



# WESTSIDE SUBWAY EXTENSION

## Cost and Financial Analysis



August 2010





## Table of Contents

- 1.0 INTRODUCTION.....1-1**
- 2.0 COST ESTIMATE METHODOLOGY .....2-1**
  - 2.1 Capital Cost Methodology ..... 2-1
  - 2.2 Capital Cost Categories..... 2-1
    - 2.2.1 SCC 10—Guideway and Track Elements ..... 2-1
    - 2.2.2 SCC 20—Stations, Stops, Terminals, Intermodal ..... 2-2
    - 2.2.3 SCC 30—Support Facilities: Yards, Shops, Administration Buildings..... 2-3
    - 2.2.4 SCC 40—Sitework and Special Conditions..... 2-3
    - 2.2.5 SCC 50—Systems ..... 2-4
    - 2.2.6 SCC 60—Right-of-Way, Land, Existing Improvements ..... 2-4
    - 2.2.7 SCC 70—Vehicles ..... 2-5
    - 2.2.8 SCC 80—Professional Services..... 2-5
    - 2.2.9 SCC 90—Unallocated Contingency..... 2-5
    - 2.2.10 SCC 100—Finance Charges ..... 2-5
  - 2.3 Operating and Maintenance Costs Methodology ..... 2-6
- 3.0 CAPITAL PLAN .....3-1**
  - 3.1 Capital Costs..... 3-1
  - 3.2 Proposed Capital Funding Sources ..... 3-4
    - 3.2.1 Federal ..... 3-4
    - 3.2.2 Local..... 3-5
  - 3.3 Evaluation of Financial Capacity..... 3-5
  - 3.4 Construction Phasing..... 3-7
  - 3.5 Funding Sources for Ongoing Capital Plan ..... 3-8
- 4.0 OPERATING AND MAINTENANCE PLAN .....4-1**
  - 4.1 Operating and Maintenance Costs ..... 4-1
  - 4.2 Operating and Maintenance Funding Sources ..... 4-3
    - 4.2.1 Local/State ..... 4-3
    - 4.2.2 Federal ..... 4-3
  - 4.3 Operating and Maintenance Expenditure Cash Flow..... 4-3
- 5.0 RISKS AND UNCERTAINTIES .....5-1**
  - 5.1 Project Cost Uncertainties..... 5-1
    - 5.1.1 Changes in Project Scope ..... 5-1
    - 5.1.2 Changes in Project Schedule ..... 5-1
  - 5.2 Funding Uncertainties ..... 5-1
    - 5.2.1 FTA New Starts Funding..... 5-1
    - 5.2.2 Local Funding Risks ..... 5-2
- 6.0 REFERENCES.....6-1**
- APPENDIX A REVISED LONG RANGE TRANSPORTATION PLAN 2011–2019,  
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## List of Tables

Table 3-1: Capital Cost Estimates for TSM and Build Alternatives by SCC Category in Current Year Dollars .....	3-2
Table 3-2: Capital Cost Estimates for Station and Alignment Alternatives in Current Year Dollars.....	3-3
Table 3-3: Total Allocated and Unallocated Contingency for TSM and Build Alternatives in 2009 Dollars (Millions) .....	3-4
Table 3-4: Capital Funding Requirements for Transportation System Management and Build Alternatives in 2009 Dollars (Millions).....	3-7
Table 3-5: Capital Cost Estimates for Minimum Operating Segments by Standardized Cost Category in 2009 Dollars (Millions) .....	3-8
Table 3-6: Long Term Capital Funding for Metro Rail System, 2010–2040 .....	3-10
Table 4-1: Annual Operating and Maintenance Costs for Year 2035 for TSM and Build Alternatives in Year of Expenditure Dollars (millions).....	4-2
Table 4-2: Year 2035 O&M Costs for Alternatives over Metro LRTP Amount for Westside Subway Extension .....	4-3
Table 4-3: Operating and Maintenance Cash Flow for the Metro Rail System, 2010–2019, YOE.....	4-4
Table 4-4: Operating and Maintenance Cash Flow for the Metro Rail System, 2020–2036.....	4-6



## **Acronyms and Abbreviations**

AA	Alternatives Analysis
ACE	advanced conceptual engineering
BBB	Santa Monica Big Blue Bus
CMAQ	Congestion Management and Air Quality
EIS/EIR	environmental impact statement/environmental impact report
FFGA	Full Funding Grand Agreement
FTA	Federal Transit Administration
FY	fiscal year
HRT	heavy rail transit
HRV	heavy rail vehicle
LRTP	Long Range Transportation Plan
LRV	light rail vehicle
MOS	minimum operable segments
O&M	operating and maintenance
PE	preliminary engineering
RIP	Regional Improvement Program
SCC	standardized cost categories
TBM	tunnel boring machine
TDA	Transportation Development Act
TSM	Transportation Systems Management
UCLA	University of California, Los Angeles
VA	Department of Veterans Affairs
YOE	year of expenditure





## 1.0 INTRODUCTION

This report presents the capital and operating cost estimates and the financial analysis for the alternatives being considered for the Westside Subway Extension in Los Angeles County. The project is currently in the Draft Environmental Impact Statement/Environmental Impact Report (EIS/EIR) phase. The Draft EIS/EIR effort continues work that began in previous planning studies specifically the Alternatives Analysis (AA) phase. The AA phase was completed in January 2009 when the Metro Board adopted heavy rail transit (HRT) as the preferred mode to extend the existing Metro Rail HRT west toward the Pacific Ocean and the City of Santa Monica.

The Draft EIS/EIR will analyze a No Build Alternative, a Transportation System Management (TSM) Alternative, and five HRT alternatives:

- Alternative 1—Westwood/University of California Los Angeles (UCLA) Extension
- Alternative 2—Westwood/Veterans Administration (VA) Hospital Extension
- Alternative 3—Santa Monica Extension
- Alternative 4—Westwood/VA Hospital Extension plus West Hollywood Extension
- Alternative 5—Santa Monica plus West Hollywood Extension

The financial analysis presented in this technical report is based on the capital and operating and maintenance (O&M) costs estimates prepared for each of the five build alternatives presented above.

This technical report also presents the capital and operating costs for several station and alignment options:

- Alternative 1 above without the Crenshaw Station
- Alternative 2 without the Crenshaw Station
- Alternative 3 without the Crenshaw Station
- Alternative 4 with a transfer station for connections between the Purple Line and the West Hollywood Line at La Cienega
- Alternative 2 with the Century City Station at Constellation rather than Santa Monica
- Alternative 2 with the Westwood Loop
- Alternative 2 with the Century City Station at Constellation and without the Crenshaw Station.

These alternatives are described further in the Project Description Report and in Chapter 2 of the Draft EIS/EIR.

This report also addresses two implementation options, which represent potential initial construction phases for Alternatives 1 through 5:

- Minimum Operable Segment 1 (MOS 1): Fairfax Extension
- Minimum Operable Segment 2 (MOS 2): Century City Extension



The financial analysis in the DEIS/EIR is consistent with Metro's adopted Long Range Transportation Plan (LRTP) dated October 2009. Metro later updated the financial plan in March 2010 to reflect a prioritization of capital projects.

The October 2009 LRTP anticipates that the Westside Subway Extension would be constructed in three phases. Phase 1 would extend from the existing Purple Line of the Metro Rail HRT system at Wilshire and Western to Wilshire and Fairfax. The LRTP assumes that construction would begin in 2012 and be completed by 2019. Phase 2 would extend the project alignments from Fairfax to Century City. This segment would be constructed from 2016 to 2026, and be operational in 2027. Phase 3 would extend the system from Century City to Westwood. Construction of this segment would begin in 2024 and be operational by 2036.

Metro is trying to accelerate its capital program with the 30/10 Initiative. The concept of the 30/10 Initiative is to use the long-term revenue from the Measure R sales tax as collateral for long-term bonds and a federal loan which will allow Metro to build 12 key mass transit projects, including the Westside project, in 10 years rather than 30.

Metro has estimated that accelerating the construction of these 12 key Metro projects will result in cost savings and create economic benefits. The Metro board adopted a position of support for the 30/10 concept on April 15, 2010, and also confirmed that future board action would be required to approve an accelerated project delivery schedule.

While these plans are preliminary, such a development would impact the Westside Extension's schedule and cost. Under the 30/10 Initiative, the Westside Extension would be operational by 2021. If such plans materialize, the impact on the total project cost in YOE dollars will be examined further. Metro is in the process of updating its financial plan, and this would be reflected in updated versions of the LRTP.

Metro's fiscal year (FY) begins on July 1 and ends on June 30. For example, FY2011 refers to the period of July 1, 2010, through June 30, 2011. All year references in this report are to Metro's fiscal year. This financial analysis did not consider costs, resources, and funding strategies associated with bus service provided by entities other than Metro. Throughout this report, costs and revenues are presented in 2009 dollars and/or year of expenditure (YOE) dollars where specified.





## **2.0 COST ESTIMATE METHODOLOGY**

### **2.1 Capital Cost Methodology**

The methodology used for generating capital cost estimates is consistent with FTA guidelines for estimating capital costs. FTA requires project sponsors to use standardized cost categories (SCC), which enables all FTA-funded projects to develop budget baselines that summarize them in a consistent framework.

Estimates that support the Draft EIS are based on conceptual drawings that are developed to an approximate 10 percent level of engineering completion. Where the level of design does not support quantity measurements, parametric estimating techniques were utilized. Costs were estimated in Year 2009 dollars and escalated to year of expenditure dollars. Additional detail is provided in the *Final Capital Cost Estimate Report*, May 10, 2010.

### **2.2 Capital Cost Categories**

The following summarizes the FTA SCCs which are used as the structure for the capital cost estimate:

- 10      Guideway and Track Elements
- 20      Station, Stops, Terminals, Inter-modal
- 30      Support Facilities—Yards, Shops, Administration Buildings
- 40      Sitework and Special Conditions
- 50      Systems
- 60      Right-of-Way, Land, Existing Improvement
- 70      Vehicles
- 80      Professional Services
- 90      Unallocated Contingency
- 100     Finance Charges

#### **2.2.1 SCC 10—Guideway and Track Elements**

Guideway and track elements are assumed to be “typical” to the industry. For purposes of the Westside Subway Extension estimates, cross sections are assumed to be congruous with existing Metro operating systems for HRT.



**2.2.1.1 Guideway**

The HRT guideway cost categories include underground construction for the HRT including the tunnel boring machine (TBM), and cut and cover sections. For the Westside Subway Extension, guideway costs are included in the following three sub-categories:

- 10.06 Guideway: Underground Cut and Cover
- 10.07 Guideway: Underground Tunnel
- 10.08 Guideway: Retained Cut or Fill

**2.2.1.2 Track**

Track cost categories consist of running rails, ties, ballast, direct fixation concrete plinth, embedded track, and special track components:

- 10.09 Track: Direct fixation
- 10.10 Track: Embedded
- 10.11 Track: Ballasted
- 10.12 Track: Special (switches, turnouts)
- 10.13 Track: Vibration and Noise Dampening

Track unit costs will be divided into three types of construction that include direct-fixation track, embedded track, and ballasted track. For HRT, the primary track technology is Direct Fixation. Embedded and ballasted track may also be utilized, but on a limited basis, for access to yards and shops for example. For purposes of the Westside Subway Extension, initial cost estimates will be based on cost-per-mile and/or cost-per-route-foot utilizing historical information. Unit costs are assumed to be all-inclusive of rail, ties, ballast, rail welding, fasteners and anchors.

**2.2.2 SCC 20—Stations, Stops, Terminals, Intermodal**

The stations cost category is made up of the following sub-categories that include station structures, parking lots, elevators, and escalators. For the Westside Subway extension, costs are included in the following sub-categories:

- 20.03 Underground Station, Stop, Shelter, Mall, Terminal, Platform
- 20.05 Joint Development
- 20.06 Automobile Parking Multi-Story Structure
- 20.07 Elevators, Escalators

Four types of stations are under consideration:

- Central Mezzanine with an entrance through the center of the station.
- Single-End Loaded
- Double-End Loaded
- Deep Station (over and under configuration for narrow right-of-way or connections to other lines)



Station work will also include architectural treatments, signage, and lighting, vertical circulation elements such as stairs and elevators, as well as equipment rooms. Parking structures include traffic control, site work, structural excavation and backfill, foundation work concrete footings, steel reinforcement, pedestrian access and protection, and lighting, electrical and mechanical work.

Generally, station costs will be based on industry-standard costs-per-square foot; parking structure costs will also be based on square foot costs, checked by cost-per-space calculations.

### **2.2.3 SCC 30—Support Facilities: Yards, Shops, Administration Buildings**

Items in this category include office support areas, maintenance of way facilities, trackwork for vehicle storage, cleaning and maintenance facilities, and storage/maintenance buildings. Sub-categories are identified as:

- 30.01 Administration Building: Offices, Sales, Storage, etc
- 30.02 Heavy Maintenance Facility

This cost category includes costs of a turnback facility in the existing Division 20 (Purple/Red Line) Maintenance Facility to accommodate 2.5-minute headways in the main subway trunk; and Improvements to the existing shop and inspection facilities at the Division 20 yard that are required for both the No Build and Build Alternatives.

### **2.2.4 SCC 40—Sitework and Special Conditions**

This cost category includes sitework and special conditions that may be in addition to scope covered under normal profiles for guideway and station construction. The cost elements included in each subcategory are described in more detail below.

#### **2.2.4.1 40.01 Demolition**

This cost category includes costs associated with building and other demolition, and can also include existing rail structures.

#### **2.2.4.2 40.02 Utility Relocation**

This cost category includes relocation of both public and private utilities, and specifically excludes betterments. For purposes of the Westside Subway Extension Corridor, utility relocations are included as an allowance, pending a detailed evaluation of the existing utilities and definition of the actual utility relocation work scope. Where known major utility impacts are identified, the utility relocations may be estimated.

#### **2.2.4.3 40.03 Hazardous Material and Environmental Mitigation**

No detailed hazardous material or environmental mitigation information will be available until the Preliminary Engineering (PE) process has been completed and an Environmental Mitigation Monitoring Plan developed. Therefore, a “plug” number based on the overall alignment length will be utilized, and is primarily intended to cover contaminated soil and ground water remediation. Should the advanced conceptual engineering (ACE) phase 1 studies or boring data reveal contamination requiring special disposal, this will be included in the cost.



**2.2.4.4 40.04 Site Structures**

Work items in this category include retaining walls, sound walls, shared lots, structures where there might be retail/economic/community activities on the ground floor, and other work that is adjacent to the actual alignment. These costs will be derived utilizing a cost-per-square foot basis as indicated through historical comparisons of similar projects.

**2.2.4.5 40.05 Pedestrian Access, Landscaping**

Work items in this category include sidewalks, paths, plazas, landscape, site and station furniture, sight lighting, signage, public artwork, bike facilities and fencing. Most of these items are defined during the Final Design phase. Therefore, allowances are utilized for pricing during PE.

**2.2.4.6 40.06 Automobile Accessways, Parking Lots**

This cost category includes roadways, streets, surface parking areas, sidewalks, curbs, and gutters. In addition, this cost category if applicable may include shared-lots or structures where there might be retail/economic or community activities on the ground floor. Costs will be based on industry averages on a cost-per-square-foot basis.

**2.2.4.7 40.07 Temporary Facilities**

This cost category includes mobilization, demobilization, temporary trailers, easements, and other costs. The costs will be determined as a percentage of the overall capital construction cost.

**2.2.5 SCC 50—Systems**

The Systems cost category includes several relevant sub-categories:

- 50.01 Train Control and Signals
- 50.02 Traffic Signals and Crossing Protection
- 50.03 Traction Power Supply: Substations
- 50.04 Traction Power Distribution: Catenary and Third Rail
- 50.05 Communications
- 50.06 Fare Collection System and Equipment
- 50.07 Central Control

This cost category includes costs for an expansion of the existing Rail Operations Center located at Imperial and Willowbrook Avenue along the Metro Blue Line. Costs for expansion to this Central Control building that are attributed to other Measure R projects are not included, as it is assumed that they are funded by Measure R in the No-Build scenario.

**2.2.6 SCC 60—Right-of-Way, Land, Existing Improvements**

This cost category includes real estate acquisition and relocation costs.

- 60.01 Purchase or Lease of Real Estate
- 60.02 Relocation of Existing Households and Businesses
- 60.03 Right of Way



Fee acquisitions of permanent and temporary easements, relocation costs, and “loss of business” compensation are included. Real Estate acquisition and relocation estimates will be provided by Metro based on information provided by the Metro Real Estate department for similar types of property. Real Estate acquisitions/easements would primarily be associated with station entrances, construction staging, access for tunnel boring machines, and/or potential subsurface easements for tunneling under private property. Cost estimates will be prepared by Metro’s Real Estate department based on right-of-way drawings provided by the Consultant for inclusion in the cost estimate.

### **2.2.7 SCC 70—Vehicles**

This cost category includes the cost of revenue and non-revenue vehicles:

- 70.01 Light Rail Vehicle (LRV)—Not Used
- 70.02 Heavy Rail Vehicle (HRV)
- 70.03 Commuter Rail—Not Used
- 70.04 BRT—Not Used
- 70.05 Others
- 70.06 Non-Revenue Vehicle
- 70.07 Spare Parts

Revenue vehicle pricing will be based on recent historical and industry-standard unit costs, and will include design engineering, manufacture, testing, and spare parts. The estimate will assume there will be no need to retrofit any of Metro’s existing fleet for consist compatibility with newer technologies.

### **2.2.8 SCC 80—Professional Services**

This cost category covers conceptual engineering and alternatives analysis, PE, final design, design support during construction, construction management, Metro agency costs, professional insurance costs, surveys and testing, specialty sub-consultants, and legal expenses.

### **2.2.9 SCC 90—Unallocated Contingency**

Unallocated contingency is intended to cover bid risk and construction risk that cannot reasonably be allocated to specific SCC codes. It is intended to cover unknowns that cannot be anticipated, but is nonetheless prudent to include for planning purposes. This is calculated as a percentage add-on based on the total capital cost estimate, typically in the range of 10 percent. Note that additional allocated contingencies ranging from 5 to 25 percent are allocated to specific cost categories as addressed in Sections 4.6 and 4.7 of the final Capital Cost Methodology Report.

### **2.2.10 SCC 100—Finance Charges**

Finance charges are not included in the scope of the initial estimates because Metro intends to fund the project without the use of project-specific debt.



## 2.3 Operating and Maintenance Costs Methodology

This section provides the basis for the O&M cost methodology developed for the Westside Extension Transit Corridor Study. The methodology for estimation of O&M costs is designed to satisfy Federal Transit Administration (FTA) criteria for cost modeling.

The O&M costs were estimated using a resource cost build-up approach. Separate O&M cost models were developed for each of the following Metro transit modes and two provisions of service types:

- Heavy Rail Transit
- Light Rail Transit
- Directly-Operated Local and Express Bus, Rapid Bus, and Bus Rapid Transit
- Purchased Transportation Local and Express Bus

O&M cost models were not developed for paratransit and charter services. These transit service categories are assumed not to be materially affected by the transit improvement alternatives being addressed.

For Metro services a selectively-grouped resource model was used. This model retains sufficient detail to ensure that service, systems, and facilities distinctions as well as major categories of costs that can be forecasted and that have recognizably different effects on O&M cost are preserved as separate parts of the overall cost models. This approach supports independent analysis of O&M cost factors or influences such as wage levels, fuel and other energy prices, vehicle technologies, materials, and supplies. For the Metro bus services provided by means of contracts with transit operating companies, a simpler costing structure that is consistent with the contracting basis and consequent lower level of available detail was used.

In addition to Metro, transit agencies within the study area of the Westside Extension Transit Corridor Study include LADOT, Santa Monica Big Blue Bus (BBB), Culver City Bus Line, Antelope Valley, Santa Clarita, and West Hollywood. Their transit operations, which may be affected by the alternatives under study, will be subject to analysis of ridership and cost effects caused by the alternative transit improvements.

The directly-operated and purchased transportation model structures developed for Metro bus services were used for the other service providers within the study area; some operate services directly, while others purchase their transit services. These providers' O&M costs are, in total, a small percentage of the overall transit O&M cost being analyzed.

The models utilize current and future service information from travel demand forecasting models and the operating plan. Annual O&M costs were prepared in 2008 dollars, and then escalated to year of expenditure. Escalation of O&M costs to future price levels is accomplished at the individual cost component level, allowing specific identification of escalation rates anticipated to apply to the different cost categories. This feature is seen as especially important in the case of energy costs, in view of the current instability and rapid increase in costs seen in recent years and months.



Additional information about the methodology used to forecast O&M costs is provided in the *Operating and Maintenance Cost Methodology and Model*, April 16, 2010.







### **3.0 CAPITAL PLAN**

The capital plan presents and compares the capital costs associated with implementing each of the alternatives, presents the proposed capital financing plan, and then analyzes Metro’s ability to fund the build alternatives.

#### **3.1 Capital Costs**

The capital costs associated with implementing each of the Westside Subway Extension alternatives are presented in Table 3-1 and Table 3-2. The No Build Alternative does not have any associated capital costs and serves as the baseline for comparing the Build Alternatives. Metro’s ability to fund the No Build is addressed in Section 3.4 on Metro’s Capital Plan.

Table 3-1 presents the capital costs for the TSM and Build Alternatives by SCC code, in 2009 dollars. Table 3-2 presents the capital costs by SCC code for the station and alignment alternatives under consideration.

The capital cost estimates include cost contingency to cover unexpected cost increases, which is consistent with FTA recommendations for transit projects at the 10 percent level of engineering completion. Contingency consists of amounts allocated in varying amounts to each cost category based on “known unknowns”. In addition, an additional amount of unallocated contingency has been added to address “unknown unknowns,” or to simply reflect a prudent amount to cover unanticipated events. Together, allocated and unallocated amounts make up the total contingency. Table 3-3 shows the total amount of contingency that is included in the cost estimate for each alternative.

**Table 3-1: Capital Cost Estimates for TSM and Build Alternatives by SCC Category in Current Year Dollars**

Cost Categories	TSM	Alt 1— Westwood UCLA	Alt 2— Westwood/VA Hospital	Alt 3— Santa Monica Extension	Alt 4— Westwood/VA Hospital plus West Hollywood	Alt 5— Santa Monica Extension plus West Hollywood
Guideway and Track Elements	—	809,966	831,688	1,124,337	1,280,581	1,590,122
Stations, Stops, Terminals, Intermodal	—	910,882	1,009,757	1,518,657	1,723,220	2,232,120
Support Facilities: Yards, Shops, Admin Bldgs	13,000	136,431	136,431	226,392	226,392	226,392
Sitework and Special Conditions	—	293,952	317,178	456,417	506,857	638,476
Systems	1,920	156,520	166,510	230,871	255,279	321,407
Right-of-Way, Land, Existing Improvements	—	101,639	159,400	209,954	216,982	325,295
Vehicles	18,018	498,036	528,528	620,004	823,284	965,580
Professional Services	4,924	761,560	812,315	1,173,702	1,317,468	1,652,811
Unallocated Contingency	3,786	366,899	396,181	556,033	635,006	795,220
Finance Charges	—	—	—	—	—	—
<b>Total Cost (2009) Dollars</b>	<b>41,648</b>	<b>4,035,885</b>	<b>4,357,988</b>	<b>6,116,367</b>	<b>6,985,069</b>	<b>8,747,423</b>

\*All Costs in 2009 Dollars (Millions)

**Table 3-2: Capital Cost Estimates for Station and Alignment Alternatives in Current Year Dollars**

<b>Cost Categories</b>	<b>Alt. 1 less Crenshaw</b>	<b>Alt. 2 less Crenshaw</b>	<b>Alt 3 less Crenshaw</b>	<b>Alt. 4 with Transfer at La Cienega</b>	<b>Alt. 2 with Constellation</b>	<b>Alt. 2 with Westwood Loop</b>	<b>Alt. 2 with Constellation less Crenshaw</b>
Guideway and Track Elements	822,130	843,853	1,136,499	1,275,679	864,065	918,605	864,870
Stations, Stops, Terminals, Intermodal	817,132	916,007	1,424,907	1,773,220	1,009,757	1,009,757	886,151
Support Facilities: Yards, Shops, Admin Buildings	136,431	136,431	226,392	226,392	136,431	136,431	136,431
Sitework and Special Conditions	275,367	320,011	437,832	548,114	321,164	327,289	298,108
Systems	150,949	160,941	225,302	252,627	171,426	174,206	165,240
Right-of-Way, Land, Existing Improvements	101,639	101,639	209,954	216,982	178,173	101,639	178,173
Vehicles	498,036	528,528	620,004	823,284	528,528	569,184	528,528
Professional Services	726,662	784,489	1,138,808	1,345,091	825,937	846,875	775,764
Unallocated Contingency	352,835	379,190	541,970	646,139	403,548	408,399	383,327
Finance Charges	0	0	0	0	0	0	0
<b>Total Cost (2009) Dollars</b>	<b>3,881,181</b>	<b>4,171,089</b>	<b>5,961,668</b>	<b>7,107,528</b>	<b>4,439,029</b>	<b>4,492,385</b>	<b>4,216,592</b>

\*All Costs in 2009 Dollars (Millions)

**Table 3-3: Total Allocated and Unallocated Contingency for TSM and Build Alternatives in 2009 Dollars (Millions)**

Cost Categories (2009 Dollars)	TSM	Alternative 1—Westwood/ UCLA	Alternative 2—Westwood/VA Hospital	Alternative 3—Santa Monica Extension	Alternative 4—Westwood/VA Hospital plus West Hollywood	Alternative 5—Santa Monica Extension plus West Hollywood
Allocated Contingency	62,900	463,578	515,654	720,033	809,990	1,025,187
Unallocated Contingency	20,000	366,899	396,181	556,033	635,006	795,220
Total Contingency	82,900	830,477	911,835	1,276,066	1,444,996	1,820,407
Contingency as Percent of Capital Cost	27.8%	25.9%	26.4%	26.4%	26.1%	26.3%

### 3.2 Proposed Capital Funding Sources

As described above, Metro is trying to accelerate its capital program with the 30/10 Initiative. The concept of the 30/10 Initiative is to use the long-term revenue from the Measure R sales tax as collateral for long-term bonds and a federal loan which will allow Metro to build 12 key mass transit projects, including the Westside project, in 10 years rather than 30 years. Metro has estimated that accelerating the construction of these 12 key Metro projects will result in cost savings and create economic benefits. The Metro board adopted a position of support for the 30/10 concept on April 15, 2010, and also confirmed that future board action would be required to approve an accelerated project delivery schedule.

While these plans are preliminary, such a development would impact the project completion schedule and cost. If such plans materialize, the impact on the total project cost in YOY dollars will be examined further.

Metro proposes to use a mix of Federal and local funding to fund the Westside Subway Extension. The funding sources that have been identified in Metro’s Long-Range Transportation Plan (LRTP) include the following:

#### 3.2.1 Federal

Section 5309 New Starts Funds: These Federal funds are awarded by the FTA on a discretionary basis to new fixed guideway projects. In the LRTP, Metro has included \$1.7 billion (in year of expenditure dollars) in FTA Section 5309 New Starts funds for the Westside Subway Extension. This amount was based on 50% of the estimated construction cost of Phase 1, 30% of the estimated construction cost of Phase 2, and 0% of the estimated construction cost of Phase 3. The financial plan assumes these funds



would be provided between 2011 and 2026, primarily for the first two construction segments.

### 3.2.2 Local

- Measure R, Los Angeles County Transportation Sales Tax: The majority of non-Federal funding will be provided by the Measure R revenues.
- Local Agency Funds: In the LRTP Metro programmed \$168.9 million in local agency transit contributions for the Westside Subway Extension. The Measure R ordinance requires that local agencies fund at least 3 percent of total project costs.
- LONP Reimbursement Fund: The LRTP includes approximately \$56.4 million in funds derived from reimbursements to Metro from the State for Letters of No Prejudice agreements on various capital projects, which Metro is free to use on other capital projects. These funds will be used to fund environmental and planning activities from 2010 to 2012.

The following funds have been expended from 2006-2010. These funds are not included in the analysis of future funding requirements, but are described below because they are shown in the LRTP as sources of funds for the project.

- Regional Improvement Funds: \$2.8 million of Regional Improvement Funds for Transit were utilized for planning and environmental work in 2008.
- LTF General Revenues: Metro utilized approximately \$2.6 million in LTF general revenues to fund planning and environmental work in 2008.
- Transportation Development Act (TDA) Article 4: TDA revenues are a statewide ¼ cent sales tax. Metro utilized approximately \$3.8 million in TDA revenues for planning and environmental work from 2006-2008.

## 3.3 Evaluation of Financial Capacity

Table 3-4 summarizes the capital costs and revenues for the alternatives under consideration. For the purpose of comparison, the revenues have been converted to 2009 dollars so they can be compared to the costs, which are also in 2009 dollars. Therefore, any potential revenue gap is also shown in 2009 dollars. The total amount of funds from all sources, as programmed in the LRTP, is \$4.283 billion when converted to 2009 dollars.

As identified in Metro's October 2009 LRTP, Measure R and other revenues are estimated to provide the following revenues (in year of expenditure dollars) for the Westside Subway Extension:

- FTA New Starts Revenue: \$1.706 billion (year of expenditure): For the purpose of this analysis, the total amount of New Starts funding available is assumed to be fixed at the amount assumed in the October 2009 LRTP. As project development continues, Metro will likely seek additional New Starts under the 30/10 Initiative. Any additional federal funding would be included in future updates of the LRTP.
- Measure R Revenues: \$4.075 billion (year of expenditure): This analysis assumes that Measure R funds would be used to fund project costs not covered by FTA New Starts or



Local Agency funds, up to the maximum amount available in the LRTP for the Westside Subway Extension.

- Local Agency Funds: \$168.9 million (year of expenditure): This financial analysis assumes that the maximum amount of local agency funding available for any of the alternatives is fixed at the amount assumed in the LRTP.
- LONP Reimbursement Fund: This financial analysis assumes that Metro will spend \$56.4 million (year of expenditure) in funds for any of the build alternatives, with the exception of the TSM alternative, from 2010 to 2012.

The above listed sources would provide a total of \$6.015 billion in revenue (year of expenditure), when combined with revenues already expended between 2006 and 2010.

For the evaluation of financial capacity, the amount of funds for each funding source programmed in the October 2009 LRTP have been de-escalated to 2009 dollars, so that they can be compared to the capital costs for each build alternative.

Based on this comparison in 2009 dollars, as illustrated in Table 3-4, the estimated capital costs of the following alternatives fall within the amount of funds identified in the LRTP:

- TSM Alternative
- Alternative 1, including its station and alignment options

Alternative 2 exceeds the amount of funding in the LRTP by \$83 million in 2009 dollars, which is less than two percent of the total cost. Because this is relatively close to the amount of funding that is currently programmed, it is assumed that Metro can program additional Measure R funding to help cover this shortfall in future updates of the LRTP without significantly impacting the agency's ability to complete other Measure R projects. Some of the station and alignment options presented in Chapter 2 would decrease this funding gap, while others would increase the gap and require Metro to reprogram additional Measure R funding in future updates of the LRTP.

Alternatives 3, 4, and 5 are not considered to be financially feasible because their capital costs significantly exceed the amount of funding available in the LRTP. As shown in Table 3-4, the funding gap is between 1,842 million and \$4,473 million (in 2009 dollars) for these alternatives. Metro would be unable to fund this gap through Measure R revenues without impacting its ability to fund other capital projects unless the agency identified a new source of funds.

Table 3-4 shows the assumed amount of Federal funds as a percentage of the total project cost in 2009 dollars.

**Table 3-4: Capital Funding Requirements for Transportation System Management and Build Alternatives in 2009 Dollars (Millions)**

Cost and Revenue	Westside Subway Funds—LRTP	TSM	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5
Total capital cost	4,283.4	41.6	4,035.9	4,358.0	6,116.4	6,985.1	8,747.4
FTA New Starts funds	1,371.7	—	1,371.7	1,371.7	1,371.7	1,371.7	1,371.7
Measure R	2,727.9	41.6	2,489.5	2,727.9	2,727.9	2,727.9	2,727.9
Local transit funds	118.7	—	118.7	118.7	118.7	118.7	118.7
LONP reimbursement	55.9	—	55.9	55.9	55.9	55.9	55.9
Other sources needed for shortfall	—	—	-	83.7	1,842.1	2,710.8	4,473.2
<b>Total revenues needed</b>	<b>4,283.4</b>	<b>41.6</b>	4,035.9	4,358.0	6,116.4	6,985.1	8,747.4
FTA funds as percent of total project cost	32%	0%	34%	31%	22%	20%	16%

Table 3-4 also provides the assumed amount of Federal funds as a percentage of the total project costs. One alternative for closing any potential shortfall is for Metro to seek additional Federal funds for the project.

While Federal legislation permits project sponsors to seek up to 80 percent of the total costs in Federal funding, FTA gives a higher financial rating to projects that seek 50 percent or less. In recent years, projects over \$1 billion that have executed FFGAs with FTA, have generally received 35 percent or less in Federal New Starts funds. However, since the LRTP assumption of \$1.7 billion (year of expenditure dollars) in New Starts funds is approximately 35 percent or less for each of the alternatives, Metro may have the ability to request additional funds without impacting its ability to secure an agreement for Federal funds. Metro will coordinate further with FTA on the amount of Federal funds as the financial plan for the selected alternative is finalized. The revised amount of requested New Starts funds will be reflected in future updates of Metro’s LRTP financial plan.

### 3.4 Construction Phasing

In addition to the alternatives described above, Metro is evaluating two minimum operating segments (MOS). The capital costs of these two segments are shown in Table 3-5.



**Table 3-5: Capital Cost Estimates for Minimum Operating Segments by Standardized Cost Category in 2009 Dollars (Millions)**

Cost Categories	MOS 1— Fairfax West Terminus	MOS 2 — Century City—Santa Monica Boulevard Terminus
Guideway and track elements	306,801	607,314
Stations, stops, terminals, intermodal	374,769	817,988
Support facilities—yards, shops, administration buildings	136,431	136,431
Sitework and special conditions	136,186	249,883
Systems	66,577	126,463
Right-of-way, land, existing improvements	72,040	83,361
Vehicles	254,100	304,920
Professional services	336,851	639,567
Unallocated contingency	168,376	296,593
Finance charges	0	—
<b>Total cost (2009 dollars)</b>	<b>1,852,131</b>	<b>3,262,520</b>

The capital and operating costs for MOS 1 and MOS 2 both fall within the amount of funding identified in Metro’s approved LRTP. The decision to use construction phases may be affected by the 30/10 plan if Metro chooses to accelerate project delivery for the Westside extension. Any updates to the construction phasing plan will be reflected in future updates of Metro’s LRTP financial plan.

### 3.5 Funding Sources for Ongoing Capital Plan

Metro’s long range capital needs are funded through a number of local, state and Federal funds. The funds programmed to the long range capital needs for Metro Rail from 2010–2040 are provided in Table 3-6.

Measure R is the half-cent sales tax for Los Angeles County that will finance new transportation projects and programs, and accelerate many projects already in the project development pipeline, including new rail and/or bus rapid transit projects, commuter rail improvements, Metro Rail systems improvements, highway projects, improved countywide and local bus operations, and local city-sponsored transportation improvements. Measure R was approved by the voters in November 2008, and took effect in July 2009.

The Metro Board of Directors originally approved a Measure R expenditure plan in July 24, 2008. The 2009 LRTP, which outlined the projects to be funded by Measure R as well as other funding sources, was approved in October 2009.

In response to changing economic conditions, reduced state transportation funding and the availability of new federal stimulus funds, in March 2010 the Metro Board of Directors approved a revised LRTP expenditure plan for projects over \$7 million





occurring between FY 2011–2019. The expenditure plan prioritizes its major capital projects into six major categories, based on the need to fulfill existing funding commitments, provide safety improvements, and leverage Federal funds. The revised expenditure plan for FY 2011–FY 2019 is provided in Appendix A.

Overall, Measure R is expected to generate nearly \$36 billion in revenues from FY 2010 to FY 2040. Of that \$36 billion, approximately \$12.2 billion (or approximately 35% of total revenues) is mandated to be allocated to the twelve 30/10 Initiative capital expansion projects by Ordinance #08-01 (with specific amounts to be allocated to each project). Revenues from Measure R can be leveraged to build capital projects, as is planned in the 30/10 Initiative.

The twelve 30/10 Initiative projects were originally proposed to be completed over 30 years. Under the 30/10 Initiative, the projects have been accelerated to reach substantial completion within 10 years. This will require leveraging of Measure R revenues to obtain the upfront funding necessary to complete the twelve capital expansion projects. In a memo from the LACMTA Board dated April 15, 2010, pledging support for the 30/10 Initiative, the LACMTA Board outlined the 30/10 Initiative acceleration schedule and ordered the projects in terms of priority to Los Angeles County.

**Table 3-6: Long Term Capital Funding for Metro Rail System, 2010–2040**

Sources of Funds (millions, YOE)	Total FY 2010– FY2040	FY 2010– FY2019	FY 2020– FY 2029	FY 2030– FY 2040
<b>Local</b>				
Proposition A 35%—Direct		2,328.9	3,047.8	5,240.0
Proposition C 40%—Direct		1,088.1	1,314.0	2,616.5
Proposition C 10%—Direct		68.5	—	—
TDA Article 4		—	1.7	6.9
Proposition C 25%—Direct		567.6	—	—
Local Agency Contributions		204.0	111.1	194.7
LTF General Revenues		—	—	—
Proposition C 10% (Metrolink)		327.0	398.8	296.4
LONP Reimbursement Fund 3562		253.8	—	—
Measure R (2%, 3%, 35% except bus cap.)		3,034.5	4,953.3	6,971.5
<i>Subtotal Local</i>	<i>33,025.3</i>	<i>7,872.6</i>	<i>9,826.8</i>	<i>15,326.0</i>
<b>State</b>				
STA—Population Share		—	—	—
Prop 1B State Bonds		1,047.3	—	—
High Speed Rail Bonds voted 11-4-08		240.9	—	—
Traffic Congestion Relief Program		196.0	—	—
Regional Improvement Program (RIP) Funds— Transit		469.5	—	259.6
<i>Subtotal State</i>	<i>2,213.3</i>	<i>1,953.7</i>	<i>—</i>	<i>259.6</i>
<b>Federal</b>				
Sect. 5309 New Starts		1,672.2	644.0	1,947.6
Sect. 5309 Fixed Guideway Mod		31.8	69.6	—
Sect. 5340 Growing States & High Dens.		—	—	—
CMAQ—Transit		293.4	—	—
RSTP—Transit		7.7	—	—
Sect. 5309 Bus & Bus-Related Facilities		2.9	—	—
ARRA (5309, 5307, 5340, TE)		195.9	—	—
<i>Subtotal Federal</i>	<i>4,865.1</i>	<i>2,203.9</i>	<i>713.6</i>	<i>1,947.6</i>

Source: Approved Metro Long Range Plan, October 2009



## **4.0 OPERATING AND MAINTENANCE PLAN**

This section addresses the O&M cost estimates for each alternative, the revenues available to fund the increased O&M costs for the Westside Subway Extension, and Metro’s ability to fund the incremental O&M costs.

### **4.1 Operating and Maintenance Costs**

The annual costs of each alternative are presented for the project horizon year (2035) in Table 4-1, along with the difference between each project alternative and the No Build alternative. The O&M costs include incremental costs for the various Metro modes, as well as the incremental O&M costs for the municipal transit systems. Additional details on the O&M costs are provided in the *Operating and Maintenance Cost Methodology*, April, 16, 2010.

The LRTP includes O&M funding for \$48 million for the Westside Subway Extension in 2025. As shown in Table 4-2, three of the build alternatives have 2035 O&M costs that exceed the amount programmed in the LRTP.

Alternatives 3, 4, and 5—and the station / design variations on each—have the greatest change in O&M costs, compared to the No Build and TSM Alternatives. These alternatives will cost an additional \$61 million to \$118 million annually to operate and maintain over the No Build condition. Alternatives 1 and 2, and the design variations of each, will cost between \$35 million and \$44 million annually more than the No Build alternative.

Given the number of cost and service variables that could change in the next 25 years, it is possible that Metro will be able to absorb a greater incremental increase in O&M costs by 2035, which may make one of the alternatives above more affordable.

**Table 4-1: Annual Operating and Maintenance Costs for Year 2035 for TSM and Build Alternatives in Year of Expenditure Dollars (millions)**

Annual Amounts	No-Build	TSM	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5
Metro Heavy Rail	127.31	127.33	193.76	198.13	220.48	246.93	277.55
Metro Light Rail	490.95	490.95	490.70	490.64	490.21	490.54	490.10
Metro Directly-Operated Bus	921.92	925.57	891.22	891.22	891.22	891.22	891.22
Metro Purchased Transp. Bus	35.11	35.11	35.11	35.11	35.11	35.11	35.11
Subtotal—Metro Total System	1,575.29	1,578.95	1,610.79	1,615.10	1,637.03	1,663.80	1,693.97
Municipal Systems Total Cost	167.02	167.00	166.93	166.94	166.96	166.96	166.99
Total Metropolitan Area Cost	1,742.31	1,745.95	1,777.72	1,782.04	1,803.98	1,830.76	1,860.97
Difference from No Build: Metro Only		3.66	35.50	39.82	61.74	88.51	118.69
Difference from No Build		3.64	35.41	39.73	61.67	88.45	118.66



Table 4-2: Year 2035 O&M Costs for Alternatives over Metro LRTP Amount for Westside Subway Extension

Alternative	2035 Incremental O&M Cost (millions, YOE)	Amount over 2035 Westside Subway O&M Cost in LRTP (\$48 million, YOE)
Alternative 3	61.74	13.74
Alternative 4	88.51	40.51
Alternative 5	118.69	70.69

## 4.2 Operating and Maintenance Funding Sources

Metro uses a combination of local, state and Federal funding sources to operate and maintain the Metro rail system. These funding sources are as follow:

### 4.2.1 Local/State

- Los Angeles County Proposition A and Proposition C Countywide Sales Tax
- TDA Article 4, statewide ¼ cent sales tax
- Other: This includes miscellaneous revenues such as advertising.
- Los Angeles County Transportation Sales Tax, Measure R
- State Transit Assistance—Population Share: Metro anticipates receiving these funds for O&M after 2013

### 4.2.2 Federal

- Section 5309 Fixed Guideway Modernization
- Section 5340 Growing States and High Density
- Homeland Security Grants
- Congestion Management and Air Quality (CMAQ) Funds: for operations on the Gold Line, Expo Line, Crenshaw, and other new lines.

In addition to these funding sources, Metro relies on fare revenues to fund about one third of its operating costs. Based on projections in Metro’s LRTP, Metro expects to recover approximately 34 percent of its total costs between 2005 and 2040 for the Red and Purple Lines (including the Westside Subway Extension), Blue Line, Green Line, Gold Line (including the Eastside Extension and Foothills), Crenshaw Line, West Santa Ana Line, and Metrolink.

## 4.3 Operating and Maintenance Expenditure Cash Flow

Table 4-3 and Table 4-4 present the operating and maintenance cash flow for the entire Metro system, including the Westside Subway Extension. This cash flow, which is included in the October 2009 LRTP, assumes that the first phase of the Westside Extension would be operational in 2019; the second phase would be operational in 2026; and the third phase would be operational in 2036.

**Table 4-3: Operating and Maintenance Cash Flow for the Metro Rail System, 2010–2019, YOY**

Funds (\$ in millions)	Plan	%	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
	Total		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
<b>Sources of Funds</b>													
<b>Local</b>													
Fares—Red/Purple Lines	2,212.7	9.6%	29.0	34.9	35.3	40.7	41.2	44.1	44.6	46.6	47.2	49.3	55.0
Fares—Blue Line (including Expo & Reg'l Conn.)	1,910.2	8.3%	16.5	28.5	29.3	33.8	34.2	36.6	43.7	45.5	46.1	48.2	52.2
Fares—Green Line	526.1	2.3%	7.2	8.7	8.8	10.1	10.3	11.0	11.1	11.6	11.8	12.3	12.4
Fares—Gold Line (including Eastside & Foothill)	737.3	3.2%	8.0	8.7	8.9	10.2	10.3	11.0	11.2	11.7	19.0	19.6	19.9
Fares—Crenshaw Line	346.3	1.5%	—	—	—	—	—	—	—	—	—	11.6	11.9
Fares—West Santa Ana Line	123.9	0.5%	—	—	—	—	—	—	—	—	—	—	—
Fares—Metrolink	2,027.7	8.8%	42.0	43.5	45.0	46.6	48.2	49.9	51.6	52.6	53.7	54.8	55.8
Proposition A 35%	3,195.4	13.8%	21.7	24.1	26.2	29.7	31.3	28.4	28.8	34.2	49.8	56.0	61.1
Proposition C 5 % (Security)	536.1	2.3%	—	—	—	—	1.6	2.9	4.2	5.3	6.4	7.6	8.8
Proposition C 40 % (Discretionary)	2,808.6	12.2%	87.1	46.4	54.0	43.4	0.1	58.7	88.1	48.3	59.2	48.6	61.2
TDA Article 4	410.0	1.8%	—	35.0	30.0	40.0	65.0	—	—	10.0	10.0	10.0	10.0
Proposition C 10% (Metrolink)	2,237.3	9.7%	35.0	36.4	37.8	39.3	40.9	42.5	44.2	46.0	47.8	49.8	51.7
Other (Advertising, General, Misc)	78.2	0.3%	1.6	1.6	1.7	1.7	1.8	1.8	1.8	1.9	1.9	1.9	2.0
Measure R Sales Tax	1,888.7	8.2%	21.9	31.6	33.2	35.5	38.3	40.6	42.9	45.0	47.1	49.3	51.6
<i>Subtotal Local</i>	<i>19,038.5</i>	<i>82.4%</i>	<i>270.0</i>	<i>299.4</i>	<i>310.2</i>	<i>331.0</i>	<i>323.0</i>	<i>327.5</i>	<i>372.4</i>	<i>358.7</i>	<i>400.0</i>	<i>419.1</i>	<i>453.6</i>
<b>State</b>													
STA—Population Share	1,678.0	7.3%	—	—	—	—	41.7	42.6	43.5	44.4	45.3	46.3	47.3
<i>Subtotal State</i>	<i>1,678.0</i>	<i>7.3%</i>	<i>—</i>	<i>—</i>	<i>—</i>	<i>—</i>	<i>41.7</i>	<i>42.6</i>	<i>43.5</i>	<i>44.4</i>	<i>45.3</i>	<i>46.3</i>	<i>47.3</i>
<b>Federal</b>													
Section 5309 Fixed Guideway Modernization	1,591.4	6.9%	37.9	40.3	40.9	41.4	42.0	42.6	43.2	43.8	17.8	39.8	35.9

**WESTSIDE SUBWAY EXTENSION**

**Table 4-3: Operating and Maintenance Cash Flow for the Metro Rail System, 2010–2019, YOY (continued)**

Funds (\$ in millions)	Plan	%	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
	Total		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Section 5340 Growing States and High Density	267.3	1.2%	6.4	6.5	6.6	6.7	6.8	6.9	7.0	7.1	7.2	7.3	7.4
Homeland Security Grants	3.8	0.0%	—	—	—	—	—	—	—	—	—	—	—
CMAQ (Gold/Expo/Crenshaw/New Lines Operations)	515.2	2.2%	9.1	28.9	29.2	18.6	—	—	—	—	26.3	48.4	65.6
<i>Subtotal Federal</i>	<i>2,377.7</i>	<i>10.3%</i>	<i>53.4</i>	<i>75.7</i>	<i>76.7</i>	<i>66.8</i>	<i>48.8</i>	<i>49.5</i>	<i>50.2</i>	<i>50.9</i>	<i>51.3</i>	<i>95.5</i>	<i>108.9</i>
<b>Total Sources</b>	<b>23,094.1</b>	<b>100.0%</b>	<b>323.4</b>	<b>375.1</b>	<b>386.9</b>	<b>397.8</b>	<b>413.6</b>	<b>419.6</b>	<b>466.1</b>	<b>454.0</b>	<b>496.6</b>	<b>560.9</b>	<b>609.8</b>
<b>Uses of Funds</b>													
Red/Purple Line	3,436.8	14.9%	72.0	67.0	68.8	70.6	72.7	75.9	78.0	78.4	80.0	81.6	83.4
Subway Extension Segments 1, 2, and 3	823.2	3.6%	—	—	—	—	—	—	—	—	—	—	17.0
Blue Line	3,309.5	14.3%	71.8	71.9	74.5	76.8	80.6	80.0	85.7	78.9	80.5	85.2	87.1
Green Line	1,341.4	5.8%	25.8	25.8	26.6	27.2	28.6	28.3	29.5	28.0	28.5	31.2	31.9
Gold Line—Pasadena (including Foothill)	1,699.5	7.4%	23.0	24.5	25.1	25.8	27.2	26.9	27.9	25.2	49.5	50.5	51.7
Gold Line—Eastside Extension	718.0	3.1%	15.4	15.3	15.7	16.2	17.0	16.9	17.5	15.8	16.1	16.5	16.9
Blue Line—Exposition Phase I	1,282.2	5.6%	—	33.5	34.2	35.2	37.0	36.7	37.9	36.0	36.7	37.4	38.3
Blue Line—Exposition Phase II	700.5	3.0%	—	—	—	—	—	—	24.8	22.8	23.2	23.7	24.2
Crenshaw Line	1,026.2	4.4%	—	—	—	—	—	—	—	—	—	38.6	39.5
West Santa Ana Line	405.5	1.8%	—	—	—	—	—	—	—	—	—	—	—
Regional Connector	288.3	1.2%	—	—	—	—	—	—	—	—	—	—	11.5
Rail Security—Red Line	1,169.9	5.1%	18.6	19.0	19.6	19.9	20.3	20.7	21.2	21.5	21.9	22.4	27.6
Rail Security—Blue Line incl. Expo/Reg'l Conn.	1,038.2	4.5%	12.2	18.4	19.0	19.4	19.7	20.1	25.4	26.0	26.5	27.6	30.4
Rail Security—Green Line	365.9	1.6%	6.5	6.6	6.9	6.9	7.1	7.2	7.4	7.8	8.0	8.7	8.9
Rail Security—Gold Line including Eastside	881.1	3.8%	12.5	13.4	13.7	13.9	14.2	14.5	14.9	15.1	24.1	24.6	25.2
Rail Security—Crenshaw Line	225.7	1.0%	—	—	—	—	—	—	—	—	—	8.5	8.7

**WESTSIDE SUBWAY EXTENSION**

**Table 4-3: Operating and Maintenance Cash Flow for the Metro Rail System, 2010–2019, YOY (continued)**

Funds (\$ in millions)	Plan	%	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
	Total		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Rail Security—West Santa Ana Line	115.3	0.5%	—	—	—	—	—	—	—	—	—	—	—
Red Line special anti-terrorism activities	1.8	0.0%											
<i>Subtotal Metro</i>	<i>18,829.2</i>		<i>257.7</i>	<i>295.4</i>	<i>304.1</i>	<i>311.9</i>	<i>324.5</i>	<i>327.2</i>	<i>370.2</i>	<i>355.4</i>	<i>395.1</i>	<i>456.4</i>	<i>502.2</i>
Metrolink	4,265.0	18.5%	77.0	79.8	82.8	85.9	89.1	92.4	95.9	98.6	101.6	104.5	107.6
<b>Total Uses</b>	<b>23,094.1</b>	<b>100.0%</b>	<b>334.7</b>	<b>375.2</b>	<b>386.9</b>	<b>397.8</b>	<b>413.6</b>	<b>419.6</b>	<b>466.1</b>	<b>454.0</b>	<b>496.6</b>	<b>560.9</b>	<b>609.8</b>

- Transit Corridor Revenue Operation Dates: Eastside—FY10, ExpoI—2010/-2011, ExpoII—6/15, Gold FthI—6/17, Crenshaw—6/18, Reg'l Conn—6/19, Sub Ext Seg I—6/19, West Santa Ana—6/27, Sub Ext Seg 2—6/26, Sub Ext Seg 3—6/36, Green So Bay—6/35, Gold East Ext—6/35
- 2009 LRTP Baseline 10/22/09

**Table 4-4: Operating and Maintenance Cash Flow for the Metro Rail System, 2020–2036**

Funds (\$ in millions)	Plan	%	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
	Total		2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
<b>Sources of Funds</b>																		
<b>Local</b>																		
Fares—Red/Purple Lines	2,212.7	9.6%	57.1	57.9	60.0	60.8	64.6	65.4	75.4	76.4	79.6	80.6	83.3	84.3	87.4	88.5	91.8	92.9
Fares—Blue Line (including Expo & Reg'l Conn.)	1,910.2	8.3%	54.3	55.0	57.0	57.7	61.3	62.1	65.5	66.3	69.1	70.0	72.3	73.2	75.8	76.8	79.7	80.7
Fares—Green Line	526.1	2.3%	13.0	13.1	13.6	13.8	14.6	14.8	15.6	15.8	17.8	18.0	18.6	18.8	19.5	19.7	20.5	25.1
Fares—Gold Line (including Eastside & Foothill)	737.3	3.2%	20.7	20.9	21.7	22.0	23.4	23.7	25.0	25.3	26.3	26.7	27.5	27.9	28.9	29.3	30.4	38.5
Fares—Crenshaw Line	346.3	1.5%	12.3	12.5	13.0	13.1	13.9	14.1	14.9	15.1	15.7	15.9	16.4	16.6	17.2	17.4	18.1	18.3
Fares—West Santa Ana Line	123.9	0.5%	—	—	—	—	—	—	—	8.4	8.5	8.6	8.9	9.0	9.3	9.4	9.8	9.9
Fares—Metrolink	2,027.7	8.8%	56.9	57.9	58.8	59.7	60.5	61.4	62.4	63.5	64.7	65.9	67.2	68.4	69.7	71.0	72.4	73.8
Proposition A 35%	3,195.4	13.8%	64.8	71.8	143.9	140.1	101.1	137.7	133.1	177.8	143.2	177.7	118.9	122.2	106.1	101.9	106.8	103.4
Proposition C 5 % (Security)	536.1	2.3%	10.1	11.6	13.1	14.7	16.1	17.5	18.8	20.2	21.5	22.8	24.1	25.4	26.7	28.1	29.5	30.9
Proposition C 40 % (Discretionary)	2,808.6	12.2%	100.9	119.2	51.8	42.1	70.8	34.4	51.4	22.9	56.9	38.6	113.1	116.4	129.0	137.8	131.8	162.1



**Table 4-4: Operating and Maintenance Cash Flow for the Metro Rail System, 2020–2036 (continued)**

Funds (\$ in millions)	Plan Total	%	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
			2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
TDA Article 4	410.0	1.8%	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Proposition C 10% (Metrolink)	2,237.3	9.7%	53.8	56.0	58.2	60.5	63.0	65.5	68.1	70.8	73.6	76.6	79.7	82.8	86.2	89.6	93.2	96.9
Other (Advertising, General, Misc)	78.2	0.3%	2.0	2.0	2.1	2.1	2.1	2.2	2.2	2.2	2.3	2.3	2.4	2.4	2.5	2.5	2.6	2.6
Measure R Sales Tax	1,888.7	8.2%	54.0	56.5	59.0	61.5	63.8	66.2	68.5	71.0	73.4	76.0	78.4	80.9	83.4	86.1	88.7	91.6
<i>Subtotal Local</i>	<i>19,038.5</i>	<i>82.4%</i>	<i>509.9</i>	<i>544.3</i>	<i>562.3</i>	<i>558.1</i>	<i>565.3</i>	<i>574.9</i>	<i>610.9</i>	<i>645.6</i>	<i>662.8</i>	<i>689.8</i>	<i>720.7</i>	<i>738.3</i>	<i>751.7</i>	<i>768.1</i>	<i>785.1</i>	<i>836.8</i>
<b>State</b>																		
STA—Population Share	1,678.0	7.3%	48.3	49.3	50.3	51.4	52.4	53.5	54.7	55.8	57.0	58.2	59.4	60.7	61.9	63.2	64.6	65.9
<i>Subtotal State</i>	<i>1,678.0</i>	<i>7.3%</i>	<i>48.3</i>	<i>49.3</i>	<i>50.3</i>	<i>51.4</i>	<i>52.4</i>	<i>53.5</i>	<i>54.7</i>	<i>55.8</i>	<i>57.0</i>	<i>58.2</i>	<i>59.4</i>	<i>60.7</i>	<i>61.9</i>	<i>63.2</i>	<i>64.6</i>	<i>65.9</i>
<b>Federal</b>																		
Section 5309 Fixed Guideway Modernization	1,591.4	6.9%	24.7	23.5	32.7	48.3	48.9	49.6	50.3	51.0	51.7	52.5	53.2	54.0	54.7	55.5	56.2	57.0
Section 5340 Growing States and High Density	267.3	1.2%	7.5	7.6	7.7	7.8	7.9	8.0	8.2	8.3	8.4	8.5	8.6	8.7	8.9	9.0	9.1	9.2
Homeland Security Grants	3.8	0.0%	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CMAQ (Gold/Expo/Crenshaw/New Lines Operations)	515.2	2.2%	38.7	16.5	—	—	—	—	12.0	27.9	28.3	16.1	—	—	—	—	—	22.6
<i>Subtotal Federal</i>	<i>2,377.7</i>	<i>10.3%</i>	<i>70.9</i>	<i>47.6</i>	<i>40.5</i>	<i>56.1</i>	<i>56.9</i>	<i>57.7</i>	<i>70.5</i>	<i>87.2</i>	<i>88.4</i>	<i>77.1</i>	<i>61.8</i>	<i>62.7</i>	<i>63.6</i>	<i>64.5</i>	<i>65.4</i>	<i>88.8</i>
<b>Total Sources</b>	<b>23,094.1</b>	<b>100.0%</b>	<b>629.1</b>	<b>641.2</b>	<b>653.0</b>	<b>665.5</b>	<b>674.6</b>	<b>686.1</b>	<b>736.1</b>	<b>788.6</b>	<b>808.2</b>	<b>825.1</b>	<b>842.0</b>	<b>861.7</b>	<b>877.2</b>	<b>895.8</b>	<b>915.1</b>	<b>991.5</b>
<b>Uses of Funds</b>																		
Red/Purple Line	3,436.8	14.9%	91.3	92.9	94.4	96.1	97.1	98.5	107.9	110.2	111.9	114.1	116.2	118.7	120.5	122.9	125.2	128.1
Subway Extension Segments 1, 2, and 3	823.2	3.6%	17.3	17.6	17.9	18.2	18.4	18.7	40.4	41.3	41.9	42.7	43.5	44.5	45.2	46.0	46.9	48.0
Blue Line	3,309.5	14.3%	88.5	90.0	91.5	93.0	94.1	95.4	97.0	99.0	100.6	102.5	104.4	106.6	108.3	110.4	112.5	115.1
Green Line	1,341.4	5.8%	32.4	32.9	33.5	34.0	34.4	34.9	35.5	36.2	41.0	41.8	42.6	43.5	44.2	45.0	45.9	61.3
Gold Line—Pasadena (including Foothill)	1,699.5	7.4%	52.4	53.3	54.2	55.2	55.8	56.6	57.5	58.8	59.6	60.8	61.9	63.3	64.2	65.4	66.7	68.3
Gold Line—Eastside Extension	718.0	3.1%	17.1	17.4	17.7	18.0	18.2	18.4	18.7	19.2	19.4	19.8	20.2	20.7	20.9	21.3	21.7	48.2

**WESTSIDE SUBWAY EXTENSION**

**Table 4-4: Operating and Maintenance Cash Flow for the Metro Rail System, 2020–2036 (continued)**

Funds (\$ in millions)	Plan Total	%	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
			2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Blue Line—Exposition Phase I	1,282.2	5.6%	38.9	39.6	40.2	40.9	41.3	41.9	42.6	43.5	44.2	45.1	45.9	46.9	47.6	48.5	49.5	50.6
Blue Line—Exposition Phase II	700.5	3.0%	24.6	25.0	25.4	25.9	26.2	26.5	27.0	27.6	28.0	28.5	29.0	29.7	30.1	30.7	31.3	32.1
Crenshaw Line	1,026.2	4.4%	40.1	40.8	41.4	42.2	42.6	43.2	43.9	44.9	45.6	46.4	47.3	48.4	49.1	50.0	51.0	52.2
West Santa Ana Line	405.5	1.8%	—	—	—	—	—	—	—	27.9	28.3	28.8	29.3	30.0	30.4	31.0	31.6	32.4
Regional Connector	288.3	1.2%	11.7	11.9	12.1	12.3	12.4	12.6	12.8	13.1	13.3	13.6	13.8	14.1	14.3	14.6	14.9	15.2
Rail Security—Red Line	1,169.9	5.1%	29.8	30.3	30.8	31.3	31.7	32.2	40.7	41.5	42.2	43.0	43.8	44.8	45.5	46.3	47.2	48.3
Rail Security—Blue Line incl. Expo/Reg'l Conn.	1,038.2	4.5%	30.9	31.4	31.9	32.5	32.9	33.3	33.9	34.6	35.1	35.8	36.5	37.2	37.8	38.6	39.3	40.2
Rail Security—Green Line	365.9	1.6%	9.1	9.2	9.4	9.5	9.6	9.8	9.9	10.1	11.5	11.7	11.9	12.2	12.3	12.6	12.8	17.1
Rail Security—Gold Line including Eastside	881.1	3.8%	25.5	26.0	26.4	26.9	27.2	27.6	28.0	28.7	29.1	29.6	30.2	30.9	31.3	31.9	32.5	42.8
Rail Security—Crenshaw Line	225.7	1.0%	8.8	9.0	9.1	9.3	9.4	9.5	9.7	9.9	10.0	10.2	10.4	10.6	10.8	11.0	11.2	11.5
Rail Security—West Santa Ana Line	115.3	0.5%	—	—	—	—	—	—	—	7.9	8.1	8.2	8.4	8.5	8.7	8.8	9.0	9.2
Red Line special anti-terrorism activities	1.8	0.0%																
<i>Subtotal Metro</i>	<i>18,829.2</i>		<i>518.3</i>	<i>527.3</i>	<i>536.0</i>	<i>545.3</i>	<i>551.2</i>	<i>559.3</i>	<i>605.6</i>	<i>654.3</i>	<i>669.8</i>	<i>682.5</i>	<i>695.1</i>	<i>710.4</i>	<i>721.3</i>	<i>735.2</i>	<i>749.5</i>	<i>820.8</i>
Metrolink	4,265.0	18.5%	110.7	113.9	117.0	120.2	123.5	126.9	130.5	134.3	138.4	142.5	146.8	151.2	155.8	160.6	165.6	170.8
<b>Total Uses</b>	<b>23,094.1</b>	<b>100.0%</b>	<b>629.1</b>	<b>641.2</b>	<b>653.0</b>	<b>665.5</b>	<b>674.6</b>	<b>686.1</b>	<b>736.1</b>	<b>788.6</b>	<b>808.2</b>	<b>825.1</b>	<b>842.0</b>	<b>861.7</b>	<b>877.2</b>	<b>895.8</b>	<b>915.1</b>	<b>991.5</b>

1. Transit Corridor Revenue Operation Dates: Eastside—FY10, ExpoI—2010/-2011, ExpoII—6/15, Gold Fthl—6/17, Crenshaw—6/18, Reg'l Conn—6/19, Sub Ext Seg I—6/19, West Santa Ana—6/27, Sub Ext Seg 2—6/26, Sub Ext Seg 3—6/36, Green So Bay—6/35, Gold East Ext—6/35

2. 2009 LRTP Baseline 10/22/09



## **5.0 RISKS AND UNCERTAINTIES**

### **5.1 Project Cost Uncertainties**

As with any project in the planning and conceptual engineering stage, there is a degree of cost risks associated with each of the alternatives under evaluation for the Westside Subway Extension. This cost risk primarily associated with the definition of the project scope, project schedule, and project funding.

#### **5.1.1 Changes in Project Scope**

Current cost estimates are based on an approximate 10-percent level of engineering completion. As the project progresses into preliminary engineering and design, the estimate will become more precise as the project is refined. Cost increases could occur as a result of unexpected soil conditions and geotechnical issues, the need for unexpected utility relocations, or the presence of tar sands, unanticipated groundwater and other environmental impacts and mitigation measures, particularly associated with the underground alignment. Issues relating to tunneling technologies, for example, can change the estimated costs. The current cost estimate includes contingencies to cover these and other potential changes.

Metro has also identified several scope elements that will be studied further during the preliminary engineering phase, including a track connection structure that preserves a future expansion of the Westside Subway Extension to West Hollywood; an allowance for the future expansion of the Westwood/VA Hospital station with two platforms; replacement parking at the VA Hospital station; and additional environmental mitigation costs to identify fossil remains in the project area.

If added to the scope of the project, these improvements would require of \$141 million to \$267 million of additional funding, in 2009 dollars.

#### **5.1.2 Changes in Project Schedule**

Schedule delays could be related to unforeseen construction challenges, local decision-making processes, equipment malfunctions, or general construction delays. Uncertainty still exists in the precise timing of the construction phases, which may be impacted by the 30/10 plan, the availability of local funding, and the timing of Federal funding approvals. However, both of Metro's prior Federal rail projects, including the Eastside Gold Line and the Red Line MOS-3, were delivered on their FFGA schedules and budgets. Increases in the schedule duration could result in additional program management and overhead costs, and potential increases in price escalation.

### **5.2 Funding Uncertainties**

#### **5.2.1 FTA New Starts Funding**

The LRTP assumes \$1.7 billion in Federal New Starts funds (in year of expenditure dollars), which represents approximately 28 percent of the total funding for the Project programmed in the long range plan. Metro may request additional New Starts funding under the terms of the 30/10 Initiative. The terms of this funding will be negotiated and



described in the Full Funding Grant Agreement between the Metro and the FTA, which is expected to occur during the final design stage of the project planning process.

The current Federal legislation that authorizes the New Starts program has been extended until December 31, 2010. There is still considerable uncertainty about when Congress will reauthorize the surface transportation program and the amount of funding that will be provided for New Starts projects. This could affect the total amount of funding available for New Starts projects around the country.

Competition for New Starts funds is significant, and that competition can increase if funding is limited. As of 2010, there are 25 projects in the New Starts project development process (14 projects in preliminary engineering and 11 in final design.) There are 8 projects under construction with full funding grant agreements in six metro areas. Delays in federal approvals could impact the project schedule, and reductions in federal funding could increase the amount of local funding required to complete the project. Because the majority of non-Federal funding for the Westside Subway Extension is coming from the Measure R program, a reduction in funding could impact Metro's ability to complete the entire Westside Subway Extension, or could impact the delivery of other capital projects.

### **5.2.2 Local Funding Risks**

The primary source of non-Federal funding is the Measure R half-cent sales tax. Sales tax collections are sensitive to economic conditions and overall rates of consumption. Any reduction in Measure R funding could impact Metro's ability to complete the entire Westside Subway Extension or could impact the delivery of other capital projects.

Metro has developed an expenditure plan for 2011 to 2019 that prioritizes its major investments based on a number of criteria. Projects that are currently under construction and have existing funding commitments are the highest priority. The next highest priority includes projects that have begun purchasing right of way and projects that require funding to continue project development.

The next tier of priorities relates to capital projects that are seeking approval to begin construction. For those projects, Metro has assigned the highest priority to safety improvements and New Starts projects. An initial phase of the Westside Subway Extension falls into this category, demonstrating the high priority that Metro places on undertaking this project in the 2011 to 2019 timeframe.

The 30/10 plan could also affect the timing and availability of local funding, which would be provided through debt that would be repaid by Measure R revenues. Some of these debt instruments could require legislative action by Congress. However, since Metro has identified the Westside project as a high priority that will be implemented in the next decade, Metro may reduce this risk by using existing debt instruments to start construction on this project in the near term.



## **6.0 REFERENCES**

- FTA 2010 Federal Transit Administration (FTA). 2010. *Annual report on new starts for fiscal year 2011.*
- Metro 2009a Los Angeles County Metropolitan Transportation Authority (Metro). 2009. *Long range transportation plan.*
- Metro 2009b Los Angeles County Metropolitan Transportation Authority (Metro). 2009. *Westside subway extension draft capital cost methodology report.*
- Metro 2010a Los Angeles County Metropolitan Transportation Authority (Metro). 2010. *Westside subway extension draft operating cost methodology report.*
- Metro 2010b Los Angeles County Metropolitan Transportation Authority (Metro) Board of Directors Meeting Materials. 2010. *Attachment 9—Long range transportation plan near-term strategies and priority setting criteria and 2011 Los Angeles County transportation improvement program, as adopted March 25, 2010.*



**APPENDIX A**
**Revised Long Range Transportation Plan 2011—2019, March 25, 2010**

Project	Pre-Constr Cost (Includes ROW)	Constr Cost (Includes Vehicles & DB)	Total MTA/State/Fed Funds	Subtotal	Cumulative Total
<b>Category 1</b>					
Eastside LRT enhancements	—	55.9	55.9		
Exposition LRT Phase I	14.6	275.1	289.7		
Light Rail Vehicles—P2550 (not included in transit projects)	—	50.2	50.2		
MTA Rail ARRA Project—Blue Line traction power substation	—	53.6	53.6		
San Fernando Valley N-S Orange Line Canoga Extension	65.1	112.4	177.5		
Congestion Reduction Demonstration		240.0	240.0		
<i>Subtotal Category 1—Transit</i>	<i>79.7</i>	<i>787.2</i>	<i>866.9</i>		
Alameda Corridor East Phase I	—	63.5	63.5		
I-10 Carpool Lane from I-605 to Puente	9.6	125.5	135.1		
I-405 Carpool Lanes from SR-90 to I-10	0.1	29.1	29.2		
I-405 NB Carpool Lanes from I-10 to US-101	182.1	851.9	1,034.0		
I-5/SR-14 Carpool Lane Direct Connector	1.9	103.4	105.3		
Soundwall on I-5 Carpool Lane from SR-118 to SR-14	0.3	77.0	77.3		
Soundwalls Package 4	1.8	6.4	8.2		
SR-60 Carpool Lane from I-605 to Brea Canyon Rd	0.3	24.1	24.4		
<i>Subtotal Category 1—Highway</i>	<i>196.1</i>	<i>1,280.9</i>	<i>1,477.0</i>		
<b>Total Category 1</b>	<b>275.8</b>	<b>2,068.1</b>	<b>2,343.9</b>	<b>2,343.9</b>	<b>2,343.9</b>
<b>Category 2</b>					
I-5 North Carpool Lanes(1): SR-170 to SR-118	83.3	167.6	250.9		
Light Rail Vehicles—P3000* (not in transit projects)	—	250.5	250.5		
<b>Total Category 2</b>	<b>83.3</b>	<b>418.1</b>	<b>501.4</b>	<b>501.4</b>	<b>2,845.3</b>
<b>Category 3</b>					
Alameda Corridor East Grade Separations Phase II	100.0		100.0		
I-5 North Carpool Lanes(2): SR 170 to Buena Vista St	17.8		17.8		

Project	Pre-Constr Cost (Includes ROW)	Constr Cost (Includes Vehicles & DB)	Total MTA/State/Fed Funds	Subtotal	Cumulative Total
I-5 North Carpool Lanes (3): SR-134 to So. of Burbank Blvd.	29.1		29.1		
I-5 South(1): Carmenita Road Interchange Improvement	187.8		187.8		
I-5 South(2): Alondra Overcrossing	27.3		27.3		
<i>Subtotal Category 3—Highway</i>	<i>362.0</i>		<i>362.0</i>		
<b>Total Category 3</b>	<b>362.0</b>		<b>362.0</b>	<b>362.0</b>	<b>3,207.3</b>
<b>Category 4</b>					
Crenshaw/LAX Transit Corridor	255.3		255.3		
Eastside Light Rail Access	4.0		4.0		
Exposition LRT Phase II	267.0		267.0		
Gold Line Eastside LRT Extension Phase II environmental	5.8		5.8		
Gold Line four quadrant gates EIR/EIS	3.7		3.7		
Metrolink capital projects & renovation/rehabilitation	31.9		31.9		
Metrolink Positive Train Control	9.5		9.5		
Regional Connector	193.1		193.1		
San Fernando Valley East North-South Rapidways	46.9		46.9		
Westside Subway Extension Segment 1	171.8		171.8		
<i>Subtotal Category 4—Transit</i>	<i>989.0</i>		<i>989.0</i>		
Arroyo Verdugo Hwy Operational Improvements*	17.4		17.4		
BNSF Grade Separations in Gateway Cities*	11.0		11.0		
CFP: Gateway Cities Traffic Signal Corr, Ph V (F1312)	0.2		0.2		
CFP: Nogales St (LA Subdiv) Grade Sep (F1159)	6.0		6.0		
CFP: San Gabriel Valley Traffic Signal Corridors (F1321)	0.3		0.3		
CFP: Victory Bl Widen, Topanga Cy-De Soto (F1141)	1.7		1.7		
CFP: Washington Bl. Widening, Reconst (F1107)	0.1		0.1		
CFP: Wilmington Ave Intrchg Modific at I-405 (F1103)	1.9		1.9		
High Desert Corridor environmental	33.0		33.0		
I-10 Carpool Lanes from Citrus to SR-57	17.4		17.4		
I-10 Carpool Lanes from Puente to Citrus	27.8		27.8		

**WESTSIDE SUBWAY EXTENSION**



<b>Project</b>	<b>Pre-Constr Cost (Includes ROW)</b>	<b>Constr Cost (Includes Vehicles &amp; DB)</b>	<b>Total MTA/State/ Fed Funds</b>	<b>Subtotal</b>	<b>Cumulative Total</b>
I-5 North Carpool Lanes (4): Burbank Blvd reconstruction	43.5		43.5		
I-5 North Carpool Lanes (5): Buena Vista St to Empire Av	66.7		66.7		
I-5 North Truck and HOV Lanes*	38.0		38.0		
I-5 South (3): Valley View Interchange	273.8		273.8		
I-5 South (4): Shoemaker, Rosecrans, Bloomfield Bridges	63.0		63.0		
I-5 South (5): San Antonio, Imperial Hwy, and Orr and Day	129.8		129.8		
I-5 South (6): Florence Avenue Interchange	50.9		50.9		
I-605 Corridor "Hot Spot" Interchanges in Gateway Cities*	50.0		50.0		
I-710 South Early Action Projects	87.0		87.0		
I-710 South*	15.0		15.0		
Las Virgenes/Malibu Hwy Operational Improvements*	29.8		29.8		
Soundwalls Package 10	10.0		10.0		
Soundwalls Package 11	8.6		8.6		
Soundwalls Packages 12, 13, & 14	8.7		8.7		
Soundwalls Packages 5 & 7	16.8		16.8		
Soundwalls Packages 6 & 8	4.9		4.9		
South Bay Ramp and Interchange Improvements*	50.0		50.0		
SR-138 Widening & Capacity Enhancements	70.0		70.0		
SR-71 Freeway: I-10 to Mission Blvd*	9.2		9.2		
SR-710 North Extension (tunnel)*	80.0		80.0		
<i>Subtotal Category 4—Highway</i>	<i>1,222.5</i>		<i>1,222.5</i>		
<b>Total Category 4</b>	<b>2,211.5</b>		<b>2,211.5</b>	<b>2,211.5</b>	<b>5,418.8</b>
<b>Category 5 (Safety &amp; New Starts)</b>					
Gold Line four quadrant gates EIR/EIS		TBD	TBD		
Metrolink Positive Train Control		86.3	86.3		
Metrolink safety projects		39.3	39.3		
Regional Connector		847.7	847.7		
Westside Subway Extension Segment 1		1,731.3	1,731.3	2,704.6	8,123.4
<b>Category 5 (Project Readiness and Sub-Regional Equity)</b>					
Alameda Corridor East Grade Sep Ph II—25% of Measure R		75.0	75.0		

**WESTSIDE SUBWAY EXTENSION**

Project	Pre-Constr Cost (Includes ROW)	Constr Cost (Includes Vehicles & DB)	Total MTA/State/Fed Funds	Subtotal	Cumulative Total
Alameda Corridor East Grade Sep Ph II—17% MTA commitment		105.9	105.9		
Arroyo Verdugo Hwy Operational Improvements*—25%		10.2	10.2		
I-5 North Carpool Lanes(2): SR 170 to Buena Vista St		90.0	90.0		
I-5 South(1): Carmenita Road Interchange Improvement		191.9	191.9		
Las Virgenes/Malibu Hwy Operational Improvements*—25%		14.5	14.5		
Rapid Bus Signalization and Station Subsidy Projects		33.3	33.3		
Soundwalls Packages 5 & 7		60.7	60.7		
Soundwalls Packages 6 & 8		17.9	17.9		
South Bay Ramp and Interchange Improvements*—25%		46.8	46.8		
SR-138 Widening—Pearblossom, 126th to Long View		26.0	26.0	672.1	8,795.5
<b>Category 5 (Transit System State of Good Repair)</b>					
Bus Capital MTA and Munis (Measure R)*		40.0	40.0		
Metrolink renovation and rehabilitation*		94.0	94.0		
MTA Bus Acquisition* (non-FAP) 33%		350.0	350.0		
MTA Bus Facility Maintenance (non-FAP) 33%		50.0	50.0		
MTA Rail Capital—Facilities maintenance—50%		50.0	50.0		
MTA Rail Capital—misc projects—50%		80.0	80.0		
MTA Rail Capital—misc Red, Blue, Green improv.—50%		40.0	40.0	704.0	9,499.5
<b>Category 5 (Mobility and Economic Benefit)</b>					
CFP: Gerald Desmond Bridge Project (F1165 & F3126)		28.6	28.6		
CFP: Port Truck Traffic Reduct.: W. Basin Railyd (F3170)		8.6	8.6		
CFP: Rte 101/Lindero Cyn Rd Intrchg Improv. (F1132)		8.6	8.6		
CFP: SR-47:Replace Heim Brdg & New Exprswy (F3132)		9.2	9.2		
I-10 Carpool Lanes from Puente to Citrus		139.0	139.0		
I-5 North Carpool Lanes (3): SR-134 to So. of Burbank Blvd.		123.5	123.5	317.5	9,817.0

**WESTSIDE SUBWAY EXTENSION**

Project	Pre-Constr Cost (Includes ROW)	Constr Cost (Includes Vehicles & DB)	Total MTA/State/Fed Funds	Subtotal	Cumulative Total
<b>Category 5 (Transit Sys .State of Good Repair)</b>					
MTA Rail Capital—Safety and Security projects—50%		36.6	36.6		
MTA Rail Capital—Vehicle maintenance—50%		14.5	14.5		
MTA Rail Capital—Wayside systems—50%		17.7	17.7		
Wilshire Bus Only Lane		28.8	28.8	97.6	9,914.5
<b>Category 5 (Mobility and Economic Benefit)</b>					
Alameda Corridor East Grade Sep Ph II—25% of Measure R		75.0	75.0		
Arroyo Verdugo Hwy Operational Improvements*—25%		10.2	10.2		
I-5 North Truck and HOV Lanes*		101.1	101.1		
I-5 South(2): Alondra Overcrossing		72.3	72.3		
Valley View Interchange		137.6	137.6		
I-605 Corridor "Hot Spot" Intchg Gateway Cities*—50%		57.5	57.5		
Las Virgenes/Malibu Hwy Operational Improvements*—25%		14.5	14.5		
South Bay Ramp and Interchange Improvements*—25%		46.8	46.8	514.9	10,429.4
<b>Category 5 (Mobility and Economic Benefit)</b>					
Eastside Light Rail Access		26.0	26.0		
Exposition LRT Phase II		1,245.0	1,245.0		
Exposition LRT Phase II Bikeway		10.0	10.0		
Gold Line Foothill Extension		810.5	810.5		
Metrolink capital projects*		52.8	52.8		
Transit contingency/rail yard/cars (Gold Line Fthl MTA 75%)		165.0	165.0		
Crenshaw/LAX Transit Corridor		1,398.9	1,398.9	3,708.2	14,137.6
<b>Category 5 (Mobility and Economic Benefit)</b>					
Alameda Corridor East Grade Sep Ph II—25% of Measure R		75.0	75.0		
Arroyo Verdugo Hwy Operational Improvements*—25%		10.2	10.2		
BNSF Grade Separations in Gateway Cities*		24.0	24.0		
CFP: Nogales St (LA Subdiv) Grade Sep (F1159)		22.8	22.8		

Project	Pre-Constr Cost (Includes ROW)	Constr Cost (Includes Vehicles & DB)	Total MTA/State/Fed Funds	Subtotal	Cumulative Total
CFP: South Wilmington Grade Separation (F1199)		19.3	19.3		
CFP: Victory Bl Widen, Topanga Cy-De Soto (F1141)		5.9	5.9		
CFP: Washington Bl. Widening, Reconst (F1107)		13.3	13.3		
CFP: Wilmington Ave Intrchg Modific at I-405 (F1103)		9.5	9.5		
City of LA—Metro Rapid Stations		42.0	42.0		
I-10 Carpool Lanes from Citrus to SR-57		167.5	167.5		
I-5 North Carpool Lanes (4): Burbank Blvd reconstruction		80.3	80.3		
Las Virgenes/Malibu Hwy Operational Improvements*—25%		14.5	14.5		
South Bay Ramp and Interchange Improvements*—25%		46.8	46.8		
SR-138 Widening—185th to Junction 18		30.0	30.0	561.0	14,698.7
<b>Category 5 (Mobility)</b>					
MTA Bus Acquisition* (non-FAP) 20%		200.0	200.0		
MTA Bus Facility Maintenance (non-FAP) 20%		30.0	30.0	230.0	14,928.7
<b>Category 5 (Mobility and Economic Benefit)</b>					
Alameda Corridor East Grade Sep Ph II—25% of Measure R		75.0	75.0		
Arroyo Verdugo Hwy Operational Improvements*—25%		10.2	10.2		
CFP: De Soto Widen: Reagan Fwy-Devonshire (F3171)		7.5	7.5		
CFP: Firestone Boulevard Capacity Improve (F3124)		9.4	9.4		
CFP: I-110/SR-47/Gibson/NB I-110 Access (F1208)		7.4	7.4		
CFP: North Main St Grade Separation (F3148)		11.1	11.1		
CFP: Ramona Corridor Transit Center Access (F3125)		7.7	7.7		
CFP: Rancho Vista Grade Sep-Sierra Hwy/RR (F1104)		22.9	22.9		
CFP: San Fernando Rd. Bike Path Ph. IIIA/IIIB (F1524))		8.4	8.4		



Project	Pre-Constr Cost (Includes ROW)	Constr Cost (Includes Vehicles & DB)	Total MTA/State/Fed Funds	Subtotal	Cumulative Total
CFP: San Fernando Rd. Bike Path Ph. IIIB Constr (F3515)		8.6	8.6		
CFP: SR-57/SR-60 Confluence: WB Slip On-ramp (F3137)		8.8	8.8		
CFP: The Old Road, Magic Mtn Pwy-Turnberry Ln F3136)		15.0	15.0		
CFP: Third St & La Verne Av Parking Struct (F1414)		7.1	7.1		
CFP: Via Princess @ Ext-Golden Val-Rainbow Gl (F1168)		11.6	11.6		
Future Call for Projects*		250.0	250.0		
I-5 North Carpool Lanes(5): Buena Vista St to Empire Av		248.8	248.8		
I-5 South(4): Shoemaker, Rosecrans, Bloomfield Bridges		147.0	147.0		
Las Virgenes/Malibu Hwy Operational Improvements*—25%		14.5	14.5		
South Bay Ramp and Interchange Improvements*—25%		46.8	46.8		
SR-138 Widening-Seg 1 & 3 (Av T-60th E.; T-8-77th St E.)		40.0	40.0	957.7	15,886.4
<b>Category 5 (Transit System State of Good Repair)</b>					
MTA Bus Acquisition* (non-FAP) 47%		500.0	500.0		
MTA Bus Facility Maintenance (non-FAP) 47%		80.0	80.0		
MTA Rail Capital—Facilities maintenance—50%		50.0	50.0		
MTA Rail Capital—misc projects—50%		80.0	80.0		
MTA Rail Capital—misc Red, Blue, Green improv.—50%		40.0	40.0		
MTA Rail Capital—Safety and Security projects—50%		35.0	35.0		
MTA Rail Capital—Vehicle maintenance—50%		15.0	15.0		
MTA Rail Capital—Wayside systems—50%		20.0	20.0		
San Fernando Valley East North-South Rapidways		123.2	123.2	943.2	16,829.6
<b>Category 5 (Mobility and Economic Benefit)</b>					
I-5 South(5): San Antonio, Imperial Hwy, and Orr and Day		160.3	160.3		
I-5 South(6): Florence Avenue Interchange		153.3	153.3		

WESTSIDE SUBWAY EXTENSION

Project	Pre-Constr Cost (Includes ROW)	Constr Cost (Includes Vehicles & DB)	Total MTA/State/Fed Funds	Subtotal	Cumulative Total
I-605 Corridor "Hot Spot" Intchg Gateway Cities*—50%		57.5	57.5		
SR-138 Widening—106th St E. to 126th St E.; 77th to 89th		65.0	65.0		
SR-138 Widening-.07 mi w of T-8-77th E; 89th E.-96th E.		65.0	65.0	501.1	17,330.7
<b>Category 5 (Transit System State of Good Repair)</b>					
Metrolink renovation and rehabilitation*		62.6	62.6		
MTA Rail Sys Improvements-Red Line ventilation N. Hllywd		160.0	160.0		
MTA Rail Sys Improve-Red Line train control-2.5 min hdwys		60.0	60.0		
MTA Rail Sys Improv-Red Line North Hollywood terminal		94.2	94.2		
MTA Rail Sys Improv-Red Line traction pwr-support hdwys		94.2	94.2		
MTA Rail Sys Improv-Red Line Union Sta upgrade Div 20		113.6	113.6		
Transit contingency/rail yd/cars (non-GL Fthl MTA 75%)		60.0	60.0	644.6	17,975.3
<b>Category 5 (Mobility and Economic Benefit)</b>					
CFP: Gateway Cities Traffic Signal Corr, Ph V (F1312)		8.1	8.1		
CFP: Gateway Cities Traffic Signal Corridors, VI (3309)		13.4	13.4		
CFP: North County Traffic Forum ITS Expansion (F1300)		9.0	9.0		
CFP: San Gabriel Valley Traffic Signal Corridors (F3308)		19.9	19.9		
CFP: San Gabriel Valley Traffic Signal Corridors (F1321)		10.5	10.5		
CFP: South Bay Traffic Signal Corridors Project (F3310)		10.4	10.4		
Future Call for Projects*		265.0	265.0		
I-405/Arbor Vitae Interchange south half		63.4	63.4	399.7	18,375.0
<b>Category 5</b>					
Bus Division 13		75.3	75.3		
Metrolink capital projects*		37.6	37.6	112.9	
<b>Total Category 5</b>		<b>13,164.9</b>	<b>13,164.9</b>		<b>18,487.9</b>

Project	Pre-Constr Cost (Includes ROW)	Constr Cost (Includes Vehicles & DB)	Total MTA/State/Fed Funds	Subtotal	Cumulative Total
<b>Category 6</b> (not a complete list and will require further analysis to complete)					
Gold Line Eastside LRT Extension Phase II environmental	12.6	—	12.6		
Heavy Rail Vehicles	—	73.1	73.1		
LAX Bus Division	—	15.0	15.0		
MTA Rail rehab and replacement	—	1,471.8	1,471.8		
Planning for Transit Projects (short-term)	25.0	—	25.0		
Wilshire Boulevard Bus Rapid Transitway	—	115.3	115.3		
<i>Subtotal Category 6—Transit</i>	<i>37.6</i>	<i>1,675.2</i>	<i>1,712.8</i>		
I-710 South Early Action Projects	—	40.0	40.0		
Soundwalls (Countywide incl Monterey Park/SR-60*)	—	96.0	96.0		
Soundwalls Package 10	—	29.7	29.7		
Soundwalls Package 11	—	31.8	31.8		
Soundwalls Packages 12, 13, & 14	—	27.4	27.4		
Soundwalls Phase I, Priority 3	—	TBD	TBD		
SR-710 North Extension (tunnel)*	—	93.9	93.9		
<i>Subtotal Category 6—Highway</i>	<i>—</i>	<i>318.8</i>	<i>318.8</i>		
<b>Total Category 6</b>	<b>37.6</b>	<b>1,994.0</b>	<b>2,031.6</b>	<b>2,031.6</b>	<b>20,519.5</b>

\* Costs (in millions, YOY)

South Bay Metro Green Line Extension, Green Line Extension to LAX, and West Santa Ana Branch are not shown since either the Board-approved studies are less than \$7 million or the Board has taken no action on the projects.

While the financial data in this document is intended to capture only those project costs that are expected between FY 2011 and FY 2019, subsequent project information we have received reveals that the information in this report often includes both FY 2010 and prior funding and/or funding expected in FY 2020 and later. Since we expect that project cash flow needs will often change as they progress through their development, we are not updating each project individually at this time. When we complete a full analysis of all the projects, we will release a revised Attachment B that captures all of these non-substantive project cash flow changes.

