WESTSIDE SUBWAY EXTENSION

Project No. PS-4350-2000

Final Capital Cost Estimate Report (120F)

Task 9.22

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Metro

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(REV1 – DEIS/DEIR)

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List of Acronyms

Acronym	Definition
ACE	Advanced Conceptual Engineering
BCI	Building Construction Cost Index
BRT	Bus Rapid Transit
CEQA	California Environmental Quality Act
CER	Cost Estimating Relationships
DEIR	Draft Environmental Impact Report
DEIS	Draft Environmental Impact Statement
EA	Each
ENR	*Engineering News-Record*
EPB	Earth Pressure Balance
FTA	Federal Transportation Administration's
HDPE	High Density Polyethylene
HRT	Heavy Rail Transit
HRV	Heavy Rail Vehicle
LF	Linear Foot
LPA	Locally Preferred Alternative
LRV	Light Rail Vehicle
MI	Mile
MOS	Minimum Operable Segment
MPO	Metropolitan Planning Organization
NEPA	National Environmental Protection Act
OCS	Overhead Contact System
PE	Preliminary Engineering
PMP	Project Management Plan
RF	Route Foot (includes both tracks)
SCADA	Supervisory Control and Data Acquisition
SCC	Standard Cost Categories
SF	Square Foot
STA	Station
TBM	Tunnel Boring Machine
TSM	Transportation System Management
TPSS	Traction Power Substation
TVM	Ticket Vending Machines
UCLA	University of California Los Angeles
USACE	US Army Corps of Engineers
VA	Veterans Administration

1.0 INTRODUCTION

This report presents the capital cost estimating methodology and capital cost estimate for the Westside Subway Extension in Los Angeles County. The project known as the Westside Subway Extension was in the Draft Environmental Impact Statement/Environmental Impact Report (DEIS/DEIR) phase and undergoing Advanced Conceptual Engineering (ACE) at the time this estimate report was prepared. The ACE effort continued 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 connect the existing Metro Rail HRT to the City of Santa Monica. Other modes considered were Bus Rapid Transit (BRT), Transportation Systems Management (TSM) and a No-Build alternative.

The focus of the engineering effort during ACE is to support the DEIS/DEIR in preparation of the project definition in accordance with the National Environmental Protection Act (NEPA) and California Environmental Quality Act (CEQA) processes. Design will progress through ACE with continuing evaluation and narrowing of alternative alignment options and the possibility of minimum operable segments (MOSs), as further described in this document.

Several base alignment alternatives are being considered and are listed below:

- 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

Alternative 1 extends from the existing Metro Purple Line Wilshire/Western station along Wilshire Boulevard to Westwood/UCLA in the City of Los Angeles. This alternative includes six stations with an optional station at Crenshaw, two alignment options between Beverly Hills and Century City and eleven alignment options between Century City and Westwood/UCLA. Refer to Appendix B for a map of the five baseline alternatives, station options and alignment options.

The stations for Alternative 1 including station options are shown below.

Alternative 1 Stations

- Wilshire/Crenshaw (optional station)
- Wilshire/La Brea
- Wilshire/Fairfax (on-street)
- Wilshire/La Cienega (West Hollywood connection via separate connection structure located at Robertson Blvd, but with no transfer)
- Wilshire/Rodeo

- Century City (Santa Monica Boulevard)
- Westwood/UCLA (off-street)

Alternative 1 Station Options

- Removal of Wilshire/Crenshaw (Option A)
- Wilshire/Fairfax East (Option B)
- Wilshire/La Cienega with transfer to West Hollywood (Option C)
- Century City (Constellation Blvd) (Option D)
- Westwood/UCLA (Option E – on-street)

Alternative 2 extends from the existing Metro Purple Line Wilshire/Western station along Wilshire Boulevard to the Wilshire/VA Hospital station. This alternative includes the six stations from Alternative 1 plus the optional station at Crenshaw with the same station options between Fairfax and Westwood/UCLA, the addition of a station at the VA Hospital in unincorporated LA County and a station option at VA Hospital on the north side of Wilshire.

Alternative 3 extends from the existing Metro Purple Line Wilshire/Western station along Wilshire Boulevard to the Wilshire/4th Street station in the City of Santa Monica. This alternative includes the same stations and options as Alternative 1 and 2 plus additional stations on Wilshire at Bundy, 26th Street, 16th Street and 4th Street.

Alternative 4 includes Alternative 2 plus the West Hollywood leg from the existing Hollywood/Highland station to the Wilshire/La Cienega station. Stations and options are listed below.

Alternative 4 Stations

- Wilshire/Crenshaw (optional station)
- Wilshire/La Brea
- Wilshire/Fairfax (on-street)
- Wilshire/La Cienega (West Hollywood connection/no transfer)
- Wilshire /Rodeo
- Century City (Santa Monica Boulevard)
- Westwood/UCLA (off-street)
- Westwood/VA Hospital
- Hollywood/Highland (X connection that preserves an option for future extension to the north although difficult and will impact existing Metro Red Line operations; short tail tracks; side platforms with double cross over; no pocket track)
- Santa Monica/La Brea
- Santa Monica/Fairfax

- Santa Monica/San Vicente
- Beverly Center Area

Alternative 4 Station Options

- Removal of Wilshire/Crenshaw (Option A)
- Wilshire/Fairfax East (Option B)
- Wilshire/La Cienega with transfer to West Hollywood (Option C)
- Century City (Constellation Blvd) (Option D)
- Westwood/UCLA (Option E – on-street)
- Westwood/VA Hospital – North of Wilshire (Option F)

Alternative 5 includes Alternative 3 (Santa Monica Extension) plus the West Hollywood leg from the existing Hollywood/Highland station to the Wilshire/La Cienega station. It is noted that funding constraints could dictate a series of phased minimum operable segments that are being identified, evaluated, and estimated separately along with each of the alignment options. The goal is to develop full corridor alternatives with the West Hollywood leg represented by Alternatives 4 and 5, shorter corridor alternatives without the West Hollywood leg represented by Alternatives 1, 2, and 3. Minimum Operable Segments (MOS-1) would extend to Fairfax and MOS-2 would extend to Century City.

Alignment Options (Beverly Hills to Century City)

In addition to the five base alternatives and station options, there are additional alignment options evaluated in this capital cost report. Please refer to the map in Appendix B. The alignment are described below:

G	Wilshire/Rodeo to Constellation
H	Wilshire/Rodeo to Constellation via Lasky
I	Wilshire/Rodeo to Santa Monica (Base Alignment)

Alignment Options (Century City to Westwood)

J	Century City (Santa Monica Boulevard) to Westwood/UCLA Off-Street (Base Alignment)
K	Century City (Santa Monica Boulevard) to Westwood/UCLA On-Street
L	Century City (Santa Monica Boulevard) to Westwood/UCLA Off-Street via Cross Country
M	Century City (Santa Monica Boulevard) to Westwood On-Street via Cross Country
N	Century City Santa Monica Boulevard) via to Westwood/UCLA Off-Street via Westwood Loop
O	Century City Santa Monica Boulevard) via to Westwood/UCLA On-Street via Westwood Loop
P	Century City (Constellation) to Westwood/UCLA Off-Street via Westfield
Q	Century City (Constellation) to Westwood/UCLA On-Street via Westfield

R	Century City (Constellation) to Westwood/UCLA Off-Street via Cross Country
S	Century City (Constellation) to Westwood/UCLA On-Street via Cross Country
T	Century City (Constellation) to Westwood/UCLA Off-Street via Westwood Loop
U	Century City (Constellation) to Westwood/UCLA On-Street via Westwood Loop

The Build alternative also includes options for expanding the Maintenance & Storage facility to accommodate the buildup in the vehicle fleet. Expansion is required in the heavy repair, service and inspection, wheel trueing, blow down and administrative facilities. In addition, two sites are being evaluated to house the additional vehicle fleet. The options include a site adjacent to the Division 20 yard between the 4th and 6th Street Bridges alongside Santa Fe Avenue or alternatively a satellite site through partial use of the Union Pacific Los Angeles Center Rail Yard on the east side of the Los Angeles River bounded by the I-5 and 101 Freeways.

In addition, the Build alternative includes options for additional special trackwork discussed with Metro Operations to achieve desired headways with flexibility to respond to planned events such as special events and to allow for preventative maintenance work, as well as unplanned incidents. Certain design considerations made in consultation with Metro include the location and size of crossovers, pocket tracks and tail tracks to achieve feasible headways and the most operational flexibility for both peak and off-peak periods. The cost for the additional special trackwork is being carried as Option V in the capital cost estimate.

2.0 PURPOSE AND SCOPE

With regard to alternatives selection, cost efficiency will be a critical factor and preparation of the capital cost estimate for each alignment alternative is integral to the process. Refinement of these cost estimates is on-going during the Advanced Conceptual Engineering (APE) phase as a part of the environmental assessment stage and the Federal Transportation Administration's (FTA) New Starts process.

The primary purpose of this document is to:

- Identify the methods and processes used to develop the capital cost estimate during the DEIS/DEIR and ACE phase;
- Identify the source documents and/or methodology used for pricing work;
- Specify how estimating assumptions have been documented during the course of the estimate development;
- Identify how the current stage of engineering completion affected scope assumptions;
- Define the approach and methodology with respect to FTA Standard Cost Categories (SCC).
- Estimates have been developed for Alternatives 1 through 5, alignment and station options, and minimum operable segments with detail appropriate for the current stage of development. This effort has been completed as a part of project advancement through the environmental and project definition processes to support Metro in selecting a Locally Preferred Alternative (LPA).

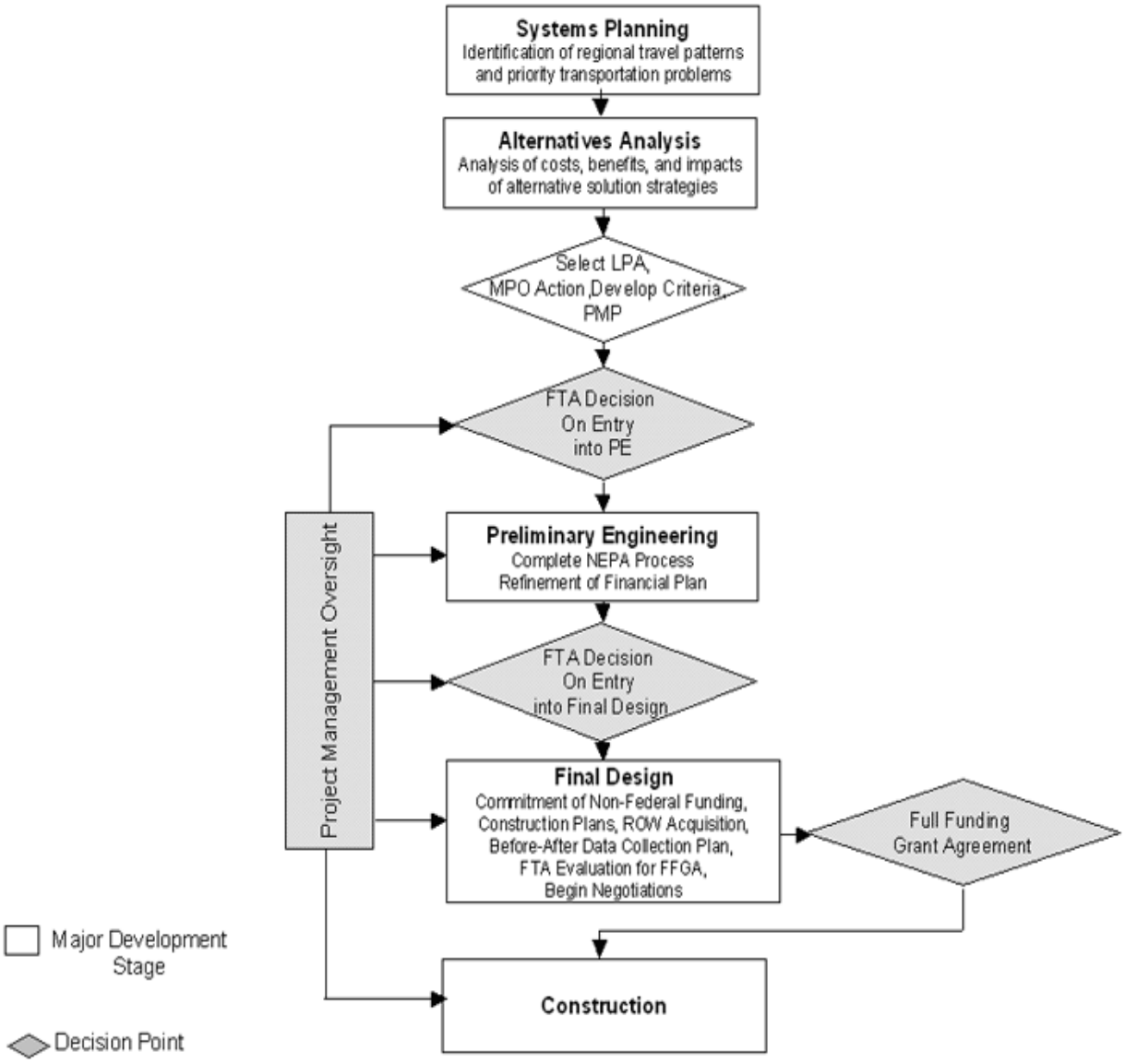
The estimating approach has been done in a manner that (1) allows consistent application to each alternative to facilitate comparisons; (2) provides the proper foundation for more detailed estimates as selected alternatives are further evaluated; and (3) allows continued development towards selection of the LPA and provides the basis for subsequent PE and Final Design estimates.

The goal of the estimating methodology in this document has been to assure consistent and uniform estimates for each alternative in order to facilitate:

- "Apples-to-apples" comparisons and revision tracking
- Expedient adjustments based on "what-if" scope assumptions
- Adequate foundation for further development during the LPA stage and beyond.

Ultimately, the methodology has been be integral to facilitating advancement of the project through FTA's New Starts process (see Figure 2-1), resulting in a quality budget baseline. Key to this endeavor is formatting estimates consistent with the FTA's SCC.

Figure 2-1. Planning and Project Development Process for New Starts Projects



Also key is the development of a unit price database that reflects construction and market conditions in the Los Angeles area. Development of this database began during the Alternatives Analysis phase and was reflected in a Standard Unit Price Table for each mode. The HRT mode was selected by the Metro Board and the associated tables are now available for ease of application to estimate the HRT alignments, stations and alignment/station options as are currently defined.

This report provides the guidance for development of this information, as well as methodologies for quantity assessments and estimate formats.

3.0 FTA STANDARD COST CATEGORY

The methodology used for generating capital cost estimates has been consistent with FTA guidelines for estimating capital costs. The heart of the FTA guidance is the SCC, which enables all FTA-funded projects to develop budget baselines that summarize to the SCC. This cost structure will be used for the capital cost detail and summary sheets, and is described below. Where the level of design does not support quantity measurements, parametric estimating techniques were utilized.

3.1 Capital Cost Categories

The following summarizes the SCC codification structure:

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

3.2 SCC 10 - Guideway and Track Elements

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

3.2.1 Guideway

The HRT guideway cost categories include underground construction for the HRT including the tunnel boring machine (TBM), and cut and cut and cover sections. All guideway categories are listed below:

10.01 Guideway: At-Grade Exclusive Right-of-Way (Not Applicable to HRT)
10.02 Guideway: At-Grade Semi-Exclusive (allows cross-traffic) (Not Applicable to HRT)
10.03 Guideway: At-Grade in Mixed Traffic (Not Applicable to HRT)
10.04 Guideway: Aerial Structure (Not Applicable to Westside Corridor Project)
10.05 Guideway: Built-Up Fill (Not Applicable to the Westside Corridor Project)
10.06 Guideway: Underground Cut and Cover
10.07 Guideway: Underground Tunnel
10.08 Guideway: Retained Cut or Fill

For Advanced Conceptual Engineering, these items have generally been estimated based on industry-standard cost-per-route-foot basis adjusted for local conditions. For purposes

of estimating each alignment alternative, tunneling is presumed to be by pressure face TBMs (twin bore) – earth pressure balance (EPB) with multiple headings and an allowance of up to four TBMs. Additional cost was also assumed for wet and gassy areas for both tunnels and stations. In these cases, additional cost was anticipated due to slower production rates, extra ventilation, slurry face TBMs, contaminated soil disposal, and additional concrete for double liners and other construction costs for protection against subsurface gasses.

The following project elements require added features and costs to address water and gas:

- Slurry Face TBM Operation
- Work Site Requirements
- Tunnel Linings
- Station Design and Construction Methods
- Station Construction Methods
- Underground Construction in Methane Zones
- Cross passages – regular and vertical for over and under configurations

3.2.2 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 have been 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 have been based on cost-per-mile and/or cost-per-route-foot utilizing historical information. Unit costs were assumed to be all-inclusive of rail, ties, ballast, rail welding, fasteners and anchors.

3.3 SCC 20 - Stations, Stops, Terminals, Intermodal

The station cost category is made up of the following sub-categories that include station structures, parking lots, elevators, and escalators:

20.01 At-Grade Station: Stop, Shelter, Mall, Terminal, Platform (Not Applicable to the Westside Subway Extension Project)
20.02 Aerial Station, Stop, Shelter, Mall, Terminal, Platform (Not Applicable to the Westside Corridor Project)
20.03 Underground Station, Stop, Shelter, Mall, Terminal, Platform

20.04 Other Stations, landings, Terminals: Intermodal Ferry, Trolley, etc. (Not Applicable to the Westside Corridor Project)
20.05 Joint Development
20.06 Automobile Parking Multi-Story Structure
20.07 Elevators, Escalators

Four types of stations are under consideration:

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

For HRT underground stations, the cost includes cut-and-cover of the station length and crossover structure if contiguous with the end of the station box, shoring, and lagging around the perimeter walls and station finishes. The platform length and ancillary space vary from 610' to 710' and most stations will include a traction power substation. The substation would be located on a mezzanine level in the station, requiring sufficient depth to accommodate the additional level, or be included in an extended box structure. If the substation is located over the cross-over tracks additional ventilation will be required. As design develops, traction power substation locations will be further refined.

Stations with No. 10 crossovers will be up to 902 feet in length and will accommodate a substation over the crossover structure. Certain stations such as at the baseline terminus for Alternative 3 and optional terminus locations for either Alternatives 1 or 2 will be longer due to the requirement to have one No. 14 double crossover.

Unit rates for station construction in gassy and tar impregnated soil areas reflect a higher cost. Station construction in gassy areas is accommodated through a revised construction approach, utilizing slurry walls in lieu of soldier piles and lagging construction, and other design details to be developed during subsequent phases. A High Density Polyethylene (HDPE) membrane has also been applied to exclude water and gas, with a larger allowance for areas of gassy soil than that made for traditional designs. Vertical and horizontal cross passages between tunnels have been included for both regular and gassy soil contexts. Certain cross passages are wider where provision for sumps is required and will be confirmed with the final vertical alignment established in the PE phase. Refer to Tasks 11.01 -11.04, Draft Special Design Concepts for Stations and Tunnels in Gassy Ground.

Station work also includes 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 have been based on a historical data base using industry-standard costs-per-square foot; parking structure costs will also be based on square foot costs, checked by cost-per-space calculations.

The Santa Monica fault crosses the alignment between Century City and the Westwood area. Geotechnical investigations to confirm the location of the fault zone are underway and will continue into the PE phase of the project. The location of the fault may have input into the locally preferred alternative and special design considerations will be developed in the subsequent phase.

3.4 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 Light Maintenance Facility (Not Applicable to HRT)
30.03 Heavy Maintenance Facility
30.03 Maintenance Facility Allowance (Not used)
30.04 Storage or Maintenance of Way Building (Not used)
30.05 Yard and Yard Track (Not used)

For purposes of the Westside Subway Extension, Metro's existing Purple Line/Red line infrastructure is not sufficient to support each of the HRT alternatives without modifications and improvements and expansion to the existing facility as a new satellite storage yard to support the increased headways. Improvements to the No-Build for improved turnback operations are being evaluated as separate tasks.

3.5 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. Sub-categories include:

40.01 Demolition, Clearing, Earthwork
40.02 Site Utilities, Utility Relocation
40.03 Hazardous Materials, Contaminated Soil Removal and Mitigation, Groundwater Treatment
40.04 Environmental Mitigation, etc Wetland, Historic/Archeologic, parks.
40.05 Site Structures including Retaining Walls, Sound Walls
40.06 Pedestrian/Bike Access and Accommodation, Landscaping
40.07 Automobile, Bus, and Van Accessways, including Roads, Parking Lots
40.08 Temporary Facilities and Other Indirect Costs during Construction

3.5.1 Demolition

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

3.5.2 Utility Relocation

This cost category includes relocation of both public and private utilities, and specifically excludes betterments. For purposes of the Westside Subway Extension Transit Corridor,

utility relocations have been 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.

3.5.3 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 ACE phase 1 studies or boring data reveal contamination requiring special disposal, this would be included in the cost.

3.5.4 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 have been derived utilizing a cost-per-square foot basis as indicated through historical comparisons of similar projects.

3.5.5 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 PE and Final Design phase. Therefore, allowances as appropriate are utilized for pricing during the ACE phase.

3.5.6 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 are based on industry averages on a cost-per-square-foot basis. With the exception of displacement at the VA Hospital, o parking lots or structures are currently planned for the project.

3.5.7 Temporary Facilities

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

3.6 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

3.6.1 Train Control and Signals

Work in this category includes signaling and control systems required for safe and efficient operations of the transit technology. Wayside signals, automatic train stop circuitry in the track and vehicles are included. Where appropriate for any particular alternative, Supervisory Control and Data Acquisition (SCADA) have also been assumed.

3.6.2 Traffic Signals and Crossing Protection

(Not Applicable to the HRT Project)

3.6.3 Traction Power Supply: Substation

A Traction Power Substation (TPSS) provides HRT electrical power. This cost category involves the cost of the station that includes structural, mechanical, electrical, and civil work. This work is generally estimated based on industry-standard per unit costs for each TPSS. For the Westside Subway Extension, substations are assumed for every station location except for the station located at Westwood/UCLA. A substation is presently located midway between the Century City and Westwood stations on the Cross County alignment alternatives. This substation location will require special consideration and is proposed to be combined with one of the mid-tunnel ventilation structures located outside the residential area. The final number and locations of substations will be verified in the PE phase through completion of a load flow analysis.

Substations will be generally located on a mezzanine level over crossover tracks (at stations with sufficient depth to construct a third mezzanine level) or by lengthening the station box up to 100 feet as a worst case. Substations are approximately 60 feet by 100 feet. If the substation is located over the cross-over tracks, additional ventilation may be required.

3.6.4 Traction Power Distribution

In a HRT project, the power is supplied through the third rail. Power provided by an overhead contact system (OCS) attached to the tunnel ceiling is not applicable to the Westside Subway Extension.

3.6.5 Communications

Costs in this category can include two-way radios, a public address system, telephones, closed-circuit television, variable message signs, and specialty communications equipment. At the early stages of engineering design, these costs have generally been estimated based on a per route foot or mile basis.

3.6.6 Fare Collection

Fare collection costs include ticket vending machines, fare gates, a cost inclusive of vendor design, manufacture, and installation. Technologies for the Westside Subway Extension are assumed to be consistent for each alterative; and ticket vending machines (TVM) pricing for estimating purposes will be based on the assumed Smart Card technology planned for implementation on all Metro properties.

3.6.7 Central Control

This cost category includes civil, structural, architectural, mechanical, electrical, and systems costs for remote monitoring of HRT operations, track and roadway conditions, substations, and station support facilities. For the Westside Subway Extension, it is

assumed that the existing central control facility at Willowbrook and Imperial (Rosa Park) adjacent to the Metro Blue and Green Lines will be expanded as a two to three story addition over the parking lots on either the north or east sides of the existing building. It is noted that there are several alternatives under consideration by Metro for combining bus and rail operations into one facility. See Section 6.

3.7 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 were provided by Metro's Real Estate department based on information they obtained 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 were based on right-of-way drawings provided by the Consultant for inclusion in the cost estimate. The right-of-way costs have been further received and adjustments made as indicated in Section 6 of this report.

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

3.9 SCC 80 - Professional Services

This cost category covers conceptual engineering and alternatives analysis, PE and the environmental process, final design, design support during construction, construction management, Metro agency costs, professional insurance costs, surveys and testing, specialty sub-consultants, and legal expenses. These costs have been estimated as a percentage of the total capital construction cost generally as follows:

80.01 Conceptual and PE 3%

80.02	Final Design	7%
80.03	Project Management for Design and Construction	10%
80.04	Construction Administration and Management	5%
80.05	Insurance (Included in Construction Categories)	0%
80.06	Legal, Permits, Review Fees by Other Agencies, Cities, etc.	1%
80.07	Surveys, Testing, Investigation, Inspection	2%
80.08	Agency Force Account Work, Start-Up	5%
	Total "Soft" costs	33%

3.10 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 below.

3.11 SCC 100 - Finance Charges

Finance charges are not included in the scope of the initial estimates.

4.0 ESTIMATING METHODOLOGY

Estimates are prepared in a standard estimating format, appropriate to the stage of project development. The following elements will comprise the estimate deliverable under Task 9.22:

- Letter of Transmittal
- Basis and Assumptions Document
- Estimate Reconciliation (if previous estimate exists)
- Estimate Summary by SCC Category
- Estimate Detail Worksheets (as appropriate)
- Unit Pricing
- Quantities

Capital cost estimates are provided in FTA's SCC format for each of the five base alternatives plus alignment and station options, and minimum operable segments. A summary table has been provided with each alternative for comparison. Detailed work sheets that support the SCC tables are available upon request. Costs associated with Professional Services, Right-of-Way, Insurance, Contingency, and Operations have been developed as an "add-on" to the Capital Cost Estimate to aid in the alternatives selection process. This methodology document focuses on the capital cost development as these other costs are treated as percentage allocations or Cost Estimating Relationships (CER) at this early stage.

4.1 Estimate Assumptions

Estimates for the ACE phase have been based on the following assumptions:

- The estimates have been prepared utilizing current year dollars, either 2009 or 2010 as appropriate.
- No premium time on labor costs have been assumed.
- Adequate experience craft labor will be available.
- Compatible trade agreements exist in the region.
- Productivity rates similar to those experienced on past Metro HRT and LRT projects will re-occur.
- No unusual labor pacts or agreements will be negotiated.
- There will be sufficient experienced contractors to complete the work.
- There will be no unusual weather conditions.
- Tunnel boring machines up to four machines and other specialty equipment will be readily available and use the existing state-of-the-art construction technology.

4.2 Software

Although several industry-standard choices exist for software selection, estimates for the Westside Subway Extension for the ACE phase will be prepared on Microsoft Excel

spreadsheets. This will better enable the review, edit, consolidation, and reporting of estimate components over the course of time, and provide Metro with flexibility to more easily make internal adjustments. Estimates will be transmitted in both hard copy and electronic formats. For subsequent phases, digital take-off software and Timberline is a consideration for use to estimate costs.

4.3 Basis and Assumptions Document

The Estimating Basis and Assumptions document is integral to providing a full understanding of the estimate submittal and an evaluation of each alternative. As each estimate has been developed, the document provides any specific information as appropriate relating to:

- Estimate Scope: A brief explanation of each alternative, option and minimum operable segment.
- Drawings: Description of drawings and sketches used, including titles and dates.
- Specifications: For the early stages, this will primarily reference Metro Standard Design Criteria.
- Quantities: A description of the basis for quantity assessments for each major SCC category, including a general description of the level of design completion.
- Unit Prices: A description of pertinent unit price information including source documents. At the early ACE stage unit prices will generally be all-inclusive of contractor overhead, profit, and General Requirements provisions. Unit Price discussion will also include comments and/or clarification relative to adjustments for local market conditions.
- Materials and Equipment: Includes indications of rate sources; for big ticket items such as tunnel boring machines, also includes relevant technology descriptions.
- Exclusions: Provides identification of items that are specifically not included in the estimate, such as insurance, contingency for construction and bid risk, escalation, etc.
- Other Information: This may include a record of site visits, documents that served as the basis for certain assumptions, reference of articles from newspapers and magazines, documentation of unusual factors having influence on the final cost, etc.

4.4 Pricing

Two methodologies are utilized for establishing unit rates, (1) historical information and (2) "bottoms-up" pricing. Typically, estimates are developed using a combination of the two; but in the early stages of the design and with few engineering details, the historical bid price method will be used almost exclusively. As the project evolves further beyond ACE into the PE Phase, a mix of detailed pricing and historical information will be utilized. When applied, the detail or "bottoms-up" pricing will be built based on production rates, material and equipment costs, labor costs, contractor overhead and profit, contractor General Requirements such as mobilization, insurance, and all costs that contribute to a contractor's anticipated overall bid price.

It should be noted that unit pricing will not be adjusted to reflect items such as market conditions and bid risk, agency reputation in the contracting community, and other

considerations. These adjustments will be addressed at the appropriate time through application of allocated and/or unallocated contingency as the project further evolves and in accordance with FTA's Risk Assessment process, which may be a requirement for entry into PE.

For purposes of the Westside Subway Extension, development of a historical database began during the Alternatives Analysis Phase and will be continually utilized. The database includes unit pricing on projects from all project life-cycles based on applicable elements from other similar projects. In all cases, any pricing information will be properly adjusted to the Los Angeles area. Ultimately, the data is reflected in the Standard Rate Table for the Westside Subway Extension Project for each alternative, option and minimum operable segment (see Table 4-1).

Utilization of this pricing data essentially represents a parametric estimating approach, whereby typical cross sections, alignments, and configurations are assigned a "cost-per-unit" such as mile, square foot, or route foot. For most applications, this type of estimate is sufficiently accurate at the early stages of design. Certainly, where adequate Standard Designs and criteria or other information exists, a detailed estimate may be developed to check the parametric assessments. Bid prices - particularly historical bid prices from Metro's database that are used as a basis to establish estimates for the Westside Subway Extension - may be adjusted to reflect any project attributes that may be unique, including geographical considerations. For location factor adjustments, the City Cost Index (CCI) published by R.S. Means will be utilized.

Equipment Rates for big ticket items such as the tunnel boring machines in later project phases will be based on manufacturer's quotes, R.S. Means, and/or the Corp. of Engineers Construction Equipment Ownership and Operating Expense Schedule. Material pricing will also be obtained from supplier quotes, and checked against published sources that include R.S. Means and *Engineering News-Record* (ENR).

4.5 Quantities

Detailed quantity take-offs have not been done during the ACE phase stage due to the preliminary nature of the drawings or sketches. Quantity assessments have been made based on general descriptions of horizontal and vertical alignments, standard design criteria, and order-of-magnitude assessments. To the extent that the ACE work has allowed more detailed quantity assessments, it should be noted that unit prices as determined through R.S. Means, the US Army Corps of Engineers (USACE), or other industry-accepted sources have been combined with the quantity take-offs to determine the costs of each major category of work, such as guideway elements, stations, and system elements.

Table 4-1. Unit Cost (2009 Dollars) Rate for HRT

WESTSIDE SUBWAY EXTENSION STANDARD UNIT COST SCHEDULE

Rev. 2

SCC Code	DESCRIPTION	UNITS	UNIT PRICE $
10	GUIDEWAY		
10.06	Box Cut and Cover- TBM Retrieval Shaft	EA	10,625,000
10.07	Tunnel - Twin Bored w/ TBM	RF	12,600
10.07	Tunnel - Twin Bored w/ TBM –Wet/Gassy	RF	14,500
10.07	Tunnel- Twin Bored (over/under tunnel) w/ TBM	RF	12,600
10.07	Cross Passage - Horizontal (Normal)	EA	1,300,000
10.07	Cross Passage - Horizontal (Gassy)	EA	1,365,000
10.07	Cross Passage -Horizontal (Normal) w/ Sump Pump	EA	1,360,000
10.07	Cross Passage - Vertical (Normal)	EA	2,100,000
10.07	Cross Passage - Vertical (Gassy)	EA	2,900,000
	Trackwork		
10.09	Direct Fixation Track	RF	750
10.13	Vibration and noise dampening	%	10% (SCC 10.09)
	Special Trackwork		
10.12	Turnout #6	EA	100,000
10.12	Single Crossover #10	EA	200,000
10.12	Single Crossover #14	EA	300,000
10.12	Double Crossover #10	EA	700,000
10.12	Double Crossover #14	EA	800,000
20	STATIONS, STOPS, TERMINALS , INTERMODAL		
20.01	Park -N- Ride	SPACE	6,000
20.02	Elevated Pedestrian Crossings	SF	420
20.03	Center Plat. (Normal)- Ave. length - 650':		
	(a) Initial Support (Excavation support systems, excavation & disposal, waterproofing, temporary decking, misc. items, etc.)	EA	20,625,000
	(b) Finish (Station cost less Initial support)includes elevators & escalators	EA	54,375,000
20.03	Center Plat- (Gassy) Ave. length - 650'		
	(a) Initial Support (Excavation support systems, excavation & disposal, waterproofing,	EA	31,875,000

SCC Code	DESCRIPTION	UNITS	UNIT PRICE $
	temporary decking, misc. items, etc.)		
	(b) Finish (Station cost less Initial support)includes elevators & escalators	EA	53,125,000
20.03	Vent Shaft – 65'and 70' depth	EA	8,000,000
20.04	Over & Under Station - 90' deep Gassy:		
	(a) Initial Support (Excavation support systems, excavation & disposal, waterproofing, temporary decking, misc. items, etc.)	EA	55,800,000
	(b) Finish (Station cost less Initial support)includes elevators & escalators	EA	69,200,000
20.03	Transition/Turnout structure w/o future connection at Robertson Bl. (Gassy)	EA	60,000,000
20.06	Parking Structure	SPACE	25,000
20.07	Elevator - Two (2) stops (If procured separately, deduct from station costs)	EA	420,000
20.07	Escalator - 20' Vertical Rise (If procured separately, deduct from station costs)	EA	500,000
30	**SUPPORT FACILITIES: YARDS, SHOPS, ADMIN BLDG.**		
30.01	Office - Operation Center	EA	TBD
30.03	Heavy Maintenance Facility Division 20	LS	100,000,000
40	**SITEWORK AND SPECIAL CONDITIONS**		
40.01	Demolition, Clearing, Earthwork	STA.	1,500,000
40.02	Utility Relocations	STA.	5,000,000
40.03	Hazardous Material Removal	STA.	200,000
40.04	Environmental Mitigation , e.g. wetlands, historic / archeologic, parks	LS	10,000,000
40.05	Site Structures including retaining walls, sound walls - 6ft high	LF	300
40.06	Art Work	%	0.5% (Category SCC 10 thru SCC 50)
40.07	Civil/ Roadway -2 Lanes	RF	260
40.07	Civil/ Roadway -4 Lanes	RF	520
40.08	G.C OH & P, bonds, fees, and Temporary Facilities	%	10% (Category SCC 10 thru 50) minus SCC 40.08
50	**SYSTEMS**		
50.01	Train Control and Signals	MI	2,400,000
50.03	Traction Power Supply- Substations	EA	1,500,000
50.03	Ductbank - At Grade	LF	160
50.03	Ductbank - Below Grade	LF	260
50.04	Traction Power Distribution (Third Rail)	RF	250
50.05	Communications	MI	5,000,000
50.06	Fare Collection Equipment (TVM) including Stand Alone Validator (SAV)	EA	153,000

SCC Code	DESCRIPTION	UNITS	UNIT PRICE $
50.06	Fare Gates Array (entrance & exit) 2 per station	ENTRANCE	713,000
50.07	Central Control	LS	9,510,000
60	ROW, LAND, EXISTING IMPROVEMENTS		
60.01	Right of Way	ACRE	TBD
60.01	Purchase or Lease of Real Estate	LS	78,184,000
60.02	Relocation of Existing (Household, Businesses)	LS	TBD
70	VEHICLES		
70.02	Heavy Rail	VEH	4,400,000
70.07	Spare Parts	%	10% (Category SCC 70.02)
80	PROFESSIONAL SERVICES		
80.01	Preliminary Engineering	%	3.0% {Category (SCC 10 thru 50)}
80.02	Final Design	%	7.0 %{Category (SCC 10 thru 50)}
80.03	Project Management for Design & Construction	%	10.0%{Category (SCC 10 thru 50)}
80.04	Construction Administration & Management	%	5.0%{Category (SCC 10 thru 50)}
80.05	Insurance-	%	0.0%{Category (SCC 10 thru 50)}
80.06	Legal: Permits, Fees, etc.	%	1.0% {Category (SCC 10 thru 50)}
80.07	Surveys, Testing, Investigation & Inspection	%	2.0%{Category (SCC 10 thru 50)}
80.08	Outside Agency Review & Start-Up	%	5.0% {Category (SCC 10 thru 50)}
90	UNALLOCATED CONTINGENCY	%	10.0% {Category (SCC 10 thru 80)}
100	FINANCE CHARGES		TBD
TOTAL COST (EXCLUDING CAT 60 & CAT 100)		MI	

4.6 Allocated Contingencies

In accordance with FTA Standard Cost Categories, allocated contingencies are typically included in an estimate to address lack of scope and quantity definition during the in-progress design stages. In the early stages, the Design Allowance may represent a significant portion of the estimate for any particular SCC Category. As the design progresses and more detailed quantity take-offs can be made, the allowance is reduced; at 100 percent design completion the Design Allowance, by definition, will be zero.

For purposes of the ACE and alternatives analyses, few detailed quantity take-offs have been done due to the early stage of engineering completion. Instead, quantities have been based on order-of-magnitude assessments and parametric analyses. During this early ACE phase of the project, allocated contingencies have been applied to address the lack of scope definition and the inability to measure exact quantities. The amount of allocated contingency will depend on the complexity of any particular SCC code as well as the stage of engineering completion, but will typically be in the 5 to 25 percent range. As part of FTA's risk assessment process, contingencies will be evaluated and appropriate allocations for risk determined.

The percentages shown in Table 4-2 are typical values; however, slightly higher or lower values may be used as specific elements of the project so warrant.

Table 4-2. Typical Conceptual Engineering Allocated Contingency

FTA Category No.	Description	Allocated Contingency Percentage
10	Guideway and Track Elements	
	Guideway Elements (except underground)	25
	Guideway Elements (underground)	25
	Track Elements	15
20	Stations, Stops, Terminals, Intermodals	25
30	Support Facilities: Yards, Shops, Admin Buildings	25
40	Sitework and Special Conditions	
	Demolition, Clearing, Earthwork	25
	Site Utilities, Utility Relocation	25
	Hazardous materials, contaminated soil removal/mitigation, ground water treatments	25
	Environmental mitigation, e.g. wetlands, historic/archaeological, parks	25
	Site structures including retaining walls, sound walls	25
	Pedestrian / bike access and accommodation, landscaping	25
	Automobile, bus, van access including roads, parking lots	25
	General Conditions, O/H & P, bonds, fees and Temp. Facilities	0
50	Systems	25
60	Right-of-way, Land, Existing Improvements	30
70	Vehicles	5

4.7 Contingency

Project Contingency addresses bid risk and construction risk and is in addition to Allocated Contingency. Detailed estimates during the Alternatives Analysis stage will include contingency only as a separate "add-on" for optional inclusion prior to estimate submittal to Metro. The contingency amount for the HRT mode is generally higher, with underground elements properly reflecting the additional exposure for unknowns as well as the construction complexity. As the design progresses into PE, more formal contingency assessments will be done based on where risk resides in the LPA. Contingency will be allocated in varying amounts to each SCC code based on "known unknowns." That is, historical perspectives will provide insight where other projects have previously experienced cost growth. If similar conditions exist on the Westside Subway Extension Transit Corridor, this risk would be identified to a particular SCC code and reflected through an appropriate contingency allocation. With the experience earned by Metro on past as well as the recent Eastside Extension project, a review of allocated contingencies has been evaluated with Metro. In some cases, and in both ACE and the PE phases, this contingency may simply be an allocation in the range of 5 to 25 percent as indicated in Section 4.6.

Unallocated Contingency has also been established at the total project level. Combined, the allocated and the unallocated contingency reflect the total contingency. Unallocated contingency is intended to address "unknown unknowns," or to simply reflect a prudent amount to cover unanticipated events, including political events, labor strife, weather, differing site conditions, mercurial commodity pricing, unfavorable market conditions, bid risk, etc. The unallocated contingency may simply be a percentage add-on in the range of 10 percent as indicated in Section 3.9.

Certainly, as the engineering design progresses, more detailed assessments relative to risk specific to the LPA will be done. Contingency amounts, both allocated and unallocated, will be adjusted to address risk specific to the Westside Subway Extension and the selected alignment, options, and minimum operable segments.

4.8 Escalation

The Alternatives Analysis stage was completed during 2008 and reflected 2008 dollars. The estimates being developed during ACE are being completed in 2009 dollars. Essentially, the rates reflected in the Standard Rate Table that was developed during the Alternatives Analysis stage are adjusted to 2009 dollars through an escalation factor of approximately 5 percent. It is understood that this escalation factor may be reduced, or held at 2008 rates. As the ACE effort progresses and estimates are updated, a similar process will be utilized to escalate to current dollars at escalation rates that are now expected to vary in a range from 1 to 3 percent.

Where historical pricing data is used as a basis for estimates, these historical figures will be adjusted to current dollars. Actual historical construction cost index values will be used to calculate the escalation factor from the earlier period to the present.

When current year dollars are inflated during the ACE phase to reflect the construction schedule, an escalation factor will be applied, calculated using the most recent moving average for the time period between the current year and the mid-point of construction. This factor will be based on Building Construction Cost Index (BCI) values published by

the ENR and adjusted by the current specific commodity index such as structural steel for a specific SCC Code.

4.9 Estimate Review and Approval

At the completion of any given estimate deliverable, copies will be reviewed internally for reasonableness and an overall quality check. The quality check will include a review for deliverable completeness, an arithmetic check, back-up documentation, and consistency with SCC coding structures. A review meeting will be held with all participants to address and respond to any comments. All estimates will be considered drafts until approved for submittal to Metro. Record copies will be provided to each participant.

4.10 Estimate Reconciliation

Over the course of the ACE and PE phases, estimates for each alternative, options and minimum operable segments, and eventually the LPA will continue to evolve. Estimates will be structured to provide the ability to reconcile changes to understand reasons for increases or decreases relative to assumed quantities, unit pricing, and/or scope. For each formal estimate submittal, a narrative will be provided that explains the primary differences compared to previous submittals with regard to these factors.

5.0 ESTIMATE LIMITATIONS

Significant uncertainty exists at the early stages of engineering completion to the extent that work scope has not been defined beyond broad descriptions of horizontal and vertical alignments. Estimates that support the ACE stage are based on drawings that are developed to an approximate 10 percent level of engineering completion. Uncertainty inherent in the project at this stage may include:

- Standard Design Criteria
- Scope and Quantity Definition
- Commodity Pricing
- Unforeseen Problems

5.1 Standard Design Criteria

Metro is a mature grantee with completed and operational projects in all modes, including HRT. The most recent Metro project is the Metro Gold line Eastside Extension, which will be considered in the cost evaluation particularly for tunneling. Standard Design Criteria that reflects the attributes of their completed projects will be assumed for each of the Westside Subway Extension alternatives. This information can be used to develop scope relative to station size and configuration, systems applications, vehicle requirements, and the like. However, to the extent that all of Metro's HRT properties are more than five years old, the possibility exists for enhancements to signaling, fare collection, vehicle configuration, etc. based on Lessons Learned as well as advances in technology. In addition, Metro is currently updating the Design Criteria, and some designs will be modified as the new criteria are established.

5.2 Scope and Quantity Definition

The lack of scope definition, coupled with an inability to make precise quantity take-offs, will almost certainly result in changes to the project cost as the design evolves. Therefore, scope cannot be intricately defined at the ACE phase. Issues relating to tunneling methodologies and vehicle type, for example, can represent huge swings in the estimated costs. Continuing changes in the scope assumptions will be incorporated into the estimate as the engineering progresses; each iteration will document changes compared to the previous. Although the Allocated Contingency is intended to mitigate some of these impacts, significant cost risk still remains in this regard.

5.3 Commodity Pricing

Over the past several years, commodities such as petroleum, concrete, and steel have risen dramatically and then fallen. This has placed an extra burden on grantees as they endeavor to establish reliable estimates, and ultimately budget baselines, that will reflect actual contractor bids. To the extent that many of these commodities remain mercurial, or could again in the future, uncertainty in the estimate may exist. Estimates in the past have tried to address this risk through inclusion of a factor based on Building Construction Cost Index (BCI) values published by the ENR and adjusted by the current specific commodity index such as structural steel for a specific SCC.

5.4 Construction and Bid Risk

Risk associated with project implementation represents a significant uncertainty in the project cost. Example risks can include soil conditions, utility relocations, hazardous materials, and certainly bid risk. Over the past several years, many projects have seen substantial variations in bids compared to estimates as a result of unfavorable market conditions, lack of competition in the marketplace, or perceived contractor risk. These types of risk are typically addressed through application of appropriate levels of contingency. Naturally, prudent contingency levels are not designed to address wildly large swings in assumed costs, representing cost risk to the project.

For entry into PE, a formal risk assessment is expected to be completed in accordance with FTA's procedures. This will require development of a risk register and a statistical analysis to assign probabilities of occurrence, mitigations and commensurate contingency levels.

6.0 SCC COST ESTIMATES

6.1 Cost Basis

ROM costs had been previously developed in discussion with Metro for a Transportation Systems Management (TSM) Alternative, and five Build Alternatives. The description of the TSM Alternative and five Build Alternatives is defined in Section 1.0 of this report.

One area of concern was the high unit costs in SCC Category 20 that covers station elements. As part of the process to look at the reasonableness of the estimated costs for this phase of the project, and upon further discussion and agreement with Metro, a historical cost data base was prepared for the Westside Subway Extension. The historical cost data base was derived by using cost at completion from prior construction contracts which included all change orders and claims during the performance of the contract. By carrying such unit costs and applying minimum allocated contingencies of 25 percent per SCC guidelines it was concluded that a reasonable adjustment could be made primarily to the station unit costs on the average of the low bids received for the appropriate category (station with crossover, station without crossover, over/under station, etc.) escalated to current time.

The allocated contingency was also revised for SCC Category 40.08 from 25 percent to 0 percent. This sub cost category covers general conditions, mobilization and de-mobilization and is a percentage of the construction cost. All remaining unit costs were unchanged.

As stated above, right-of-way (ROW) costs were prepared by Metro's Real Estate Department. In discussion with Metro, the following adjustments were made to the estimates for inclusion in the capital cost estimates:

- Metro owned properties were removed from the ROW costs.
- All stations include multiple station entrances which are being evaluated and cleared through the environmental process. Metro will only commit to building one entrance per station with additional entrances funded through private development. The capital cost estimate carries the property acquisition cost of one entrance.
- Similar to station entrances, several options are being evaluated for construction staging space and potential TBM insertion/retrieval sites. The capital cost estimate does not include the property acquisition cost for each potential site. Options will be further narrowed in the PE phase.
- Certain properties including use of Lot 36 at UCLA for an off-street station, VA Hospital property along Wilshire Boulevard west of 405 Freeway and the federal court house property on Wilshire Boulevard east of 405 Freeway are not included in the capital cost estimate. Negotiations will be undertaken with the respective property owners relative to the significant benefits the Westside Subway Extension brings to the community. Easement costs may be re-applied in the subsequent phase of the project to these respective properties. Overall contingencies on right-of-way costs have been maintained at 30 percent.

A summary of the capital cost data for the TSM and Build Alternatives 1 through 5 plus MOS 1 and MOS 2 is shown below in Table 6-1. Variations on the Build Alternatives are also included in Table 6-1 for modeling purposes and are listed below:

- Alternative 1B without Crenshaw Station
- Alternative 2B without Crenshaw Station
- Alternative 3B without Crenshaw Station
- Alternative 4B with transfer station at La Cienega
- Alternative 2C with Constellation Blvd alignment
- Alternative 2D with Santa Monica Blvd/Westwood Loop alignment
- Alternative 2E with Constellation Blvd alignment less Crenshaw Station

Capital cost data for the TSM Alternative and the Build Alternatives including variations of the Build Alternatives in SCC format are shown in Appendix A. Detailed worksheets to support the SCC tables are available upon request.

Table 6-1. Summary of Capital Cost Estimates (2009 Dollars)

Cost Categories	TSM	Alternative 1 - Westwood UCLA ($Millions)	Alternative 2 - Westwood/VA Hospital ($Millions)	Alternative 3 - Santa Monica Extension ($Millions)	Alternative 4 - Westwood/VA Hospital plus WeHo ($Millions)	Alternative 5 - Santa Monica Extension plus WeHo ($Millions)	MOS 1 - Fairfax West Terminal ($Millions)	MOS 2 - Century City - Santa Monica Blvd Terminal ($Millions)
Guideway and Track Elements	-	809,966	831,688	1,124,337	1,280,581	1,590,122	306,801	607,314
Stations, Stops, Terminals, Intermodal	-	910,882	1,009,757	1,518,657	1,723,220	2,232,120	374,769	817,988
Support Facilities: Yards, Shops, Administrative Buildings	13,000	136,431	136,431	226,392	226,392	226,392	136,431	136,431
Sitework and Special Conditions	-	293,952	317,178	456,417	506,857	638,476	136,186	249,883
Systems	1,920	156,520	166,510	230,871	255,279	321,407	66,577	126,463
Construction Subtotal	**$14,920**	**$2,307,751**	**$2,461,564**	**$3,556,674**	**$3,992,329**	**$5,008,517**	**$1,020,764**	**$1,938,079**
Right-of-Way, Land, Existing Improvements	-	101,639	159,400	209,954	216,982	325,295	72,040	83,361
Vehicles	18,018	498,036	528,528	620,004	823,284	965,580	336,851	304,920
Professional Services	4,924	761,560	812,315	1,173,702	1,317,468	1,652,811	294,907	639,567
Unallocated Contingency	3,786	366,899	396,181	556,033	635,006	795,220	168,376	296,593
Finance Charges								
Total Cost (2009) Dollars	**$41,648**	**$4,035,885**	**$4,357,988**	**$6,116,367**	**$6,985,069**	**$8,747,423**	**$1,852,131**	**$3,262,520**
Total Length in Miles		8.6	8.96	12.38	14.06	17.49	3.10	6.61

Table 6-1. Summary of Capital Cost Estimates (2009 Dollars) (Continued)

Cost Categories	Alt. 1B less Crenshaw ($Millions)	Alt. 2B less Crenshaw ($Millions)	Alt 3B less Crenshaw ($Millions)	Alt. 4B with Transfer at La Cienega ($Millions)	Alt. 2C with Constellation ($Millions)	Alt. 2D with Westwood Loop ($Millions)	Alt. 2E with Constellation less Crenshaw ($Millions)
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, Administrative 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
Construction Subtotal	**$2,02,009**	**$2,377,243**	**$3,450,932**	**$4,076,032**	**$2,502,843**	**$2,566,288**	**$2,350,800**
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							
Total Cost (2009) Dollars	**$3,881,181**	**$4,171,089**	**$5,961,668**	**$7,107,528**	**$4,439,029**	**$4,492,385**	**$4,216,592**
Total Length in Miles	8.6	8.96	12.38	13.7	9.36	9.58	9.36

In addition to the Build Alternatives and alignment variations listed in Table 6-1, capital costs have also been developed in comparison to the base for station options A though F, alignment options G through I between Wilshire/Rodeo and Century City and alignment options J though U between Century City and Westwood. Cost comparisons are measured as an increase or decrease over the base costs. Table 6-2 though Table 6-4 below show the respective cost over or under the base costs. One final option for adding additional special trackwork (crossovers/pocket tracks) has been evaluated as Option V and is shown in Table 6-5. Detailed worksheets to support these summary tables are available upon request.

Table 6-2: Cost Comparison of Stations Options A though F over Base

	Crenshaw Station	Option A Remove Crenshaw Station	Option B Fairfax East Station	Option C La Cienega Transfer Station	Option E Constellation Blvd Station	Option E Westwood/UC LA On-Street Station	Option F VA Hospital Station North and Alignment
Capital cost in base year dollars	In base cost	Cost saving of $151.9 M	No change from base	Cost saving of $18.9 M	Cost saving of $4.1 M	Cost increase of $10.1 M	Cost increase of $92.6 M over base

Table 6-3: Cost Comparison of Alignment Options G, H, and I over Base

	Option G	Option H	Option I (Base)
Capital cost in million 2009 dollars	$455 M ($17.1 M less than Base I)	$471 M ($0.6 M less than Base I)	$472 M

Table 6-4: Cost Comparison of Alignment Options J, K, L, M, N, O, P, Q, R, S, T and U over Base

	Option J (Base)	Option K	Option L	Option M	Option N	Option O
Capital cost in millions (2009 dollars)	$691 M	$683 M ($8.5 M less than Base J)	$697 M ($6.0 M more than Base J)	$694 M ($3.1 M more than Base J)	$827 M ($135.2 M more than Base J)	$814 M ($122.2 M more than Base J)
	Option P	**Option Q**	**Option R**	**Option S**	**Option T**	**Option U**
Capital cost in millions (2009 dollars)	$715 M ($23.5M more than Base J)	$716 M ($24.8M more than Base J)	$723 M ($32.2M more than Base J)	$727 M ($35.7M more than Base J)	$830 M ($138.5M more than Base J)	$834 M ($142.5M more than Base J)

Table 6-5: Special Trackwork Option V

	Option Va Crossover at Fairfax Station	Option Vb Crossover at La Cienega Station	Option Vc Pocket Track at Rodeo Station	Option Vd Crossover at 26th Street Station
Capital cost in millions (2009 dollars)	$76.7 M	$76.7 M	$123.0 M	$76.5 M

6.2 Vehicle Storage and Maintenance Facility

There are several options to accommodate the increased vehicle fleet for the Westside Subway Extension. The Division 20 Maintenance and Storage Facility with the planned No Build enhancements cannot accommodate Metro's fleet requirements for any of the five Build Alternatives. The primary options for providing this expanded capacity are as follows:

- Additional storage immediately south of the Division 20 Maintenance and Storage Facility between the 4th and 6th Street Bridges, which would accommodate Metro's requirements for Alternatives 1 and 2 at a estimated construction cost of $136.4 Million and is included in the base cost for Alternatives 1 and 2.
- Satellite facility at the Union Pacific Los Angeles Transportation Center Rail Yard that is connected by yard lead tracks to the Division 20 Maintenance and Storage Facility, which would accommodate Metro's requirements for all five HRT Alternatives at a cost of $226.4 Million and is included in the base cost for Alternatives 3, 4 and 5.

6.3 Rail Operations Center

Capital cost estimates have also been developed to expand the existing Rail Operations Center (ROC) at Wilmington and Imperial (Rosa Park) adjacent to the Metro Blue and Green Lines to accommodate the Measure R projects listed below.

- Expo Line, Phase I
- Expo Line, Phase II
- Metro Gold Line Eastside Extension
- Metro Gold line Foothill Extension
- Crenshaw Transit Corridor including Green Line extension to Aviation/Century.
- Eastside Transit Corridor Phase II
- Harbor Subdivision Transit Corridor
- Regional Connector Transit Corridor
- Westside Subway Extension

The costs attributed to the Westside Subway include equipment costs and a percentage of the building expansion costs based on heavy rail mileage compared to light rail mileage. The total construction cost for Westside is $11.9 million including 27 percent of building cost attributed to a heavy rail project. The building cost attributed to light rail projects is $9.2 million.

Metro is also considering several alternatives for combining both a Rail Operations Center and Bus Operations Center (BOC) into one facility.

Four additional alternatives are also being evaluated separate from this Capital Cost Report and are listed below:

- Alternative 1 – Immediate implementation of a combined BOC/ROC at Gateway Center

- Alternative 2 – Immediate implementation of a combined BOC/ROC at Rosa Parks
- Alternative 3 – Immediate implementation of a combined BOC/ROC at One Santa Fe
- Alternative 4 – Phased implementation of a combined BOC/ROC at Rosa Park

6.4 Other Project Costs

The capital cost estimates for the build alternatives do not include certain capital project costs that benefit the system as a whole, and that are necessary precursors to a Westside Subway Extension. It is assumed that these capital costs will be funded outside the project using separate funding categories in the LRTP that are designed to benefit the overall rail network. Examples of such costs include:

- An expansion of the existing Rail Operations Center located at Imperial and Willowbrook Avenue along the Metro Blue and Green Lines to accommodate both the expanded heavy rail and light rail systems identified in the LRTP.
- Expansion of a possible terminal station at VA Hospital to accommodate up to 30 trains per hour should Alternative 2 be selected as the LPA.

The fully burdened cost of these elements is in the order of $90 Million and worksheets are available upon request.

APPENDIX A DETAILED SCC WORKSHEETS

TSM Alternative

MAIN WORKSHEET-BASELINE ALTERNATIVE (Rev.12, July 31, 2009)

LACMTA Today's Date **3/4/10**

Westside Subway Extension - TSM Alternative Yr of Base Year $ 2009

DEIS/DEIR Yr of Revenue Ops 2019

	Quantity	Base Year Dollars w/o Contingency (X000)	Base Year Dollars Allocated Contingency (X000)	Base Year Dollars TOTAL (X000)	Base Year Dollars Unit Cost (X000)	Base Year Dollars Percentage of Construction Cost	Base Year Dollars Percentage of Total Project Cost	**Baseline** Alternative Cost Parameters (X000) see New Starts Reporting Instructions for additional info
10 GUIDEWAY & TRACK ELEMENTS (route miles)	**0.00**	0	0	**0**		**0%**	**0%**	
10.01 Guideway: At-grade exclusive right-of-way				0				
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)				0				1200/route mile
10.03 Guideway: At-grade in mixed traffic				0				
10.04 Guideway: Aerial structure				0				
10.05 Guideway: Built-up fill				0				
10.06 Guideway: Underground cut & cover				0				
10.07 Guideway: Underground tunnel				0				
10.08 Guideway: Retained cut or fill				0				
10.09 Track: Direct fixation				0				
10.10 Track: Embedded				0				
10.11 Track: Ballasted				0				
10.12 Track: Special (switches, turnouts)				0				
10.13 Track: Vibration and noise dampening				0				
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	**0**	0	0	**0**		**0%**	**0%**	
20.01 At-grade station, stop, shelter, mall, terminal, platform				0				225/station
20.02 Aerial station, stop, shelter, mall, terminal, platform				0				
20.03 Underground station, stop, shelter, mall, terminal, platform				0				
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.				0				
20.05 Joint development				0				
20.06 Automobile parking multi-story structure				0				
20.07 Elevators, escalators				0				
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	0.00	10,400	2,600	**13,000**		**87%**	**31%**	
30.01 Administration Building: Office, sales, storage, revenue counting				0				
30.02 Light Maintenance Facility				0				
30.03 Heavy Maintenance Facility	26	10,400	2,600	13,000				
30.04 Storage or Maintenance of Way Building				0				
30.05 Yard and Yard Track				0				
40 SITEWORK & SPECIAL CONDITIONS	0.00	0	0	**0**		**0%**	**0%**	
40.01 Demolition, Clearing, Earthwork				0				
40.02 Site Utilities, Utility Relocation				0				
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments				0				
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks				0				
40.05 Site structures including retaining walls, sound walls				0				
40.06 Pedestrian / bike access and accommodation, landscaping				0				
40.07 Automobile, bus, van accessways including roads, parking lots				0				5.6/on-grade space
40.08 Temporary Facilities and other indirect costs during construction				0				
50 SYSTEMS	0.00	1,477	443	**1,920**		**13%**	**5%**	
50.01 Train control and signals				0				
50.02 Traffic signals and crossing protection				0				28/intersection
50.03 Traction power supply: substations				0				
50.04 Traction power distribution: catenary and third rail				0				
50.05 Communications		676	203	879				13.5/bus and 13.5/sign
50.06 Fare collection system and equipment		281	84	365				11.2/bus
50.07 Central Control		520	156	676				17 - 28 /bus
Construction Subtotal (10 - 50)	0.00	11,877	3,043	**14,920**		**100%**	**36%**	
60 ROW, LAND, EXISTING IMPROVEMENTS	0.00	0	0	**0**			**0%**	
60.01 Purchase or lease of real estate				0				
60.02 Relocation of existing households and businesses				0				
70 VEHICLES (number)	**26**	17,160	858	**18,018**	**$ 693**		**43%**	
70.01 Light Rail				0				
70.02 Heavy Rail				0				
70.03 Commuter Rail				0				
70.04 Bus	26	15,600	780	16,380	$ 630			$600,000 per bus - Metro
70.05 Other				0				
70.06 Non-revenue vehicles				0				
70.07 Spare parts		1,560	78	1,638				
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)	0.00	4,924	0	**4,924**		**33%**	**12%**	25-35% of Construction 10-50
80.01 Preliminary Engineering		448		448				
80.02 Final Design		1,044		1,044				
80.03 Project Management for Design and Construction		1,492		1,492				
80.04 Construction Administration & Management		746		746				
80.05 Professional Liability and other Non-Construction Insurance				0				
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.		149		149				
80.07 Surveys, Testing, Investigation, Inspection		298		298				
80.08 Start up		746		746				
Subtotal (10 - 80)	0.00	33,960	3,901	**37,861**			**91%**	
90 UNALLOCATED CONTINGENCY				3,786			**9%**	
Subtotal (10 - 90)	0.00			**41,648**			**100%**	
100 FINANCE CHARGES				NA				
Total Project Cost (10 - 100)	0.00			**41,648**			**100%**	
Total Base Year Cost per Mile Not Including Vehicles (X000)					#DIV/0!			
Allocated Contingency as % of Base Yr Dollars w/o Cont.				11.49%				
Unallocated Contingency as % of Base Yr Dollars w/o Contingency				11.15%				
Total Contingency as % of Base Yr Dollars w/o Contingency				22.64%				
Unallocated Contingency as % of Subtotal (10 - 80)				10.00%				

Alternative 1– Westwood/University of California Los Angeles (UCLA) Extension

MAIN WORKSHEET - BUILD ALTERNATIVE

(Rev.12, July 31, 2009)

Los Angeles Metropolitan Transportation Authority						Today's Date	8/16/10
Westside Extension						Yr of Base Year $	2009
Alternative 1 - Westwood/UCLA Extension						Yr of Revenue Ops	

	Quantity	Base Year Dollars w/o Contingency (X000)	Base Year Dollars Allocated Contingency (X000)	Base Year Dollars TOTAL (X000)	Base Year Dollars Unit Cost (X000)	Base Year Dollars Percentage of Construction Cost	Base Year Dollars Percentage of Total Project Cost	YOE Dollars Total (X000)
10 GUIDEWAY & TRACK ELEMENTS (route miles)	**8.60**	651,160	158,806	**809,966**	**$ 94,182**	**35%**	**20%**	
10.01 Guideway: At-grade exclusive right-of-way	8.60			0	$ -			0
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)				0				0
10.03 Guideway: At-grade in mixed traffic				0				0
10.04 Guideway: Aerial structure				0				0
10.05 Guideway: Built-up fill				0				0
10.06 Guideway: Underground cut & cover		10,625	2,656	13,281				0
10.07 Guideway: Underground tunnel		600,680	150,171	750,851				0
10.08 Guideway: Retained cut or fill				0				0
10.09 Track: Direct fixation		34,050	5,108	39,158				0
10.10 Track: Embedded				0				0
10.11 Track: Ballasted				0				0
10.12 Track: Special (switches, turnouts)		2,400	360	2,760				0
10.13 Track: Vibration and noise dampening		3,405	511	3,916				0
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	**7**	728,705	182,177	**910,882**	**$ 130,126**	**39%**	**23%**	
20.01 At-grade station, stop, shelter, mall, terminal, platform								0
20.02 Aerial station, stop, shelter, mall, terminal, platform				0				0
20.03 Underground station, stop, shelter, mall, terminal, platform	7	728,705	182,177	910,882	$ 130,126			0
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.				0				0
20.05 Joint development				0				0
20.06 Automobile parking multi-story structure				0				0
20.07 Elevators, escalators				0				0
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	8.60	109,144	27,287	**136,431**	**$ 15,864**	**6%**	**3%**	
30.01 Administration Building: Office, sales, storage, revenue counting				0				0
30.02 Light Maintenance Facility				0				0
30.03 Heavy Maintenance Facility		81,870	20,468	102,338				0
30.04 Storage or Maintenance of Way Building				0				0
30.05 Yard and Yard Track		27,274	6,819	34,093				0
40 SITEWORK & SPECIAL CONDITIONS	8.60	277,121	16,831	**293,952**	**$ 34,180**	**13%**	**7%**	
40.01 Demolition, Clearing, Earthwork		10,500	2,625	13,125				0
40.02 Site Utilities, Utility Relocation		35,000	8,750	43,750				0
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments		1,400	350	1,750				0
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks		10,000	2,500	12,500				0
40.05 Site structures including retaining walls, sound walls				0				0
40.06 Pedestrian / bike access and accommodation, landscaping		10,425	2,606	13,031				0
40.07 Automobile, bus, van accessways including roads, parking lots				0				0
40.08 Temporary Facilities and other indirect costs during construction		209,796	0	209,796				0
50 SYSTEMS	8.60	125,214	31,306	**156,520**	**$ 18,200**	**7%**	**4%**	
50.01 Train control and signals		20,636	5,159	25,795				0
50.02 Traffic signals and crossing protection				0				0
50.03 Traction power supply: substations		20,034	5,009	25,043				0
50.04 Traction power distribution: catenary and third rail		11,350	2,838	14,188				0
50.05 Communications		42,992	10,748	53,740				0
50.06 Fare collection system and equipment		20,692	5,174	25,866				0
50.07 Central Control		9,510	2,378	11,888				0
Construction Subtotal (10 - 50)	8.60	1,891,344	416,407	**2,307,751**	**$ 268,343**	**100%**	**57%**	**0**
60 ROW, LAND, EXISTING IMPROVEMENTS	8.60	78,184	23,455	**101,639**	**$ 11,818**		**3%**	
60.01 Purchase or lease of real estate		78,184	23,455	101,639				0
60.02 Relocation of existing households and businesses				0				0
70 VEHICLES (number)	**98**	474,320	23,716	**498,036**	**$ 5,082**		**12%**	
70.01 Light Rail				0				0
70.02 Heavy Rail	98	431,200	21,560	452,760	$ 4,620			0
70.03 Commuter Rail				0				0
70.04 Bus				0				0
70.05 Other				0				0
70.06 Non-revenue vehicles				0				0
70.07 Spare parts		43,120	2,156	45,276				0
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)	8.60	761,560	0	**761,560**	**$ 88,553**	**33%**	**19%**	
80.01 Preliminary Engineering		69,233		69,233				0
80.02 Final Design		161,543		161,543				0
80.03 Project Management for Design and Construction		230,775		230,775				0
80.04 Construction Administration & Management		115,388		115,388				0
80.05 Professional Liability and other Non-Construction Insurance				0				0
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.		23,078		23,078				0
80.07 Surveys, Testing, Investigation, Inspection		46,155		46,155				0
80.08 Start up		115,388		115,388				0
Subtotal (10 - 80)	8.60	3,205,408	463,578	**3,668,986**	**$ 426,626**		**91%**	**0**
90 UNALLOCATED CONTINGENCY				**366,899**			**9%**	
Subtotal (10 - 90)	8.60			**4,035,885**	**$ 469,289**		**100%**	**0**
100 FINANCE CHARGES							**0%**	
Total Project Cost (10 - 100)	8.60			**4,035,885**	**$ 469,289**		**100%**	**415,063**
Allocated Contingency as % of Base Yr Dollars w/o Contingency				14.46%				
Unallocated Contingency as % of Base Yr Dollars w/o Contingency				11.45%				
Total Contingency as % of Base Yr Dollars w/o Contingency				25.91%				
Unallocated Contingency as % of Subtotal (10 - 80)				10.00%				
YOE Construction Cost per Mile (X000)								$0
YOE Total Project Cost per Mile Not Including Vehicles (X000)								$48,263
YOE Total Project Cost per Mile (X000)								$48,263

Alternative 2 – Westwood/Veterans Administration (VA) Hospital Extension

MAIN WORKSHEET - BUILD ALTERNATIVE

(Rev.12, July 31, 2009)

Los Angeles Metropolitan Transportation Authority						Today's Date	8/16/10
Westside Extension						Yr of Base Year $	2009
Alternative 2 - Westwood/VA Hospital Extension						Yr of Revenue Ops	

	Quantity	Base Year Dollars w/o Contingency (X000)	Base Year Dollars Allocated Contingency (X000)	Base Year Dollars TOTAL (X000)	Base Year Dollars Unit Cost (X000)	Base Year Dollars Percentage of Construction Cost	Base Year Dollars Percentage of Total Project Cost	YOE Dollars Total (X000)
10 GUIDEWAY & TRACK ELEMENTS (route miles)	**8.96**	668,680	163,008	**831,688**	**$ 92,822**	**34%**	**19%**	
10.01 Guideway: At-grade exclusive right-of-way	8.96			0	$ -			0
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)				0				0
10.03 Guideway: At-grade in mixed traffic				0				0
10.04 Guideway: Aerial structure				0				0
10.05 Guideway: Built-up fill				0				0
10.06 Guideway: Underground cut & cover		10,625	2,656	13,281				0
10.07 Guideway: Underground tunnel		616,432	154,109	770,541				0
10.08 Guideway: Retained cut or fill				0				0
10.09 Track: Direct fixation		35,475	5,321	40,796				0
10.10 Track: Embedded				0				0
10.11 Track: Ballasted				0				0
10.12 Track: Special (switches, turnouts)		2,600	390	2,990				0
10.13 Track: Vibration and noise dampening		3,548	532	4,080				0
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	**8**	807,805	201,952	**1,009,757**	**$ 126,220**	**41%**	**23%**	
20.01 At-grade station, stop, shelter, mall, terminal, platform		2,100	525	2,625				0
20.02 Aerial station, stop, shelter, mall, terminal, platform				0				0
20.03 Underground station, stop, shelter, mall, terminal, platform	8	805,705	201,427	1,007,132	$ 125,892			0
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.				0				0
20.05 Joint development				0				0
20.06 Automobile parking multi-story structure				0				0
20.07 Elevators, escalators				0				0
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	8.96	109,144	27,287	**136,431**	**$ 15,227**	**6%**	**3%**	
30.01 Administration Building: Office, sales, storage, revenue counting				0				0
30.02 Light Maintenance Facility				0				0
30.03 Heavy Maintenance Facility		81,870	20,468	102,338				0
30.04 Storage or Maintenance of Way Building				0				0
30.05 Yard and Yard Track		27,274	6,819	34,093				0
40 SITEWORK & SPECIAL CONDITIONS	8.96	298,498	18,680	**317,178**	**$ 35,399**	**13%**	**7%**	
40.01 Demolition, Clearing, Earthwork		12,000	3,000	15,000				0
40.02 Site Utilities, Utility Relocation		40,000	10,000	50,000				0
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments		1,600	400	2,000				0
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks		10,000	2,500	12,500				0
40.05 Site structures including retaining walls, sound walls				0				0
40.06 Pedestrian / bike access and accommodation, landscaping		11,119	2,780	13,899				0
40.07 Automobile, bus, van accessways including roads, parking lots				0				0
40.08 Temporary Facilities and other indirect costs during construction		223,779	0	223,779				0
50 SYSTEMS	8.96	133,208	33,302	**166,510**	**$ 18,584**	**7%**	**4%**	
50.01 Train control and signals		21,500	5,375	26,875				0
50.02 Traffic signals and crossing protection				0				0
50.03 Traction power supply: substations		21,933	5,483	27,416				0
50.04 Traction power distribution: catenary and third rail		11,825	2,956	14,781				0
50.05 Communications		44,792	11,198	55,990				0
50.06 Fare collection system and equipment		23,648	5,912	29,560				0
50.07 Central Control		9,510	2,378	11,888				0
Construction Subtotal (10 - 50)	8.96	2,017,335	444,229	**2,461,564**	**$ 274,728**	**100%**	**56%**	**0**
60 ROW, LAND, EXISTING IMPROVEMENTS	8.96	114,143	45,257	**159,400**	**$ 17,790**		**4%**	
60.01 Purchase or lease of real estate		113,143	45,257	158,400				0
60.02 Relocation of existing households and businesses		1,000		1,000				0
70 VEHICLES (number)	**104**	503,360	25,168	**528,528**	**$ 5,082**		**12%**	
70.01 Light Rail				0				0
70.02 Heavy Rail	104	457,600	22,880	480,480	$ 4,620			0
70.03 Commuter Rail				0				0
70.04 Bus				0				0
70.05 Other				0				0
70.06 Non-revenue vehicles				0				0
70.07 Spare parts		45,760	2,288	48,048				0
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)	8.96	812,315	0	**812,315**	**$ 90,660**	**33%**	**19%**	
80.01 Preliminary Engineering		73,847		73,847				0
80.02 Final Design		172,309		172,309				0
80.03 Project Management for Design and Construction		246,156		246,156				0
80.04 Construction Administration & Management		123,078		123,078				0
80.05 Professional Liability and other Non-Construction Insurance				0				0
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.		24,616		24,616				0
80.07 Surveys, Testing, Investigation, Inspection		49,231		49,231				0
80.08 Start up		123,078		123,078				0
Subtotal (10 - 80)	8.96	3,447,153	514,654	**3,961,807**	**$ 442,166**		**91%**	**0**
90 UNALLOCATED CONTINGENCY				**396,181**			**9%**	
Subtotal (10 - 90)	8.96			**4,357,988**	**$ 486,383**		**100%**	**0**
100 FINANCE CHARGES							**0%**	
Total Project Cost (10 - 100)	8.96			**4,357,988**	**$ 486,383**		**100%**	**415,063**
Allocated Contingency as % of Base Yr Dollars w/o Contingency				14.93%				
Unallocated Contingency as % of Base Yr Dollars w/o Contingency				11.49%				
Total Contingency as % of Base Yr Dollars w/o Contingency				26.42%				
Unallocated Contingency as % of Subtotal (10 - 80)				10.00%				
YOE Construction Cost per Mile (X000)								$0
YOE Total Project Cost per Mile Not Including Vehicles (X000)								$46,324
YOE Total Project Cost per Mile (X000)								$46,324

Alternative 3 – Santa Monica Extension

MAIN WORKSHEET-BUILD ALTERNATIVE

(Rev.12, July 31, 2009)

Los Angeles Metropolitan Transportation Authority						Today's Date	8/16/10
Westside Extension						Yr of Base Year $	2009
Alternative 3 - Santa Monica Extension						Yr of Revenue Ops	

	Quantity	Base Year Dollars w/o Contingency (X000)	Base Year Dollars Allocated Contingency (X000)	Base Year Dollars TOTAL (X000)	Base Year Dollars Unit Cost (X000)	Base Year Dollars Percentage of Construction Cost	Base Year Dollars Percentage of Total Project Cost	YOE Dollars Total (X000)
10 GUIDEWAY & TRACK ELEMENTS (route miles)	**12.38**	904,082	220,255	**1,124,337**	**$ 90,819**	**32%**	**18%**	
10.01 Guideway: At-grade exclusive right-of-way				0				0
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)				0				0
10.03 Guideway: At-grade in mixed traffic				0				0
10.04 Guideway: Aerial structure				0				0
10.05 Guideway: Built-up fill				0				0
10.06 Guideway: Underground cut & cover	12.38	10,625	2,656	13,281	$ 1,073			0
10.07 Guideway: Underground tunnel		835,784	208,947	1,044,731				0
10.08 Guideway: Retained cut or fill				0				0
10.09 Track: Direct fixation		49,038	7,356	56,394				0
10.10 Track: Embedded				0				0
10.11 Track: Ballasted				0				0
10.12 Track: Special (switches, turnouts)		3,731	560	4,291				0
10.13 Track: Vibration and noise dampening		4,904	736	5,640				0
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	**12**	1,214,925	303,732	**1,518,657**	**$ 126,555**	**43%**	**25%**	
20.01 At-grade station, stop, shelter, mall, terminal, platform		2,100	525	2,625				0
20.02 Aerial station, stop, shelter, mall, terminal, platform				0				0
20.03 Underground station, stop, shelter, mall, terminal, platform	12	1,212,825	303,207	1,516,032	$ 126,336			0
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.				0				0
20.05 Joint development				0				0
20.06 Automobile parking multi-story structure				0				0
20.07 Elevators, escalators				0				0
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	12.38	181,113	45,279	**226,392**	**$ 18,287**	**6%**	**4%**	
30.01 Administration Building: Office, sales, storage, revenue counting				0				0
30.02 Light Maintenance Facility				0				0
30.03 Heavy Maintenance Facility		135,239	33,810	169,049				0
30.04 Storage or Maintenance of Way Building				0				0
30.05 Yard and Yard Track		45,874	11,469	57,343				0
40 SITEWORK & SPECIAL CONDITIONS	12.38	429,800	26,617	**456,417**	**$ 36,867**	**13%**	**7%**	
40.01 Demolition, Clearing, Earthwork		18,000	4,500	22,500				0
40.02 Site Utilities, Utility Relocation		60,000	15,000	75,000				0
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments		2,400	600	3,000				0
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks		10,000	2,500	12,500				0
40.05 Site structures including retaining walls, sound walls				0				0
40.06 Pedestrian / bike access and accommodation, landscaping		16,066	4,017	20,083				0
40.07 Automobile, bus, van accessways including roads, parking lots				0				0
40.08 Temporary Facilities and other indirect costs during construction		323,334	0	323,334				0
50 SYSTEMS	12.38	184,696	46,175	**230,871**	**$ 18,649**	**6%**	**4%**	
50.01 Train control and signals		29,720	7,430	37,150				0
50.02 Traffic signals and crossing protection				0				0
50.03 Traction power supply: substations		31,731	7,933	39,664				0
50.04 Traction power distribution: catenary and third rail		16,346	4,087	20,433				0
50.05 Communications		61,917	15,479	77,396				0
50.06 Fare collection system and equipment		35,472	8,868	44,340				0
50.07 Central Control		9,510	2,378	11,888				0
Construction Subtotal (10 - 50)	12.38	2,914,616	642,058	**3,556,674**	**$ 287,292**	**100%**	**58%**	**0**
60 ROW, LAND, EXISTING IMPROVEMENTS	12.38	161,503	48,451	**209,954**	**$ 16,959**		**3%**	
60.01 Purchase or lease of real estate		161,503	48,451	209,954				0
60.02 Relocation of existing households and businesses				0				0
70 VEHICLES (number)	**122**	590,480	29,524	**620,004**	**$ 5,082**		**10%**	
70.01 Light Rail				0				0
70.02 Heavy Rail	122	536,800	26,840	563,640	$ 4,620			0
70.03 Commuter Rail				0				0
70.04 Bus				0				0
70.05 Other				0				0
70.06 Non-revenue vehicles				0				0
70.07 Spare parts		53,680	2,684	56,364				0
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)	12.38	1,173,702	0	**1,173,702**	**$ 94,806**	**33%**	**19%**	
80.01 Preliminary Engineering		106,700		106,700				0
80.02 Final Design		248,967		248,967				0
80.03 Project Management for Design and Construction		355,667		355,667				0
80.04 Construction Administration & Management		177,834		177,834				0
80.05 Professional Liability and other Non-Construction Insurance				0				0
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.		35,567		35,567				0
80.07 Surveys, Testing, Investigation, Inspection		71,133		71,133				0
80.08 Start up		177,834		177,834				0
Subtotal (10 - 80)	12.38	4,840,301	720,033	**5,560,334**	**$ 449,138**		**91%**	**0**
90 UNALLOCATED CONTINGENCY				**556,033**			**9%**	
Subtotal (10 - 90)	12.38			**6,116,367**	**$ 494,052**		**100%**	**0**
100 FINANCE CHARGES							**0%**	
Total Project Cost (10 - 100)	12.38			**6,116,367**	**$ 494,052**		**100%**	**415,063**
Allocated Contingency as % of Base Yr Dollars w/o Contingency				14.88%				
Unallocated Contingency as % of Base Yr Dollars w/o Contingency				11.49%				
Total Contingency as % of Base Yr Dollars w/o Contingency				26.36%				
Unallocated Contingency as % of Subtotal (10 - 80)				10.00%				
YOE Construction Cost per Mile (X000)								$0
YOE Total Project Cost per Mile Not Including Vehicles (X000)								$33,527
YOE Total Project Cost per Mile (X000)								$33,527

Alternative 4 – Westwood/VA Hospital Extension plus West Hollywood Extension

MAIN WORKSHEET - BUILD ALTERNATIVE

(Rev.12, July 31, 2009)

Los Angeles Metropolitan Transportation Authority						Today's Date	8/16/10
Westside Extension						Yr of Base Year $	2009
Alternative 4 - Weswood/VA Hospital Plus West Hollywood Extension						Yr of Revenue Ops	

	Quantity	Base Year Dollars w/o Contingency (X000)	Base Year Dollars Allocated Contingency (X000)	Base Year Dollars TOTAL (X000)	Base Year Dollars Unit Cost (X000)	Base Year Dollars Percentage of Construction Cost	Base Year Dollars Percentage of Total Project Cost	YOE Dollars Total (X000)
10 GUIDEWAY & TRACK ELEMENTS (route miles)	**14.06**	1,029,634	250,947	**1,280,581**	**$ 91,080**	**32%**	**18%**	
10.01 Guideway: At-grade exclusive right-of-way				0				0
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)				0				0
10.03 Guideway: At-grade in mixed traffic				0				0
10.04 Guideway: Aerial structure				0				0
10.05 Guideway: Built-up fill				0				0
10.06 Guideway: Underground cut & cover	14.06	10,625	2,656	13,281	$ 945			0
10.07 Guideway: Underground tunnel		954,388	238,597	1,192,985				0
10.08 Guideway: Retained cut or fill				0				0
10.09 Track: Direct fixation		55,110	8,267	63,377				0
10.10 Track: Embedded				0				0
10.11 Track: Ballasted				0				0
10.12 Track: Special (switches, turnouts)		4,000	600	4,600				0
10.13 Track: Vibration and noise dampening		5,511	827	6,338				0
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	**13**	1,378,575	344,645	**1,723,220**	**$ 132,555**	**43%**	**25%**	
20.01 At-grade station, stop, shelter, mall, terminal, platform		2,100	525	2,625				0
20.02 Aerial station, stop, shelter, mall, terminal, platform				0				0
20.03 Underground station, stop, shelter, mall, terminal, platform	13	1,376,475	344,120	1,720,595	$ 132,353			0
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.				0				0
20.05 Joint development				0				0
20.06 Automobile parking multi-story structure				0				0
20.07 Elevators, escalators				0				0
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	14.06	181,113	45,279	**226,392**	**$ 16,102**	**6%**	**3%**	
30.01 Administration Building: Office, sales, storage, revenue counting				0				0
30.02 Light Maintenance Facility				0				0
30.03 Heavy Maintenance Facility		135,239	33,810	169,049				0
30.04 Storage or Maintenance of Way Building				0				0
30.05 Yard and Yard Track		45,874	11,469	57,343				0
40 SITEWORK & SPECIAL CONDITIONS	14.06	478,073	28,784	**506,857**	**$ 36,050**	**13%**	**7%**	
40.01 Demolition, Clearing, Earthwork		19,500	4,875	24,375				0
40.02 Site Utilities, Utility Relocation		65,000	16,250	81,250				0
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments		2,600	650	3,250				0
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks		10,000	2,500	12,500				0
40.05 Site structures including retaining walls, sound walls				0				0
40.06 Pedestrian / bike access and accommodation, landscaping		18,034	4,509	22,543				0
40.07 Automobile, bus, van accessways including roads, parking lots				0				0
40.08 Temporary Facilities and other indirect costs during construction		362,939	0	362,939				0
50 SYSTEMS	14.06	204,221	51,058	**255,279**	**$ 18,156**	**6%**	**4%**	
50.01 Train control and signals		33,400	8,350	41,750				0
50.02 Traffic signals and crossing protection				0				0
50.03 Traction power supply: substations		34,930	8,733	43,663				0
50.04 Traction power distribution: catenary and third rail		18,370	4,593	22,963				0
50.05 Communications		69,583	17,396	86,979				0
50.06 Fare collection system and equipment		38,428	9,608	48,036				0
50.07 Central Control		9,510	2,378	11,888				0
Construction Subtotal (10 - 50)	14.06	3,271,616	720,713	**3,992,329**	**$ 283,949**	**100%**	**57%**	**0**
60 ROW, LAND, EXISTING IMPROVEMENTS	14.06	166,909	50,073	**216,982**	**$ 15,433**		**3%**	
60.01 Purchase or lease of real estate		166,909	50,073	216,982				0
60.02 Relocation of existing households and businesses				0				0
70 VEHICLES (number)	**162**	784,080	39,204	**823,284**	**$ 5,082**		**12%**	
70.01 Light Rail				0				0
70.02 Heavy Rail	162	712,800	35,640	748,440	$ 4,620			0
70.03 Commuter Rail				0				0
70.04 Bus				0				0
70.05 Other				0				0
70.06 Non-revenue vehicles				0				0
70.07 Spare parts		71,280	3,564	74,844				0
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)	14.06	1,317,468	0	**1,317,468**	**$ 93,703**	**33%**	**19%**	
80.01 Preliminary Engineering		119,770		119,770				0
80.02 Final Design		279,463		279,463				0
80.03 Project Management for Design and Construction		399,233		399,233				0
80.04 Construction Administration & Management		199,616		199,616				0
80.05 Professional Liability and other Non-Construction Insurance				0				0
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.		39,923		39,923				0
80.07 Surveys, Testing, Investigation, Inspection		79,847		79,847				0
80.08 Start up		199,616		199,616				0
Subtotal (10 - 80)	14.06	5,540,073	809,990	**6,350,063**	**$ 451,640**		**91%**	**0**
90 UNALLOCATED CONTINGENCY				**635,006**			**9%**	
Subtotal (10 - 90)	14.06			**6,985,069**	**$ 496,804**		**100%**	**0**
100 FINANCE CHARGES							**0%**	
Total Project Cost (10 - 100)	14.06			**6,985,069**	**$ 496,804**		**100%**	**415,063**
Allocated Contingency as % of Base Yr Dollars w/o Contingency				14.62%				
Unallocated Contingency as % of Base Yr Dollars w/o Contingency				11.46%				
Total Contingency as % of Base Yr Dollars w/o Contingency				26.08%				
Unallocated Contingency as % of Subtotal (10 - 80)				10.00%				
YOE Construction Cost per Mile (X000)								$0
YOE Total Project Cost per Mile Not Including Vehicles (X000)								$29,521
YOE Total Project Cost per Mile (X000)								$29,521

Alternative 5 – Santa Monica plus West Hollywood Extension

MAIN WORKSHEET - BUILD ALTERNATIVE

(Rev.12, July 31, 2009)

Los Angeles Metropolitan Transportation Authority						Today's Date	8/16/10
Westside Extension						Yr of Base Year $	2009
Alternative 5 - Santa Monica Plus West Hollywood Extension						Yr of Revenue Ops	

	Quantity	Base Year Dollars w/o Contingency (X000)	Base Year Dollars Allocated Contingency (X000)	Base Year Dollars TOTAL (X000)	Base Year Dollars Unit Cost (X000)	Base Year Dollars Percentage of Construction Cost	Base Year Dollars Percentage of Total Project Cost	YOE Dollars Total (X000)
10 GUIDEWAY & TRACK ELEMENTS (route miles)	**17.49**	1,278,601	311,521	**1,590,122**	**$ 90,916**	**32%**	**18%**	
10.01 Guideway: At-grade exclusive right-of-way				0				0
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)				0				0
10.03 Guideway: At-grade in mixed traffic				0				0
10.04 Guideway: Aerial structure				0				0
10.05 Guideway: Built-up fill				0				0
10.06 Guideway: Underground cut & cover	17.49	10,625	2,656	13,281	$ 759			0
10.07 Guideway: Underground tunnel		1,186,678	296,670	1,483,348				0
10.08 Guideway: Retained cut or fill				0				0
10.09 Track: Direct fixation		69,243	10,386	79,629				0
10.10 Track: Embedded				0				0
10.11 Track: Ballasted				0				0
10.12 Track: Special (switches, turnouts)		5,131	770	5,901				0
10.13 Track: Vibration and noise dampening		6,924	1,039	7,963				0
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	**17**	1,785,695	446,425	**2,232,120**	**$ 131,301**	**45%**	**26%**	
20.01 At-grade station, stop, shelter, mall, terminal, platform		2,100	525	2,625				0
20.02 Aerial station, stop, shelter, mall, terminal, platform				0				0
20.03 Underground station, stop, shelter, mall, terminal, platform	17	1,783,595	445,900	2,229,495	$ 131,147			0
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.				0				0
20.05 Joint development				0				0
20.06 Automobile parking multi-story structure				0				0
20.07 Elevators, escalators				0				0
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	17.49	181,113	45,279	**226,392**	**$ 12,944**	**5%**	**3%**	
30.01 Administration Building: Office, sales, storage, revenue counting				0				0
30.02 Light Maintenance Facility				0				0
30.03 Heavy Maintenance Facility		135,239	33,810	169,049				0
30.04 Storage or Maintenance of Way Building				0				0
30.05 Yard and Yard Track		45,874	11,469	57,343				0
40 SITEWORK & SPECIAL CONDITIONS	17.49	601,845	36,631	**638,476**	**$ 36,505**	**13%**	**7%**	
40.01 Demolition, Clearing, Earthwork		25,500	6,375	31,875				0
40.02 Site Utilities, Utility Relocation		85,000	21,250	106,250				0
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments		3,400	850	4,250				0
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks		10,000	2,500	12,500				0
40.05 Site structures including retaining walls, sound walls				0				0
40.06 Pedestrian / bike access and accommodation, landscaping		22,625	5,656	28,281				0
40.07 Automobile, bus, van accessways including roads, parking lots				0				0
40.08 Temporary Facilities and other indirect costs during construction		455,320	0	455,320				0
50 SYSTEMS	17.49	257,124	64,283	**321,407**	**$ 18,377**	**6%**	**4%**	
50.01 Train control and signals		41,965	10,491	52,456				0
50.02 Traffic signals and crossing protection				0				0
50.03 Traction power supply: substations		44,888	11,223	56,111				0
50.04 Traction power distribution: catenary and third rail		23,081	5,770	28,851				0
50.05 Communications		87,428	21,857	109,285				0
50.06 Fare collection system and equipment		50,252	12,564	62,816				0
50.07 Central Control		9,510	2,378	11,888				0
Construction Subtotal (10 - 50)	17.49	4,104,378	904,139	**5,008,517**	**$ 286,365**	**100%**	**57%**	**0**
60 ROW, LAND, EXISTING IMPROVEMENTS	17.49	250,227	75,068	**325,295**	**$ 18,599**		**4%**	
60.01 Purchase or lease of real estate		250,227	75,068	325,295				0
60.02 Relocation of existing households and businesses				0				0
70 VEHICLES (number)	**190**	919,600	45,980	**965,580**	**$ 5,082**		**11%**	
70.01 Light Rail				0				0
70.02 Heavy Rail	190	836,000	41,800	877,800	$ 4,620			0
70.03 Commuter Rail				0				0
70.04 Bus				0				0
70.05 Other				0				0
70.06 Non-revenue vehicles				0				0
70.07 Spare parts		83,600	4,180	87,780				0
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)	17.49	1,652,811	0	**1,652,811**	**$ 94,500**	**33%**	**19%**	
80.01 Preliminary Engineering		150,256		150,256				0
80.02 Final Design		350,596		350,596				0
80.03 Project Management for Design and Construction		500,852		500,852				0
80.04 Construction Administration & Management		250,426		250,426				0
80.05 Professional Liability and other Non-Construction Insurance				0				0
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.		50,085		50,085				0
80.07 Surveys, Testing, Investigation, Inspection		100,170		100,170				0
80.08 Start up		250,426		250,426				0
Subtotal (10 - 80)	17.49	6,927,016	1,025,187	**7,952,203**	**$ 454,671**		**91%**	**0**
90 UNALLOCATED CONTINGENCY				**795,220**			**9%**	
Subtotal (10 - 90)	17.49			**8,747,423**	**$ 500,139**		**100%**	**0**
100 FINANCE CHARGES							**0%**	
Total Project Cost (10 - 100)	17.49			**8,747,423**	**$ 500,139**		**100%**	**415,063**
Allocated Contingency as % of Base Yr Dollars w/o Contingency				14.80%				
Unallocated Contingency as % of Base Yr Dollars w/o Contingency				11.48%				
Total Contingency as % of Base Yr Dollars w/o Contingency				26.28%				
Unallocated Contingency as % of Subtotal (10 - 80)				10.00%				
YOE Construction Cost per Mile (X000)								$0
YOE Total Project Cost per Mile Not Including Vehicles (X000)								$23,731
YOE Total Project Cost per Mile (X000)								$23,731

Minimum Operable Segment (MOS) 1

MAIN WORKSHEET - BUILD ALTERNATIVE

(Rev.12, July 31, 2009)

Los Angeles Metropolitan Transportation Authority — Today's Date **8/16/10**
Westside Extension — Yr of Base Year $ 2009
MOS 1 - Fairfax Station Terminus — Yr of Revenue Ops

	Quantity	Base Year Dollars w/o Contingency (X000)	Base Year Dollars Allocated Contingency (X000)	Base Year Dollars TOTAL (X000)	Base Year Dollars Unit Cost (X000)	Base Year Dollars Percentage of Construction Cost	Base Year Dollars Percentage of Total Project Cost	YOE Dollars Total (X000)
10 GUIDEWAY & TRACK ELEMENTS (route miles)	**3.10**	246,637	60,164	**306,801**	**$ 98,968**	**30%**	**17%**	
10.01 Guideway: At-grade exclusive right-of-way				0				0
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)				0				0
10.03 Guideway: At-grade in mixed traffic				0				0
10.04 Guideway: Aerial structure				0				0
10.05 Guideway: Built-up fill				0				0
10.06 Guideway: Underground cut & cover	3.10	10,625	2,656	13,281	$ 4,284			0
10.07 Guideway: Underground tunnel		221,054	55,264	276,318				0
10.08 Guideway: Retained cut or fill				0				0
10.09 Track: Direct fixation		12,240	1,836	14,076				0
10.10 Track: Embedded				0				0
10.11 Track: Ballasted				0				0
10.12 Track: Special (switches, turnouts)		1,494	224	1,718				0
10.13 Track: Vibration and noise dampening		1,224	184	1,408				0
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	**3**	299,815	74,954	**374,769**	**$ 124,923**	**37%**	**20%**	
20.01 At-grade station, stop, shelter, mall, terminal, platform				0				0
20.02 Aerial station, stop, shelter, mall, terminal, platform				0				0
20.03 Underground station, stop, shelter, mall, terminal, platform	3	299,815	74,954	374,769	$ 124,923			0
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.				0				0
20.05 Joint development				0				0
20.06 Automobile parking multi-story structure				0				0
20.07 Elevators, escalators				0				0
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	3.10	109,144	27,287	**136,431**	**$ 44,010**	**13%**	**7%**	
30.01 Administration Building: Office, sales, storage, revenue counting				0				0
30.02 Light Maintenance Facility				0				0
30.03 Heavy Maintenance Facility		81,870	20,468	102,338				0
30.04 Storage or Maintenance of Way Building				0				0
30.05 Yard and Yard Track		27,274	6,819	34,093				0
40 SITEWORK & SPECIAL CONDITIONS	3.10	127,508	8,678	**136,186**	**$ 43,931**	**13%**	**7%**	
40.01 Demolition, Clearing, Earthwork		4,500	1,125	5,625				0
40.02 Site Utilities, Utility Relocation		15,000	3,750	18,750				0
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments		600	150	750				0
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks		10,000	2,500	12,500				0
40.05 Site structures including retaining walls, sound walls				0				0
40.06 Pedestrian / bike access and accommodation, landscaping		4,611	1,153	5,764				0
40.07 Automobile, bus, van accessways including roads, parking lots				0				0
40.08 Temporary Facilities and other indirect costs during construction		92,797	0	92,797				0
50 SYSTEMS	3.10	53,259	13,318	**66,577**	**$ 21,476**	**7%**	**4%**	
50.01 Train control and signals		7,418	1,855	9,273				0
50.02 Traffic signals and crossing protection				0				0
50.03 Traction power supply: substations		7,928	1,983	9,911				0
50.04 Traction power distribution: catenary and third rail		4,080	1,020	5,100				0
50.05 Communications		15,455	3,864	19,319				0
50.06 Fare collection system and equipment		8,868	2,218	11,086				0
50.07 Central Control		9,510	2,378	11,888				0
Construction Subtotal (10 - 50)	3.10	836,363	184,401	**1,020,764**	**$ 329,279**	**100%**	**55%**	**0**
60 ROW, LAND, EXISTING IMPROVEMENTS	3.10	55,415	16,625	**72,040**	**$ 23,239**		**4%**	
60.01 Purchase or lease of real estate		55,415	16,625	72,040				0
60.02 Relocation of existing households and businesses				0				0
70 VEHICLES (number)	**50**	242,000	12,100	**254,100**	**$ 5,082**		**14%**	
70.01 Light Rail				0				0
70.02 Heavy Rail	50	220,000	11,000	231,000	$ 4,620			0
70.03 Commuter Rail				0				0
70.04 Bus				0				0
70.05 Other				0				0
70.06 Non-revenue vehicles				0				0
70.07 Spare parts		22,000	1,100	23,100				0
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)	3.10	336,851	0	**336,851**	**$ 108,662**	**33%**	**18%**	
80.01 Preliminary Engineering		30,623		30,623				0
80.02 Final Design		71,453		71,453				0
80.03 Project Management for Design and Construction		102,076		102,076				0
80.04 Construction Administration & Management		51,038		51,038				0
80.05 Professional Liability and other Non-Construction Insurance				0				0
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.		10,208		10,208				0
80.07 Surveys, Testing, Investigation, Inspection		20,415		20,415				0
80.08 Start up		51,038		51,038				0
Subtotal (10 - 80)	3.10	1,470,629	213,126	**1,683,755**	**$ 543,147**		**91%**	**0**
90 UNALLOCATED CONTINGENCY				**168,376**			**9%**	
Subtotal (10 - 90)	3.10			**1,852,131**	**$ 597,462**		**100%**	**0**
100 FINANCE CHARGES							**0%**	
Total Project Cost (10 - 100)	3.10			**1,852,131**	**$ 597,462**		**100%**	**415,063**
Allocated Contingency as % of Base Yr Dollars w/o Contingency				14.49%				
Unallocated Contingency as % of Base Yr Dollars w/o Contingency				11.45%				
Total Contingency as % of Base Yr Dollars w/o Contingency				25.94%				
Unallocated Contingency as % of Subtotal (10 - 80)				10.00%				
YOE Construction Cost per Mile (X000)								$0
YOE Total Project Cost per Mile Not Including Vehicles (X000)								$133,891
YOE Total Project Cost per Mile (X000)								$133,891

Minimum Operable Segment (MOS) 2

MAIN WORKSHEET - BUILD ALTERNATIVE (Rev.12, July 31, 2009)

Los Angeles Metropolitan Transportation Authority						Today's Date	8/16/10
Westside Extension						Yr of Base Year $	2009
MOS 2 - Century City Station Terminus						Yr of Revenue Ops	

	Quantity	Base Year Dollars w/o Contingency (X000)	Base Year Dollars Allocated Contingency (X000)	Base Year Dollars TOTAL (X000)	Base Year Dollars Unit Cost (X000)	Base Year Dollars Percentage of Construction Cost	Base Year Dollars Percentage of Total Project Cost	YOE Dollars Total (X000)
10 GUIDEWAY & TRACK ELEMENTS (route miles)	**6.61**	488,324	118,990	**607,314**	**$ 91,878**	**31%**	**19%**	
10.01 Guideway: At-grade exclusive right-of-way				0				0
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)				0				0
10.03 Guideway: At-grade in mixed traffic				0				0
10.04 Guideway: Aerial structure				0				0
10.05 Guideway: Built-up fill				0				0
10.06 Guideway: Underground cut & cover	6.61	10,625	2,656	13,281	$ 2,009			0
10.07 Guideway: Underground tunnel		446,786	111,697	558,483				0
10.08 Guideway: Retained cut or fill				0				0
10.09 Track: Direct fixation		26,158	3,924	30,082				0
10.10 Track: Embedded				0				0
10.11 Track: Ballasted				0				0
10.12 Track: Special (switches, turnouts)		2,139	321	2,460				0
10.13 Track: Vibration and noise dampening		2,616	392	3,008				0
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	**7**	654,390	163,598	**817,988**	**$ 116,855**	**42%**	**25%**	
20.01 At-grade station, stop, shelter, mall, terminal, platform				0				0
20.02 Aerial station, stop, shelter, mall, terminal, platform				0				0
20.03 Underground station, stop, shelter, mall, terminal, platform	7	654,390	163,598	817,988	$ 116,855			0
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.				0				0
20.05 Joint development				0				0
20.06 Automobile parking multi-story structure				0				0
20.07 Elevators, escalators				0				0
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	6.61	109,144	27,287	**136,431**	**$ 20,640**	**7%**	**4%**	
30.01 Administration Building: Office, sales, storage, revenue counting				0				0
30.02 Light Maintenance Facility				0				0
30.03 Heavy Maintenance Facility		81,870	20,468	102,338				0
30.04 Storage or Maintenance of Way Building				0				0
30.05 Yard and Yard Track		27,274	6,819	34,093				0
40 SITEWORK & SPECIAL CONDITIONS	6.61	235,144	14,739	**249,883**	**$ 37,804**	**13%**	**8%**	
40.01 Demolition, Clearing, Earthwork		9,000	2,250	11,250				0
40.02 Site Utilities, Utility Relocation		30,000	7,500	37,500				0
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments		1,200	300	1,500				0
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks		10,000	2,500	12,500				0
40.05 Site structures including retaining walls, sound walls				0				0
40.06 Pedestrian / bike access and accommodation, landscaping		8,755	2,189	10,944				0
40.07 Automobile, bus, van accessways including roads, parking lots				0				0
40.08 Temporary Facilities and other indirect costs during construction		176,189	0	176,189				0
50 SYSTEMS	6.61	101,169	25,294	**126,463**	**$ 19,132**	**7%**	**4%**	
50.01 Train control and signals		15,853	3,963	19,816				0
50.02 Traffic signals and crossing protection				0				0
50.03 Traction power supply: substations		16,324	4,082	20,406				0
50.04 Traction power distribution: catenary and third rail		8,719	2,180	10,899				0
50.05 Communications		33,027	8,257	41,284				0
50.06 Fare collection system and equipment		17,736	4,434	22,170				0
50.07 Central Control		9,510	2,378	11,888				0
Construction Subtotal (10 - 50)	6.61	1,588,171	349,908	**1,938,079**	**$ 293,204**	**100%**	**59%**	**0**
60 ROW, LAND, EXISTING IMPROVEMENTS	6.61	64,124	19,237	**83,361**	**$ 12,611**		**3%**	
60.01 Purchase or lease of real estate		64,124	19,237	83,361				0
60.02 Relocation of existing households and businesses				0				0
70 VEHICLES (number)	**60**	290,400	14,520	**304,920**	**$ 5,082**		**9%**	
70.01 Light Rail				0				0
70.02 Heavy Rail	60	264,000	13,200	277,200	$ 4,620			0
70.03 Commuter Rail				0				0
70.04 Bus				0				0
70.05 Other				0				0
70.06 Non-revenue vehicles				0				0
70.07 Spare parts		26,400	1,320	27,720				0
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)	6.61	639,567	0	**639,567**	**$ 96,757**	**33%**	**20%**	
80.01 Preliminary Engineering		58,142		58,142				0
80.02 Final Design		135,666		135,666				0
80.03 Project Management for Design and Construction		193,808		193,808				0
80.04 Construction Administration & Management		96,904		96,904				0
80.05 Professional Liability and other Non-Construction Insurance				0				0
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.		19,381		19,381				0
80.07 Surveys, Testing, Investigation, Inspection		38,762		38,762				0
80.08 Start up		96,904		96,904				0
Subtotal (10 - 80)	6.61	2,582,262	383,665	**2,965,927**	**$ 448,703**		**91%**	**0**
90 UNALLOCATED CONTINGENCY				**296,593**			**9%**	
Subtotal (10 - 90)	6.61			**3,262,520**	**$ 493,573**		**100%**	**0**
100 FINANCE CHARGES							**0%**	
Total Project Cost (10 - 100)	6.61			**3,262,520**	**$ 493,573**		**100%**	**415,063**
Allocated Contingency as % of Base Yr Dollars w/o Contingency				14.86%				
Unallocated Contingency as % of Base Yr Dollars w/o Contingency				11.49%				
Total Contingency as % of Base Yr Dollars w/o Contingency				26.34%				
Unallocated Contingency as % of Subtotal (10 - 80)				10.00%				
YOE Construction Cost per Mile (X000)								$0
YOE Total Project Cost per Mile Not Including Vehicles (X000)								$62,793
YOE Total Project Cost per Mile (X000)								$62,793

Alternative 1B – Westwood/University of California Los Angeles (UCLA) Extension without Crenshaw Station

MAIN WORKSHEET - BUILD ALTERNATIVE (Rev.12, July 31, 2009)

Los Angeles Metropolitan Transportation Authority						Today's Date	**8/16/10**
Westside Extension						Yr of Base Year $	2009
Alternative 1B - Westwood/UCLA Extension- Less Crenshaw						Yr of Revenue Ops	

	Quantity	Base Year Dollars w/o Contingency (X000)	Base Year Dollars Allocated Contingency (X000)	Base Year Dollars TOTAL (X000)	Base Year Dollars Unit Cost (X000)	Base Year Dollars Percentage of Construction Cost	Base Year Dollars Percentage of Total Project Cost	YOE Dollars Total (X000)
10 GUIDEWAY & TRACK ELEMENTS (route miles)	**8.60**	660,891	161,239	**822,130**	**$ 95,597**	**37%**	**21%**	
10.01 Guideway: At-grade exclusive right-of-way	8.60			0	$ -			0
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)				0				0
10.03 Guideway: At-grade in mixed traffic				0				0
10.04 Guideway: Aerial structure				0				0
10.05 Guideway: Built-up fill				0				0
10.06 Guideway: Underground cut & cover		10,625	2,656	13,281				0
10.07 Guideway: Underground tunnel		610,411	152,604	763,015				0
10.08 Guideway: Retained cut or fill				0				0
10.09 Track: Direct fixation		34,050	5,108	39,158				0
10.10 Track: Embedded				0				0
10.11 Track: Ballasted				0				0
10.12 Track: Special (switches, turnouts)		2,400	360	2,760				0
10.13 Track: Vibration and noise dampening		3,405	511	3,916				0
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	**6**	653,705	163,427	**817,132**	**$ 136,189**	**37%**	**21%**	
20.01 At-grade station, stop, shelter, mall, terminal, platform								0
20.02 Aerial station, stop, shelter, mall, terminal, platform				0				0
20.03 Underground station, stop, shelter, mall, terminal, platform	6	653,705	163,427	817,132	$ 136,189			0
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.				0				0
20.05 Joint development				0				0
20.06 Automobile parking multi-story structure				0				0
20.07 Elevators, escalators				0				0
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	8.60	109,144	27,287	**136,431**	**$ 15,864**	**6%**	**4%**	
30.01 Administration Building: Office, sales, storage, revenue counting				0				0
30.02 Light Maintenance Facility				0				0
30.03 Heavy Maintenance Facility		81,870	20,468	102,338				0
30.04 Storage or Maintenance of Way Building				0				0
30.05 Yard and Yard Track		27,274	6,819	34,093				0
40 SITEWORK & SPECIAL CONDITIONS	8.60	260,330	15,037	**275,367**	**$ 32,019**	**13%**	**7%**	
40.01 Demolition, Clearing, Earthwork		9,000	2,250	11,250				0
40.02 Site Utilities, Utility Relocation		30,000	7,500	37,500				0
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments		1,200	300	1,500				0
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks		10,000	2,500	12,500				0
40.05 Site structures including retaining walls, sound walls				0				0
40.06 Pedestrian / bike access and accommodation, landscaping		9,947	2,487	12,434				0
40.07 Automobile, bus, van accessways including roads, parking lots				0				0
40.08 Temporary Facilities and other indirect costs during construction		200,183	0	200,183				0
50 SYSTEMS	8.60	120,758	30,191	**150,949**	**$ 17,552**	**7%**	**4%**	
50.01 Train control and signals		20,636	5,159	25,795				0
50.02 Traffic signals and crossing protection				0				0
50.03 Traction power supply: substations		18,534	4,634	23,168				0
50.04 Traction power distribution: catenary and third rail		11,350	2,838	14,188				0
50.05 Communications		42,992	10,748	53,740				0
50.06 Fare collection system and equipment		17,736	4,434	22,170				0
50.07 Central Control		9,510	2,378	11,888				0
Construction Subtotal (10 - 50)	8.60	1,804,828	397,181	**2,202,009**	**$ 256,048**	**100%**	**57%**	**0**
60 ROW, LAND, EXISTING IMPROVEMENTS	8.60	78,184	23,455	**101,639**	**$ 11,818**		**3%**	
60.01 Purchase or lease of real estate		78,184	23,455	101,639				0
60.02 Relocation of existing households and businesses				0				0
70 VEHICLES (number)	**98**	474,320	23,716	**498,036**	**$ 5,082**		**13%**	
70.01 Light Rail				0				0
70.02 Heavy Rail	98	431,200	21,560	452,760	$ 4,620			0
70.03 Commuter Rail				0				0
70.04 Bus				0				0
70.05 Other				0				0
70.06 Non-revenue vehicles				0				0
70.07 Spare parts		43,120	2,156	45,276				0
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)	8.60	726,662	0	**726,662**	**$ 84,496**	**33%**	**19%**	
80.01 Preliminary Engineering		66,060		66,060				0
80.02 Final Design		154,141		154,141				0
80.03 Project Management for Design and Construction		220,201		220,201				0
80.04 Construction Administration & Management		110,100		110,100				0
80.05 Professional Liability and other Non-Construction Insurance				0				0
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.		22,020		22,020				0
80.07 Surveys, Testing, Investigation, Inspection		44,040		44,040				0
80.08 Start up		110,100		110,100				0
Subtotal (10 - 80)	8.60	3,083,994	444,352	**3,528,346**	**$ 410,273**		**91%**	**0**
90 UNALLOCATED CONTINGENCY				**352,835**			**9%**	
Subtotal (10 - 90)	8.60			**3,881,181**	**$ 451,300**		**100%**	**0**
100 FINANCE CHARGES							**0%**	
Total Project Cost (10 - 100)	8.60			**3,881,181**	**$ 451,300**		**100%**	**415,063**
Allocated Contingency as % of Base Yr Dollars w/o Contingency				14.41%				
Unallocated Contingency as % of Base Yr Dollars w/o Contingency				11.44%				
Total Contingency as % of Base Yr Dollars w/o Contingency				25.85%				
Unallocated Contingency as % of Subtotal (10 - 80)				10.00%				
YOE Construction Cost per Mile (X000)								$0
YOE Total Project Cost per Mile Not Including Vehicles (X000)								$48,263
YOE Total Project Cost per Mile (X000)								$48,263

Alternative 2B – Westwood/Veterans Administration (VA) Hospital Extension without Crenshaw Station

MAIN WORKSHEET - BUILD ALTERNATIVE

(Rev.12, July 31, 2009)

Los Angeles Metropolitan Transportation Authority						Today's Date	8/16/10
Westside Extension						Yr of Base Year $	2009
Alternative 2B - Westwood/VA Hospital Extension -Less Crenshaw						Yr of Revenue Ops	

	Quantity	Base Year Dollars w/o Contingency (X000)	Base Year Dollars Allocated Contingency (X000)	Base Year Dollars TOTAL (X000)	Base Year Dollars Unit Cost (X000)	Base Year Dollars Percentage of Construction Cost	Base Year Dollars Percentage of Total Project Cost	YOE Dollars Total (X000)
10 GUIDEWAY & TRACK ELEMENTS (route miles)	**8.96**	678,412	165,441	**843,853**	**$ 94,180**	**35%**	**20%**	
10.01 Guideway: At-grade exclusive right-of-way	8.96			0	$ -			0
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)				0				0
10.03 Guideway: At-grade in mixed traffic				0				0
10.04 Guideway: Aerial structure				0				0
10.05 Guideway: Built-up fill				0				0
10.06 Guideway: Underground cut & cover		10,625	2,656	13,281				0
10.07 Guideway: Underground tunnel		626,164	156,542	782,706				0
10.08 Guideway: Retained cut or fill				0				0
10.09 Track: Direct fixation		35,475	5,321	40,796				0
10.10 Track: Embedded				0				0
10.11 Track: Ballasted				0				0
10.12 Track: Special (switches, turnouts)		2,600	390	2,990				0
10.13 Track: Vibration and noise dampening		3,548	532	4,080				0
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	**8**	732,805	183,202	**916,007**	**$ 114,501**	**39%**	**22%**	
20.01 At-grade station, stop, shelter, mall, terminal, platform		2,100	525					0
20.02 Aerial station, stop, shelter, mall, terminal, platform				0				0
20.03 Underground station, stop, shelter, mall, terminal, platform	8	730,705	182,677	913,382	$ 114,173			0
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.				0				0
20.05 Joint development				0				0
20.06 Automobile parking multi-story structure				0				0
20.07 Elevators, escalators				0				0
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	8.96	109,144	27,287	**136,431**	**$ 15,227**	**6%**	**3%**	
30.01 Administration Building: Office, sales, storage, revenue counting				0				0
30.02 Light Maintenance Facility				0				0
30.03 Heavy Maintenance Facility		81,870	20,468	102,338				0
30.04 Storage or Maintenance of Way Building				0				0
30.05 Yard and Yard Track		27,274	6,819	34,093				0
40 SITEWORK & SPECIAL CONDITIONS	8.96	281,708	38,303	**320,011**	**$ 35,716**	**13%**	**8%**	
40.01 Demolition, Clearing, Earthwork		10,500	2,625	13,125				0
40.02 Site Utilities, Utility Relocation		35,000	8,750	43,750				0
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments		1,400	350	1,750				0
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks		10,000	2,500	12,500				0
40.05 Site structures including retaining walls, sound walls				0				0
40.06 Pedestrian / bike access and accommodation, landscaping		10,642	2,661	13,303				0
40.07 Automobile, bus, van accessways including roads, parking lots				0				0
40.08 Temporary Facilities and other indirect costs during construction		214,166	21,417	235,583				0
50 SYSTEMS	8.96	128,752	32,189	**160,941**	**$ 17,962**	**7%**	**4%**	
50.01 Train control and signals		21,500	5,375	26,875				0
50.02 Traffic signals and crossing protection				0				0
50.03 Traction power supply: substations		20,433	5,108	25,541				0
50.04 Traction power distribution: catenary and third rail		11,825	2,956	14,781				0
50.05 Communications		44,792	11,198	55,990				0
50.06 Fare collection system and equipment		20,692	5,174	25,866				0
50.07 Central Control		9,510	2,378	11,888				0
Construction Subtotal (10 - 50)	8.96	1,930,821	446,422	**2,377,243**	**$ 265,317**	**100%**	**57%**	**0**
60 ROW, LAND, EXISTING IMPROVEMENTS	8.96	78,184	23,455	**101,639**	**$ 11,344**		**2%**	
60.01 Purchase or lease of real estate		78,184	23,455	101,639				0
60.02 Relocation of existing households and businesses				0				0
70 VEHICLES (number)	**104**	503,360	25,168	**528,528**	**$ 5,082**		**13%**	
70.01 Light Rail				0				0
70.02 Heavy Rail	104	457,600	22,880	480,480	$ 4,620			0
70.03 Commuter Rail				0				0
70.04 Bus				0				0
70.05 Other				0				0
70.06 Non-revenue vehicles				0				0
70.07 Spare parts		45,760	2,288	48,048				0
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)	8.96	784,489	0	**784,489**	**$ 87,555**	**33%**	**19%**	
80.01 Preliminary Engineering		71,317		71,317				0
80.02 Final Design		166,407		166,407				0
80.03 Project Management for Design and Construction		237,724		237,724				0
80.04 Construction Administration & Management		118,862		118,862				0
80.05 Professional Liability and other Non-Construction Insurance				0				0
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.		23,772		23,772				0
80.07 Surveys, Testing, Investigation, Inspection		47,545		47,545				0
80.08 Start up		118,862		118,862				0
Subtotal (10 - 80)	8.96	3,296,854	495,045	**3,791,899**	**$ 423,203**		**91%**	**0**
90 UNALLOCATED CONTINGENCY				**379,190**			**9%**	
Subtotal (10 - 90)	8.96			**4,171,089**	**$ 465,523**		**100%**	**0**
100 FINANCE CHARGES							**0%**	
Total Project Cost (10 - 100)	8.96			**4,171,089**	**$ 465,523**		**100%**	**415,063**
Allocated Contingency as % of Base Yr Dollars w/o Contingency				15.02%				
Unallocated Contingency as % of Base Yr Dollars w/o Contingency				11.50%				
Total Contingency as % of Base Yr Dollars w/o Contingency				26.52%				
Unallocated Contingency as % of Subtotal (10 - 80)				10.00%				
YOE Construction Cost per Mile (X000)								$0
YOE Total Project Cost per Mile Not Including Vehicles (X000)								$46,324
YOE Total Project Cost per Mile (X000)								$46,324

Alternative 3B – Santa Monica Extension without Crenshaw Station

MAIN WORKSHEET - BUILD ALTERNATIVE (Rev.12, July 31, 2009)

Los Angeles Metropolitan Transportation Authority						Today's Date	8/16/10
Westside Extension						Yr of Base Year $	2009
Alternative 3B - Santa Monica Extension_Less Crenshaw Station						Yr of Revenue Ops	

	Quantity	Base Year Dollars w/o Contingency (X000)	Base Year Dollars Allocated Contingency (X000)	Base Year Dollars TOTAL (X000)	Base Year Dollars Unit Cost (X000)	Base Year Dollars Percentage of Construction Cost	Base Year Dollars Percentage of Total Project Cost	YOE Dollars Total (X000)
10 GUIDEWAY & TRACK ELEMENTS (route miles)	**12.38**	913,812	222,687	**1,136,499**	**$ 91,801**	**33%**	**19%**	
10.01 Guideway: At-grade exclusive right-of-way				0				0
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)				0				0
10.03 Guideway: At-grade in mixed traffic				0				0
10.04 Guideway: Aerial structure				0				0
10.05 Guideway: Built-up fill				0				0
10.06 Guideway: Underground cut & cover	12.38	10,625	2,656	13,281	$ 1,073			0
10.07 Guideway: Underground tunnel		845,514	211,379	1,056,893				0
10.08 Guideway: Retained cut or fill				0				0
10.09 Track: Direct fixation		49,038	7,356	56,394				0
10.10 Track: Embedded				0				0
10.11 Track: Ballasted				0				0
10.12 Track: Special (switches, turnouts)		3,731	560	4,291				0
10.13 Track: Vibration and noise dampening		4,904	736	5,640				0
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	**12**	1,139,925	284,982	**1,424,907**	**$ 118,742**	**41%**	**24%**	
20.01 At-grade station, stop, shelter, mall, terminal, platform		2,100	525	2,625				0
20.02 Aerial station, stop, shelter, mall, terminal, platform				0				0
20.03 Underground station, stop, shelter, mall, terminal, platform	12	1,137,825	284,457	1,422,282	$ 118,524			0
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.				0				0
20.05 Joint development				0				0
20.06 Automobile parking multi-story structure				0				0
20.07 Elevators, escalators				0				0
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	12.38	181,113	45,279	**226,392**	**$ 18,287**	**7%**	**4%**	
30.01 Administration Building: Office, sales, storage, revenue counting				0				0
30.02 Light Maintenance Facility				0				0
30.03 Heavy Maintenance Facility		135,239	33,810	169,049				0
30.04 Storage or Maintenance of Way Building				0				0
30.05 Yard and Yard Track		45,874	11,469	57,343				0
40 SITEWORK & SPECIAL CONDITIONS	12.38	413,010	24,822	**437,832**	**$ 35,366**	**13%**	**7%**	
40.01 Demolition, Clearing, Earthwork		16,500	4,125	20,625				0
40.02 Site Utilities, Utility Relocation		55,000	13,750	68,750				0
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments		2,200	550	2,750				0
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks		10,000	2,500	12,500				0
40.05 Site structures including retaining walls, sound walls				0				0
40.06 Pedestrian / bike access and accommodation, landscaping		15,589	3,897	19,486				0
40.07 Automobile, bus, van accessways including roads, parking lots				0				0
40.08 Temporary Facilities and other indirect costs during construction		313,721	0	313,721				0
50 SYSTEMS	12.38	180,240	45,062	**225,302**	**$ 18,199**	**7%**	**4%**	
50.01 Train control and signals		29,720	7,430	37,150				0
50.02 Traffic signals and crossing protection				0				0
50.03 Traction power supply: substations		30,231	7,558	37,789				0
50.04 Traction power distribution: catenary and third rail		16,346	4,087	20,433				0
50.05 Communications		61,917	15,479	77,396				0
50.06 Fare collection system and equipment		32,516	8,130	40,646				0
50.07 Central Control		9,510	2,378	11,888				0
Construction Subtotal (10 - 50)	12.38	2,828,100	622,832	**3,450,932**	**$ 278,751**	**100%**	**58%**	**0**
60 ROW, LAND, EXISTING IMPROVEMENTS	12.38	161,503	48,451	**209,954**	**$ 16,959**		**4%**	
60.01 Purchase or lease of real estate		161,503	48,451	209,954				0
60.02 Relocation of existing households and businesses				0				0
70 VEHICLES (number)	**122**	590,480	29,524	**620,004**	**$ 5,082**		**10%**	
70.01 Light Rail				0				0
70.02 Heavy Rail	122	536,800	26,840	563,640	$ 4,620			0
70.03 Commuter Rail				0				0
70.04 Bus				0				0
70.05 Other				0				0
70.06 Non-revenue vehicles				0				0
70.07 Spare parts		53,680	2,684	56,364				0
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)	12.38	1,138,808	0	**1,138,808**	**$ 91,988**	**33%**	**19%**	
80.01 Preliminary Engineering		103,528		103,528				0
80.02 Final Design		241,565		241,565				0
80.03 Project Management for Design and Construction		345,093		345,093				0
80.04 Construction Administration & Management		172,547		172,547				0
80.05 Professional Liability and other Non-Construction Insurance				0				0
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.		34,509		34,509				0
80.07 Surveys, Testing, Investigation, Inspection		69,019		69,019				0
80.08 Start up		172,547		172,547				0
Subtotal (10 - 80)	12.38	4,718,891	700,807	**5,419,698**	**$ 437,779**		**91%**	**0**
90 UNALLOCATED CONTINGENCY				**541,970**			**9%**	
Subtotal (10 - 90)	12.38			**5,961,668**	**$ 481,556**		**100%**	**0**
100 FINANCE CHARGES							**0%**	
Total Project Cost (10 - 100)	12.38			**5,961,668**	**$ 481,556**		**100%**	**415,063**
Allocated Contingency as % of Base Yr Dollars w/o Contingency				14.85%				
Unallocated Contingency as % of Base Yr Dollars w/o Contingency				11.49%				
Total Contingency as % of Base Yr Dollars w/o Contingency				26.34%				
Unallocated Contingency as % of Subtotal (10 - 80)				10.00%				
YOE Construction Cost per Mile (X000)								$0
YOE Total Project Cost per Mile Not Including Vehicles (X000)								$33,527
YOE Total Project Cost per Mile (X000)								$33,527

Alternative 4B – Westwood/VA Hospital Extension plus West Hollywood Extension with Transfer Station

MAIN WORKSHEET - BUILD ALTERNATIVE (Rev.12, July 31, 2009)

Los Angeles Metropolitan Transportation Authority						Today's Date	8/16/10
Westside Extension						Yr of Base Year $	2009
Alternative 4B - Weswood/VA Hospital Plus West Hollywood Extension -with Transfer Station at La Cienega						Yr of Revenue Ops	

	Quantity	Base Year Dollars w/o Contingency (X000)	Base Year Dollars Allocated Contingency (X000)	Base Year Dollars TOTAL (X000)	Base Year Dollars Unit Cost (X000)	Base Year Dollars Percentage of Construction Cost	Base Year Dollars Percentage of Total Project Cost	YOE Dollars Total (X000)
10 GUIDEWAY & TRACK ELEMENTS (route miles)	**13.70**	1,025,614	250,065	**1,275,679**	**$ 93,110**	**31%**	**18%**	
10.01 Guideway: At-grade exclusive right-of-way				0				0
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)				0				0
10.03 Guideway: At-grade in mixed traffic				0				0
10.04 Guideway: Aerial structure				0				0
10.05 Guideway: Built-up fill				0				0
10.06 Guideway: Underground cut & cover	13.70	10,625	2,656	13,281	$ 969			0
10.07 Guideway: Underground tunnel		951,608	237,902	1,189,510				0
10.08 Guideway: Retained cut or fill				0				0
10.09 Track: Direct fixation		54,255	8,138	62,393				0
10.10 Track: Embedded				0				0
10.11 Track: Ballasted				0				0
10.12 Track: Special (switches, turnouts)		3,700	555	4,255				0
10.13 Track: Vibration and noise dampening		5,426	814	6,240				0
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	**13**	1,418,575	354,645	**1,773,220**	**$ 136,402**	**44%**	**25%**	
20.01 At-grade station, stop, shelter, mall, terminal, platform		2,100	525	2,625				0
20.02 Aerial station, stop, shelter, mall, terminal, platform				0				0
20.03 Underground station, stop, shelter, mall, terminal, platform	13	1,416,475	354,120	1,770,595	$ 136,200			0
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.				0				0
20.05 Joint development				0				0
20.06 Automobile parking multi-story structure				0				0
20.07 Elevators, escalators				0				0
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	13.70	181,113	45,279	**226,392**	**$ 16,524**	**6%**	**3%**	
30.01 Administration Building: Office, sales, storage, revenue counting				0				0
30.02 Light Maintenance Facility				0				0
30.03 Heavy Maintenance Facility		135,239	33,810	169,049				0
30.04 Storage or Maintenance of Way Building				0				0
30.05 Yard and Yard Track		45,874	11,469	57,343				0
40 SITEWORK & SPECIAL CONDITIONS	13.70	482,556	65,558	**548,114**	**$ 40,006**	**13%**	**8%**	
40.01 Demolition, Clearing, Earthwork		19,500	4,875	24,375				0
40.02 Site Utilities, Utility Relocation		65,000	16,250	81,250				0
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments		2,600	650	3,250				0
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks		10,000	2,500	12,500				0
40.05 Site structures including retaining walls, sound walls				0				0
40.06 Pedestrian / bike access and accommodation, landscaping		18,246	4,562	22,808				0
40.07 Automobile, bus, van accessways including roads, parking lots				0				0
40.08 Temporary Facilities and other indirect costs during construction		367,210	36,721	403,931				0
50 SYSTEMS	13.70	202,100	50,527	**252,627**	**$ 18,439**	**6%**	**4%**	
50.01 Train control and signals		32,882	8,221	41,103				0
50.02 Traffic signals and crossing protection				0				0
50.03 Traction power supply: substations		34,691	8,673	43,364				0
50.04 Traction power distribution: catenary and third rail		18,085	4,521	22,606				0
50.05 Communications		68,504	17,126	85,630				0
50.06 Fare collection system and equipment		38,428	9,608	48,036				0
50.07 Central Control		9,510	2,378	11,888				0
Construction Subtotal (10 - 50)	13.70	3,309,958	766,074	**4,076,032**	**$ 297,504**	**100%**	**57%**	**0**
60 ROW, LAND, EXISTING IMPROVEMENTS	13.70	166,909	50,073	**216,982**	**$ 15,837**		**3%**	
60.01 Purchase or lease of real estate		166,909	50,073	216,982				0
60.02 Relocation of existing households and businesses				0				0
70 VEHICLES (number)	**162**	784,080	39,204	**823,284**	**$ 5,082**		**12%**	
70.01 Light Rail				0				0
70.02 Heavy Rail	162	712,800	35,640	748,440	$ 4,620			0
70.03 Commuter Rail				0				0
70.04 Bus				0				0
70.05 Other				0				0
70.06 Non-revenue vehicles				0				0
70.07 Spare parts		71,280	3,564	74,844				0
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)	13.70	1,345,091	0	**1,345,091**	**$ 98,176**	**33%**	**19%**	
80.01 Preliminary Engineering		122,281		122,281				0
80.02 Final Design		285,322		285,322				0
80.03 Project Management for Design and Construction		407,603		407,603				0
80.04 Construction Administration & Management		203,802		203,802				0
80.05 Professional Liability and other Non-Construction Insurance				0				0
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.		40,760		40,760				0
80.07 Surveys, Testing, Investigation, Inspection		81,521		81,521				0
80.08 Start up		203,802		203,802				0
Subtotal (10 - 80)	13.70	5,606,038	855,351	**6,461,389**	**$ 471,608**		**91%**	**0**
90 UNALLOCATED CONTINGENCY				**646,139**			**9%**	
Subtotal (10 - 90)	13.70			**7,107,528**	**$ 518,769**		**100%**	**0**
100 FINANCE CHARGES							**0%**	
Total Project Cost (10 - 100)	13.70			**7,107,528**	**$ 518,769**		**100%**	**415,063**
Allocated Contingency as % of Base Yr Dollars w/o Contingency				15.26%				
Unallocated Contingency as % of Base Yr Dollars w/o Contingency				11.53%				
Total Contingency as % of Base Yr Dollars w/o Contingency				26.78%				
Unallocated Contingency as % of Subtotal (10 - 80)				10.00%				
YOE Construction Cost per Mile (X000)								$0
YOE Total Project Cost per Mile Not Including Vehicles (X000)								$30,295
YOE Total Project Cost per Mile (X000)								$30,295

Alternative 2C – Westwood/Veterans Administration (VA) Hospital Extension with Constellation

MAIN WORKSHEET - BUILD ALTERNATIVE

(Rev.12, July 31, 2009)

Los Angeles Metropolitan Transportation Authority — Today's Date **8/16/10**
Westside Extension — Yr of Base Year $ 2009
Alternative 2C - Westwood/VA Hospital Extension_ with Constellation — Yr of Revenue Ops

	Quantity	Base Year Dollars w/o Contingency (X000)	Base Year Dollars Allocated Contingency (X000)	Base Year Dollars TOTAL (X000)	Base Year Dollars Unit Cost (X000)	Base Year Dollars Percentage of Construction Cost	Base Year Dollars Percentage of Total Project Cost	YOE Dollars Total (X000)
10 GUIDEWAY & TRACK ELEMENTS (route miles)	**9.36**	694,721	169,344	**864,065**	**$ 92,329**	**35%**	**19%**	
10.01 Guideway: At-grade exclusive right-of-way	9.36			0	$ -			0
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)				0				0
10.03 Guideway: At-grade in mixed traffic				0				0
10.04 Guideway: Aerial structure				0				0
10.05 Guideway: Built-up fill				0				0
10.06 Guideway: Underground cut & cover		10,625	2,656	13,281				0
10.07 Guideway: Underground tunnel		640,730	160,183	800,913				0
10.08 Guideway: Retained cut or fill				0				0
10.09 Track: Direct fixation		37,060	5,559	42,619				0
10.10 Track: Embedded				0				0
10.11 Track: Ballasted				0				0
10.12 Track: Special (switches, turnouts)		2,600	390	2,990				0
10.13 Track: Vibration and noise dampening		3,706	556	4,262				0
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	**8**	807,805	201,952	**1,009,757**	**$ 126,220**	**40%**	**23%**	
20.01 At-grade station, stop, shelter, mall, terminal, platform		2,100	525					0
20.02 Aerial station, stop, shelter, mall, terminal, platform				0				0
20.03 Underground station, stop, shelter, mall, terminal, platform	8	805,705	201,427	1,007,132	$ 125,892			0
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.				0				0
20.05 Joint development				0				0
20.06 Automobile parking multi-story structure				0				0
20.07 Elevators, escalators				0				0
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	9.36	109,144	27,287	**136,431**	**$ 14,578**	**5%**	**3%**	
30.01 Administration Building: Office, sales, storage, revenue counting				0				0
30.02 Light Maintenance Facility				0				0
30.03 Heavy Maintenance Facility		81,870	20,468	102,338				0
30.04 Storage or Maintenance of Way Building				0				0
30.05 Yard and Yard Track		27,274	6,819	34,093				0
40 SITEWORK & SPECIAL CONDITIONS	9.36	302,437	18,727	**321,164**	**$ 34,318**	**13%**	**7%**	
40.01 Demolition, Clearing, Earthwork		12,000	3,000	15,000				0
40.02 Site Utilities, Utility Relocation		40,000	10,000	50,000				0
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments		1,600	400	2,000				0
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks		10,000	2,500	12,500				0
40.05 Site structures including retaining walls, sound walls				0				0
40.06 Pedestrian / bike access and accommodation, landscaping		11,306	2,827	14,133				0
40.07 Automobile, bus, van accessways including roads, parking lots				0				0
40.08 Temporary Facilities and other indirect costs during construction		227,531	0	227,531				0
50 SYSTEMS	9.36	137,141	34,285	**171,426**	**$ 18,318**	**7%**	**4%**	
50.01 Train control and signals		22,460	5,615	28,075				0
50.02 Traffic signals and crossing protection				0				0
50.03 Traction power supply: substations		22,377	5,594	27,971				0
50.04 Traction power distribution: catenary and third rail		12,353	3,088	15,441				0
50.05 Communications		46,793	11,698	58,491				0
50.06 Fare collection system and equipment		23,648	5,912	29,560				0
50.07 Central Control		9,510	2,378	11,888				0
Construction Subtotal (10 - 50)	9.36	2,051,248	451,595	**2,502,843**	**$ 267,440**	**100%**	**56%**	**0**
60 ROW, LAND, EXISTING IMPROVEMENTS	9.36	127,552	50,621	**178,173**	**$ 19,039**		**4%**	
60.01 Purchase or lease of real estate		126,552	50,621	177,173				0
60.02 Relocation of existing households and businesses		1,000		1,000				0
70 VEHICLES (number)	**104**	503,360	25,168	**528,528**	**$ 5,082**		**12%**	
70.01 Light Rail				0				0
70.02 Heavy Rail	104	457,600	22,880	480,480	$ 4,620			0
70.03 Commuter Rail				0				0
70.04 Bus				0				0
70.05 Other				0				0
70.06 Non-revenue vehicles				0				0
70.07 Spare parts		45,760	2,288	48,048				0
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)	9.36	825,937	0	**825,937**	**$ 88,255**	**33%**	**19%**	
80.01 Preliminary Engineering		75,085		75,085				0
80.02 Final Design		175,199		175,199				0
80.03 Project Management for Design and Construction		250,284		250,284				0
80.04 Construction Administration & Management		125,142		125,142				0
80.05 Professional Liability and other Non-Construction Insurance				0				0
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.		25,028		25,028				0
80.07 Surveys, Testing, Investigation, Inspection		50,057		50,057				0
80.08 Start up		125,142		125,142				0
Subtotal (10 - 80)	9.36	3,508,097	527,384	**4,035,481**	**$ 431,209**		**91%**	**0**
90 UNALLOCATED CONTINGENCY				**403,548**			**9%**	
Subtotal (10 - 90)	9.36			**4,439,029**	**$ 474,330**		**100%**	**0**
100 FINANCE CHARGES							**0%**	
Total Project Cost (10 - 100)	9.36			**4,439,029**	**$ 474,330**		**100%**	**415,063**
Allocated Contingency as % of Base Yr Dollars w/o Contingency				15.03%				
Unallocated Contingency as % of Base Yr Dollars w/o Contingency				11.50%				
Total Contingency as % of Base Yr Dollars w/o Contingency				26.54%				
Unallocated Contingency as % of Subtotal (10 - 80)				10.00%				
YOE Construction Cost per Mile (X000)								$0
YOE Total Project Cost per Mile Not Including Vehicles (X000)								$44,351
YOE Total Project Cost per Mile (X000)								$44,351

Alternative 2D – Westwood/Veterans Administration (VA) Hospital Extension with Westwood Loop

MAIN WORKSHEET - BUILD ALTERNATIVE

(Rev.12, July 31, 2009)

Los Angeles Metropolitan Transportation Authority						Today's Date	8/16/10
Westside Extension						Yr of Base Year $	2009
Alternative 2D - Westwood/VA Hospital Extension_with Westwood Loop						Yr of Revenue Ops	

	Quantity	Base Year Dollars w/o Contingency (X000)	Base Year Dollars Allocated Contingency (X000)	Base Year Dollars TOTAL (X000)	Base Year Dollars Unit Cost (X000)	Base Year Dollars Percentage of Construction Cost	Base Year Dollars Percentage of Total Project Cost	YOE Dollars Total (X000)
10 GUIDEWAY & TRACK ELEMENTS (route miles)	**9.58**	738,432	180,173	**918,605**	**$ 95,841**	**36%**	**20%**	
10.01 Guideway: At-grade exclusive right-of-way	9.58			0	$ -			0
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)				0				0
10.03 Guideway: At-grade in mixed traffic				0				0
10.04 Guideway: Aerial structure				0				0
10.05 Guideway: Built-up fill				0				0
10.06 Guideway: Underground cut & cover		10,625	2,656	13,281				0
10.07 Guideway: Underground tunnel		683,456	170,865	854,321				0
10.08 Guideway: Retained cut or fill				0				0
10.09 Track: Direct fixation		37,955	5,693	43,648				0
10.10 Track: Embedded				0				0
10.11 Track: Ballasted				0				0
10.12 Track: Special (switches, turnouts)		2,600	390	2,990				0
10.13 Track: Vibration and noise dampening		3,796	569	4,365				0
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	**8**	807,805	201,952	**1,009,757**	**$ 126,220**	**39%**	**22%**	
20.01 At-grade station, stop, shelter, mall, terminal, platform		2,100	525					0
20.02 Aerial station, stop, shelter, mall, terminal, platform				0				0
20.03 Underground station, stop, shelter, mall, terminal, platform	8	805,705	201,427	1,007,132	$ 125,892			0
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.				0				0
20.05 Joint development				0				0
20.06 Automobile parking multi-story structure				0				0
20.07 Elevators, escalators				0				0
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	9.58	109,144	27,287	**136,431**	**$ 14,234**	**5%**	**3%**	
30.01 Administration Building: Office, sales, storage, revenue counting				0				0
30.02 Light Maintenance Facility				0				0
30.03 Heavy Maintenance Facility		81,870	20,468	102,338				0
30.04 Storage or Maintenance of Way Building				0				0
30.05 Yard and Yard Track		27,274	6,819	34,093				0
40 SITEWORK & SPECIAL CONDITIONS	9.58	308,491	18,798	**327,289**	**$ 34,147**	**13%**	**7%**	
40.01 Demolition, Clearing, Earthwork		12,000	3,000	15,000				0
40.02 Site Utilities, Utility Relocation		40,000	10,000	50,000				0
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments		1,600	400	2,000				0
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks		10,000	2,500	12,500				0
40.05 Site structures including retaining walls, sound walls				0				0
40.06 Pedestrian / bike access and accommodation, landscaping		11,592	2,898	14,490				0
40.07 Automobile, bus, van accessways including roads, parking lots				0				0
40.08 Temporary Facilities and other indirect costs during construction		233,299	0	233,299				0
50 SYSTEMS	9.58	139,364	34,842	**174,206**	**$ 18,176**	**7%**	**4%**	
50.01 Train control and signals		23,003	5,751	28,754				0
50.02 Traffic signals and crossing protection				0				0
50.03 Traction power supply: substations		22,628	5,657	28,285				0
50.04 Traction power distribution: catenary and third rail		12,652	3,163	15,815				0
50.05 Communications		47,923	11,981	59,904				0
50.06 Fare collection system and equipment		23,648	5,912	29,560				0
50.07 Central Control		9,510	2,378	11,888				0
Construction Subtotal (10 - 50)	9.58	2,103,236	463,052	**2,566,288**	**$ 267,750**	**100%**	**57%**	**0**
60 ROW, LAND, EXISTING IMPROVEMENTS	9.58	78,184	23,455	**101,639**	**$ 10,604**		**2%**	
60.01 Purchase or lease of real estate		78,184	23,455	101,639				0
60.02 Relocation of existing households and businesses				0				0
70 VEHICLES (number)	**112**	542,080	27,104	**569,184**	**$ 5,082**		**13%**	
70.01 Light Rail				0				0
70.02 Heavy Rail	112	492,800	24,640	517,440	$ 4,620			0
70.03 Commuter Rail				0				0
70.04 Bus				0				0
70.05 Other				0				0
70.06 Non-revenue vehicles				0				0
70.07 Spare parts		49,280	2,464	51,744				0
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)	9.58	846,875	0	**846,875**	**$ 88,357**	**33%**	**19%**	
80.01 Preliminary Engineering		76,989		76,989				0
80.02 Final Design		179,640		179,640				0
80.03 Project Management for Design and Construction		256,629		256,629				0
80.04 Construction Administration & Management		128,314		128,314				0
80.05 Professional Liability and other Non-Construction Insurance				0				0
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.		25,663		25,663				0
80.07 Surveys, Testing, Investigation, Inspection		51,326		51,326				0
80.08 Start up		128,314		128,314				0
Subtotal (10 - 80)	9.58	3,570,375	513,611	**4,083,986**	**$ 426,096**		**91%**	**0**
90 UNALLOCATED CONTINGENCY				**408,399**			**9%**	
Subtotal (10 - 90)	9.58			**4,492,385**	**$ 468,706**		**100%**	**0**
100 FINANCE CHARGES							**0%**	
Total Project Cost (10 - 100)	9.58			**4,492,385**	**$ 468,706**		**100%**	**415,063**
Allocated Contingency as % of Base Yr Dollars w/o Contingency				14.39%				
Unallocated Contingency as % of Base Yr Dollars w/o Contingency				11.44%				
Total Contingency as % of Base Yr Dollars w/o Contingency				25.82%				
Unallocated Contingency as % of Subtotal (10 - 80)				10.00%				
YOE Construction Cost per Mile (X000)								$0
YOE Total Project Cost per Mile Not Including Vehicles (X000)								$43,305
YOE Total Project Cost per Mile (X000)								$43,305

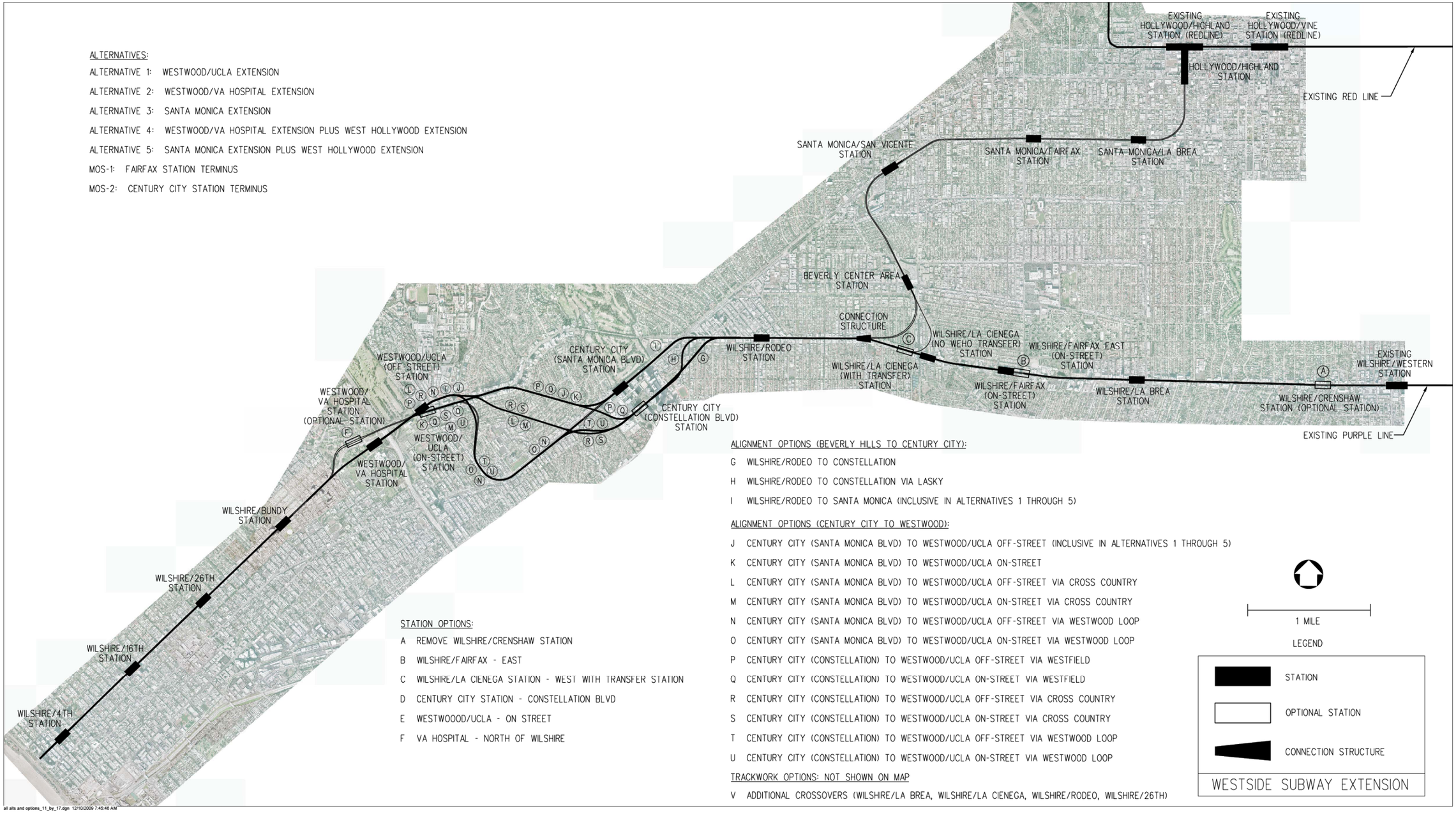
Alternative 2E – Westwood/Veterans Administration (VA) Hospital Extension with Constellation but without Crenshaw Station

MAIN WORKSHEET - BUILD ALTERNATIVE (Rev.12, July 31, 2009)

Los Angeles Metropolitan Transportation Authority						Today's Date	8/20/10
Westside Extension						Yr of Base Year $	2009
Alternative 2E - Westwood/VA Hospital Extension_ with Constellation less Crenshaw						Yr of Revenue Ops	

	Quantity	Base Year Dollars w/o Contingency (X000)	Base Year Dollars Allocated Contingency (X000)	Base Year Dollars TOTAL (X000)	Base Year Dollars Unit Cost (X000)	Base Year Dollars Percentage of Construction Cost	Base Year Dollars Percentage of Total Project Cost	YOE Dollars Total (X000)
10 GUIDEWAY & TRACK ELEMENTS (route miles)	**9.36**	695,421	169,449	**864,870**	**$ 92,415**	**37%**	**21%**	
10.01 Guideway: At-grade exclusive right-of-way	9.36			0	$ -			0
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)				0				0
10.03 Guideway: At-grade in mixed traffic				0				0
10.04 Guideway: Aerial structure				0				0
10.05 Guideway: Built-up fill				0				0
10.06 Guideway: Underground cut & cover		10,625	2,656	13,281				0
10.07 Guideway: Underground tunnel		640,730	160,183	800,913				0
10.08 Guideway: Retained cut or fill				0				0
10.09 Track: Direct fixation		37,060	5,559	42,619				0
10.10 Track: Embedded				0				0
10.11 Track: Ballasted				0				0
10.12 Track: Special (switches, turnouts)		3,300	495	3,795				0
10.13 Track: Vibration and noise dampening		3,706	556	4,262				0
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	**8**	708,920	177,231	**886,151**	**$ 110,769**	**38%**	**21%**	
20.01 At-grade station, stop, shelter, mall, terminal, platform								0
20.02 Aerial station, stop, shelter, mall, terminal, platform				0				0
20.03 Underground station, stop, shelter, mall, terminal, platform	8	708,920	177,231	886,151	$ 110,769			0
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.				0				0
20.05 Joint development				0				0
20.06 Automobile parking multi-story structure				0				0
20.07 Elevators, escalators				0				0
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	9.36	109,144	27,287	**136,431**	**$ 14,578**	**6%**	**3%**	
30.01 Administration Building: Office, sales, storage, revenue counting				0				0
30.02 Light Maintenance Facility				0				0
30.03 Heavy Maintenance Facility		81,870	20,468	102,338				0
30.04 Storage or Maintenance of Way Building				0				0
30.05 Yard and Yard Track		27,274	6,819	34,093				0
40 SITEWORK & SPECIAL CONDITIONS	9.36	281,228	16,880	**298,108**	**$ 31,854**	**13%**	**7%**	
40.01 Demolition, Clearing, Earthwork		10,500	2,625	13,125				0
40.02 Site Utilities, Utility Relocation		35,000	8,750	43,750				0
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments		1,400	350	1,750				0
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks		10,000	2,500	12,500				0
40.05 Site structures including retaining walls, sound walls				0				0
40.06 Pedestrian / bike access and accommodation, landscaping		10,619	2,655	13,274				0
40.07 Automobile, bus, van accessways including roads, parking lots				0				0
40.08 Temporary Facilities and other indirect costs during construction		213,709	0	213,709				0
50 SYSTEMS	9.36	132,685	32,555	**165,240**	**$ 17,657**	**7%**	**4%**	
50.01 Train control and signals		22,460	5,615	28,075				0
50.02 Traffic signals and crossing protection				0				0
50.03 Traction power supply: substations		20,877	5,219	26,096				0
50.04 Traction power distribution: catenary and third rail		12,353	2,471	14,824				0
50.05 Communications		46,793	11,698	58,491				0
50.06 Fare collection system and equipment		20,692	5,174	25,866				0
50.07 Central Control		9,510	2,378	11,888				0
Construction Subtotal (10 - 50)	9.36	1,927,398	423,402	**2,350,800**	**$ 251,193**	**100%**	**56%**	**0**
60 ROW, LAND, EXISTING IMPROVEMENTS	9.36	127,552	50,621	**178,173**	**$ 19,039**		**4%**	
60.01 Purchase or lease of real estate		126,552	50,621	177,173				0
60.02 Relocation of existing households and businesses		1,000		1,000				0
70 VEHICLES (number)	**104**	503,360	25,168	**528,528**	**$ 5,082**		**13%**	
70.01 Light Rail				0				0
70.02 Heavy Rail	104	457,600	22,880	480,480	$ 4,620			0
70.03 Commuter Rail				0				0
70.04 Bus				0				0
70.05 Other				0				0
70.06 Non-revenue vehicles				0				0
70.07 Spare parts		45,760	2,288	48,048				0
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)	9.36	775,764	0	**775,764**	**$ 82,894**	**33%**	**18%**	
80.01 Preliminary Engineering		70,524		70,524				0
80.02 Final Design		164,556		164,556				0
80.03 Project Management for Design and Construction		235,080		235,080				0
80.04 Construction Administration & Management		117,540		117,540				0
80.05 Professional Liability and other Non-Construction Insurance				0				0
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.		23,508		23,508				0
80.07 Surveys, Testing, Investigation, Inspection		47,016		47,016				0
80.08 Start up		117,540		117,540				0
Subtotal (10 - 80)	9.36	3,334,074	499,191	**3,833,265**	**$ 409,602**		**91%**	**0**
90 UNALLOCATED CONTINGENCY				**383,327**			**9%**	
Subtotal (10 - 90)	9.36			**4,216,592**	**$ 450,562**		**100%**	**0**
100 FINANCE CHARGES							**0%**	
Total Project Cost (10 - 100)	9.36			**4,216,592**	**$ 450,562**		**100%**	**415,063**
Allocated Contingency as % of Base Yr Dollars w/o Contingency				14.97%				
Unallocated Contingency as % of Base Yr Dollars w/o Contingency				11.50%				
Total Contingency as % of Base Yr Dollars w/o Contingency				26.47%				
Unallocated Contingency as % of Subtotal (10 - 80)				10.00%				
YOE Construction Cost per Mile (X000)								$0
YOE Total Project Cost per Mile Not Including Vehicles (X000)								$44,351
YOE Total Project Cost per Mile (X000)								$44,351

APPENDIX B ALTERNATIVES AND OPTIONS DRAWING



ALTERNATIVES:

ALTERNATIVE 1: WESTWOOD/UCLA EXTENSION

ALTERNATIVE 2: WESTWOOD/VA HOSPITAL EXTENSION

ALTERNATIVE 3: SANTA MONICA EXTENSION

ALTERNATIVE 4: WESTWOOD/VA HOSPITAL EXTENSION PLUS WEST HOLLYWOOD EXTENSION

ALTERNATIVE 5: SANTA MONICA EXTENSION PLUS WEST HOLLYWOOD EXTENSION

MOS-1: FAIRFAX STATION TERMINUS

MOS-2: CENTURY CITY STATION TERMINUS

STATION OPTIONS:

A REMOVE WILSHIRE/CRENSHAW STATION

B WILSHIRE/FAIRFAX - EAST

C WILSHIRE/LA CIENEGA STATION - WEST WITH TRANSFER STATION

D CENTURY CITY STATION - CONSTELLATION BLVD

E WESTWOOOD/UCLA - ON STREET

F VA HOSPITAL - NORTH OF WILSHIRE

ALIGNMENT OPTIONS (BEVERLY HILLS TO CENTURY CITY):

G WILSHIRE/RODEO TO CONSTELLATION

H WILSHIRE/RODEO TO CONSTELLATION VIA LASKY

I WILSHIRE/RODEO TO SANTA MONICA (INCLUSIVE IN ALTERNATIVES 1 THROUGH 5)

ALIGNMENT OPTIONS (CENTURY CITY TO WESTWOOD):

J CENTURY CITY (SANTA MONICA BLVD) TO WESTWOOD/UCLA OFF-STREET (INCLUSIVE IN ALTERNATIVES 1 THROUGH 5)

K CENTURY CITY (SANTA MONICA BLVD) TO WESTWOOD/UCLA ON-STREET

L CENTURY CITY (SANTA MONICA BLVD) TO WESTWOOD/UCLA OFF-STREET VIA CROSS COUNTRY

M CENTURY CITY (SANTA MONICA BLVD) TO WESTWOOD/UCLA ON-STREET VIA CROSS COUNTRY

N CENTURY CITY (SANTA MONICA BLVD) TO WESTWOOD/UCLA OFF-STREET VIA WESTWOOD LOOP

O CENTURY CITY (SANTA MONICA BLVD) TO WESTWOOD/UCLA ON-STREET VIA WESTWOOD LOOP

P CENTURY CITY (CONSTELLATION) TO WESTWOOD/UCLA OFF-STREET VIA WESTFIELD

Q CENTURY CITY (CONSTELLATION) TO WESTWOOD/UCLA ON-STREET VIA WESTFIELD

R CENTURY CITY (CONSTELLATION) TO WESTWOOD/UCLA OFF-STREET VIA CROSS COUNTRY

S CENTURY CITY (CONSTELLATION) TO WESTWOOD/UCLA ON-STREET VIA CROSS COUNTRY

T CENTURY CITY (CONSTELLATION) TO WESTWOOD/UCLA OFF-STREET VIA WESTWOOD LOOP

U CENTURY CITY (CONSTELLATION) TO WESTWOOD/UCLA ON-STREET VIA WESTWOOD LOOP

TRACKWORK OPTIONS: NOT SHOWN ON MAP

V ADDITIONAL CROSSOVERS (WILSHIRE/LA BREA, WILSHIRE/LA CIENEGA, WILSHIRE/RODEO, WILSHIRE/26TH)

1 MILE

LEGEND

STATION

OPTIONAL STATION

CONNECTION STRUCTURE

WESTSIDE SUBWAY EXTENSION