90
	San Fernando (south)	13.6	18	0.76
	Sepulveda (south)	12.8	16	0.80
	Torrance-Long Beach	15.6	20	0.78
	Lincoln	12.1	13	0.93
	Total Phase II	356.5	460	0.78

Table 2
Metro Rapid Corridor Proposed Service Spans

		Weekday Peak	Weekday Midday	Weekday Evening ¹	Saturday	Sunday
PHASE II A	South Broadway	X	X	X	X	X
	Vermont	X	X	X	X	X
	Florence	X	X		X	X
	Van Nuys	X	X	X	X	X
	Soto	X	X		X	
	Crenshaw-Rossmore	X	X			
PHASE II B	Pico	X	X	X	X	X
	Santa Monica	X	X	X	X	X
	Hawthorne	X	X		X	
	Long Beach Blvd	X	X		X	X
PHASE II C	Hollywood-Fairfax-Pasadena	X	X			
	Western	X	X	X	X	X
	Beverly	X				
	Vernon-La Cienega	X				
PHASE II D	Atlantic	X				
	Central	X				
	San Fernando-Lankershim	X	X			
	West Olympic	X	X			
PHASE II E	Garvey-Chavez	X	X		X	
	Manchester	X				
	San Fernando (south)	X	X			
	Sepulveda (south)	X				
	Torrance-Long Beach	X				
	Lincoln	X	X			

¹ Weekday evening indicates service that operates after 9:00 pm.

Table 3
Metro Rapid Corridor Frequency Comparison (in minutes)

Metro Rapid Line	AM Peak			Off Peak			PM Peak			Saturday			Sundry			
	Existing	Proposed	% Change													
PHASE II A																
South Broadway	2.7	2.6	0.1	4.3%	10.0	7.5	2.5	25.0%	3.5	3.3	0.2	4.8%	10.0	7.5	2.5	25.0%
Vermont	3.0	2.9	0.1	4.8%	5.0	4.6	0.4	7.7%	3.0	2.9	0.1	4.8%	8.0	4.8	3.2	40.0%
Florence	5.5	5.5	0.0	0.0%	11.0	10.0	1.0	9.1%	6.0	6.0	0.0	0.0%	10.0	10.0	0.0	0.0%
Van Nuys	6.3	6.0	0.3	5.0%	12.0	8.6	3.4	28.6%	7.5	6.0	1.5	20.0%	12.0	8.6	3.4	28.6%
Soto	6.0	5.0	1.0	16.7%	9.0	6.6	2.4	4.8%	8.0	6.0	2.0	25.0%	12.0	10.0	2.0	16.7%
Crenshaw-Rossmore	6.2	6.0	0.2	3.3%	12.0	10.0	2.0	16.7%	8.0	5.5	2.5	31.3%	6.0	6.0	0.0	0.0%
PHASE II B																
Pogo	3.0	3.0	0.0	0.0%	7.5	8.7	-1.2	-11.1%	3.5	3.3	0.2	4.8%	6.0	6.0	0.0	0.0%
Santa Monica	3.4	2.9	0.5	15.2%	8.5	8.0	0.5	5.9%	3.8	3.3	0.5	11.1%	7.0	5.5	1.5	21.4%
Hawthorne	6.0	6.0	0.0	0.0%	10.0	8.8	1.2	14.3%	8.0	9.0	-1.0	-12.5%	10.0	8.8	1.2	14.3%
Long Beach Blvd	4.0	3.8	0.2	5.0%	8.5	7.5	1.0	11.8%	3.4	3.3	0.1	2.9%	8.0	7.5	0.5	6.3%
PHASE II C																
Hollywood-Fairfax-Pasadena	7.5	6.0	1.5	20.0%	12.0	10.0	2.0	18.7%	7.5	6.0	1.5	20.0%	8.0	6.0	2.0	25.0%
Western	5.0	4.8	0.2	4.0%	6.0	5.4	0.6	8.8%	4.0	3.5	0.5	11.4%	6.0	6.0	0.0	0.0%
Beverly	6.5	6.0	0.5	7.7%	8.0	6.0	2.0	25.0%	6.5	6.0	0.5	7.7%	8.0	6.0	2.0	25.0%
Vermont-La Cienega	7.0	6.7	0.3	4.3%	8.0	6.7	1.3	16.3%	7.0	6.7	0.3	4.3%	8.0	6.7	1.3	16.3%
PHASE II D																
Atlantic	6.1	6.6	-0.5	-8.2%	10.0	6.6	3.4	34.0%	10.0	6.6	3.4	34.0%	10.0	6.6	3.4	34.0%
Central	4.0	4.0	0.0	0.0%	9.0	5.5	3.5	38.9%	9.0	5.5	3.5	38.9%	9.0	5.5	3.5	38.9%
San Fernando-Lankershim	5.0	3.3	1.7	33.3%	15.0	8.6	6.4	42.9%	8.0	4.4	3.6	44.4%	15.0	8.6	6.4	42.9%
West Olympic	2.9	2.7	0.2	6.9%	6.0	7.5	-1.5	-25.0%	4.1	3.9	0.2	5.1%	4.0	3.9	0.1	2.5%
PHASE II E																
Ganey-Chavez	4.8	3.4	1.4	29.2%	6.0	5.0	1.0	16.7%	4.0	3.9	0.1	2.5%	6.5	6.0	0.5	7.7%
Manchester	5.2	5.0	0.2	4.2%	15.0	10.0	5.0	33.3%	6.0	6.0	0.0	0.0%	6.0	6.0	0.0	0.0%
San Fernando (south)	6.0	5.5	0.5	8.3%	12.0	10.0	2.0	16.7%	6.5	6.0	0.5	7.7%	6.5	6.0	0.5	7.7%
Sepulveda (south)	12.0	10.0	2.0	16.7%	12.0	10.0	2.0	16.7%	12.0	10.0	2.0	16.7%	12.0	10.0	2.0	16.7%
Torrance-Long Beach	15.0	12.0	3.0	20.0%	15.0	12.0	3.0	20.0%	15.0	12.0	3.0	20.0%	15.0	12.0	3.0	20.0%
Lincoln	10.0	10.0	0.0	0.0%	10.0	10.0	0.0	0.0%	10.0	10.0	0.0	0.0%	10.0	10.0	0.0	0.0%
Averages	6.1	5.5	0.6	9.8%	9.7	7.9	1.8	18.6%	6.6	5.8	0.8	12.1%	8.2	7.3	0.9	11.0%

Table 4
Corridor Service Requirement Comparison

Metro Rapid Line	Corridor Daily Trips			Corridor Peak Vehicles			Annual Corridor Revenue Hours			Annual Corridor Revenue Miles			Required Metro Rapid Fleet						
	Existing	Proposed	% Change	Existing	Proposed	% Change	Existing	Proposed	% Change	Existing	Proposed	% Change	AM Peak	PM Peak	Spares (20%)	Total			
PHASE II A																			
South Broadway	294	318	44	45	43	(2)	-4.4%	123,047	132,378	9,332	7.6%	1,368,879	1,548,746	181,866	13.3%	22	20	5	27
Vermont	455	515	60	52	50	(2)	-3.8%	183,575	184,899	1,324	0.7%	1,891,100	2,182,790	291,690	15.4%	34	32	7	41
Florence	242	269	27	25	26	1	4.0%	99,913	101,271	1,358	1.4%	1,223,062	1,291,931	68,869	5.6%	9	10	2	12
Van Nuys	204	236	52	28	29	0	0.0%	112,379	110,510	(1,869)	-1.7%	1,457,281	1,576,246	118,965	8.2%	18	20	4	24
Solo	267	304	37	32	31	(1)	-3.1%	101,555	102,195	640	0.6%	1,000,927	1,112,225	111,298	11.1%	15	15	3	18
Crenshaw-Rossmore	209	230	21	33	31	(2)	-6.1%	105,280	105,815	536	0.5%	1,241,207	1,355,869	114,572	9.2%	18	18	4	22
PHASE II B																			
Pico	349	393	44	60	62	2	3.3%	204,783	208,011	3,227	1.6%	2,060,721	2,291,879	231,158	11.2%	21	26	6	32
Santa Monica	354	423	69	55	54	(1)	-1.8%	216,705	207,535	(9,170)	-4.0%	2,255,339	2,858,886	603,547	26.8%	33	37	6	45
Hawthorne	247	260	13	42	33	(9)	-21.4%	140,610	139,799	(811)	-0.6%	1,582,090	1,641,151	59,062	3.7%	21	20	5	26
Long Beach Blvd	311	334	23	46	50	4	8.7%	180,621	199,838	19,217	10.7%	1,821,421	2,066,148	244,727	13.4%	20	23	5	28
PHASE II C																			
Hollywood-Fairfax-Pasadena	442	386	(56)	50	47	(3)	-6.0%	181,724	188,481	6,758	3.7%	1,809,161	2,091,104	281,942	15.6%	20	23	5	28
Western	361	377	16	36	37	1	2.8%	145,202	143,090	(2,112)	-1.5%	1,536,749	1,732,861	196,112	12.8%	18	23	5	28
Beverly	390	396	6	32	35	3	9.4%	107,769	108,432	663	0.6%	1,119,624	1,175,546	55,922	5.0%	8	8	2	10
Vermont-La Cienega	176	187	11	26	28	2	7.7%	91,253	91,508	255	0.3%	1,113,208	1,109,893	(3,315)	-0.3%	14	15	3	18
PHASE II D																			
Abbot	142	154	12	20	26	6	30.0%	86,071	80,224	(5,847)	-6.8%	1,100,371	1,163,643	63,272	5.7%	13	15	3	18
Central	164	219	35	24	23	(1)	-4.2%	74,634	78,037	3,403	4.6%	871,726	822,243	(49,483)	-5.7%	10	10	2	12
San Fernando-Lankershim	121	121	0	8	8	0	0.0%	19,457	19,457	0	0.0%	306,000	306,000	0	0.0%	7	8	2	10
West Olympic	346	369	23	42	43	1	2.4%	106,615	113,970	7,355	6.9%	1,197,068	1,374,315	177,247	14.8%	18	18	4	22
PHASE II E																			
Garvey-Chavez	408	427	19	45	44	(1)	-2.2%	192,770	178,776	(13,993)	-7.3%	2,224,855	2,173,891	(50,964)	-2.3%	17	20	4	24
Manchester	178	185	7	28	27	(1)	-3.6%	81,064	81,064	0	0.0%	1,016,283	1,026,983	10,700	1.1%	11	10	3	14
San Fernando (Loop)	193	226	33	37	31	(6)	-16.2%	120,556	113,064	(7,492)	-6.2%	1,719,031	1,845,141	(70,890)	-4.1%	12	14	3	17
Sepulveda (Loop)	140	149	9	15	15	0	0.0%	60,029	59,519	(510)	-0.8%	602,700	633,555	30,855	5.1%	6	6	2	8
Torrance-Long Beach	130	130	0	11	14	3	27.3%	51,912	48,597	(3,315)	-6.4%	690,071	684,298	(5,773)	-0.8%	4	4	1	5
Lincoln	184	205	21	17	18	1	5.9%	72,535	71,637	(898)	-1.2%	810,138	911,042	100,904	12.5%	5	5	1	6
Totals	6,206	6,647	641	808	809	1	0.1%	2,827,871	2,843,517	15,646	0.6%	31,711,853	34,995,403	3,284,218	9.7%	372	400	89	493

Note: Hollywood-Fairfax-Pasadena Metro Rapid operates over a combination of Line 217-Fairfax and Lines 180/181-Hollywood-Pasadena; this results in 2 local trips combined into one longer Metro Rapid trip, reducing the number of trips, but not service.

Table 5
Annual Corridor Operating Cost Comparison

	Metro Rapid Line	Existing ¹	Proposed ²	Net Change (Incremental Cost)	Percent Change
PHASE II A	South Broadway	\$7,331,000	\$8,484,000	\$1,153,000	15.7%
	Vermont	\$10,476,000	\$11,555,000	\$1,079,000	10.3%
	Florence	\$6,017,000	\$6,457,000	\$440,000	7.3%
	Van Nuys	\$6,929,000	\$7,605,000	\$676,000	9.8%
	Soto	\$5,752,000	\$6,186,000	\$434,000	7.5%
	Crenshaw-Rossmore	\$6,336,000	\$6,726,000	\$390,000	6.2%
PHASE II B	Pico	\$11,620,000	\$12,443,000	\$823,000	7.1%
	Santa Monica	\$12,329,000	\$12,829,000	\$500,000	4.1%
	Hawthorne	\$8,307,000	\$8,704,000	\$397,000	4.8%
	Long Beach Blvd	\$9,583,000	\$10,454,000	\$871,000	9.1%
PHASE II C	Hollywood-Fairfax-Pasadena	\$10,236,000	\$11,137,000	\$901,000	8.8%
	Western	\$8,297,000	\$8,859,000	\$562,000	6.8%
	Beverly	\$6,185,000	\$6,441,000	\$256,000	4.1%
	Vernon-La Cienega	\$5,528,000	\$5,648,000	\$120,000	2.2%
PHASE II D	Atlantic	\$5,394,000	\$5,860,000	\$466,000	8.6%
	Central	\$4,484,000	\$4,731,000	\$247,000	5.5%
	San Fernando-Lankershim	\$0	\$1,521,000	\$1,521,000	N/A
	West Olympic	\$6,482,000	\$7,191,000	\$709,000	10.9%
PHASE II E	Garvey-Chavez	\$11,321,000	\$10,950,000	(\$371,000)	-3.3%
	Manchester	\$5,022,000	\$5,122,000	\$100,000	2.0%
	San Fernando (south)	\$7,794,000	\$7,516,000	(\$278,000)	-3.6%
	Sepulveda (south)	\$3,372,000	\$3,504,000	\$132,000	3.9%
	Torrance-Long Beach	\$3,202,000	\$3,207,000	\$5,000	0.2%
	Lincoln	\$4,211,000	\$4,633,000	\$422,000	10.0%
Total Phase II Operating Cost ^{1,2}		\$166,208,000	\$177,763,000	\$11,555,000	7.0%

¹ Existing operating cost includes both local and limited services on the corridor in FY2002 dollars.

² Proposed operating cost includes both Metro Rapid and local services on the corridor in FY2002 dollars.

Table 6
Corridor Capital Costs

Metro Rapid Line	Stations ¹				Signal Priority		Revenue Vehicles			Ops Support		Line Capital Cost										
	Single Gate	Double Gate	Double Gate	Double Gate	Line Miles	Ave Cost per Mile	40-foot Buses	40-ft Bus Cost	Cost	Cost	Cost											
PHASE I A	26	\$54,900	4	\$88,200	\$1,780,200	10.5	\$141,800	(2)	\$340,000	(\$680,000)	\$214,000	\$2,800,200										
	26	\$54,900	6	\$88,200	\$1,956,600	11.9	\$250,699	(2)	\$340,000	(\$660,000)	\$339,000	\$4,598,600										
	24	\$54,900	0	\$88,200	\$1,317,600	10.3	\$155,157	1	\$340,000	\$340,000	\$44,000	\$3,299,600										
	38	\$54,900	0	\$88,200	\$2,086,200	21.4	\$121,262	0	\$340,000	\$0	\$44,000	\$4,730,200										
	30	\$54,900	0	\$88,200	\$1,647,000	10.0	\$119,167	(1)	\$340,000	(\$340,000)	\$214,000	\$2,715,000										
	42	\$54,900	0	\$88,200	\$2,305,800	18.8	\$114,473	(2)	\$340,000	(\$680,000)	\$44,000	\$3,821,800										
	36	\$54,900	2	\$88,200	\$2,152,800	17.3	\$102,631	2	\$340,000	\$680,000	\$44,000	\$4,653,800										
	44	\$54,900	4	\$88,200	\$2,768,400	20.2	\$125,617	(1)	\$340,000	(\$340,000)	\$44,000	\$5,003,400										
	21	\$54,900	0	\$88,200	\$1,152,900	18.7	\$146,262	(9)	\$340,000	(\$3,060,000)	\$214,000	\$1,040,900										
	28	\$54,900	0	\$88,200	\$1,537,200	15.3	\$149,983	4	\$340,000	\$1,360,000	\$44,000	\$5,236,200										
PHASE I C	52	\$54,900	0	\$88,200	\$2,854,800	21.5	\$134,112	(3)	\$340,000	(\$1,020,000)	\$44,000	\$4,761,800										
	31	\$54,900	5	\$88,200	\$2,142,900	13.1	\$256,231	1	\$340,000	\$340,000	\$44,000	\$5,883,900										
	30	\$54,900	0	\$88,200	\$1,647,000	11.0	\$140,711	3	\$340,000	\$1,020,000	\$44,000	\$4,259,000										
	34	\$54,900	0	\$88,200	\$1,866,600	16.5	\$182,279	2	\$340,000	\$680,000	\$44,000	\$5,598,600										
PHASE I D	52	\$54,900	0	\$88,200	\$2,854,800	25.1	\$182,117	2	\$340,000	\$680,000	\$44,000	\$7,647,800										
	19	\$54,900	0	\$88,200	\$1,043,100	10.8	\$174,245	1	\$340,000	\$340,000	\$44,000	\$3,269,100										
	18	\$54,900	0	\$88,200	\$968,200	9.9	\$120,918	8	\$340,000	\$2,720,000	\$44,000	\$4,949,200										
	38	\$54,900	2	\$88,200	\$2,262,600	12.1	\$149,474	1	\$340,000	\$340,000	\$44,000	\$4,455,600										
PHASE I E	30	\$54,900	0	\$88,200	\$1,647,000	14.7	\$161,764	(1)	\$340,000	(\$340,000)	\$44,000	\$3,729,000										
	28	\$54,900	0	\$88,200	\$1,537,200	13.5	\$156,659	(1)	\$340,000	(\$340,000)	\$44,000	\$3,356,200										
	25	\$54,900	4	\$88,200	\$1,725,300	13.6	\$147,723	(6)	\$340,000	(\$2,040,000)	\$44,000	\$4,009,300										
	24	\$54,900	0	\$88,200	\$1,317,600	12.8	\$120,918	0	\$340,000	\$0	\$44,000	\$2,909,600										
	38	\$54,900	0	\$88,200	\$2,086,200	15.6	\$202,913	3	\$340,000	\$1,020,000	\$44,000	\$6,315,200										
	18	\$54,900	0	\$88,200	\$988,200	12.1	\$118,509	1	\$340,000	\$340,000	\$44,000	\$2,806,200										
	Total Phase I											752	27	\$43,686,200	356.5	\$157,647	\$55,989,000	1	\$340,000	\$340,000	\$1,861,000	\$101,856,200

All capital costs in FY2002 dollars

¹ These are individual stations; Table 1 shows station pairs. More than one Metro Rapid line may share a station; in these cases station costs are shown for the first line implemented.

Table 7
Five Year Implementation Phasing

Metro Rapid Line	Total Miles of Metro Rapid Corridor									
	FY2002 - FY2003	FY2003 - FY2004	FY2004 - FY2005	FY2005 - FY2006	FY2006 - FY2007	FY2007 - FY2008	TOTAL			
South Broadway	10.5						10.5			
Vermont	11.9						11.9			
Florence		10.3					10.3			
Van Nuys		21.4					21.4			
Soto		10.0					10.0			
Crenshaw-Rossmore		18.8					18.8			
Pico			17.3				17.3			
Santa Monica			20.2				20.2			
Hawthorne			18.7				18.7			
Long Beach Blvd			15.3				15.3			
Hollywood-Fairfax-Pasadena				21.5			21.5			
Western				13.1			13.1			
Beverly				11.0			11.0			
Vernon-La Cienega				16.5			16.5			
Atlantic					25.1		25.1			
Central					10.6		10.6			
San Fernando-Lankershim					9.9		9.9			
West Olympic					12.1		12.1			
Garvey-Chavez						14.7	14.7			
Manchester						13.5	13.5			
San Fernando (south)						13.6	13.6			
Sepulveda (south)						12.8	12.8			
Torrance-Long Beach						15.6	15.6			
Lincoln						12.1	12.1			
Total Phase II	22.4	60.6	71.5	62.1	57.7	82.3	356.5			

Table 8
Five Year Plan Incremental Operating Costs¹

Metro Rapid Line	Incremental Operating Costs (FY2002 Dollars)							
	FY2002 - FY2003 ²	FY2003 - FY2004	FY2004 - FY2005	FY2005 - FY2006	FY2006 - FY2007	FY2007 - FY2008		
PHASE II A								
South Broadway	\$576,500	\$1,153,000	\$1,153,000	\$1,153,000	\$1,153,000	\$1,153,000	\$1,153,000	
Vermont	\$539,500	\$1,079,000	\$1,079,000	\$1,079,000	\$1,079,000	\$1,079,000	\$1,079,000	
Florence		\$440,000	\$440,000	\$440,000	\$440,000	\$440,000	\$440,000	
Van Nuys		\$676,000	\$676,000	\$676,000	\$676,000	\$676,000	\$676,000	
Soto		\$434,000	\$434,000	\$434,000	\$434,000	\$434,000	\$434,000	
Crenshaw-Rossmore		\$390,000	\$390,000	\$390,000	\$390,000	\$390,000	\$390,000	
PHASE II B								
Pico		\$823,000	\$823,000	\$823,000	\$823,000	\$823,000	\$823,000	
Santa Monica		\$500,000	\$500,000	\$500,000	\$500,000	\$500,000	\$500,000	
Hawthorne		\$397,000	\$397,000	\$397,000	\$397,000	\$397,000	\$397,000	
Long Beach Blvd		\$871,000	\$871,000	\$871,000	\$871,000	\$871,000	\$871,000	
PHASE II C								
Hollywood-Fairfax-Pasadena								
Western								
Beverly								
Vernon-La Cienega								
PHASE II D								
Atlantic								
Central								
San Fernando-Lankershim								
West Olympic								
PHASE II E								
Garvey-Chavez								
Manchester								
San Fernando (south)								
Sepulveda (south)								
Torrance-Long Beach								
Lincoln								
TOTAL PHASE II								
Incremental Operating Cost	\$1,116,000	\$4,172,000	\$6,783,000	\$8,602,000	\$11,545,000	\$11,555,000	\$11,555,000	
Incremental Operating Revenue ³	\$595,000	\$2,321,000	\$3,769,000	\$5,122,000	\$6,332,000	\$6,480,000	\$6,480,000	
Net Required Operating Subsidy	(\$521,000)	(\$1,851,000)	(\$2,994,000)	(\$3,480,000)	(\$5,213,000)	(\$5,075,000)	(\$5,075,000)	

¹ Incremental operating cost is the differential of the proposed operating cost and the existing operating cost.

² FY2002-2003 costs reflect mid-year implementation of Metro Rapid service.

³ Incremental operating revenue is the estimated increase in patronage times the average fare of \$0.692.

Table 9
Five Year Plan Capital Costs

Metro Rapid Line		Capital Costs (FY2002 Dollars)						
		FY2002	FY2003	FY2004	FY2005	FY2006	FY2007	FY2008
PHASE I A	South Broadway	\$2,800,200						
	Vermont	\$4,598,600						
	Florence		\$3,299,600					
	Van Nuys		\$4,730,200					
	Soto		\$2,715,000					
PHASE I B	Crenshaw-Rossmore		\$3,821,800					
	Pico			\$4,653,800				
	Santa Monica			\$5,009,400				
	Hawthorne			\$1,040,900				
	Long Beach Blvd			\$5,236,200				
PHASE I C	Hollywood-Fairfax-Pasadena				\$4,761,800			
	Western				\$5,883,900			
	Beverly				\$4,259,000			
	Vernon-La Cienega				\$5,598,600			
	Atlantic					\$7,647,800		
PHASE I D	Central					\$3,269,100		
	San Fernando-Lankershim					\$4,949,200		
	West Olympic					\$4,455,600		
	Garvey-Chavez						\$3,729,000	
PHASE I E	Manchester							\$3,356,200
	San Fernando (south)							\$4,009,300
	Sepulveda (south)							\$2,909,600
	Torrance-Long Beach							\$6,315,200
	Lincoln							\$2,806,200
Total Phase I		\$7,398,800	\$14,566,600	\$15,940,300	\$20,503,300	\$20,321,700	\$23,125,500	

All costs are in FY2002 dollars.

Table 10

**Metro Rapid Five-Year Implementation Plan
Capital Expenditure and Funding Plan FY 03-08**
(\$ Escalated and in Millions)

Expenditure Plan	FY 03	FY 04	FY 05	FY 06	FY 07	FY 08	FY 09	FY 10	Total
BSP Installation	4.570	7.884	9.975	11.770	9.915	16.921	-	-	61.035
Station Construction	3.821	7.688	8.126	9.279	7.949	10.549	-	-	47.413
TOS vans	0.088	0.186	0.191	0.196	0.201	0.309	-	-	1.171
BOCC/Other ITS Hardware	0.025	0.824	-	-	-	-	-	-	0.849
Total Expenditure	8.504	16.583	18.293	21.245	18.064	27.779	-	-	110.468

Funding Plan	Funding Source	FY 03	FY 04	FY 05	FY 06	FY 07	FY 08	FY 09	FY 10	Total
BSP Installation	CFP	4.570	3.228	1.735	3.066	1.632	-	-	-	14.231
Station Construction ¹	Fed/Local	3.821	1.754	-	-	-	-	-	-	5.575
TOS vans	Local	0.088	-	-	-	-	-	-	-	0.088
BOCC/Other ITS Hardware ²	Fed/Local	0.025	-	-	-	-	-	-	-	0.025
Long Range Plan (LRTP)	Fed/Local	-	-	12.500	19.600	13.100	14.200	12.200	20.700	92.300
Total Funding		8.504	4.982	14.235	22.666	14.732	14.200	12.200	20.700	112.219

Balance ³		(1.601)	(4.058)	1.421	(3.332)	(13.579)	12.200	20.700	1.752

Notes:

1. Approved as STIP funds in the 2001 Call for Projects (Board report November 2001). Project has since been funded with CMAQ.
2. Funding comes from FY02 carryover funds.
3. It is anticipated that internal fund transfers and other short-term financing mechanisms will be used to annually balance FY04-08 of the Five-Year Implementation Plan.

Abbreviations:

- BSP = Bus Signal Priority
- TOS = Transit Operations Supervisor
- BOCC = Bus Operations Control Center
- ITS = Intelligent Transportation Systems
- STIP = State Transportation Improvement Program
- CMAQ = Congestion Mitigation and Air Quality Improvement Program
- CFP = Call for Projects

Attachment E

**LACMTA MOU
QUARTERLY PROGRESS / EXPENSE REPORT**

Grantee To Complete	
Invoice #	
Invoice Date	
MOU#	
Quarterly Report #	

PROJECT SPONSORS ARE REQUESTED TO SUBMIT THIS REPORT TO THE **METRO PROJECT MANAGER RESPONSIBLE** FOR THIS PROJECT during or after the close of each month. Please note that letters or other forms of documentation may not be substituted for this form. Refer to the Reporting & Expenditure Guidelines (Attachment E1) for further information.

SECTION 1: QUARTERLY EXPENSE REPORT

Please itemize grant-related charges for this Quarter on Page 5 of this report and include totals in this Section.

	LACMTA Grant \$	Local Match (Incl. In-Kind) \$	Local Match %	Total \$
Project Quarter Expenditure				
This Quarter Expenditure				
Retention Amount				
Net Invoice Amount (Less Retention)				
Project-to-Date Expenditure				
Funds Expended to Date (Include this Quarter)				
Total Project Budget				
% of Project Budget Expended to Date				
Balance Remaining				

SECTION 2: GENERAL INFORMATION

PROJECT TITLE: _____

MOU #: _____

QUARTERLY REPORT SUBMITTED FOR:

Fiscal Year : 2007-2008 2008-2009 2009-2010
 2010-2011 2011-2012 2012-2013

Quarter : Q1: Jul - Sep Q2: Oct - Dec
 Q3: Jan - Mar Q4: Apr - Jun

DATE SUBMITTED: _____

LACMTA Project Mgr.	Name:	
	Area Team:	
	Phone Number:	
	e-mail:	

Project Sponsor Contact / Project Manager	Contact Name:	
	Job Title:	
	Department:	
	City / Agency:	
	Mailing Address:	
	Phone Number:	
	e-mail:	

SECTION 3 : QUARTERLY PROGRESS REPORT
1. DELIVERABLES & MILESTONES

List all deliverables and milestones as stated in the MOU, with start and end dates. Calculate the total project duration. **DO NOT CHANGE THE ORIGINAL MOU MILESTONE START AND END DATES SHOWN IN THE 2ND AND 3RD COLUMNS BELOW.**

Grantees must make every effort to accurately portray milestone dates in the original MOU Scope of Work, since this will provide the basis for calculating any project delay. If milestone start and/or end dates change from those stated in the Original MOU Scope of Work, indicate the new dates under Actual Schedule below and re-calculate the project duration. However, this does not change the original milestones in your MOU. **PER YOUR MOU AGREEMENT, ANY CHANGES TO THE PROJECT SCHEDULE MUST BE FORMALLY SUBMITTED UNDER SEPARATE COVER TO LACMTA FOR WRITTEN CONCURRENCE.**

MOU Milestones	Original MOU Schedule in Scope of Work		Actual Schedule	
	Start Date	End Date	Start Date	End Date
Total Project Duration (Months)				

2. PROJECT COMPLETION

A. Based on the comparison of the original and actual project milestone schedules above, project is (select only one) :

- On schedule per original MOU schedule Less than 12 months behind original schedule
 Between 12-24 months behind original schedule More than 24 months behind original schedule

B. Was the project design started within 6 months of the date originally stated in the MOU?

- Yes No Not Applicable

C. Was a construction contract or capital purchase executed within 9 months after completion of design / specifications?

- Yes No Not Applicable

3. TASKS / MILESTONES ACCOMPLISHED

List tasks or milestones accomplished and progress made this quarter.

4. PROJECT DELAY

If project is delayed, describe reasons for delay (this quarter). Pay particular attention to schedule delays. If delay is for the same reason as mentioned in previous quarters, please indicate by writing "Same as Previous Quarter".

5. ACTION ITEMS TO RESOLVE DELAY

If the project is delayed (as described in #4), include action items that have been, or will be, undertaken to resolve the delay.

SECTION 4: ITEMIZED LISTING OF EXPENSES AND CHARGES THIS QUARTER

All expenses and charges, including grant and local match, must be itemized and listed below. Each item listed must be verifiable by an invoice and/or other proper documentation. The total amounts shown here must be equal to this quarter's expenditures listed on page 1 of this report. All expenses and charges must be reflective of the approved budget and rates as shown in the MOU Attachment B, Scope of Work. Use additional pages if needed.

ITEM	INVOICE #	TOTAL EXPENSES / CHARGES	\$ CHARGED TO LACMTA GRANT	\$ CHARGED TO LOCAL MATCH
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
TOTAL				

Notes:

1. Local match spent in each quarter, must be in the appropriate proportion to LACMTA grant.
2. All receipts, invoices, and time sheets, attached and included with this Expense Report must be listed and shown under the Invoice Number column of the Itemized Listing (above).

Invoice Payment Information:

LACMTA will make all disbursements electronically unless an exception is requested in writing.
 ACH Payments require that you complete an ACH Request Form and fax it to Accounts Payable at 213-922-6107
 ACH Request Forms can be found at www.metro.net/callforprojects.
 Written exception requests for Check Payments should be completed and faxed to Accounts Payable at 213-922-

I certify that I am the responsible Project Manager or fiscal officer and representative of _____ and that to the best of my knowledge and belief the information stated in this report is true and correct.

Signature

Date

Name

Title

Attachment E1

REPORTING & EXPENDITURE GUIDELINES

REPORTING PROCEDURES

- Monthly/Quarterly Expense Report and Monthly/Quarterly Progress Report (Attachment F) are required for all projects. No funds will be disbursed unless these reports have been submitted and approved by the Metro based on the Memorandum of Understanding (MOU) reporting schedule.
- The Monthly/Quarterly Progress Report covers all activities related to the project. It is essential that Grantee provide complete and adequate response to all the questions. In cases where there are no activities to report, or problems causing delays, clear explanation, including actions to remedy the situation, must be provided.
- The Monthly/Quarterly Expense Report lists all costs incurred. The expenses listed must be supported by appropriate documentation such as invoices, receipts, time sheets, etc. Every invoice or receipt must be accompanied with a clear explanation of its purpose and its relevance to the project.
- The Monthly/Quarterly Expense Report must reflect the share of local match, including in-kind, charged to the grant. **If reported charges to local match are below the committed ratio (grant to local match) as indicated in the project MOU, Metro may automatically adjust the grant payment accordingly or payment may be withheld at the discretion of the Metro Project Manager.**
- Monthly/Quarterly reports are due on the 15th day of the months of October, January, April and July. Reporting schedule is based on the fiscal year as follows:

<i>Quarter</i>	<i>Report Due Date</i>
July - September	October 15
October - December	January 15
January - March	April 15
April - June	July 15

EXPENDITURE GUIDELINES

- Any activity or expense charged above and beyond the approved Scope-of-Work (Attachment C), **is considered ineligible** and will not be reimbursed by the Metro unless **prior written authorization** has been granted by the Metro Chief Executive Officer or his designee.
- Any expense charged to the grant or local match, including in-kind, must be clearly and directly related to the project.

- Any activity or expense charged as local match cannot be applied to any other Metro-funded or non-Metro-funded projects; activities or expenses related to a previously funded project cannot be used as local match for the current project.
- Administrative cost is the ongoing expense incurred by the grantee for the duration of the project and for the direct benefit of the project as specified in the Scope-of-Work (Attachment A). Examples of administrative costs are personnel, office supplies, and equipment. As a condition for eligibility, all costs must be necessary for maintaining, monitoring, coordinating, reporting and budgeting of the project. Additionally, expenses must be reasonable and appropriate to the activities related to the project.
- Metro is not responsible for, and will not reimburse any costs incurred by the Grantee prior to the execution of the MOU, unless **written authorization** has been granted by the Metro Chief Executive Officer or her designee.
- The MOU is considered executed when the Metro Chief Executive Officer or her designee signs the document.

DEFINITIONS

- **Local Participation:** Where local participation consists of “in-kind” contributions rather than funds, the following contributions may be included:
 - Costs incurred by a local jurisdiction to successfully complete the project. Examples include engineering, design, rights-of-way purchase, and construction management costs.
 - Donations of land, building space, supplies, equipment, loaned equipment, or loaned building space dedicated to the project.
 - Donations of volunteer services dedicated to the project.
 - A third-party contribution of services, land, building space, supplies or equipment dedicated to the project.
- **Allowable Cost:** To be allowable, costs must be reasonable, recognized as ordinary and necessary, consistent with established practices of the organization, and consistent with industry standard of pay for work classification.
- **Excessive Cost:** Any expense deemed “excessive” by Metro staff will be adjusted to reflect a “reasonable and customary” level. For detail definition of “reasonable cost”, please refer to the Federal Register *OMB Circulars A-87 Cost Principals for State and Local Governments; and A-122 Cost Principals for Nonprofit Organizations*.
- **In-eligible Expenditures:** Any activity or expense charged above and beyond the approved Scope-of-Work is considered in-eligible.