Eastside Transit Corridor Phase 2
Draft Environmental Impact Statement/ Environmental Impact Report

APPENDIX G

FINAL ALTERNATIVES ANALYSIS REPORT

State Clearinghouse Number: 2010011062

Los Angeles County Metropolitan Transportation Authority

EASTSIDE TRANSIT CORRIDOR PHASE 2 STUDY

Alternatives Analysis (AA) Report

ADDENDUM

FINAL

October2009

Metro™

CDM AECOM A JOINT VENTURE

Table of Contents

ES.0 Executive Summary
ES.1 Evaluation Summary ... ES-6
ES.2 Recommended Alternatives ... ES-12
ES.2.1 SR-60 LRT ... ES-14
ES.2.2 Washington Boulevard LRT ... ES-17
ES.3 Alternatives Not Recommended for Further Study ... ES-19
ES.3.1 Beverly Boulevard LRT ... ES-20
ES.3.2 Beverly/Whittier Boulevards LRT ... ES-21

1.0 Purpose & Need
1.1 Project Study Area ... 1-1
1.1.1 PSA Description ... 1-1
1.1.2 PSA Demographics and Transit Dependency Factors ... 1-6
1.2 Existing Transportation System ... 1-11
1.3 The Mobility Problem ... 1-13

2.0 Alternatives Considered
2.1 Screening and Selection Process ... 2-1
2.2 Final Alternatives ... 2-7
2.2.1 No Build Alternative ... 2-7
2.2.2 Baseline/TSM Alternative ... 2-8
2.2.3 Final Alternative 1 – SR-60 Light Rail Transit ... 2-9
2.2.4 Final Alternative 2 – Beverly Boulevard Light Rail Transit ... 2-14
2.2.5 Final Alternative 3 – Beverly/Whittier Boulevards Light Rail Transit ... 2-20
2.2.6 Final Alternative 4 – Washington Boulevard Light Rail Transit ... 2-26

3.0 Transportation Issues and Analysis
3.1 Transit Analysis ... 3-1
3.1.1 Operating Assumptions and Plans ... 3-4
3.1.2 Run Time Estimates ... 3-6
3.1.3 Ridership Results ... 3-8
3.2 FTA Criteria ... 3-9

4.0 Affected Environment and Environmental Issues
4.1 Land Use and Economic Development 4-2
4.2 Catalyst for Public/Private Economic Revitalization 4-3
4.3 Right-of-Way Acquisition 4-3
4.4 Community and Neighborhood (Quality of Life and Environmental Justice) 4-7
4.5 Visual and Aesthetic Impacts 4-7
4.6 Cultural Resources 4-8
4.7 Air Quality 4-8
4.8 Noise and Vibration 4-10
4.9 Ecosystems 4-10
4.10 Water Resources 4-11
4.11 Geology and Subsurface Conditions 4-11
4.12 Hazardous Materials and Waste 4-12
4.13 Energy 4-15
4.14 Parklands and Recreational Resources 4-15
4.15 Summary of Environmental Issues 4-20

5.0 Cost Analysis
5.1 Capital Costs Analytical Overview 5-1
5.2 Capital Costs 5-2
5.3 Operating and Maintenance Costs 5-5

6.0 Public Involvement and Agency Coordination
6.1 Public Involvement Efforts 6-1
6.2 Project Briefings 6-5
6.3 Outreach Summary 6-7

7.0 Comparative Analysis of Alternatives
7.1 Recommended Alternatives 7-1
7.1.1 SR-60 LRT 7-1
7.1.2 Washington Boulevard LRT 7-5
7.2 Alternatives Not Recommended for Further Study 7-6
7.2.1 Beverly Boulevard LRT 7-6
7.2.2 Beverly/Whittier Boulevards LRT 7-7

List of Figures

ES-1 Project Study Area ES-2
ES-2 Screening Process ES-3
ES-3 Four Final Alternatives. ES-5
ES-4 SR-60 Alternative ES-15
ES-5 Washington Boulevard Alternative ES-19

1-1 Project Study Area 1-2
1-2 Activity Centers and Destinations. 1-4
1-3 Future Development. 1-5
1-4 2005 Transit-Dependent Population 1-8
1-5 2030 Population Density (2030) 1-9
1-6 2030 Employment Density (2030) 1-10

2-1 Screening Process 2-2
2-2 SR-60 LRT Alternative 2-10
2-3 SR-60 LRT Alternative Design and Operational Issues 2-13
2-4 Beverly Boulevard LRT Alternative 2-15
2-5 Beverly Boulevard LRT Alternative Design and Operational Issues 2-19
2-6 Beverly/Whittier LRT Alternative 2-21
2-7 Beverly/Whittier LRT Alternative Design and Operational Issues 2-25
2-8 Washington Boulevard LRT Alternative 2-29
2-9 Washington Boulevard LRT Alternative Design and Operational Issues 2-30

4-1 Cultural Resources Near Final Alternatives 4-9
4-2 Superfund Sites in PSA 4-13
4-3 Parkland and Recreational Facilities in PSA 4-16

List of Tables

ES.1 Conceptual Engineering Evaluation Criteria ES-6
ES.2 Description of Alternatives and Resulting Travel Times ES-7
ES.3 Estimated Annual O&M and Capital Costs ES-8
ES.4 Forecast Project Boardings and User Benefits ES-10
ES.5 Cost Effectiveness Indices and Other Evaluation Measures ES-11
ES.6 Comparative Analysis. ES-13

1.1 PSA Activity Centers and Destinations 1-3
1.2 Potential Future Development 1-6

2.1 Conceptual Engineering Evaluation Criteria 2-6
2.2 Operational Description of Alternatives 2-8
2.3 New Bridge Requirements 2-18
2.4 Conceptual Engineering Alignment and Station Refinements 2-31

3.1 SR-60 LRT Proposed Parking Spaces 3-2
3.2 Beverly Boulevard LRT Proposed Parking Spaces 3-3
3.3 Beverly/Whittier Boulevards LRT Proposed Parking Spaces 3-3
3.4 Washington Boulevard LRT Proposed Parking Spaces 3-4
3.5 Metro LRT Service Frequency 3-5
3.6 Proposed Train Consist Sizes (2030) 3-6
3.7 Summary of Operating Characteristics 3-7
3.8 Total Run Times 3-8
3.9 Project Boardings and User Benefits 3-9
3.10 Cost Effectiveness Indices and Other Evaluation Measures 3-10

4.1 Transit Oriented Development Opportunities 4-3
4.2 Summary of Preliminary Right-of-Way Acquisition Requirements 4-5
4.3 Purpose of Proposed Right-of-Way Acquisitions 4-6
4.4 Parkland and Recreational Facilities. 4-19
4.5 Summary of Environmental Impacts 4-22

5.1 Estimated Capital Costs (FY 2008 dollars) 5-4
5.2 Estimated Capital Costs per Mile (FY 2008 dollars). 5-4
5.3 Estimated Annual O&M Costs (FY 2008 dollars). 5-6
5.4 Proposed Train Consist Sizes (2030 Operations) 5-7

6.1 City Council Meetings and Open Houses 6-2
6.2 Summary of Focus Group Meetings. 6-3
6.3 Summary of City and Stakeholder Briefings. 6-7
6.4 Support of Project Alternatives by City 6-9

7.1 Comparative Analysis of Alternatives 7-2

Appendices

Appendix A	Conceptual Engineering Drawings
Appendix B	Phase 2 Ridership Technical Report
Appendix C	Basis of Capital Cost Estimate Refinement & Capital Cost Estimate Spreadsheets
Appendix D	Preliminary Operating Plan Technical Memorandum
Appendix E	Preliminary Operating and Maintenance Cost Estimate Technical Memorandum
Appendix F	Focus Group Invitee List
Appendix G	Outreach Meeting Record
Appendix H	Eastside Transit Corridor Phase 2 Acronym List

ES.0 EXECUTIVE SUMMARY

In 2007, the Eastside Transit Corridor Phase 2 Alternatives Analysis (AA) process was initiated for an 80-square mile study area located in eastern Los Angeles County. As shown in Figure ES-1, the study area consists of portions of 14 jurisdictions, including the cities of Bell, Commerce, Downey, El Monte, Industry, Los Angeles, Montebello, Monterey Park, Pico Rivera, Rosemead, Santa Fe Springs, South El Monte, Whittier and portions of unincorporated Los Angeles County.

The overall objective of the Eastside Transit Corridor Phase 2 AA process was to identify and assess a full range of transportation alternatives and recommend a preferred strategy, or phasing of strategies, that addresses PSA mobility needs and capacity requirements in the year 2030 and beyond. The AA process and documentation followed the Federal Transit Administration (FTA) New Starts Program guidelines and standards to not only provide a reasoned basis for the selection of the Recommended Alternatives, but also to ensure that the identified transportation strategy is eligible for federal funding.

Eastside Transit Corridor Phase 2 transportation alternatives were identified and evaluated through a detailed screening process incorporating technical and environmental analysis and public input. The screening process was based on project goals and evaluation criteria identified in consultation with the community and stakeholders. Each evaluation phase refined the results of the previous effort using increasingly detailed engineering, operational and environmental analysis along with continued public input. As illustrated in Figure ES-2, the evaluation process included the following efforts:

1. **Preliminary Screening** – A wide range of 47 Conceptual Alternatives was identified from previous corridor studies and through this project's early scoping process. These 47 Conceptual Alternatives were screened down to 17 Initial Alternatives representing varied alignments (routes) and technologies.
2. **Initial Screening** – Based on a comparative analysis and public feedback, the 17 Initial Alternatives were evaluated and reduced to five Refined Alternatives.
3. **Final Screening** – The five Refined Alternatives were studied and evaluated in detail. Based on the analytical results and public input, four Final Alternatives were identified for further study during conceptual engineering efforts.
4. **Conceptual Engineering Screening** – The four Final Alternatives were refined and studied based on conceptual-level engineering and station design, correspondingly more detailed technical analysis, and additional public and stakeholder input. This effort has resulted in the identification of the two Recommended Alternatives for further study.

Figure ES-1 Project Study Area

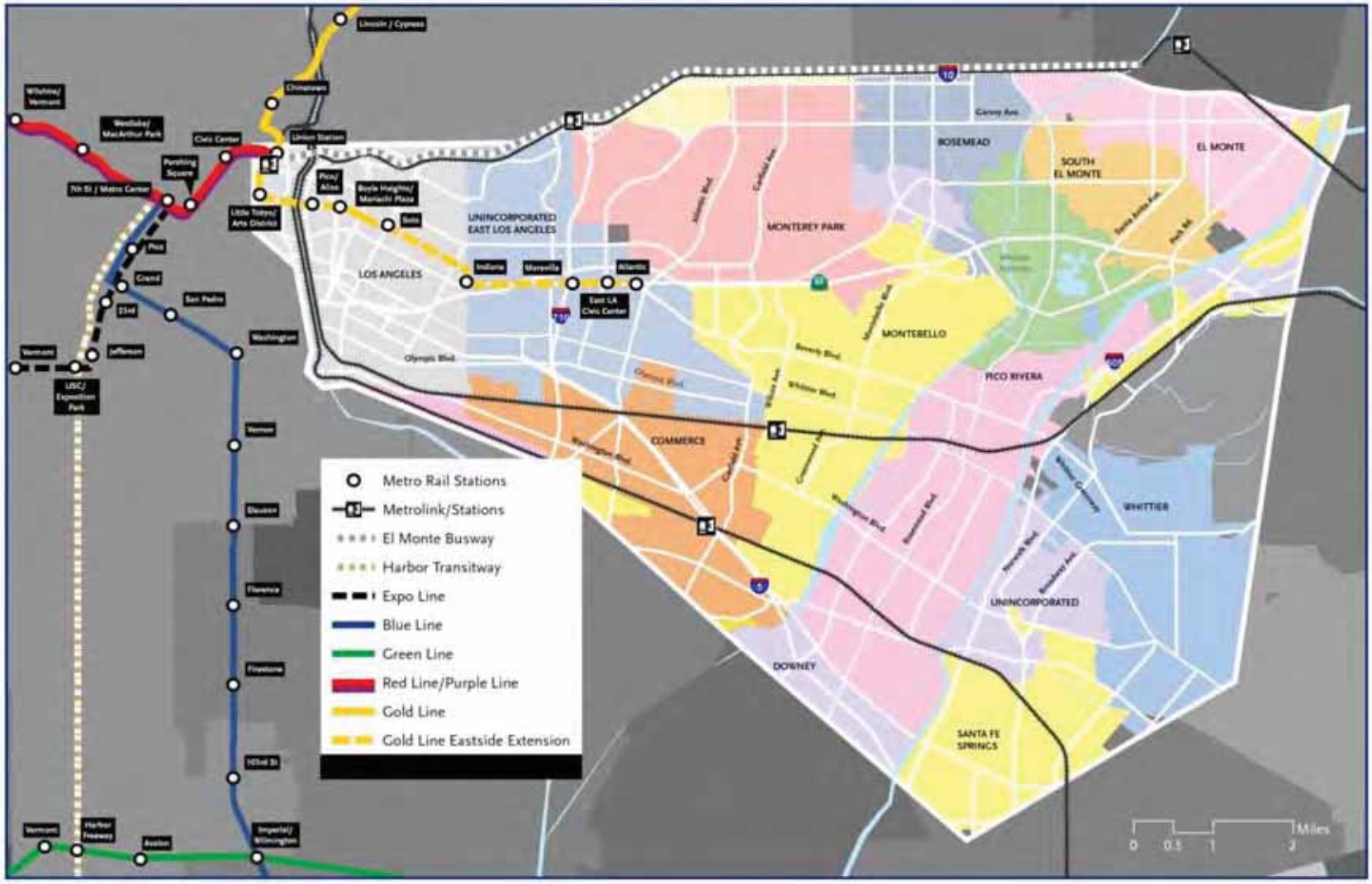


Figure ES-2 Screening Process

The first three screening efforts were documented in the *Eastside Transit Corridor Phase 2 Study Alternatives Analysis Report* completed in January 2009. The AA Report provided a detailed overview of the PSA's transportation needs and how they would be served by each of the five proposed project alternatives under consideration at the time. In January 2009, the Metro Board approved the four Final Alternatives, illustrated in Figure ES-3 on the following page, for further study:

- Alternative 1: State Route (SR) 60 Light Rail Technology
- Alternative 2: Beverly Boulevard Light Rail Technology
- Alternative 3: Beverly Boulevard/Whittier Boulevard Light Rail Technology (North-south connections between Beverly and Whittier Boulevards were considered on Montebello and Rosemead Boulevards.)
- Alternative 4: Washington Boulevard Light Rail Technology

Conceptual Engineering Screening

Conceptual-level engineering and station plans provided a higher level of definition of system design and operational parameters for the four Final Alternatives. This allowed for further refinement of project-related technical information, including operating speeds and travel times, ridership forecasts, travel benefits and capital and operating costs, as well as environmental and community impacts. As part of this effort, the individual alternatives were further examined to identify any alignment, engineering, operating, or environmental issue that could potentially preclude successful construction or operation of the alternatives. These issues would be considered to be fatal flaws and, to the extent that an alternative had such issues, it would be recommended for removal from further study in the Draft EIS/EIR phase and ACE. In addition, the individual alternatives were evaluated against each other to determine, based on the further identification of alignment, engineering, operating or environmental issues, whether some alternatives could be considered technically superior and therefore be the focus of continued study in a Draft EIS/EIR. Those alternatives with no specific fatal flaws but not considered to be technically superior compared to the remaining alternatives, would be recommended for removal from further study in the Draft EIS/EIR Table ES.1 presents the smaller, more focused set of evaluation criteria and performance measures used to clarify the differences between the Final Alternatives, allow for more informed decision-making, and highlight issues to be resolved during the next phase of analysis.

Figure ES-3 Four Final Alternatives

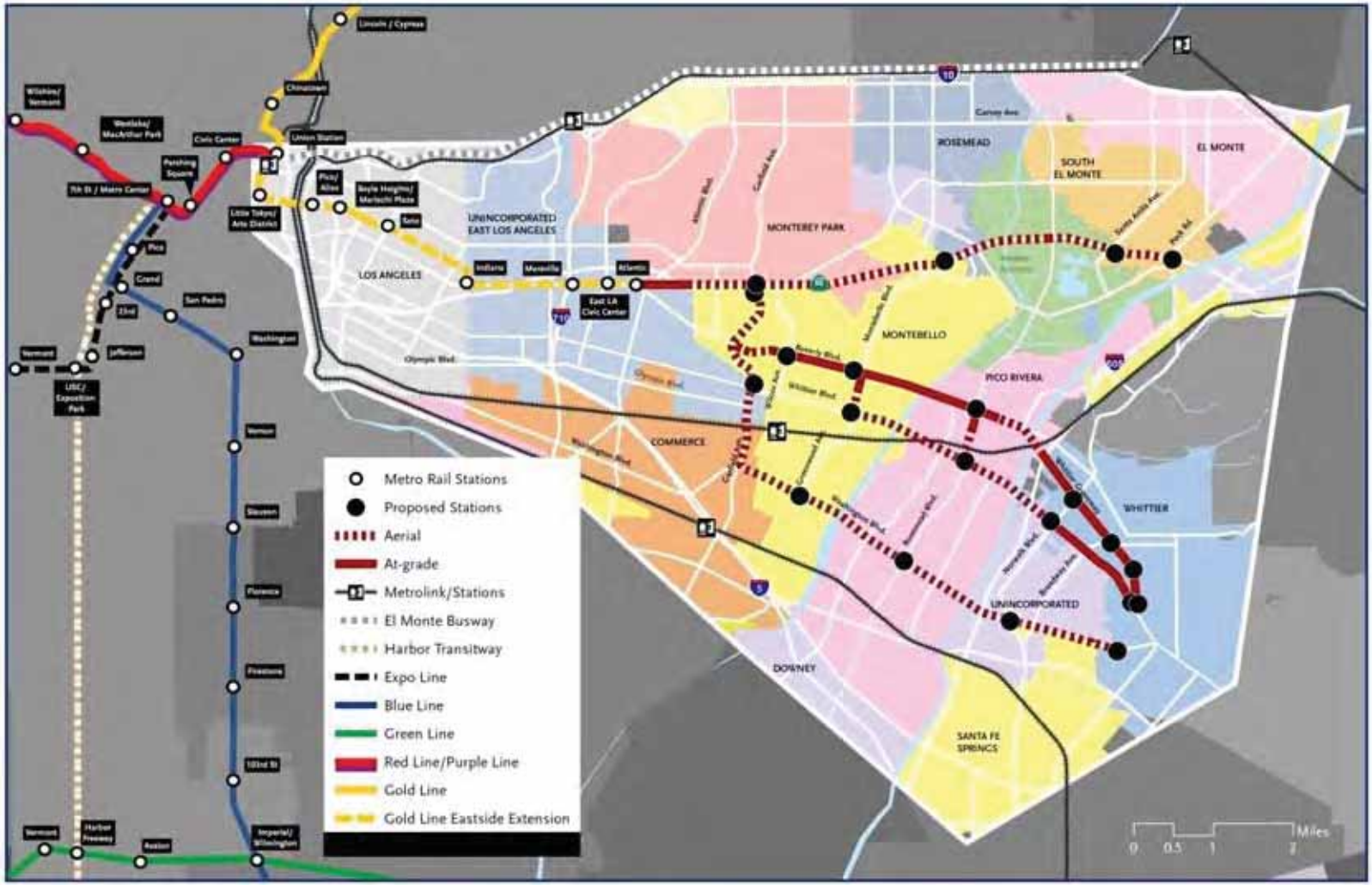


Table ES.1 Conceptual Engineering Evaluation Criteria

Mobility and Accessibility Improvements
1. Population and Employment Growth ▪ Capacity of New Projects ▪ Regional Connectivity 2. Ridership Forecasts ▪ Project Boardings ▪ Net New Transit Riders ▪ Change in Transit Mode Share 3. Travel Times ▪ Total Travel Times for each alternative ▪ Travel Time Savings 4. Cost Analysis (compared to Transportation System Management (TSM)) ▪ Cost Per New Daily Transit Trip ▪ Cost Effectiveness Rating
Project Costs
5. Capital Costs 6. Annual Operations and Maintenance Costs
Design and Operational Concerns
7. Overview of System Design and Operational Issues and Concerns
Environmental Concerns
8. Summary of Environmental and Community Impacts and Benefits
Public Support
9. Public, stakeholder and elected official input

ES.1 Evaluation Summary

The conceptual engineering-based evaluation of the four Final Alternatives has been completed and the results documented in an Addendum to the AA Report. The Conceptual Engineering alignment drawings provided refined design information, allowing for a more detailed assessment of the four Final Alternatives. Horizontal alignment and selective vertical profiles were developed, as well as conceptual-level station plans and designs that were used to finalize each alternative's alignment. The Final Alternatives were refined further to reduce identified impacts where possible. Conceptual engineering efforts provided a higher level of definition of system design and operational parameters. The refinement to the alignments resulted in revisions to operating speeds, travel times, projected ridership and user benefits, and capital and operating costs.

Technical Analysis Results

Conceptual engineering-based evaluation of the four Final Alternatives has been completed and the results are summarized below. Table ES.2 presents a description of the four Final Alternatives, including the north-south connector options on Montebello and Rosemead Boulevards, evaluated during Conceptual Engineering. The SR-60 and Washington Boulevard alternatives, with their predominately aerial operations, have the fastest travel times of the alternatives considered. The Washington Boulevard Alternative has an average travel time of 1.87 miles per minute, and the SR-60 Alternative's speed averages 1.77 miles per minute.

Table ES.2 Description of Alternatives and Resulting Travel Times

Alternative	Number of Stations	Length (miles)	Operational Characteristics	Run Time (min:sec)
1 SR-60 LRT	4	6.92	Aerial:94% Fill*:6%	12:28
2 Beverly Boulevard LRT	8	8.99	At-grade:64% Aerial:29% Fill: 7%	23:58
3 Beverly/Whittier LRT via Montebello Boulevard	8	9.10	At-grade:40% Aerial:52% Fill:8%	24:55
3 Beverly/Whittier LRT via Rosemead Boulevard	8	9.06	At-grade:56% Aerial:37% Fill:7%	23:17
4 Washington Boulevard LRT	6	9.26	Aerial:96% Fill: 4%	17:28

* Retained fill

A summary of the operating and capital costs associated with implementing each of the alternatives, as compared to the Transportation System Management (TSM) Option, is presented below in Table ES.3. The TSM Alternative represents enhancements to current bus service, such as providing more frequent service and limited stop service, along with the addition of new bus and shuttle services.

During Conceptual Engineering, estimated operations and maintenance (O&M) costs increased over those presented in the AA Report due to a number of factors including: revisions to the lengths of the alignments and number of stations; refinements to alignment horizontal and vertical profiles; changes in related run time estimates; and new Metro Operations policy for 2030 calling for the operation of three-car consist trains rather than the one- and two-car consist size used in the AA analysis.

The SR-60 Alternative had the lowest estimated O&M costs due to a high level of aerial operations along with the shortest alignment, the fewest number of stations and the lowest number of vehicles required of the Final Alternatives. The Washington Boulevard Alternative had the second lowest cost, but was higher than the SR-60 Alternative due to being 2.47 miles longer, having two more stations and requiring six more peak fleet vehicles. The three options with the initial segment of Beverly Boulevard were similar in O&M costs, primarily due to a similar length, number of stations and peak fleet vehicle requirement. Of the three options, the Beverly Boulevard Alternative had the lowest operating costs, primarily due to operations within a limited access right-of-way along the Whittier Greenway. The Beverly/Montebello/Whittier Alternative was second lowest of the three due to higher percentage of aerial operations and a shorter alignment length (0.09 miles) than the Beverly/Rosemead/Whittier option.

Table ES.3 Estimated Annual O&M and Capital Costs (Fiscal Year (FY) 2008 dollars)

Alternative	Annual O&M Cost (Millions)	Incremental Cost Over TSM (Millions)	Total Project Capital Cost (Billions)	Construction Cost Per Mile (Millions)	Total Project Cost Per Mile (Millions)
TSM	$143.4	-	$0.4	-	-
1 SR-60 LRT	$169.8	$26.4	$1.8	$131.4	$270.2
2 Beverly Boulevard LRT	$184.5	$41.1	$1.5	$74.8	$162.5
3 Beverly/Whittier LRT via Montebello Blvd.	$184.9	$41.3	$1.6	$95.3	$177.4
3 Beverly/Whittier LRT via Rosemead Blvd.	$184.7	$41.5	$1.5	$83.3	$166.4
4 Washington Boulevard LRT	$181.0	$37.6	$2.2	$133.3	$239.6

The resulting order-of-magnitude capital costs for the Final Alternatives, along with a comparison to the TSM Alternative, are presented above in Table ES.3. During Conceptual Engineering, estimated capital costs increased over those presented in the AA Report due to factors including:

- Refinement of each alternative's horizontal and vertical plans;
- Refinement of the number of stations, their conceptual design and proposed location;

- Identification of the number of required parking structures, their size and possible location;
- Clarification of land acquisition requirements;
- Identification of the need for new bridges crossing the Rio Hondo, San Gabriel River and I-605 Freeway, and Norwalk Boulevard (for the Whittier Greenway section of the Beverly Boulevard Alternative);
- Addition of aerial segments to avoid Southern California Edison (SCE) transmission lines and to more easily cross bridges and the I-605 Freeway;
- Identification of a higher peak fleet size based on Metro Operations policy; and
- More detailed identification of utility impacts.

The alternatives with the highest estimated capital costs were the two options with primarily aerial operations: the SR-60 and Washington Boulevard alternatives. The Washington Boulevard Alternative was identified as more expensive due to a longer alignment (2.47 miles longer) and two more aerial stations than the SR-60 option. The estimated capital costs of the other three alternatives were similar; the Beverly/Montebello/Whittier Alternative was identified as slightly higher in cost due to more miles of aerial operations (2.2 miles more than the Beverly Boulevard Alternative and 1.4 miles more than the Beverly/Rosemead/Whittier Alternative).

The per mile costs are close for the SR-60 and Washington Boulevard alternatives, but the SR-60 option was estimated to cost more due to higher (33 percent) land and right-of-way acquisition requirements for stations and supporting structures. The Beverly Boulevard Alternative had the lowest estimated cost per mile due to the lowest percentage (37 percent) of aerial operations among the options. The Beverly/Rosemead/Whittier Alternative was estimated to cost slightly more per mile based on a higher percentage (44 percent) of aerial operations. The Beverly/ Montebello/Whittier Alternative was identified as even higher in cost due to 60 percent aerial operations.

Ridership projections were prepared utilizing the Metro Travel Demand Model for the Final Alternatives to provide a basis for comparison. Table ES.4 on the following page presents the projected passenger daily and annual boardings along with forecast new transit riders attracted through implementation of each of the proposed alternatives in the year 2030. User benefits have been identified and presented for each alternative.

The forecast daily boardings for the Final Alternatives fall within a close range and the resulting ridership is almost indistinguishable. However, the Washington Boulevard

Alternative is forecast to have the highest level of daily and annual boardings, at 15,660 and 5.1 million, respectively, of the alternatives.

Table ES.4 Forecast Project Boardings and User Benefits (FY 2030)

Alternative	Daily Boardings	Annual Boardings (Millions)	Average Weekday New Riders	User Benefits Per Project Boarding (Minutes)	User Benefits (Hours)
1 SR-60 LRT	12,270	4.0	3,835	17.0	3,474
2 Beverly Boulevard LRT	12,780	4.2	5,020	24.6	5,241
3 Beverly/Whittier LRT via Montebello Boulevard	12,700	4.1	5,190	25.9	5,470
3 Beverly/Whittier LRT via Rosemead Boulevard	12,410	4.0	5,060	25.8	5,336
4 Washington Boulevard LRT	15,660	5.1	6,280	24.1	6,293

The Washington Boulevard Alternative is forecast to attract the highest number of new transit riders, and the SR-60 Alternative the lowest number of new riders. The Beverly Boulevard and Beverly/Whittier Boulevards alternatives are estimated to attract a similar number of new riders. User benefits are defined as the weighted travel time savings for all users of each of the project alternatives. The Washington Boulevard Alternative is forecast to have the greatest user benefits at 6,293 hours or 24.1 minutes per project boarding. The Beverly/Whittier via Montebello Boulevard Alternative is projected to have the next highest user benefits at 5,470 hours, or 25.9 minutes per project boarding. The SR-60 Alternative is forecast to have the lowest level of user benefits at 3,474 hours, or 17.0 minutes per project boarding.

Cost-effectiveness is a measure used by FTA to evaluate the efficiency of a transit project, by comparing the project costs (both capital and operating) with the expected benefits (increased ridership). The efficiency is measured in cost per new transit rider. This cost is based on the annualized total capital project investment and the annual project operating costs, divided by the forecast change in annual transit system ridership. The lower the incremental cost per new transit rider, the more cost-effective the project alternative is. A project with a cost effectiveness of $24.49 per new rider or less has typically received an FTA rating of medium, which represents a minimum acceptable threshold for entering FTA's New Starts Program.

As shown below in Table ES.5, none of the alternatives currently meets the FTA threshold for cost-effectiveness. Two of the alternatives – the Beverly Boulevard and the Beverly/Whittier alternatives – have similar cost effectiveness indices that range between $72.51 and $74.02. The two aerial alternatives have lower indices: the Washington Boulevard Alternative at $82.94 and the SR-60 Alternative, the lowest cost effectiveness rating of the alternatives, at $110.66. The Washington Boulevard Alternative, even with a significantly higher capital cost, is comparable in the cost-effectiveness comparison with the other two lower cost alternatives due to attracting a higher level of ridership. The differences between the alternatives are minor when considering the Incremental Cost per Project Boarding.

Table ES.5 Cost Effectiveness Indices and Other Evaluation Measures (FY 2030)

Evaluation Measure	SR-60	Beverly	Beverly/ Rosemead/ Whittier	Beverly/ Montebello/ Whittier	Washington
Cost Effectiveness Index					
Average Weekday User Benefits (hours)	3,474	5,241	5,470	5,336	6,293
Average Annual User Benefits (hours)	1,129,050	1,703,325	1,777,750	1,734,200	2,045,225
Cost Effectiveness Index	**$110.36**	**$72.51**	**$72.81**	**$74.02**	**$82.94**
Other Evaluation Measures					
Average Weekday New Riders	3,835	5,020	5,060	5,190	6,280
Average Annual New Riders (millions)	1.1	1.6	1.7	1.6	2.0
Incremental Cost Per New Rider	$99.97	$75.75	$76.78	$78.00	$83.10
Incremental Cost Per Project Boarding	$31.25	$29.74	$31.32	$31.89	$33.33

Public Involvement and Agency Coordination

During the Conceptual Engineering phase, a comprehensive public participation program was developed and implemented to involve the public, stakeholders, city representatives and elected officials in the alternative evaluation process. The outreach program included community open houses, council briefings and a series of focus groups as well as ongoing briefings. Public open houses were held prior to the council briefings made to the seven cities through which the alternatives travel: Commerce, Montebello, Monterey Park, Pico Rivera, Rosemead, South El Monte and Whittier. Four alignment-specific focus groups were held with city elected officials, city executive staff members, planning commissioners, chamber of commerce members, college and school district representatives, developers and other key stakeholders. Ongoing briefings were held to keep elected officials, city staff, institutional groups, regulatory agencies and other stakeholders apprised of the latest project information. Agencies briefed included the Federal Transit Administration, Caltrans, and the San Gabriel

Valley and Gateway Cities councils of governments. A legislative briefing for federal, state and local elected officials and their staff was also held in September 2009.

A strong support base developed for two of the alternatives under consideration: the SR-60 and Washington Boulevard alternatives as presented in the Addendum to the AA. Letters and/or resolutions from ten cities documented their support for either of these two options. The SR-60 Alternative is supported by the cities of El Monte, Montebello, Monterey Park, Rosemead and South El Monte in resolutions, as well as through the formation of the SR-60 Coalition. The City of Industry has also indicated support for the SR-60 Alternative. Support for the Washington Boulevard Alternative has been demonstrated by the cities of Commerce, Pico Rivera, Santa Fe Springs and Whittier.

ES.2 Recommended Alternatives

In summary, all of the proposed alternatives have benefits and impacts, as it is challenging to construct a high-capacity light rail transit system in a heavily-developed, urban area with constrained street right-of-way widths lined with one- and two-story buildings. The primary goal of the Eastside Transit Corridor Phase 2 project is to provide a transportation system that better serves the PSA's communities without negatively impacting quality of life. Based on the technical analysis and outreach results documented in the Addendum to the AA Report, two build alternatives, along with the No Build and Baseline/TSM options, are recommended to be carried through the preparation of a Draft EIS/EIR process. A graphic summary comparison is provided, in Table ES.6, to compare all non-fatal flawed proposed alternatives and to demonstrate the technically superior alternatives.

Table ES.6 Comparative Analysis

Key Measures	SR-60	Beverly/Whittier	Washington
Total Ridership	◐	◐	●
Ridership: Boardings per Mile per Day	◐	○	●
Ridership: Boardings per Station	●	◐	●
Ridership: Access by Park-N-Ride Riders	●	◐	◐
Ridership: Access by Pedestrian & Bicycle Riders	○	◐	●
Ridership: Access by Bus Riders	○	●	◐
Accessibility to Transit-Dependent Populations	○	●	◐
Capital Cost	◐	●	○
Cost per Mile	○	●	◐
Travel Time	●	○	◐
Operations & Maintenance Costs	●	○	◐
Required Land Use and Zoning Changes to Support Transit Along Corridor	◐	○	●
Loss of Travel Lanes and/or Vehicle Conflicts	●	○	●
Loss of On-Street Parking	●	○	●
Catalyst for Public/Private Economic Revitalization	◐	●	◐
Right-of-Way Acquisition Note: Property for replacement parking may be necessary and has not yet been analyzed	◐	◐	◐
Community and Neighborhood Impacts (EJ)	●	○	◐
Visual Compatibility and Aesthetic Impacts	◐	○	◐
Section 4(f) Resources (Cultural & Parklands)	◐	◐	●

Key Measures	SR-60	Beverly/Whittier	Washington
Air Quality	●	●	◐
Noise and Vibration Sensitive Land Uses	●	○	◐
Ecosystems	◐	●	●
Water Resources	◐	◐	◐
Geology and Subsurface Conditions	◐	●	●
Hazardous Materials and Waste	○	◐	◐
Community Support	●	○	●

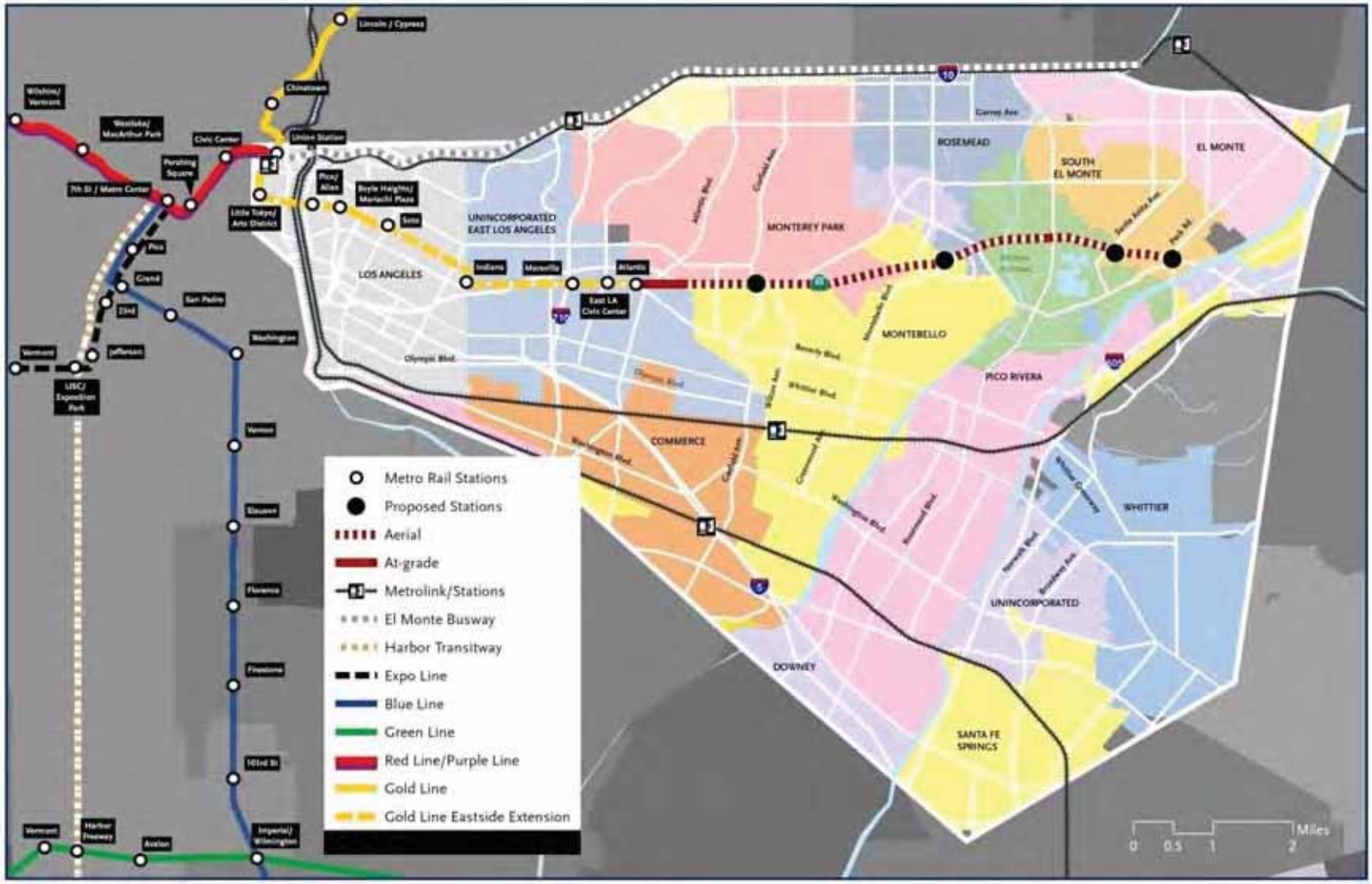
● Favorable rank ◐ Mid rank ○ Low rank

ES.2.1 SR-60 LRT

The SR-60 Alternative, as illustrated in Figure ES-4 on the following page, is recommended to move forward into the Draft EIS/EIR phase based on the following:

- Minimal community impacts would result from the construction and operation of this alternative – the aerial system and stations fit within the SR-60 Freeway right-of-way; however, it should be noted that as currently designed, this alternative will impact 12 residential properties.
- PSA mobility goals of providing improved regional connectivity are achieved with this alternative by connecting with the regional Metro rail system, providing additional transportation capacity to serve increasing travel demand, reducing vehicular travel on the regional highway system and attracting new transit riders.
- This alternative will primarily serve longer work-based trips. Access to this alternative will be enhanced by the provision of a bus feeder network and station-related parking structures. This alternative will also serve educational, shopping and recreational trips.
- Existing development and proposed land use plans along the alignment will be supported. Station areas provide transit oriented development opportunities.

Figure ES-4 SR-60 LRT Alternative



- North-south bus feeder networks and parking structures at every station provide additional accessibility.
- This alternative provides the fastest travel time of all the alternatives.
- This alternative results in good ridership that may be strengthened in the future with the use of the new Metro ridership model under development. The new model includes the Regional Connector, which would improve performance of this alternative by providing east-west, one-seat connections and single transfer, north-south connections desired by people traveling to and from the PSA.
- This alignment has experienced a high level of community, stakeholder and elected official support.

Challenges

- Hazardous Materials – Hazardous materials are present and remediation efforts are underway at the former OII/current Superfund site. Construction of the project adjacent to the site has the potential to disrupt ongoing remediation efforts.
- Flood Control and Parkland Impacts – According to the U.S. Army Corps of Engineers, flood plains are located within the Santa Anita station area. Rail system construction may impact these facilities. Additionally, the alignment travels adjacent to and within a portion of the Whittier Narrows Recreation Center, which also serves a flood control role; therefore, there is also the potential for parkland and flood control impacts.
- High Capital Cost – Options for potentially reducing the costs of this alignment will be explored during the next study phase, which includes development of ACE plans which will examine in more detail the proposed station to refine property requirements; the alignment in the area of the Whittier-Narrows Park to move the alignment out of the park area, if possible; develop a minimum operating segment for construction; review impacts utility relocations in greater detail; and refine capital cost estimates based upon the increased level of alignment detail .
- Terminus Station – Assessing an extension of the alignment further east to the former Crossroads Parkway Station could help recapture lost ridership caused by shortening the alignment and not serving commuters before the I-605/SR-60 interchange.
- Southern California Edison (SCE) Plans – Future engineering efforts will require close coordination with SCE due to their plans for construction of new 500kV transmission lines and towers adjacent to the SR-60/Paramount interchange and in the Peck Road Station Area as part of the Tehachapi Renewable Transmission project.

  Agency Coordination – This alignment will require significant coordination with other agencies including, but not limited to, Caltrans, Federal Highway Administration, U.S. Environmental Protection Agency, SCE and the U.S. Army Corps of Engineers.

ES.2.2 Washington Boulevard LRT

The Washington Boulevard LRT Alternative, as illustrated in Figure ES-5, is to move forward into the Draft EIS/EIR phase based on the following:

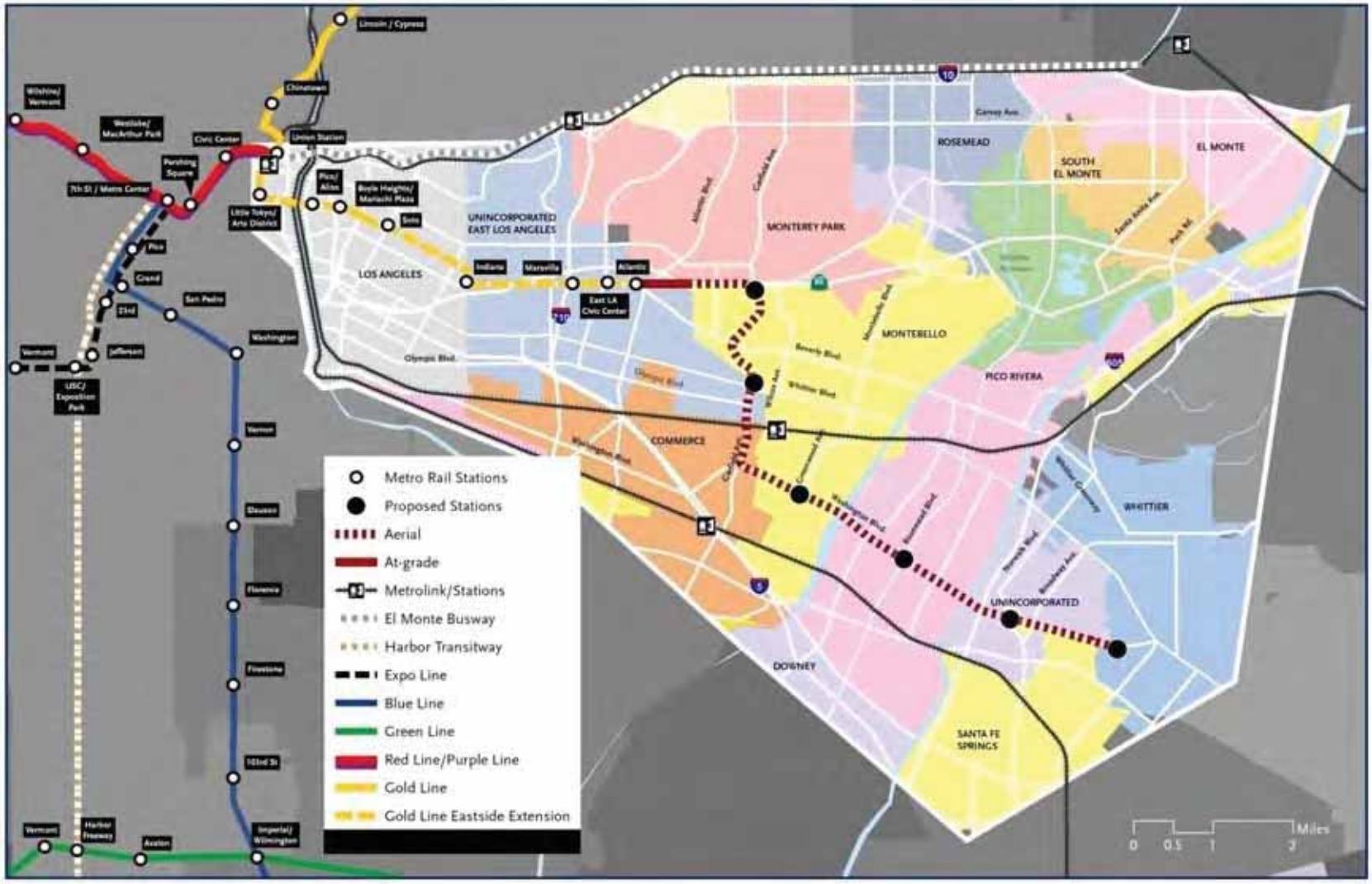
- Minimal community impacts would result from the construction and operation of this alternative due to the scale of the community, and streets along this alignment can accommodate both the aerial system and stations with minimal impacts to quality of life and traffic circulation.
- PSA mobility goals of providing improved regional connectivity are achieved with this alternative by connecting with the regional Metro rail system, providing additional transportation capacity to serve increasing travel demand, reducing vehicular travel on the regional highway system and attracting new transit riders.
- This alternative would build a strong ridership base by providing service for the following trip purposes:
    - Short, frequent trips within the communities it operates through.
    - Work trips to and from Washington Boulevard employment sites.
    - Work and other trips to and from the southern portion of the PSA including the Gateway Cities and I-5 Freeway corridor as well as to communities to the north of the SR-60 Freeway via bus and park-and-ride access at the SR-60/Garfield station.
    - Work trips west to downtown Los Angeles and destinations beyond.
- North-south bus feeder networks and parking structures at most stations provide additional accessibility.
- Existing development and proposed land use plans are transit-supportive along the alignment, particularly at the terminus station area within the City of Whittier.
- This alternative results in the highest ridership and user benefits of all the alternatives. These numbers may increase in the future with the use of the new Metro ridership model under development. This new model includes the Regional Connector, which would improve performance of this alternative by providing east-west, one-seat connections and single transfer, north-south connections desired by people traveling to and from the PSA.
- This alternative attracts the highest number of new transit riders.
- This alternative provides the second fastest travel time of the four alternatives.

- This alternative will provide additional travel capacity with minimal impacts on the PSA's street system, which is heavily-used by cars and large trucks.
- This alternative has experienced a high level of community, stakeholder and elected official support.

Challenges

- High Capital Cost – Options for potentially reducing the cost of this alternative will be explored during the next study phase, which includes development of ACE plans which will examine in more detail: right-of-way requirements; potential at-grade alignment east of the San Gabriel River; station design to reflect property needs for station facilities; refine utility relocation requirements; develop a minimum operating segment for construction; and refine capital cost estimates based upon increased level of alignment detail . Cost reduction considerations will include, but will not be limited to, evaluating some at-grade sections and identifying partnerships to develop shared-use parking structures.
- Agency Coordination – This alignment will require significant coordination with other agencies including, but not limited to, Caltrans, the Federal Highway Administration, SCE, Union Pacific Railroad (UPRR), the U.S. Army Corps of Engineers and the Los Angeles Department of Water and Power.

Figure ES-5 Washington Boulevard LRT Alternative



ES.3 Alternatives Not Recommended for Further Study

ES.3.1 Beverly Boulevard LRT

The Beverly Boulevard LRT Alternative is not recommended to move forward into the Draft EIS/EIR phase based on the following:

- Fatal Flaws – The eastern half of this alignment has several major challenges where it leaves the Beverly Boulevard right-of-way and crosses primarily vacant land to enter the Whittier Greenway, which is a former railroad right-of-way that has been reused as a landscaped recreational trail. The vacant land through which the alignment would traverse is owned by SCE and UPRR. The Whittier Greenway is owned by the City of Whittier.
    - This vacant area serves as SCE's "regional backbone" with existing 220kV transmission lines that are planned for upgrading to 500kV service, including new transmission towers as part of SCE's Tehachapi Renewable Transmission project. SCE representatives have indicated that they cannot permit at-grade or aerial rail operations through the property and that they have potential long-term plans for use of all of their property.
    - The UPRR tracks currently accommodate Metrolink and freight operations, and they too have future plans for their property that preclude any other structures.
    - The Whittier Greenway is lined on both sides by single-family residences, and on the north side by four schools. LRT operations would require acquisition of half of this recreational area. Taking half of this parkland resource for rail use raises 4(f) issues that may not be resolvable. Funding for the Greenway included federal funds from the U. S. Department of the Interior (National Park Service) raising the possibility of 6(f) issues. As owner of the Greenway, the City of Whittier has stated that they oppose the co-use of their recreational resource for LRT operations.
- Community Impacts:
    - Project would provide additional transportation capacity; however existing street system operations would be negatively impacted. There are several constrained sections on Beverly Boulevard that make it difficult for rail operations and necessary vehicular capacity to coexist.
    - Additional regional transportation capacity is provided to the detriment of local communities with impacts to sensitive land uses including visual, traffic, safety, noise and vibration impacts.

- Rider Benefits – Lack of compelling transit rider benefits, since ridership, user benefits, and travel times are not promising enough when balanced against the possible community impacts.
- Lack of community, stakeholder and elected official support.

ES.3.2 Beverly/Whittier Boulevards LRT

The Beverly/Whittier Boulevards LRT Alternative, with north-south travel connections on Montebello or Rosemead Boulevards, is not recommended to move forward into the Draft EIS/EIR phase and ACE due to the following:

A. Community Impacts – This alternative introduces approximately 50 percent aerial rail operations into a constrained street system lined with one- and two-story structures often built to the sidewalk edge, such as in downtown Montebello. Technical and environmental analysis identified significant community impacts, including a high potential for noise and vibration, community cohesion and street system capacity impacts, for this alternative. There are possible parkland impacts related to the final operating segment, terminal station and tail tracks, which would be located adjacent to and possibly within a portion of the Whittier Greenway. Individually, specific potential community impacts can be mitigated. However, the culmination of a high number of potential community impacts can be a high concern for community cohesion. A number of specific potential impacts are as follows:

B. The Beverly/Montebello/Whittier Boulevards alignment has a major pinch point as the aerial rail structure traveling south in the median of Montebello Boulevard turns east onto Whittier Boulevard in downtown Montebello. The resulting alignment radius is so tight that the rail structure comes within several feet of the commercial building located at the northeast corner of Whittier and Montebello Boulevards. In addition, with the commercial buildings along Whittier Boulevard built to the sidewalk edge of this narrow street, the aerial rail structure and station planned for this location would cover approximately 60 percent of the street right-of-way. Construction of a rail system in this location would require the removal of the recently implemented downtown Montebello streetscape improvements.

C. On the Beverly/Rosemead/Whittier Boulevards alignment, there is a major community impact along Rosemead Boulevard just north of Whittier Boulevard. This section is planned for aerial operations running in the median of Rosemead Boulevard

where it must cross-over Union Pacific/Metrolink tracks set on a bridge perpendicular to Rosemead Boulevard. In order to allow sufficient room for the LRT structure to cross over the Metrolink and freight trains, the top of the aerial rail structure would need to be 48 feet above the existing railroad bridge. This portion of the alignment is lined with one- and two-story, single-family homes resulting in significant visual, noise and other impacts.

- Rider Benefits – Lack of compelling transit rider benefits as resulting ridership, user benefits and travel times are not promising enough when balanced against the possible community impacts.
- Lack of community, stakeholder and elected official support.

Next Steps

The recommendations contained herein will be presented to the Metro Board in October 2009 for approval. With Metro Board approval, the two Recommended Alternatives will advance into environmental review in compliance with the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA).

1.0 PURPOSE AND NEED

1.1 Project Study Area

The Los Angeles County Metropolitan Transportation Authority (Metro) has initiated an Alternatives Analysis (AA) study to evaluate possible transportation alternatives for the second phase of the Metro Gold Line Eastside Extension. The first phase of the Metro Gold Line Eastside Extension is a six mile, eight station light rail transit line that is scheduled to begin operations in 2009. This extension will directly interface with the Metro Gold Line service to Pasadena, thereby eliminating any need to transfer at the line's current terminus at Union Station, and will provide residents of East Los Angeles with a direct connection to the region's Metro Rail system. Approximately 30,000 daily riders are expected to utilize the first phase of the Eastside Extension by the year 2030.

The purpose of the Eastside Transit Corridor Phase 2 AA process was to identify and assess a full range of transportation alternatives to extend transit service east from the terminus of the first phase of the Metro Gold Line Eastside Extension, and to recommend a preferred strategy that addresses the Project Study Area (PSA) mobility needs and capacity requirements in the year 2030 and beyond. Initiated in January 2007, the AA process included four phases of screening all possible alternatives down to the most viable alternatives to meet the identified goals and objectives for transportation improvements in the study area. The first three evaluation efforts were documented in the *Eastside Transit Corridor Phase 2 AA Report* completed and approved by the Metro Board in January 2009. The final level of evaluation of the four Final Alternatives identified in the AA Report, based on conceptual level-engineering and station design, is documented in this Addendum to the AA Report.

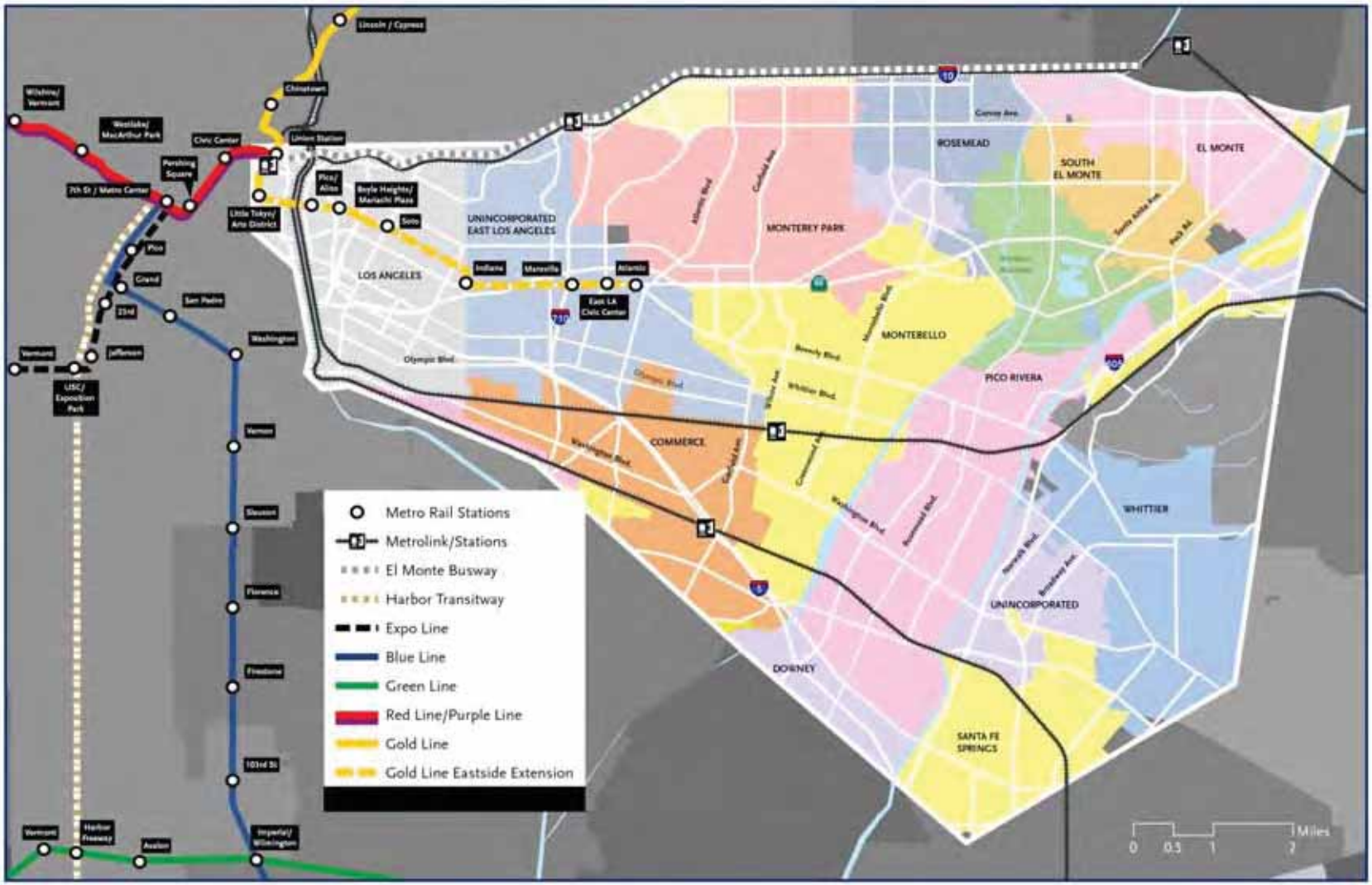
1.1.1 PSA Description

The Eastside Transit Corridor Phase 2 Project Study Area (PSA), which includes the Phase 1 study area, is 80 square miles in area and located in eastern Los Angeles County. (See Figure 1-1 on the following page). The PSA's western boundary is the eastern edge of downtown Los Angeles; the eastern boundary lies east of the I-605 Freeway. It is bounded by the I-10 Freeway to the north, and the I-5 Freeway to the southeast. The Phase 2 PSA includes the cities of Bell, Commerce, Downey, El Monte, Industry, Los Angeles, Montebello, Monterey Park, Pico Rivera, Rosemead, Santa Fe Springs, South El Monte, Whittier and unincorporated portions of Los Angeles County.

Activity Centers and Destinations

The PSA's key activity, employment, and transportation destinations are presented in Table 1.1 and Figures 1-2 and 1-3 on the following pages. The types of activities served by the

Figure 1-1 Project Study Area



alignment alternatives include the following:

- Health and Medical Services – including the Beverly Hospital, Kaiser Permanente medical offices and the Presbyterian Intercommunity Hospital;
- Business/Industrial Parks – are concentrated in the cities of Commerce, El Monte and Industry;
- Commercial Areas – including main street retail districts, such as Downtown Montebello, Whittier Boulevard and Uptown Whittier. In addition, the cities of Commerce, Montebello and Pico Rivera each have large regional retail centers;
- Educational Institutions – including the East Los Angeles Community College, Rio Hondo Community College and Whittier College; and
- Recreational Areas – including the Whittier Narrows Recreation Center, Montebello Golf Course, Whittier Greenway, Palm Park, Pio Pico State Park and many other smaller parks.

Table 1.1 PSA Activity Centers and Destinations

City	#	Activity Center/Destination
Commerce	1	Citadel Regional Shopping Center
	2	Commerce Casino
El Monte	3	El Monte Busway Station
	4	Five Points Plaza
Industry	5	Industry Office Park
Los Angeles	6	Historic Whittier Boulevard Shopping District
Montebello	7	Beverly Bowl
	8	Beverly Hospital
	9	Montebello Golf Course
	10	Montebello Mart Shopping Center
	11	Montebello Town Center
	12	Montebello Town Square Shopping Center
	13	Newmark Street Mall
Monterey Park	14	Atlantic Square Shopping Center
	15	East Los Angeles Community College
	16	Garfield Medical Center
	17	Landmark Shopping Center
	18	Monterey Park Hospital
	19	Monterey Park Mall
	20	Monterey Park Village
	21	Taipei Center
Pico Rivera	22	Pico Rivera Towne Center
Rosemead	23	Jess Gonzales Sports Park
	24	Whittier Narrows Recreation Area
Santa Fe Springs	25	Santa Fe Springs Market Place

Figure 1-2 Activity Centers and Destinations

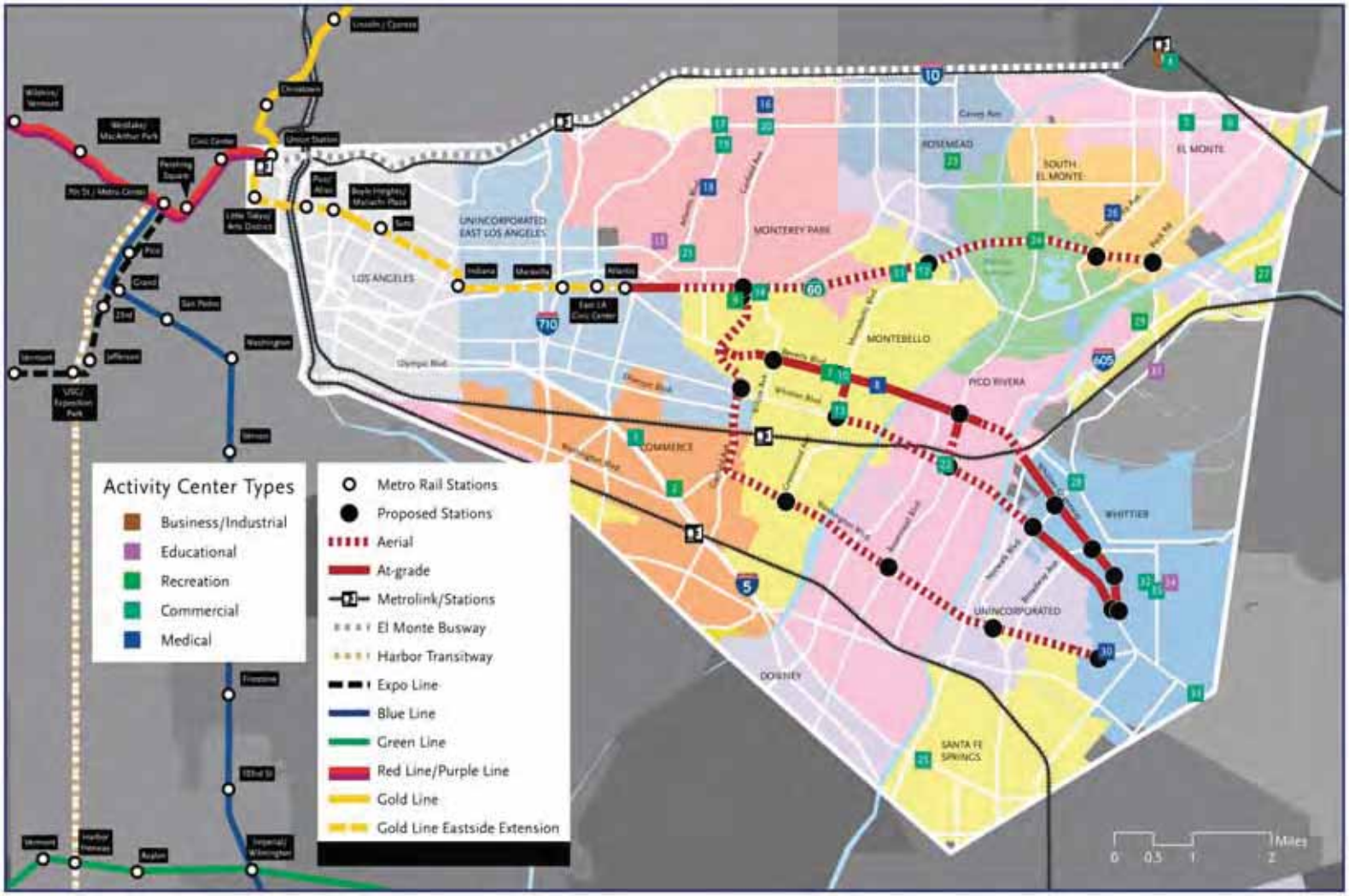


Figure 1-3 Future Development

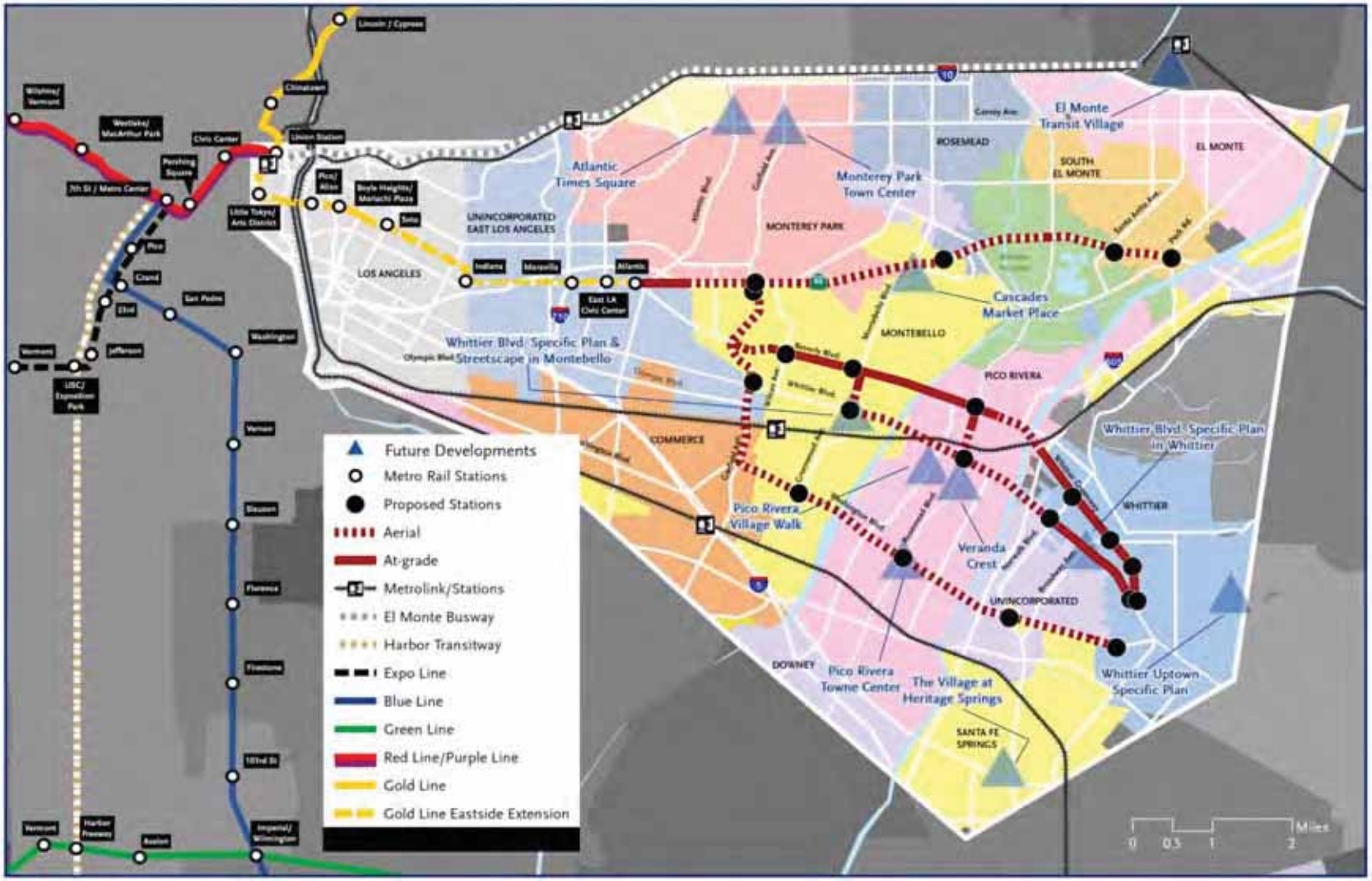


Table 1.1 PSA Activity Centers and Destinations (continued)

City	#	Activity Center/Destination
South El Monte	26	Greater El Monte Community Hospital
Whittier	27	California Country Club
	28	Model Plaza Shopping Center
	29	Pico Rivera Sports Arena
	30	Presbyterian Intercommunity Hospital
	31	Rio Hondo College
	32	Uptown Whittier District
	33	Village Square Shopping Center
	34	Whittier College
	35	Whittier Station Shopping Center

Future Development

As documented in the AA Report, many of the cities in the PSA are planning development projects to meet increasing residential and commercial demands. These future projects are typically ideal locations for public transit services due to the potential to capture a large share of patrons and alleviate traffic congestion. Figure 1-2 and Table 1.2 describe the anticipated future development projects in the PSA. Development information will be updated in future study phases.

Table 1.2 Potential Future Development

City	Future Development	Type
El Monte	El Monte Transit Village Specific Plan	Mixed-Use
Monterey Park	Atlantic Times Square	Mixed-Use
	Cascades Market Place	Retail
	Monterey Park Towne Center	Mixed-Use
Pico Rivera	Pico Rivera Towne Center	Retail
	Pico Rivera Village Walk	Retail
	Veranda Crest	Residential
Santa Fe Springs	The Village at Heritage Springs	Residential

1.1.2 PSA Demographics and Transit Dependency Factors

Since the completion of the Eastside Transit Corridor Phase 2 AA Report in January 2009, there have been no updates or revisions to the demographics reported in that document. Consequently, the same demographics were used in the development of this Addendum to the AA Report. The demographics and transit dependency factors, as previously discussed in the AA, are summarized below:

- 2005 PSA population is 673,000, or approximately seven percent of the Los Angeles County population.

- Population growth in the PSA is projected to increase by 23 percent between 2008 and 2030.
- Low-income households comprise 45 percent of the PSA's total 2005 households.
- 42 percent of the PSA population is age 18 and younger, or age 65 and older.
- Approximately 16 percent of households in the PSA had zero vehicles in 2005, with some tracts in the western portion of the PSA containing 25 percent of households with no vehicles.

In 2030, transit dependency and the number of households with low and medium income levels in the Eastside PSA are forecast to continue growing, and transit-dependent residents will increasingly rely on alternate modes of travel. Figure 1-4 presents transit dependency characteristics in the PSA.

Population and Employment Density

By the year 2030, the PSA population of 673,000 in the year 2005 is expected to increase by 23 percent – making the Eastside home to more people than the current population of the City of San Francisco. The average PSA population density in 2005 was approximately 12,000 people per square mile, compared to a countywide average of 2,431 in 2008. The eastern portion of the PSA has many census tracts with more than 20,000 persons per square mile.

PSA employment is forecast to grow by 15 percent by the year 2030. Currently, employment densities in the PSA range from less than 300 employees per square mile to over 170,000 employees per square mile, with an average employment density of approximately 6,000 employees per square mile. The average employment density is expected to increase to approximately 7,000 employees per square mile in 2030.

Areas of high projected employment density are, for the most part, found outside the Eastside PSA, resulting in the population within the PSA generally traveling west for employment opportunities. A high-capacity, fixed guideway transit investment connecting residents to the Metro Gold Line Eastside Extension would allow for increased mobility and reduced travel time to employment centers served by the Metro rail system.

Figures 1-5 and 1-6 on the following pages present the forecast 2030 population and employment densities, respectively, within the PSA. High forecast population and employment densities will result in more daily trips within the PSA, leading to more congestion and longer travel times, thereby increasing the need for alternative forms of transit.

Figure 1-4 2005 Transit-Dependent Population

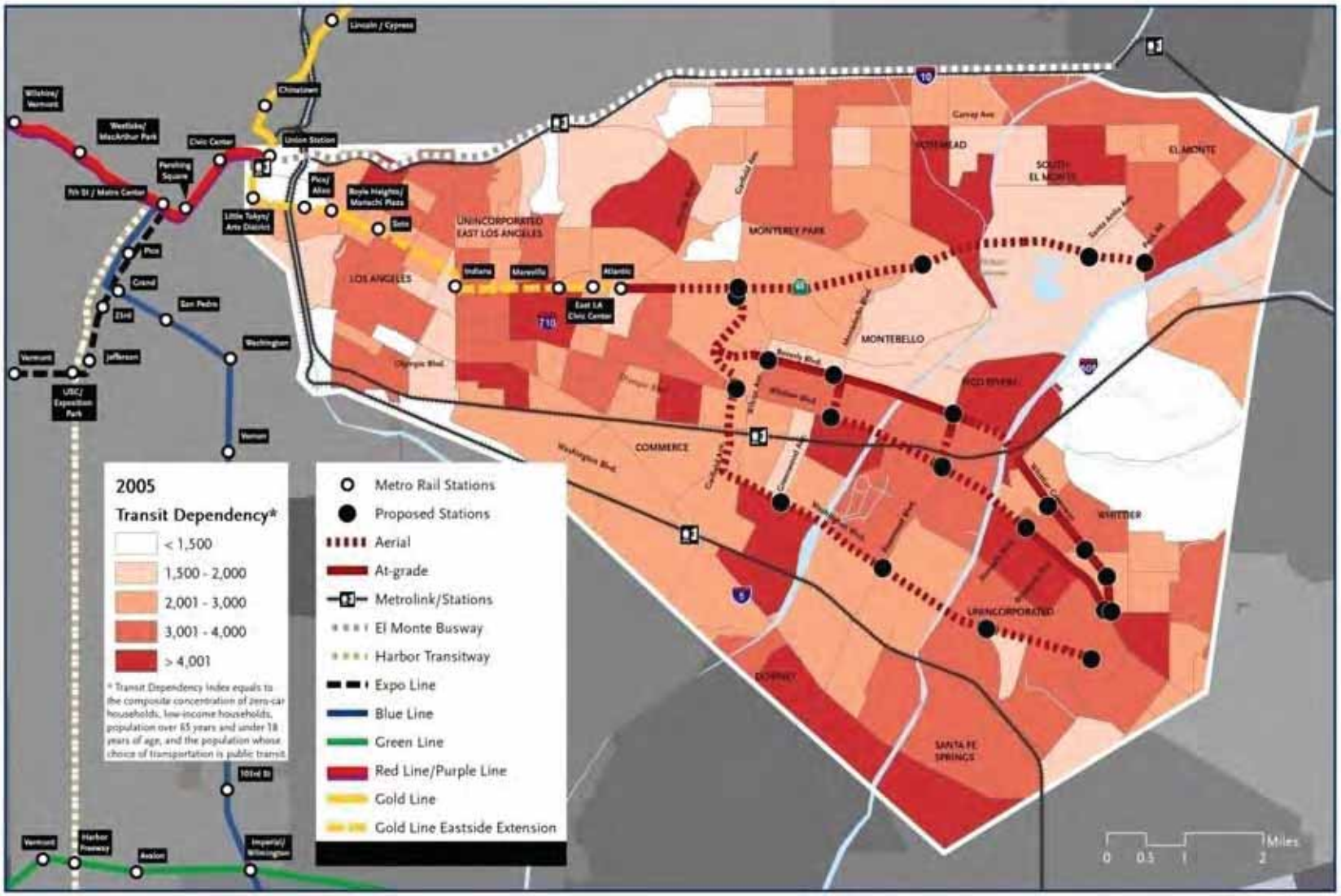


Figure 1-5 2030 Population Density (2030)

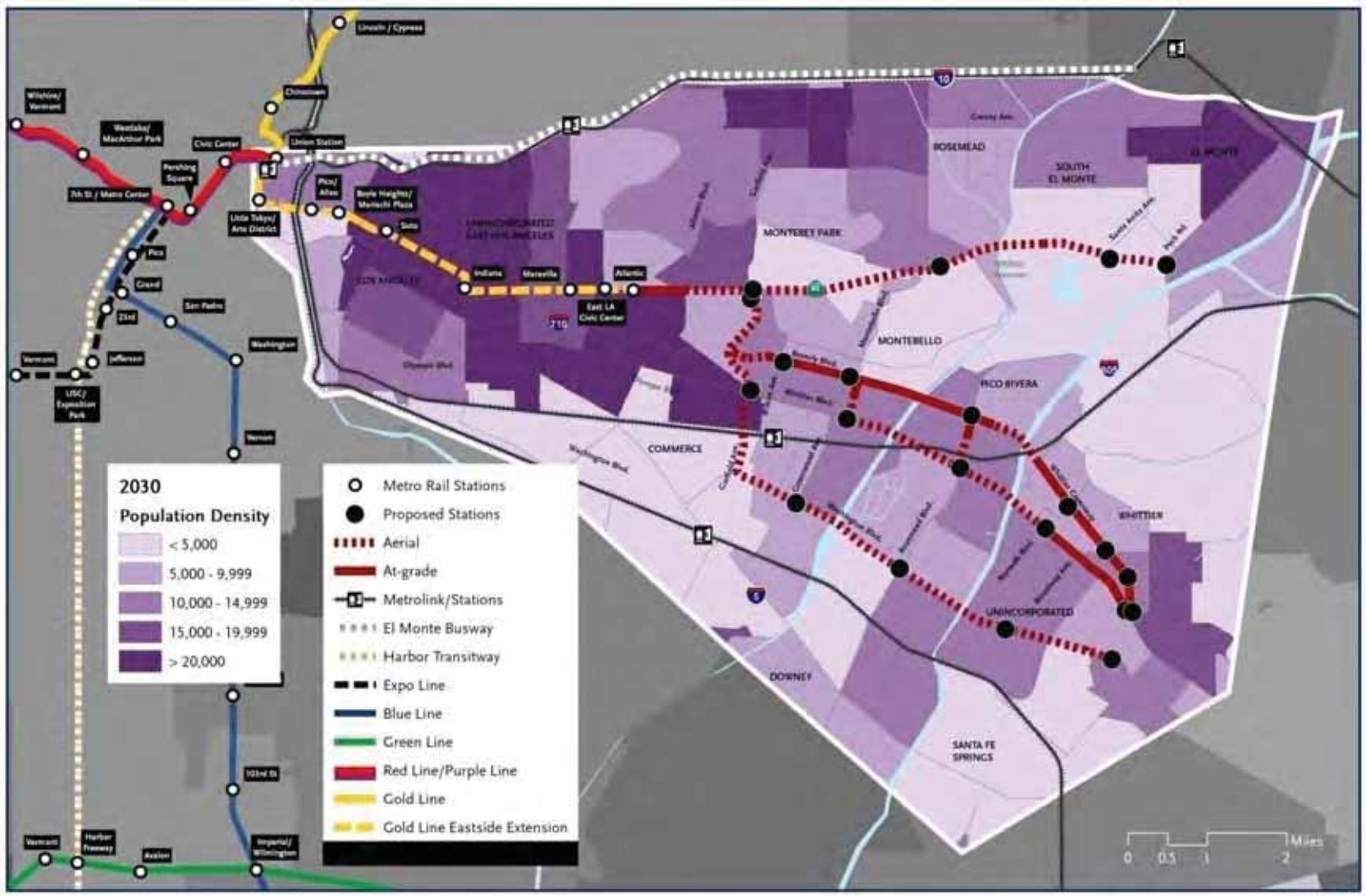
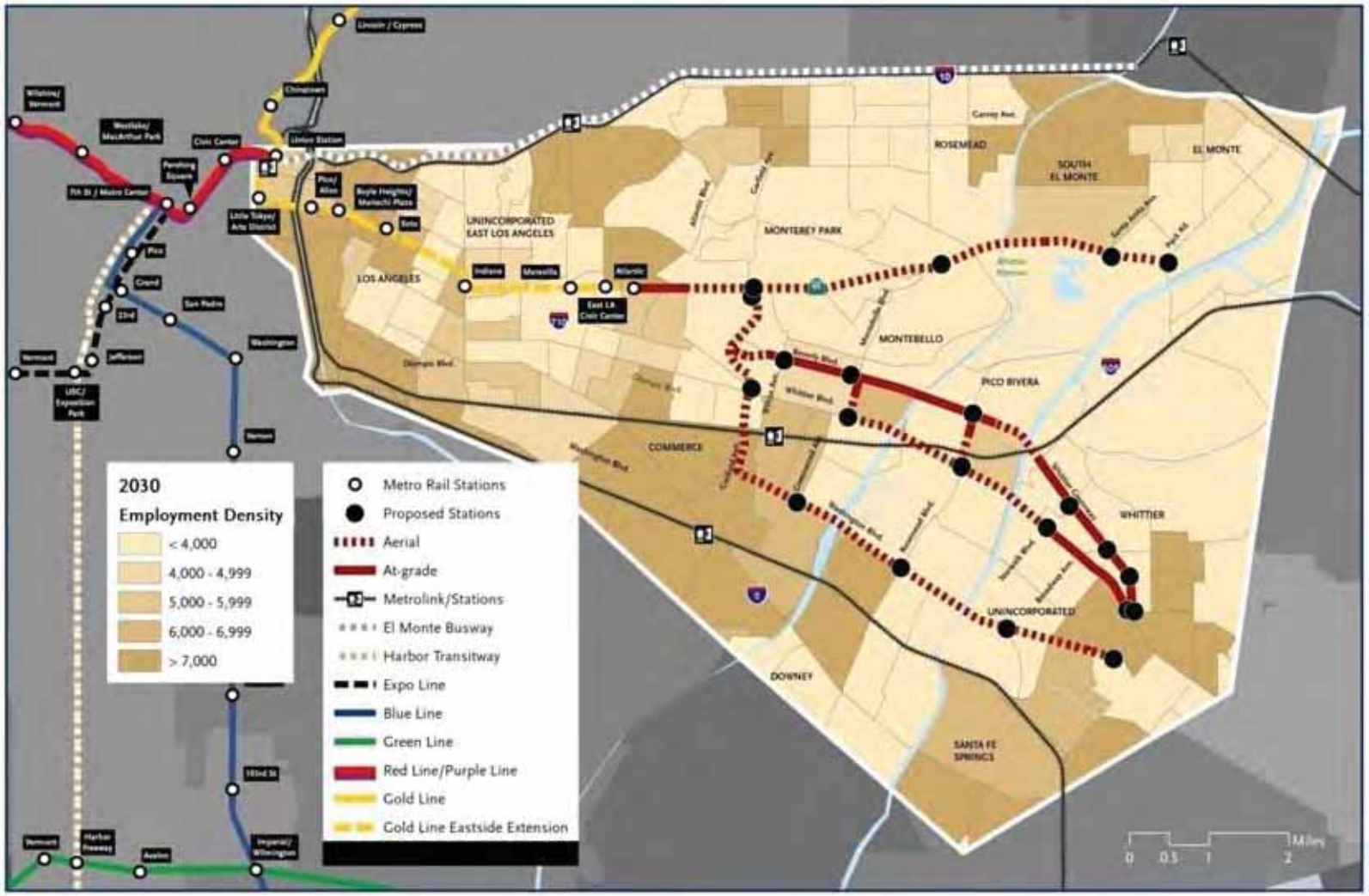


Figure 1-6 2030 Employment Density (2030)



Travel Demand and Patterns

The regional transportation network includes 9,000 lane-miles of freeway, more than 42,000 lane-miles of arterials and several large public transit service providers, yet growth of the transportation system has not kept pace with PSA population growth and the corresponding increases in transportation demand. As the population in the region doubled between 1960 and 2000, highway miles increased by less than 30 percent. The congestion caused by insufficient transportation capacity affects both personal travel and goods movement. If the current trend persists, travel delays are expected to rise to 5.4 million person hours by 2030, more than double the currently experienced delays, and will deeply affect PSA productivity and quality of life. Expanding the public transportation system will provide more choices for commuters and potentially reduce travel demand on the PSA's major highway and arterial systems.

PSA travel patterns identified in Year 2000 factored census data taken from the Census Transportation Planning Package (CTPP) indicate the following:

- One-third of the work trips originating in the PSA, approximately 115,000 daily trips, are destined for areas within the PSA.
- Two-thirds of the work trips originating in the PSA, approximately 230,000 daily trips, are destined for areas external to the PSA.
- Central Los Angeles, including the Central Business District (CBD), is the number one destination for external work trips with more than 50,000 daily trips.
- There are even greater numbers of trips attracted to PSA destinations than work trips produced in the PSA. Many of these trips originate in zones to the north, south and west of the PSA – in areas already served by the Metro Rail system.

With travel demand and patterns already stretching the currently available transportation resources, the forecast increase in PSA daily trips will be challenging to accommodate with the existing transportation system. A fixed guideway transit solution that diverts PSA travel demand and serves the predominant travel patterns will help relieve the region by adding increased transit capacity.

1.2 Existing Transportation System

Existing area freeways and roadways within the PSA are highly congested during peak periods. The heaviest congestion occurs on the I-5, SR-60 and I-10 Freeways in the westbound direction towards the Los Angeles CBD in the morning peak period and in the eastbound direction during the afternoon peak period. In the PM peak period, congestion is also present to a lesser degree in the reverse peak direction. The north/south I-710 and I-605 Freeways are

congested both in the AM and PM peak periods. Additionally, the SR-60 Freeway and Washington Boulevard experience heavy truck traffic due to goods movement throughout the day.

Major arterials in the PSA experience similar morning and evening peak period congestion, which negatively impacts access to local destinations. Peak period congestion also impacts local streets as drivers detour to avoid travel delays, negatively impacting the PSA's neighborhoods. The arterial network also accommodates the extensive bus transit system operating in the PSA, with congestion negatively impacting bus service. As discussed in the AA, seven bus service providers utilize the study area corridors for local and regional bus service, including express, limited, shuttle and paratransit services: Metro Bus, Montebello Bus Lines, Foothill Transit Zone, Norwalk Transit, Monterey Park Spirit Bus Lines, City of Commerce Lines and Whittier Transit.

Highway Conditions

Preliminary projections for Year 2030 show the same congested travel patterns continuing and increasing with a nearly 33 percent growth in travel demand over existing conditions. With no major freeway or highway improvements identified in the financially constrained *2008 Regional Transportation Plan*, building transit network coverage and services will be crucial to address the projected growth in population and employment. In general, as discussed in the AA, the anticipated growth along the freeway segments and on major arterials in the PSA would worsen operating conditions and result in increased congestion and delays.

Travel Time

Traffic congestion and commute times are forecast to increase in the County and PSA. Over the ten-year period from 1990 to 2000, residents of Los Angeles County experienced an 11 percent increase in travel time to and from work. Areas within the PSA experienced an increase in commute times well above County figures, as represented by the cities of Commerce (21 percent growth), Santa Fe Springs (20 percent), and Whittier (17 percent). The mean commuting time for cities in the PSA ranged from approximately 25 to 30 minutes.

Summary

The Southern California Association of Governments (SCAG) estimates that if no transportation system improvements are made within the PSA, congestion will increase significantly between the 2000 and the 2030 Base Years. SCAG projections include the following:

- The average travel speed will decrease from 35.2 mph to 31.9 mph;
- Daily person hours of delay will increase from 2.2 million hours to 5.4 million hours;

- The percentage of PSA peak period evening work trips that take 45 minutes door-to-door for autos and transit would decrease from 88 to 83 percent for residents commuting by car and from 33 to 29 percent for bus transit riders; and

- Average home to work travel times will increase from 21.6 minutes to 25.9 minutes.

Providing alternatives to automobile and bus travel on congested roadways will help offset increased commuter demand and decreased quality of life associated with residential and employment population growth within Los Angeles County.

1.3 The Mobility Problem

The Southern California region is faced with multiple mobility challenges that constrain the region's ability to effectively meet additional travel demand, primarily associated with rapid population growth. As previously discussed, many residents in the Eastside PSA already encounter long travel delays as they travel west to regional employment centers in downtown Los Angeles and beyond. Developing an east-west transit alternative to connect PSA residents with the rest of Los Angeles County through the Metro Rail system will help address the future mobility needs of residents and business by providing vital inter- and intra-connectivity.

If unaddressed, these mobility challenges pose a risk to future PSA population and economic growth, commuter safety, existing infrastructure, goods movement, air quality, and environmental considerations. As discussed in the AA, growth trends in the PSA are expected to lead to significant transportation challenges in 2030, including the following:

- *Increasing travel* – The number of trips taken to and from the PSA are forecast to increase by 33 percent.

- *Increasing travel times* – With average travel speed decreasing by nine percent, average peak-hour travel time will increase by 20 percent, accompanied by a 145 percent increase in daily person hours of delay.

- *Continuing transit-dependent population* – With 45 percent of households categorized as low-income, 42 percent of the PSA population under age 18 or over age 65 and 16 percent of all households with zero vehicles, the PSA has a high level of transit-dependent residents.

- *Continuing freeway congestion* – With no major freeway improvements planned, a growing population and increasing travel forecasts, the level of service on the already congested freeways will continue to decrease.

- *Continuing arterial congestion* – At the 17 major PSA intersections observed during the AA Report work, levels of service are expected to decrease by one or two complete service levels, including almost all locations during the PM peak hour.

- *Heavy truck traffic* – The SR-60, I-5 and I-10 Freeways along with some PSA arterial streets, such as Washington Boulevard, are subject to heavy truck traffic due to port traffic and local manufacturing distribution.

- *Growing population and employment density* – An increasing number of trips within, to and from the PSA will continue to strain the presently available transportation network.

- *Limited travel options* – With limited regional rail system connections, residents of and visitors to the PSA can rely only on available bus systems operating on the same congested street system and three Metrolink stations.

The following sections of this document present and evaluate the proposed transportation system solutions developed to address the mobility challenges faced by the Eastside Transit Corridor Phase 2 Project Study Area.

2.0 ALTERNATIVES CONSIDERED

This section documents the development of the Recommended Set of Alternatives for the Eastside Transit Corridor Phase 2 Alternatives Analysis (AA). A wide range of possible transportation alternatives was identified based on past corridor studies and in consultation with the community and stakeholders during the project's early scoping process. The resulting transportation options were screened and refined through a four-step evaluation process to identify a Recommended Set of Alternatives that best meets the mobility needs and goals for transportation improvements in the Project Study Area (PSA).

2.1 Screening and Selection Process

The overall objective of the Eastside Transit Corridor Phase 2 AA process was to identify and assess a full range of transportation alternatives and recommend a preferred strategy, or phasing of strategies, that addresses study area mobility needs and capacity requirements in the year 2030 and beyond. The AA process and documentation followed the Federal Transit Administration (FTA) New Starts Program guidelines and standards to not only provide a methodical basis for the selection of the Recommended Alternatives, but also to ensure that the identified transportation strategy is eligible for federal funding.

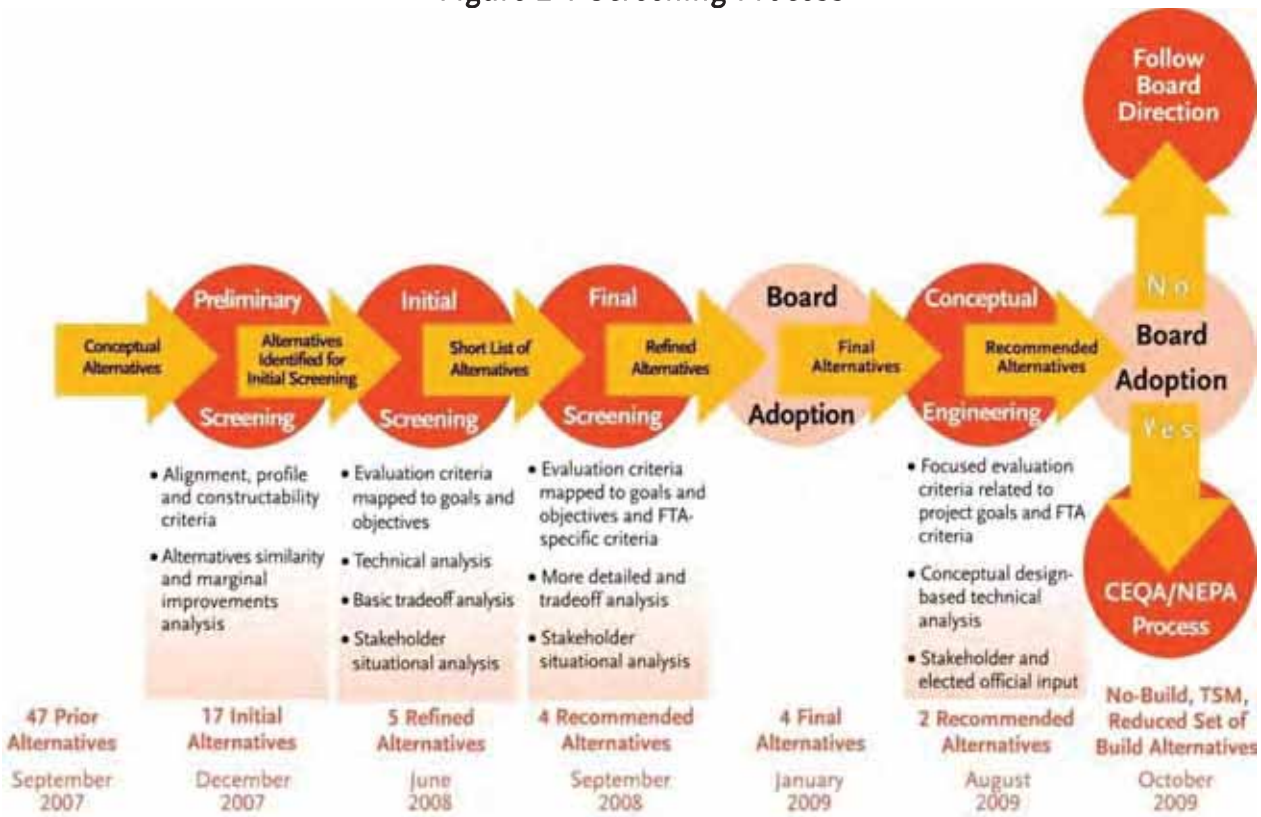
Eastside Transit Corridor Phase 2 transportation alternatives were identified and evaluated through a detailed screening process incorporating technical and environmental analysis and public input. The screening process was based on project goals and evaluation criteria identified in consultation with the community and stakeholders, along with FTA New Starts criteria. Each evaluation phase refined the results of the previous effort using increasingly detailed engineering, operational and environmental analysis along with continued public input. As illustrated in Figure 2.1, the evaluation process included the four efforts listed below. The first three screening efforts were documented in the *Eastside Transit Corridor Phase 2 Study Alternatives Analysis Report* that was completed and adopted by the Metro Board in January 2009. The results of the Conceptual Engineering Screening, along with identification of the Recommended Alternatives, are presented in this addendum to the AA.

1. **Preliminary Screening** – A wide range of 47 Conceptual Alternatives was identified from previous corridor studies and through this project's early scoping process. These 47 Conceptual Alternatives were screened down to 17 Initial Alternatives representing varied alignments (routes) and technologies.
2. **Initial Screening** – Based on a comparative analysis and public feedback, the 17 Initial Alternatives were evaluated and reduced to five Refined Alternatives.
3. **Final Screening** – The five Refined Alternatives were studied and evaluated in detail. Based on the analytical results and public input, four Final Alternatives were identified for further study during conceptual engineering efforts.

4. **Conceptual Engineering Screening** – The four Final Alternatives were refined and studied based on conceptual-level engineering and station design, correspondingly more detailed technical analysis, and additional public and stakeholder input. This effort has resulted in the identification of the two Recommended Alternatives for further study.

The Metro Board of Directors will select the alternatives to be carried through the preparation of the Draft Environmental Impact Statement (EIS) as defined by the National Environmental Policy Act (NEPA) and the Draft Environmental Impact Report (EIR) process as identified in the California Environmental Quality Act (CEQA). Upon completion of the DEIS/DEIR process, the Metro Board will adopt a Locally Preferred Alternative (LPA) to enter the Preliminary Engineering (PE) phase. FTA concurrence to enter PE is necessary, if the project will be seeking federal funding from the New Starts Program.

Figure 2-1 Screening Process



Screening Methodology and Evaluation Criteria

The study's screening process was based on goals and related evaluation criteria developed in accordance with FTA New Starts Guidance, Metro Corridor goals, feedback from PSA stakeholders and the project's Technical Advisory Committee (TAC), and public comments

received during the early scoping process. As documented in the *Eastside Transit Corridor Phase 2 AA Report*, the following six goals were established to guide the evaluation of Eastside Transit Corridor Phase 2 transportation options:

1. Improve mobility, accessibility and connectivity of the transit system and region.
2. Support local land use objectives.
3. Choose a cost-effective solution.
4. Plan for projected growth in an environmentally sustainable manner.
5. Meet the needs of the transit dependent.
6. Respond to community needs and support.

The project goals are consistent with Metro's *Draft 2008 Long Range Transportation Plan* and the *2008 Regional Transportation Plan* prepared by the Southern California Association of Governments (SCAG).

A detailed set of evaluation criteria, with related performance measures, was developed to provide the public and decision-makers with information on the benefits and impacts of the alternatives, as well as the differences between the options. Different levels of evaluation criteria were used during each screening step as the technical information and comments on the alternatives became more specific. The following evaluation categories were used to analyze the proposed transportation options:

1. Transportation System and Mobility Improvements
2. Environmental Impacts including Land Use and Economic Considerations
3. Financial Feasibility
4. Public and Agency Input

Preliminary Screening

During the preliminary screening step, a wide range of 47 Conceptual Alternatives was identified from previous corridor studies and through this project's early scoping process. The alternatives were evaluated based on stakeholder input and a fatal flaw-level of technical analysis, primarily evaluating constructability and alignment profile fit within the study area. In December 2007, preliminary screening resulted in the identification of 17 Initial Alternatives that included varied transit modes, alignments (routes) and potential station locations. The Initial Alternatives included 14 Light Rail Transit (LRT) alternatives and three Bus Rapid Transit (BRT) options for further study.

Initial Screening

The 17 Initial Alternatives, along with the required No Build and Transportation System Management (TSM) options, were subjected to an initial level of technical and environmental analysis to identify the highest performing alternatives. Based on a comparative analysis and public feedback, the 17 Initial Alternatives were refined to a smaller set of five Refined Alternatives that best met the project goals, were technically viable and had stakeholder support. The five alternatives were further refined to incorporate the most promising operational characteristics and features. For example, the Washington Boulevard Alternative was refined to include additional aerial segments to improve travel time and avoid traffic capacity issues identified in the initial screening process. In June 2008, the following five Refined Alternatives were selected for final screening:

- Alternative 1 – SR-60 Light Rail Transit
- Alternative 2 – SR-60 Busway/Bus Rapid Transit
- Alternative 3 – Beverly Boulevard Light Rail Transit
- Alternative 4 – Whittier Boulevard Light Rail Transit
- Alternative 5 – Washington Boulevard Light Rail Transit

Final Screening

The five Refined Alternatives were evaluated through the screening process and criteria documented in the *Eastside Transit Corridor Phase 2 AA Report*. Engineering plans were prepared presenting a single line horizontal alignment with conceptual cross-sections at key locations. Reflecting the availability of more detailed information, the final screening process involved more specific evaluation information including engineering and operational analysis, initial capital and operating cost estimates, ridership forecast modeling, and community and environmental impacts analysis.

Based on technical analysis and public input, it was determined that LRT technology was the most appropriate transit mode for Phase 2 of the Eastside Transit Corridor given the higher ridership projections and resulting capacity needs. A BRT alternative was identified and evaluated during this final screening level. Technical analysis showed that the BRT option produced the lowest ridership of the alternatives and did not provide any cost savings when compared to the LRT alternatives. In addition, LRT travel times were shorter as a result of eliminating the need for transfers.

The AA process was completed in January 2009 and documented in the *Eastside Transit Corridor Phase 2 Study AA Report*. Four Final Alternatives were identified for further refinement and analysis through a conceptual engineering-based evaluation:

- Alternative 1 – SR-60 Light Rail Transit
- Alternative 2 – Beverly Boulevard Light Rail Transit
- Alternative 3 – Beverly Boulevard/Whittier Boulevard Light Rail Transit
- Alternative 4 – Washington Boulevard Light Rail Transit

In summary, the differences between the five Refined Alternatives and the four Final Alternatives were:

- Shortening the SR-60 LRT option to Peck Road and deleting the Crossroads Parkway Station to reduce the cost of this alternative;
- Eliminating the SR-60 Busway/BRT option from further consideration based on the reasons discussed above and resulting low ridership and user benefits;
- Deleting three stations from the Beverly Boulevard LRT option, Beverly/Garfield, Beverly/Poplar, and Beverly/Civic Center, to reduce the travel time for this alternative. In addition, the initial station spacing of this alternative, documented in the AA Report, was too close and did not meet Metro's station spacing policy of approximately one mile between stations.
- Combining the western section of the Beverly Boulevard alignment and the eastern portion of the Whittier Boulevard LRT alignment, with north-south connections on either Montebello Boulevard or Rosemead Boulevard, to form a new Beverly/Whittier Boulevards Alternative. This new option represented a promising combination of the least constrained right-of-way sections of Beverly and Whittier Boulevards, while providing good PSA service coverage.

Conceptual Engineering Screening

During the current screening effort, documented in this Addendum to the AA, Conceptual Engineering drawings provided refined design information to allow for a more detailed analysis of the alternatives. Horizontal double-track alignment and selective vertical profile drawings were prepared and conceptual station plans were designed to identify the best locations for the station platforms and related facilities. Reflecting evolving design information, the Final Alternatives were refined further to identify and reduce impacts where possible. Design refinements made during this phase are documented below in Section 2.2.

Conceptual Engineering provided a higher level of definition of system design and operational parameters, allowing for further refinement of technical information, including operating speeds and travel times, ridership forecasts, travel benefits and costs, as well as environmental and community impacts for each of the four Final Alternatives. As part of this effort, the individual alternatives were examined to identify any alignment, engineering, operating or environmental issue that could potentially preclude successful construction or operation of the alternatives. These issues would be considered to be fatal flaws and, to the extent that an alternative had such issues, it would not be recommended for advancement into the Draft EIS/EIR and Advanced Conceptual Engineering phase.

Table 2.1 presents the evaluation criteria and performance measures used to clarify the differences between the Final Alternatives, allow for more informed decision-making and highlight issues to be resolved during the next phase of analysis. Conceptual Engineering Screening evaluation results are presented below and are summarized in *Section 7, Comparative Analysis of Alternatives* in this report.

Table 2.1 Conceptual Engineering Evaluation Criteria

Mobility and Accessibility Improvements
1. Population and Employment Growth ▪ Capacity of New Projects ▪ Regional Connectivity 2. Ridership Forecasts ▪ Project Boardings ▪ Net New Transit Riders ▪ Change in Transit Mode Share 3. Travel Times ▪ Total Travel Times for each alternative ▪ Travel Time Savings (compared to No Build) 4. Cost Analysis (compared to TSM) ▪ Cost Per New Daily Transit Trip ▪ Cost Effectiveness Rating
Project Costs
5. Capital Costs 6. Annual Operations and Maintenance Costs
Design and Operational Concerns
7. Overview of System Design and Operational Issues and Concerns
Environmental Concerns
8. Summary of Environmental and Community Impacts and Benefits
Public Support
9. Public, stakeholder and elected official input

In addition, the individual alternatives were evaluated against each other to determine, based on the further identification of alignment, engineering, operating and environmental issues, whether some alternatives could be considered technically superior and therefore be the focus of continued study in a Draft EIS/EIR. Those alternatives with no specific fatal flaws, but not considered to be technically superior compared to the remaining alternatives, would be recommended for removal from further study in the Draft EIS/EIR.

2.2 Final Alternatives

In January 2009, four LRT or "build" Final Alternatives were adopted by the Metro Board of Directors to be further studied. These four alternatives were refined and studied through Conceptual Engineering efforts. At this level of analysis, alignment engineering and station design information was prepared to a five percent level of completion. In addition to the four "build" alternatives, two options required for comparison purposes were included: the No Build and the TSM alternatives. Reflective of the addendum role of this document, the Final Alternatives were compared to the No Build and TSM options identified in the *Alternatives Analysis Report,* with a minor refinement to the TSM alternative as discussed below.

Under FTA guidance published in 2000, new direction was given on the definition of the No Build and TSM alternatives in the AA/Major Investment Study (MIS) planning process. This Rule eliminated the requirement for separate No Build and TSM alternatives, and instead required that the proposed "build" options be evaluated against a single "Baseline Alternative" in order to effectively measure resulting mobility improvements. The Baseline Alternative is defined by FTA as all reasonable, cost-effective transit improvements included in the adopted financially constrained regional transportation plan. During the Eastside Transit Corridor Phase 2 AA process, a decision was made to evaluate both a No Build and a Future Baseline/TSM alternative in order to effectively measure the resulting build transportation options.

2.2.1 No Build Alternative

The No Build Alternative is used for comparison purposes to assess the relative benefits and impacts of constructing a new transit project in the PSA versus implementing only currently planned and funded projects. The No Build Alternative includes all of the projects that are identified for construction and implementation in the "Constrained Plan" of Metro's *Draft 2008 Long Range Transportation Plan (2030)*. The currently adopted plan includes the Gold Line Eastside Extension to the Atlantic/Pomona Station, but does not include any project resulting from this study effort. Existing transit service will be maintained as is, and only minor service level adjustments will be made as warranted.

2.2.2 Baseline/TSM Alternative

The TSM Alternative is intended to address the same mobility needs as the build alternatives, but does not include the construction of a fixed guideway facility. Thus, typically the TSM Alternative will have a lower level of capital investment. This option includes all of the provisions of the No Build Alternative, plus the planned enhancements to existing bus service previously presented in the AA Report. During the Conceptual Engineering study phase, a required increase in the number of peak Light Rail Vehicles for the TSM option was identified. AA analysis was based on the use of 2-car consists, while recent Metro operations policy direction was updated to require 3-car consists on the Metro Gold Line in FY 2030. As a result, the TSM capital and operating and maintenance costs were also revised to reflect the cost of the additional vehicles.

The following sections present a brief description of the four Final Alternatives, including:

- **General information** – An overview of each alternative's alignment and operational configuration along with a brief discussion of refinements made during the preparation of the Conceptual Engineering Drawings (Appendix A) to reduce identified impacts where possible.
- **Proposed stations** – Station information, including type (at-grade or aerial, single-center or split-platform), location and system-related facilities. Conceptual-level station plans and cross-sections are included in the Conceptual Engineering Drawings and the separate *Station Concepts Report*.
- **Design and operational issues** – A summary of design concerns identified during preparation of the Conceptual Engineering documents and related technical analysis that will require a more detailed evaluation during the next study phase.

A summary of operational configurations for each of the options is presented below in Table 2.2.

Table 2.2 Operational Description of Alternatives

Operational Segments (miles)	1 SR-60 LRT	2 Beverly Boulevard LRT	3 Beverly/ Whittier LRT via Montebello	3 Beverly/ Whittier LRT via Rosemead	4 Washington Boulevard LRT
At-grade	0.22	5.80	3.63	5.11	0.22
Aerial	6.50	2.60	4.75	3.38	8.97
Retained fill	0.17	0.68	0.68	0.68	0.17
Total length	6.89	9.08	9.06	9.17	9.36

2.2.3 Final Alternative 1 – SR-60 Light Rail Transit

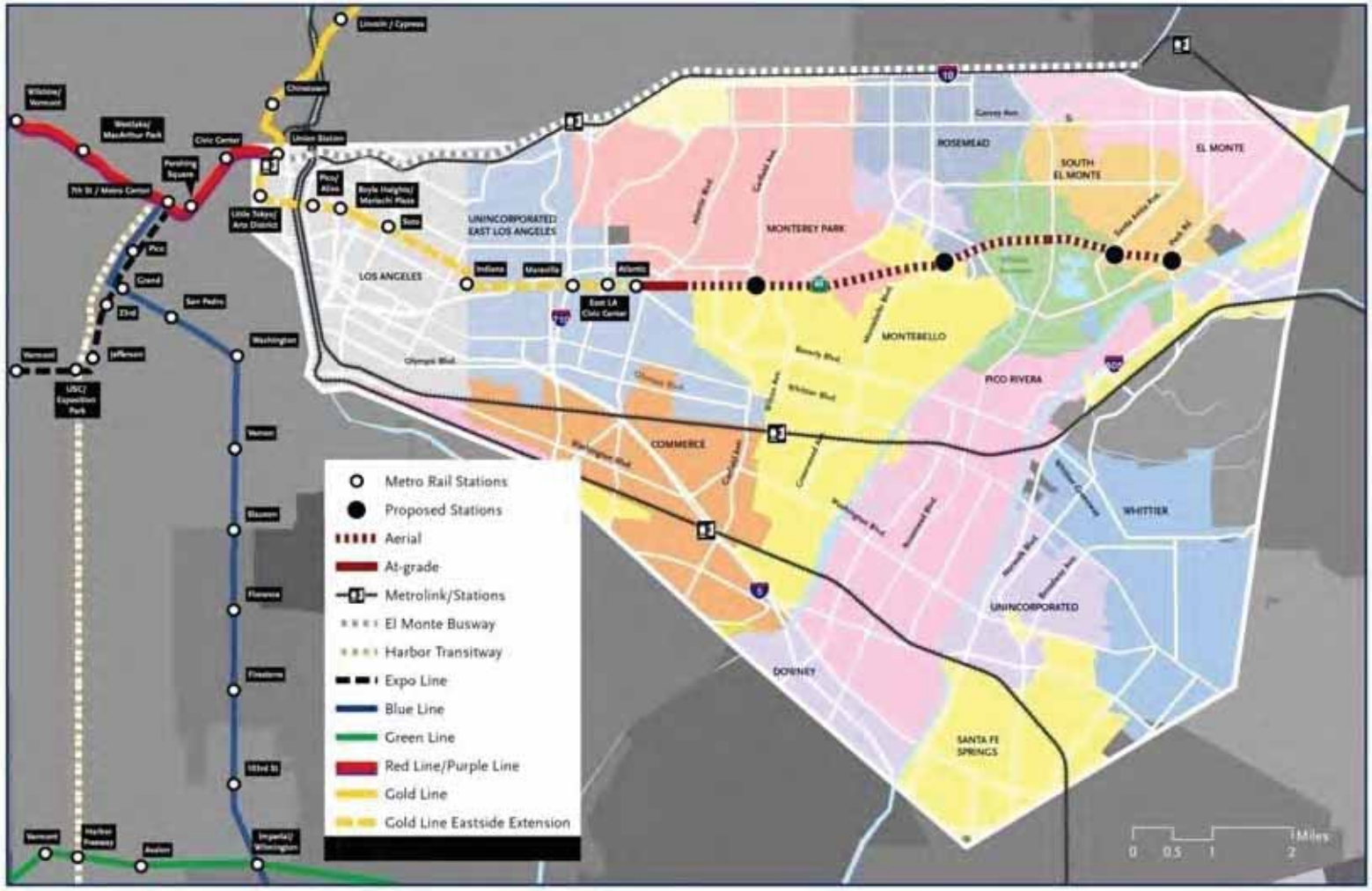
General Description:

As illustrated in Figure 2-2, more than 94 percent of this alternative operates in an aerial configuration and primarily within the SR-60 Freeway right-of-way. The first operational segment is the same for all of the four LRT options: the Phase 2 alignment extends at-grade east from the Metro Gold Line Eastside Extension Atlantic/Pomona Station in the median of Pomona Boulevard, where the alignment transitions to an independent aerial structure within the south side of the SR-60 Freeway right-of-way until Garfield Avenue. The SR-60 Alternative continues east beyond Garfield Avenue in the freeway right-of-way, terminating in the vicinity of the SR-60/Peck Road interchange in the City of South El Monte. The proposed LRT alignment is located on the south side of the freeway between the edge of the eastbound traffic lanes and the SR-60 Freeway property line.

During Conceptual Engineering, alignment and station refinements were made as the design documents advanced from single line alignment drawings to a five percent level of engineering design. Table 2.4, located at the end of this section, provides a detailed overview of the conceptual engineering-based refinements for all of the alternatives. For the SR-60 Alternative, a summary of the refinements made includes the following:

1. Relocation of the SR-60/Garfield Station, from its location straddling Garfield Avenue, to east of Garfield Avenue within the SR-60 Freeway right-of-way to better accommodate station access.
2. Elimination of retained cut operating sections proposed along the former OII/current Superfund site to avoid integrity and stability impacts to the clay liners, soil and vegetation covering the landfill site.
3. Modification of the aerial alignment profile to avoid impacts to the Southern California Edison's (SCE) transmission lines crossing the SR-60 Freeway, and proposed rail system alignment, north of Paramount Boulevard.
4. Modification of the alignment and station location in the Peck Road station area to avoid impacts to SCE existing and future transmission lines; the alignment, station and tail tracks were shifted to the west and the proposed station area taking was reduced to avoid SCE property.
5. Relocation of the Montebello Town Center Station closer to the SR-60 Freeway and at a lower vertical profile allowing for a station platform approximately at the same level as the adjacent Montebello Town Center and bus depot allowing for better pedestrian access to the Town Center, improved station and bus interface, and lower system and station costs.
6. Initial location of traction power substations (TPSS) required for rail operations.

Figure 2-2 SR-60 LRT Alternative



7. Minor relocation of some stations to better fit within the existing community, or to reduce traffic impacts, such as shifting a station taking travel lanes to the street median. Stations initially located on curved alignment sections were shifted to straight alignment sections.

Proposed Stations:

The SR-60 LRT Alternative has four stations designed with bus and parking facilities to intercept vehicular and bus travel operating within the east-west freeway corridor and circulating in a north-south direction crossing the freeway. All of the station areas will require property acquisition to accommodate stations and related facilities, including Park-and-Ride (PNR) structures, and all have the potential for Transit Oriented Development (TOD).

- *SR-60/Garfield* – aerial, center platform station located within the freeway right-of-way east of Garfield Avenue along Via Campo Street (Montebello). Station facilities include on-street bus interface, Kiss-and-Ride (KNR) space and a PNR structure, along with a TOD opportunity.

- *SR-60/Town Center Drive* – aerial, center platform station located on private property adjacent to the Montebello Town Center (Montebello). Station facilities include an off-street bus plaza, KNR space and a PNR structure, along with a TOD opportunity.

- *SR-60/Santa Anita Avenue* – aerial, center platform station located on vacant land on the south side of the freeway to the east of Santa Anita Avenue (South El Monte). Station facilities include on-street bus interface, KNR space and a PNR structure, along with a TOD opportunity.

- *SR-60/Peck Road* – aerial, center platform terminus station located within the freeway right-of-way to the east of Peck Road (South El Monte). Station facilities include an off-street bus plaza, KNR space and two PNR structures, along with several TOD opportunities in the station area.

Design and Operational Concerns

During Conceptual Engineering, the following issues and concerns were identified and are discussed below and illustrated in Figure 2.3. If this alternative moves forward into Advanced Conceptual Engineering and the Draft EIS/EIR phase, they will need to be addressed.

- *Construction within the SR-60 Freeway right-of-way* – Design of LRT facilities must meet Caltrans and Federal Highway Administration (FHWA) standards; requires establishment of a cooperative working agreement with Caltrans and FHWA.

- *Fit with future Southern California Edison projects* – The backbone of SCE's transmission system crosses the alignment in two locations: diagonally just east of

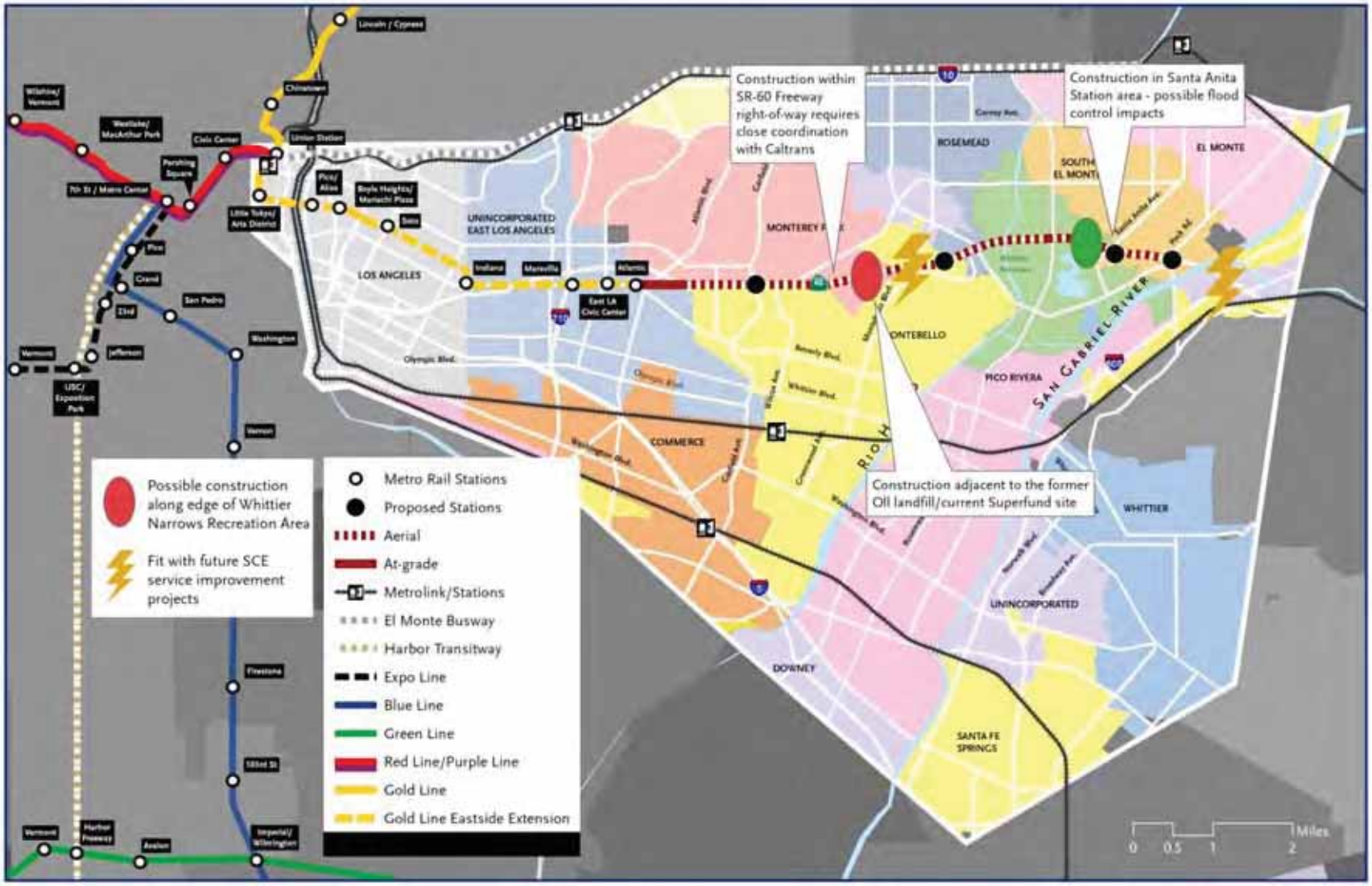
Paramount Boulevard and east of Peck Road. SCE has plans for major service improvements involving the construction and operation of new and upgraded transmission facilities in both locations as part of the Tehachapi Renewable Transmission Project. Project improvements include: adding new lines to a vacant position on existing 220 kV towers, and replacing existing 220kV service with new double-circuit, 500 kV transmission lines and towers within the same right-of-way. Successful design of the rail system interface with the proposed transmission facilities will require a cooperative working relationship with SCE.

- *Construction adjacent to former OII landfill/current Superfund site* – This current Superfund site is located on both sides of the SR-60 Freeway, approximately between Vail Avenue and Paramount Boulevard in the cities of Montebello and Monterey Park. The landfill located on the south parcel has been mitigated with a geotextile and clay monocover placed on the sides and a geosynthetic clay cover located over the top deck, with both covers topped with soil and vegetation. The north parcel contains the leachate treatment and thermal destruction facilities. Initial conversations with on-site U.S. Environmental Protection Agency (EPA) staff indicate that there are viable engineering and environmentally-safe methods to penetrate the site's cap. Piles for columns can be backfilled with impermeable clay, and geotech liners can be connected to the pile. Mitigation will ensure methane will not leak out around the columns.. Further site investigation, development of more detailed engineering plans in cooperation with the U.S. EPA, and identification of cost estimates are required.

- *Construction within the Whittier Narrows Recreation Center Area* – The proposed aerial system will require placement of columns and footings adjacent to, and possibly within, this parkland resource and flood control plain. Further site investigation and development of more detailed engineering plans are required to identify any site-specific impacts and possible mitigation measures.

- *Construction of the Santa Anita Avenue Station* – Located adjacent to the Whittier Narrows Recreation Center Area, portions of this site are owned by the U.S. Army Corps of Engineers (USACE) to accommodate flood control. Further site investigation and development of more detailed engineering plans are required in coordination with USACE to identify any site-specific impacts and possible mitigation measures.

Figure 2-3 SR-60 LRT Alternative – Design and Operational Issues



2.2.4 Final Alternative 2 – Beverly Boulevard Light Rail Transit

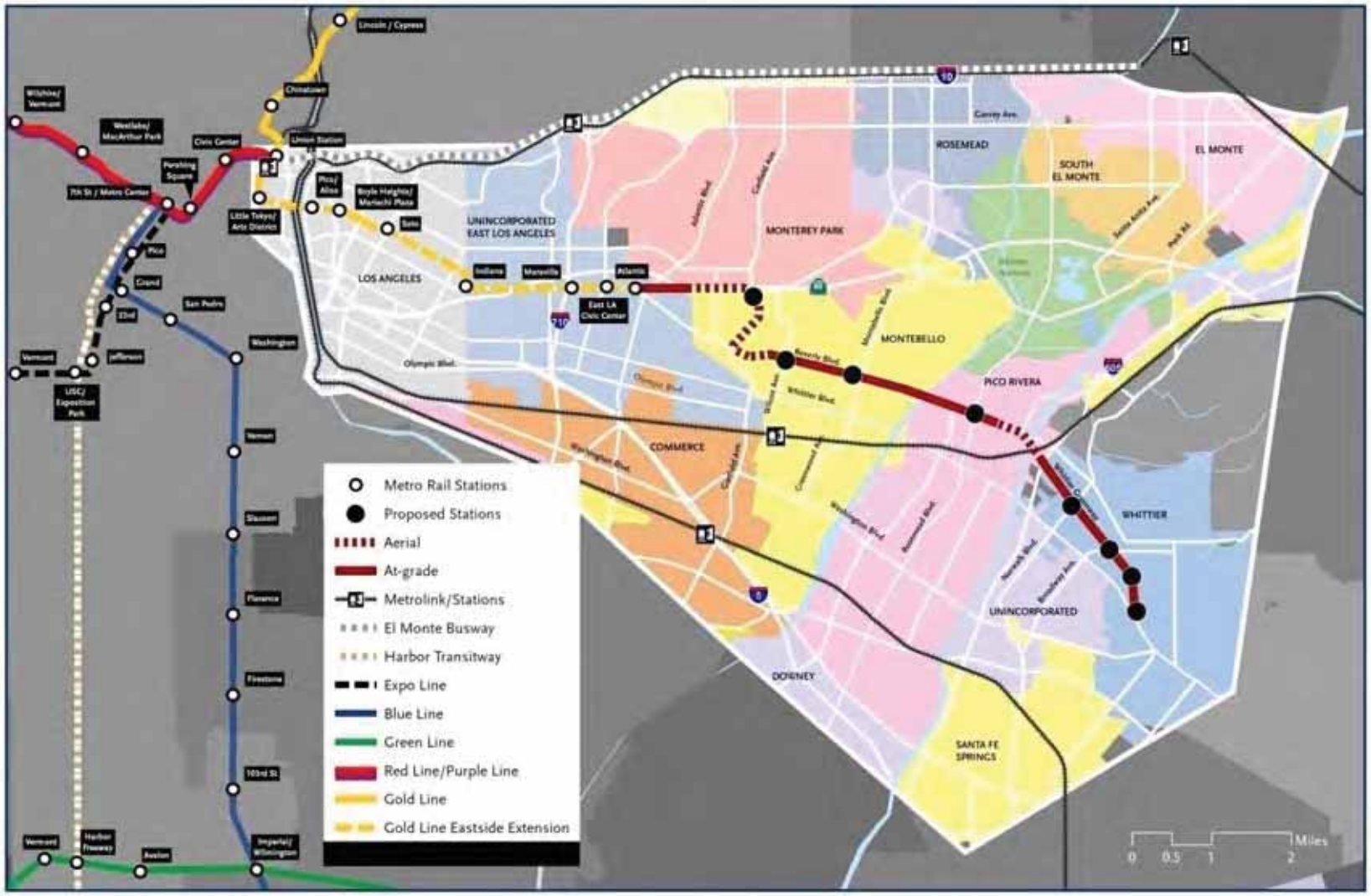
General Description:

As illustrated in Figure 2-4, the Beverly Boulevard LRT Alternative operates primarily at-grade with aerial sections as well as retained fill operations where the alignment transitions between at-grade and aerial configurations. Similar to the other LRT options, this alternative extends at-grade east from the Metro Gold Line Eastside Extension Atlantic/Pomona Station in the median of Pomona Boulevard, where the alignment transitions to aerial operations running in the south side of the SR-60 Freeway right-of-way until Garfield Avenue. At Garfield Avenue, this option turns south to operate in an aerial configuration in the median of Garfield Avenue until Beverly Boulevard, where the alignment turns east and transitions to at-grade, median-running operations along Beverly Boulevard to just east of the San Gabriel River. Here, the alignment turns southeast to cross vacant and storage property to enter the Whittier Greenway via a former railroad bridge over the I-605 Freeway. A former railroad right-of-way, the Whittier Greenway is now owned by the City of Whittier and has been converted to a landscaped bicycling and walking trail. Under this option, the width of the trail will be reduced to half of its size to accommodate the proposed LRT system. The existing trail facilities will be shifted to the north half of the Greenway right-of-way to allow for continuous trail use, and the rail system will be built on the southern side. A fence or wall will be constructed between the rail and trail uses for safety purposes, and adjacent residential properties will have landscaped screening on the rail side of the alignment.

During Conceptual Engineering, alignment and station refinements were made as the design documents advanced from single line alignment drawings to a five percent level of engineering design. Table 2.4, located at the end of this section, provides a detailed overview of the conceptual engineering-based refinements for all of the alternatives. For the Beverly Boulevard, a summary of the refinements made includes the following:

1. Relocation of the SR-60/Garfield Station from the southwest corner of the intersection of Garfield Avenue and Via Campo Street to the southeast corner to provide more room for required station facilities and to reduce impacts on the Montebello Golf Course.
2. Redesign of the alignment as it turns from Garfield Avenue onto Beverly Boulevard: started the transition from aerial to at-grade operations earlier than shown in AA drawings to avoid conflict with SCE transmission lines.
3. Relocation of rail operations to the south side of the Whittier Greenway to allow for continuous trail usage on the northern half.
4. Design of a proposed land bridge at Palm Park located along the Whittier Greenway to allow for park users to cross under the rail tracks.
5. Redesign of some Whittier Greenway stations to address pedestrian and bicyclist safety concerns.
6. Initial location of TPSS required for rail operations.

Figure 2-4 Beverly Boulevard LRT Alternative



7. Minor relocation of some stations to better fit within the existing community, or to reduce traffic impacts, such as shifting a station taking travel lanes to the street median. Stations initially located on curved alignment sections were shifted to straight alignment sections.

Proposed Stations:

The Beverly Boulevard LRT Alternative has eight stations located to best serve the communities through which this option runs. Several of the stations will require acquisition to accommodate stations and related station facilities, including PNR structures. Four of the stations have TOD opportunities.

- *SR-60/Garfield* – aerial, center platform station located on the southeast corner of Garfield Avenue and Via Campo Street (Montebello). Property acquisition is required to accommodate station facilities, including KNR space and a PNR structure, along with a TOD opportunity.
- *Beverly/Wilcox* – at-grade, split station with single-sided platforms located on both sides of the Beverly Boulevard/Wilcox Avenue intersection (Montebello).
- *Beverly/Montebello* – at-grade, split station with single-sided platforms located on both sides of the Beverly and Montebello Boulevards intersection (Montebello). Property acquisition required to accommodate station facilities, including KNR and PNR spaces, along with a TOD opportunity.
- *Beverly/Rosemead* – at-grade, split platform station with single-sided platforms located on both sides of the Beverly and Rosemead Boulevards intersection (Pico Rivera). Property acquisition is required to accommodate station facilities, including KNR and PNR spaces, along with a TOD opportunity.
- *Greenway/Norwalk* – at-grade, split platform station located on either side of a rebuilt railroad bridge located over Norwalk Boulevard (Whittier). On-street bus and KNR access is provided.
- *Greenway/Broadway* – at-grade, split platform station located on both sides of the greenway crossing of Broadway Avenue (Whittier).
- *Greenway/Philadelphia* – at-grade, center platform station located east of Philadelphia Street (Whittier).
- *Greenway/Mar Vista* – at-grade, center platform terminus station located east of Mar Vista Street (Whittier). Property acquisition is required to accommodate station facilities, including an off-street bus plaza, KNR space and PNR structures, along with a TOD opportunity.

Design and Operational Issues:

During Conceptual Engineering, the following issues and concerns were identified and are discussed below and illustrated in Figure 2.5. If this alternative moves forward into Advanced Conceptual Engineering and the Draft EIS/EIR phase, they will need to be addressed.

- *Whittier Greenway* – This alternative proposes to use the former railroad right-of-way, now owned by the City of Whittier and redesigned as a bike and walk trail, for both rail and recreational uses with a fence or wall between the uses. The Whittier Greenway is identified as a park by the City of Whittier, and federal, state, regional and local funds were used to build the park. Approval by the City of Whittier is required for its proposed joint use for rail operations and recreational trail. The right-of-way runs through single-family residential neighborhoods and adjacent to several schools; safety, visual and noise mitigation measures will be required. During Conceptual Engineering, the Norwalk Boulevard and Broadway stations on the Whittier Greenway were redesigned with split-platforms located on either sides of a street crossing to increase a train operator's view of the surrounding area and to accommodate safety features, such as four-quadrant gates for pedestrians and vehicles.

  In some locations along the northern end of the Greenway, the right-of-way width is constrained and will require construction of retaining walls along the edges of the right-of-way to allow for use of the full width to accommodate both rail and trail facilities.

  Palm Park, which is currently bisected by the Greenway, will be further impacted by rail operations operating on the right-of-way. A "land bridge" is proposed at Palm Park to allow park users to cross under a slightly raised rail alignment on a land bridge designed to complement the existing park setting.

  In 2007, a 9,000-foot long, 48-inch water line was installed on the Greenway from Norwalk Boulevard to Mar Vista Street. Located at a minimum depth of three feet along the centerline of the Greenway right-of-way, relocation of this utility to the northern side of the right-of-way will be required to accommodate rail operations.
- *Traffic impacts* – In some locations, Beverly Boulevard has a constrained right-of-way width ranging from 80 to 100 feet. Elimination of left turns at minor intersections will allow for two through traffic lanes during peak periods, while retaining off-peak parking within the existing roadway right-of-way. Spot widening at stations and principal intersections may be required to maintain needed roadway capacity.
- *Construction within the SR-60 and I-605 Freeway right-of-way* – Design of LRT facilities must meet Caltrans and FHWA standards; requires establishment of a cooperative working agreement with Caltrans and FHWA.

- *New Bridges* – This alternative will cross over four bridges: the Rio Hondo Flood Channel, the San Gabriel River, a former railroad bridge over the I-605 Freeway and a former railroad bridge over Norwalk Boulevard. Conceptual Engineering efforts evaluated

  the existing bridges and developed preliminary determinations of whether the structures could be strengthened to accommodate rail operations or whether replacement was required. As shown in Table 2.3, four new bridges are recommended for this alternative. Possible site-specific construction impacts on flood control facilities will require further analysis and working closely with agencies, including USACE as well as Caltrans and impacted municipalities.

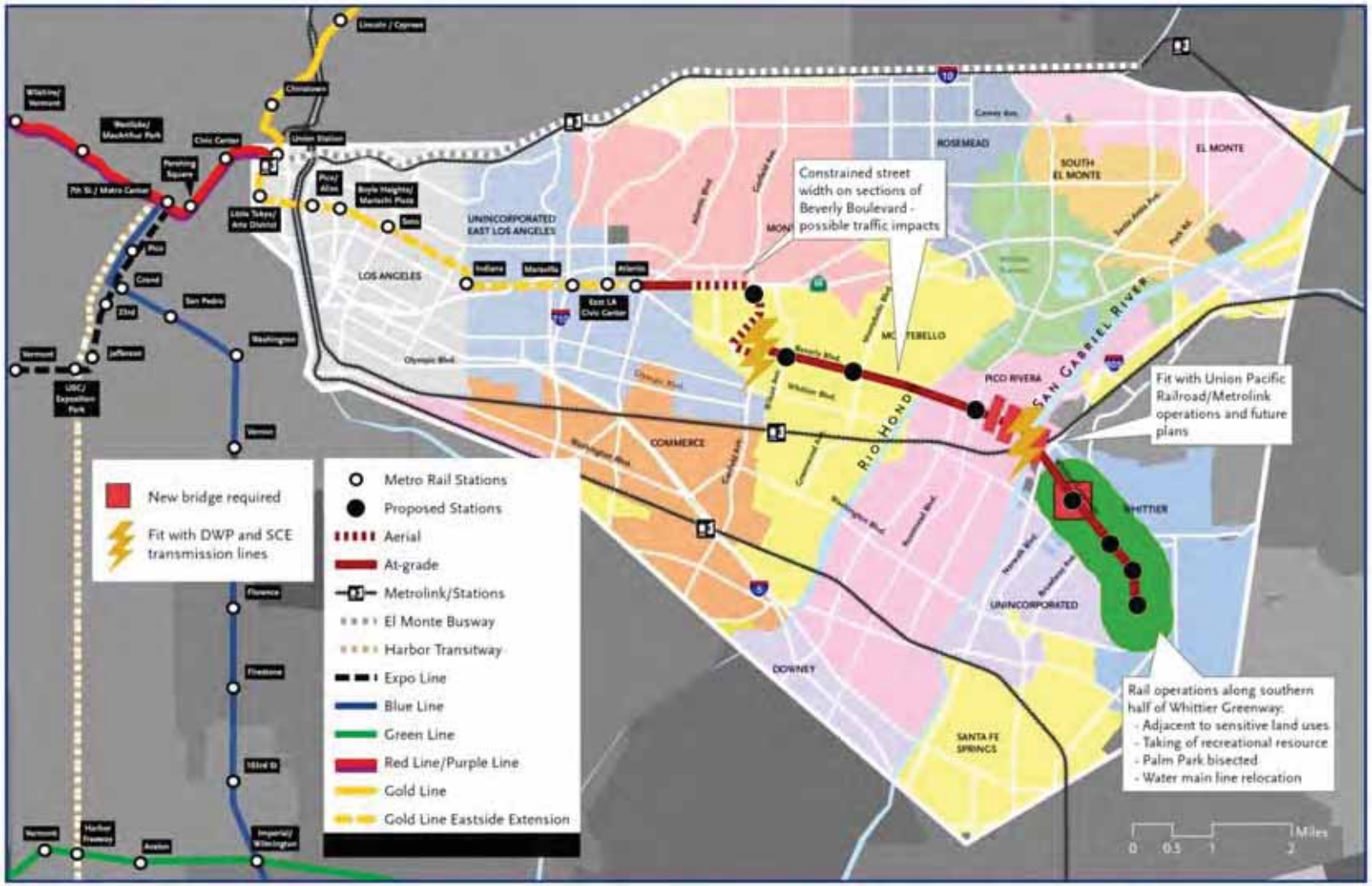
- *Fit with existing and future Southern California Edison projects* – Major portions of SCE's transmission system cross this alignment in two locations: on the western end as the alignment turns east from Garfield Avenue on to Beverly Boulevard; and east of the San Gabriel River. Both power alignments currently have 220kV transmission lines and towers. A significant portion of the land east of the San Gabriel River is owned by SCE, who has indicated in initial conversations that their future plans will preclude rail operations through this site. Successful design of the rail system in this area will require a cooperative working relationship with SCE.

- *Fit with Union Pacific plans* – The Union Pacific (UP) Railroad owns a portion of the currently vacant land on the east side of the San Gabriel River that will be crossed by this alternative's alignment; any use of this property will require UP's approval and may conflict with their future plans.

Table 2.3 New Bridge Requirements

Alternative	Rio Hondo	San Gabriel River	I-605 Freeway	Norwalk/ Whittier Trail
1 SR-60 LRT	-	-	-	-
2 Beverly Boulevard LRT	✓	✓	✓	✓
3 Beverly/Whittier LRT via Montebello	✓	✓	✓	-
3 Beverly/Whittier LRT via Rosemead	✓	✓	✓	-
4 Washington Boulevard LRT	✓	✓	✓	-

Figure 2-5 Beverly Boulevard LRT Alternative – Design and Operational Issues



2.2.5 Final Alternative 3 – Beverly/Whittier Boulevards Light Rail Transit

General Description:

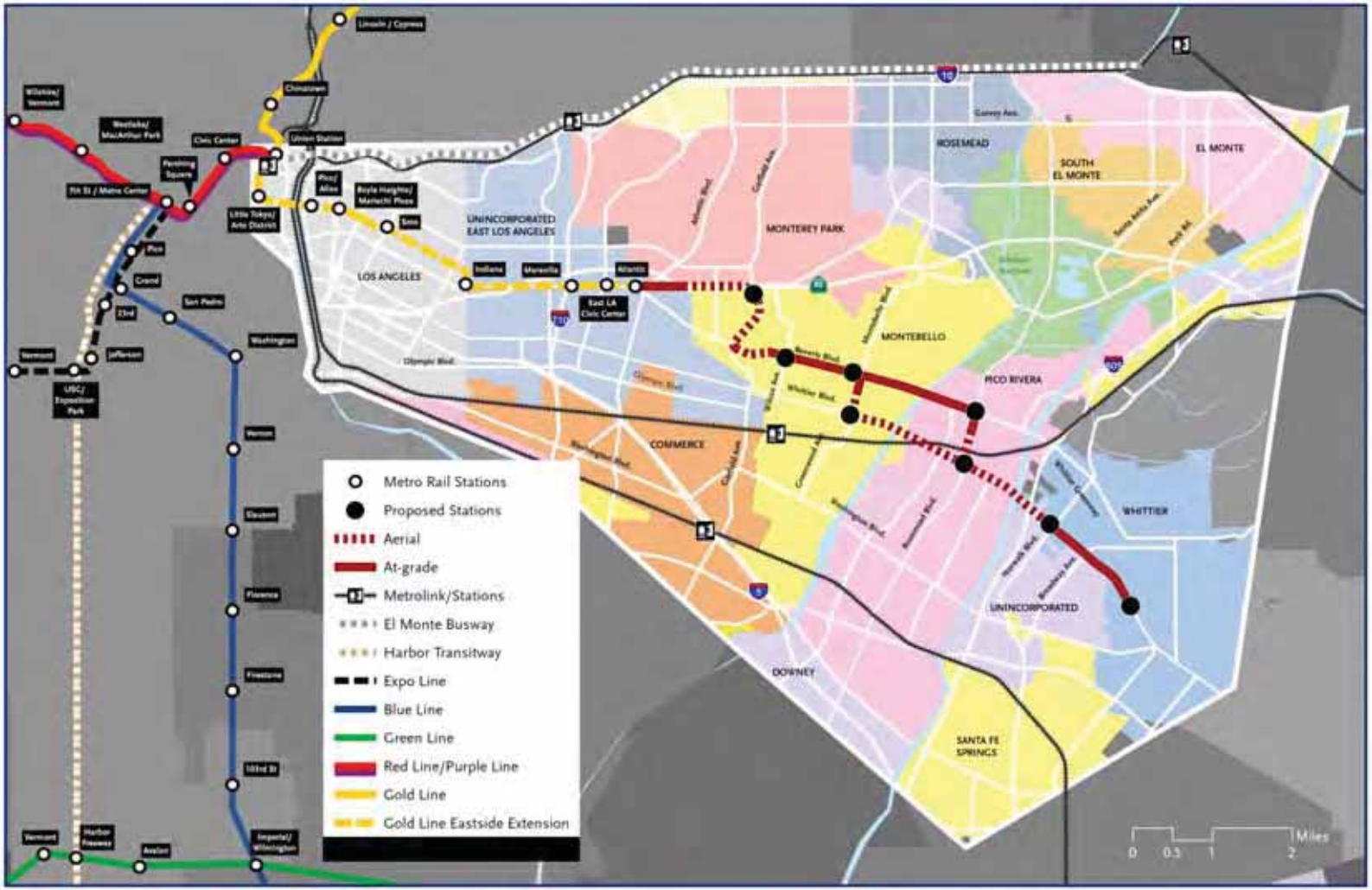
As illustrated in Figure 2-4, the Beverly/Whittier LRT alternative operates in a combination of at-grade and aerial configurations as well as retained fill for operational transitions. This new alternative combines the first half of the Beverly Boulevard Alternative with the eastern half of the previously-studied Whittier Boulevard alignment. North-south connections are proposed on either Montebello or Rosemead Boulevards. Similar to the other LRT options, this alternative extends at-grade east from the Metro Gold Line Eastside Extension Atlantic/Pomona Station in the median of Pomona Boulevard, where the alignment transitions to a combination of aerial and retained fill operations running in the south side of the SR-60 Freeway right-of-way until Garfield Avenue. At Garfield Avenue, this option turns south continuing to operate in an aerial configuration in the median of Garfield Avenue until Beverly Boulevard, where the alignment turns east and transitions to at-grade, median-running operations along Beverly Boulevard. It then turns south to operate on either Montebello Boulevard or Rosemead Boulevard:

- *Montebello Boulevard Option* – The Beverly/Montebello Station becomes a center platform and is pulled back to the western side of the intersection; the at-grade alignment then turns south to travel in the Montebello Boulevard median, where it transitions to an aerial configuration and turns east onto Whittier Boulevard with an aerial Whittier/Montebello Station.

- *Rosemead Boulevard Option* – The Beverly/Montebello Station remains similar to the Beverly Boulevard Alternative (at-grade, split center platform station) and continues east at-grade along Beverly Boulevard to Rosemead Boulevard, where the at-grade, center platform Beverly/Rosemead Station is located to the west of the intersection. The alignment then turns to travel south on Rosemead Boulevard, where it transitions almost immediately to an aerial configuration to travel south over the Union Pacific/Metrolink tracks located north of Whittier Boulevard. This option turns east on Whittier Boulevard with an aerial Whittier/Rosemead Station.

Both options continue east on Whittier Boulevard in aerial operations crossing the Rio Hondo, San Gabriel River and I-605 Freeway, after which the alignment returns to at-grade, median-running operations along Whittier Boulevard from just west of Norwalk Boulevard to a terminus station located at Mar Vista Street adjacent to the Whittier Greenway. In summary, both options operate in a combination of at-grade and aerial configurations. The Beverly/Montebello/Whittier option will operate 40 percent at-grade and 52 percent in an aerial configuration, while 56 percent of the Beverly/Rosemead/Whittier option runs at-grade and 37 percent runs in aerial operations. The remainder of both options, eight and seven percent, respectively, operates in a retained fill configuration in two locations: where the alignments transition between at-grade and aerial operations between the Metro Gold Line Eastside Extension Atlantic/Pomona Station and

Figure 2-6 Beverly/Whittier Boulevards LRT Alternative



the SR-60 Freeway right-of-way, and on Montebello and Rosemead Boulevards, where they transition from at-grade to aerial operations.

During Conceptual Engineering, alignment and station refinements were made as the design documents advanced from single line alignment drawings to a five percent level of engineering design. Table 2.4, located at the end of this section, provides a detailed overview of the conceptual engineering-based refinements for all of the alternatives. For the Beverly/Whittier Boulevards Alternative, a summary of the refinements made includes the following:

1. Relocation of the SR-60/Garfield Station from the southwest corner of the intersection of Garfield Avenue and Via Campo Street to the southeast corner to provide more room for required station facilities and to reduce impacts on the Montebello Golf Course.
2. Redesign of previously at-grade sections on Whittier Boulevard to aerial operations to:
   - Reduce travel impacts within the constrained street width of Montebello Boulevard (56 feet curb-to-curb) in Montebello's downtown area; and
   - Replace proposed at-grade rail operations through a significantly constrained right-of-way under a substandard Union Pacific bridge used by the railroad and Metrolink.
3. Whittier Boulevard median-running operations were shifted to the east side of Whittier Boulevard just north of Mar Vista Street to mitigate impacts to an historic landmark (Paradox Hybrid Walnut Tree) and the median parkway (listed as a park by Whittier).
4. Initial location of TPSS required for rail operations.
5. Minor relocation of some stations to better fit within the existing community, or to reduce traffic impacts, such as shifting a station taking travel lanes to the street median.

Proposed Stations

The Beverly/Whittier Boulevards LRT Alternative has seven stations located to best serve the communities through which this option runs. Several of the stations will require acquisition to accommodate stations and related system facilities, including PNR spaces; five of the stations have TOD opportunities.

<u>Four stations common to both the Montebello and Rosemead options</u>

- *SR-60/Garfield* – aerial, center platform station located on the southeast corner of S. Garfield Avenue and Via Campo Street (Montebello). Property acquisition is required to accommodate system access and facilities, including drop-off space and a PNR structure, along with a TOD opportunity.
- *Beverly/Wilcox* – at-grade, split platform station with single-sided platforms located on both sides of the Beverly Boulevard/Wilcox Avenue intersection (Montebello).
- *Whittier/Norwalk* – aerial, center station in median of Whittier Boulevard to east of Norwalk Boulevard (Whittier). Property acquisition is required at two corner locations to accommodate system access and facilities, including PNR spaces.

- *Whittier/Mar Vista* – at-grade, center platform station located off-street east of Whittier Boulevard (Whittier). Property acquisition is required at this terminus station to provide system facilities, including an off-street shuttle and bus plaza, drop-off space and a PNR structure, along with a TOD opportunity.

Three stations specific to the Montebello Boulevard option

- *Beverly/Montebello* – at-grade, center platform station located on the west side of the Beverly and Montebello Boulevards intersection (Montebello). Property acquisition is required at the northwest corner to accommodate system facilities, including drop-off space and PNR spaces.
- *Whittier/Montebello* – aerial, center platform station located in the median of Whittier Boulevard east of Montebello Boulevard (Montebello).
- *Whittier/Rosemead* – aerial, center platform station located in median of Whittier Boulevard east of Rosemead Boulevard (Pico Rivera). Property acquisition is required at the southeast corner to provide system access and facilities, including a PNR structure, along with a TOD opportunity.

Three stations specific to the Rosemead Boulevard option

- *Beverly/Montebello* – at-grade, split platform station located on both sides of the Beverly and Montebello Boulevards intersection (Montebello). Property acquisition is required at the northwest corner for station access and related facilities, including drop-off and PNR spaces.
- *Beverly/Rosemead* - at-grade, center platform station located on the west side of the Beverly and Rosemead Boulevards intersection (Pico Rivera). Property acquisition is required at the northwest corner for station access and related facilities, including drop-off space and a PNR structure, along with a TOD opportunity.
- *Rosemead/Whittier* – aerial, center platform station located in the median of Whittier Boulevard east of Rosemead Boulevard (Pico Rivera). Property acquisition is required for station access and related facilities, including drop-off and PNR spaces, along with a TOD opportunity.

Design and Operational Concerns:

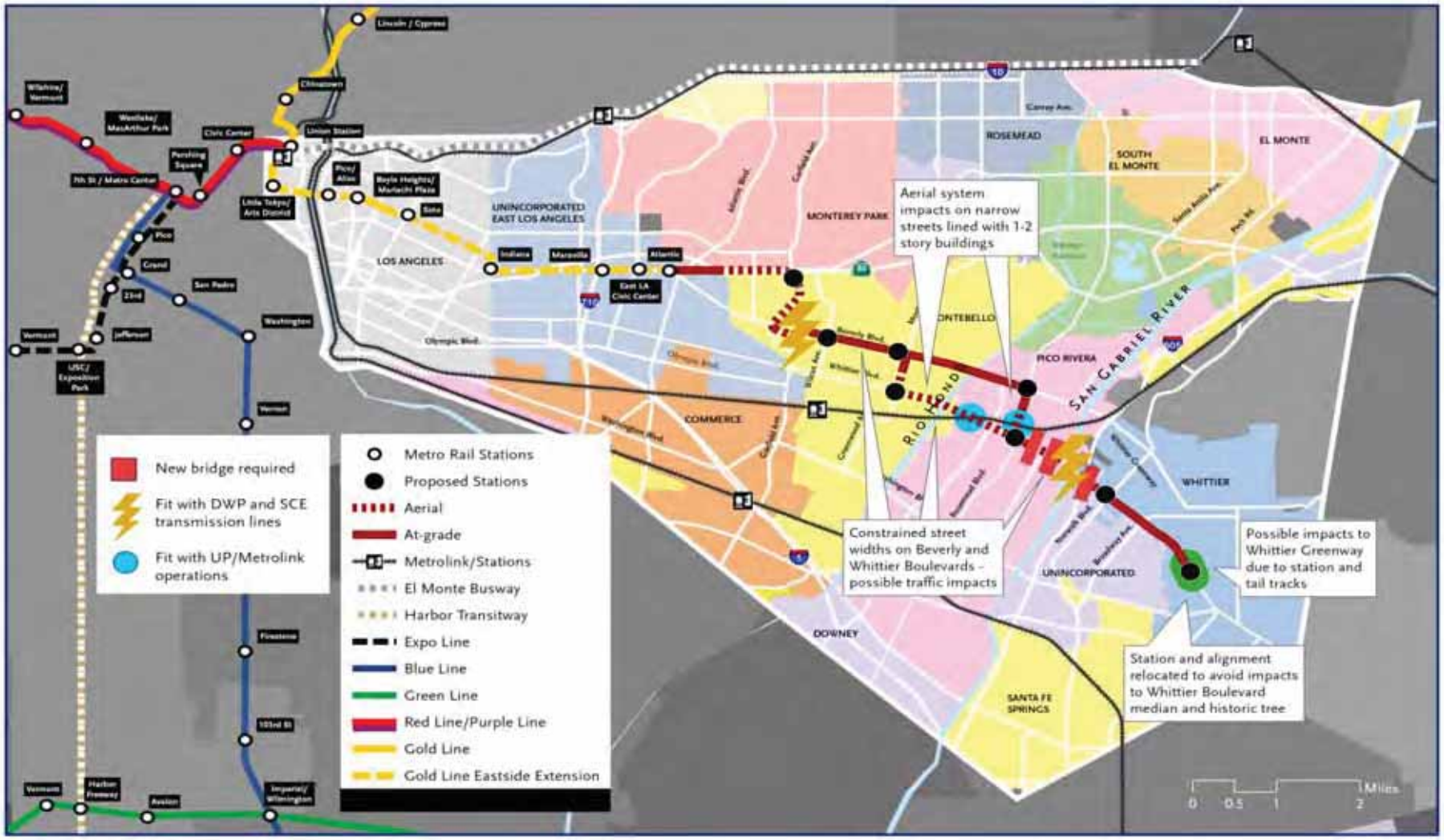
During Conceptual Engineering, the following issues and concerns were identified and are discussed below and illustrated in Figure 2.7. If this alternative moves forward into Advanced Conceptual Engineering and the Draft EIS/EIR phase, they will need to be addressed.

- *Traffic impacts* – In several locations, Beverly and Whittier Boulevards have constrained right-of-way widths ranging from 76 to 90 feet. As identified in the AA Report, elimination of left turns at minor intersections may be required and will be identified during

environmental analysis. Spot widening at stations and principal intersections may be required to provide needed roadway capacity.

- *Aerial system impacts on Downtown Montebello* – Introduction of an aerial system along this street of low-scale buildings may have scale, visual, noise and vibration impacts that will need to be further evaluated in the next phase.
- *Constrained right-of-way along Whittier Boulevard* – Current plans show at-grade operations on Whittier Boulevard between Norwalk Boulevard and west of Broadway. The street and sidewalk widths are narrow in this area of single-family residences; design of rail operations in this area will require more detailed analysis.
- *Construction within the SR-60 and I-605 Freeway right-of-way* – Design of LRT facilities must meet Caltrans and FHWA standards; requires establishment of a cooperative working agreement with Caltrans and FHWA.
- *New Bridges* – This alternative will require three bridge crossings: the Rio Hondo Flood Channel, the San Gabriel River and the I-605 Freeway. Conceptual Engineering efforts evaluated the existing bridges and developed preliminary determinations of whether the structures could be strengthened to accommodate rail operations or whether replacement was required. As shown in Table 2.3, three new bridges are recommended for this alternative. Possible site-specific construction impacts on flood control facilities will require further analysis and working closely with affected agencies, including the USACE as well as Caltrans and impacted municipalities.
- *Fit with existing Southern California Edison projects* – This alignment crosses under the SCE regional transmission system as the alignment turns east from Garfield Avenue on to Beverly Boulevard. During Conceptual Engineering, horizontal and vertical alignment refinements were made to reduce the alignment's closeness to electrical wires. Successful design of the rail system clearance of transmission facilities will require a cooperative working relationship with SCE.
- *Fit with Union Pacific operations* – This alternative will operate in an aerial alignment over the UP Railroad tracks in two locations: just west of Paramount Boulevard, and along the Rosemead Boulevard north-south section north of Whittier Boulevard. Successful design of the LRT system will require a cooperative working relationship with UP.
- *Whittier Greenway* – The end segment of this alternative will run alongside the Whittier Greenway; the end segment includes some operating line, a station and storage tail tracks. Further assessment and design is required to reduce possible impacts to the Greenway, considered parkland and a recreational resource by the City of Whittier, at this location.

Figure 2-7 Beverly/Whittier Boulevards LRT Alternative – Design and Operational Issues



2.2.6 Final Alternative 4 – Washington Boulevard LRT

General Description:

As illustrated in Figure 2-8, the Washington Boulevard LRT Alternative operates predominately (97 percent) in an aerial configuration, with the remaining three percent operating on retained fill. The first operational segment is similar to the LRT options in Alternatives 2 and 3: the alignment extends at-grade east from the Metro Gold Line Eastside Extension Atlantic/Pomona Station in the median of Pomona Boulevard, where it then transitions to aerial operations running in the south side of the SR-60 Freeway right-of-way until Garfield Avenue. After the SR-60/Garfield Station, the Washington Boulevard Alternative turns south in an aerial configuration to operate in the median of Garfield Avenue until Washington Boulevard, where it turns east and continues in median-running, aerial operations on Washington Boulevard to a terminus station located east of Lambert Road with tail tracks for storage extending farther east.

During Conceptual Engineering, alignment and station refinements were made as the design documents advanced from single line alignment drawings to a five percent level of engineering design. Table 2.4, located at the end of this section, provides a detailed overview of the conceptual engineering-based refinements for all of the alternatives. For the Washington Boulevard Alternative, a summary of the refinements made includes the following:

1. Relocation of the SR-60/Garfield Station from the southwest corner of the intersection of Garfield Avenue and Via Campo Street to the southeast corner to provide more room for required station facilities and to reduce impacts on the Montebello Golf Course.
2. Relocation of the terminus station at Lambert Road farther east by 150 feet to reduce impacts on adjacent businesses and to better fit with the City of Whittier's land use plans.
3. Relocation of the alignments to the south side of the Rio Hondo and San Gabriel River bridges to provide a smoother, more direct crossing of the I-605 Freeway. The vertical profile was revised to reduce the alignment's closeness to the SCE transmission lines adjacent to the San Gabriel River.
4. Initial location of TPSS was required for rail operations.
5. Minor relocation of some stations to better fit within the existing community, or to reduce traffic impacts, such as shifting a station taking travel lanes to the street median. Stations initially located on curved alignment sections were shifted to straight alignment sections.

Proposed Stations:

The Washington Boulevard LRT Alternative has six elevated stations located to best serve the communities through which this option runs. Five of the six stations require property acquisition to accommodate stations, access and related facilities, including PNR spaces; four of the stations have TOD opportunities.

- *SR-60/Garfield* – aerial, center platform station located on the southeast corner of S. Garfield Avenue and Via Campo Street (Montebello). Property acquisition is required for station access and facilities, including drop-off space and a PNR structure, along with a related TOD opportunity.
- *Garfield/Whittier* – aerial, center platform station located in the median of Garfield Avenue just north of Whittier Boulevard (unincorporated East Los Angeles). Property acquisition is required for station access and facilities.
- *Washington/Greenwood* – aerial, center platform station located in the median of Washington Boulevard east of Greenwood Avenue (Montebello). Property acquisition is required for station access and facilities, including a PNR structure, along with a related TOD opportunity.
- *Washington/Rosemead* – aerial, center platform station located in the center of Washington Boulevard west of Rosemead Boulevard (Pico Rivera). Property acquisition is required for station access and facilities, including a PNR structure. There are development opportunities within walking distance of the station.
- *Washington/Norwalk* – aerial, center platform station located in the median of Washington Boulevard east of Norwalk Boulevard (Whittier). Property acquisition is required for station access and facilities, including a PNR structure, along with a related TOD opportunity. There are other station area development opportunities.
- *Washington/Lambert* – aerial, center platform station located in the median of Washington Boulevard east of Lambert Road (Whittier). Property acquisition is required at this terminus for station access and facilities, including off-street shuttle access, drop-off space and PNR structures with related TOD opportunities. There are other station area development opportunities as well.

Design and Operational Concerns:

During Conceptual Engineering, the following issues and concerns were identified and are discussed below and illustrated in Figure 2.9. If this alternative moves forward into Advanced Conceptual Engineering and the Draft EIS/EIR phase, they will need to be addressed.

- *Traffic impacts* – Aerial rail operations are seen as a way of maintaining existing street system capacity while providing additional corridor travel capacity, and this is true where there is sufficient street right-of-way. In the study area, Washington Boulevard varies from four to six lanes in width, and along the wider street sections there will be minimal impacts to vehicular traffic due to the introduction of a rail system. In the corridor's constrained street areas, placement of aerial structural system elements, such as columns and station access elements, may negatively impact street circulation. Elimination of left turns at minor intersections will allow for two through traffic lanes during peak periods, while retaining off-peak parking within the existing roadway right-of-

way. Spot widening at stations and principal intersections may be required to provide needed roadway capacity.

- *Construction within the SR-60 and I-605 Freeway right-of-way* – Design of LRT facilities must meet Caltrans and FHWA standards; requires establishment of a cooperative working agreement with Caltrans and FHWA.
- *New Bridges* – This alternative will require three bridge crossings: the Rio Hondo Flood Channel, the San Gabriel River and the I-605 Freeway. Conceptual Engineering efforts evaluated the existing bridges and developed preliminary determinations of whether the structures could be strengthened to accommodate rail operations or whether replacement was required. As shown in Table 2.3, all new bridges are recommended for this alternative. Possible site-specific construction impacts on flood control facilities will require further analysis and working closely with agencies, including USACE as well as Caltrans and impacted municipalities.
- *Assessment of at-grade operations* – During Conceptual Engineering, an initial assessment of the viability of at-grade operations along portions of Washington Boulevard was performed. Currently, this major street plays many travel roles. Washington Boulevard not only serves the communities it runs through, but it is also a regional major truck route, particularly west of the I-605 Freeway, and a commuter alternative to the I-5 Freeway. In addition, Washington Boulevard varies in width from four to six lanes.

  Conceptual-level engineering and operational analysis identified that west of Rosemead Boulevard, at-grade operations were not feasible primarily given the heavy truck traffic and the constrained street width. In four lane-wide locations, the introduction of an at-grade system structure will reduce travel capacity to one through lane in each direction. East of Rosemead Boulevard, particularly east of the I-605 Freeway, the viability of replacing aerial operations on Washington Boulevard with at-grade operations is possible from an engineering perspective, but will impact existing traffic circulation system and future rail system run times. An initial review of at-grade operations, including identification of the current street system operations, was performed between Rosemead Boulevard and the rail system's proposed terminus at the Five Points area of Whittier (Whittier Boulevard, Washington Boulevard, Santa Fe Springs Road and Pickering Avenue). Currently, there are eight signalized intersections, not including signals at Rosemead Boulevard and the Five Points area, each adding 30 seconds to an at-grade rail system's run time. With the introduction of at-grade rail operations, new traffic lights may be required for the safety of rail and vehicular traffic. In addition, there are a high number of non-signalized intersections: mid-block left-turn lanes into both shopping center driveways and minor residential streets; and side streets that "T" into Washington Boulevard via non-signalized left turn lanes. All of the identified traffic issues will increase rail run times and negatively affect the system's attractiveness to existing and new riders.

Figure 2-8 Washington Boulevard LRT Alternative

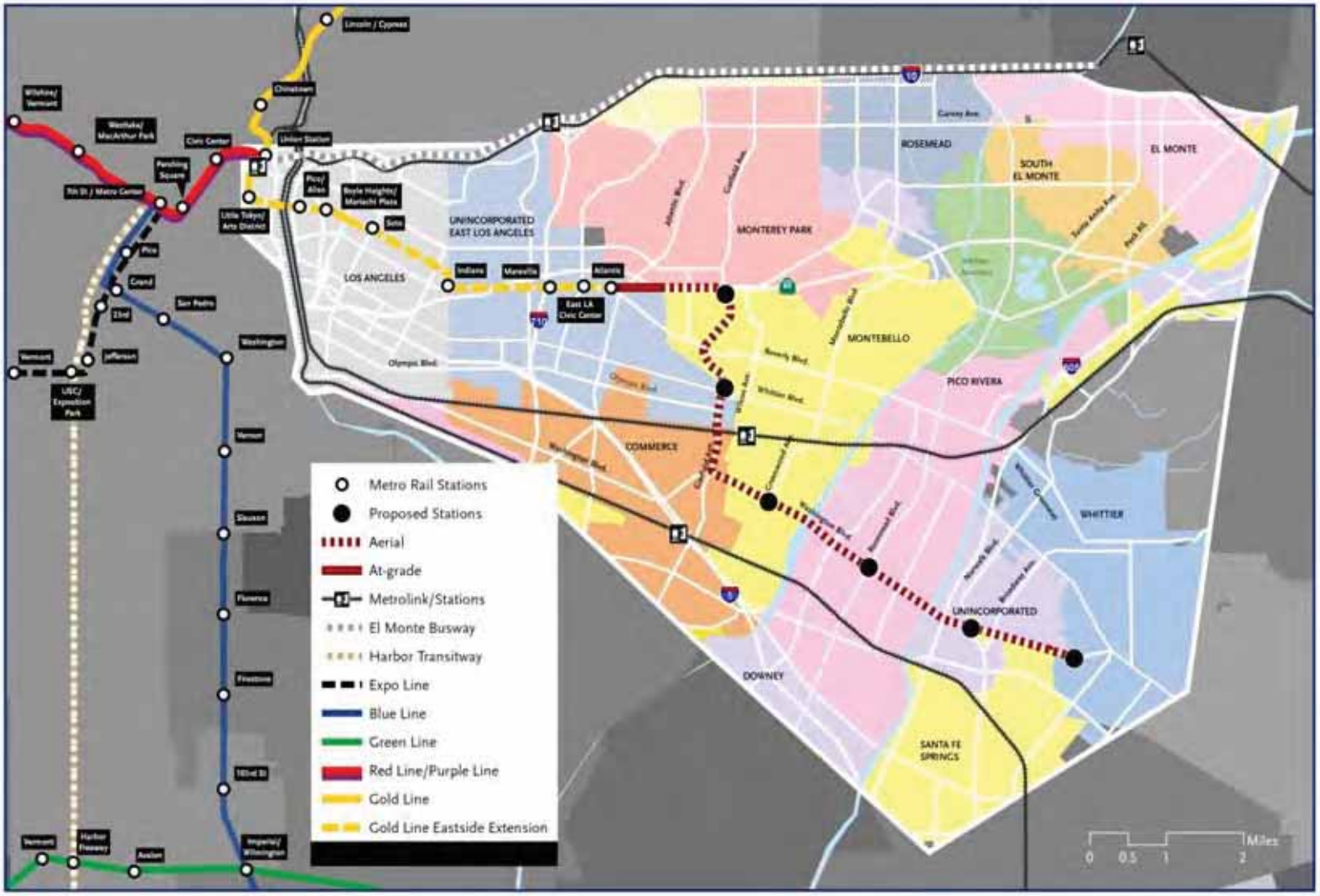


Figure 2-9 Washington Boulevard LRT Alternative – Design and Operational Issues

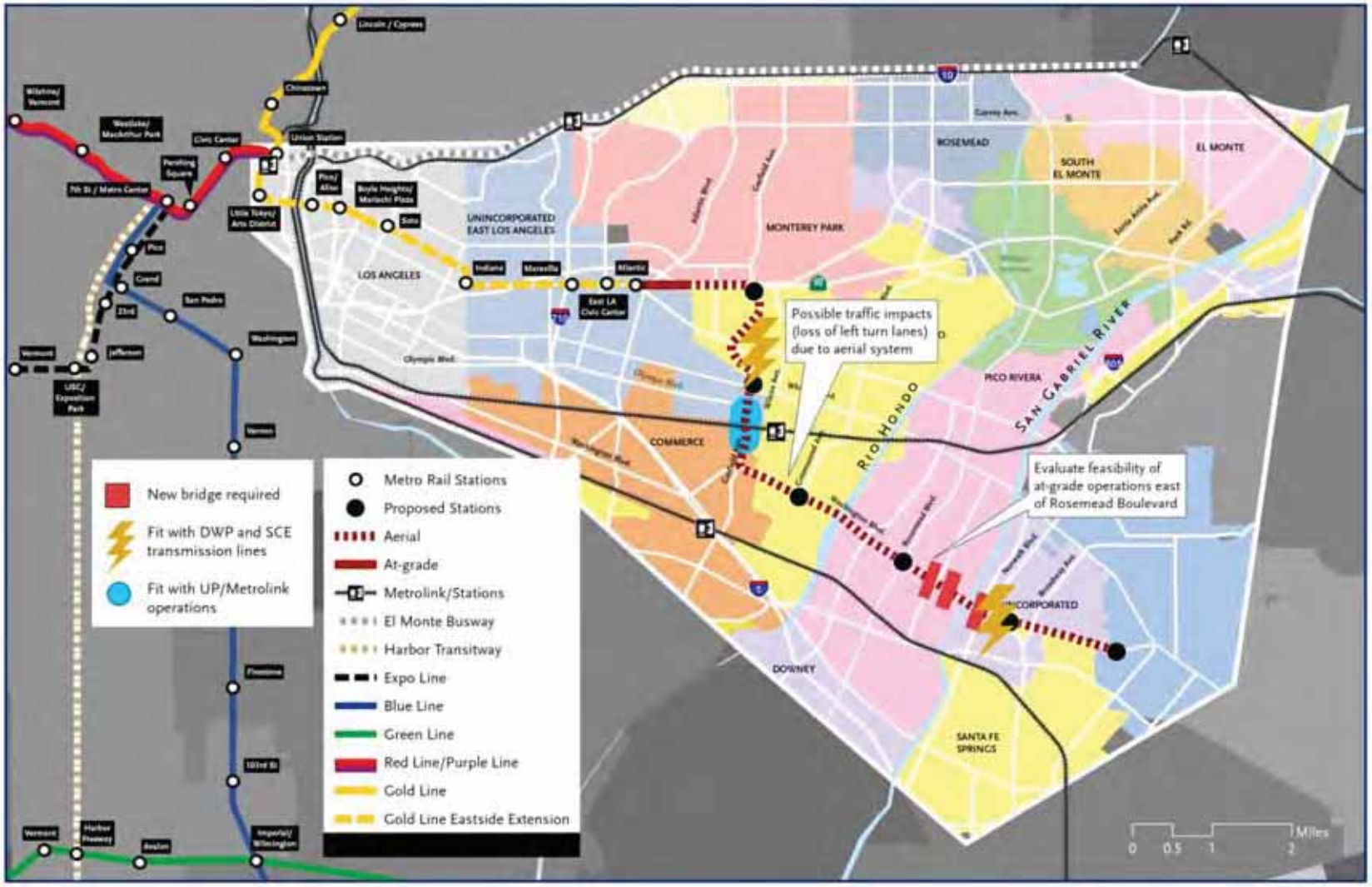


Table 2.4 Conceptual Engineering Alignment and Station Refinements

Alternative	Revision	Background
Alignment Revisions		
1 SR-60 LRT	Alignment shortened by 1.25 miles from AA terminus at Crossroads Parkway to Peck Road	• Reduces project cost by avoiding crossing of complex I-605/SR-60 interchange and SR-60
2 Beverly Boulevard LRT	• SR-60/Garfield station area alignment revised to reflect shifting of station from southwest to southeast corner of Garfield Avenue and Via Campo Street intersection • Beverly Boulevard – lengthened transition from aerial to at-grade operations by 100 ± feet • Smoothed out curves as alignment transitions from Beverly median to cross through primarily vacant land to cross I-605 Freeway • Whittier Greenway – alignment shifted to south side of trail • Whittier Greenway from Bailey Street south to Mar Vista Street – shifted alignment to south side and smoothed out curves (requires some property acquisition)	• Improves system access with new station location • Improves system operation • Meets Metro Design Criteria • Improves system operation by redesigning tight curves • Meets Metro Design Criteria • Allows for continuous recreational use along north side of trail • Improves system operation • Meets Metro Design Criteria
Whittier Boulevard LRT	Deleted from further consideration as a stand-alone alternative	• Avoids significantly constrained street widths in western section of alignment
3A Beverly/Whittier Boulevard LRT via Montebello Boulevard 3B Beverly/Whittier Boulevards LRT via Rosemead Boulevard	New alternative combining western portion of Beverly Boulevard Alternative with eastern portion of Whittier Boulevard Alternative, with north-south connections on either Montebello or Rosemead Boulevards Alignment revisions include: • Montebello option: former at-grade operations now are aerial east from Montebello Boulevard to east to the I-605 Freeway • Rosemead option: remains aerial to east of I-605 Freeway • Mar Vista Station area – former landscaped median-running alignment now crosses Whittier Boulevard to operate along the eastern street edge	• Provides most promising combination of Beverly and Whittier Boulevards options • Provides good study area service coverage • Improves travel time

Table 2.4 Conceptual Engineering Alignment and Station Refinements

Alternative	Revision	Background
Alignment Revisions		
4 Washington Boulevard LRT	• SR-60/Garfield station area alignment revised to reflect shifting station from southwest to southeast corner of Garfield Avenue and Via Campo Street intersection	• Improves system access with new station location
	• San Gabriel River Crossing – just west of river, median-running operations were shifted to the south side of the street right-of-way and then onto a new bridge over the river, continuing in an aerial structure over the I-605 Freeway and returns to median-running after Pioneer Boulevard; profile changes were also made	• Avoids SCE transmission lines and provides smoother crossing of I-605 for system riders
	• Terminus – alignment lengthened by 400 ± feet	• Accommodates new location of Lambert Road Station
Station Revisions		
1 SR-60 LRT	**SR-60/Garfield Station** Shifted station 350 ± feet to the east from initial location in SR-60 Freeway right-of-way spanning Garfield Avenue to location with station entirely within SR-60 right-of-way and facing on to Via Campo Street	Revised location provides improved station access: • Pedestrian access from bus stops • Drop-off space • Future parking access via pedestrian bridge
	Montebello Town Center Station Minor alignment profile revisions	
	Santa Anita Avenue Station • Alignment curve from western approach to this station was smoothed out • Station remained in previous location, but is now on a straight alignment section	• Improves system operation by redesigning tight curves • Station was located on a curve which does not meet Metro or industry engineering design or operating standards
	Peck Road Station • Station and tail tracks will be shifted 125± feet to the west	• Tail track location encroaches on SCE property planned for a transmission improvement project
2 Beverly Boulevard LRT	Deletion of three stations: • Beverly/Garfield • Beverly/Poplar • Beverly Civic Center	Deletion of these stations improved operations of this alternative: • Station spacing was too close – did not meet Metro station spacing criteria • Resulted in faster travel time for this alternative

Table 2.4 Conceptual Engineering Alignment and Station Refinements

Alternative	Revision	Background
	Station Revisions	
2 Beverly Boulevard LRT	**SR-60/Garfield Station** • Shifted station from initial location at southwest corner adjacent to Montebello Golf Course to southeast corner of Garfield Avenue/Via Campo Street (Both location options require property acquisition.)	AA station location had: • Constrained site size that could not accommodate station access facilities including drop-off and parking spaces • Poor interface with bus stops • Required possible take of golf course property
	Beverly/Wilcox Station No change	
	Beverly/Montebello Station No change	
	Beverly/Rosemead Station No change	
	Greenway/Norwalk Station • Redesigned with split platforms on either side of former railroad bridge; located within southern half of trail right-of-way • Drop-off space now provided • Improved bus stop access	AA station was single platform located in center of former railroad bridge: • Insufficient bridge right-of-way to accommodate center platform • Poor station access
	Greenway/Broadway Station • Redesigned with split platforms on either side of Broadway; both located within southern half of trail right-of-way • Split platform design improves safety by providing improved operator visibility	AA station was center platform located in center of trail right-of-way on west side of Broadway: • Constrained trail right-of-way did not accommodate center platform and trail • Poor operator visibility in heavy pedestrian area
	Greenway/Philadelphia Station • Station relocated to southern half of right-of-way and shifted slightly to the east to reflect alignment changes	AA station was located in center of trail right-of-way
	Greenway/Mar Vista Station • Station was relocated to the southern half of right-of-way and shifted slightly to the west to reflect alignment changes	AA station was located on a curve in center of trail right-of-way

Table 2.4 Conceptual Engineering Alignment and Station Refinements

Alternative	Revision	Background
	Station Revisions	
3 Beverly/Whittier Boulevards LRT	**Common Stations**	
	SR-60/Garfield Station • Shifted station from initial location at southwest corner adjacent to Montebello Golf Course to southeast corner of Garfield Avenue/Via Campo Street (Both location options require property acquisition.)	AA station location had: • Constrained site size that could not accommodate station access facilities including drop-off and parking spaces • Poor interface with bus stops • Required possible take of golf course property
	Beverly/Wilcox Station No change	
	Whittier/Norwalk Station • Now at-grade station shifted 400 ± feet to east of Norwalk Boulevard • Reduces traffic capacity, parking and visibility impacts • Provides better access to future parking at southeast corner of intersection	AA aerial station was located over travel lanes and sidewalk on the south side of Whittier Boulevard; station spanned the intersection
	Whittier/Mar Vista Station • Reflecting new alignment configuration, station was shifted out of the median and located along the eastern side of Whittier Boulevard within private property and a portion of the Greenway Trail • Redesigned with center platform	AA station was designed with split platforms to fit within the Whittier Boulevard landscaped median: • Median is a City of Whittier park • Station negatively impacted the Paradox Hybrid Walnut Tree listed on the National Register of Historic Places
	Montebello Boulevard Alternative Stations	
	Beverly/Montebello Station No change	
	Whittier/Montebello Station • Now aerial station relocated east of Montebello Boulevard on Whittier Boulevard to provide service to Downtown Montebello	AA at-grade station was located west of Montebello Boulevard – the new alignment no longer serves that location
	Whittier/Rosemead Station • Aerial station shifted 100 ± feet east of Rosemead Boulevard to provide room for improved system access	AA station assumed station access from street median: • Station was located too close to intersection to provide safe system access

Table 2.4 Conceptual Engineering Alignment and Station Refinements

Alternative	Revision	Background
	Station Revisions	
3 Beverly/Whittier Boulevards LRT (continued)	**Rosemead Boulevard Alternative Stations**	
	Beverly/Rosemead Station • Station was redesigned with center platform and shifted 75± feet west of Rosemead Boulevard to fit with new alignment curving to turn south on Rosemead Boulevard from Beverly Boulevard	AA station was split-platform with platforms located in the median of Beverly Boulevard on both sides of Rosemead Boulevard
	Beverly/Montebello Station No changes	
	Rosemead/Whittier Station • Station shifted 100 ± feet east of Rosemead Boulevard to fit with new alignment curve from Rosemead Boulevard to Whittier Boulevard	AA station accommodated straight-running Whittier Boulevard Alternative alignment
4 Washington Boulevard LRT	**SR-60/Garfield Station** • Shifted station from initial location at southwest corner adjacent to Montebello Golf Course to southeast corner of Garfield Avenue/Via Campo Street (Both location options require property acquisition.)	AA station location had: • Constrained site size that could not accommodate station access facilities including drop-off and parking spaces • Poor interface with bus stops • Required possible take of golf course property
	Garfield/Whittier Station No change in station location Property acquisition has been identified to provide improved access to this aerial station	AA station assumed station access from street median; due to constrained street right-of-way and safety concerns access recommended to be off-street
	Washington/Greenwood Station • Shifted station 300 ± feet east of Greenwood Avenue • Provides strong interface with single site recommended for acquisition to provide drop-off and parking spaces with future TOD opportunity • Reduces possible traffic and truck impacts • Reserves future development opportunities for others	AA station spanned Greenwood Avenue to provide access to proposed PNR/TOD opportunities, with property acquisition, at all four corners of the intersection: • Possible traffic visibility impacts • Possible truck impacts as Greenwood is heavily used by trucks • Development analysis showed limited need for Metro to acquire property for station parking and TOD
	Washington/Rosemead Station No change	

Table 2.4 Conceptual Engineering Alignment and Station Refinements

Alternative	Revision	Background
	Station Revisions	
4 Washington Boulevard LRT (continued)	**Washington/Norwalk Station** • Shifted 350 ± feet west, closer to intersection • Provides improved pedestrian, bus, and parking access	AA station was located east of the intersection at a distance that created significant walking distances for riders transferring from buses or accessing the system by walking and car
	Washington/Lambert Station • Shifted station east 400 ± from initial location to east of Lambert Road • Reduces traffic and visibility impacts • Provides better access to future parking at southeast corner of intersection • Provides better interface with future land use plans and adjacent land uses	AA station spanned Washington Boulevard and Lambert Road intersection: • Significant impact on heavily-used intersection • Poor fit with adjacent land uses and employment sites • Poor fit with City of Whittier's Specific Plan for area

3.0 TRANSPORTATION ISSUES AND ANALYSIS

The Eastside Transit Corridor Phase 2 Alternatives Analysis (AA) Report, completed in January 2009, provided a detailed overview of the Project Study Area's (PSA) existing transportation system that would be affected by the five proposed project alternatives under consideration at the time. In January 2009, the Metro Board approved four Final Alternatives for further study. As presented in Section 2 of this report, Metro Board action, along with conceptual engineering and station planning efforts, resulted in physical and operational revisions to the alternatives studied in the AA Report. As a result, the following transportation issues were affected by these refinements and are discussed in detail in this section: travel times, ridership boardings and user benefits. No other transportation system areas documented in the AA Report were impacted.

3.1 Transit Analysis

The following presents a brief description of the physical and operational refinements made to each of the alternatives evaluated during Conceptual Engineering. Section 2 of this document presents a more detailed discussion of the revisions.

No Build Alternative

There were no changes to the No Build Alternative that includes all PSA projects identified for construction in the "Constrained Plan" of Metro's *Draft 2008 Long Range Transportation Plan*.

Transportation System Management Alternative

The Transportation System Management (TSM) Alternative addresses the same mobility needs as the build alternatives, but does not include the construction of a fixed guideway facility. The Eastside Transit Corridor Phase 2 TSM option includes all of the provisions of the No Build Alternative, plus the planned enhancements to existing bus service previously presented in the AA Report. During Conceptual Engineering, an increase in the number of the peak Light Rail Vehicles (LRV) for the TSM and the four Final Alternatives was identified based on Metro Operations policy for 2030.

Build Alternatives

The four Final Alternatives, approved by the Metro Board in January 2009, were refined and evaluated during Conceptual Engineering efforts, and then compared against the TSM Alternative. Each of the Build Alternatives includes all of the TSM Alternative improvements. An

overview of the operational refinements made to each of the alternatives is presented below. A detailed description of the operational revisions is presented in Section 2 of this document.

Alternative 1 - SR-60 Freeway LRT

The SR-60 Freeway Alternative will extend Metro Gold Line Light Rail Transit (LRT) service east to Peck Road within the southern SR-60 Freeway right-of-way. As presented in Section 2, the length of this alignment was reduced by approximately 1.25 miles, and the Crossroads Parkway station was deleted from the option identified and evaluated in the AA Report.

Station area parking requirements for each of the four stations along the alignment were identified based on forecast ridership, access information and community fit. The proposed parking for each of this alternative's four stations is presented below in Table 3.1. The final number of required parking spaces will be refined during the Draft EIS/EIR phase.

Table 3.1 SR-60 LRT Proposed Parking Spaces

Station	Parking Spaces
Garfield	344
Montebello Town Center	417
Santa Anita Boulevard	692
Peck Road	1,983
Total	**3,436**

Alternative 2 – Beverly Boulevard LRT

The Beverly Boulevard Alternative will extend Metro Gold Line LRT service east along the Beverly Boulevard Corridor to a terminus station located at Mar Vista Street in the City of Whittier. As discussed in Section 2 of this report, three stations were deleted from those under consideration in the AA Report: Garfield/Beverly, Beverly/Civic Center and Beverly/Poplar.

Station area parking requirements were identified based on forecast ridership, station access information and community fit. No parking facilities were proposed at three stations due to the single-family community setting and the surrounding area's conduciveness to walking, drop-off and bus access. These stations include Beverly/Wilcox, Whittier Greenway/Norwalk and Whittier Greenway/Broadway. Additionally, the Greenway/Philadelphia station will not have parking facilities due to the lack of an appropriately-sized property and constrained station area circulation patterns. The proposed parking for four of this alternative's stations is presented in Table 3.2. Final parking space requirements will be identified during the Draft EIS/EIR phase.

Table 3.2 Beverly Boulevard LRT Proposed Parking Spaces

Station	Parking Spaces
SR-60/Garfield	444
Beverly/Wilcox	0
Beverly/Montebello	231
Beverly/Rosemead	496
Greenway/Norwalk	0
Greenway/Broadway	0
Greenway/Philadelphia	0
Greenway/Mar Vista	1,070
Total	**2,241**

Alternative 3 – Beverly/Whittier Boulevards LRT

This new alternative combines the first half of the Beverly Boulevard Alternative alignment with the eastern half of the previously-studied Whittier Boulevard Alternative. North-south connections are proposed on either Montebello or Rosemead Boulevards. This option will extend Metro Gold Line LRT service east to a terminus station located at Mar Vista Street in the City of Whittier.

Station area parking requirements were identified based on forecast ridership, station access information and community fit. No parking facilities were proposed at the Beverly/Wilcox or Whittier/Montebello (for the Montebello option) stations due to the single-family community setting and the surrounding area's conduciveness to walking, drop-off and bus access. The proposed parking for four of this alternative's stations is presented below in Table 3.3. The final number of required parking spaces will be identified during the Draft EIS/EIR phase.

Table 3.3 Beverly/Whittier Boulevards LRT Proposed Parking Spaces

Via Montebello Boulevard		Via Rosemead Boulevard	
Station	Parking Spaces	Station	Parking Spaces
SR-60/Garfield	444	SR-60/Garfield	444
Beverly/Wilcox	0	Beverly/Wilcox	0
Beverly/Montebello	231	Beverly/Montebello	231
Whittier/Montebello	0	Beverly/Rosemead	496
Whittier/Rosemead	472	Whittier/Rosemead	472
Whittier/Norwalk	0	Whittier/Norwalk	0
Whittier/Mar Vista	1,236	Whittier/Mar Vista	1,236
Total	**2,283**	**Total**	**2,879**

Alternative 4 – Washington Boulevard LRT

The Washington Boulevard Alternative will extend Metro Gold Line Eastside Extension LRT service east from the Atlantic/Pomona Station, turning south on Garfield Avenue to Washington Boulevard, where it operates east to the Lambert Road area in the City of Whittier.

Station area parking requirements were identified based on forecast ridership, station access information and community fit. The proposed parking for this alternative is presented below in Table 3.4. No parking is proposed at the Garfield/Whittier station as it is designed primarily for walking, drop-off and bus access due to the lack of an appropriately-sized property and constrained station area circulation patterns. Property acquisition at this aerial station, to provide vertical access elements, may result in limited parking opportunities. The final number of required parking spaces will be identified during the Draft EIS/EIR phase.

Table 3.4 Washington Boulevard LRT Proposed Parking Spaces

Station	Parking Spaces
SR-60/Garfield	523
Garfield/Whittier	0
Washington/Greenwood	151
Washington/Rosemead	353
Washington/Norwalk	667
Washington/Lambert	1,008
Total	**2,702**

3.1.1 Operating Assumptions and Plans

The following provides a summary of the general operating assumptions and plans for each of the Eastside Transit Corridor Phase 2 TSM and LRT alternatives. The resulting operating plans and requirements are detailed in *Appendix D: Preliminary Operating Plan Technical Memorandum*.

Operating Assumptions

Existing bus services in the Eastside Transit Corridor Phase 2 PSA are operated by Metro, Montebello Bus Lines, Norwalk Transit System, Monterey Park Spirit Bus and Foothill Transit Zone. Metro is assumed to be the operating agency for the proposed extension that will connect

to Phase 1 of the Metro Gold Line Eastside Extension, which is slated for revenue operations by the end of 2009.

Hours of Operation

When modeling the transportation impacts of each of the proposed alternatives, service frequency for the LRT alternatives was assumed to be the same as that of the Metro Gold Line as presented below in Table 3.5. The service frequencies for LRT operations are based on criteria documented in Metro's *Draft 2008 Long Range Transportation Plan*. The hours of operation for the proposed LRT alternatives, presented in Table 3.5, are comparable to the weekday, Saturday and Sunday and holiday schedules for the rest of the Metro rail system.

Table 3.5 Metro LRT Service Frequency

Day of Week	Frequency	Hours
Weekday	5 minutes	6:30 – 8:30 a.m. 4:00 – 7:00 p.m.
	10 minutes	8:30 a.m. – 4:00 p.m. 7:00 – 8:00 p.m.
	15 minutes	4:00 – 6:30 a.m. 8:00 p.m. – 1:30 a.m.
Weekend	12 minutes	9:00 a.m. – 6:30 p.m.
	15 minutes	7:00 – 9:00 a.m. 6:30 – 7:30 p.m.
	20 minutes	4:00 – 7:00 a.m. 7:30 p.m. – 1:00 a.m.

Vehicle Assumptions

Vehicle capacity and passenger loading standards have been established to determine the service frequency and fleet requirements for each of the LRT alternatives. Based on Metro load factors, each 76-seat LRT vehicle was identified as having a peak hour passenger loading of 144 passengers. During Conceptual Engineering, the number of cars to be operated per train, or consist, was revised per direction from Metro Operations. In 2030, Metro's operations policy, reflecting a forecast increase in ridership capacity needs, requires three-car consists to be operated during the entire span of service. Table 3.6 shows the difference between the consist sizes assumed during the AA process and what is reflected in the operating plans developed during Conceptual Engineering.

Table 3.6 Proposed Train Consist Sizes (2030)

Operating Timeframe	Peak	Base	Evening	Ready Cars
Alternatives Analysis				
Monday-Friday	2	2	1	2
Saturday	2	2	1	2
Sunday	2	2	1	2
Conceptual Engineering				
Monday-Friday	3	3	3	3
Saturday	3	3	3	3
Sunday	3	3	3	3

3.1.2 Run Time Estimates

Travel times for the Final Alternatives were calculated using a computer simulation model calibrated to the performance characteristics of Metro's current fleet of LRT vehicles. Inputs to the run time model included:

- Speed restrictions for operations – speeds utilized reflected proposed LRT operation in three configurations: the median of the PSA's streets with operations guided by the traffic signal system; exclusive right-of-way; or aerial alignment;
- Horizontal curves – utilized alignment curve radii identified during the development of Conceptual Engineering plans;
- Distances between stations – calculated from the Conceptual Engineering plans;
- Dwell times – reflected Metro operations policy of 20 seconds at LRT stations; and
- Vehicle performance characteristics – utilized acceleration and deceleration rates and maximum operating speeds from current LRV fleet type.

During Conceptual Engineering, maximum allowable operating speeds along the various alignment segments were identified and confirmed with Metro Rail Operations staff. Aerial-running sections of the Final Alternatives, such as the SR-60 and Washington Boulevard alternatives, will have a maximum allowable speed of 65 mph; this maximum speed is constrained at some locations by horizontal curves in the alignment. At-grade, street-running operations such as those along Beverly Boulevard will reflect the maximum speed of the streets in which they operate – typically 35 mph. The initial maximum speed proposed along the Whittier Greenway, which is a limited access, at-grade corridor, was 45 mph. Based on field observations, and with the concurrence of Metro Operations staff, the maximum speed along

this section of the Beverly Boulevard Alternative has been reduced to 35 mph to reflect operational safety concerns. An overview of the operating characteristics of the Final Alternatives, based on Conceptual Engineering, station design and operational plans developed for each alternative is presented below in Table 3.7.

Table 3.7 Summary of Operating Characteristics

Alternative	Average Station Spacing (miles)	Average Speed (miles per hour)	Maximum Speed (miles per hour)
1 SR-60 LRT	1.4	33.3	55
2 Beverly Boulevard LRT	1.1	22.5	40
3 Beverly/Whittier LRT via Montebello Boulevard	1.3	23.4	45
3 Beverly/Whittier LRT via Rosemead Boulevard	1.3	21.9	40
4 Washington Boulevard LRT	1.5	31.8	55

Using the operating inputs identified above, station-to-station run times for each of the Final Alternatives were identified and are presented below in Table 3.8. The travel times shown represent the total travel time between the Metro Gold Line Eastside Extension Atlantic/Pomona Station and the terminus station of each alternative. While the resulting run times for the Final Alternatives are comparable to the estimates developed in the AA phase, changes in the number of stations, the lengths of the alignments, modifications to speed assumptions and the inclusion of more detailed vertical design and horizontal curve data resulted in a refinement of run times. The Washington Boulevard Alternative was the only option that remained unchanged from the definition included in the AA Report, and the Conceptual Engineering-based run time analysis resulted in a 52 second increase in travel time. For the Beverly Boulevard Alternative, deletion of three stations while decreasing the operating speed on the Whittier Greenway resulted in a 39 second decrease in travel time.

Table 3.8 Total Run Times

Alternative	Number of Stations	Distance (miles)	Run Time (min:sec)
1 SR-60 LRT	4	6.92	12:28
2 Beverly Boulevard LRT	8	8.99	23:58
3 Beverly/Whittier Boulevards LRT via Montebello Boulevard	8	9.10	24:55
3 Beverly/Whittier Boulevards LRT via Rosemead Boulevard	8	9.06	23:17
4 Washington Boulevard LRT	6	9.26	17:28

The SR-60 LRT Alternative, with the shortest alignment, fewest stations and highest maximum operating speed, was identified as having the lowest travel time between the Metro Gold Line Eastside Extension Atlantic/Pomona Station and its terminus station at Peck Road in the City of South El Monte. The predominately (97 percent) aerial-operating Washington Boulevard Alternative has the second lowest travel time – only five minutes more travel time than the SR-60 Alternative to traverse a longer length (2.34 miles), three more stations and two tight curves. The other two alternatives, with very similar alignment lengths, number of stations and operational speeds were identified as having similar total travel times. There are approximately 1:12 minutes difference between the lowest and the highest run time option: Beverly/Whittier Boulevards via Rosemead Boulevard Alternative and Beverly/Whittier Boulevards via Montebello Boulevard Alternative, respectively. The option with the Rosemead Boulevard north-south connection does have four percent (0.34 miles) more aerial operations, and the Montebello option is slightly longer.

3.1.3 Ridership Results

Ridership projections were prepared utilizing the Metro Travel Demand Model for the Final Alternatives to provide a basis for comparison. Table 3.9 below presents the projected passenger daily and annual boardings along with forecast new transit riders attracted through implementation of each of the proposed alternatives in the year 2030. User benefits have been identified and are presented for each alternative.

Table 3.9 Project Boardings and User Benefits (FY 2030)

Alternative	Daily Boardings	Annual Boardings (Millions)	Daily Net New Riders	User Benefits Per Project Boarding (Minutes)	User Benefits (Hours)
1 SR-60 LRT	12,270	4.0	3,835	17.0	3,474
2 Beverly Boulevard LRT	12,780	4.2	5,020	24.6	5,241
3 Beverly/Whittier Boulevards LRT via Montebello Boulevard	12,700	4.1	5,190	25.9	5,470
3 Beverly/Whittier Boulevards LRT via Rosemead Boulevard	12,410	4.0	5,060	25.8	5,336
4 Washington Boulevard LRT	15,660	5.1	6,280	24.1	6,293

The forecast daily boardings for the Final Alternatives fall within a close range and the resulting ridership is almost indistinguishable among the options. Even when identifying annual boardings (defined by Metro as the daily boardings multiplied by 325 days), the resulting numbers are almost all the same. The exception is the Washington Boulevard Alternative, which is forecast to have the highest level of daily boardings (15,660) and annual boardings (5.1 million) of the alternatives.

3.2 FTA Criteria

Key performance metrics considered by the Federal Transit Administration (FTA) include daily net new transit riders and user benefit hours that the build alternatives provide compared to the TSM Alternative. The identified "net new transit riders" includes all transit riders, whether bus or rail patrons. As shown in Table 3.9, the Washington Boulevard Alternative is forecast to attract the highest number of new transit riders and the SR-60 Alternative the lowest number of new riders. The Beverly Boulevard and Beverly/Whittier Boulevards alternatives are estimated to attract a similar number of new riders.

User benefits are defined as the weighted travel time savings for all users of each of the project alternatives. While the Washington Boulevard Alternative does not have the highest user benefits at a per project boarding level, when the user benefits are calculated at the hour level, the Washington Boulevard was forecast to have the greatest user benefit of 6,293 hours. The Beverly/Whittier Boulevards via Montebello Boulevard Alternative was projected to have the next

highest user benefit of 5,470 hours, and the SR-60 Alternative was forecast to have the lowest level of user benefit with 3,474 hours.

The daily net new transit riders and user benefit hours are used to compute the cost-effectiveness of the build alternatives, or the efficiency of a transit project – how the project costs (both capital and operating) compare to the expected benefits (increased ridership). Cost-effectiveness can be more easily understood as the annual cost incurred to save a transit rider an hour of travel time. As may be expected, the lower the incremental cost per new transit rider, the more cost-effective the project alternative. Generally, a project must have a cost effectiveness index (CEI) of under $25 to qualify for federal New Starts funding.

Table 3.10 Cost Effectiveness Indices and Other Evaluation Measures (2030)

Evaluation Measure	SR-60 LRT	Beverly Boulevard LRT	Beverly/ Rosemead/ Whittier Boulevards LRT	Beverly/ Montebello/ Whittier Boulevards LRT	Washington Boulevard LRT
Cost Effectiveness Index					
Average Weekday User Benefits (hours)	3,474	5,241	5,470	5,336	6,293
Average Annual User Benefits (hours)	1,129,050	1,703,325	1,777,750	1,734,200	2,045,225
Cost Effectiveness Index	**$110.36**	**$72.51**	**$72.81**	**$74.02**	**$82.94**
Other Evaluation Measures					
Average Weekday New Riders	3,835	5,017	5,060	5,191	6,281
Average Annual New Riders (millions)	1.1	1.6	1.7	1.6	2.0
Incremental Cost Per New Rider	$99.97	$75.75	$76.78	$78.00	$83.10
Incremental Cost Per Project Boarding	$31.25	$29.74	$31.32	$31.89	$33.33

As shown above in Table 3.10, none of the alternatives currently meets the FTA threshold for cost-effectiveness. Two of the alternatives – the Beverly Boulevard and the Beverly/Whittier alternatives – have similar cost effectiveness indices that range between $72.51 and $74.01. The two aerial alternatives have lower indices with the Washington Boulevard Alternative at $82.94 and the SR-60 Alternative, the lowest cost efficiency of the alternatives, at $110.36. The Washington Boulevard Alternative, even with a significantly higher capital cost, is comparable in the cost-effectiveness comparison with the three lower cost alternatives due to attracting a higher level of ridership.

4.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL ISSUES

The Eastside Transit Corridor Phase 2 transportation alternatives will have direct and indirect effects on the physical environment of the Project Study Area (PSA). In January 2009, the *Eastside Transit Corridor Phase 2 Alternatives Analysis (AA)* was completed and adopted by the Metro Board. As presented in more detail in Section 2, the Final Alternatives refined and evaluated in this report were previously presented and analyzed in the AA Report with the following revisions:

- Alternative 1 SR-60 LRT – shortened by 1.25 miles and one station deleted;
- Alternative 2 Beverly Boulevard LRT – three stations deleted;
- Alternative 3 Beverly/Whittier Boulevards LRT – new alternative formed by combining the western portion of the Beverly Boulevard Alternative with the eastern portion of the former Whittier Boulevard option. New north-south connections were proposed on either Montebello or Rosemead Boulevards. This new alternative has seven stations previously studied in the AA, with no new stations proposed along Montebello or Rosemead Boulevards.
- Alternative 4 Washington Boulevard LRT – no changes identified.

In this Addendum to the AA Report, the environmental review effort focused on areas where more detailed information became available with the refinement of the Final Alternatives during conceptual engineering and station planning efforts. The purpose of this additional impact assessment was to ascertain if, with the additional information, there were any insurmountable technical or environmental challenges, and to identify areas to be studied further during the subsequent preparation of a Draft Environmental Impact Study (DEIS)/Draft Environmental Impact Report (DEIR) under guidance provided by the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA).

While an overview of all possible environmental impacts is presented, the following potential impact areas are discussed in more detail in this report, based on additional information identified during Conceptual Engineering:

- Right-of-Way Acquisition
- Hazardous Materials and Waste
- Parklands and Section 4(f) Resources

Conceptual engineering-level of environmental analysis for the new north-south, connector sections, proposed along Montebello and Rosemead Boulevards, was based primarily on AA analysis as both of these sections travel through urbanized areas comparable to those previously identified and evaluated for the Beverly and Whittier Boulevards alternatives. The evaluation was supplemented with a windshield-level of analysis to identify any unique conditions not covered by the AA analytical work.

4.1 Land Use and Economic Development

As discussed in the AA Report, the Eastside Transit Corridor Phase 2 transportation alternatives can provide benefits to the PSA by improving access to existing activity centers and focusing new development opportunities. Higher density development near transit stations can accommodate the area's significant forecast growth by encouraging transit usage and reducing vehicular travel and related environmental impacts. Conversely, transit-supportive land uses and high levels of residential and employment density in station areas can support transit system ridership. An analysis of existing land uses along the alternatives performed during the AA identified a range of transit-supportive land uses and densities. The SR-60 Alternative had the lowest level of transit-supportive land uses as well as the lowest levels of population and employment densities. At the other end of the range, the Beverly Boulevard Alternative had the highest level of transit-supportive land uses, and the Beverly/Whittier Alternative had the highest population and employment densities. While a new alternative, a majority of the alignment of the proposed Beverly/Whittier Boulevards Alternative was addressed in the AA Report through work performed for the Beverly Boulevard and Whittier Boulevard alternatives. Field visits confirmed the applicability of the information documented in the AA Report to the new alignment sections along Montebello and Rosemead Boulevards.

During Conceptual Engineering, no stations were identified that had not been previously analyzed in the AA Report. A windshield-level analysis of the land uses and economic development along the proposed connector sections on Montebello and Rosemead Boulevards was performed. Both proposed routes operate through urbanized areas with a diverse mix of land uses. The Montebello Boulevard alignment is lined with small-scale commercial uses, single- and multi-family housing and industrial development. The Rosemead Boulevard connector option passes through a mix of commercial and single-family housing on the northern end, with industrial and commercial land uses located adjacent to the Union Pacific Railroad tracks on the southern end. There may be opportunities for new development in the commercial and industrial areas. With approval of the Recommended Alternatives, further analysis will be performed, including outreach to cities to identify any new land use changes and/or development plans.

4.2 Catalyst for Public/Private Economic Revitalization

As presented in the AA Report, the proposed Eastside Transit Corridor Phase 2 transportation investment can provide opportunities for transit-oriented development (TOD) that can serve as catalysts for public and private economic revitalization. As demonstrated in other projects completed by Metro, investments in transit station area development can provide economic benefits and enhanced quality of life to communities, while accommodating forecast population and employment growth. The AA analysis identified that all of the alternatives had a high number of possible TOD opportunities.

During the Conceptual Engineering phase, initial station planning efforts were completed and are summarized in Section 2 of this report. An initial summary of TOD opportunities at station areas along the proposed alignments has been completed and is presented below in Table 4.1. At this level of analysis, station-related sites offering development opportunities were defined as property that was vacant, used for surface parking, or was underutilized when compared to both the current surrounding land uses and future land use plans. More than 70 percent of the proposed stations have TOD opportunities. During the Draft EIS/EIR phase, a more detailed analysis of economic development opportunities will be provided for the alternatives that move forward.

Table 4.1 Transit Oriented Development (TOD) Opportunities

Alternatives	Total Number of Stations	Stations with Possible TOD Opportunities
1 SR-60 LRT	4	4
2 Beverly Boulevard LRT	8	5
3 Beverly/Whittier Boulevards LRT via Montebello Boulevard	7	6
3 Beverly/Whittier Boulevards LRT via Rosemead Boulevard	7	6
4 Washington Blvd LRT	6	4
Total	32	25

4.3 Right-of-Way Acquisition

A majority of the proposed LRT system and station improvements will be located within the public right-of-way. However, there are locations where additional right-of-way will be required to allow for: stations and access elements (stairs, escalators and elevators), Park-

and-Ride (PNR) facilities, off-street bus and shuttle space, Traction Power Substations (TPSS) and alignment takes required for rail operations and/or for street widening to maintain travel lanes. Based on conceptual engineering and station plans, an updated assessment of the right-of-way requirements was prepared for each of the Final Alternatives.

The PSA contains a diverse mix of land uses including commercial areas, industrial business, residential neighborhoods, parks, schools, flood control facilities and vacant land. A summary of the land uses along each of the alternative shows the following:

- **Alternative 1 SR-60 LRT** – This option will primarily operate within the SR-60 Freeway right-of-way adjacent to large concentrations of mixed use development as well as commercial, residential, recreational, flood control and vacant properties.

- **Alternative 2 Beverly Boulevard LRT** – West of the San Gabriel River, this alternative operates through commercial and some residential neighborhoods; east of the river, the proposed alignment passes through undeveloped land primarily owned by Southern California Edison and the Union Pacific Railroad. It then enters the Whittier Greenway used for recreational facilities, and passes through single-family residential neighborhoods with four schools and has commercial properties located at the terminus in Downtown Whittier.

- **Alternative 3 Beverly/Whittier Boulevards LRT** – Along the Beverly Boulevard portion, this alternative operates primarily through commercial with some residential land uses. The Montebello Boulevard north-south route section runs through a diverse area including small-scale commercial uses, single- and multi-family housing and industrial development, while the Rosemead Boulevard connector option passes through a mix of commercial, single-family houses and manufacturing uses. The Whittier Boulevard alignment section runs through Montebello's historic downtown and then through mixed use areas with commercial, residential and recreational properties.

- **Alternative 4 Washington Boulevard LRT** – West of the I-605 Freeway, this option primarily operates through an area of industrial and commercial properties, with some residential and commercial uses; east of the I-605 Freeway, Washington Boulevard is lined with a mix of commercial and residential properties. The terminus station area contains a mix of commercial, industrial and hospital land uses.

As presented below in Table 4.2, an initial identification of the square footage of land required to implement each of the Final Alternatives was calculated by land use type. The resulting square footage requirements are higher than those identified in the AA Report due to more detailed engineering and station plans. In summary, acquisition impacts identified during Conceptual Engineering include the following:

- The identified possible total square footage requirements range from a low of 830,070 square feet for the Beverly/Whittier Boulevards via Montebello Boulevard option to 1,744,235 square feet for the SR-60 Alternative.

- Commercial and industrial land uses including retail, manufacturing, warehousing and office space, represented the largest takings for all of the alternatives, except for the SR-60 option. Commercial and industrial land use takings range from 74 percent for the Beverly Boulevard Alternative to 100 percent of the proposed acquisition for the Washington Boulevard Alternative.

- Residential land use takings were the lowest: 12 houses may be required along the SR-60 Freeway Alternative just east of Vail Avenue; and one house/commercial property may be acquired on the Montebello Boulevard section of the Beverly/Whittier Boulevards Alternative.

- Park land may be required for the SR-60 (Whittier Narrows Recreation Area) and the Beverly Boulevard (Whittier Greenway) alternatives. The possible park land square footage has been identified, and is included in Table 4.2, but is not added to the total acquisition requirements. Park land cannot be taken; further analysis during the Draft EIS/EIR phase will identify other solutions for the two identified impact areas.

- Vacant land is the largest proposed land use taking (49.5 percent) for the SR-60 Freeway Alternative. It also represents a significant requirement (25.6 percent) for the Beverly Boulevard Alternative due to the proposed taking of vacant land between Beverly Boulevard and the Whittier Greenway to accommodate the alignment transition from operating in the median of Beverly Boulevard to Whittier Greenway operations.

Table 4.2 Summary of Preliminary Right-of-Way Acquisition Requirements (Square feet)

Alternative	Land Use Type				
	Commercial/ Industrial	Residential	Park	Vacant	Total
1 SR-60 LRT	799,815	22,839	(27,705)	863,475	1,686,129
2 Beverly Boulevard LRT	1,181,204	-	(256,210)	64,750	1,245,954
3 Beverly/Whittier LRT via Montebello	793,713	-	-	5,000	798,713
3 Beverly/Whittier LRT via Rosemead	975,135	-	-	5,000	980,135
4 Washington Boulevard LRT	1,278,190	-	-	-	1,278,190

In Table 4.3, the purpose for the proposed land use takings is summarized for the following two categories:

1. Operations – alignment takes required to accommodate rail operations and/or to maintain street travel lanes, and TPSS;
2. Stations and Other Uses – acquisition of land for all other rail system uses including stations, station access facilities (stairs, escalators and elevators), off-street bus and shuttle space, drop-off space and, in some locations, PNR facilities that are integrated with or located adjacent to the proposed stations.

The amount of property acquisition required for future rail operational needs was identified as lower than that needed for station-related functions. The exception was the Beverly Boulevard Alternative, which will require land acquisition for the rail alignment where it transitions from the Beverly Boulevard public right-of-way through primarily vacant land to the Whittier Greenway. Land required for station-related parking facilities is highest for the Washington Boulevard Alternative, where PNR access will attract and serve commuters to the south from the Gateway Cities area and the I-5 Freeway travel corridor. The same is true for the SR-60 Alternative, but many of the proposed parking facilities along this option are integrated with proposed stations due to the availability of larger parcels of land.

Table 4.3 Purpose of Proposed Right-of-Way Acquisitions

Alternative	Operations (Square feet)	Station/PNR/ Other (Square feet)	Total (Square feet)
1 SR-60 LRT	84,307 (5%)	1,601,822 (95%)	1,686,129
2 Beverly Boulevard LRT	236,731 (19%)	1,009,223 (81%)	1,245,954
3 Beverly/Whittier LRT via Montebello	7,987 (1%)	790,726 (99%)	7,987,713
3 Beverly/Whittier LRT via Rosemead	0 (0%)	980,135 (100%)	980,135
4 Washington Boulevard LRT	89,474 (7%)	1,188,716 (93%)	1,278,190

This information will be refined on an alignment- and site-specific level of detail as part of the Draft EIR/EIS and Advanced Conceptual Engineering, which will include a discussion of potential relocations and displacements, and related Federal and State requirements related to relocation policies for transportation projects.

4.4 Community and Neighborhood (Quality of Life and Environmental Justice)

As presented in the AA Report, each alternative's impacts on community cohesion, quality of life and environmental justice were identified and evaluated. AA analysis identified that the SR-60 Alternative had the lowest impacts on community cohesion, while the Beverly Boulevard Alternative had the highest level of impact due to its proposed operations through the residential neighborhoods lining the Whittier Greenway. All of the alternatives will increase access by transit dependent residents to the regional transit system, with the Beverly/Whittier Boulevard Alternative providing the highest level of transit dependent access, and the SR-60 Freeway Alternative the lowest.

During the Conceptual Engineering phase, the most significant change made to the alternatives with a possible community and neighborhood impacts was the introduction of the Montebello and Rosemead Boulevards north-south connector segments. For both options, at-grade rail operations will turn south onto a connector section street from Beverly Boulevard, where they will transition to an aerial configuration that then will turn east onto Whittier Boulevard. Both connector streets have a wide right-of-way designed to serve a heavy level of north-south traffic, with Rosemead Boulevard being slightly wider. Along Montebello Boulevard, there may be community cohesion impacts to the single- and multi-family housing facing the street. There also may be impacts to the primarily single-family residences located along Rosemead Boulevard, though much of the housing primarily faces away from the street. With refinement of the conceptual engineering plans, significant possible quality of life impacts to the rear yards of 12 single-family homes along the SR-60 Alternative were identified. A detailed analysis of community cohesion, quality of life and environmental justice impacts based on site-specific drawings will be prepared during the Draft EIS/EIR phase.

4.5 Visual and Aesthetic

A preliminary analysis of existing visual and aesthetic qualities in the PSA and potential changes to these qualities resulting from implementation of the rail transit system alternatives was documented in the AA Report. All of the alternatives have the potential to affect the visual and aesthetic resources in the PSA:

- SR-60 Freeway Alternative – operating within the freeway right-of-way will have the lowest level of possible visual and aesthetic impacts when compared to the other options traversing through urbanized communities. With refinement of the conceptual engineering plans, visual and aesthetic impacts to 12 houses and possible impacts to the Whittier Narrows Recreation Area were identified.

- Beverly Boulevard Alternative – operating through urbanized neighborhoods and along the Whittier Greenway would have the highest level of possible visual and aesthetic impacts among the alternatives.

  Beverly/Whittier Boulevards Alternative – operating through urbanized communities, some with historic resources, such as those in the Downtown Montebello section of Whittier Boulevard, would have a high level of possible visual and aesthetic impacts. There may be visual and aesthetic impacts with the introduction of aerial rail operations in the medians of Montebello and Rosemead Boulevards.

- Washington Boulevard Alternative – operating primarily through commercial and industrial areas, with some residential neighborhood impacts, this alternative would have the second lowest level of possible visual and aesthetic impacts.

A more detailed visual and aesthetic analysis will be conducted in the subsequent Draft EIS/EIR phase.

4.6 Cultural Resources

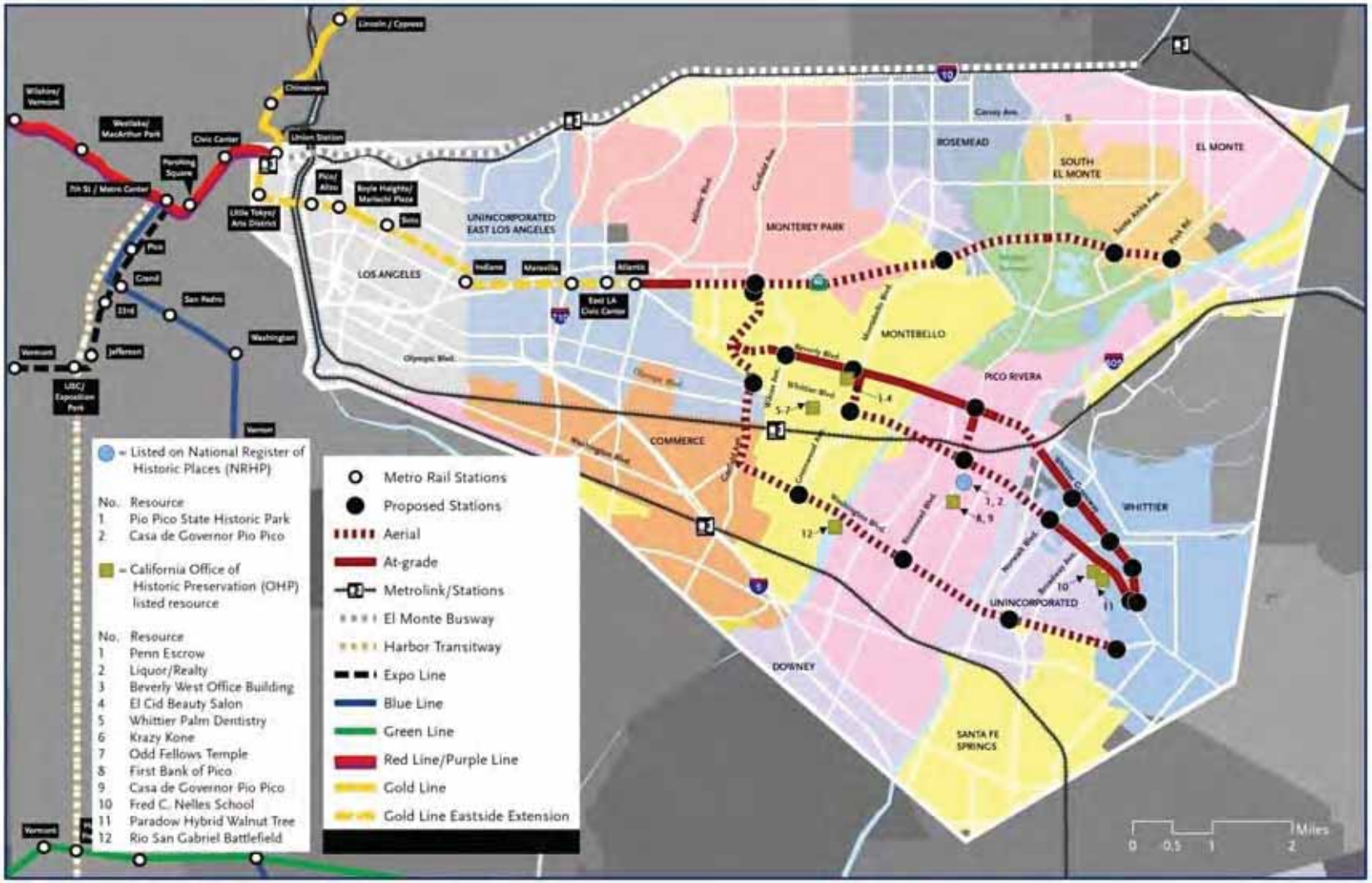
Cultural resources in the vicinity of the proposed alternatives were identified and documented in the AA Report based on a review of readily available information. The AA effort identified cultural resources along all of the alternatives as illustrated in Figure 4-1 on the following page. In summary, the SR-60 alignment had no resources located along the proposed right-of-way, while the eastern section of the Beverly/Whittier Boulevards Alternative had the highest number of cultural resources, primarily located in the City of Whittier.

During the Conceptual Engineering phase, a significant cultural resource was identified as being impacted by a segment of the Beverly/Whittier Boulevards Alternative. Initially, the Whittier Boulevard alignment section was designed to run in the proximity of the Paradox Hybrid Walnut Tree – a National Register, State and Local historic resource located in the median of Whittier Boulevard. The proposed alignment was revised to operate along the north side of Whittier Boulevard to avoid impacting the resource. In the subsequent Draft EIS/EIR effort, a more specific evaluation of cultural resources will be undertaken.

4.7 Air Quality

As documented in the AA Report, none of the proposed rail system alternatives will cause or contribute to local or regional air quality violations or exceedances of attainment status or regulatory standards. Analysis identified that three of the four proposed alternatives will improve monitored emissions when compared to the No Build option. Initial analysis identified that the Washington Boulevard option did increase some emissions, but by less than one percent. These increased emissions included CO_2 and PM_{10}. It should be noted

Figure 4-1 Cultural Resources Near Final Alternatives



That the Southern California Air Basin has been identified as nonattainment for the following pollutants monitored on a Federal and State level: O_3, PM_{10}, $PM_{2.5}$, CO and NO_2 .

During the Conceptual Engineering phase, there were no significant changes to the alternatives such that new air quality violations or exceedances would occur. A detailed evaluation of localized increases in emissions will be conducted during the Draft EIS/EIR phase.

4.8 Noise and Vibration

During the AA process, the PSA's noise and vibration environment was identified in terms of existing ambient noise levels along with the number of noise- and vibration-sensitive land uses along each alternative's alignment. The results of the preliminary noise and vibration analysis showed that the alternatives vary in impacts, with the SR-60 Freeway Alternative as having the lowest possible impact. The Whittier Greenway section of the Beverly Boulevard Alternative, operating through single-family residential neighborhoods and adjacent to elementary and secondary schools, was identified as having the highest potential for noise and vibration impacts.

During the Conceptual Engineering phase, rail operations along the Whittier Greenway segment were shifted to the southern half of the right-of-way, as discussed in Section 2 of this report, placing proposed rail operations closer to adjacent single-family residences, thereby increasing the possibility of noise and vibration impacts. With refinement of the engineering plans as discussed in Section 2, the alignment of the SR-60 Alternative now operates in proximity to 12 single-family residences, resulting in the possibility of noise and vibration impacts. There may be impacts with the introduction of aerial rail operations in the medians of Montebello and Rosemead Boulevards. A site-specific evaluation of noise and vibration impacts and possible mitigation measures will be conducted in the Draft EIS/EIR phase.

4.9 Ecosystems

An initial evaluation of possible impacts to existing ecosystems and biological resources along the proposed rail alignments was documented in the AA Report. A majority of the proposed alignments and stations are located within highly developed, urbanized areas and the identified biological resources were limited to a few parks and open space areas. The AA Report identified the SR-60 Alternative as having possible ecosystem impacts in the Whittier Narrows Recreation Area. While the proposed alignment primarily operates within the freeway right-of-way, it will pass through a portion of this recreational area as it turns south to traverse the SR-60/Santa Anita Avenue Interchange, requiring possible property acquisition or the shared use of parkland for column footings. Placement of the alignment and related

ecosystem issues will be explored in more detail during the preparation of Advanced Conceptual Engineering documents during the Draft EIS/EIR phase.

During Conceptual Engineering, the Beverly Boulevard, Beverly/Whittier Boulevards and Washington Boulevard alignment changes did not pose any additional impacts to existing ecosystems. All of the options traverse urbanized streets and cross the Rio Hondo concrete-lined channel. A detailed evaluation of ecosystem and biological resources will be provided in the Draft EIS/EIR phase.

4.10 Water Resources

A preliminary assessment of potential impacts to water resources caused by implementation of the proposed rail options was documented in the AA Report. All of the alternatives were identified as having the potential to affect water resources through bridge crossings of the San Gabriel River and the Rio Hondo Flood Channel, and possible building of new structures in 100-year flood zones.

During Conceptual Engineering, more detailed information was identified for the SR-60 Alternative. A segment of this option's alignment, located at the Santa Anita Avenue off-ramp, may infringe on the boundaries of the Whittier Narrows Recreation Area, which serves as a reservoir flood control basin as part of the Los Angeles County Drainage Area. The area that may be impacted is located between the northernmost recreational area parking lot and the SR-60 Freeway. Located immediately adjacent to the Whittier Narrows Recreation Area, portions of the proposed Santa Anita Avenue station area were identified as being owned by the U.S. Army Corps of Engineers (USACE), for similar flood control purposes. Further investigation of requirements for building in a flood control basin, in consultation with USACE, will be undertaken during the subsequent Draft EIS/EIR phase.

In addition, Conceptual Engineering efforts evaluated the bridges crossing the San Gabriel River and Rio Hondo Flood Channel to determine whether the structures could be strengthened to accommodate rail operations or whether replacement was required. All of the bridges were identified as requiring strengthening or replacement to accommodate rail operations. As bridge improvements will be located in or near flood control areas, possible site-specific construction impacts will be identified and studied further during the Draft EIS/EIR phase.

4.11 Geology and Subsurface Conditions

As part of the AA effort, a preliminary geological and subsurface conditions analysis along the alignment of each of the alternatives was completed. All of the alternatives were identified as requiring detailed seismic and soils analysis due to proximity to active fault zones. During

Conceptual Engineering, no significant revisions to the alternatives were identified requiring geotechnical analysis. As more detailed engineering drawings are prepared in support of the Draft EIS/EIR phase, site-specific evaluations of geological conditions, including seismicity and soil characteristics, will be undertaken and reflected in the resulting engineering design and drawings.

4.12 Hazardous Materials and Waste

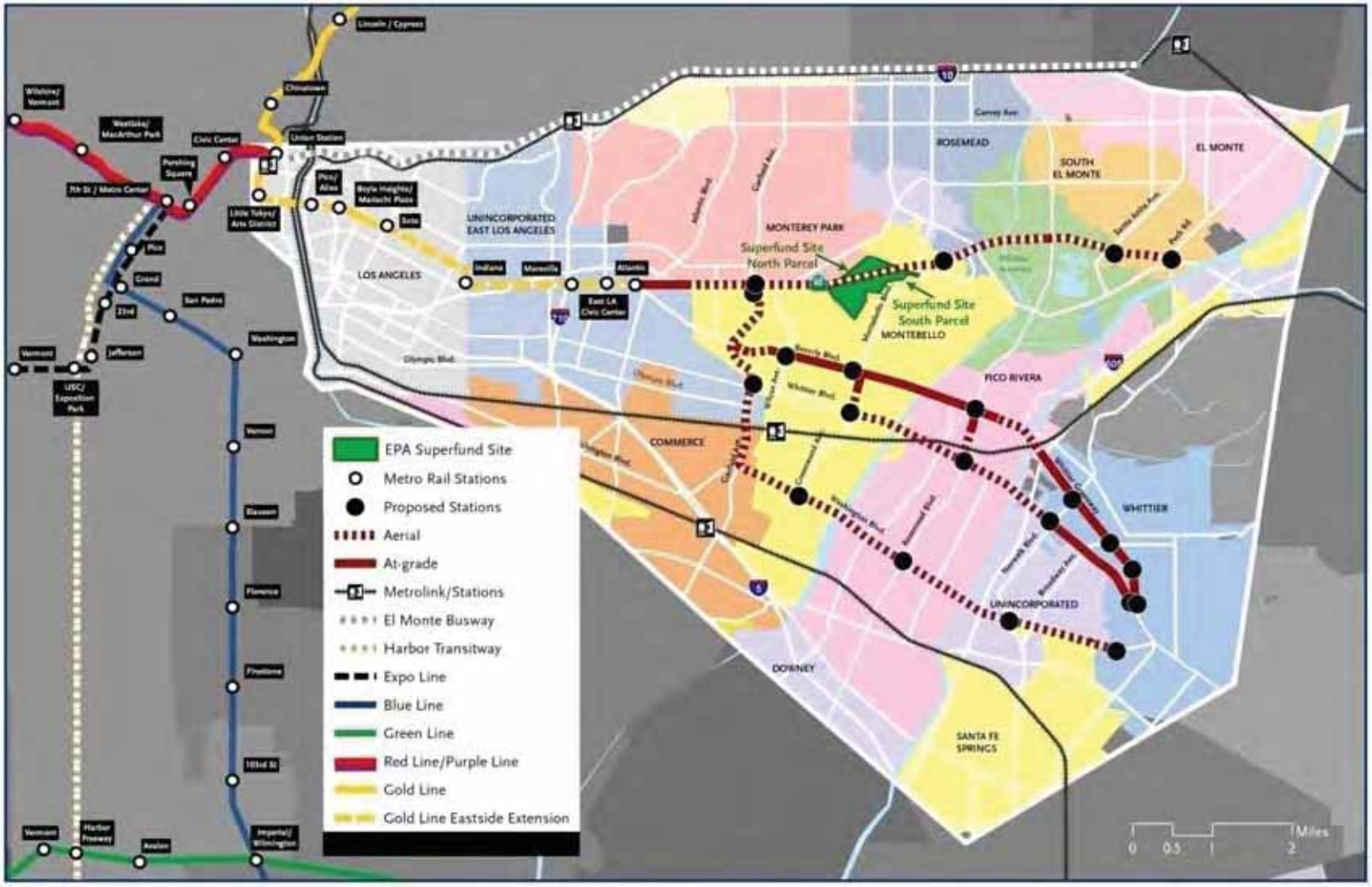
During the AA effort, an initial identification and assessment of existing hazardous materials was performed along the alternative alignments. In general, the at-grade segments of the proposed alternatives were identified as having the lowest level of concern as construction is primarily within the existing road right-of way, while the proposed aerial alternative had a higher level of concern due to the intrusive nature of pile construction required to support the aerial structure and stations.

Alternative 1 SR-60 LRT, operating in an aerial configuration within the SR-60 Freeway right-of-way, was identified as having potential hazardous material impacts due to the alignment's proximity to a Superfund Site – the former Operating Industries, Inc. (OII) landfill. While the Superfund site is located on both the north and south sides of the SR-60 Freeway, as illustrated in Figure 4-2 on the following page, the proposed rail alignment operates within the Caltrans right-of-way, which is not identified as part of the Superfund site. The landfill has a 36-year history of commercial, residential and industrial waste dumping and was designated as a Superfund site in 1986. The U.S. Environmental Protection Agency (EPA) has negotiated Consent Decrees with more than 100 participating companies, including Caltrans and Metro, to implement the agreed-upon remedies. Mitigation included the removal of six million cubic yards of contaminated earth and placement of a clay monocover on the sides of the landfill. A geosynthetic clay (GCL) cover was placed on the top deck, and a six-foot thick layer of clean soil and vegetation was placed over both the clay and GCL covers.

Construction of the SR-60 Freeway Alternative may be affected by remediation operations as the proposed alignment operates along the toe of the steep slope (38 degrees) of capped landfill material that rises approximately 320 feet in elevation above the south side of the freeway. Of key concern is the location and limits of the clay monocover and the viability of penetrating the liner for column construction to support the proposed aerial structure. In addition, the extent (horizontally and vertically) of possible hazardous materials within the SR-60 Freeway right-of-way is unclear.

An initial search of existing records has not clearly identified the exact boundary of the clay cap, though U.S. EPA staff believes it is unlikely that the clay cap remedy would extend beyond the administrative boundaries of the Superfund parcel and onto the Caltrans right-of-way. However, visually the graded slope of the landfill face extends from the shoulder of SR-60 to the top bench of the landfill, and seems to have been constructed uniformly. And while there

Figure 4-2 Superfund Sites in the PSA



is clear documentation on the remediation efforts undertaken on the north and south landfill-related parcels located on either side of the freeway, no clear information has been identified on the mitigation measures taken within the freeway right-of-way. Verbal history from several participants reflects that landfill materials were removed from the freeway alignment prior to construction in the 1960s, but may have been only removed to the depth required for freeway construction, and possibly did not exceed 20 feet in depth. Along the SR-60 Freeway, footings for the proposed aerial rail structure will be approximately 20 feet in depth depending on soil conditions in the pile area. Any waste materials encountered during construction will have to be disposed of off-site under U.S. EPA's direction. During construction, measures to mitigate possible health impacts due to possible exposure to hazardous materials will be identified and implemented to mitigate possible health impacts.

The south parcel, located west of Greenwood Avenue to just west of Paramount Boulevard, contains clay-capped landfill material and approximately 400 wells designed to extract landfill gas and liquid. A network of pipelines along the Greenwood Avenue overpass over the SR-60 conveys these flows to the treatment facilities located on the north parcel. More than 100 sampling wells are used on the south parcel to monitor the effectiveness of the groundwater cleanup measures. U.S. EPA staff reports that the landfill and clay cover have had issues with cracking and settlement of up to 1.5 feet per year; in addition, the stability of the slope in earthquakes should be considered in future analysis.

According to the U.S. EPA, the 45-acre north parcel was impacted to a much lesser degree from landfill operations than the south parcel. The north parcel has recently completed remedial activities. A 10-acre portion of the north parcel received a clay cap and the remaining 35 acres do not require cleanup action. Located in the City of Monterey Park, the north parcel is planned for future construction of the Cascades Marketplace retail center.

The north parcel also houses the leachate treatment facility and the landfill gas thermal destruction facility for the entire OII site. While the plant chemical emissions do not represent an unacceptable risk, if construction is planned at this location, the thermal plume from the two incinerator flares will have to be addressed through plume dispersion modeling and possible retrofitting of the stacks to increase their height.

The site remains on the Federal Comprehensive Environmental Compensation and Liability Act (CERCLA) list with oversight of remediation efforts provided by the U.S. EPA. Initial discussions with staff responsible for this site identified that there are acceptable design methods to seal piles driven through both clay and GCL covers. U.S. EPA staff has encouraged relocation of the rail alignment to the north side of the freeway where 70 feet of right-of-way has been cleared by Caltrans for future expansion of the freeway for two high occupancy vehicle (HOV) lanes.

During the Advanced Engineering and Draft EIS/EIR phase, design of the SR-60 alternative in this area will require detailed research, evaluation and close coordination with and the approval of the U.S. EPA, Caltrans and Federal Highway Administration.

4.13 Energy

During preparation of the AA Report, a general analysis of direct energy consumption was performed based on either a LRT or a BRT alternative, but not for specific alternatives. A detailed evaluation of energy-related impacts and benefits will be provided during the subsequent Draft EIS/EIR phase.

4.14 Parklands and Recreational Resources

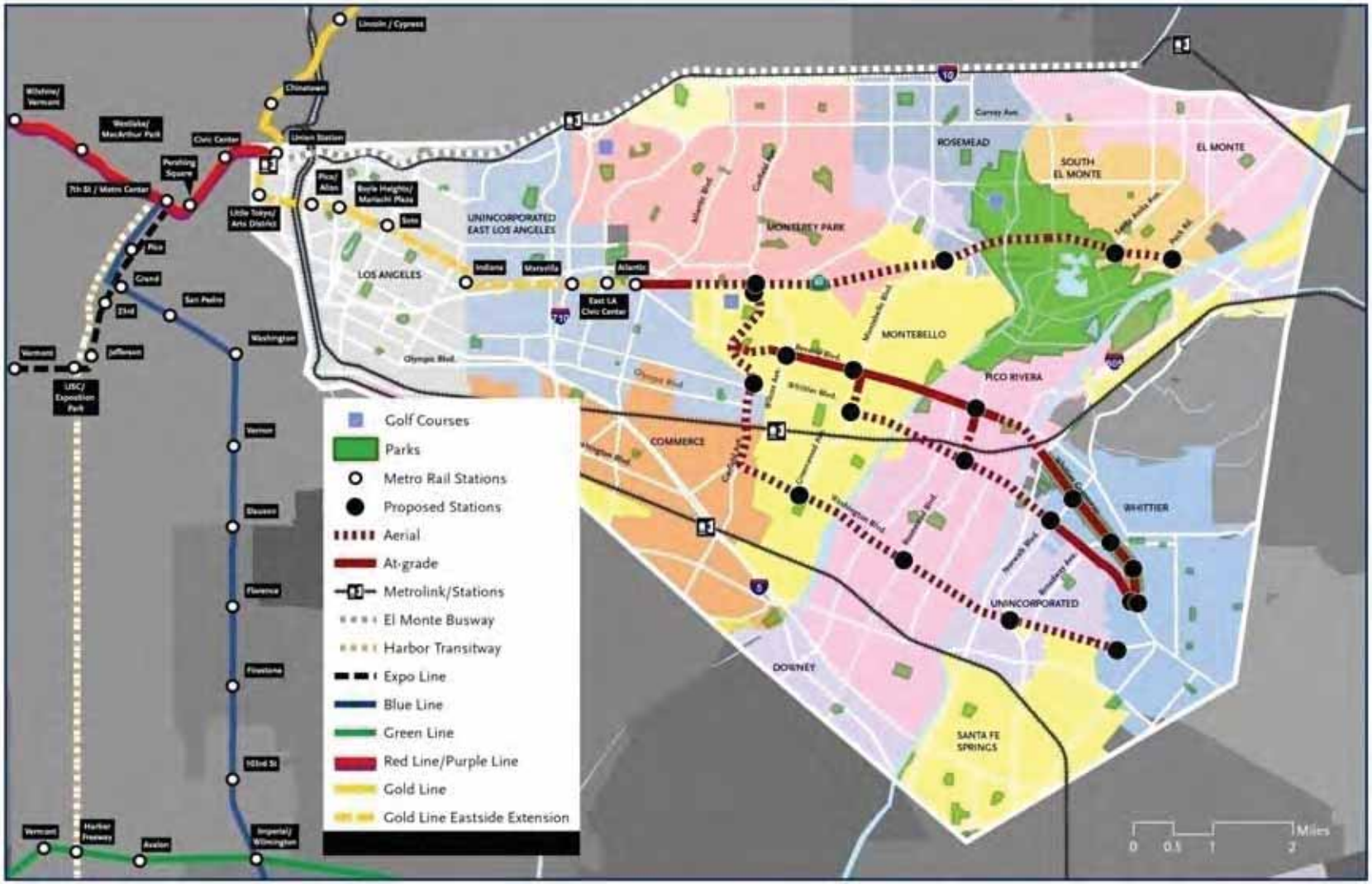
As documented in the AA Report, PSA parkland and recreational facilities were identified along the alignments of each of the proposed alternatives as illustrated in Figure 4-3 and listed in Table 4.4 on the following pages. A preliminary evaluation of the potential benefits of and impacts on resources was developed. Resource impacts may occur during both construction and operation of a LRT line; possible impacts fall into two categories:

- Constructive use effects include noise and vibration impacts, impediment or alteration of access, changes in the visual setting, and the introduction of conflicts with resource patrons; and
- Direct use effects include acquisition of parkland or recreational areas as right-of-way for an Alternative, requiring compliance with applicable Federal, State and Local regulatory laws.

On the federal level, Section 4(f) of the Department of Transportation Act of 1966 prohibits the direct use of parklands and recreational areas for federally funded transportation projects unless no other prudent alternative exists. In addition, Section 6(f) of the Land and Water Conservation Fund Act of 1965 prohibits the conversion of property acquired or developed with Act grants to a non-recreational purpose without the approval of the U.S. Department of the Interior's National Park Service. At the state level, the California Public Park Preservation Act of 1971 requires a public agency that acquires public parkland for non-park uses to either provide compensation sufficient enough to acquire substantially equivalent replacement parkland, or provide replacement parkland of comparable qualities.

A preliminary parkland and recreational resource impact analysis was prepared during the AA phase; the only major revisions made to the alternatives studied in the AA Report were the addition of north-south connector rail segments on Montebello and Rosemead Boulevards. Both proposed routes operate through highly-developed, urbanized areas with no parkland or

Figure 4-3 Parkland and Recreational Facilities in the PSA



recreational resources. The following discussion summarizes the preliminary parkland and recreational resources impact analysis prepared during AA efforts, along with an initial analysis of refinements made during Conceptual Engineering.

- Alternative 1 SR-60 LRT – This alternative's proposed alignment may have the following impacts:

    1. Montebello Golf Course – The AA Report identified possible constructive impacts to this resource, including noise and vibration impacts, changes to the visual setting and alteration of access. During Conceptual Engineering, these possible impacts were reduced by moving the alignment and aerial station away from the northeast corner of the golf course, with the alignment now continuing east in the SR-60 Freeway right-of-way and the station now located in the freeway shoulder at Garfield Avenue.
    2. Whittier Narrows Recreational Area – While the proposed alignment primarily operates within the SR-60 Freeway right-of-way, it will pass through a landscaped portion at the northern edge of the park as the aerial alignment turns southeast to traverse through the Santa Anita Avenue Interchange, requiring possible acquisition of parkland for column footings and raising Section 4(f) compliance issues. While the structure may not impact the use of recreational facilities, it may require the removal of trees buffering the park from the freeway. Possible constructive use effects may include noise and vibration impacts and changes to the visual setting. The alignment location and related 4(f) issues will be explored during the Draft EIS/EIR phase.
    3. California Country Club – Possible impacts identified in the AA report to this resource located east of the I-605 Freeway no longer exist due to the shortening of the alternative to Peck Road west of the I-605 Freeway.

- Alternative 2 Beverly Boulevard LRT – This alternative has ten parkland or recreational facilities along the proposed alignment; the three resources with the highest level of possible impacts are:

    1. Montebello Golf Course – as discussed above, but with the station relocated to the southeast corner of Garfield Avenue and Via Campo Street.
    2. Palm Park – Located southeast of Norwalk Boulevard, this park is bisected by the Whittier Greenway along which LRT operations are proposed to occur. Rail operations have the potential to divide the park and impede patron access between the two sections. Access impacts are proposed to be mitigated with a "land bridge," allowing pedestrians to cross under a slightly raised rail alignment on a bridge designed to complement the existing park setting.

3. Whittier Greenway – Formerly a railroad right-of-way, the Whittier Greenway is now owned by the City of Whittier and has been rebuilt as a landscaped bicycle and walking trail. Under this alternative, the proposed at-grade, rail alignment will traverse the southern portion of the Whittier Greenway Trail, with the recreational facilities proposed to be relocated and reconstructed on the northern section of the right-of-way. This alternative may require acquisition of half of the Whittier Greenway Trail.

   Project funding was provided by the U.S. Department of the Interior (National Park Service), State of California (statewide bond funds), Metro grant funds and City of Whittier Department of Parks and Recreation funding. Impacts of relocating the Trail, including possible Sections 4(f) and 6(f) issues, will require detailed analysis during the Draft EIS/EIR phase.

- **Alternative 3 Beverly/Whittier LRT** – This Beverly Boulevard portion of this alternative has only one resource with possible constructive and direct impacts – the Montebello Golf Course as discussed above under Alternative 2. There are no parkland or recreational resources located along the proposed Montebello and Rosemead Boulevards north-south connecting sections. Along the Whittier Boulevard segment of this alternative, two recreational resources have possible visual impacts:

  1. Montebello Park – At-grade, street-running operations will travel in front of this park located on Whittier Boulevard one block west of Greenwood Avenue.
  2. Pio Pico State Historic Park – The aerial alignment will operate on the far side of the street from this park located on Whittier Boulevard, between the San Gabriel River and I-605 Freeway. Possible constructive use effects include noise and vibration impacts and changes to the visual setting.
  3. During Conceptual Engineering, possible impacts to Roadside Park – the landscaped median of Whittier Boulevard located within the City of Whittier – were removed by shifting the alignment away from its proposed location running through the park to the northern side of Whittier Boulevard. The end segment of this alternative, including a station and storage tail tracks, will run alongside the Whittier Greenway. Further assessment and design is required to reduce possible impacts to this recreational resource.

- **Alternative 4 Washington Boulevard LRT** – This option has two resources with possible impacts:

  1. Montebello Golf Course – as discussed above.
  2. Chet Holifield Park – This park and community center is located one block south of Washington Boulevard on Greenwood Avenue.

Table 4.4 Parkland and Recreational Facilities

Alignment Alternative	Parkland/ Recreational Facility	Location	City	Approximate Distance to Line/Station
SR-60 LRT	Montebello Golf Course	901 Via San Clemente	Montebello	Adjacent to SR-60
	Whittier Narrows Recreation Area	SR-60 between Rio Hondo and N. Santa Anita Avenue	Rosemead	Adjacent to SR-60
Beverly Boulevard LRT	Montebello Golf Course	901 Via San Clemente	Montebello	Adjacent to SR-60
	Ashiya Park	2700 W. Beverly Boulevard	Montebello	North and south side of Beverly, east of Garfield
	Henry Acuna Park	600 N. 18th Street	Montebello	500 feet north of alignment
	Grant Rea Park	600 Rea Drive	Montebello	Adjacent to Beverly to the north
	Rio Hondo Park	4632 Orange Street	Pico Rivera	500 feet south of Beverly, east of the river
	Pio Pico Park	9258 Beverly Boulevard	Pico Rivera	Adjacent to Beverly, on the south side
	Amigo Park	5700 Juarez Avenue	Whittier	500 feet southwest of Whittier Greenway on west side of I-605
	Guirado Park	5760 Pioneer Boulevard	Whittier	500 feet south of Whittier Greenway on east side of I-605 Whittier Greenway bisects Palm Park
	Palm Park	5703 Palm Avenue	Whittier	
	Whittier Greenway	From Beverly at Rio Hondo to end of alignment	Whittier	From Beverly at Rio Hondo to end of alignment
Beverly/Whittier Boulevards LRT	All of the above parks for Beverly			
	Pio Pico State Park	9258 Beverly Boulevard	Pico Rivera	Adjacent to Beverly, on the south side

Table 4.4 Parkland and Recreational Facilities (continued)

Alignment Alternative	Parkland/ Recreational Facility	Location	City	Approximate Distance to Line/Station
Washington Boulevard LRT	Montebello Golf Course	901 Via San Clemente	Montebello	Adjacent to SR-60
	Ashiya Park	2700 W. Beverly Boulevard	Montebello	North and south side of Beverly, east of Garfield
	Chet Holifield Park	1060 S. Greenwood Avenue	Montebello	500 feet south of Washington

In summary, all of the alternatives provide the benefit of increased public accessibility to the identified PSA parkland and recreational resources. The two alternatives with the highest potential for resource impacts were: the SR-60 Alternative due to traversing a portion of the Whittier Narrows Recreation Area, and the Beverly Boulevard Alternative due to operations within the Whittier Greenway. Further investigation of impacts on parkland and recreational facilities will be undertaken during the Draft EIS/EIR phase.

4.15 Summary of Environmental Issues

An initial environmental analysis of a full range of alternatives was prepared and documented in the *Eastside Transit Corridor Phase 2 AA Report*. In January 2009, the Metro Board approved four Final Alternatives to be refined and evaluated further through conceptual engineering and station planning efforts. In this Addendum to the AA Report, the initial environmental review was updated to reflect possible impact areas where more detailed information became available.

At this preliminary level of analysis, with alignment engineering and station design information at a five percent level of completeness, there are minor differences in the level of environmental impacts between the Final Alternatives as summarized below in Table 4.5. And while there does not appear to be any insurmountable technical or environmental challenges, there are remaining areas of concern requiring further analysis during the subsequent Draft EIS/EIR effort:

- **SR-60 LRT Alternative** – This option's alignment operates adjacent to a current Superfund site where the location and extent of hazardous materials is not fully known. Initial analysis has identified that there are viable engineering and environmentally-acceptable methods to construct columns and related footings in this area. Significant challenges remain requiring detailed research, evaluation and close coordination with and the approval of the U.S. EPA, Caltrans and FHWA. In addition,

this alternative traverses through a portion of the Whittier Narrows Recreational Area where construction of an aerial LRT system may require shared use or acquisition of small portions of parkland to allow for column placement.

- **Beverly Boulevard LRT Alternative** – This alternative has two areas of concern:

  1. Construction of a rail system along the Whittier Greenway will impact two existing park facilities within the City of Whittier: the Whittier Greenway and Palm Park. Currently, a landscaped bicycle and pedestrian trail occupies the full width of the Greenway's right-of-way; placement of a rail system along the Greenway will require approximately half of the right-of-way, requiring relocation and reduction in the size of the recreational facility. There are possible section 4(f) and 6(f) issues: 4(f) as the rail system will require partial acquisition or an agreement for joint use with the City of Whittier; and 6(f) as the facility was built with National Park Service funds from the U.S. Department of the Interior.

     Palm Park is located astride the Whittier Greenway, and the proposed rail operations will bisect the park, negatively impacting use of the facility. A proposed land bridge may mitigate user impacts.

  2. As this alternative transitions from Beverly Boulevard to operate within the Whittier Greenway, the alignment crosses an area of primarily vacant land owned by Southern California Edison and the Union Pacific Railroad. Initial discussions with these entities have identified that both have future plans that may preclude LRT operations in this area.

During preparation of the subsequent Draft EIS/EIR, more detailed plans will be prepared and site-specific impacts and possible mitigation measures will be identified and evaluated.

Table 4.5 Summary of Environmental Impacts

Resource Area	Environmental Impact
Land Use and Economic Development	All of the alternatives support PSA land use and economic development plans.
	The Beverly Boulevard option has the highest level of transit-supportive land uses; the Whittier section of the Beverly/Whittier alternative has the highest levels of population and employment densities; while the SR-60 option has the lowest levels of transit-supportive land uses, population density and employment density.
Catalyst for Public/Private Economic Revitalization	All of the alternatives provide transit oriented development opportunities.
Right-of-Way Acquisition	All of the alternatives will require property acquisition to accommodate rail system operations, stations and related facilities, including park-and-ride structures and off-street bus and shuttle space. The SR-60 Alternative requires the most property acquisition for construction of parking structures to support access to and use of this option. In addition, acquisition of a portion or all of 12 single-family residential properties may be required.
	The Beverly Boulevard Alternative requires the second highest amount of land as the eastern half of the alignment leaves the public right-of-way and operates through properties owned by Southern California Edison, the Union Pacific Railroad, the City of Whittier and others.
Community and Neighborhood Impacts (Quality of Life and Environmental Justice)	All of the alternatives have possible community cohesion impacts; the SR-60 option has the fewest, and the Whittier Greenway segment of the Beverly Alternative has the highest.
	All of the alternatives increase transit service to the PSA's transit dependent residents, with the Beverly and Beverly/Whittier alternatives providing the highest levels of access.
Visual and Aesthetic	All of the alternatives have possible visual and aesthetic impacts.
Cultural Resources	The SR-60 alternative has no resource impacts; the Whittier segment of the Beverly/Whittier option has the highest number of resources and possible impacts.

Table 4.5 Summary of Environmental Impacts (continued)

Resource Area	Environmental Impact
Air Quality	A majority of the alternatives improve regional air quality over the No Build option; the Washington Boulevard Alternative does increase some emissions.
Noise and Vibration	All of the alternatives will have possible noise and vibration impacts. Due to their settings, the SR-60 option will have the lowest impact and the Whittier Greenway section of the Beverly alternative will have the highest potential for impacts.
Ecosystems	Due to the PSA's highly-developed, urbanized setting, the alternatives will have minor to no impacts on biological resources; the SR-60 option may impact a small portion of the Whittier Narrows Recreation Park.
Water Resources	All of the alternatives have potential water resource impacts: the SR-60 option due to the flood control land within the Santa Anita station; and the other options due to new bridge construction in flood control areas adjacent to the San Gabriel River and Rio Hondo Flood Channel.
Geology and Subsurface Conditions	All of the alternatives require alignment- and site-specific analysis of seismic and soil conditions.
Hazardous Materials and Waste	The SR-60 Alternative has potential impacts on the former OII landfill/current Superfund site. Initial conversations with U.S. EPA indicate that there are viable engineering and environmentally-acceptable methods to penetrate the site's clay and GCL caps for column and footing placement to support the aerial LRT system. Further site research, engineering and cost information is required.
Energy	None of the alternatives increase PSA energy consumption when compared to the No Build option.
Parklands and Recreational Resources	Two alternatives may have impacts on park resources. The Beverly Boulevard Alternative will require acquisition or shared use of approximately half of the Whittier Greenway, and relocation of existing recreational facilities, and the alignment will bisect Palm Park and impact its use. The SR-60 option may require acquisition or shared use of a small portion of the Whittier Narrows Recreation Area to accommodate aerial system columns and footings.

5.0 COST ANALYSIS

This section presents the resulting conceptual engineering-level of capital and operating and maintenance cost estimates for the Final Alternatives, along with the Transportation System Management Alternative (TSM) required for comparison purposes. The cost analysis prepared as part of this Addendum to the Eastside Phase 2 Alternatives Analysis (AA) Report reflects the four Final Alternatives approved by the Metro Board in January 2009 to be further studied through Conceptual Engineering. The following capital and operating and maintenance costs reflect the engineering, station and operational refinements made to the Final Alternatives as documented in Sections 2 and 3 of this report. In addition, the costs related to the TSM Alternative were updated as part of this effort. The methodology used to develop the Conceptual Engineering capital and operating and maintenance costs is the same methodology developed and approved for the AA Report.

5.1 Capital Costs Analytical Overview

Capital costs are the expenses associated with the design and construction of the proposed alternatives, and they fall into two categories:

1. Construction Costs – including guideway and track elements; stations, parking structures and station access elements (elevators and escalators); maintenance and storage facilities; site work (demolition and utility work); and system equipment such as train control, traffic signals and crossing protection, traction power substations and traction power distribution.

2. Total Project Costs – acquisition of land and/or right-of-way; purchase of vehicles and provision of professional services such as engineering, project and construction management; insurance; permits; surveying; testing and finance charges.

Conceptual engineering-level capital costs were developed by estimating the quantities for individual line items required to build and operate each alternative based on engineering and station drawings, and then by applying standardized unit costs. Quantity take-offs, including right-of-way requirements and route measurements, were based on the conceptual engineering and station plans provided in *Appendix A – Conceptual Engineering Drawings*. In some cases, system elements were not specified at this level of engineering, such as the number of elevators and escalators required at each aerial station. These major cost elements were priced separately for inclusion in the capital cost estimates. It should be noted that the resulting capital cost estimates do not include costs associated with environmental mitigation measures or joint development.

The unit costs used in preparing the capital cost estimates were derived primarily from similar Metro projects with recent construction bid information, and were documented in the methodology report developed for the AA. *Appendix C – Basis of Capital Cost Estimate Refinement & Capital Cost Estimates Spreadsheet* document*s* the unit costs used to develop the capital costs for the Eastside Phase 2 Final Alternatives. The capital costs were derived by multiplying the unit costs by the quantities such as length of the track and number of stations. A capital cost for each alternative is presented in the technical memorandum in Standardized Cost Categories (SCC), developed by the Federal Transit Administration for comparing project costs on a national basis.

Contingencies were applied to the unit costs as a percentage of the category and then included to develop the total project cost for each alternative. The contingency percentages were supplied by Metro as documented in the previous AA Report. When performing any cost estimate, especially at this early level of design, unforeseen costs arise due to circumstances beyond the defined scope of work. Two types of contingencies provide a way to account for these unforeseen costs:

- Allocated contingencies are applied to each cost category and reflect items that are not definable at a conceptual level of design. As the engineering moves forward and the project scope is further clarified, the contingencies will be reduced.
- Unallocated contingencies are used to reflect unforeseen costs arising while the project is under construction, and are defined as overall costs to the project.

5.2 Capital Costs

During Conceptual Engineering, order-of-magnitude capital cost estimates were developed for the four Final Alternatives. The No Build Alternative was not included in this effort as it does not have any associated capital or operating and maintenance costs – all No Build costs are considered to be within Metro's financial capability as reflected in the adopted *FY 2008 Adopted Budget (Activity Based Gold Line Cost Model)* and the *Draft 2008 Long Range Transportation Plan*. Capital costs for the TSM Alternative were updated from those identified in the AA Report to reflect an increase in the background Light Rail Vehicle (LRV) fleet size.

Vehicle Requirements

Rail vehicle requirements for each alternative were identified based on Metro Operations policies and each option's length, forecast run time and projected ridership. For the Eastside Transit Corridor Phase 2, rail cars were identified in addition to those already planned for the Metro Gold Line Eastside Phase 1 operations to its terminus at the Atlantic/Pomona Station. The final Phase 2 fleet size reflects Metro Operation's policy for FY 2030 that requires three-

car consists, rather than the two-car consists previously planned for and costed in the AA Report. Among the four Final Alternatives, the number of new vehicles required varies from six to 21.

Storage and Maintenance Facilities

The capital cost estimates presented below include a placeholder cost for the construction of an incremental storage and heavy maintenance facility required for each alternative to support operations. The capital cost was calculated using the existing Metro Gold Line yard (50 LRVs) as the basis. Capital cost estimates include a placeholder to accommodate the peak fleet size for each Phase 2 alternative. The final decision of where to locate new support facilities and how to allocate their cost will be made based on further policy and cost analysis within the larger framework of Metro's entire light rail system needs.

Summary

The resulting order-of-magnitude capital costs for the Final Alternatives, along with a comparison to the TSM Alternative, are presented below in Table 5.1. These costs are presented in FY 2008 dollars. During Conceptual Engineering, estimated capital costs increased over those presented in the AA Report due to refinements documented in Section 2 of this report. The revisions include a number of general factors including:

- Refinement of the engineering horizontal and vertical plans;
- Refinement of the number of stations and their conceptual design;
- Refinement of the number of required parking structures, their size and preliminary location;
- Refinement of land acquisition requirements;
- Identification of the need for new bridges crossing the Rio Hondo, San Gabriel River, I-605 Freeway and Norwalk Boulevard (for the Whittier Greenway section of the Beverly Boulevard Alternative only);
- Refinement and addition of aerial segments to avoid Southern California Edison transmission lines, and to more easily cross study area bridges and the I-605 Freeway;
- Requirement for a higher peak fleet size by revised Metro policy; and
- More detailed identification of utility impacts.

Table 5.1 Estimated Capital Costs (FY 2008 dollars)

Alternative	Total Project Capital Cost (billions)	Incremental Cost Increase Over TSM
TSM	$0.5	-
1 SR-60 LRT	$1.8	$1.3
2 Beverly Boulevard LRT	$1.5	$1.0
3 Beverly/Montebello/Whittier LRT	$1.6	$1.1
3 Beverly/Rosemead/Whittier LRT	$1.5	$1.0
4 Washington Boulevard LRT	$2.2	$1.7

The alternatives with the highest estimated capital costs were the two options with primarily aerial operations: the SR-60 and Washington Boulevard alternatives. The Washington Boulevard option was identified as more expensive due a longer alignment (2.47 miles longer than SR-60) and two more aerial stations than the SR-60 option. The estimated capital costs of the other three alternatives were similar; the Beverly/Montebello/Whittier Alternative was identified as slightly higher in cost due to more miles of aerial operations (2.2 miles more than the Beverly Boulevard option and 1.4 miles more than Beverly/Rosemead/Whittier).

Table 5.2 Estimated Capital Costs Per Mile (FY 2008 dollars)

Alternative	Construction Cost Per Mile (millions)	Total Project Cost Per Mile (millions)
1 SR-60 LRT	$131.4	$270.2
2 Beverly Boulevard LRT	$74.8	$162.5
3 Beverly/Montebello/Whittier LRT	$95.3	$177.4
3 Beverly/Rosemead/Whittier LRT	$83.3	$166.4
4 Washington Boulevard LRT	$133.3	$239.6

Table 5.2 presents the estimated capital costs on a per mile basis allowing for a more detailed identification of the differences between the Final Alternatives. The per mile costs are close for the SR-60 and Washington Boulevard aerial alternatives, but the SR-60 option was estimated to cost more due to higher (33 percent) land and right-of-way acquisition requirements for stations and supporting structures. The Beverly Boulevard Alternative had the lowest estimated cost per mile due to the lowest percentage (37 percent) of aerial operations among the options. The Beverly/Rosemead/Whittier Alternative was estimated to cost slightly more per mile based on a higher percentage (44 percent) of aerial operations. The Beverly/Montebello/Whittier Alternative was identified as even higher in cost due to 60 percent of its alignment operating in an aerial configuration.

During subsequent Advanced Conceptual Engineering efforts, system components and requirements will become more detailed, and revised capital cost assessments will be prepared and evaluated in the Draft EIS/EIR document.

5.3 Operating and Maintenance Costs

Operating and maintenance (O&M) costs are those related to the day-to-day operations of the proposed transportation service including labor, vehicle maintenance and overall transit facility maintenance. During Conceptual Engineering, O&M costs were identified using a fully-allocated, five-variable cost model (HDR O&M Cost Model). Since Metro currently operates Light Rail Transit, O&M cost estimates were developed using Metro Gold Line financial and operating data from Metro's *FY 2008 Adopted Budget (Activity Based Gold Line Cost Model).* A second phase of the Metro Gold Line Eastside Extension would have an impact on Metro local and express bus operations. Metro's bus operating costs for FY 2008 were used from Metro's *FY 2008 Adopted Budget (Activity Based Bus Cost Model)*. Financial and other operating costs for the other affected bus systems (i.e. the Norwalk Transit System, Monterey Park Spirit Bus, Foothill Transit Zone and Montebello Bus Lines) that are within the study area were developed based on FY 2006 National Transit Database (NTD) reports. These costs were adjusted to FY 2008 dollars. The model used meets FTA guidelines for estimating operating costs.

As documented in *Appendix E – Preliminary Operating Plan and Maintenance Cost Estimate Technical Memorandum*, the cost allocation model assumes that each expense incurred by a transit system alternative is "driven" by supply variables, such as vehicle revenue-miles, train revenue-hours and peak-vehicles. A unit cost is developed for each supply variable by disaggregating operating expense data (i.e. National Transit Database [NTD] data), and assigning cost drivers (e.g. annual revenue rail hours or miles) to each expense object. To derive unit costs, the total expenses assigned to each supply variable are divided by the annual quantity supplied. To determine total O&M costs, the unit cost for each supply variable is multiplied by the projected annual units of service. The following equation summarizes the fully-allocated cost model used to estimate annual O&M costs for the Eastside Transit Corridor Phase 2 alternatives:

Estimated Annual O&M Cost	=	Route-Mile Unit Cost x Projected Route-Miles	+	Garage/Yard Unit Cost x Projected Garages/Yards	+	Bus/Train-Hour Unit Cost x Projected Bus/Train-Hours	+	Car/Bus-Mile Unit Cost x Projected Car/Bus-Miles	+	Peak LRV/Buses Unit Cost x Projected Peak LRV/Buses

Where:

- Route-Miles = Total number of directional route miles.

- Garages/Yards = Total number of maintenance and storage facilities.
- Annual Revenue Car/Bus-Miles = Total annual miles of revenue service operated by all trains or buses.
- Annual Revenue Bus-/Train-Hours = Total annual hours of revenue service operated by all bus or train lines.
- Peak LRV Cars/Buses = Maximum number of passenger Light Rail Vehicles or buses scheduled to be simultaneously in service.

The unit costs derived from the model then were applied to the projected LRT and bus operating statistics generated for each project alternative to estimate the total O&M costs. A comparison of the incremental O&M costs for each of the Final Alternatives relative to the TSM Alternative is presented in Table 5.3. The annual O&M cost estimates are presented in (rounded) FY 2008 dollars based on the 2030 design year operating plans and ridership projections.

Table 5.3 Estimated Annual O&M Costs (FY 2008 dollars)

Alternative	Total Annual O&M Cost (millions)	Incremental Cost over TSM
TSM	$143.4	-
1 SR-60 LRT	$169.9	$26.4
2 Beverly Boulevard LRT	$184.5	$41.1
3 Beverly/Montebello/Whittier LRT	$184.7	$41.3
3 Beverly/Rosemead/Whittier LRT	$184.9	$41.5
4 Washington Boulevard LRT	$181.0	$37.6

During Conceptual Engineering, estimated O&M costs increased over those presented in the AA Report due to a number of factors including:

- Revisions to the length of the alignments and the number of stations;
- Refinements to alignment vertical and horizontal profiles;
- Reduction in the vehicle speed on Whittier Greenway from 45 mph to 35 mph to reflect the single-family residential setting, high number of schools and constrained street crossings of the Beverly Boulevard Alternative ;
- Changes in related run time estimates; and

- Increase in train consist sizes for all alternatives – as discussed above and presented in Table 5.4, Metro Operations Policy for 2030 calls for three-car consists, rather than the one- and two-car consist size used in the AA analysis.

Table 5.4 Proposed Train Consist Sizes (FY 2030)

Operating Timeframe	Peak	Base	Evening	Ready Cars
Alternatives Analysis				
Monday-Friday	2	2	1	2
Saturday	2	2	1	2
Sunday	2	2	1	2
Conceptual Engineering				
Monday-Friday	3	3	3	3
Saturday	3	3	3	3
Sunday	3	3	3	3

The SR-60 Alternative had the lowest estimated O&M costs due to a high level of aerial operations along with the shortest alignment, the fewest number of stations and the lowest number of vehicles required of the Final Alternatives. The Washington Boulevard Alternative had the second lowest cost, but was higher than the SR-60 Alternative due to being 2.47 miles longer, having two more stations and requiring six more peak fleet vehicles. The three options with the initial segment of Beverly Boulevard were similar in O&M costs, primarily due to a similar length, the same number of stations and same requirement for peak fleet vehicles. Of the three options, the Beverly Boulevard Alternative had the lowest operating costs due to operations within a limited access right-of-way along the Whittier Greenway. The Beverly/Montebello/Whittier Boulevards Alternative was second lowest of the three due to higher percentage of aerial operations and a shorter alignment length (0.09 miles) than the Beverly/Rosemead/Whittier Boulevards option.

During subsequent Advanced Conceptual Engineering efforts, system components and requirements will become more detailed, and revised operating and maintenance cost assessments will be prepared and evaluated in the Draft EIS/EIR document.

6.0 PUBLIC INVOLVEMENT AND AGENCY COORDINATION

In January 2009, the Metro Board of Directors approved the Eastside Transit Corridor Phase 2 Alternatives Analysis (AA) Report and adopted four build alternatives for further analysis. In addition to technical analysis, this effort included a comprehensive public participation program designed to support the ongoing technical work, ensuring that cities in the Project Study Area (PSA), stakeholders and interested parties were well informed of the results of the Metro Board approved AA Study.

As part of this effort, an eight-month outreach action plan was developed to engage all affected and interested parties and facilitate discussions focusing on which of the four alternatives should be recommended for further environmental and advanced conceptual engineering analysis. The eight-month outreach action plan efforts are organized and summarized below in two categories: public involvement and project briefings.

6.1 Public Involvement Efforts

Public involvement included community open houses, council meeting updates and a series of focus groups.

Council Briefings & Open Houses

To initiate the public participation program, council briefings were held with each of the seven corridor cities that the four alternatives traverse. To encourage public participation, public open houses were held prior to the council briefings, allowing the residents, businesses and elected officials time to review the summary of the AA findings and Board-adopted Final Alternatives. These city council briefings/public open house meetings were conducted between April 8 and May 12, 2009. A total of 207 people participated in the open house sessions, where attendees had the opportunity to view project boards and ask questions or raise concerns directly to the project team members stationed around the room. Comment cards were also provided to document public input. Following the open house sessions, a PowerPoint presentation was made to the city councils, including a brief question and answer session. The presentation and display boards included information on the project development process, alternatives, technology, project schedule and strategy to reduce and refine the four alternatives. The seven briefings are summarized in Table 6.1.

Table 6.1 City Council Meeting and Open Houses

Meeting Type / Name	Meeting Date	Location	No. of Attendees	No. of Written Comments Received
Montebello City Council Open House	April 8, 2009	City Hall, Montebello	41	6
South El Monte City Council Open House	April 14, 2009	City Hall, South El Monte	61	7
Pico Rivera City Council Open House	April 14, 2009	City Hall, Pico Rivera	16	2
Monterey Park City Council Open House	April 15, 2009	City Hall, Monterey Park	23	7
Commerce City Council Open House	April 21, 2009	City Hall, Commerce	16	0
Rosemead City Council Open House	April 28, 2009	City Hall, Rosemead	18	0
Whittier City Council Open House	May 12, 2009	City Hall, Whittier	32	5

Totals: Attendees: 207 / Comments: 27

Notification for the open house portion of the meetings was completed using a variety of methods, including:

- Bilingual postcard mailed to the project database, consisting of interested stakeholders who participated in previous meetings, elected officials, resource agencies, city staff as well as property owners along the four alternatives (approximately 1,500 records).
- Electronic postcard e-blast to project database records with e-mail data
- Postcard hard copies delivered to local chambers and city hall counters
- Project website/helpline

- City websites
- City outreach database e-blast
- City cable television announcement
- Local area chambers of commerce

Focus Groups

Following the council briefings/public open houses, Metro conducted a series of four workshops. Each workshop focused on an individual alternative, providing a forum for detailed discussions of the proposed alignment configurations, station/parking locations, land use opportunities and constraints and other issues. Invitation letters were mailed to a targeted list of key stakeholders that was vetted through each of the seven corridor cities. Participants included city elected officials, executive staff members, planning commissioners, chamber of commerce members, community leaders, developers, college and school district representatives and other key stakeholders. Table 6.2 provides a summary of the four focus group meetings. See Appendix F for a detailed list of invitees.

Table 6.2 Summary of Focus Group Meetings

Meeting Type/Name	Meeting Date	Location	No. of Attendees	No. of Comments Received
Focus Group Meeting #1 – Washington Alignment	June 2, 2009	El Rancho High School, Pico Rivera	29	Group Input
Focus Group Meeting #2 – Beverly and Beverly/Whittier Alignments	June 3, 2009	Whittier Train Depot, Whittier	27	Group Input
Focus Group Meeting #3 – SR-60 Alignment	June 4, 2009	South El Monte Senior Center, South El Monte	59	Group Input
Focus Group Meeting #4 – Montebello Alignments	July 9, 2009	Montebello Senior Center, Montebello	29	Group Input

Totals: Attendees: 144

The first three focus groups were alignment-specific, focusing on the Washington Boulevard alignment, Beverly and Whittier Boulevards alignments and the SR-60 alignment. The fourth focus group was a special request from the City of Montebello to discuss all four alternatives that traverse their city.

Each workshop began with an introductory video, "Transit for Everyone," which demonstrates the characteristics of light rail and other transit modes and how they can be integrated into a community. A short PowerPoint presentation was also given by Metro staff and consultants that summarized the evaluation process and reviewed the alternatives still under consideration. Following the video and presentation, participants were broken up into groups of four to eight people at a table and shown aerial maps of the alternatives. A facilitator at each table led the discussion of the alternatives from the terminus station of the Gold Line Eastside Extension Phase 1 to the end of the particular alignment being discussed. Scribes at each of the table took notes to document the key discussion points. At the conclusion of the meeting, a representative from each group was asked to share the key points that came out of the discussion at their table.

Community Open Houses

After garnering input from the focus groups and some technical review of the proposed alignments, Metro scheduled three community meetings. The first community meeting, conducted on July 29, focused exclusively on tenants and property owners located along each of the four proposed alternatives. The other two community meetings will be held for the general public on October 20th and 22nd, 2009.

The first community meeting, held on July 29 at the Montebello Golf Course, provided a forum to educate businesses and property owners on the proposed alignments, project development process and right-of-way issues. Approximately 8,000 invitation letters were mailed to tenants and property owners located within 300 feet of each of the four proposed alternatives.

The meeting was set up open house style with stations covering various topics related to the project. Attendees had the opportunity to review project background and overview information, alignment-specific display boards, view an introductory video, "Transit for Everyone," and hear a project presentation. The meeting was attended by 125 people and included a broad representation of both residents and business owners. The stations covered the following topics:

1. Project Overview
2. Alternatives Analysis and Draft Environmental Impact Statement (EIS)/ Environmental Impact Report (EIR) Process
3. SR-60 Alignment
4. Beverly Boulevard Alignment

5. Beverly/Whittier Boulevards Alignment
6. Washington Boulevard Alignment
7. Project Presentation
8. Light Rail Transit (LRT) Characteristics

The station generating the largest interest was the Beverly Boulevard Alignment, which had numerous attendees expressing their opposition to building on the Whittier Greenway Trail, a pedestrian and bicycle trail that opened in the City of Whittier in early 2009.

Two additional Community Open Houses are planned for October 20th and 22nd, 2009. The purpose of these meetings is to inform the general public of the results of the technical analysis and public outreach effort, and provide information on the next steps.

The format is a combination of an open house session, with a formal presentation. During the open house session, participants have the opportunity to view project display boards, and ask questions and/or raise concerns directly to project team members stationed around the room. After the open house session, a PowerPoint presentation is provided to describe the goals and purpose of the project and meeting. At the conclusion of the presentation, participants are encouraged to submit written comments using the comment cards provided.

To encourage participation in the Community Open Houses scheduled for October 20th and 22nd, the following mediums will be utilized:

- Metro Eastside Transit Corridor Phase 2 project database (1,500 records)
- Project website
- Project helpline
- E-blast invitation
- Invitation deliveries to local chambers and city hall offices/counters
- City websites
- City outreach database e-blast
- City cable television announcement
- Local area chambers of commerce
- Meeting notices in local newspapers
- Take Ones on Gold Line and local buses

6.2 Project Briefings

In addition to the meetings held as part of public involvement, ongoing briefings were held with elected officials, city staff, institutional groups, regulatory agencies and selected key stakeholders to keep them apprised of the latest project developments and findings. The following summarizes the efforts to maintain frequent communication with stakeholders as the project moves forward in the study.

Elected Official Briefings

Legislative Briefings

A Legislative Briefing was held in September 2009 to provide local, state, and federal elected officials and their staff with a detailed briefing on the status of the Eastside Transit Corridor Phase 2 study.

Council of Government (COG) Briefings

In an effort to keep stakeholders in such a large project area abreast of all developments, a total of four briefings were conducted to the Gateway and San Gabriel Valley Councils of Government (COG). The first two briefings took place on March 31 and April 2 with executive directors of both San Gabriel Valley and Gateway COGs, respectively. The two subsequent meetings were with the Transportation Committees during their regularly scheduled meetings. Project updates were provided to the San Gabriel Valley Transportation Committee during their April 16 meeting and the Gateway Transportation Committee was briefed on May 6th. These meetings served as project updates during the initiation of this outreach program. A follow-up briefing is planned for September/October 2009 with the executive directors for both COGs to provide a project status, including which alternatives Metro staff is recommending for further study and which will proceed into the Draft EIS/EIR phase.

Technical Advisory Committee Meetings

The Technical Advisory Committee (TAC) is comprised of key city staff, state, federal and regional regulatory agencies and was organized as part of the AA process for the purpose of keeping them informed of the study's progress, technical evaluation methodology, scope of work and community outreach efforts. During the eight-month outreach action plan effort, one TAC meeting was scheduled in March 2009 and a second meeting is planned for October 2009.

On March 17, 2009, a presentation was given to the TAC participants that outlined the findings of the AA study, and the four Final Alternatives as adopted by the Metro Board in January 2009. The presentation also included an overview of the environmental and conceptual engineering process together with the eight-month outreach action plan and strategy to refine and reduce the number of alternatives prior to initiating the environmental review work. In October, a meeting is planned to update TAC on the status of the Eastside Transit Corridor Phase 2 project, including the two build alternatives that staff is not recommending for further study as well as the two build alternatives that are being recommended for entry into the Draft EIS/EIR phase.

City and Stakeholder Briefings

Over the course of the AA study and the subsequent eight-month outreach action plan, the project team conducted numerous city and stakeholder briefings to provide the latest information and updates. In addition, one-on-one briefings were used to coordinate with city staff on the physical components of each alternative as it pertained to their city. Meeting participants included City Managers, Directors of Public Works, Planning, Community Development, Transportation and City Engineers. Involving the various department heads at each city ensured that the discussions were productive and covered the range of study disciplines needed for planning and design.

Smaller group briefings were also conducted to inform interested and key stakeholders of the project status and the project development process. These individual meetings were valuable in building project consensus and helping to navigate through the corridor issues, especially as they relate to specific groups. A total of 21 stakeholder briefings were conducted with local service and business organizations, including: chambers of commerce, business associations, hospitals, academic institutions, shopping centers, churches and schools. (For a detailed list of briefings, refer to Project Meeting Record, Appendix G). Table 6.3 provides a summary of the city and stakeholder briefings.

Table 6.3 Summary of City and Stakeholder Briefings

Meeting Type/Name	No. of Meetings	No. of Attendees	No. of Written Comments Received
Elected Official Briefings	4	18	2
Technical Advisory Committee Meetings	1	28	Group Input
Stakeholder & City Meetings	21	182	8

6.3 Outreach Summary

The Eastside Transit Corridor Phase 2 transportation alternatives were identified and evaluated through a detailed screening process incorporating technical and environmental analysis and public input. During the preliminary screening step, 47 Conceptual Alternatives were identified from previous corridor studies and through this project's early scoping process. Following an initial screening, 17 Initial Alternatives were identified. Based on a

comparative analysis and public feedback, the Initial Alternatives were refined to a smaller set of five Refined Alternatives that best met the project goals, were technically viable, and had stakeholder support. The five Refined Alternatives were evaluated through the screening process and criteria documented in the Eastside Transit Corridor Phase 2 AA Report. The final screening process involved more specific evaluation information, including engineering and operational analysis, initial capital and operating cost estimates, ridership forecast modeling, community and environmental impacts analysis, and public input. In January 2009, the Metro Board of Directors adopted four Final Alternatives for further analysis through additional environmental evaluation and public outreach effort: SR-60, Beverly Boulevard, Beverly/Whittier Boulevards and Washington Boulevard.

Initial public support during the AA centered on the Whittier Boulevard Alternative due in part to the direct route to Uptown Whittier, seen by many as a popular terminus area. In addition, Whittier Boulevard is a major retail corridor. However, supportive comments also noted concern for potential impacts to businesses during construction, right-of-way requirements and increased congestion. The SR-60 and Washington Boulevard routes were mentioned as good alternatives to avoid impacts on Whittier Boulevard. The Beverly Boulevard Alternative was the least supported route.

Following adoption of the four build Final Alternatives by the Metro Board of Directors in January 2009, an intensive public involvement plan was developed to further evaluate and refine the alternatives prior to the initiation of the Draft EIS/EIR. This effort was focused on outreach to elected officials, city staff, affected property owners, business leaders and key community stakeholders for the purpose of further technical evaluation and in-depth alternative discussions. At meetings and briefings, physical components of each alignment were discussed, including configuration, station locations, parking, land use potential, ridership, travel times, system costs, noise, property and traffic impacts.

During the refinement of the four Final Alternatives, elected officials and stakeholders had the opportunity to study the four alternatives in greater detail and consider their city's General Plans, including the Circulation Element and land use policies. In addition, comments received during this period at open houses, focus groups and individual stakeholder briefings showed significant support for both the SR-60 and Washington Boulevard alternatives. This support was a catalyst for the corridor cities to solidify their positions and adopt resolutions or letters of support for these two alternatives. The cities of Monterey Park, Rosemead, Montebello, South El Monte and El Monte formed a coalition around the SR-60 Alternative. The City of Industry has also stated their support for the SR-60 Alternative. And in a similar effort, the cities of Commerce, Pico Rivera, Santa Fe Springs and Whittier articulated their support for the Washington Boulevard Alternative.

Only the City of Pico Rivera included the Beverly/Whittier Boulevards Alternative as a secondary option. The City of Whittier voiced their opposition to the Beverly Boulevard, Beverly/Whittier Boulevards, and SR-60 alternatives in their resolution. Once the City

Councils formalized their support for the SR-60 and Washington Boulevard Alternatives, respective constituencies generally aligned themselves with their local government. As such, the community of Whittier initiated the "Save the Greenway Committee" to communicate their opposition to the Beverly Boulevard Alternative and their support for the Washington Boulevard Alternative. Through resolutions, letters and public comments submitted over the past eight months, support for the SR-60 and Washington Boulevard alternatives is nearly 6 to 1 compared with the Beverly Boulevard and Beverly/Whittier Boulevards Alternatives. Table 6.4 summarizes the support of the alternatives by each city.

Table 6.4 Support of Project Alternatives by City

City	SR-60 LRT	Washington Boulevard LRT	Beverly /Whittier Boulevards LRT	Beverly Boulevard LRT
Commerce		Support		
El Monte	Support			
City of Industry	Support			
Monterey Park	Support			
Montebello	Support			
Pico Rivera		Support	Support (2nd choice)	
Rosemead	Support			
Santa Fe Springs		Support		
South El Monte	Support			
Whittier		Support		

The collection of community input reflects an overwhelming support for both the SR-60 and Washington Boulevard Alternatives and a strong opposition to the Beverly/Whittier Boulevards and Beverly Boulevard Alternatives. The comments supporting the SR-60 and Washington Boulevard alternatives highlighted the connectivity potential and limited impacts to traffic, homes and businesses. Supporters of the SR-60 specifically mentioned the connectivity to the Montebello Town Center, Rio Hondo Community College and Whittier

Narrows Park, a regional park that holds major community events. Likewise, supporters of the Washington Alternative mentioned the connectivity to the large employment base in City of Commerce, Pico Rivera Town Center and Presbyterian Intercommunity Hospital, a major healthcare provider and employer in the City of Whittier.

The opposition to the Beverly/Whittier Alternative was primarily because of potential impacts to Whittier Boulevard, a major thoroughfare that is highly congested. According to the comments received, additional traffic impacts to this street would be detrimental to not only the motorist but to the business community. Comments received indicated that recent construction projects such as the reconstruction of the Rio Hondo Bridge and Whittier Boulevard improvements in Montebello have severely impacted the business community and Beverly Hospital. The Montebello Chamber of Commerce voiced strong opposition to the Beverly/Whittier Boulevards Alternative due to the potential right of way impacts at the northwest and southwest corners of the Beverly Boulevard and Montebello Boulevard intersection. Lastly, the Beverly Boulevard Alternative received the most opposition from the Whittier community; primarily because a segment of the alternative runs on the Whittier Greenway Trail in the City of Whittier. This trail opened this year with huge support and community participation. According to the comments received, the community would like to see this alternative removed from further consideration due in large part to pedestrian safety. The trail is heavily used by cyclists, runners and families who believe that sharing the trail with the light rail system could pose significant safety risks to the local community. In addition, the lack of parking along the route caused concern for overflow parking into the residential areas. The comments also demonstrated the community's concern that the alignment would have negative noise impacts, right of way issues, impacts to property values and privacy, due to the proximity of the alignment to local schools and residential areas. In an effort to show a united community effort against this alternative, Whittier residents formed the "Save the Greenway Committee."

7.0 COMPARATIVE ANALYSIS OF ALTERNATIVES

The Eastside Transit Corridor Phase 2 Alternatives Analysis (AA) Report completed in January 2009 provided a detailed overview of the Project Study Area's (PSA) transportation needs and how they would be served by the five proposed project alternatives under consideration at the time. In January 2009, the Metro Board approved four Final Alternatives and the initiation of Conceptual Engineering to refine and further evaluate the approved alternatives. This Addendum to the AA Report has documented the Conceptual Engineering-based effort intended to provide decision-makers and the public with an informed basis for selecting the most viable transportation strategy, or phasing of strategies, that would address the Eastside Transit Corridor's mobility needs and capacity requirements in year 2030 and beyond, while being sensitive to community, environmental and economic development concerns.

In summary, all of the proposed alternatives have benefits and impacts, as it is challenging to construct a high-capacity, light rail transit system in a heavily-developed, urban area with constrained street right-of-way widths lined with one- and two-story buildings. The primary goal of the Eastside Transit Corridor Phase 2 project is to provide a transportation system that better serves the PSA's communities without negatively impacting quality of life. Based on the technical analysis and outreach results documented in this report, two build alternatives, along with the No Build and Baseline/TSM options, are recommended to be carried through the preparation of a Draft EIS/EIR process. A discussion of the findings related to the four Final Alternatives is presented below. A graphic summary comparison is provided, in Table 7.1, to compare all of the non-fatal flawed, proposed alternatives and to demonstrate the technically superior alternatives.

7.1 Recommended Alternatives

Two of the Final Alternatives are recommended for further study: the SR-60 LRT and Washington Boulevard LRT options as discussed below.

7.1.1 SR-60 LRT

The SR-60 Alternative is recommended to move forward based on the following:

- This alignment provides the fastest travel speed and time of all of the alternative

Table 7.1 Comparative Analysis of Alternatives

Key Measures	SR-60	Beverly/Whittier	Washington
Total Ridership	◐	◐	●
Ridership: Boardings per Mile per Day	◐	○	●
Ridership: Boardings per Station	●	◐	●
Ridership: Access by Park-N-Ride Riders	●	◐	◐
Ridership: Access by Pedestrian & Bicycle Riders	○	◐	●
Ridership: Access by Bus Riders	○	●	◐
Accessibility to Transit-Dependent Populations	○	●	◐
Capital Cost	◐	●	○
Cost per Mile	○	●	◐
Travel Time	●	○	◐
Operations & Maintenance Costs	●	○	◐
Required Land Use and Zoning Changes to Support Transit Along Corridor	◐	○	●
Loss of Travel Lanes and/or Vehicle Conflicts	●	○	●
Loss of On-Street Parking	●	○	●
Catalyst for Public/Private Economic Revitalization	◐	●	◐
Right-of-Way Acquisition Note: Property for replacement parking may be necessary and has not yet been analyzed	◐	◐	◐
Community and Neighborhood Impacts (EJ)	●	○	◐
Visual Compatibility and Aesthetic Impacts	◐	○	◐
Section 4(f) Resources (Cultural & Parklands)	◐	◐	●

Key Measures	SR-60	Beverly/Whittier	Washington
Air Quality	●	●	◐
Noise and Vibration Sensitive Land Uses	●	○	◐
Ecosystems	◐	●	●
Water Resources	◐	◐	◐
Geology and Subsurface Conditions	◐	●	●
Hazardous Materials and Waste	○	◐	◐
Community Support	●	○	●

● Favorable rank ◐ Mid rank ○ Low rank

- PSA mobility goals of providing improved regional connectivity are achieved with this alternative by connecting with the regional Metro rail system, providing additional transportation capacity to serve increasing travel demand, reducing vehicular travel on the regional highway system and attracting new transit riders.
- North-south bus feeder networks and parking structures at every station provide additional accessibility.
- This alternative will primarily serve longer work-based trips. Access to this alternative will be enhanced by the provision of a bus feeder network and station-related parking structures. This option will also serve educational, shopping and recreational trips.
- This alternative will support both existing development, such as the Montebello Town Center and the Montebello Square shopping centers, and proposed land use plans, including the Cascades Market Place in Monterey Park. It also provides improved access to PSA recreational facilities such as the Whittier Narrows Recreation Area.
- This alternative results in good ridership that may be strengthened in the future with the use of the new Metro ridership model under development, including the Regional Connector, which would improve performance of this alternative by providing east-west one-seat connections and single transfer north-south connections desired by people traveling to and from the PSA.

- Minimal community impacts would result from the construction and operation of this alignment. Located in an aerial configuration within the SR-60 Freeway right-of-way, this alternative would have minimal visual, traffic, safety, noise and vibration impacts. However, it should be noted that as currently designed, this alternative will impact 12 residential properties.

- This alignment has experienced a high level of community, stakeholder and elected official support.

Challenges

- Hazardous Materials – Hazardous materials are present and remediation efforts are underway at the former OII/current Superfund site. Construction of the project adjacent to the site has the potential to disrupt ongoing remediation efforts.

- Flood Control and Parkland Impacts – According to the U.S. Army Corps of Engineers, flood plains and flood control facilities are located within the Santa Anita station area. System construction may impact these facilities. Additionally, the alignment travels adjacent to and within a portion of the Whittier Narrows Recreation Center, which also serves a flood control role; therefore, there is also the potential for parkland impacts.

- High Capital Cost – Options for potentially reducing the costs of this alignment will be explored during the next study phase, which includes environmental analysis and Advanced Conceptual Engineering. Considerations will include, but will not be limited to, identifying partnerships to develop shared-used parking structures.

- Terminus Station – Assessing an extension of the alignment further east to the former Crossroads Parkway Station could help recapture lost ridership caused by shortening the alignment and not serving commuters before the I-605/SR-60 interchange.

- Southern California Edison (SCE) Plans – Future engineering efforts will require close coordination with SCE due to their plans for construction of new 500kV transmission lines and towers adjacent to the SR-60/Paramount interchange and in the Peck Road Station Area as part of the Tehachapi Renewable Transmission project.

- Agency Coordination – This alignment will require significant coordination with other agencies including, but not limited to, Caltrans, Federal Highway Administration, U.S. Environmental Protection Agency, SCE and the U.S. Army Corps of Engineers.

7.1.2 Washington Boulevard LRT

The Washington Boulevard LRT Alternative is recommended to move forward based on the following:

- This alternative attracts the highest number of new transit riders, and provides the second fastest travel time of the four alternatives.
- PSA mobility goals of providing improved regional connectivity by connecting to the regional Metro rail system are achieved by providing additional transportation capacity to serve increasing travel demand, and by attracting new riders to transit.
- This alternative would build a strong ridership base by providing service for the following trip purposes:
    - Short, frequent trips within the communities it operates through.
    - Commuter trips to and from Washington Boulevard employment sites.
    - Commuter and other trips to and from the southern portion of the PSA, including the Gateway Cities and I-5 Freeway corridor, as well as to communities north of the SR-60 Freeway via bus and park-and-ride access at the SR-60/Garfield Station.
- North-south bus feeder networks and parking structures at every station, except the Garfield/Whittier Station, provide additional accessibility. Proposed property acquisition at this aerial station, to provide vertical access elements, may result in limited parking opportunities.
- Existing development and proposed land use plans are transit-supportive along this alignment, particularly at the terminus station area within the City of Whittier.
- This alternative results in the highest ridership and user benefits of all the alternatives. These numbers may increase in the future with the use of the new Metro ridership model under development, including the Regional Connector, which would improve performance of this alternative by providing east-west one-seat connections and single transfer north-south connections desired by people traveling to and from the PSA.
- This alternative will provide additional travel capacity with minimal impacts on the PSA's street system, which is heavily-traveled, particularly by trucks.
- Minimal community impacts, such as traffic, safety, noise and vibration impacts, would result from the construction and operation of this alternative. Located in an

aerial configuration within the medians of Garfield and Washington Boulevards, both with wide right-of-ways, this alternative's route is lined primarily with two- to three-story commercial and industrial uses.

- This alternative has experienced a high level of community, stakeholder and elected official support.

Challenges

- High Capital Cost – Options for potentially reducing the cost of this alternative will be explored during the next study phase, which includes Advanced Conceptual Engineering (ACE) and environmental analysis. Considerations will include, but will not be limited to, having some at-grade sections and identifying partnerships to develop shared-use parking structures.
- Agency Coordination – This alignment will require significant coordination with other agencies including, but not limited to, Caltrans, Federal Highway Administration, SCE, the Los Angeles Department of Water and Power Union Pacific Railroad and the U.S. Army Corps of Engineers.

7.2 Alternatives Not Recommended for Further Study

Two of the Final Alternatives are not recommended for further study: the Beverly Boulevard LRT and the Beverly/Whittier Boulevards LRT options as discussed below.

7.2.1 Beverly Boulevard LRT

The Beverly Boulevard LRT Alternative is not recommended to move forward into the Draft EIS/EIR and ACE phase due to the following:

- Fatal Flaws – The eastern half of this alignment has several major challenges where it leaves the Beverly Boulevard right-of-way and crosses primarily vacant land to enter the Whittier Greenway:
    - The vacant land through which the alignment would traverse is owned by SCE and the Union Pacific Railroad (UPRR). This area serves as SCE "regional backbone" with existing 220kV transmission lines that are planned for upgrading to 500kV service, including new transmission towers as part of SCE's Tehachapi Renewable Transmission project. SCE representatives have indicated that they cannot permit at-grade or aerial rail operations through their

property due to their current service improvement projects and long-term plans.

- The UPRR tracks currently accommodate Metrolink and freight operations, and they have future plans for their property that preclude the inclusion of other rail structures.

- The Whittier Greenway is a former railroad right-of-way that has been redesigned as a landscaped recreational trail. It is lined on both sides by single-family residences, and on the north side by four schools. LRT operations would require the acquisition of half of this recreational area now owned by the City of Whittier. Funding for this recreational resource included federal funds from the U. S. Department of the Interior (National Park Service), raising the possibility of 6(f) issues. Taking half of this parkland resource for rail operations also raises 4(f) issues that may not be resolvable. The City of Whittier has stated their position against the use of their recreational resource for LRT operations.

- Community Impacts:

  - Additional regional transportation capacity is provided to the detriment of the communities along the alignment with impacts to sensitive land uses, including possible visual, traffic, safety, noise and vibration impacts.

  - Additional transportation capacity is provided, but it negatively impacts street system operations; there are several constrained sections on Beverly Boulevard making it difficult for rail operations and necessary vehicular capacity to coexist.

- Rider Benefits – Lack of compelling transit rider benefits; ridership, user benefits, and travel times are not promising enough when balanced against possible community impacts.

- Lack of community, stakeholder and elected official support.

7.2.2 Beverly/Whittier Boulevards LRT

The Beverly/Whittier Alternative, with north-south travel connections on Montebello or Rosemead Boulevards, is not recommended to move forward into the Draft EIS/EIR and ACE phase due to the following:

- Community Impacts – This alternative introduces approximately 50 percent aerial rail operations into a constrained street system lined with one- and two-story structures

often built to the sidewalk edge, such as in downtown Montebello. Technical and environmental analysis identified significant community impacts, including a high potential for noise and vibration, community cohesion and street system capacity impacts, for this alternative. There are possible parkland impacts related to the final operating segment, terminal station and tail tracks, which would be located adjacent to and possibly within a portion of the Whittier Greenway. Individually, specific potential community impacts can be mitigated. However, the culmination of a high number of potential community impacts can be a high concern for community cohesion. A number of specific potential impacts are as follows:

- The Beverly/Montebello/Whittier Boulevards alignment has a major pinch point as the aerial rail structure traveling south in the median of Montebello Boulevard turns east onto Whittier Boulevard in downtown Montebello. The resulting alignment radius is so tight that the rail structure comes within several feet of the commercial building located at the northeast corner of Whittier and Montebello Boulevards. In addition, with the commercial buildings along Whittier Boulevard built to the sidewalk edge of this narrow street, the aerial rail structure and station planned for this location would cover approximately 60 percent of the street right-of-way. Construction of a rail system in this location would require the removal of the recently implemented downtown Montebello streetscape improvements.

- On the Beverly/Rosemead/Whittier Boulevards alignment, there is a major community impact along Rosemead Boulevard just north of Whittier Boulevard. This section is planned for aerial operations running in the median of Rosemead Boulevard where it must cross over Union Pacific/Metrolink tracks set on a bridge perpendicular to Rosemead Boulevard. In order to allow sufficient room for the LRT structure to cross over Metrolink and freight trains, the top of the aerial rail structure would need to be 48 feet above the existing railroad bridge. This portion of the alignment is lined with one- and two-story, single family homes resulting in significant visual, noise and other impacts.

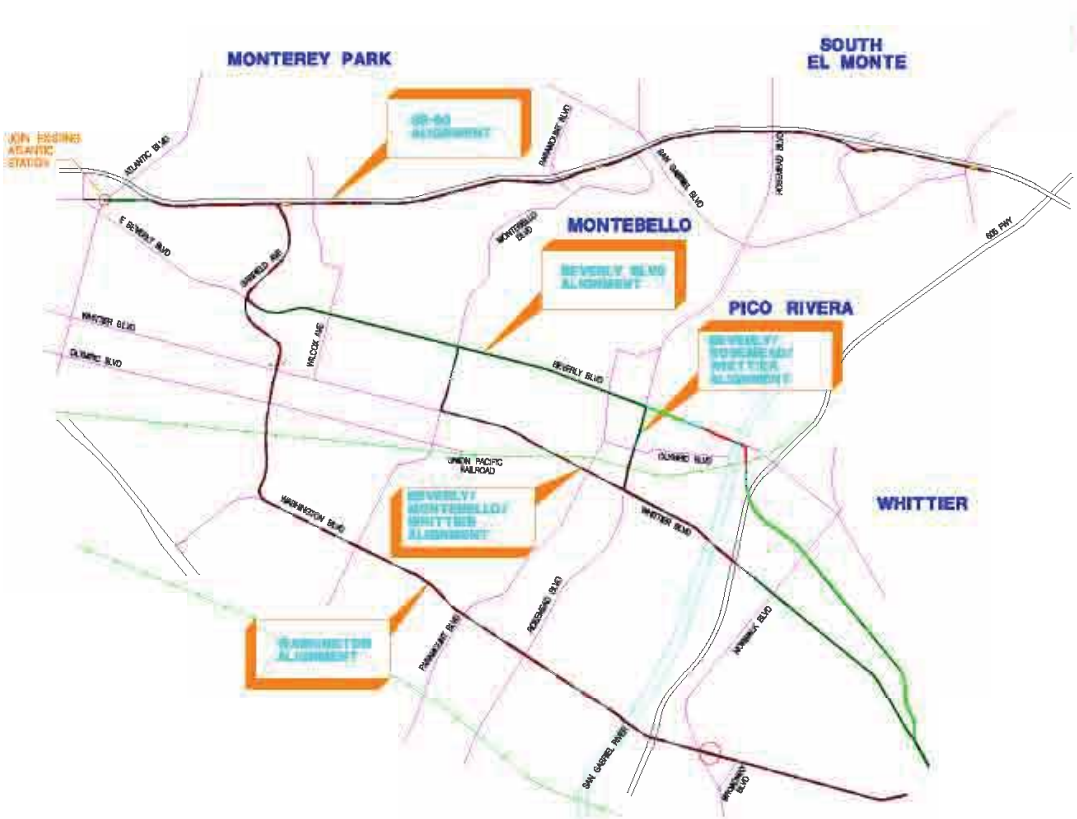
- Rider Benefits – Lack of compelling transit rider benefits; resulting ridership, user benefits and travel times are not promising enough when balanced against possible community impacts.

- Lack of community, stakeholder and elected official support.

The recommendations contained herein will be presented to the Metro Board in October 2009 for approval. With Metro Board approval, the two Recommended Alternatives will advance into environmental review in compliance with the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA).

APPENDIX A:

Conceptual Engineering Drawings



CONCEPTUAL ENGINEERING
GENERAL, TRACK ALIGNMENT
PLANS & PROFILES
CROSS SECTIONS
STATIONS ARCHITECTURE

OCTOBER 20, 2009
CONTRACT NO. PS4320-2003

ALTERNATIVES ANALYSIS
ADDENDUM - APPENDIX A

EASTSIDE PHASE 2 - PART 1 (METRO GOLD LINE)

Metro
Metropolitan Transportation Authority

CDM AECOM

SHT NO.	DGN NO.	DRAWING TITLE	CONCEPTUAL ENGINEERING
		GENERAL	
		TITLE SHEET	■
	G-001	INDEX OF DRAWINGS - SHEET 1 OF 3	■
	G-002	INDEX OF DRAWINGS - SHEET 2 OF 3	■
	G-003	INDEX OF DRAWINGS - SHEET 3 OF 3 AND LEGEND	■
	G-004	GENERAL PLAN	■
	G-005	SR-60 ALIGNMENT KEY PLAN	■
	G-006	BEVERLY BLVD ALIGNMENT KEY PLAN	■
	G-007	BEVERLY/MONTEBELLO/WHITTIER ALIGNMENT KEY PLAN	■
	G-008	BEVERLY/ROSEMEAD/WHITTIER ALIGNMENT KEY PLAN	■
	G-009	WASHINGTON BLVD ALIGNMENT KEY PLAN	■
		SR-60 ALIGNMENT	
		TRACK ALIGNMENT	
	T-001	SR-60 ALIGNMENT - SHEET 1 OF 14	■
	T-002	SR-60 ALIGNMENT - SHEET 2 OF 14	■
	T-003	SR-60 ALIGNMENT - SHEET 3 OF 14	■
	T-004	SR-60 ALIGNMENT - SHEET 4 OF 14	■
	T-005	SR-60 ALIGNMENT - SHEET 5 OF 14	■
	T-006	SR-60 ALIGNMENT - SHEET 6 OF 14	■
	T-007	SR-60 ALIGNMENT - SHEET 7 OF 14	■
	T-008	SR-60 ALIGNMENT - SHEET 8 OF 14	■
	T-009	SR-60 ALIGNMENT - SHEET 9 OF 14	■
	T-010	SR-60 ALIGNMENT - SHEET 10 OF 14	■
	T-011	SR-60 ALIGNMENT - SHEET 11 OF 14	■
	T-012	SR-60 ALIGNMENT - SHEET 12 OF 14	■
	T-013	SR-60 ALIGNMENT - SHEET 13 OF 14	■
	T-014	SR-60 ALIGNMENT - SHEET 14 OF 14	■
		PLAN AND PROFILE	
	T-015	SR-60 AT N. VAIL AVE.. PLAN AND PLAN AND PROFILE SHEET 1 OF 1	■
		SECTIONS	
	S-001	SR-60 SECTIONS - SHEET 1 OF 12	■
	S-002	SR-60 SECTIONS - SHEET 2 OF 12	■
	S-003	SR-60 SECTIONS - SHEET 3 OF 12	■
	S-004	SR-60 SECTIONS - SHEET 4 OF 12	■
	S-005	SR-60 SECTIONS - SHEET 5 OF 12	■
	S-006	SR-60 SECTIONS - SHEET 6 OF 12	■
	S-007	SR-60 SECTIONS - SHEET 7 OF 12	■
	S-008	SR-60 SECTIONS - SHEET 8 OF 12	■
	S-009	SR-60 SECTIONS - SHEET 9 OF 12	■
	S-010	SR-60 SECTIONS - SHEET 10 OF 12	■
	S-011	SR-60 SECTIONS - SHEET 11 OF 12	■
	S-012	SR-60 SECTIONS - SHEET 12 OF 12	■

SHT NO.	DGN NO.	DRAWING TITLE	CONCEPTUAL ENGINEERING
		STATIONS ARCHITECTURE	
	A-001	SR-60 GARFIELD AVE. STATION LOCATION PLAN	■
	A-002	SR-60 GARFIELD AVE. STATION SECTION 1 OF 3	■
	A-003	SR-60 GARFIELD AVE. STATION SECTION 2 OF 3	■
	A-004	SR-60 GARFIELD AVE. STATION SECTION 3 OF 3	■
	A-005	SR-60 MONTEBELLO TOWN CENTER LOCATION PLAN	■
	A-006	SR-60 MONTEBELLO TOWN CENTER SECTION	■
	A-007	SR-60 SANTA ANITA AVE. STATION LOCATION PLAN	■
	A-008	SR-60 SANTA ANITA AVE. STATION SECTION	■
	A-009	SR-60 PECK RD. STATION LOCATION PLAN	■
	A-010	SR-60 PECK RD. STATION SECTION	■
		BEVERLY BLVD ALIGNMENT	
		TRACK ALIGNMENT	
	T-051	BEVERLY BLVD. ALIGNMENT - SHEET 1 OF 18	■
	T-052	BEVERLY BLVD. ALIGNMENT - SHEET 2 OF 18	■
	T-053	BEVERLY BLVD. ALIGNMENT - SHEET 3 OF 18	■
	T-054	BEVERLY BLVD. ALIGNMENT - SHEET 4 OF 18	■
	T-055	BEVERLY BLVD. ALIGNMENT - SHEET 5 OF 18	■
	T-056	BEVERLY BLVD. ALIGNMENT - SHEET 6 OF 18	■
	T-057	BEVERLY BLVD. ALIGNMENT - SHEET 7 OF 18	■
	T-058	BEVERLY BLVD. ALIGNMENT - SHEET 8 OF 18	■
	T-059	BEVERLY BLVD. ALIGNMENT - SHEET 9 OF 18	■
	T-060	BEVERLY BLVD. ALIGNMENT - SHEET 10 OF 18	■
	T-061	BEVERLY BLVD. ALIGNMENT - SHEET 11 OF 18	■
	T-062	BEVERLY BLVD. ALIGNMENT - SHEET 12 OF 18	■
	T-063	BEVERLY BLVD. ALIGNMENT - SHEET 13 OF 18	■
	T-064	BEVERLY BLVD. ALIGNMENT - SHEET 14 OF 18	■
	T-065	BEVERLY BLVD. ALIGNMENT - SHEET 15 OF 18	■
	T-066	BEVERLY BLVD. ALIGNMENT - SHEET 16 OF 18	■
	T-067	BEVERLY BLVD. ALIGNMENT - SHEET 17 OF 18	■
	T-068	BEVERLY BLVD. ALIGNMENT - SHEET 18 OF 18	■
		SECTIONS	
	S-051	BEVERLY SECTIONS - SHEET 1 OF 19	■
	S-052	BEVERLY SECTIONS - SHEET 2 OF 19	■
	S-053	BEVERLY SECTIONS - SHEET 3 OF 19	■
	S-054	BEVERLY SECTIONS - SHEET 4 OF 19	■
	S-055	BEVERLY SECTIONS - SHEET 5 OF 19	■
	S-056	BEVERLY SECTIONS - SHEET 6 OF 19	■
	S-057	BEVERLY SECTIONS - SHEET 7 OF 19	■
	S-058	BEVERLY SECTIONS - SHEET 8 OF 19	■
	S-059	BEVERLY SECTIONS - SHEET 9 OF 19	■
	S-060	BEVERLY SECTIONS - SHEET 10 OF 19	■
	S-061	BEVERLY SECTIONS - SHEET 11 OF 19	■

SHT NO.	DGN NO.	DRAWING TITLE	CONCEPTUAL ENGINEERING
	S-062	BEVERLY SECTIONS - SHEET 12 OF 19	■
	S-063	BEVERLY SECTIONS - SHEET 13 OF 19	■
	S-064	BEVERLY SECTIONS - SHEET 14 OF 19	■
	S-065	BEVERLY SECTIONS - SHEET 15 OF 19	■
	S-066	BEVERLY SECTIONS - SHEET 16 OF 19	■
	S-067	BEVERLY SECTIONS - SHEET 17 OF 19	■
	S-068	BEVERLY SECTIONS - SHEET 18 OF19	■
	S-069	BEVERLY SECTIONS - SHEET 19 OF 19	■
		STATIONS ARCHITECTURE	
	A-051	BEVERLY BLVD. GARFIELD AVE. STATION	■
	A-052	BEVERLY BLVD. GARFIELD AVE. STATION SECTION	■
	A-053	BEVERLY BLVD. WILCOX AVE. STATION LOCATION PLAN 1 OF 2	■
	A-054	BEVERLY BLVD. WILCOX AVE. STATION LOCATION PLAN 2 OF 2	■
	A-055	BEVERLY BLVD. WILCOX AVE. STATION SECTION	■
	A-056	BEVERLY BLVD. MONTEBELLO BLVD. STATION LOCATION PLAN 1 OF 2	■
	A-057	BEVERLY BLVD. MONTEBELLO BLVD. STATION LOCATION PLAN 2 OF 2	■
	A-058	BEVERLY BLVD. MONTEBELLO BLVD. STATION SECTION	■
	A-059	BEVERLY BLVD. ROSEMEAD BLVD. STATION LOCATION PLAN 1 OF 2	■
	A-060	BEVERLY BLVD. ROSEMEAD BLVD. STATION LOCATION PLAN 2 OF 2	■
	A-061	BEVERLY BLVD. ROSEMEAD BLVD. STATION SECTION	■
	A-062	BEVERLY BLVD. NORWALK AVE. STATION LOCATION PLAN 1 OF 2	■
	A-063	BEVERLY BLVD. NORWALK AVE. STATION LOCATION PLAN 2 OF 2	■
	A-064	BEVERLY BLVD. NORWALK AVE. STATION SECTION	■
	A-065	BEVERLY BLVD. BROADWAY STATION PLAN 1 OF 2	■
	A-066	BEVERLY BLVD. BROADWAY STATION PLAN 2 OF 2	■
	A-067	BEVERLY BLVD. BROADWAY STATION SECTION	■
	A-068	BEVERLY BLVD. PHILADELPIA ST STATION LOCATION PLAN	■
	A-069	BEVERLY BLVD. PHILADELPIA ST STATION SECTION	■
	A-070	BEVERLY BLVD. MAR VISTA ST STATION LOCATION PLAN	■
	A-071	BEVERLY BLVD. MAR VISTA ST STATION SECTION	■
		BEVERLY/MONTEBELLO/WHITTIER ALIGNMENT	
		TRACK ALIGNMENT	
	T-101	BEVERLY/MONTEBELLO/WHITTIER ALIGNMENT - SHEET 1 OF 18	■
	T-102	BEVERLY/MONTEBELLO/WHITTIER ALIGNMENT - SHEET 2 OF 18	■
	T-103	BEVERLY/MONTEBELLO/WHITTIER ALIGNMENT - SHEET 3 OF 18	■
	T-104	BEVERLY/MONTEBELLO/WHITTIER ALIGNMENT - SHEET 4 OF 18	■
	T-105	BEVERLY/MONTEBELLO/WHITTIER ALIGNMENT - SHEET 5 OF 18	■
	T-106	BEVERLY/MONTEBELLO/WHITTIER ALIGNMENT - SHEET 6 OF 18	■
	T-107	BEVERLY/MONTEBELLO/WHITTIER ALIGNMENT - SHEET 7 OF 18	■
	T-108	BEVERLY/MONTEBELLO/WHITTIER ALIGNMENT - SHEET 8 OF 18	■

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY R. NIGHT
DRAWN BY R. NIGHT
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 7/4/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1

INDEX OF DRAWINGS
SHEET 1 OF 3

CONTRACT NO PS4320-2003
DRAWING NO G-001
REV 0
SCALE NONE
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 12:15:33 PM
PLOT DRIVER = Raster_half_pdf.plt
PEN TABLE = WA_AL_COLOR.tbl

USER=rrains 12:15:33 PM 10/23/2009 w:\60039033_eastside2_lg_part_2\cadd\gen\sheet\CEg-001.plg

SHT NO.	DGN NO.	DRAWING TITLE	CONCEPTUAL ENGINEERING
	T-109	BEVERLY/MONTEBELLO/WHITTIER ALIGNMENT - SHEET 9 OF 18	■
	T-110	BEVERLY/MONTEBELLO/WHITTIER ALIGNMENT - SHEET 10 OF 18	■
	T-111	BEVERLY/MONTEBELLO/WHITTIER ALIGNMENT - SHEET 11 OF 18	■
	T-112	BEVERLY/MONTEBELLO/WHITTIER ALIGNMENT - SHEET 12 OF 18	■
	T-113	BEVERLY/MONTEBELLO/WHITTIER ALIGNMENT - SHEET 13 OF 18	■
	T-114	BEVERLY/MONTEBELLO/WHITTIER ALIGNMENT - SHEET 14 OF 18	■
	T-115	BEVERLY/MONTEBELLO/WHITTIER ALIGNMENT - SHEET 15 OF 18	■
	T-116	BEVERLY/MONTEBELLO/WHITTIER ALIGNMENT - SHEET 16 OF 18	■
	T-117	BEVERLY/MONTEBELLO/WHITTIER ALIGNMENT - SHEET 17 OF 18	■
	T-118	BEVERLY/MONTEBELLO/WHITTIER ALIGNMENT - SHEET 18 OF 18	■
		PLAN AND PROFILE	
	T-121	BEVERLY/MONTEBELLO/WHITTIER PLAN AND PROFILE SHEET 1 OF 7	■
	T-122	BEVERLY/MONTEBELLO/WHITTIER PLAN AND PROFILE SHEET 2 OF 7	■
	T-123	BEVERLY/MONTEBELLO/WHITTIER PLAN AND PROFILE SHEET 3 OF 7	■
	T-124	BEVERLY/MONTEBELLO/WHITTIER PLAN AND PROFILE SHEET 4 OF 7	■
	T-125	BEVERLY/MONTEBELLO/WHITTIER PLAN AND PROFILE SHEET 5 OF 7	■
	T-126	BEVERLY/MONTEBELLO/WHITTIER PLAN AND PROFILE SHEET 6 OF 7	■
	T-127	BEVERLY/MONTEBELLO/WHITTIER PLAN AND PROFILE SHEET 7 OF 7	■
		SECTIONS	
	S-101	BEVERLY/MONTEBELLO/WHITTIER SECTIONS - SHEET 1 OF 14	■
	S-102	BEVERLY/MONTEBELLO/WHITTIER SECTIONS - SHEET 2 OF 14	■
	S-103	BEVERLY/MONTEBELLO/WHITTIER SECTIONS - SHEET 3 OF 14	■
	S-104	BEVERLY/MONTEBELLO/WHITTIER SECTIONS - SHEET 4 OF 14	■
	S-105	BEVERLY/MONTEBELLO/WHITTIER SECTIONS - SHEET 5 OF 14	■
	S-106	BEVERLY/MONTEBELLO/WHITTIER SECTIONS - SHEET 6 OF 14	■
	S-107	BEVERLY/MONTEBELLO/WHITTIER SECTIONS - SHEET 7 OF 14	■
	S-108	BEVERLY/MONTEBELLO/WHITTIER SECTIONS - SHEET 8 OF 14	■
	S-109	BEVERLY/MONTEBELLO/WHITTIER SECTIONS - SHEET 19 OF 14	■
	S-110	BEVERLY/MONTEBELLO/WHITTIER SECTIONS - SHEET 10 OF 14	■
	S-111	BEVERLY/MONTEBELLO/WHITTIER SECTIONS - SHEET 11 OF 14	■
	S-112	BEVERLY/MONTEBELLO/WHITTIER SECTIONS - SHEET 12 OF 14	■
	S-113	BEVERLY/MONTEBELLO/WHITTIER SECTIONS - SHEET 13 OF 14	■
	S-114	BEVERLY/MONTEBELLO/WHITTIER SECTIONS - SHEET 14 OF 14	■
		STATIONS ARCHITECTURE	
	A-101	BEVERLY/MONTEBELLO/WHITTIER GARFIELD AVE. STATION LOCATION PLAN	■
	A-102	BEVERLY/MONTEBELLO/WHITTIER GARFIELD AVE. STATION SECTION	■
	A-103	BEVERLY/MONTEBELLO/WHITTIER WILCOX AVE. STATION LOCATION PLAN 1 OF 2	■
	A-104	BEVERLY/MONTEBELLO/WHITTIER WILCOX AVE. STATION LOCATION PLAN 2 OF 2	■
	A-105	BEVERLY/MONTEBELLO/WHITTIER WILCOX AVE. STATION SECTION	■

SHT NO.	DGN NO.	DRAWING TITLE	CONCEPTUAL ENGINEERING
	A-106	BEVERLY/MONTEBELLO/WHITTIER BEVERLY-MONTEBELLO STATION LOCATION PLAN	■
	A-107	BEVERLY/MONTEBELLO/WHITTIER BEVERLY-MONTEBELLO STATION SECTION	■
	A-108	BEVERLY/MONTEBELLO/WHITTIER - WHITTIER-MONTEBELLO STATION LOCATION PLAN	■
	A-109	BEVERLY/MONTEBELLO/WHITTIER - WHITTIER-MONTEBELLO STATION SECTION	■
	A-110	BEVERLY/MONTEBELLO/WHITTIER ROSEMEAD BLVD. STATION LOCATION PLAN	■
	A-111	BEVERLY/MONTEBELLO/WHITTIER ROSEMEAD BLVD. STATION SECTION	■
	A-112	BEVERLY/MONTEBELLO/WHITTIER NORWALK AVE. STATION LOCATION PLAN	■
	A-113	BEVERLY/MONTEBELLO/WHITTIER NORWALK AVE. STATION SECTION	■
	A-114	BEVERLY/MONTEBELLO/WHITTIER MAR VISTA ST. STATION LOCATION PLAN	■
	A-115	BEVERLY/MONTEBELLO/WHITTIER MAR VISTA ST. STATION SECTION	■
		BEVERLY/ROSEMEAD/WHITTIER ALIGNMENT	
		TRACK ALIGNMENT	
	T-151	BEVERLY/ROSEMEAD/WHITTIER ALIGNMENT - SHEET 1 OF 18	■
	T-152	BEVERLY/ROSEMEAD/WHITTIER ALIGNMENT - SHEET 2 OF 18	■
	T-153	BEVERLY/ROSEMEAD/WHITTIER ALIGNMENT - SHEET 3 OF 18	■
	T-154	BEVERLY/ROSEMEAD/WHITTIER ALIGNMENT - SHEET 4 OF 18	■
	T-155	BEVERLY/ROSEMEAD/WHITTIER ALIGNMENT - SHEET 5 OF 18	■
	T-156	BEVERLY/ROSEMEAD/WHITTIER ALIGNMENT - SHEET 6 OF 18	■
	T-157	BEVERLY/ROSEMEAD/WHITTIER ALIGNMENT - SHEET 7 OF 18	■
	T-158	BEVERLY/ROSEMEAD/WHITTIER ALIGNMENT - SHEET 8 OF 18	■
	T-159	BEVERLY/ROSEMEAD/WHITTIER ALIGNMENT - SHEET 9 OF 18	■
	T-160	BEVERLY/ROSEMEAD/WHITTIER ALIGNMENT - SHEET 10 OF 18	■
	T-161	BEVERLY/ROSEMEAD/WHITTIER ALIGNMENT - SHEET 11 OF 18	■
	T-162	BEVERLY/ROSEMEAD/WHITTIER ALIGNMENT - SHEET 12 OF 18	■
	T-163	BEVERLY/ROSEMEAD/WHITTIER ALIGNMENT - SHEET 13 OF 18	■
	T-164	BEVERLY/ROSEMEAD/WHITTIER ALIGNMENT - SHEET 14 OF 18	■
	T-165	BEVERLY/ROSEMEAD/WHITTIER ALIGNMENT - SHEET 15 OF 18	■
	T-166	BEVERLY/ROSEMEAD/WHITTIER ALIGNMENT - SHEET 16 OF 18	■
	T-167	BEVERLY/ROSEMEAD/WHITTIER ALIGNMENT - SHEET 17 OF 18	■
	T-168	BEVERLY/ROSEMEAD/WHITTIER ALIGNMENT - SHEET 18 OF 18	■
		PLAN AND PROFILE	
	T-175	BEVERLY/ROSEMEAD/WHITTIER PLAN AND PROFILE SHEET 1 OF 4	■
	T-176	BEVERLY/ROSEMEAD/WHITTIER PLAN AND PROFILE SHEET 2 OF 4	■
	T-177	BEVERLY/ROSEMEAD/WHITTIER PLAN AND PROFILE SHEET 3 OF 4	■
	T-178	BEVERLY/ROSEMEAD/WHITTIER PLAN AND PROFILE SHEET 4 OF 4	■
		SECTIONS	
	S-151	BEVERLY/ROSEMEAD/WHITTIER SECTIONS - SHEET 1 OF 3	■
	S-152	BEVERLY/ROSEMEAD/WHITTIER SECTIONS - SHEET 2 OF 3	■
	S-153	BEVERLY/ROSEMEAD/WHITTIER SECTIONS - SHEET 3 OF 3	■

SHT NO.	DGN NO.	DRAWING TITLE	CONCEPTUAL ENGINEERING
		STATIONS ARCHITECTURE	
	A-151	BEVERLY/ROSEMEAD/WHITTIER GARFIELD AVE. STATION LOCATION PLAN	■
	A-152	BEVERLY/ROSEMEAD/WHITTIER GARFIELD AVE. STATION SECTION	■
	A-153	BEVERLY/ROSEMEAD/WHITTIER WILCOX AVE. STATION LOCATION PLAN 1 OF 2	■
	A-154	BEVERLY/ROSEMEAD/WHITTIER WILCOX AVE. STATION LOCATION PLAN 2 OF 2	■
	A-155	BEVERLY/ROSEMEAD/WHITTIER WILCOX AVE. SECTION	■
	A-156	BEVERLY/ROSEMEAD/WHITTIER MONTEBELLO BLVD. STATION LOCATION PLAN 1 OF 2	■
	A-157	BEVERLY/ROSEMEAD/WHITTIER MONTEBELLO BLVD. STATION LOCATION PLAN 2 OF 2	■
	A-158	BEVERLY/ROSEMEAD/WHITTIER MONTEBELLO BLVD. STATION SECTION	■
	A-159	BEVERLY/ROSEMEAD/WHITTIER BEVERLY-ROSEMEAD STATION LOCATION PLAN	■
	A-160	BEVERLY/ROSEMEAD/WHITTIER BEVERLY-ROSEMEAD STATION SECTION	■
	A-161	BEVERLY/ROSEMEAD/WHITTIER WHITTIER-ROSEMEAD STATION LOCATION PLAN	■
	A-162	BEVERLY/ROSEMEAD/WHITTIER WHITTIER-ROSEMEAD STATION SECTION	■
	A-163	BEVERLY/ROSEMEAD/WHITTIER NORWALK AVE. STATION LOCATION PLAN	■
	A-164	BEVERLY/ROSEMEAD/WHITTIER NORWALK AVE. SECTION	■
	A-165	BEVERLY/ROSEMEAD/WHITTIER MAR VISTA ST. STATION LOCATION PLAN	■
	A-166	BEVERLY/ROSEMEAD/WHITTIER MAR VISTA ST. STATION SECTION	■
		WASHINGTON BLVD ALIGNMENT	
		TRACK ALIGNMENT	
	T-201	WASHINGTON BLVD ALIGNMENT - SHEET 1 OF 19	■
	T-202	WASHINGTON BLVD ALIGNMENT - SHEET 2 OF 19	■
	T-203	WASHINGTON BLVD ALIGNMENT - SHEET 3 OF 19	■
	T-204	WASHINGTON BLVD ALIGNMENT - SHEET 4 OF 19	■
	T-205	WASHINGTON BLVD ALIGNMENT - SHEET 5 OF 19	■
	T-206	WASHINGTON BLVD ALIGNMENT - SHEET 6 OF 19	■
	T-207	WASHINGTON BLVD ALIGNMENT - SHEET 7 OF 19	■
	T-208	WASHINGTON BLVD ALIGNMENT - SHEET 8 OF 19	■
	T-209	WASHINGTON BLVD ALIGNMENT - SHEET 9 OF 19	■
	T-210	WASHINGTON BLVD ALIGNMENT - SHEET 10 OF 19	■
	T-211	WASHINGTON BLVD ALIGNMENT - SHEET 11 OF 19	■
	T-212	WASHINGTON BLVD ALIGNMENT - SHEET 12 OF 19	■
	T-213	WASHINGTON BLVD ALIGNMENT - SHEET 13 OF 19	■
	T-214	WASHINGTON BLVD ALIGNMENT - SHEET 14 OF 19	■
	T-215	WASHINGTON BLVD ALIGNMENT - SHEET 15 OF 19	■
	T-216	WASHINGTON BLVD ALIGNMENT - SHEET 16 OF 19	■
	T-217	WASHINGTON BLVD ALIGNMENT - SHEET 17 OF 19	■
	T-218	WASHINGTON BLVD ALIGNMENT - SHEET 18 OF 19	■
	T-219	WASHINGTON BLVD ALIGNMENT - SHEET 19 OF 19	■

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY R. NIGHT
DRAWN BY R. NIGHT
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 7/4/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1

INDEX OF DRAWINGS
SHEET 2 OF 3

CONTRACT NO PS4320-2003
DRAWING NO G-002
REV 0
SCALE NONE
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 12:15:36 PM
PLOT DRIVER = Raster_half_pdf.plt
PEN TABLE = WHA_BLACK.tbl

USER=rrains 12:15:36 PM 10/23/2009 w:\60039033_eastside2_lg_part_2\cadd\gen\sheet\CG-002.pig

SHT NO.	DGN NO.	DRAWING TITLE	CONCEPTUAL ENGINEERING				
		PLAN AND PROFILE					
	T-221	WASHINGTON BLVD. AT RIO HONDO PLAN AND PROFILE SHEET 1 OF 3	■				
	T-222	WASHINGTON BLVD. AT SAN GABRIEL RIVER PLAN AND PROFILE SHEET 2 OF 3	■				
	T-223	WASHINGTON BLVD. AT SAN GABRIEL RIVER PLAN AND PROFILE SHEET 3 OF 3	■				
		SECTIONS					
	S-201	WASHINGTON BLVD SECTIONS - SHEET 1 OF 15	■				
	S-202	WASHINGTON BLVD SECTIONS - SHEET 2 OF 15	■				
	S-203	WASHINGTON BLVD SECTIONS - SHEET 3 OF 15	■				
	S-204	WASHINGTON BLVD SECTIONS - SHEET 4 OF 15	■				
	S-205	WASHINGTON BLVD SECTIONS - SHEET 5 OF 15	■				
	S-206	WASHINGTON BLVD SECTIONS - SHEET 6 OF 15	■				
	S-207	WASHINGTON BLVD SECTIONS - SHEET 7 OF 15	■				
	S-208	WASHINGTON BLVD SECTIONS - SHEET 8 OF 15	■				
	S-209	WASHINGTON BLVD SECTIONS - SHEET 9 OF 15	■				
	S-210	WASHINGTON BLVD SECTIONS - SHEET 10 OF 15	■				
	S-211	WASHINGTON BLVD SECTIONS - SHEET 11 OF 15	■				
	S-212	WASHINGTON BLVD SECTIONS - SHEET 12 OF 15	■				
	S-213	WASHINGTON BLVD SECTIONS - SHEET 13 OF 15	■				
	S-214	WASHINGTON BLVD SECTIONS - SHEET 14 OF 15	■				
	S-215	WASHINGTON BLVD SECTIONS - SHEET 15 OF 15	■				
		STATIONS ARCHITECTURE					
	A-201	WASHINGTON BLVD. GARFIELD AVE. STATION LOCATION PLAN	■				
	A-202	WASHINGTON BLVD. GARFIELD AVE. STATION SECTION	■				
	A-203	WASHINGTON BLVD. WHITTIER BLVD. STATION LOCATION PLAN	■				
	A-204	WASHINGTON BLVD. WHITTIER BLVD. STATION SECTION	■				
	A-205	WASHINGTON BLVD. GREENWOOD AVE. STATION LOCATION PLAN	■				
	A-206	WASHINGTON BLVD. GREENWOOD AVE. STATION SECTION	■				
	A-207	WASHINGTON BLVD. ROSEMEAD BLVD. STATION LOCATION PLAN	■				
	A-208	WASHINGTON BLVD. ROSEMEAD BLVD. STATION SECTION	■				
	A-209	WASHINGTON BLVD. NORWALK AVE. STATION LOCATION PLAN	■				
	A-210	WASHINGTON BLVD. NORWALK AVE STATION SECTION	■				
	A-211	WASHINGTON BLVD. LAMBERT AVE. STATION LOCATION PLAN	■				
	A-212	WASHINGTON BLVD. LAMBERT AVE. STATION SECTION	■				

LEGEND:

- GRADE CROSSING
- AERIAL ALIGNMENT
- AT GRADE ALIGNMENT
- TRANSITION
- STATION
- PARK AND RIDE TRANSIT ORIENTED DEVELOPMENT — P&R/TOD
- TRACK CENTER LINE
- LIGHT RAIL R.O.W
- PEDESTRIAN/BICYCLE ACCESS
- PLAZA
- VERTICAL ACCESS TO STATION
- OPPORTUNITY SITE
- KISS & RIDE
- VERTICAL ACCESS FROM PARKING
- BUS STOP

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY R. NIGHT
DRAWN BY R. NIGHT
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 7/4/09

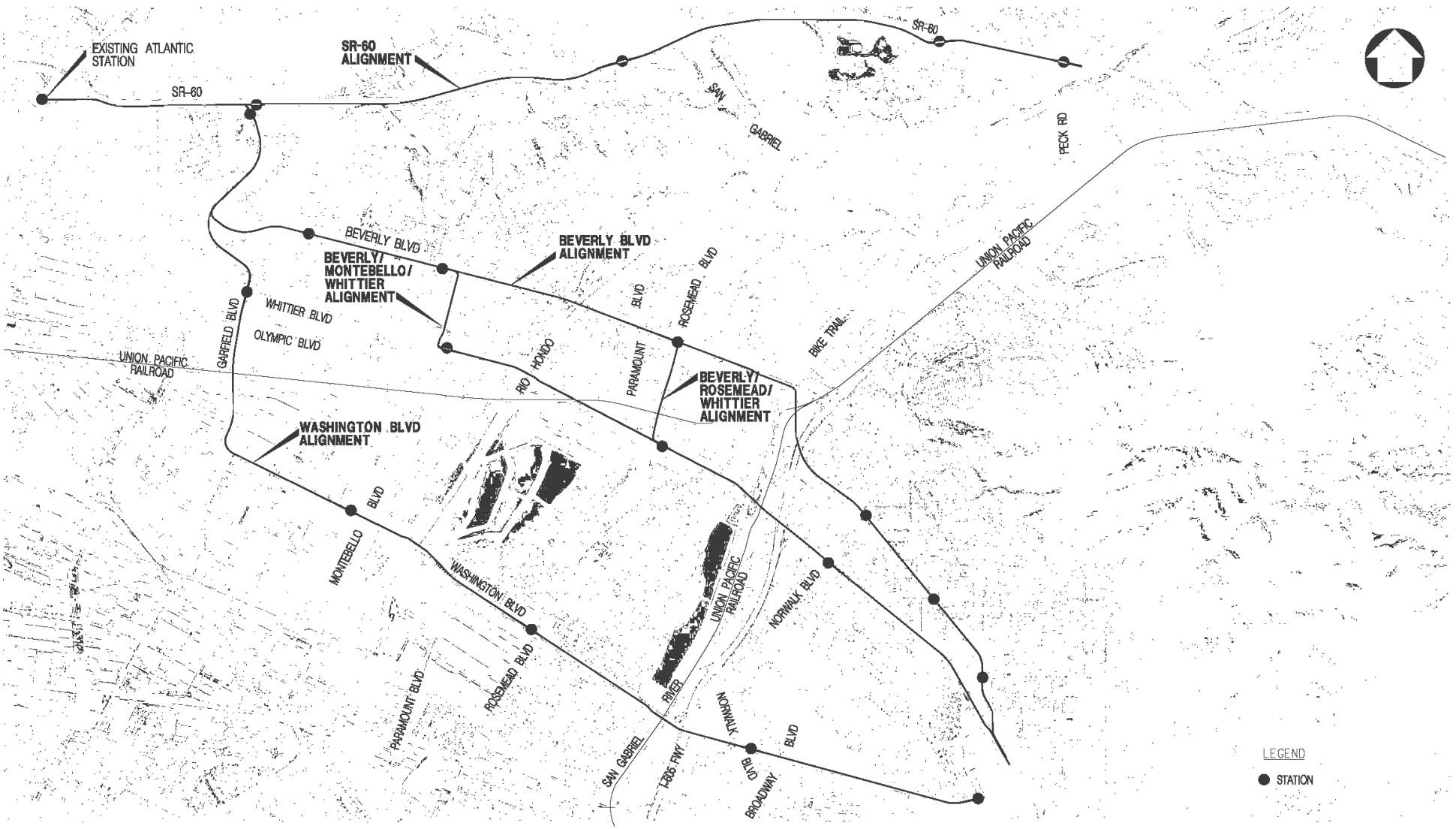
Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
INDEX OF DRAWINGS
AND LEGEND
SHEET 3 OF 3

CONTRACT NO PS4320-2003
DRAWING NO G-003 REV 0
SCALE NONE
SHEET NO

DATE PLOTTED = 10/23/2009 PLOT DRIVER = Raster-half-pdf.plt
TIME PLOTTED = 12:15:39 PM PEN TABLE = MTA-1-COLOR.tbl

USER-drains 12:15:39 PM 10/23/2009 w:\60039033_eastside2_to_part_2\cadd\gen\sheet\G-g-003.plg



REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY A. GRANDOV
DRAWN BY A. GRANDOV
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

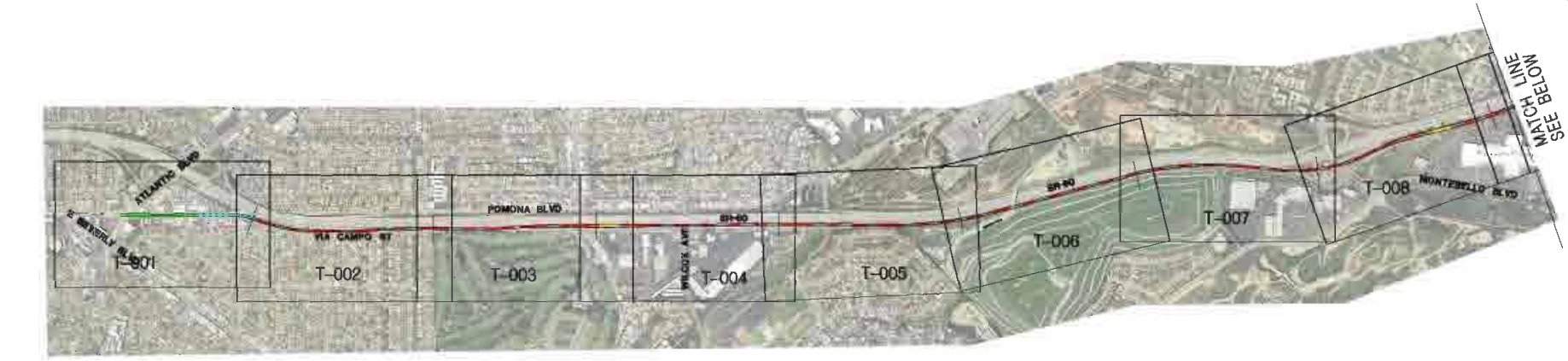
Metro Metropolitan Transportation Authority

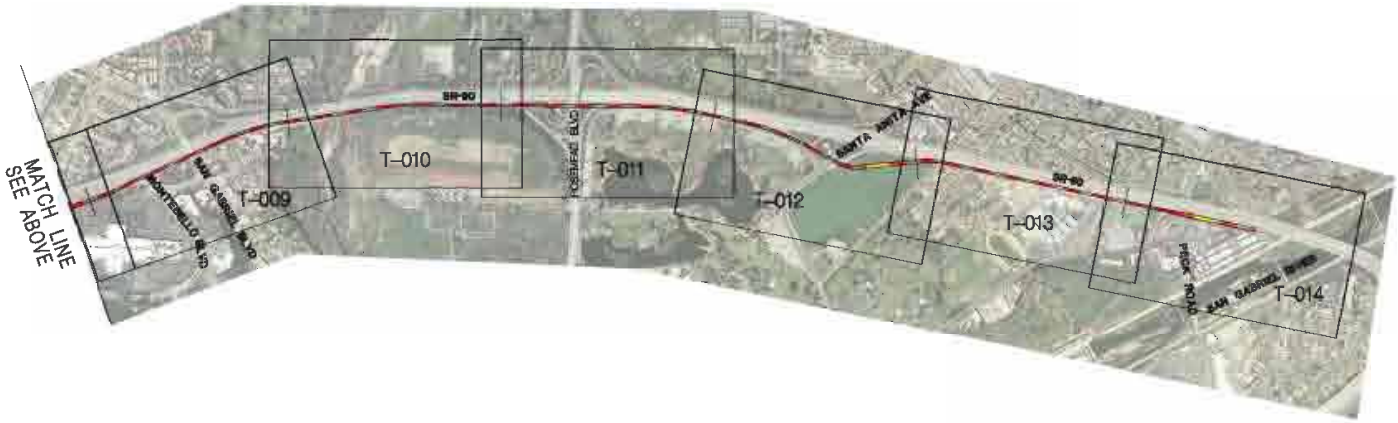
EASTSIDE PHASE 2 - PART 1
GENERAL PLAN

CONTRACT NO PS4320-2003
DRAWING NO G-004 REV 0
SCALE NOT TO SCALE
SHEET NO

DATE PLOTTED = 10/23/2009 TIME PLOTTED = 12:16:13 PM
PLOT DRIVER = Raster.half_pdf.plt PEN TABLE = WIN_AL_COLOR.TBL

USER=grants 12:16:13 PM 10/23/2009 w:\60039033_eastside2_lg_part_2\cadd\gen\sheet\CLG-004.plg





REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

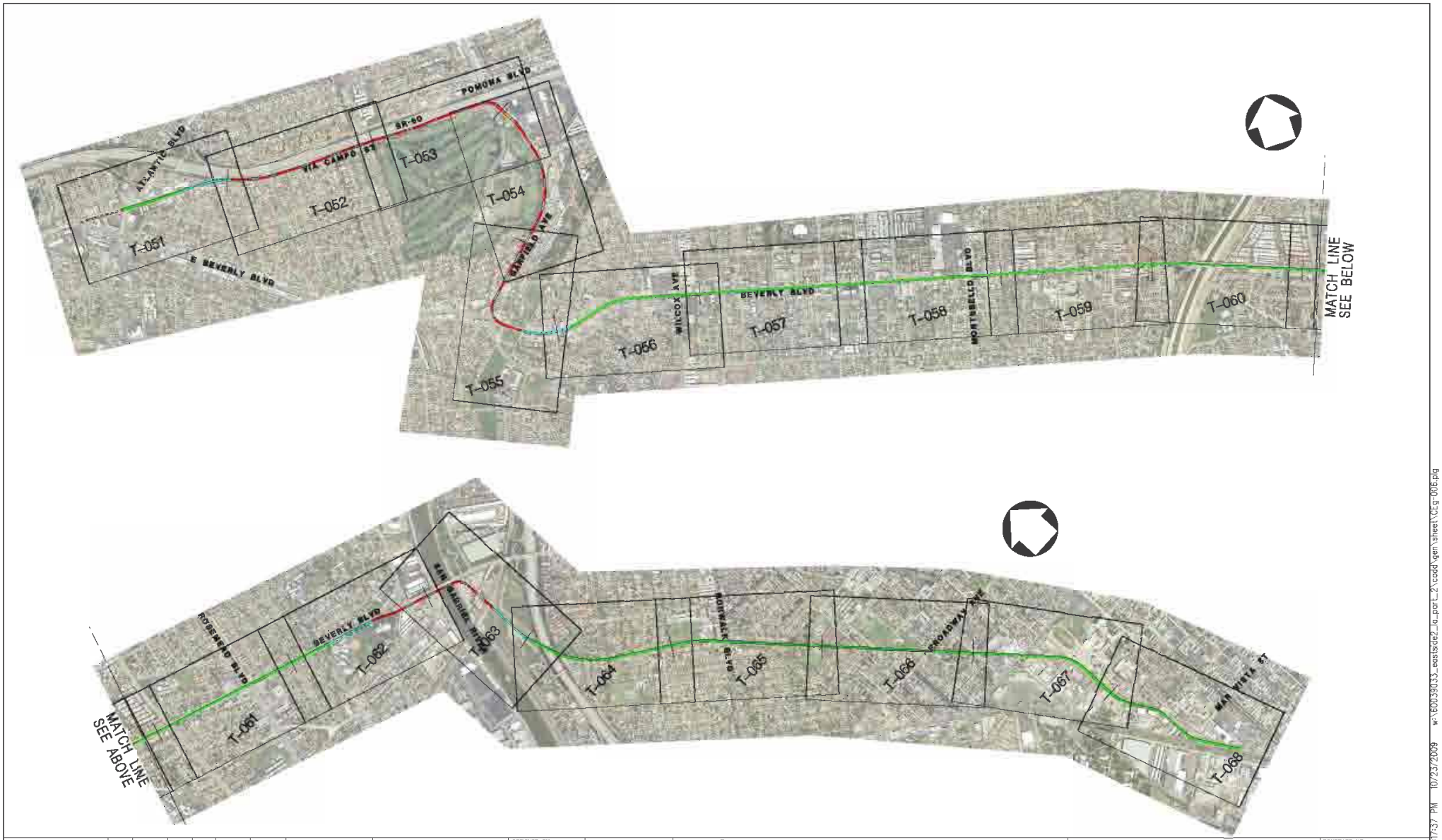
DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
SR-60 ALIGNMENT
KEY MAP

CONTRACT NO PS4320-2003
DRAWING NO G-005 REV 0
SCALE 1"=800'
SHEET NO

USER-drams 12:16:50 PM 10/23/2009 w:\60039033_eastside2_la_part_2\cadd\gen\sheet\Cfg-005.plg



REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY: W. ABREGO
DRAWN BY: S. ARAIN
CHECKED BY: J. AL-MASHAT
IN CHARGE: S. FIALKOFF
DATE: 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY ALIGNMENT
KEY MAP

CONTRACT NO: PS4320-2003
DRAWING NO: G-006
REV: 0
SCALE: 1" =800'
SHEET NO

USER=arains 12:17:37 PM 10/23/2009 w:\60039033_eastside2_lg_part_2\cadd\gen\sheet\GLg-006.plg

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

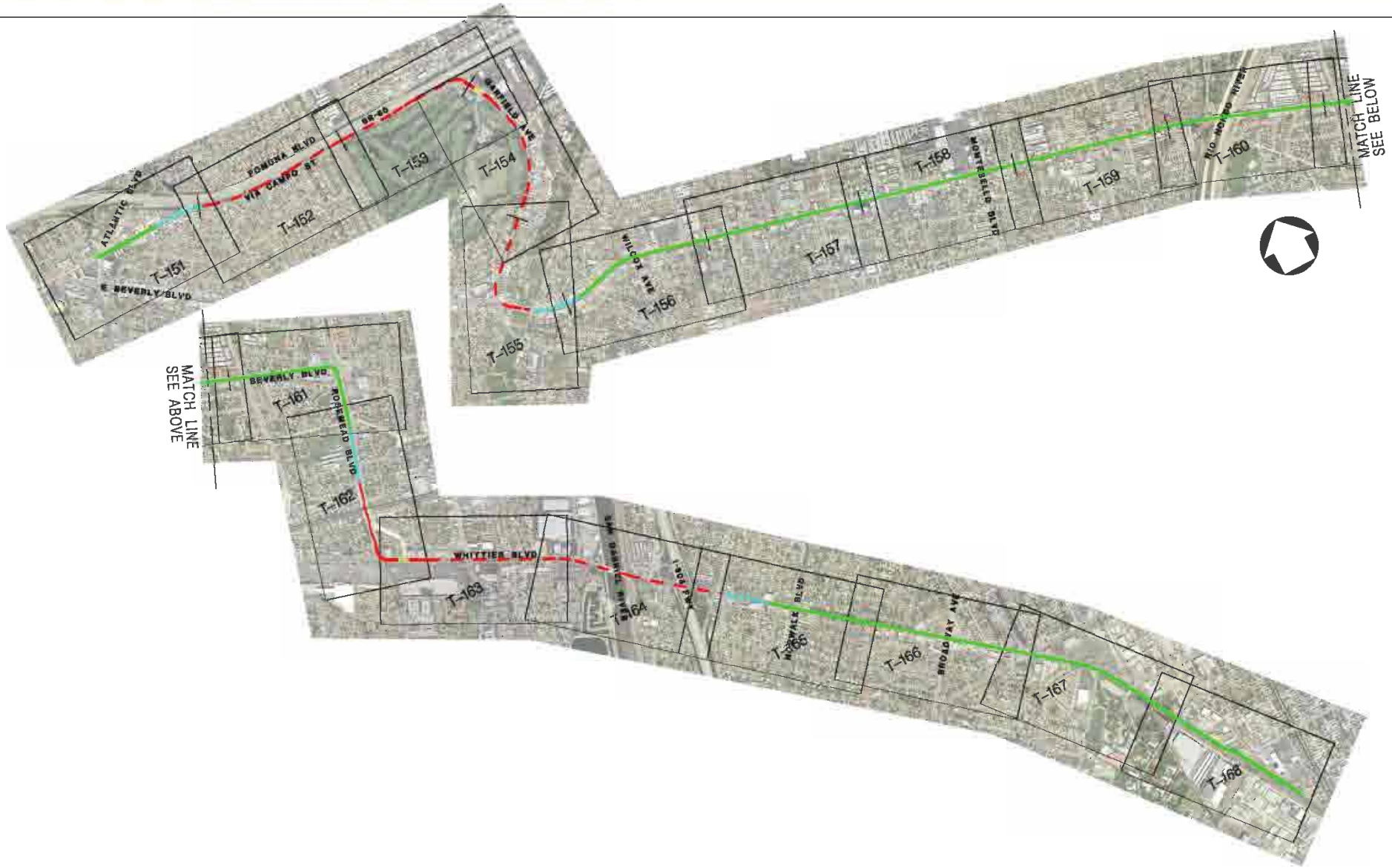
DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVRLY BLVD / WHITTIER BLVD
(BEVRLY/MONTEBELLOW/WHITTIER)
ALIGNMENT
KEY MAP

CONTRACT NO PS4320-2003
DRAWING NO G-007
REV 0
SCALE 1"=800'
SHEET NO

USER-drains 12:18:14 PM 10/23/2009 w:\60039033_eastside2_le_part_2\cadd\gen\sheet\G-007.plg



REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metro Metropolitan Transportation Authority

CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVRLY BLVD / WHITTIER BLVD
(BEVRLY/ROSEMEAD/WHITTIER)
ALIGNMRNT
KEY MAP

CONTRACT NO PS4320-2003
DRAWING NO G-008 REV 0
SCALE 1"=800'
SHEET NO

USER-drains 12:18:46 PM 10/23/2009 w:\60039033_eastside2_to_part_2\cadd\gen\sheet\G-g-008.plg

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
WASHINGTON BLVD
KEY MAP

CONTRACT NO PS4320-2003
DRAWING NO G-009
REV 0
SCALE 1"=800'
SHEET NO

USER-drains 12:19:16 PM 10/23/2009 w:\60039033_eastside2_to_part_2\cddd\gen\sheet\Dfg009.plg

HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
SR-60
ALIGNMENT
SHEET 1 OF 14

CONTRACT NO PS4320-2003
DRAWING NO T- 001
REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 11:52:00 AM
PLOT DRIVER = Raster-half.pdf.plt
PEN TABLE = MTA-II-COLOR.tbl

USER=arains 11:52:00 AM 10/23/2009 W:\60039033_EastSide2_LA_Part_2\cadd\Rail\Sheet\CET-001.plg

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

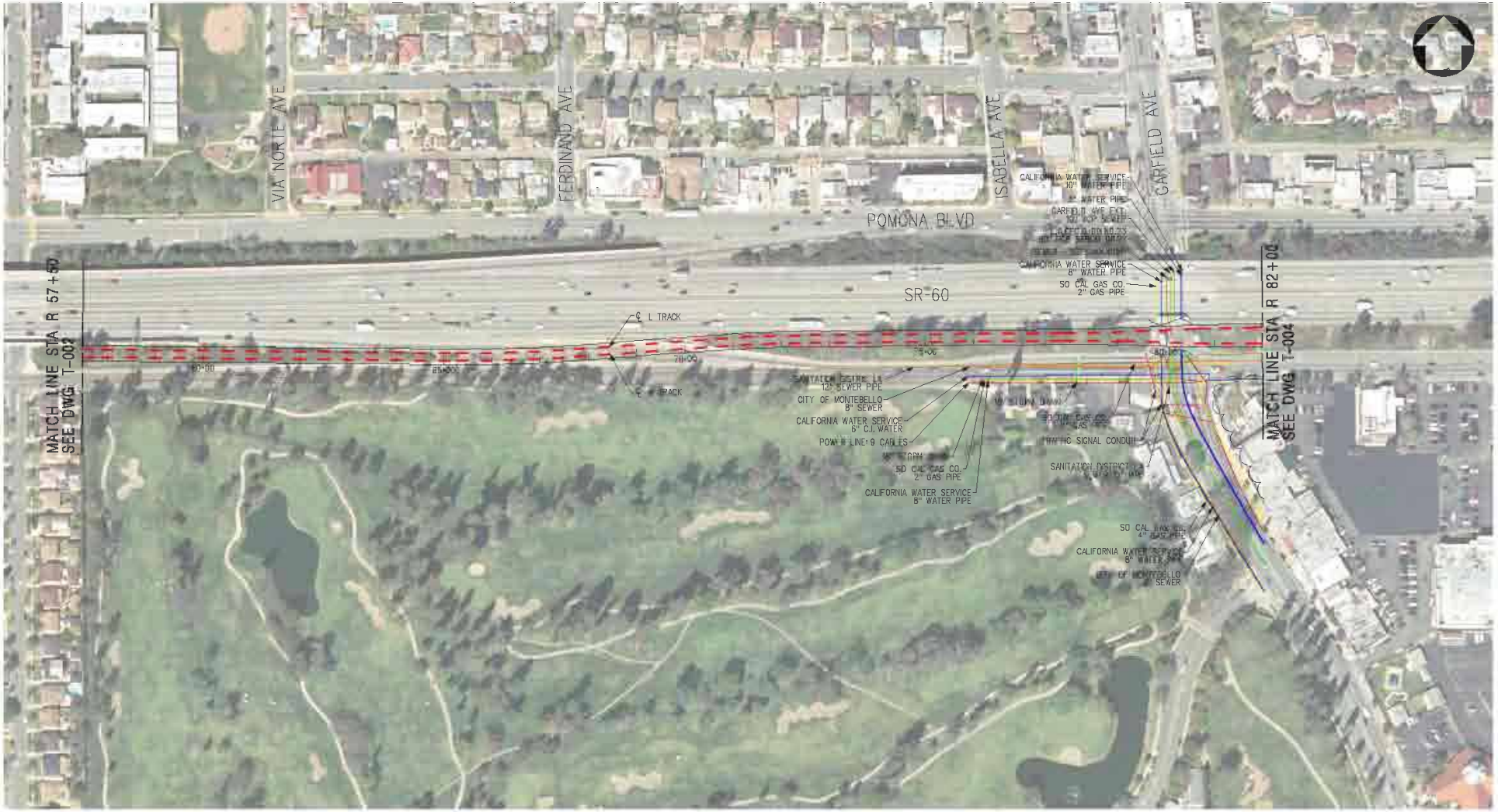
Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
SR-60
ALIGNMENT
SHEET 2 OF 14

CONTRACT NO PS4320-2003
DRAWING NO T-002
REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 11:52:22 AM
PLOT DRIVER = Raster-half.pdf.plt
PEN TABLE = MTA-H-COLOR.tbl

USER=arains 11:52:22 AM 10/23/2009 w:\60039033_eastside2_to_part_2\cadd\rail\sheet\CET-002.plg



HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

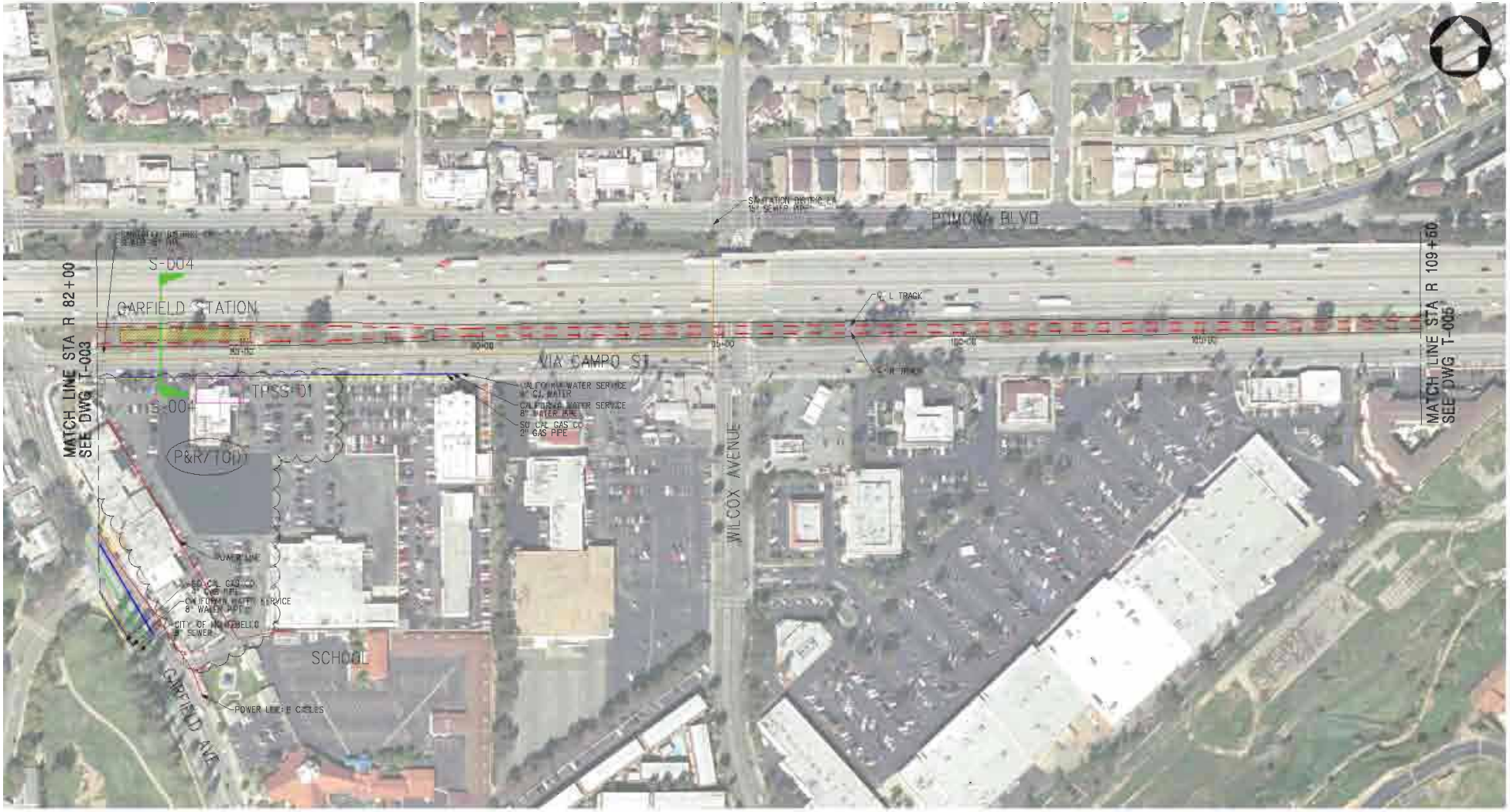
Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
SR-60
ALIGNMENT
SHEET 3 OF 14

CONTRACT NO PS4320-2003
DRAWING NO T-003
REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 11:52:42 AM
PLOT DRIVER = Raster-half-pdf.plt
PEN TABLE = MTA-H-COLOR.tbl

USER=arains 11:52:42 AM 10/23/2009 w:\60039033_eastside2_to_part_2\cadd\rail\sheet\CET-003.plg



HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
SR-60
ALIGNMENT
SHEET 4 OF 14

CONTRACT NO PS4320-2003
DRAWING NO T-004 REV 0
SCALE HORIZ: 1" =100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 11:53:01 AM
PLOT DRIVER = Raster.hplf.pdf.pltr
PEN TABLE = WHITE.COLOR.TBL

USER=rrains 11:53:01 AM 10/23/2009 w:\60039033_eastside2_la_part_2\cadd\rail\sheet\CET-004.plg

HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
SR-60
ALIGNMENT
SHEET 5 OF 14

CONTRACT NO PS4320-2003
DRAWING NO T-005 REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 11:33:22 AM
PLOT DRIVER = Raster.hplf_pdf.pltr
PEN TABLE = WA-bl-color.tbl

USER=drains 11:33:22 AM 10/23/2009 w:\60039033_eastside2_le_part_2\cadd\roll\sheet\CET-005.plg

HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
SR-60
ALIGNMENT
SHEET 6 OF 14

CONTRACT NO PS4320-2003
DRAWING NO T-006 REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 1:50:48 PM
PLOT DRIVER = Raster-half-pdf.plt
PENTABLE = MTA-H-COLOR.tbl
USER=arains 1:50:48 PM 10/23/2009 W:\60039033_EastSide2_LA_Part_2\cadd\Rail\Sheet\CET-006.plg

HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
SR-60
ALIGNMENT
SHEET 7 OF 14

CONTRACT NO PS4320-2003
DRAWING NO T-007
REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 11:54:02 AM
PLOT DRIVER = Rasterhalf.pdf.plt
PEN TABLE = MTA-H-COLOR.tbl

USER=arains 11:54:02 AM 10/23/2009 w:\60039033_eastside2_to_part_2\cadd\rail\sheet\CET-007.plg

HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
SR-60
ALIGNMENT
SHEET 8 OF 14

CONTRACT NO PS4320-2003
DRAWING NO T-008 REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 11:54:23 AM
PLOT DRIVER = Raster.hplf_pdf.plt
PEN TABLE = WIN_34_COLOR.TBL

USER=drains 11:54:23 AM 10/23/2009 w:\60039033_eastside2_le_part_2\cadd\roll\sheet\CET-008.plg

HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY: W. ABREGO
DRAWN BY: S. ARAIN
CHECKED BY: J. AL-MASHAT
IN CHARGE: S. FIALKOFF
DATE: 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
SR-60
ALIGNMENT
SHEET 9 OF 14

CONTRACT NO: PS4320-2003
DRAWING NO: T-009
REV: 0
SCALE: HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 11:54:44 AM
PLOT DRIVER = Raster.hplf_pdf.pltr
PEN TABLES = WIN_BLACK.CTB
USER=drains 11:54:44 AM 10/23/2009 w:\60039033_eastside2_le_part_2\cadd\roll\sheet\CET-009.plg

HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
SR-60
ALIGNMENT
SHEET 10 OF 14

CONTRACT NO PS4320-2003
DRAWING NO T-010
REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 11:55:03 AM
PLOT DRIVER = Raster-half-pdf.plt
PEN TABLE = MTA-H-COLOR.tbl

USER=arains 11:55:03 AM 10/23/2009 w:\60039033_eastside2_to_part_2\cadd\rail\sheet\CET-010.plg

HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

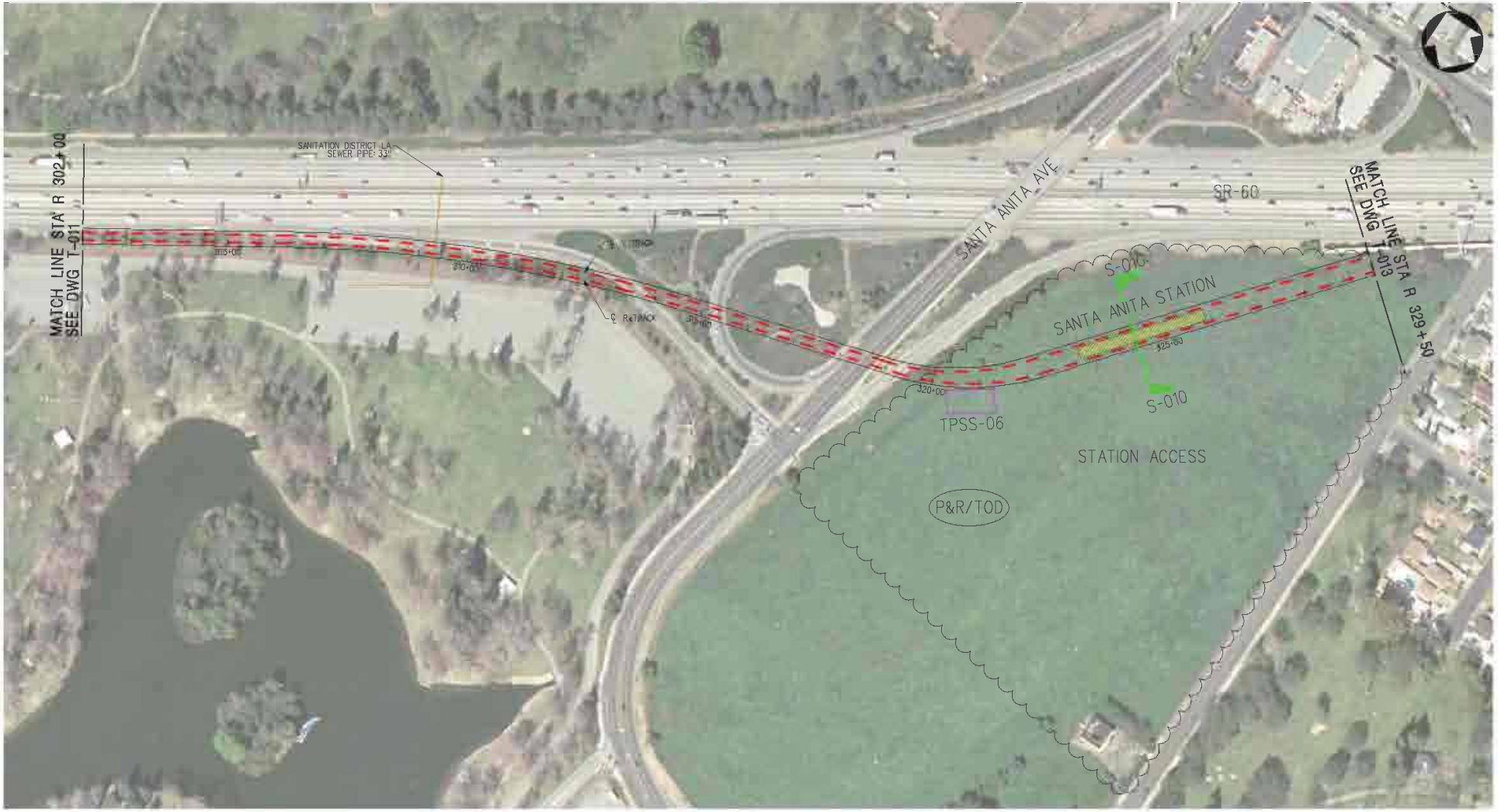
Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
SR-60
ALIGNMENT
SHEET 11 OF 14

CONTRACT NO PS4320-2003
DRAWING NO T-011 REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 11:55:23 AM
PLOT DRIVER = Raster.hdlf.pdf.plt
PEN TABLE = MTA_LI_COLOR.tbl

USER=drains 11:55:23 AM 10/23/2009 w:\60039033_eastside2_la_part_2\cadd\rail\sheet\CET-011.plg



HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
SR-60
ALIGNMENT
SHEET 12 OF 14

CONTRACT NO PS4320-2003
DRAWING NO T-012
REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 11:55:13 AM
PLOT DRIVER = Raster-half-pdf.plt
PEN TABLE = MTA-H-COLOR.tbl

USER=arains 11:55:43 AM 10/23/2009 w:\60039033_eastside2_to_part_2\cadd\rail\sheet\CET-012.plg

HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
SR-60
ALIGNMENT
SHEET 13 OF 14

CONTRACT NO PS4320-2003
DRAWING NO T-013
REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 11:56:03 AM
PLOT DRIVER = Raster_half_pdf.plt
PEN TABLE = MTA-H-COLOR.tbl
USER=arains 11:56:03 AM 10/23/2009 w:\60039033_eastside2_to_part_2\cadd\rail\sheet\CET-013.plg

HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

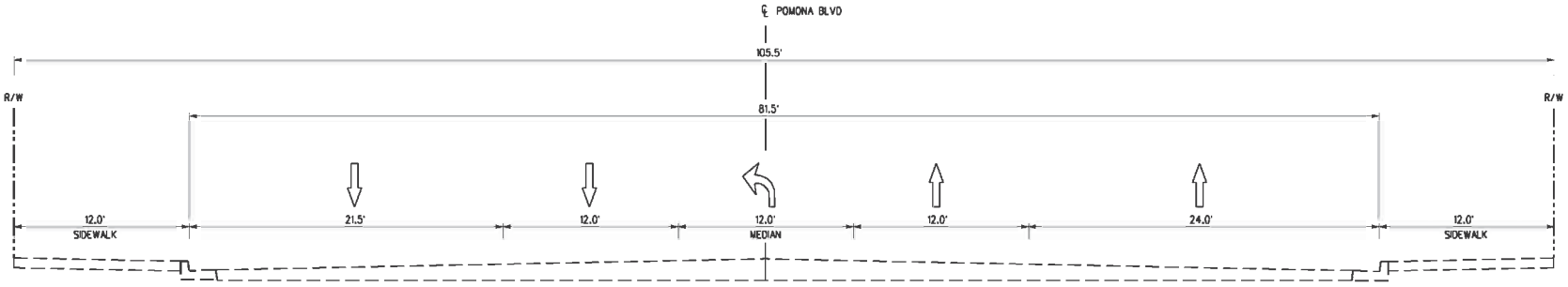
Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
SR-60
ALIGNMENT
SHEET 14 OF 14

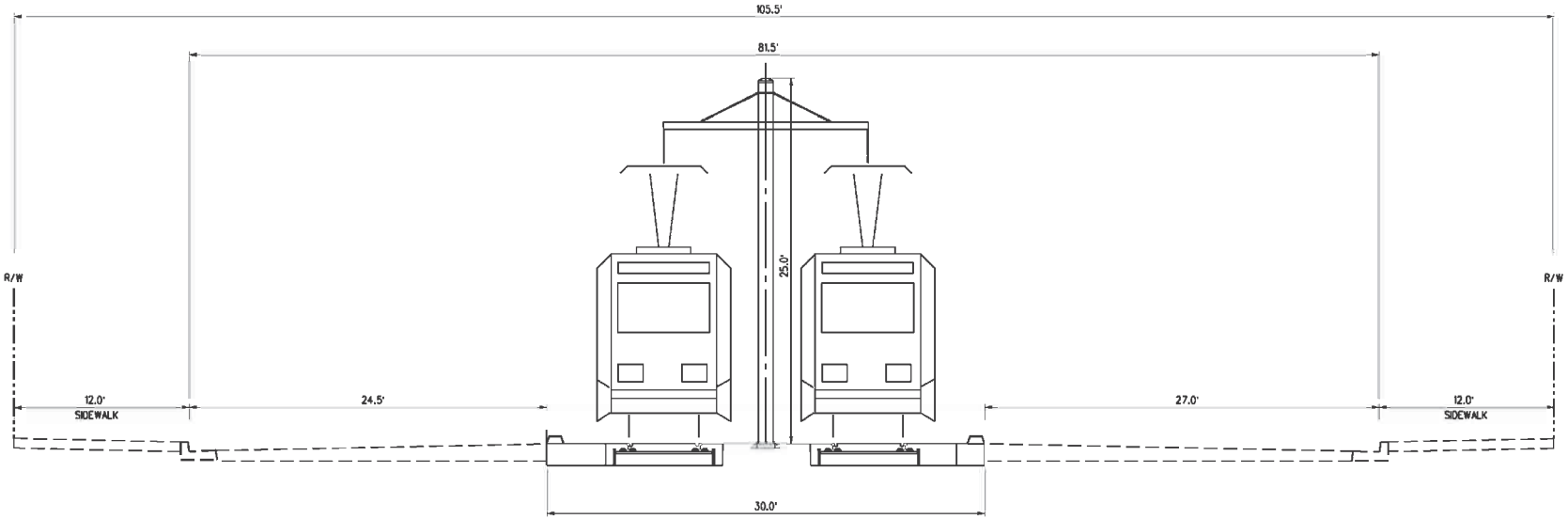
CONTRACT NO PS4320-2003
DRAWING NO T-014
REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 11:56:23 AM
PLOT DRIVER = Raster-half.pdf.plt
PENT TABLE = MTA-H-COLOR.tbl

USER=arains 11:56:23 AM 10/23/2009 w:\60039033_eastside2_lo_par1_2\cadd\rail\sheet\CET-014.plg



EXISTING TYPICAL SECTION (A / S-001) T-001



PROPOSED TYPICAL SECTION (B / S-001) T-001

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

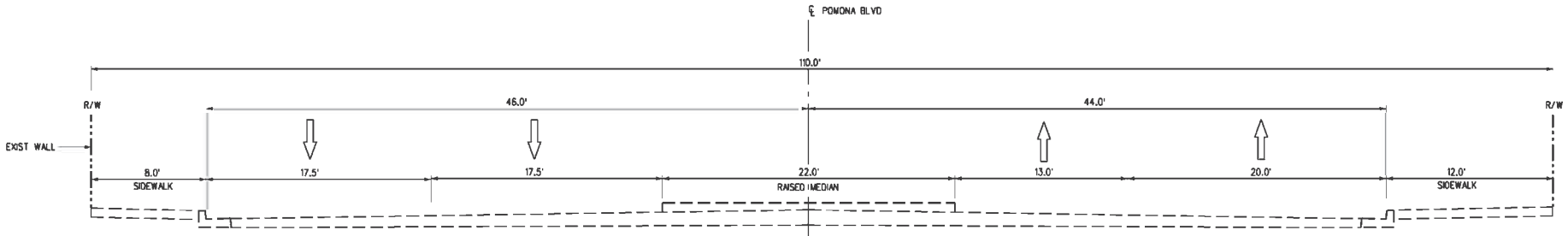
DESIGNED BY: S. ARAIN
DRAWN BY: J. VARIAS
CHECKED BY: B. BALDERRAMA
IN CHARGE: S. FIALKOFF
DATE: 09/22/09

Metropolitan Transportation Authority
Metro
CDM AECOM

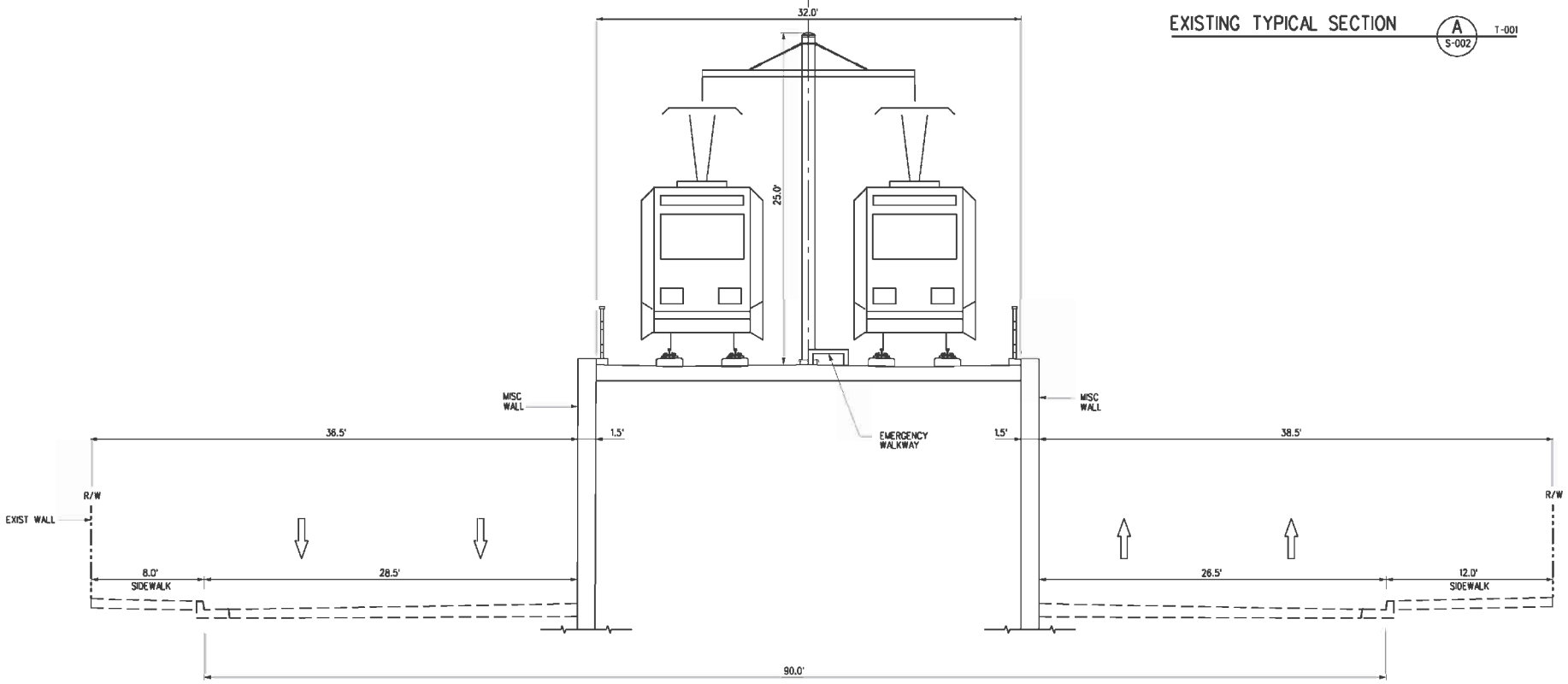
EASTSIDE PHASE 2 - PART 1
SR-60
SECTIONS
SHEET 1 OF 12

CONTRACT NO: PS4320-2003
DRAWING NO: S-001 REV: 0
SCALE: NO SCALE
SHEET NO:

DATE PLOTTED = 10/23/2009 11:39:09 AM
PLOT DRIVER = PDF_HOTF4.PC3
PEN TABLE = MTA_LJ_PCT.TBL
USER=arains 11:39:09 AM 10/23/2009 W:\60039033_East\562_LA_Part_2\cadd\Civil\Sheet\CES-001.dgn



EXISTING TYPICAL SECTION A S-002 T-001



PROPOSED TYPICAL SECTION B S-002 T-001

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. ARAIN
DRAWN BY J. VARIAS
CHECKED BY B. BALDERRAMA
IN CHARGE S. FIALKOFF
DATE 09/22/09

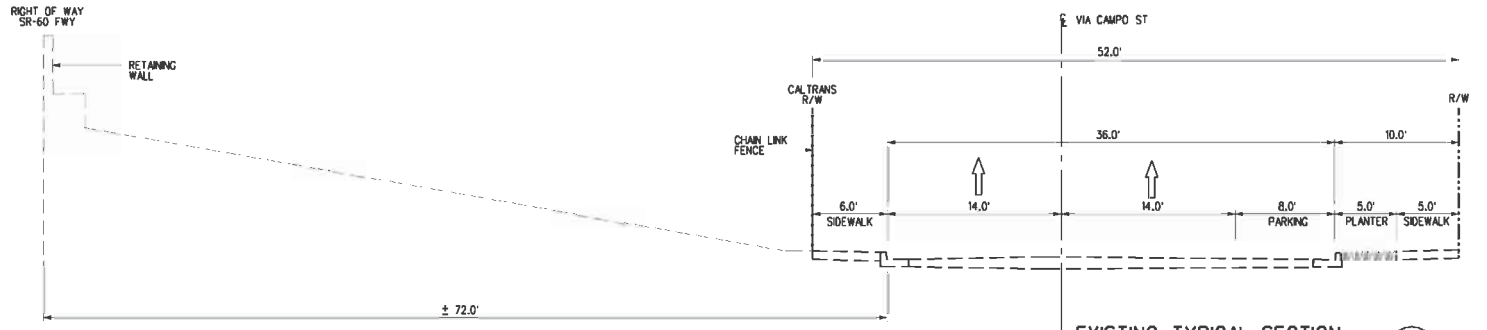
Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
SR-60
SECTIONS
SHEET 2 OF 12

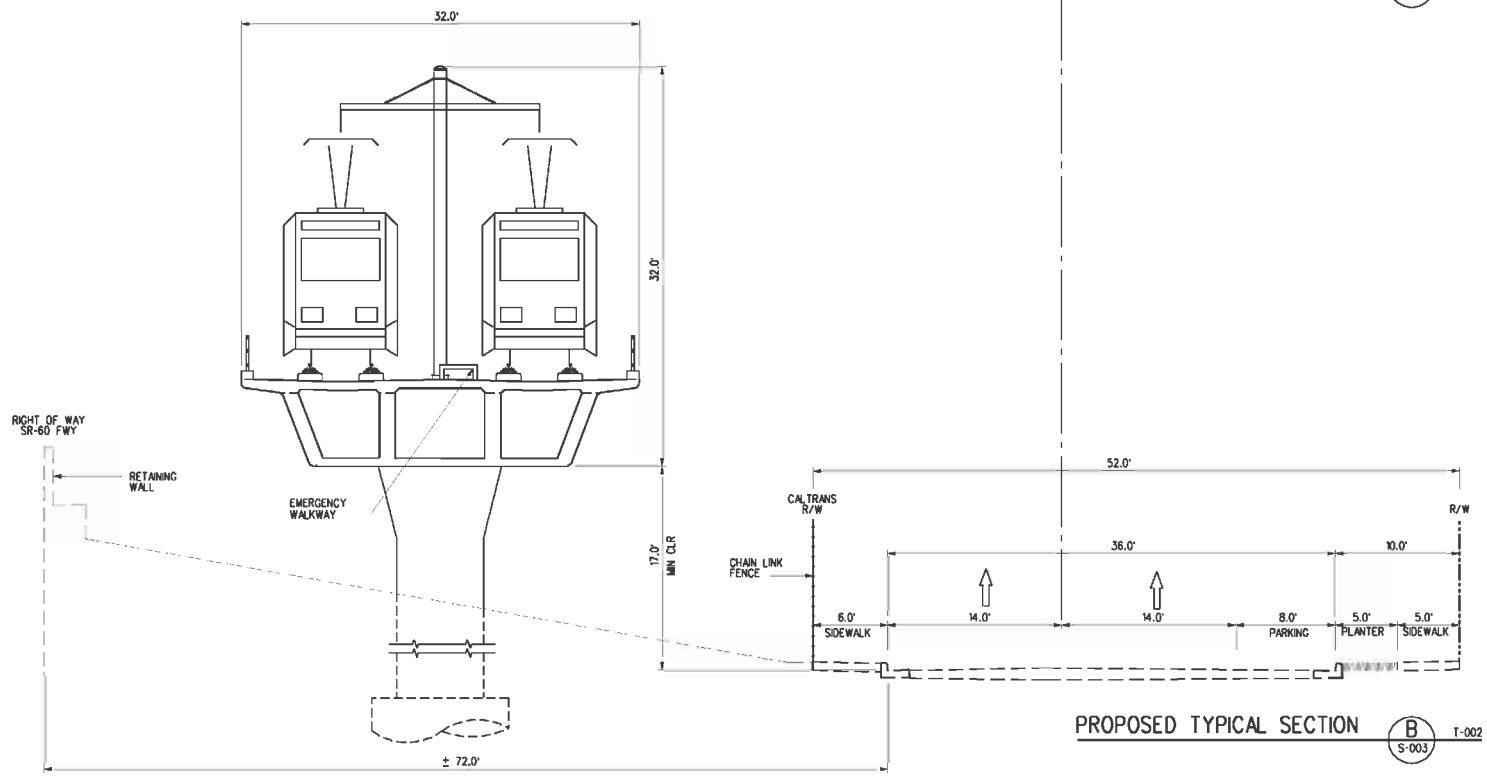
CONTRACT NO PS4320-2003
DRAWING NO S-002 REV 0
SCALE NO SCALE
SHEET NO

DATE PLOTTED = 10/23/2009 TIME PLOTTED = 11:39:10 AM
PLOT DRIVER = PDF_HOLF_BW.pltr PEN TABLE = MTA_LJ_pen.tbl

USER=arains 11:39:10 AM 10/23/2009 w:\60039033_eastside2_lo_part_2\cad\civil\sheet\S-002.dgn



EXISTING TYPICAL SECTION (A / S-003) T-002



PROPOSED TYPICAL SECTION (B / S-003) T-002

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY: S. ARAIN
DRAWN BY: J. VARIAS
CHECKED BY: B. BALDERRAMA
IN CHARGE: S. FIALKOFF
DATE: 09/22/09

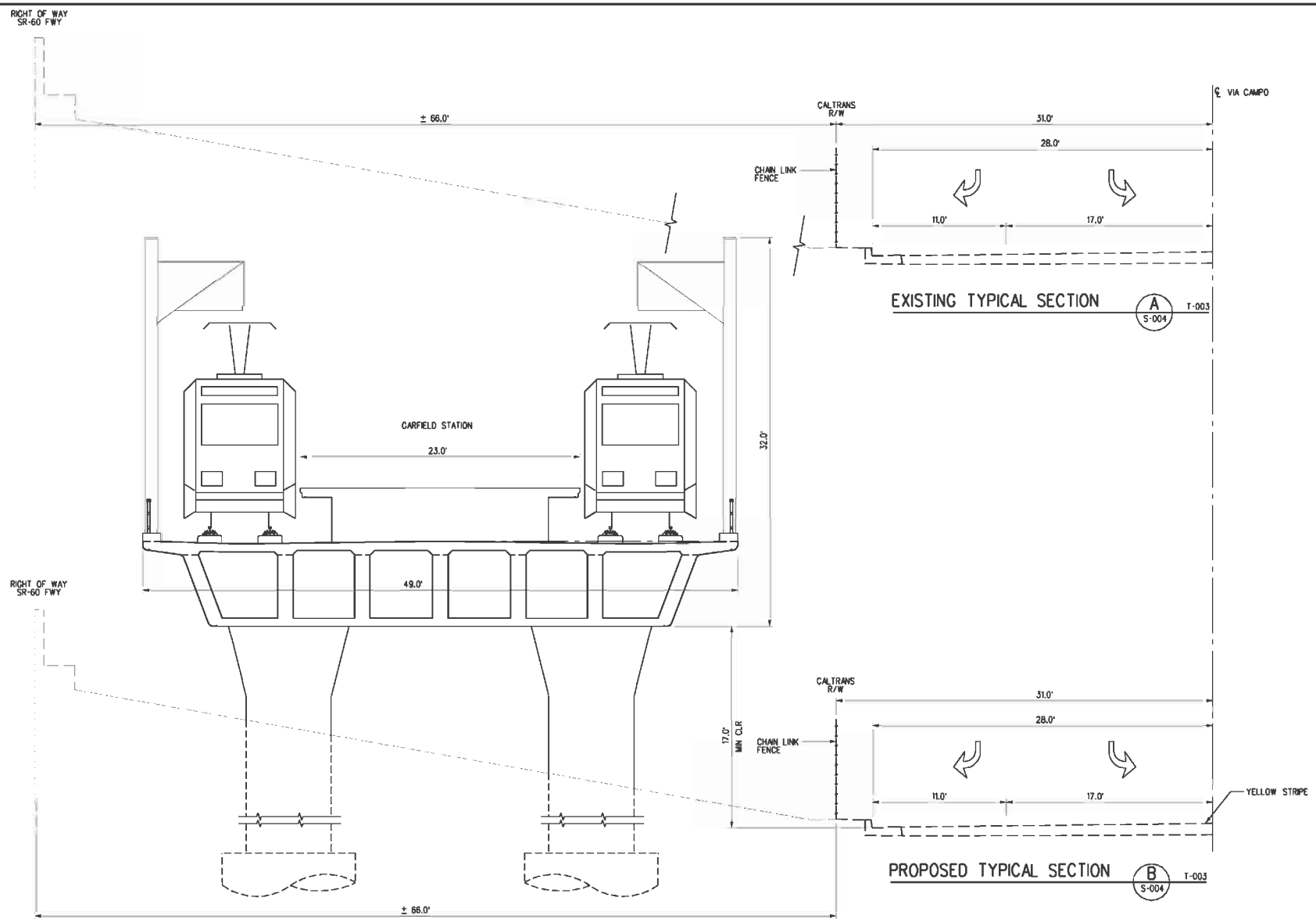
Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
SR-60
SECTIONS
SHEET 3 OF 12

CONTRACT NO: PS4320-2003
DRAWING NO: S-003 REV: 0
SCALE: NO SCALE
SHEET NO:

DATE PLOTTED = 10/23/2009 PLOT DRIVER = PDF_HOLF_BW.pltr
TIME PLOTTED = 11:39:11 AM PEN TABLE = MTA_LJ_PORT.tbl

USER-grams 11:39:11 AM 10/23/2009 w:\60039033_eastside2_lc_part_2\cad\civil\sheet\CS-003.plg



REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY: S. ARAIN
DRAWN BY: J. VARIAS
CHECKED BY: B. BALDERRAMA
IN CHARGE: S. FIALKOFF
DATE: 09/22/09

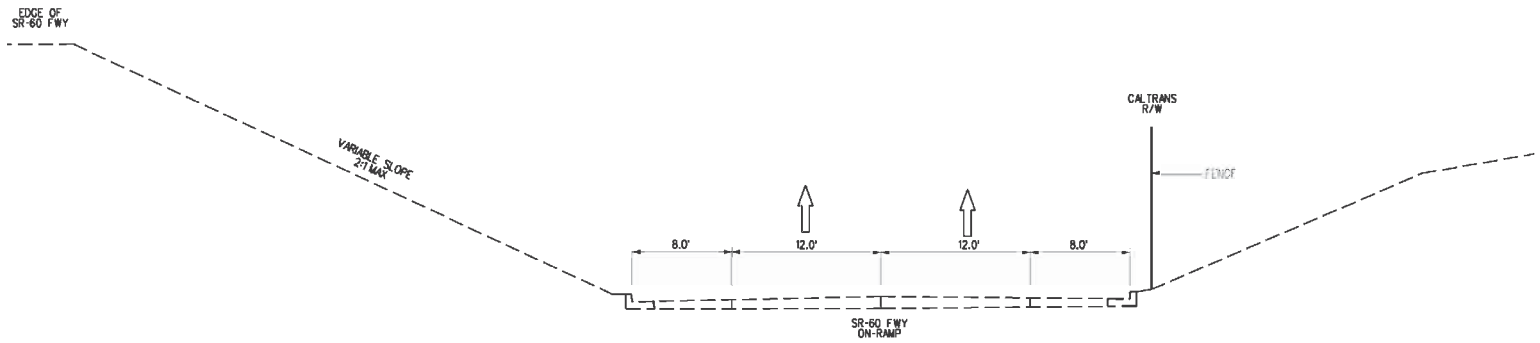
Metropolitan Transportation Authority
Metro
CDM
AECOM

EASTSIDE PHASE 2 - PART 1
SR-60
SECTIONS
SHEET 4 OF 12

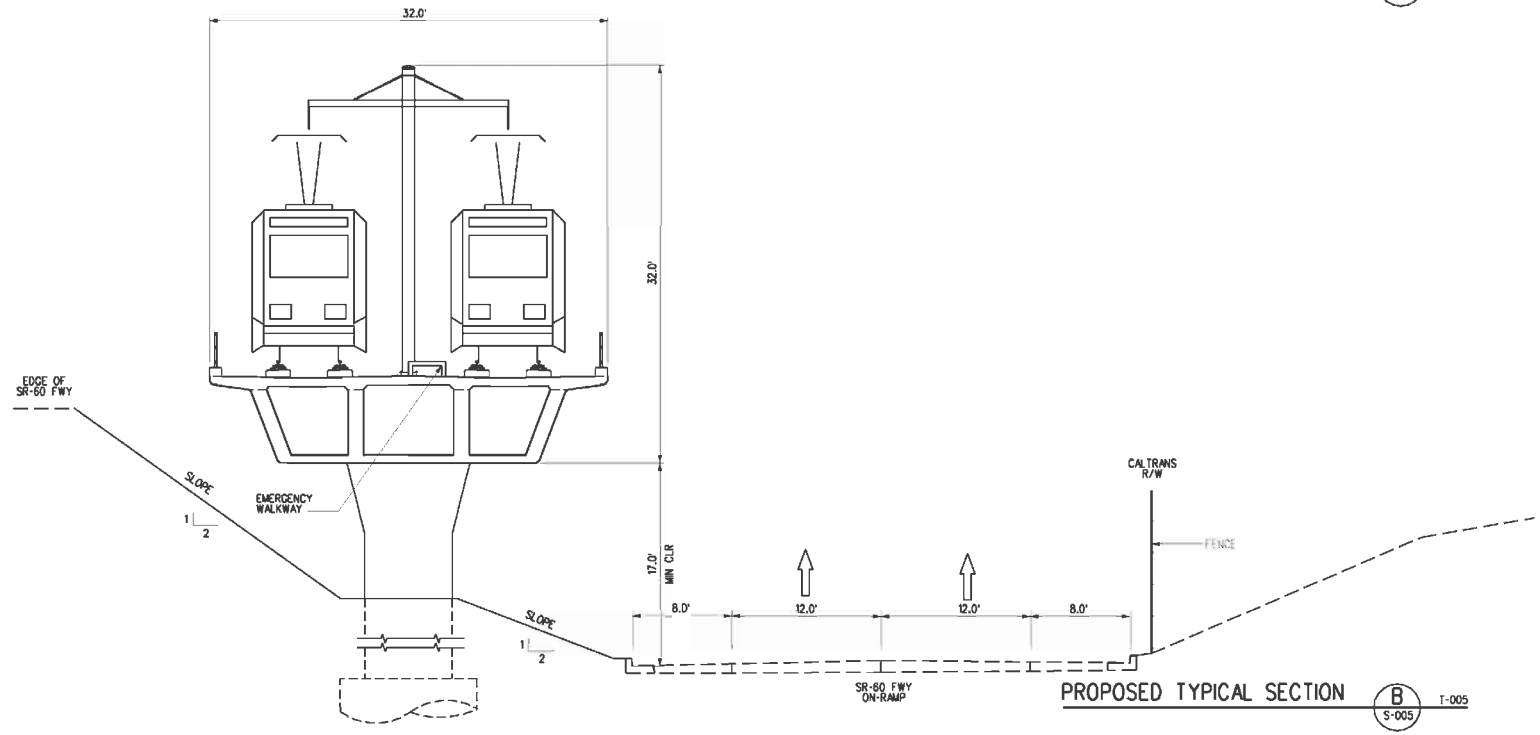
CONTRACT NO: PS4320-2003
DRAWING NO: S-004
REV: 0
SCALE: NO SCALE
SHEET NO:

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 11:39:12 AM
PLOT DRIVER = PDF_HP14_BW.pltt
PEN TABLE = MTA_A_PDF.tbl

USER=arains 11:39:12 AM 10/23/2009 w:\60039033_eastside2_to_part1_2\cad\civil\sheet\S-004.dgn



EXISTING TYPICAL SECTION (A / S-005) T-005



PROPOSED TYPICAL SECTION (B / S-005) T-005

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY: S. ARAIN
DRAWN BY: J. VARIAS
CHECKED BY: B. BALDERRAMA
IN CHARGE: S. FIALKOFF
DATE: 09/22/09

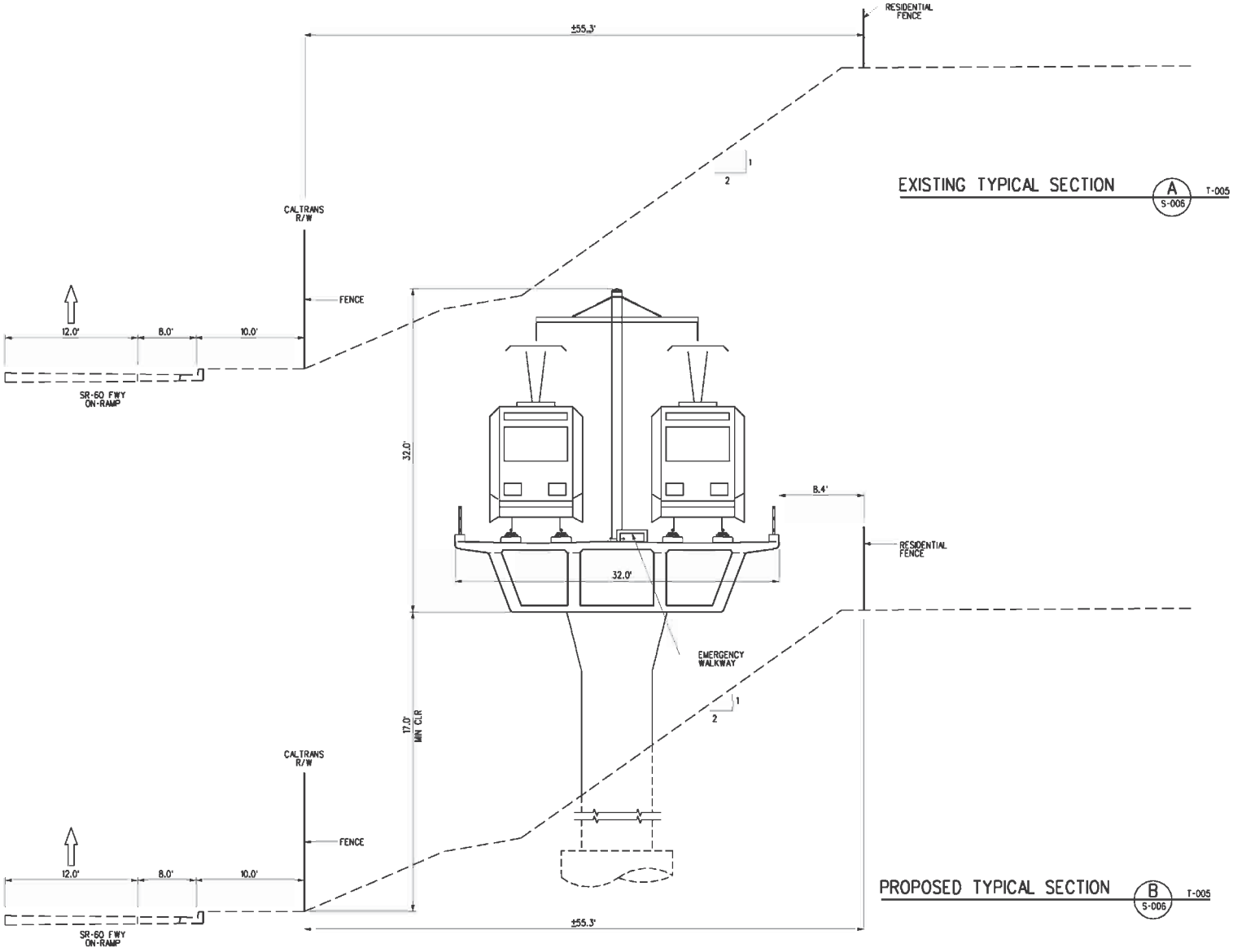
Metropolitan Transportation Authority
Metro
CDM AECOM JOINT VENTURE

EASTSIDE PHASE 2 - PART 1
SR-60
SECTIONS
SHEET 5 OF 12

CONTRACT NO: PS4320-2003
DRAWING NO: S-005
REV: 0
SCALE: NO SCALE
SHEET NO:

DATE PLOTTED = 10/23/2009 PLOT DRIVER = PDF_Half_BW.plt
TIME PLOTTED = 11:39:14 AM PEN TABLE = MTA_Landport.tbl

USER=arains 11:39:14 AM 10/23/2009 w:\60039033_eastside2_to_part_2\cadd\civil\sheet\CES-005.plg



REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. ARAIN
DRAWN BY J. VARIAS
CHECKED BY B. BALDERRAMA
IN CHARGE S. FIALKOFF
DATE 09/22/09

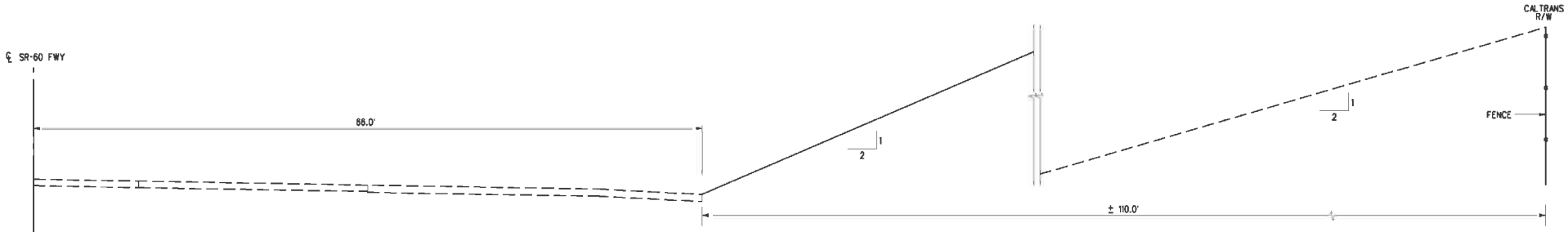
Metropolitan Transportation Authority
Metro
CDM AECOM JOINT VENTURE

EASTSIDE PHASE 2 - PART 1
SR-60
SECTIONS
SHEET 6 OF 12

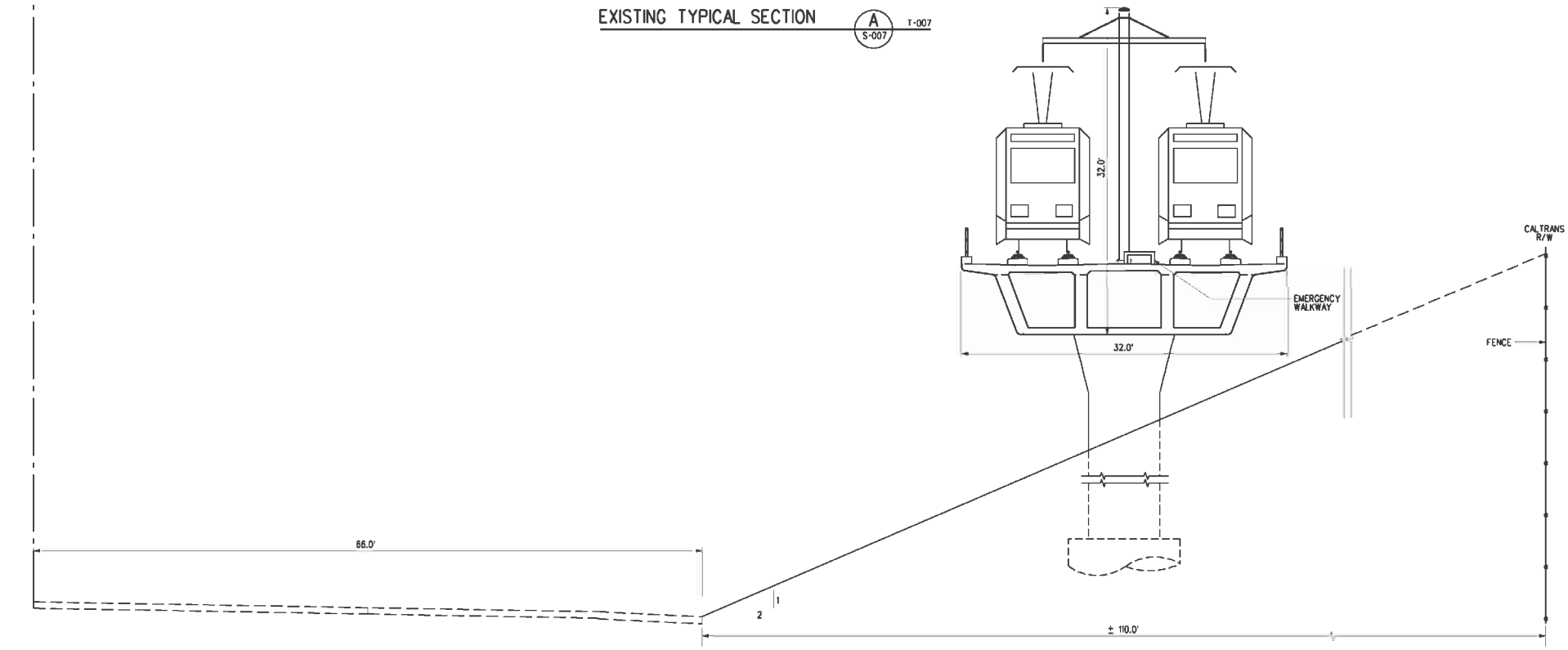
CONTRACT NO PS4320-2003
DRAWING NO S-006 REV 0
SCALE NO SCALE
SHEET NO

DATE PLOTTED = 10/23/2009 PLOT DRIVER = PDF_Half_BW.plt
TIME PLOTTED = 11:39:15 AM PEN TABLE = MTA_Lipsor.tbl

USER-grains 11:39:15 AM 10/23/2009 w:\60039033_eastside2_to_part_2\cadd\civil\sheet\CES-006.plg



EXISTING TYPICAL SECTION (A / S-007) T-007



PROPOSED TYPICAL SECTION (B / S-007) T-007

REV	DATE	BY	APP	REQ NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

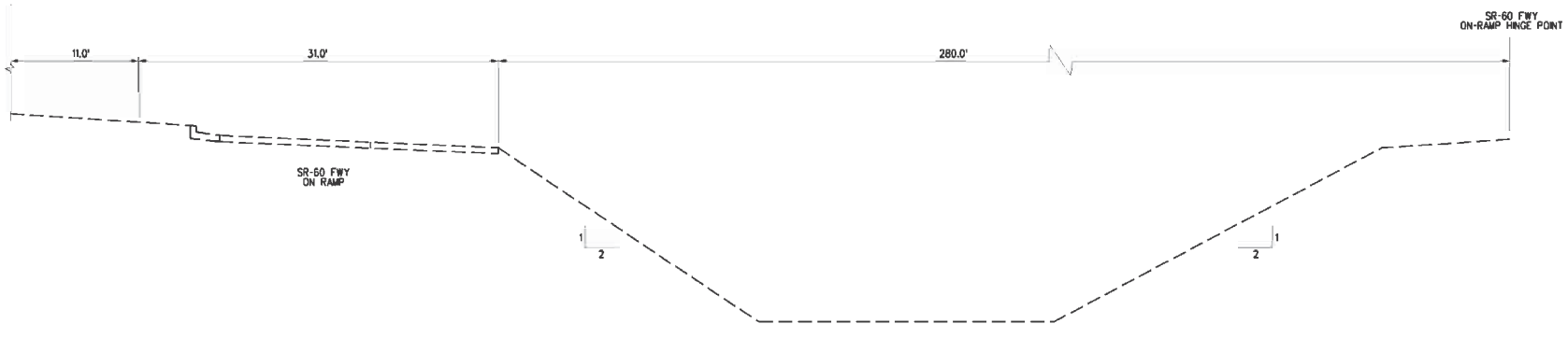
DESIGNED BY S. ARAIN
DRAWN BY J. VARIAS
CHECKED BY B. BALDERRAMA
IN CHARGE S. FIALKOFF
DATE 09/22/09

Metropolitan Transportation Authority
Metro
CDM AECOM JOINT VENTURE

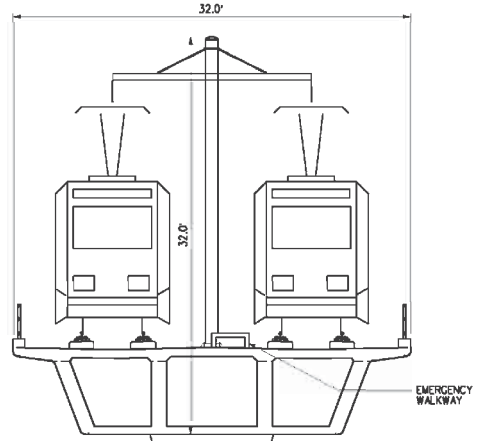
EASTSIDE PHASE 2 - PART 1
SR-60
SECTIONS
SHEET 7 OF 12

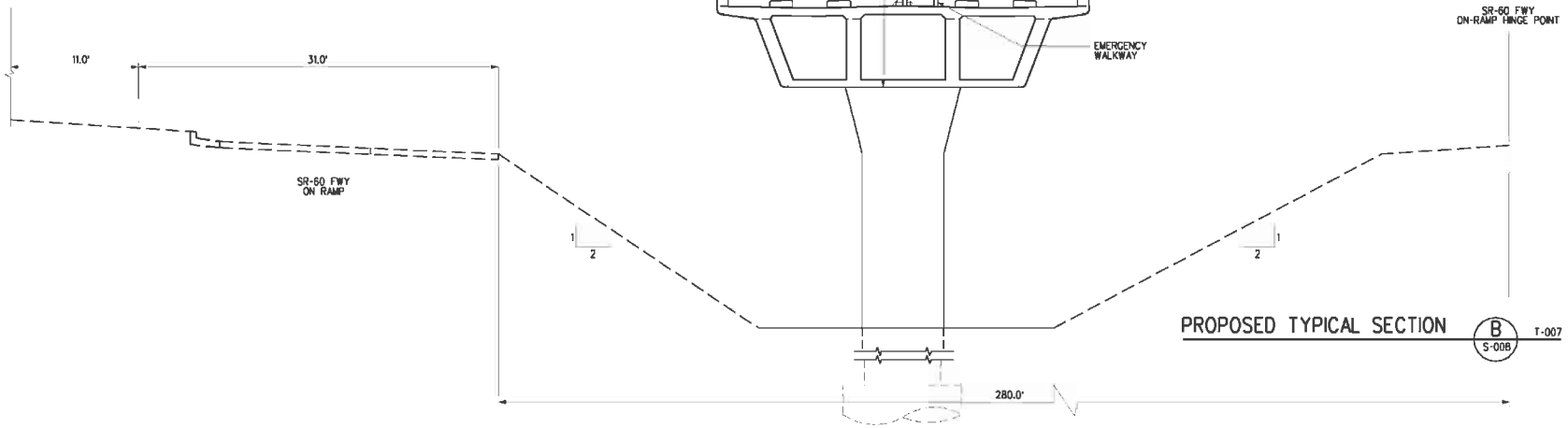
CONTRACT NO PS4320-2003
DRAWING NO S-007 REV 0
SCALE NO SCALE
SHEET NO

DATE PLOTTED = 10/23/2009 11:39:16 AM
PLOT DRIVER = PDF_HOLF_BW.pltr
PEN TABLE = MTA_LJ_pen.tbl
USER=grams 11:39:16 AM 10/23/2009 w:\60039033_eastside2_lo_part_2\cadd\civil\sheet\CLS-007.dgn



EXISTING TYPICAL SECTION (A / S-008) T-007





PROPOSED TYPICAL SECTION (B / S-008) T-007

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

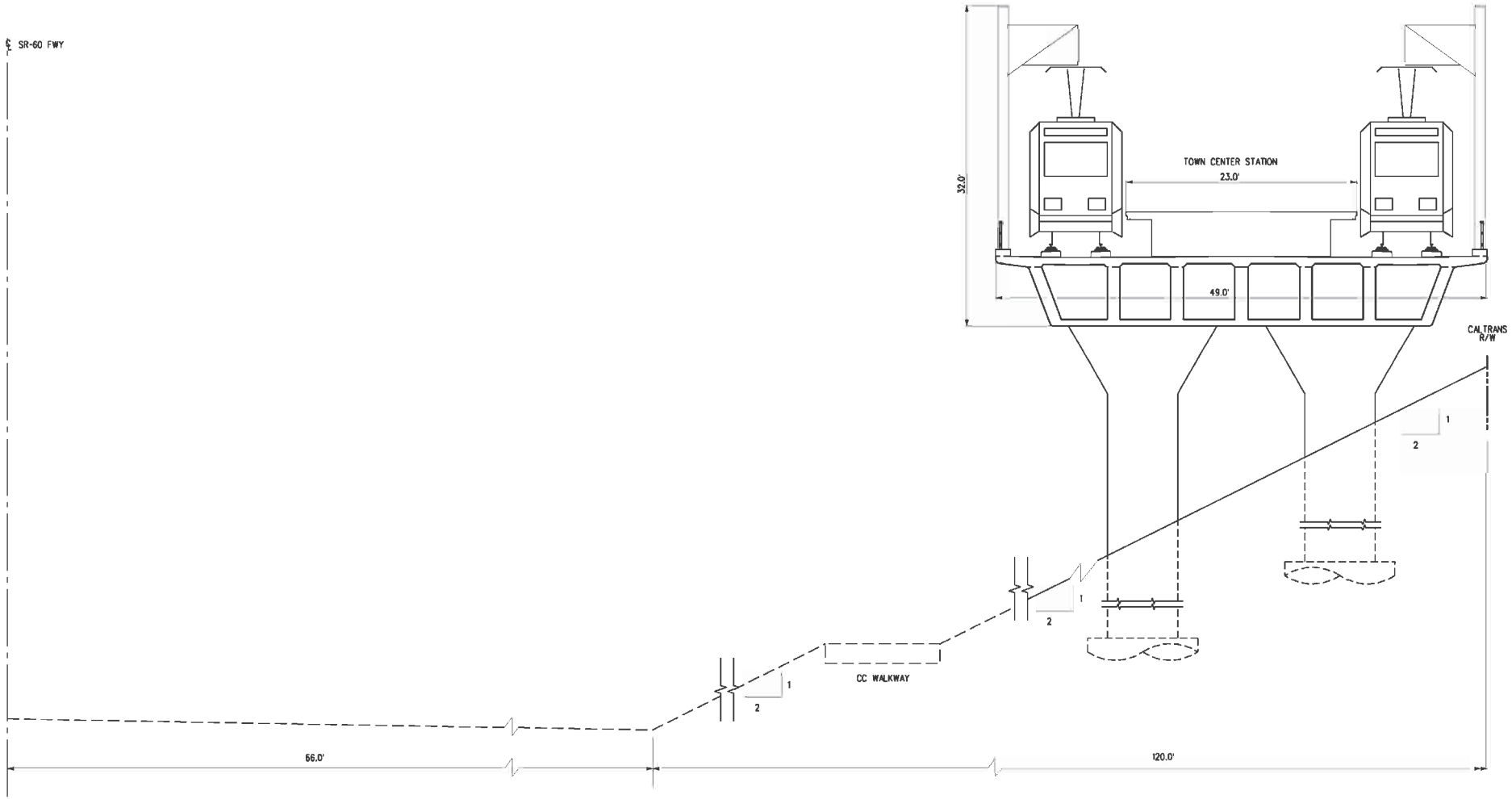
DESIGNED BY: S. ARAIN
DRAWN BY: J. VARIAS
CHECKED BY: B. BALDERRAMA
IN CHARGE: S. FIALKOFF
DATE: 09/22/09

Metropolitan Transportation Authority
Metro
CDM AECOM JOINT VENTURE

EASTSIDE PHASE 2 - PART 1
SR-60
SECTIONS
SHEET 8 OF 12

CONTRACT NO: PS4320-2003
DRAWING NO: S-008 REV: 0
SCALE: NO SCALE
SHEET NO:

DATE PLOTTED = 10/23/2009 TIME PLOTTED = 11:39:17 AM
PLOT DRIVER = PDF_Half_Bit.pltr PEN TABLE = MTA_Lpdf.tbl
USER=arains 11:39:17 AM 10/23/2009 w:\60039033_eastside2_lc_part_2\cadd\civil\sheet\CLS-008.plg



PROPOSED TYPICAL SECTION B S-009 T-008

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. ARAIN
DRAWN BY J. VARIAS
CHECKED BY B. BALDERRAMA
IN CHARGE S. FIALKOFF
DATE 09/22/09

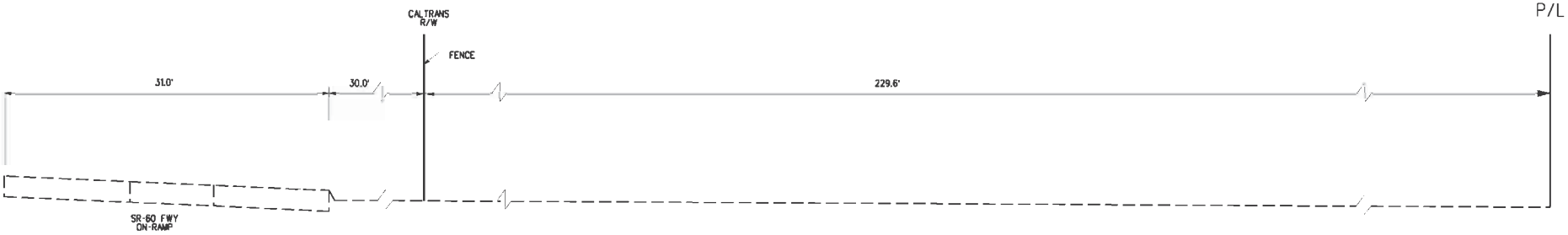
Metropolitan Transportation Authority
Metro
CDM AECOM JOINT VENTURE

EASTSIDE PHASE 2 - PART 1
SR-60
SECTIONS
SHEET 09 OF 12

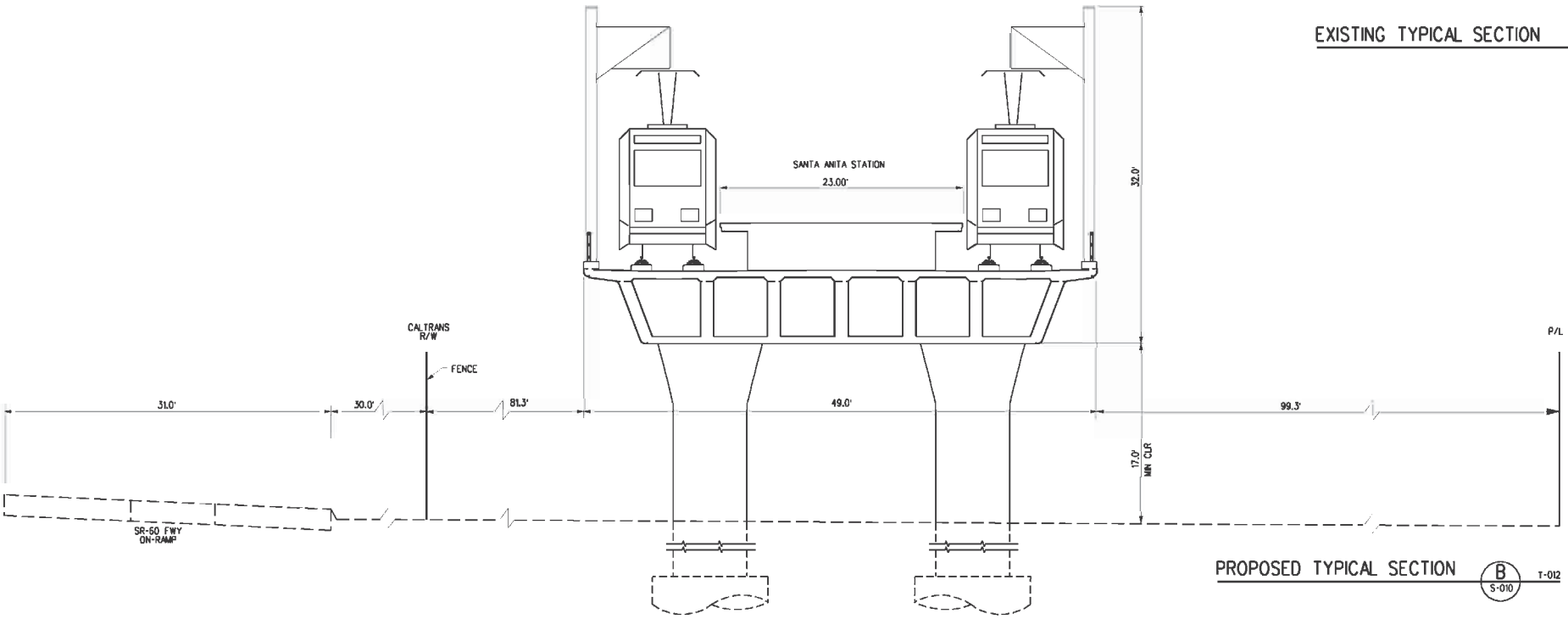
CONTRACT NO PS4320-2003
DRAWING NO S-009 REV 0
SCALE NO SCALE
SHEET NO

DATE PLOTTED = 10/23/2009 PLOT DRIVER = PDF_HOTF_BW.pltr
TIME PLOTTED = 11:39:18 AM PEN TABLE = MTA_LJ_PDF.tbl

10/23/2009 11:39:18 AM w:\60039033_eastside2_ic_part_2\cad\civil\sheet\CS-009.dwg USER-grams



EXISTING TYPICAL SECTION (A / S-010) T-01



PROPOSED TYPICAL SECTION (B / S-010) T-012

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

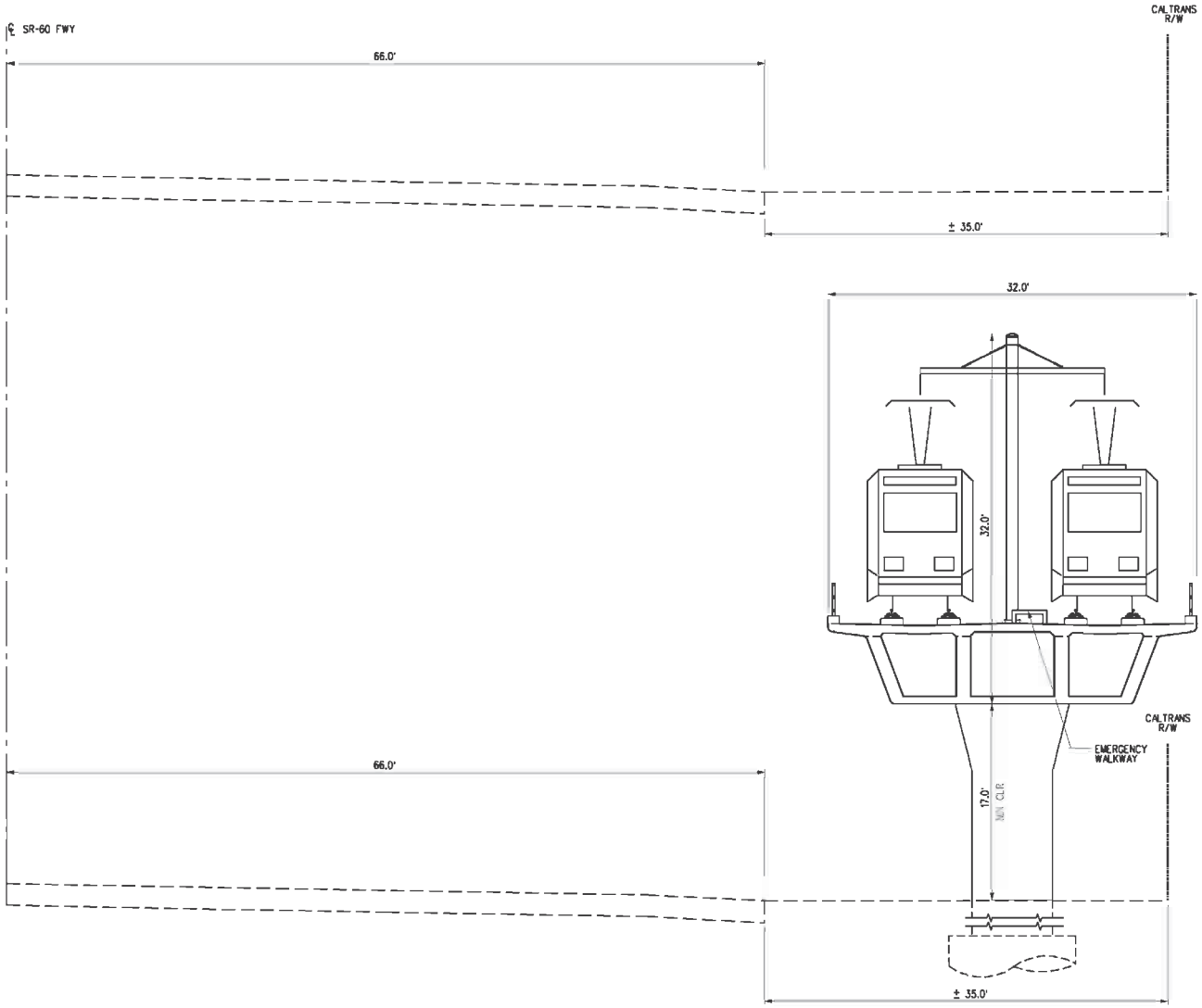
DESIGNED BY: S. ARAIN
DRAWN BY: J. VARIAS
CHECKED BY: B. BALDERRAMA
IN CHARGE: S. FIALKOFF
DATE: 09/22/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
SR-60
SECTIONS
SHEET 10 OF 12

CONTRACT NO: PS4320-2003
DRAWING NO: S-010 REV: 0
SCALE: NO SCALE
SHEET NO:

DATE PLOTTED = 10/23/2009 TIME PLOTTED = 11:39:19 AM
PLOT DRIVER = PDF_HELF_BW.pltr PEN TABLE = MTA_LJ_PORT.tbl
USER=grams 11:39:19 AM 10/23/2009 w:\60039033_eastside2_to_part_2\cad\civil\sheet\S-010.dgn



EXISTING TYPICAL SECTION (A / S-011) T-013

PROPOSED TYPICAL SECTION (B / S-011) T-013

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

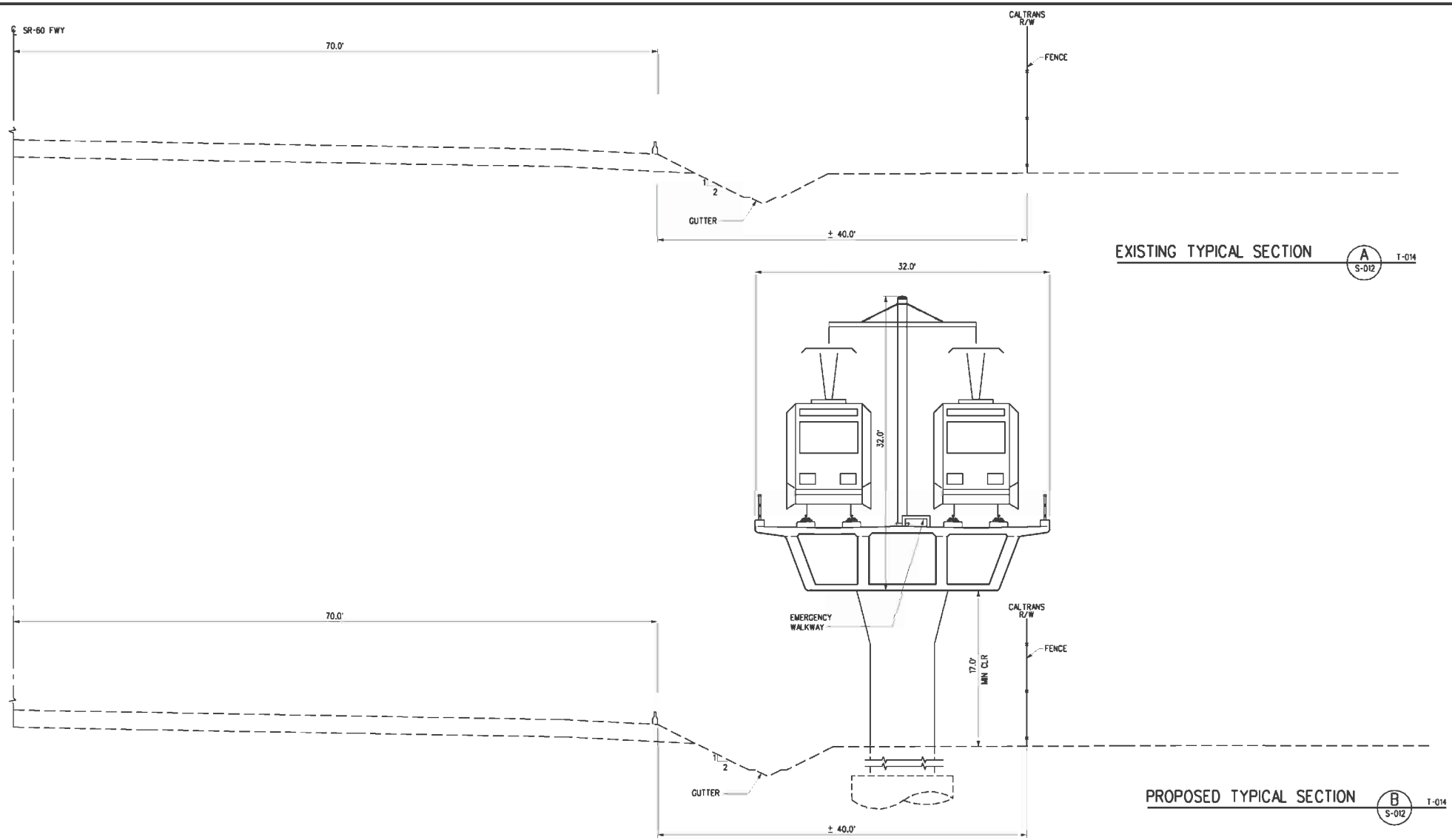
DESIGNED BY S. ARAIN
DRAWN BY J. VARIAS
CHECKED BY B. BALDERRAMA
IN CHARGE S. FIALKOFF
DATE 09/22/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
SR-60
SECTIONS
SHEET 11 OF 12

CONTRACT NO PS4320-2003
DRAWING NO S-011 REV 0
SCALE NO SCALE
SHEET NO

DATE PLOTTED = 10/23/2009 TIME PLOTTED = 11:39:20 AM
PLOT DRIVER = PDF_Half_Bit.pltr PEN TABLE = MTA_Lpdf.tbl
USER=arains 11:39:20 AM 10/23/2009 w:\60039033_eastside2_lc_part_2\cad\civil\sheet\CS-011.dgn



REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. ARAIN
DRAWN BY J. VARIAS
CHECKED BY B. BALDERRAMA
IN CHARGE S. FIALKOFF
DATE 09/22/09

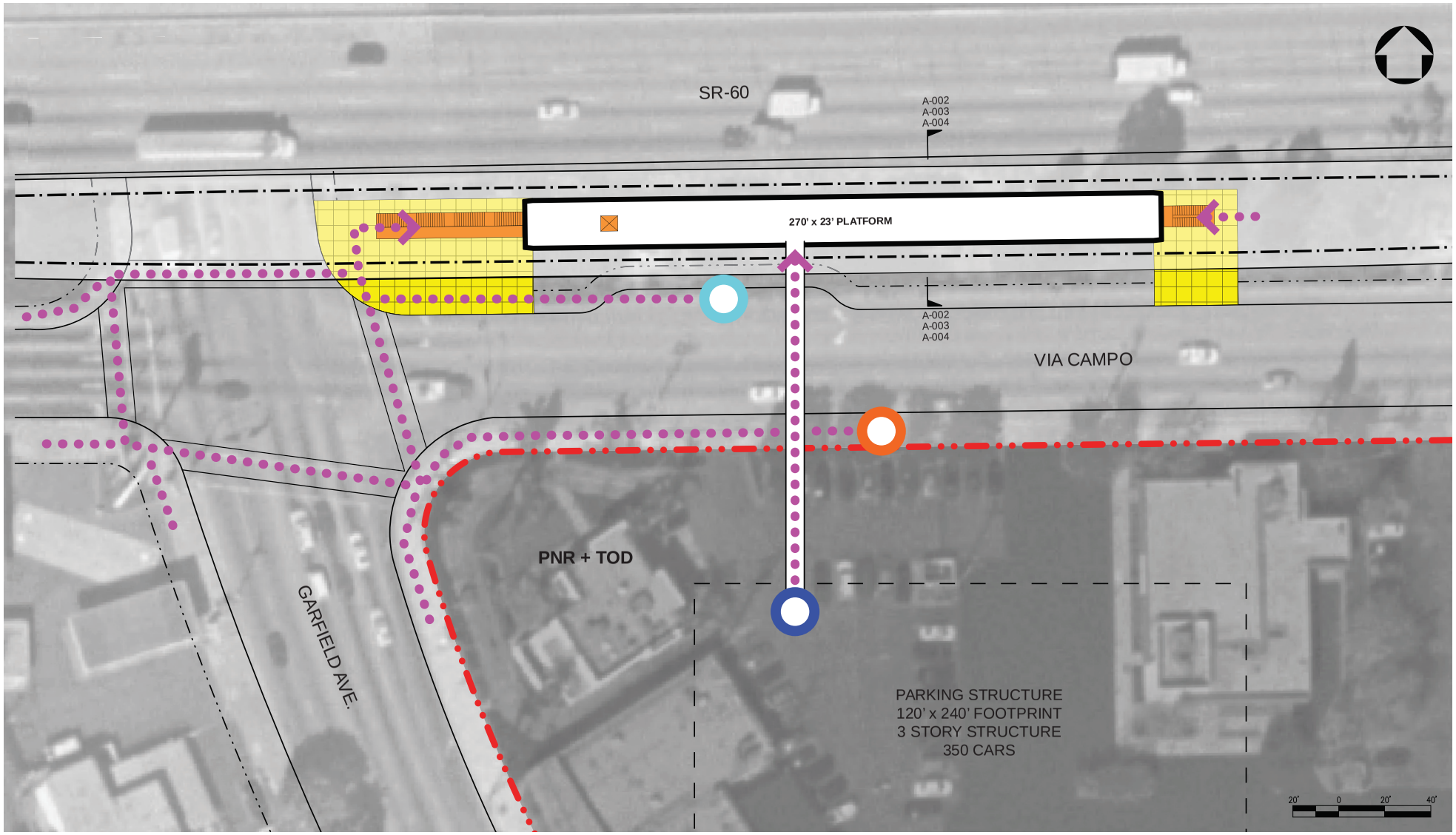
Metropolitan Transportation Authority
Metro
CDM AECOM JOINT VENTURE

EASTSIDE PHASE 2 - PART 1
SR-60
SECTIONS
SHEET 12 OF 12

CONTRACT NO PS4320-2003
DRAWING NO S-012 REV 0
SCALE NO SCALE
SHEET NO

DATE PLOTTED = 10/23/2009 11:39:21 AM
TIME PLOTTED =
PLOT DRIVER = PDF_hotfix.pltr
PEN TABLE = MTA_A_pen.tbl

USER=grams 11:39:21 AM 10/23/2009 w:\60039033_eastside2_lc_part_2\cadd\civil\sheet\CLS-012.plg



REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. SCHWARZKOPF
DRAWN BY S. GODKIN
CHECKED BY S. SCHWARZKOPF
IN CHARGE V. DAVIES
DATE 06/29/09

Metro
Metropolitan Transportation Authority
CDM AECOM

EASTSIDE PHASE 2 - PART 1
SR-60
GARFIELD AVE. STATION
LOCATION PLAN

CONTRACT NO PS4320-2003
DRAWING NO A-001
REV 0
SCALE 1⊠ = 40⊠
SHEET NO

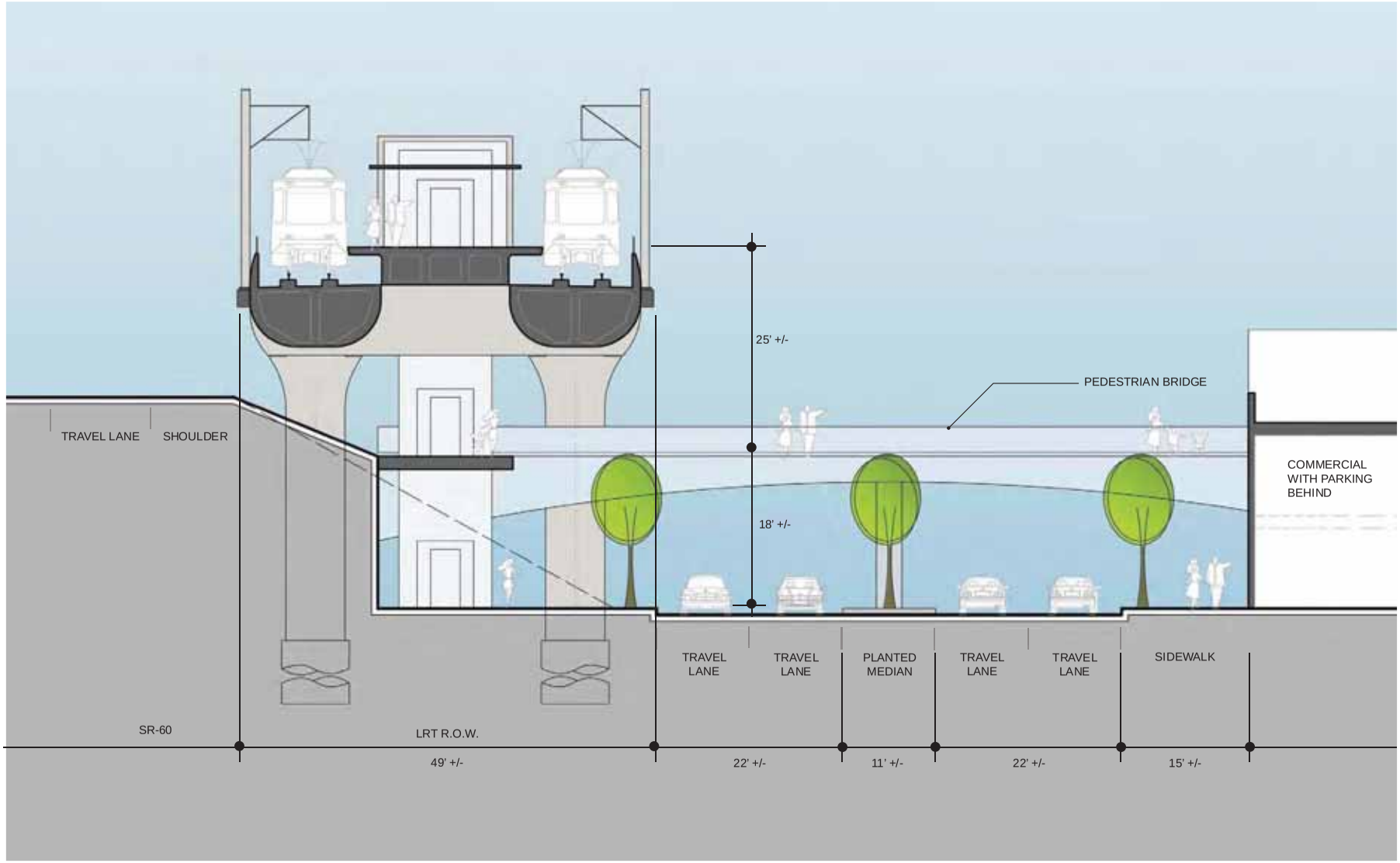
REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. SCHWARZKOPF
DRAWN BY S. GODKIN
CHECKED BY S. SCHWARZKOPF
IN CHARGE V. DAVIES
DATE 06/29/09

Metro
Metropolitan Transportation Authority
CDM AECOM

EASTSIDE PHASE 2 - PART 1
SR-60
GARFIELD AVE. STATION
SECTION 1 OF 3

CONTRACT NO PS4320-2003
DRAWING NO A-002
REV 0
SCALE NO SCALE
SHEET NO



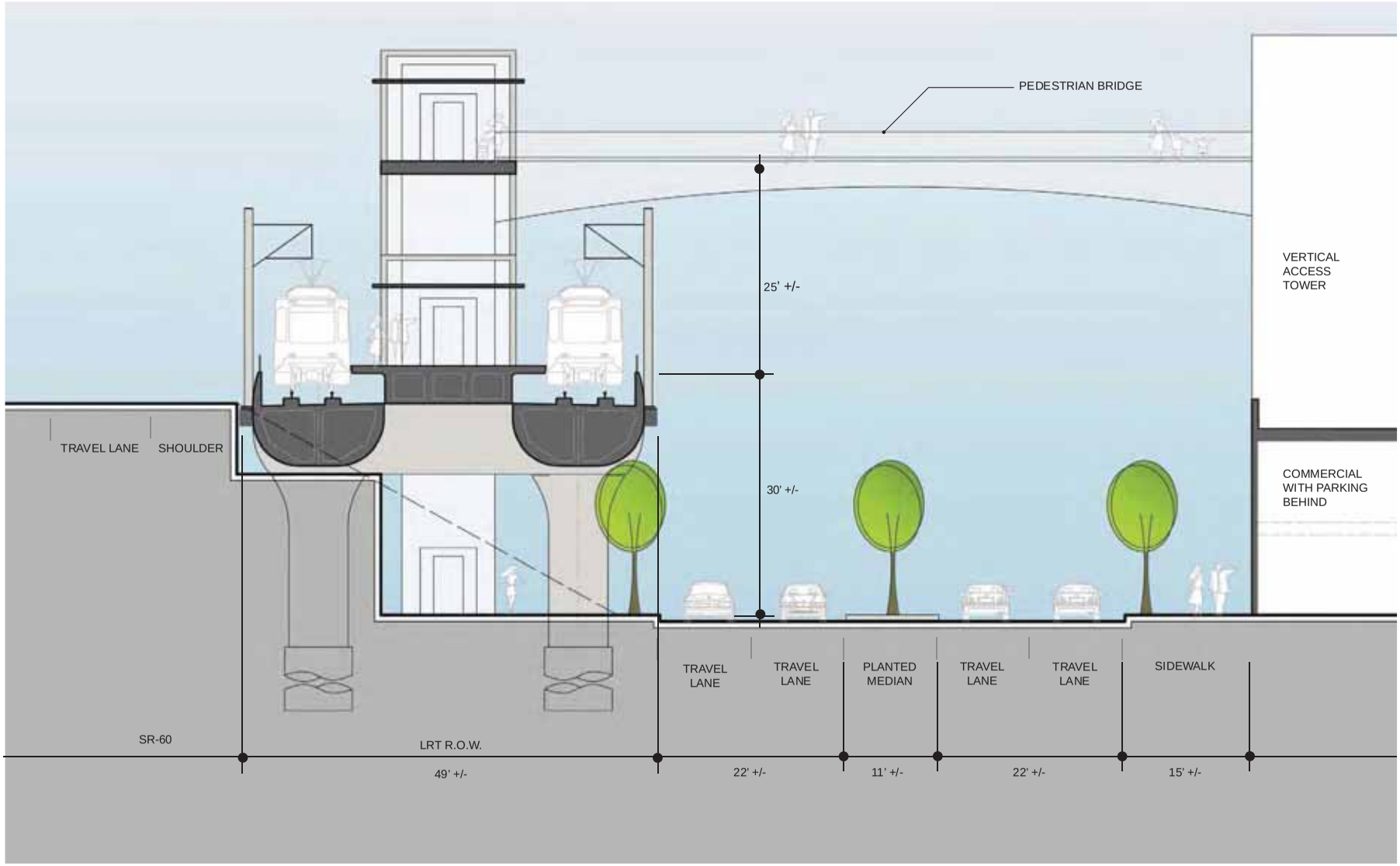
REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. SCHWARZKOPF
DRAWN BY S. GODKIN
CHECKED BY S. SCHWARZKOPF
IN CHARGE V. DAVIES
DATE 06/29/09

Metro
Metropolitan Transportation Authority
CDM AECOM

EASTSIDE PHASE 2 - PART 1
SR-60
GARFIELD AVE. STATION
SECTION 2 OF 3

CONTRACT NO PS4320-2003
DRAWING NO A-003
REV 0
SCALE NO SCALE
SHEET NO



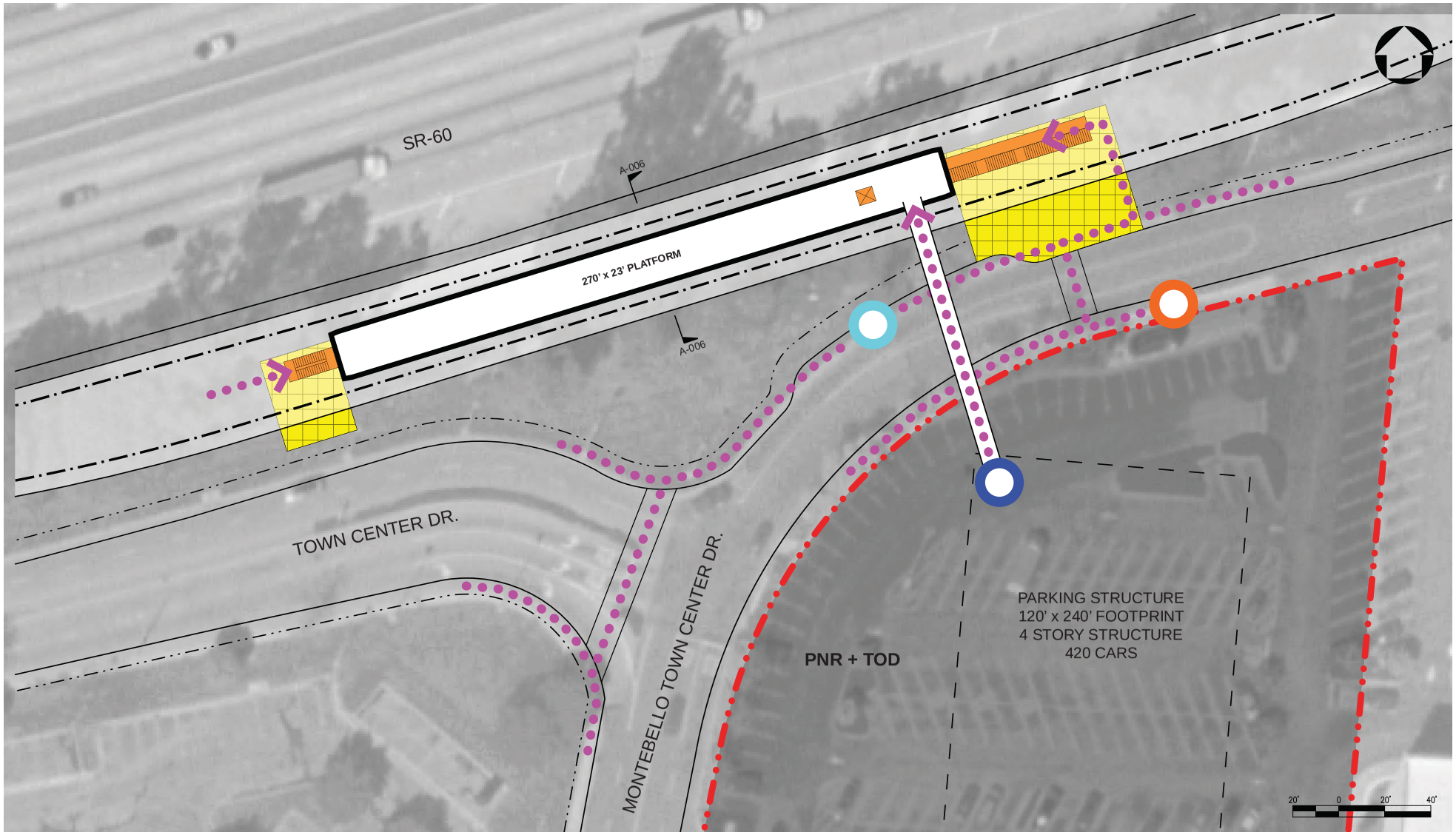
REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. SCHWARZKOPF
DRAWN BY S. GODKIN
CHECKED BY S. SCHWARZKOPF
IN CHARGE V. DAVIES
DATE 06/29/09

Metro
Metropolitan Transportation Authority
CDM AECOM

EASTSIDE PHASE 2 - PART 1
SR-60
GARFIELD AVE. STATION
SECTION 3 OF 3

CONTRACT NO PS4320-2003
DRAWING NO A-004
REV 0
SCALE NO SCALE
SHEET NO



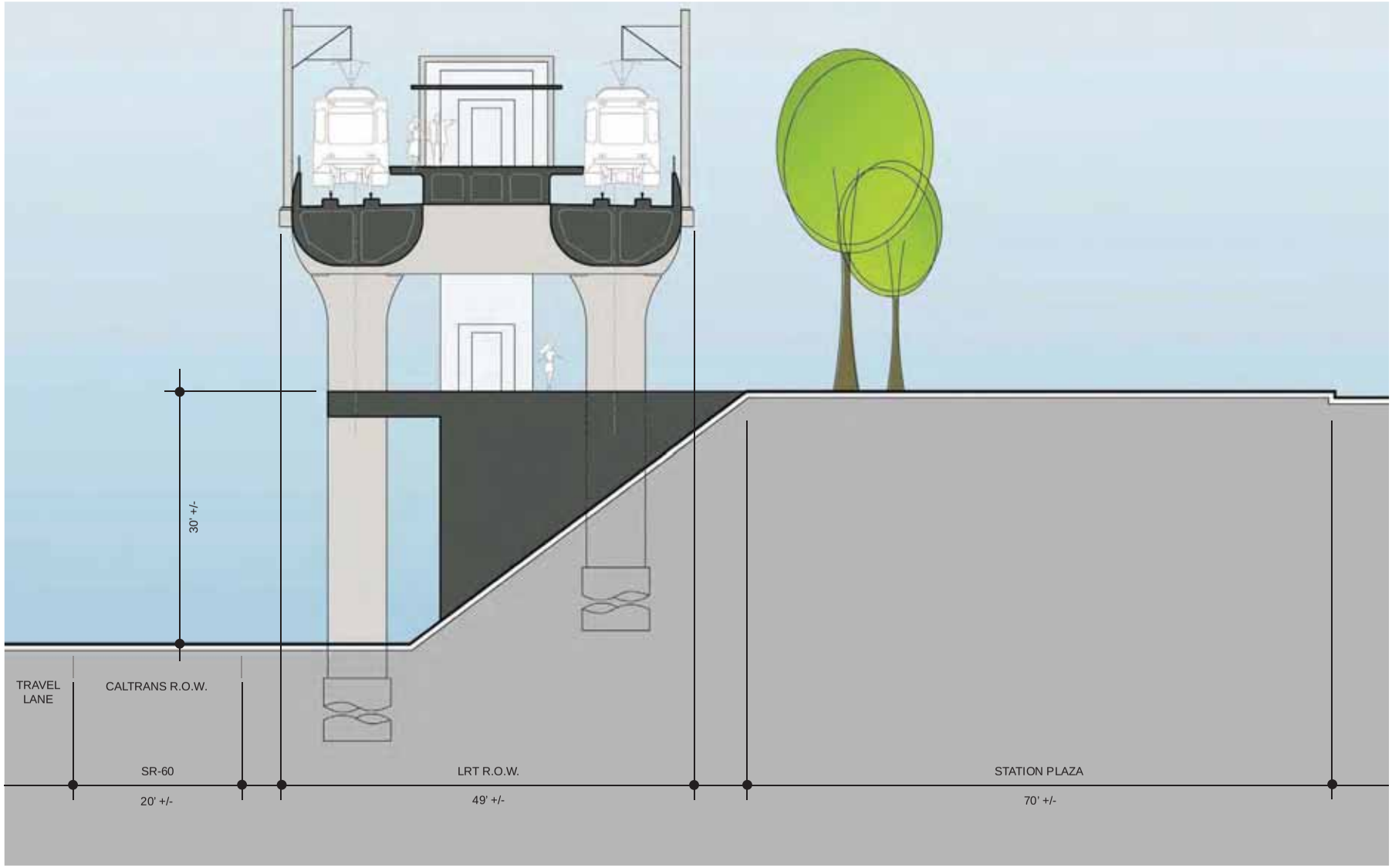
REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. SCHWARZKOPF
DRAWN BY S. GODKIN
CHECKED BY S. SCHWARZKOPF
IN CHARGE V. DAVIES
DATE 06/29/09

Metro
Metropolitan Transportation Authority
CDM AECOM

EASTSIDE PHASE 2 - PART 1
SR-60
MONTEBELLO TOWN CENTER
LOCATION PLAN

CONTRACT NO PS4320-2003
DRAWING NO A-005
REV 0
SCALE 1⊠ = 40⊠
SHEET NO



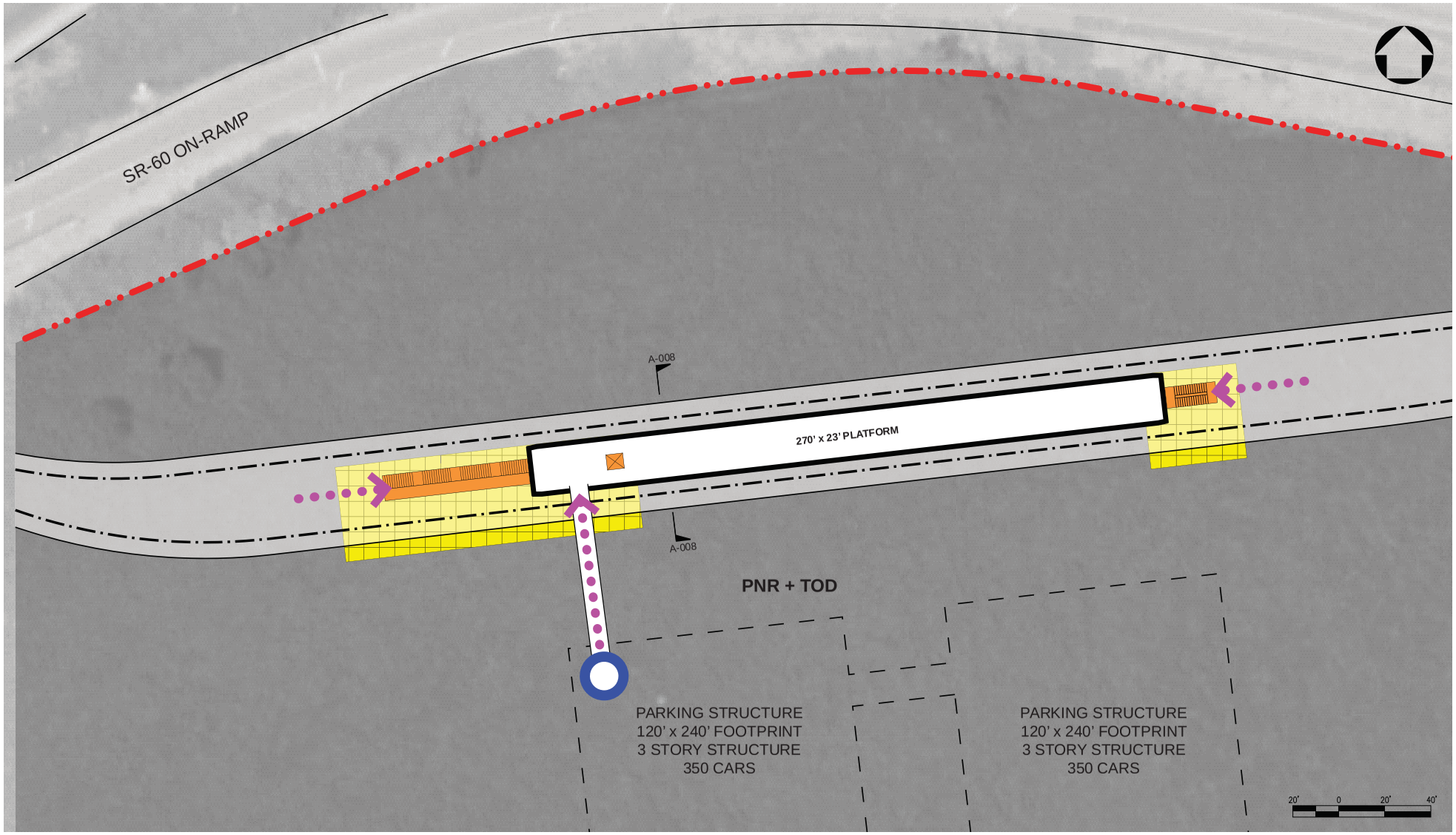
REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. SCHWARZKOPF
DRAWN BY S. GODKIN
CHECKED BY S. SCHWARZKOPF
IN CHARGE V. DAVIES
DATE 06/29/09

Metro
Metropolitan Transportation Authority
CDM AECOM

EASTSIDE PHASE 2 - PART 1
SR-60
MONTEBELLO TOWN CENTER SECTION

CONTRACT NO PS4320-2003
DRAWING NO A-006
REV 0
SCALE NO SCALE
SHEET NO



REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. SCHWARZKOPF
DRAWN BY S. GODKIN
CHECKED BY S. SCHWARZKOPF
IN CHARGE V. DAVIES
DATE 06/29/09

Metro Metropolitan Transportation Authority

CDM AECOM

EASTSIDE PHASE 2 - PART 1
SR-60
SANTA ANITA AVE. STATION
LOCATION PLAN

CONTRACT NO PS4320-2003
DRAWING NO A-007
REV 0
SCALE 1⊠ = 40⊠
SHEET NO

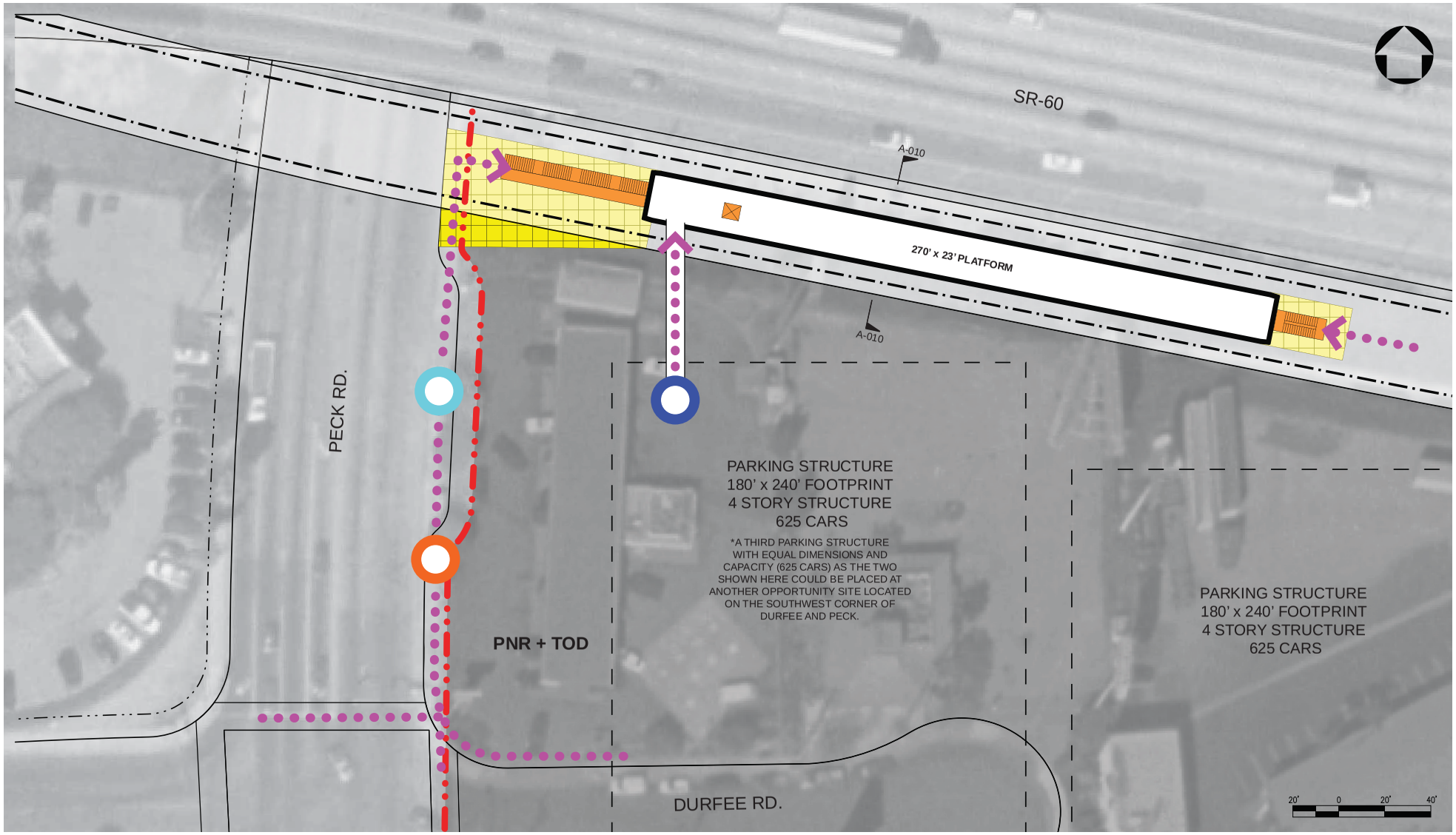
REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. SCHWARZKOPF
DRAWN BY S. GODKIN
CHECKED BY S. SCHWARZKOPF
IN CHARGE V. DAVIES
DATE 06/29/09

Metro
Metropolitan Transportation Authority
CDM AECOM

EASTSIDE PHASE 2 - PART 1
SR-60
SANTA ANITA AVE. STATION SECTION

CONTRACT NO PS4320-2003
DRAWING NO A-008
REV 0
SCALE NO SCALE
SHEET NO



REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. SCHWARZKOPF
DRAWN BY S. GODKIN
CHECKED BY S. SCHWARZKOPF
IN CHARGE V. DAVIES
DATE 06/29/09

Metro Metropolitan Transportation Authority

CDM AECOM

EASTSIDE PHASE 2 - PART 1
SR-60
PECK RD. STATION
LOCATION PLAN

CONTRACT NO PS4320-2003
DRAWING NO A-009 REV 0
SCALE 1⊠ = 40⊠
SHEET NO

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. SCHWARZKOPF
DRAWN BY S. GODKIN
CHECKED BY S. SCHWARZKOPF
IN CHARGE V. DAVIES
DATE 06/29/09

Metro
Metropolitan Transportation Authority
CDM AECOM

EASTSIDE PHASE 2 - PART 1
SR-60
PECK RD. STATION
SECTION

CONTRACT NO PS4320-2003
DRAWING NO A-010
REV 0
SCALE NO SCALE
SHEET NO

HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD
ALIGNMENT
SHEET 1 OF 18

CONTRACT NO PS4320-2003
DRAWING NO T-051
REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 11:58:13 AM
PLOT DRIVER = Raster-half-pdf.plt
PEN TABLE = MTA-HI-COLOR.tbl

USER=arains 11:58:43 AM 10/23/2009 w:\60039033_eastside2_to_part_2\cadd\rail\sheet\CET-051.plg

HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD
ALIGNMENT
SHEET 2 OF 18

CONTRACT NO PS4320-2003
DRAWING NO T-052
REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 11:57:04 AM
PLOT DRIVER = Raster-half-pdf.plt
PEN TABLE = MTA-H-COLOR.tbl

USER=arains 11:57:04 AM 10/23/2009 w:\60039033_eastside2_to_part_2\cadd\rail\sheet\CET-052.plg

HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD
ALIGNMENT
SHEET 3 OF 18

CONTRACT NO PS4320-2003
DRAWING NO T-053
REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 11:57:25 AM
PLOT DRIVER = Raster-half.pdf.plt
PEN TABLE = MTA-H-COLOR.tbl

USER=arains 11:57:25 AM 10/23/2009 w:\60039033_eastside2_to_part_2\cadd\rail\sheet\CET-053.plg

HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
D	10/20/09						ISSUED FOR FINAL

DESIGNED BY: W. ABREGO
DRAWN BY: S. ARAIN
CHECKED BY: J. AL-MASHAT
IN CHARGE: S. FIALKOFF
DATE: 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD
ALIGNMENT
SHEET 4 OF 18

CONTRACT NO: PS4320-2003
DRAWING NO: T-054
REV: 0
SCALE: HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 11:57:45 AM
PLOT DRIVER = Raster_hp1f.pdf.plt
PEN TABLE = MTA_JL_COLOR.tbl

USER=arains 11:57:45 AM 10/23/2009 w:\60039033_eastside2_le_part_2\cadd\rail\sheet\CET-054.plg

HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD
ALIGNMENT
SHEET 5 OF 18

CONTRACT NO PS4320-2003
DRAWING NO T-055 REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 11:38:07 AM
PLOT DRIVER = Raster_half_pdf.plt
PEN TABLE = WA_al_colors.tbl

USER=drains 11:38:07 AM 10/23/2009 w:\60039033_eastside2_la_part_2\cadd\roll\sheet\CET-055.plg

HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

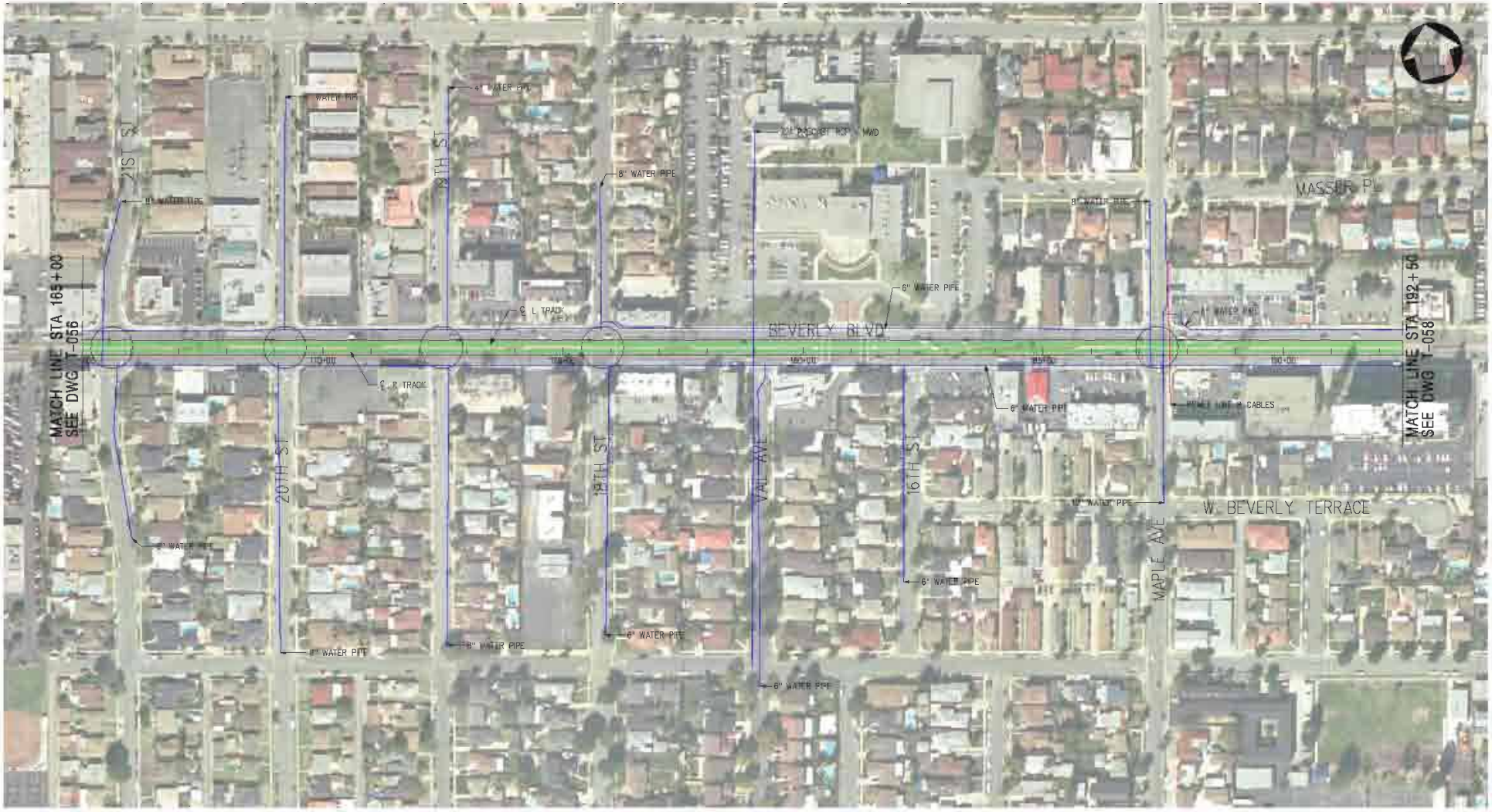
Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD
ALIGNMENT
SHEET 6 OF 18

CONTRACT NO PS4320-2003
DRAWING NO T-056 REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 11:38:29 AM
PLOT DRIVER = Raster.hplf.pdf.plt
PEN TABLE = WALK-LOCUS.TBL

USER=drains 11:38:29 AM 10/23/2009 w:\60039033_eastside2_le_part_2\cadd\roll\sheet\CET-056.plg



HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD
ALIGNMENT
SHEET 7 OF 18

CONTRACT NO PS4320-2003
DRAWING NO T-057
REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 11:38:51 AM
PLOT DRIVER = Raster_half_pdf.plt
PEN TABLE = WA_bl_color.tbl

USER=drains 11:38:51 AM 10/23/2009 w:\60039033_eastside2_le_part_2\cadd\roll\sheet\CET-057.plg

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY: W. ABREGO
DRAWN BY: S. ARAIN
CHECKED BY: J. AL-MASHAT
IN CHARGE: S. FIALKOFF
DATE: 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD
ALIGNMENT
SHEET 8 OF18

CONTRACT NO: PS4320-2003
DRAWING NO: T-058
REV: 0
SCALE: HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 11:59:13 AM
PLOT DRIVER = Raster.hplf.pdf.plt
PEN TABLE = WMA_LOCLOW.tbl

USER=drains 11:59:13 AM 10/23/2009 w:\60039033_eastside2_le_part_2\cadd\roll\sheet\CET-058.plg

HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD
ALIGNMENT
SHEET 9 OF 18

CONTRACT NO PS4320-2003
DRAWING NO T-059 REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 11:59:56 AM
PLOT DRIVER = Raster.hplf.pdf.plt
PEN TABLE = WA.ctb.CDM.ctb

USER=drains 11:59:56 AM 10/23/2009 w:\60039033_eastside2_ie_part_2\cadd\roll\sheet\CET-059.plg

HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD
ALIGNMENT
SHEET 10 OF 18

CONTRACT NO PS4320-2003
DRAWING NO T-060
REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 12:00:03 PM
PLOT DRIVER = Raster-half.pdf.plt
PENT TABLE = MTA-H-COLOR.tbl

USER=arains 12:00:03 PM 10/23/2009 w:\60039033_eastside2_lo_part_2\cadd\roll\sheet\CET-060.plg

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD
ALIGNMENT
SHEET 11 OF 18

CONTRACT NO PS4320-2003
DRAWING NO T-061
REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 12:00:28 PM
PLOT DRIVER = Raster-half.pdf.plt
PENTABLE = MTA-H-COLOR.tbl
USER=arains 12:00:28 PM 10/23/2009 w:\60039033_eastside2_lo_part_2\cadd\rail\sheet\CET-061.plg

HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

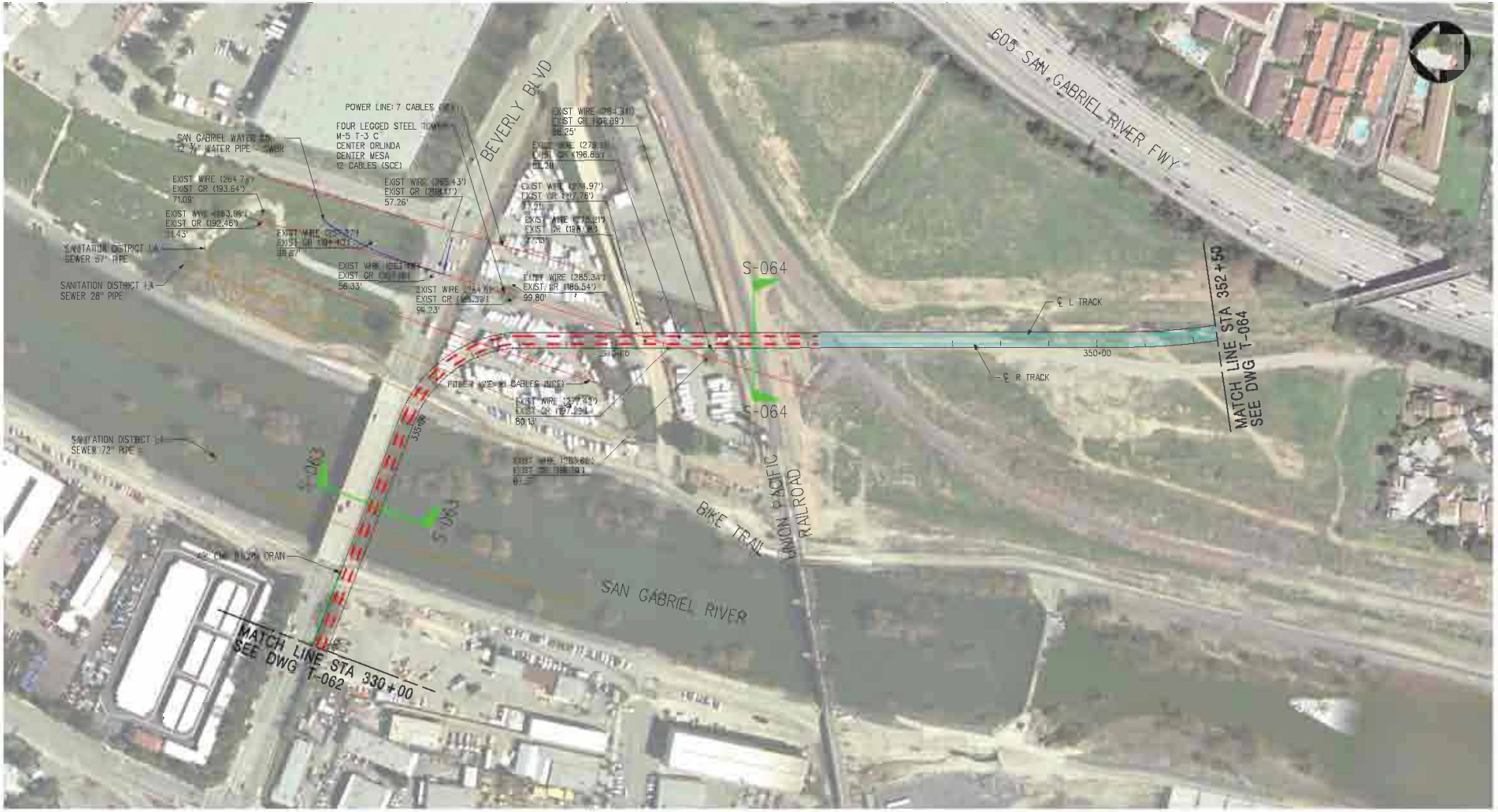
DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD
ALIGNMENT
SHEET 12 OF 18

CONTRACT NO PS4320-2003
DRAWING NO T-062
REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 12:00:52 PM
PLOT DRIVER = Rasterhalf.pdf.plt
PEN TABLE = MTA-H-COLOR.tbl
USER=arains 12:00:52 PM 10/23/2009 w:\60039033_eastside2_to_part_2\cadd\roll\sheet\CET-062.plg



HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD
ALIGNMENT
SHEET 13 OF 18

CONTRACT NO PS4320-2003
DRAWING NO T-063
REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 12:01:12 PM
PLOT DRIVER = Raster-half.pdf.plt
PEN TABLE = MTA-HI-COLOR.tbl

USER=arains 12:01:12 PM 10/23/2009 w:\60039033_eastside2_to_part_2\cadd\rail\sheet\CET-063.plt

HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD
ALIGNMENT
SHEET 14 OF 18

CONTRACT NO PS4320-2003
DRAWING NO T-064 REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 12:01:34 PM
PLOT DRIVER = Raster.hplf_pdf.plt
PEN TABLE = WYA_BLCOLOR.TBL

USER=drains 12:01:34 PM 10/23/2009 w:\60039033_eastside2_le_part_2\cadd\roll\sheet\CET-064.plg

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY: W. ABREGO
DRAWN BY: S. ARAIN
CHECKED BY: J. AL-MASHAT
IN CHARGE: S. FIALKOFF
DATE: 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD
ALIGNMENT
SHEET 15 OF 18

CONTRACT NO: PS4320-2003
DRAWING NO: T-065
REV: 0
SCALE: HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 12:01:58 PM
PLOT DRIVER = Raster-half_pdf.plt
PEN TABLE = WA-3_COLOR.TBL

USER=drains 12:01:58 PM 10/23/2009 w:\60039033_eastside2_la_part_2\cadd\roll\sheet\CET-065.plg

HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD
ALIGNMENT
SHEET 16 OF 18

CONTRACT NO PS4320-2003
DRAWING NO T-066
REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 12:02:24 PM
PLOT DRIVER = Raster-half.pdf.plt
PENT TABLE = MTA-H-COLOR.tbl

USER=arains 12:02:24 PM 10/23/2009 w:\60039033_eastside2_to_part_2\cadd\rail\sheet\CET-066.plg

HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY: W. ABREGO
DRAWN BY: S. ARAIN
CHECKED BY: J. AL-MASHAT
IN CHARGE: S. FIALKOFF
DATE: 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD
ALIGNMENT
SHEET 17 OF 18

CONTRACT NO: PS4320-2003
DRAWING NO: T-067
REV: 0
SCALE: HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 12:02:50 PM
PLOT DRIVER = Raster_half_pdf.plt
PEN TABLE = WA_bl_COLOR.TBL

USER=drains 12:02:50 PM 10/23/2009 w:\60039033_eastside2_le_part_2\cadd\roll\sheet\CET-067.plg

HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

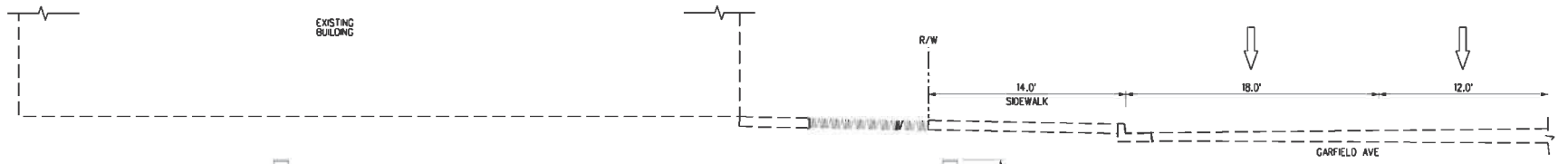
Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD
ALIGNMENT
SHEET 18 OF 18

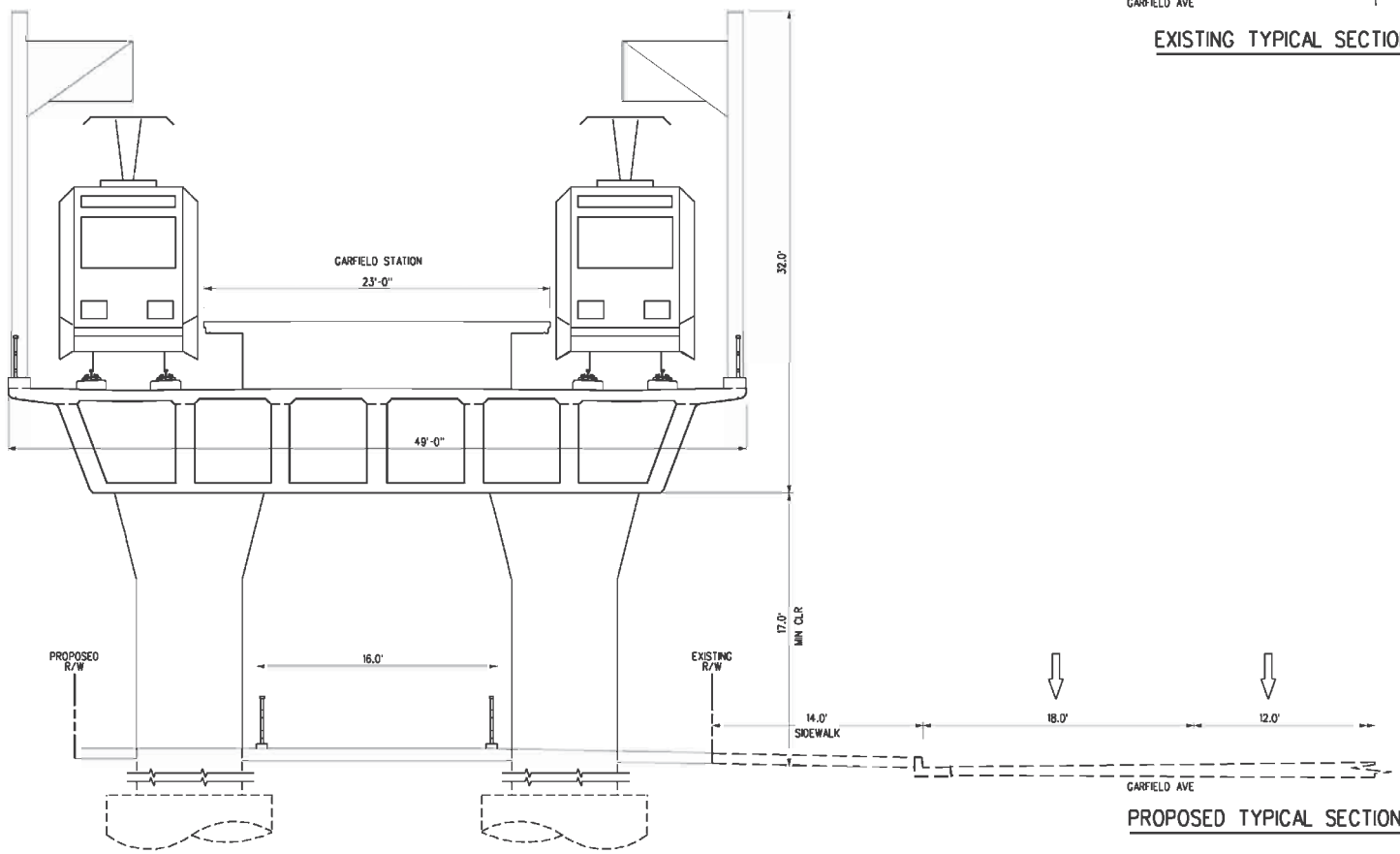
CONTRACT NO PS4320-2003
DRAWING NO T-068
REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 12:03:15 PM
PLOT DRIVER = Raster-half.pdf.plt
PEN TABLE = MTA-H-COLOR.tbl

USER=arains 12:03:15 PM 10/23/2009 w:\60039033_eastside2_to_par1_2\cadd\rail\sheet\CET-068.plg



EXISTING TYPICAL SECTION (A / S-051) T-054 T-104 T-154



PROPOSED TYPICAL SECTION (B / S-051) T-054 T-104 T-154

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

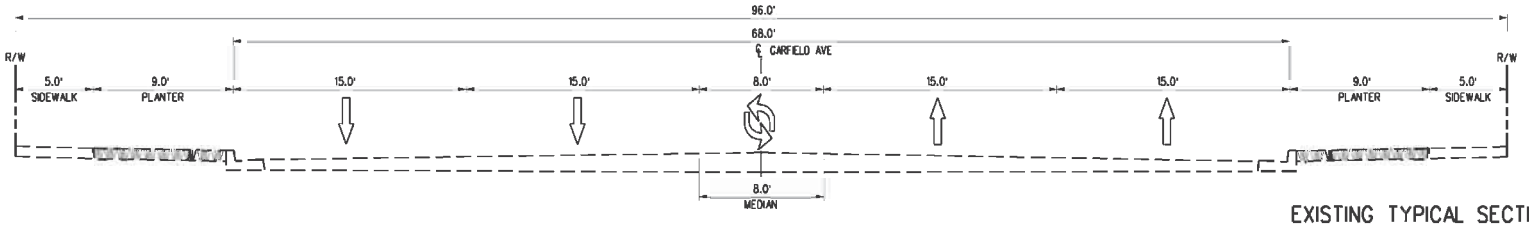
DESIGNED BY: S. ARAIN
DRAWN BY: J. VARIAS
CHECKED BY: B. BALDERRAMA
IN CHARGE: S. FIALKOFF
DATE: 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

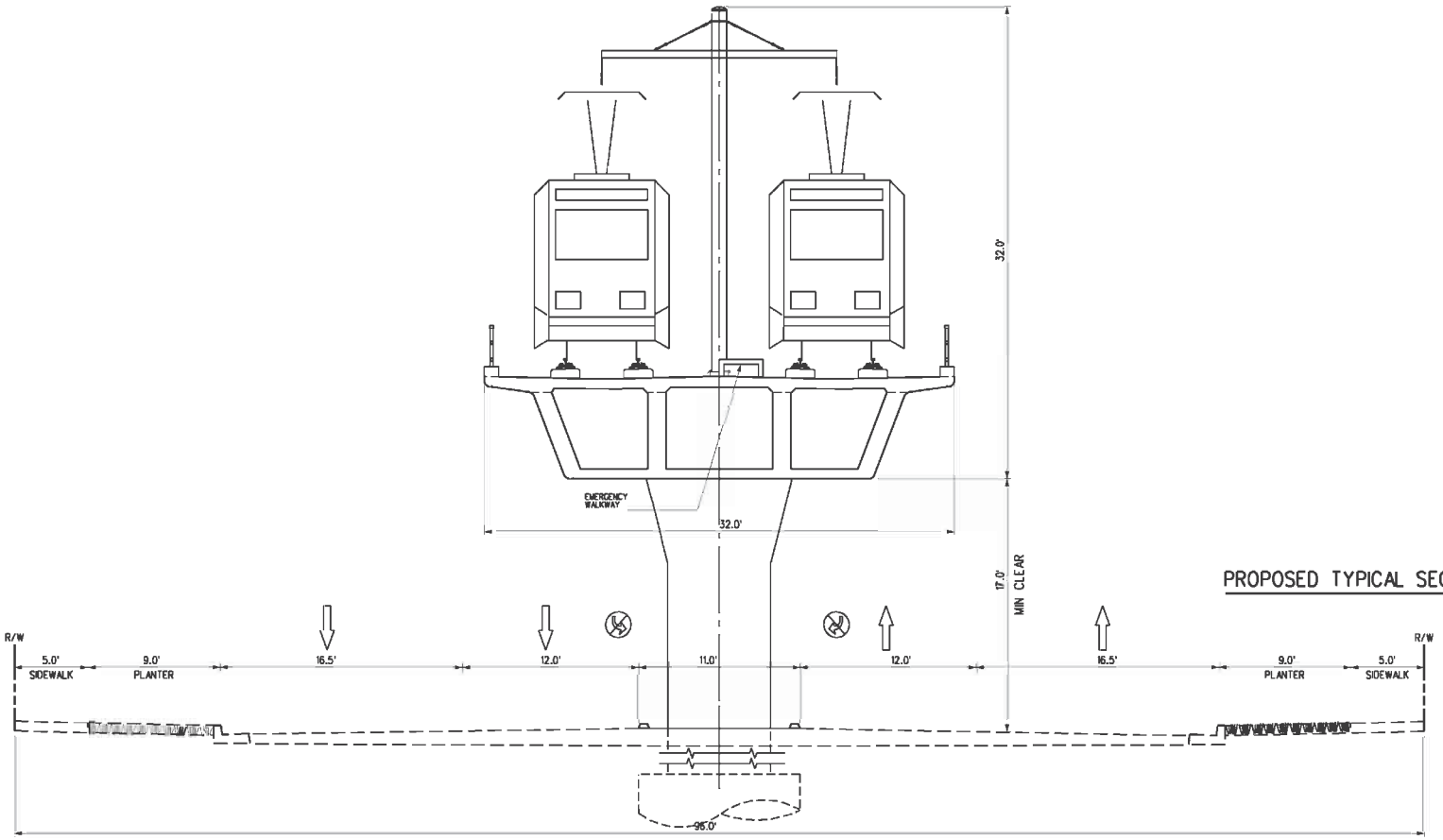
EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD
SECTIONS
SHEET 1 OF 19

CONTRACT NO: PS4320-2003
DRAWING NO: S-051 REV: 0
SCALE: NO SCALE
SHEET NO:

DATE PLOTTED = 10/23/2009 11:39:22 AM
PLOT DRIVER = PDF_HOLF_BW.pltr
PEN TABLE = MTA_LJ_pen.tbl
USER=arains 11:39:22 AM 10/23/2009 w:\60039033_eastside2_lc_part1_2\cad\civil\sheet\S-051.plg



EXISTING TYPICAL SECTION (A / S-052) T-055 T-105 T-155



PROPOSED TYPICAL SECTION (B / S-052) T-055 T-105 T-155

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. ARAIN
DRAWN BY J. VARIAS
CHECKED BY B. BALDERRAMA
IN CHARGE S. FIALKOFF
DATE 07/03/09

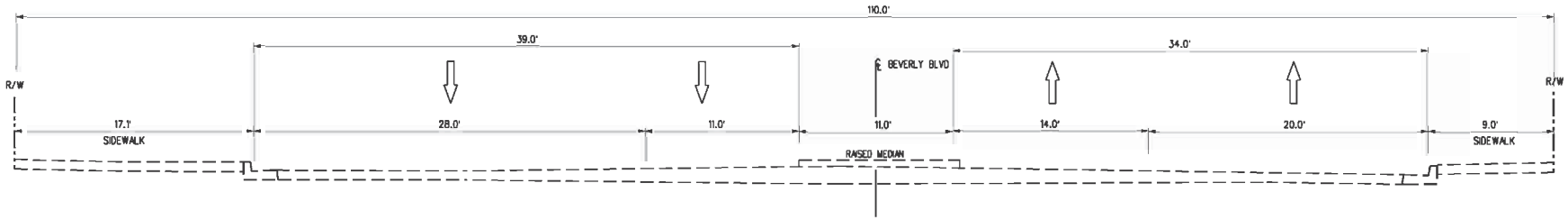
Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD
SECTIONS
SHEET 2 OF 19

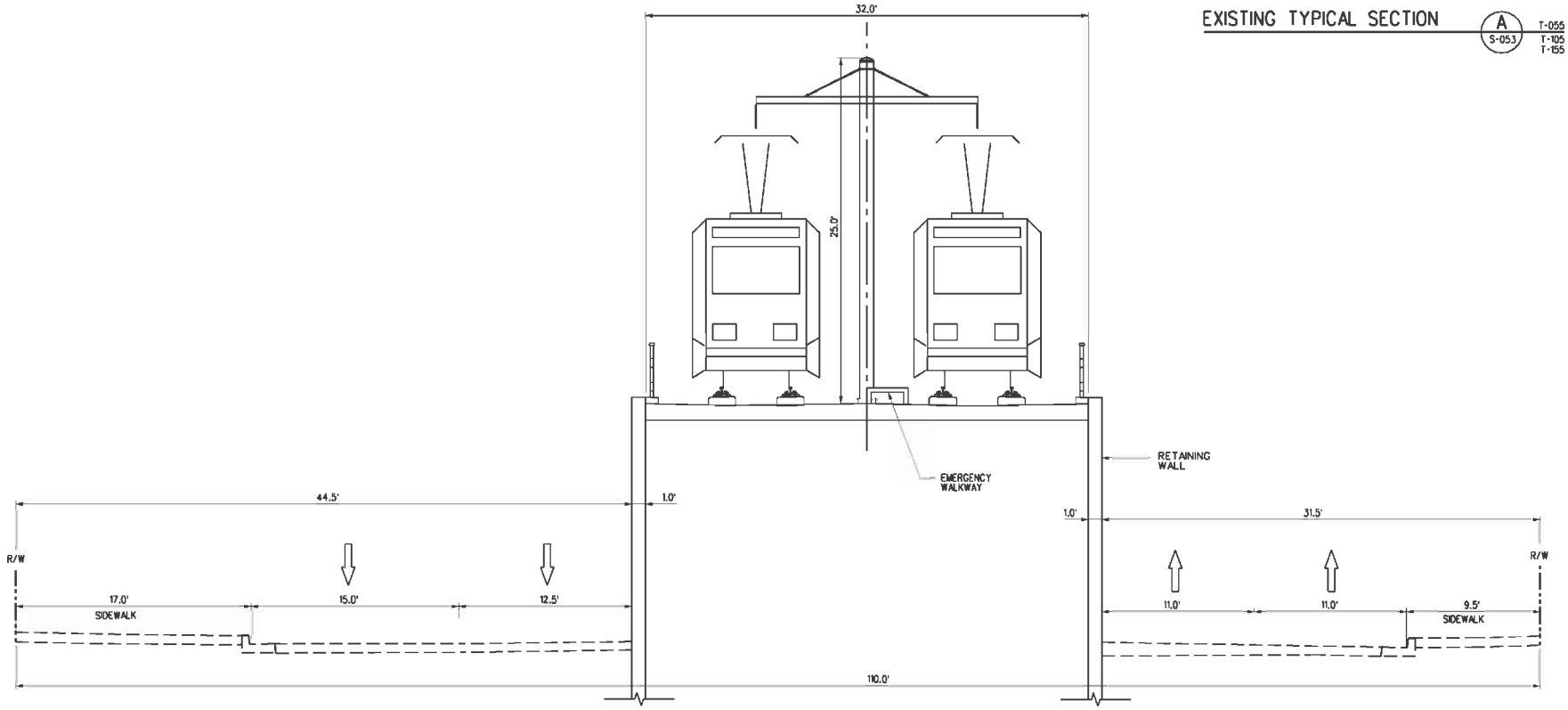
CONTRACT NO PS4320-2003
DRAWING NO S-052 REV 0
SCALE NO SCALE
SHEET NO

DATE PLOTTED = 10/23/2009 11:39:23 AM
TIME PLOTTED
PLOT DRIVER = PDF_HOT4.PC3
PEN TABLE = MTA_M_COT.TBL

USER=grams 11:39:23 AM 10/23/2009 w:\60039033_eastside2_lo_part_2\cadd\civil\sheet\CLS-052.dwg



EXISTING TYPICAL SECTION (A / S-053) T-055 T-105 T-155



PROPOSED TYPICAL SECTION (B / S-053) T-055 T-105 T-155

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

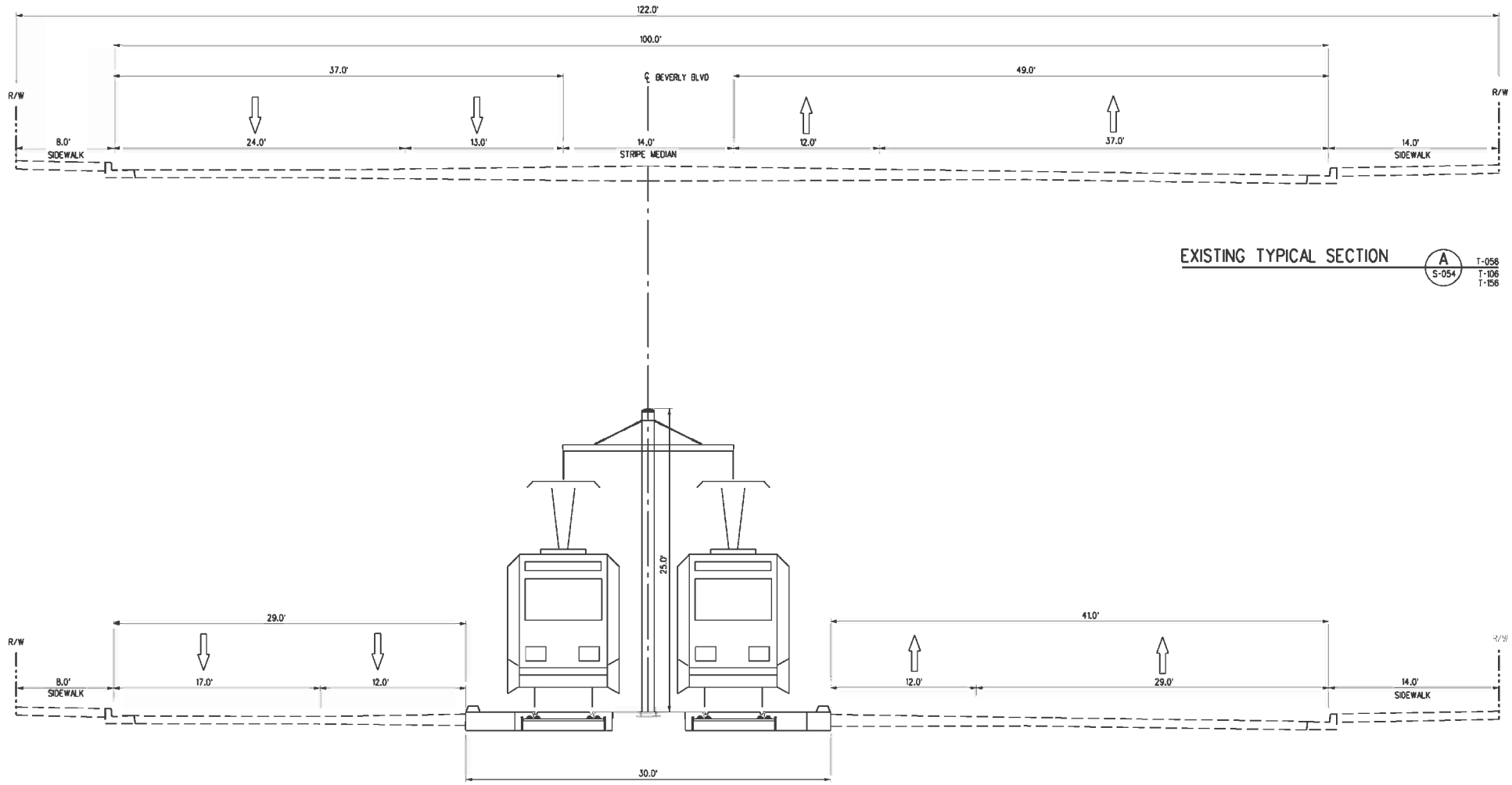
DESIGNED BY S. ARAIN
DRAWN BY J. VARIAS
CHECKED BY B. BALDERRAMA
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD
SECTIONS
SHEET 3 OF 19

CONTRACT NO PS4320-2003
DRAWING NO S-053 REV 0
SCALE NO SCALE
SHEET NO

DATE PLOTTED = 10/23/2009 TIME PLOTTED = 11:39:25 AM
PLOT DRIVER = PDF_HOLF_BW.pltt PEN TABLE = MTA_LJ_POT.tbl
USER=arains 11:39:25 AM 10/23/2009 w:\60039033_eastside2_lc_part_2\cadd\civil\sheet\CS-053.dgn



REV	DATE	BY	APP	REQ NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. ARAIN
DRAWN BY J. VARIAS
CHECKED BY B. BALDERRAMA
IN CHARGE S. FIALKOFF
DATE 07/03/09

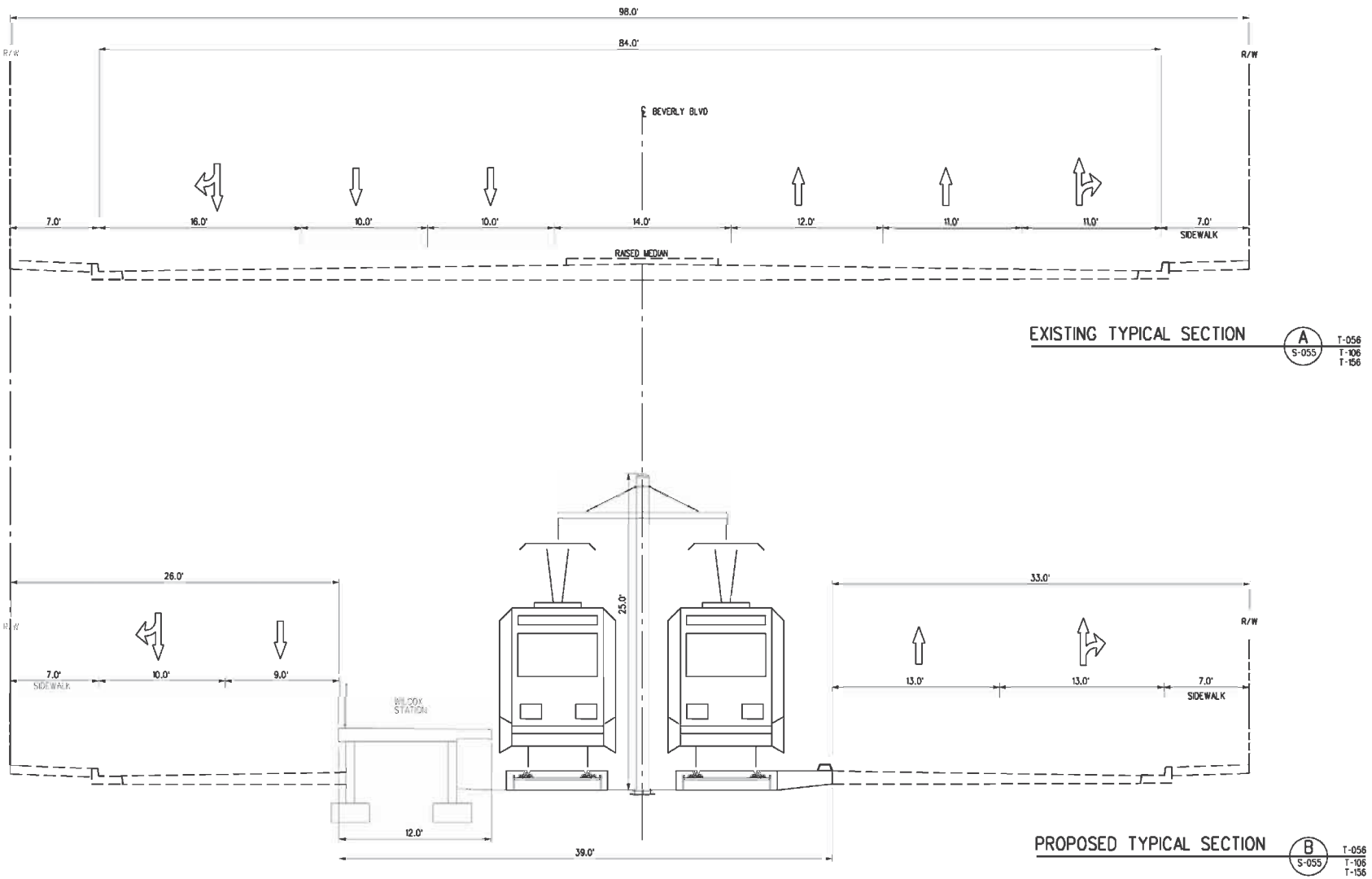
Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD
SECTIONS
SHEET 4 OF 19

CONTRACT NO PS4320-2003
DRAWING NO S-054
REV 0
SCALE NO SCALE
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 11:39:26 AM
PLOT DRIVER = PDF_HOLF_BW.pltt
PEN TABLE = MTA_A_port.tbl

USER-grams 11:39:26 AM 10/23/2009 w:\60039033_eastside2_to_part_2\cad\civil\sheet\CS-054.dgn



REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. ARAIN
DRAWN BY J. VARIAS
CHECKED BY B. BALDERRAMA
IN CHARGE S. FIALKOFF
DATE 07/03/09

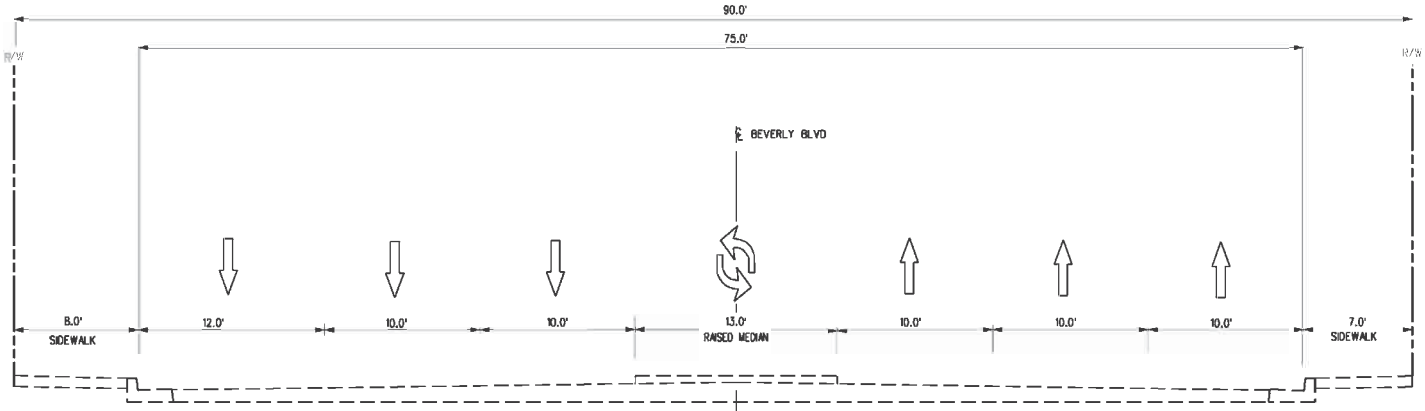
Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD
SECTIONS
SHEET 5 OF 19

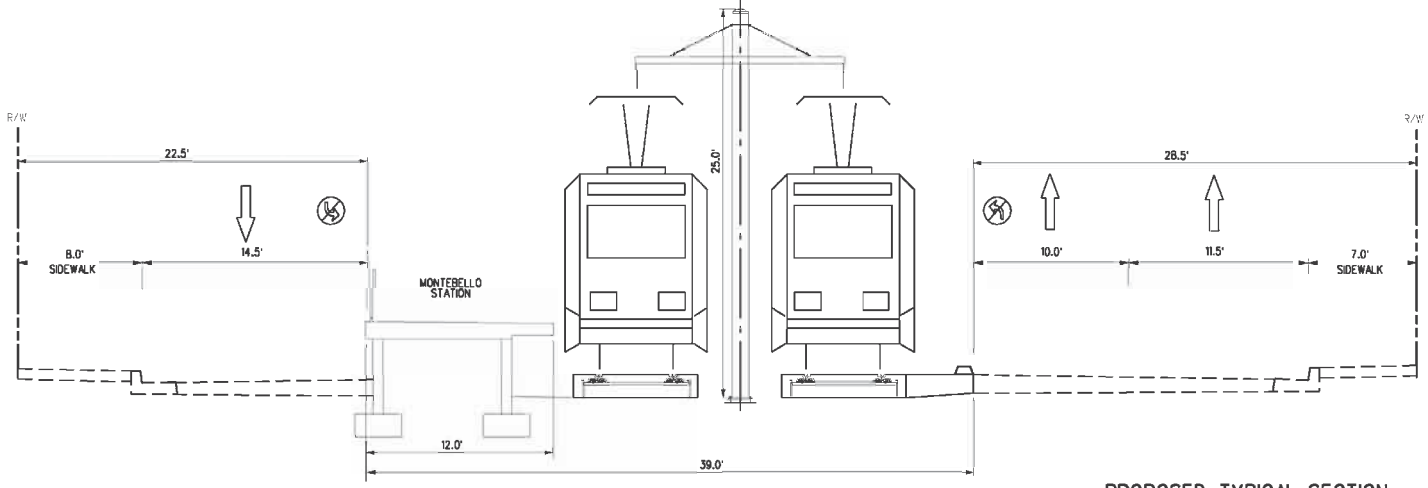
CONTRACT NO PS4320-2003
DRAWING NO S-055
REV 0
SCALE NO SCALE
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 11:39:27 AM
PLOT DRIVER = PDF_HOTF_BW.pltr
PEN TABLE = MTA_LPOT.tbl

USER=grams 11:39:27 AM 10/23/2009 w:\60039033_eastside2_lc_part_2\cadd\civil\sheet\CLS-055.pdg



EXISTING TYPICAL SECTION (A / S-056) T-058 T-158



PROPOSED TYPICAL SECTION (B / S-056) T-058 T-158

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

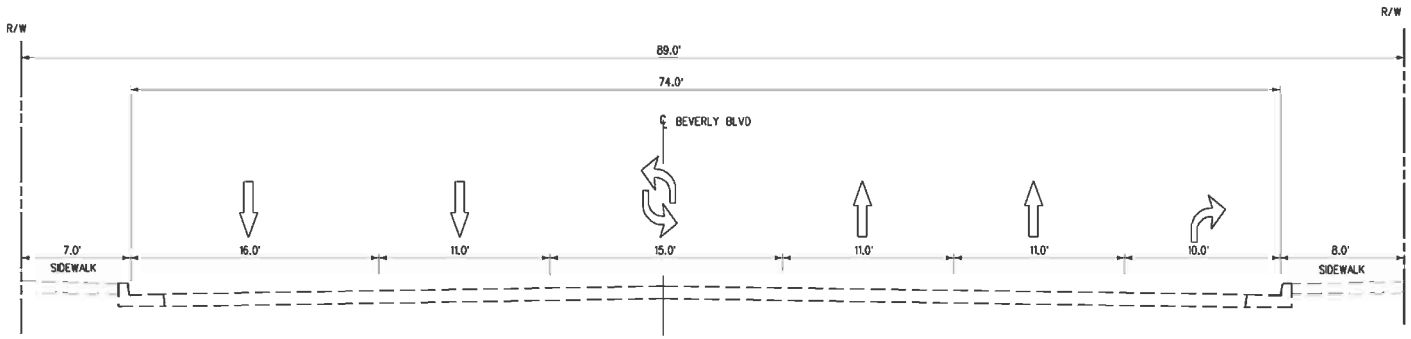
DESIGNED BY S. ARAIN
DRAWN BY J. VARIAS
CHECKED BY B. BALDERRAMA
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

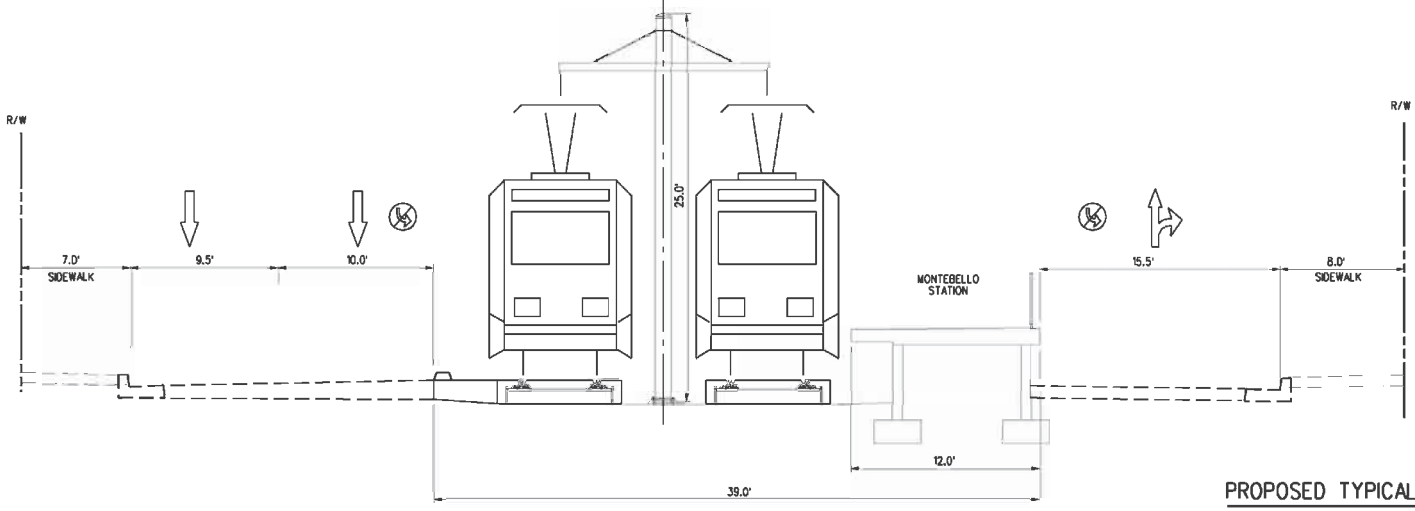
EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD
SECTIONS
SHEET 6 OF 19

CONTRACT NO PS4320-2003
DRAWING NO S-056 REV 0
SCALE NO SCALE
SHEET NO

DATE PLOTTED = 10/23/2009 TIME PLOTTED = 11:39:28 AM
PLOT DRIVER = PDF_HOTF4.PRT PEN TABLE = MTA_LPOT.TBL
USER-arains 11:39:28 AM 10/23/2009 w:\60039033_eastside2_lc_part_2\cadd\civil\sheet\S-056.dgn



EXISTING TYPICAL SECTION (A / S-057) T-058 T-158



PROPOSED TYPICAL SECTION (B / S-057) T-058 T-158

REV	DATE	BY	APP	REQ NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

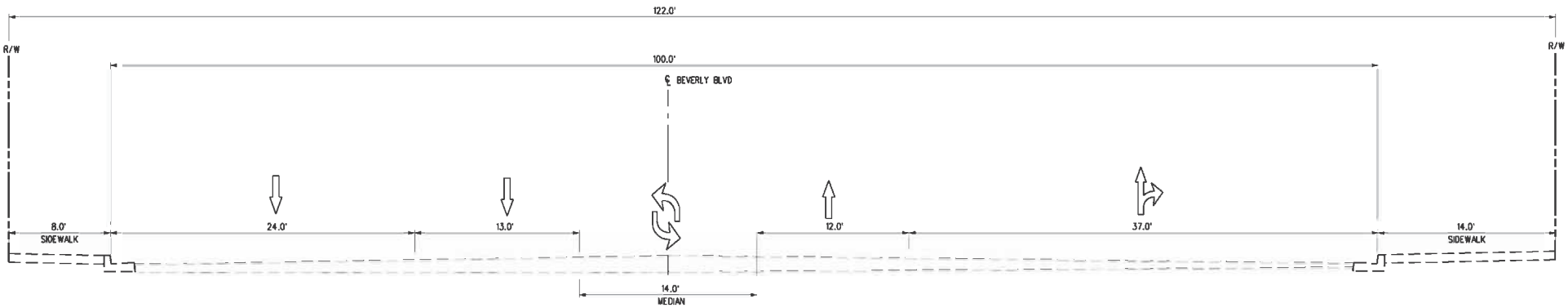
DESIGNED BY S. ARAIN
DRAWN BY J. VARIAS
CHECKED BY B. BALDERRAMA
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

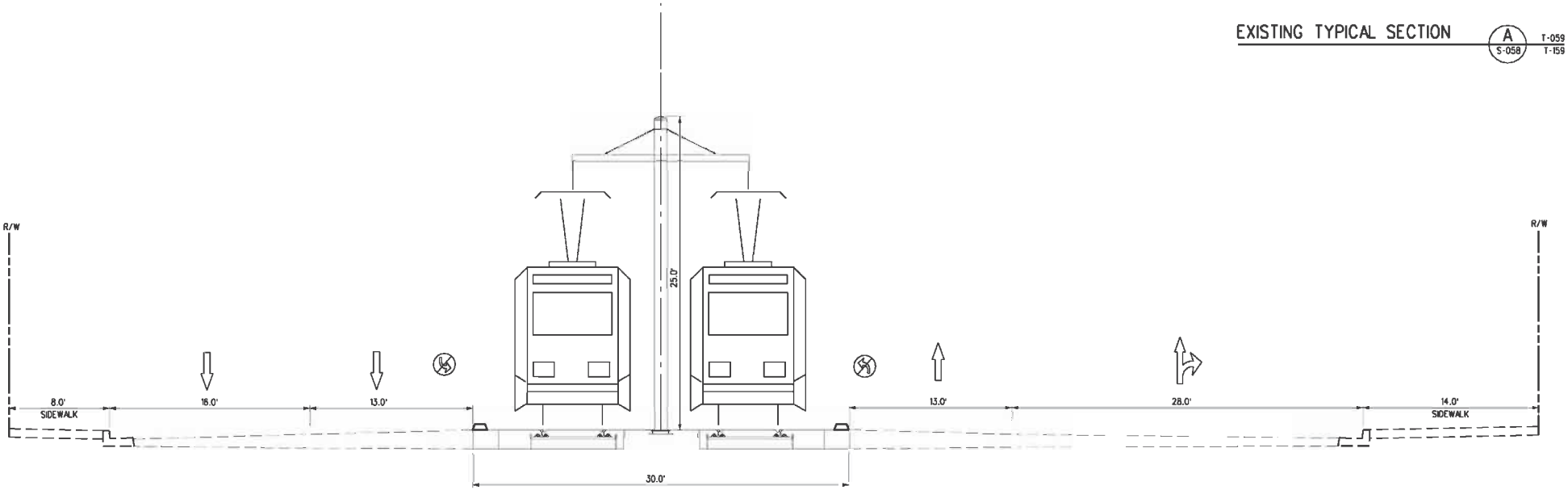
EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD
SECTIONS
SHEET 7 OF 19

CONTRACT NO PS4320-2003
DRAWING NO S-057 REV 0
SCALE NO SCALE
SHEET NO

DATE PLOTTED = 10/23/2009 11:39:29 AM
PLOT DRIVER = PDF_HOTF_BW.pltr
PEN TABLE = MTA_LJ_PCT.tbl
TIME PLOTTED
USER=grams 11:39:29 AM 10/23/2009 w:\60039033_eastside2_lo_part_2\cad\civil\sheet\CS-057.dgn



EXISTING TYPICAL SECTION (A / S-058) T-059 T-159



PROPOSED TYPICAL SECTION (B / S-058) T-059 T-159

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. ARAIN
DRAWN BY J. VARIAS
CHECKED BY B. BALDERRAMA
IN CHARGE S. FIALKOFF
DATE 07/03/09

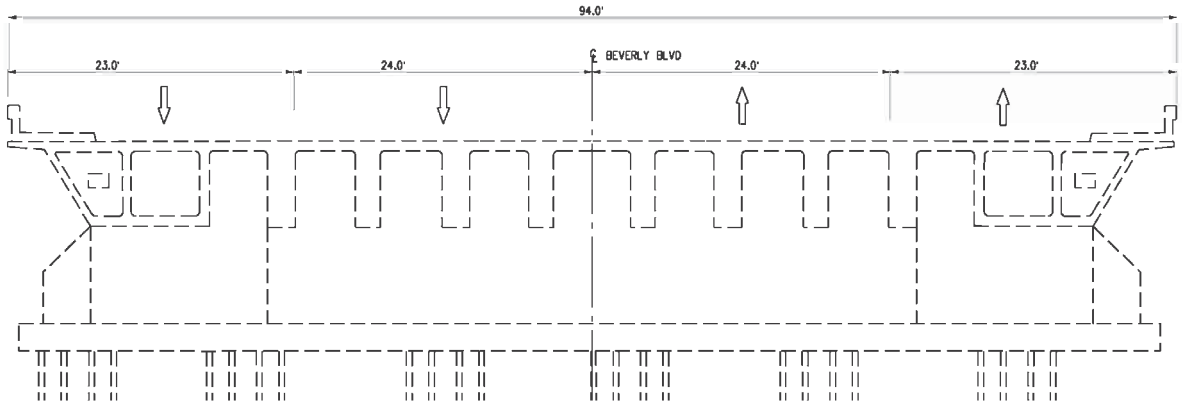
Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD
SECTIONS
SHEET 8 OF 19

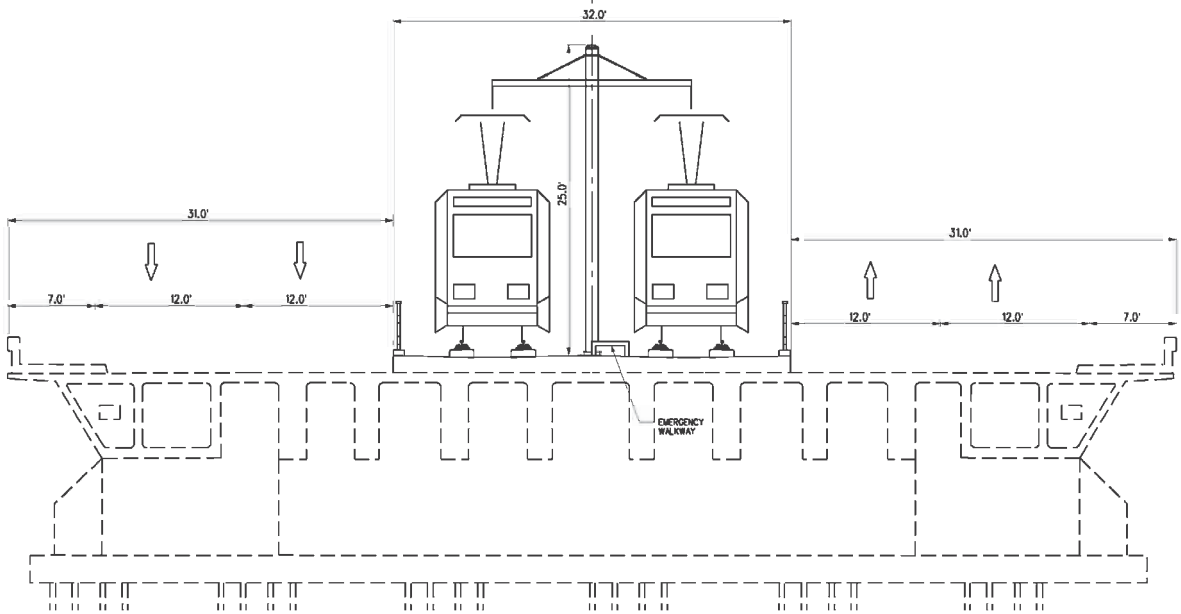
CONTRACT NO PS4320-2003
DRAWING NO S-058 REV 0
SCALE NO SCALE
SHEET NO

DATE PLOTTED = 10/23/2009 PLOT DRIVER = PDF_HOT4.PRT
TIME PLOTTED = 11:39:30 AM PEN TABLE = MTA_LJ_PDF1.TBL

USER-grams 11:39:30 AM 10/23/2009 w:\60039033_eastside2_lc_part_2\cadd\civil\sheet\CLS-058.dgn



EXISTING TYPICAL SECTION (A / S-059) T-060



PROPOSED TYPICAL SECTION (B / S-059) T-060

REV	DATE	BY	APP	REQ NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/2009						CONCEPTUAL ENGINEERING STUDIES

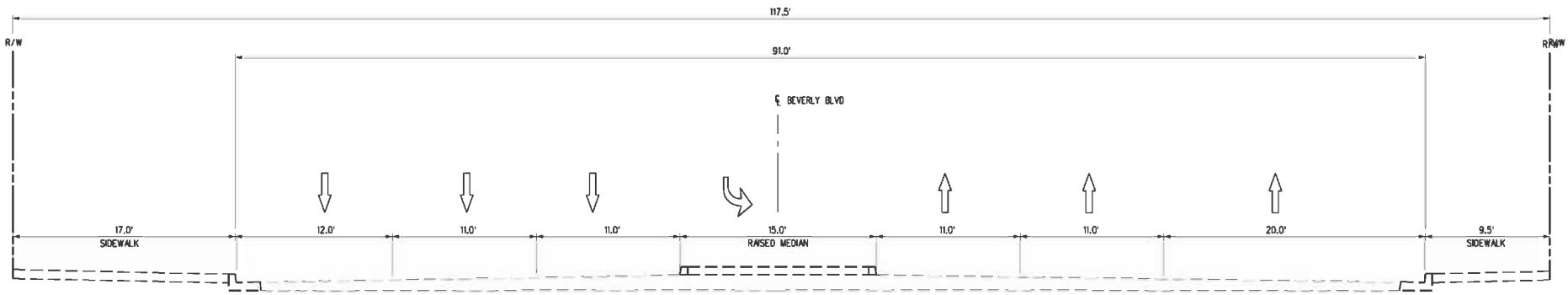
DESIGNED BY: S. ARAIN
DRAWN BY: J. VARIAS
CHECKED BY: B. BALDERRAMA
IN CHARGE: S. FIALKOFF
DATE: 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

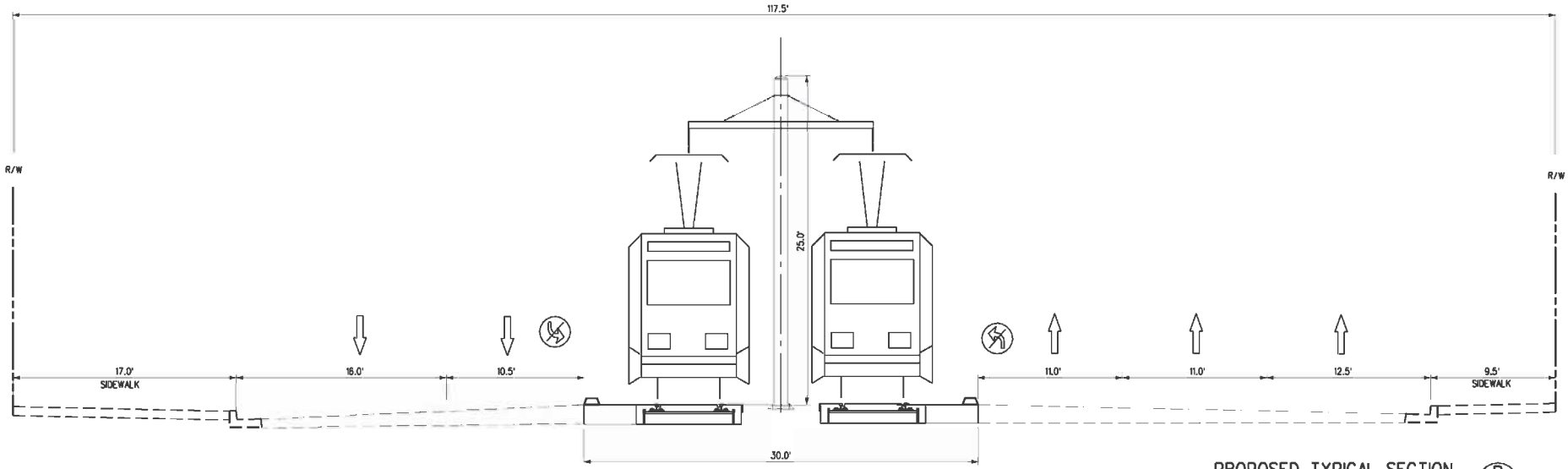
EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD
SECTIONS
SHEET 9 OF 19

CONTRACT NO: PS4320-2003
DRAWING NO: S-059 REV: 0
SCALE: NO SCALE
SHEET NO:

DATE PLOTTED = 10/23/2009 11:39:32 AM
PLOT DRIVER = PDF_HOLF4.PRT
PEN TABLE = MTA_LJ_PORT.TBL
USER=arains 11:39:32 AM 10/23/2009 w:\60039033_eastside2_ic_part1_2\cad\civil\sheet\CES-059.dgn



EXISTING TYPICAL SECTION (A / S-060) T-060 T-180



PROPOSED TYPICAL SECTION (B / S-060) T-060 T-180

REV	DATE	BY	APP	REQ NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. ARAIN
DRAWN BY J. VARIAS
CHECKED BY B. BALDERRAMA
IN CHARGE S. FIALKOFF
DATE 07/03/09

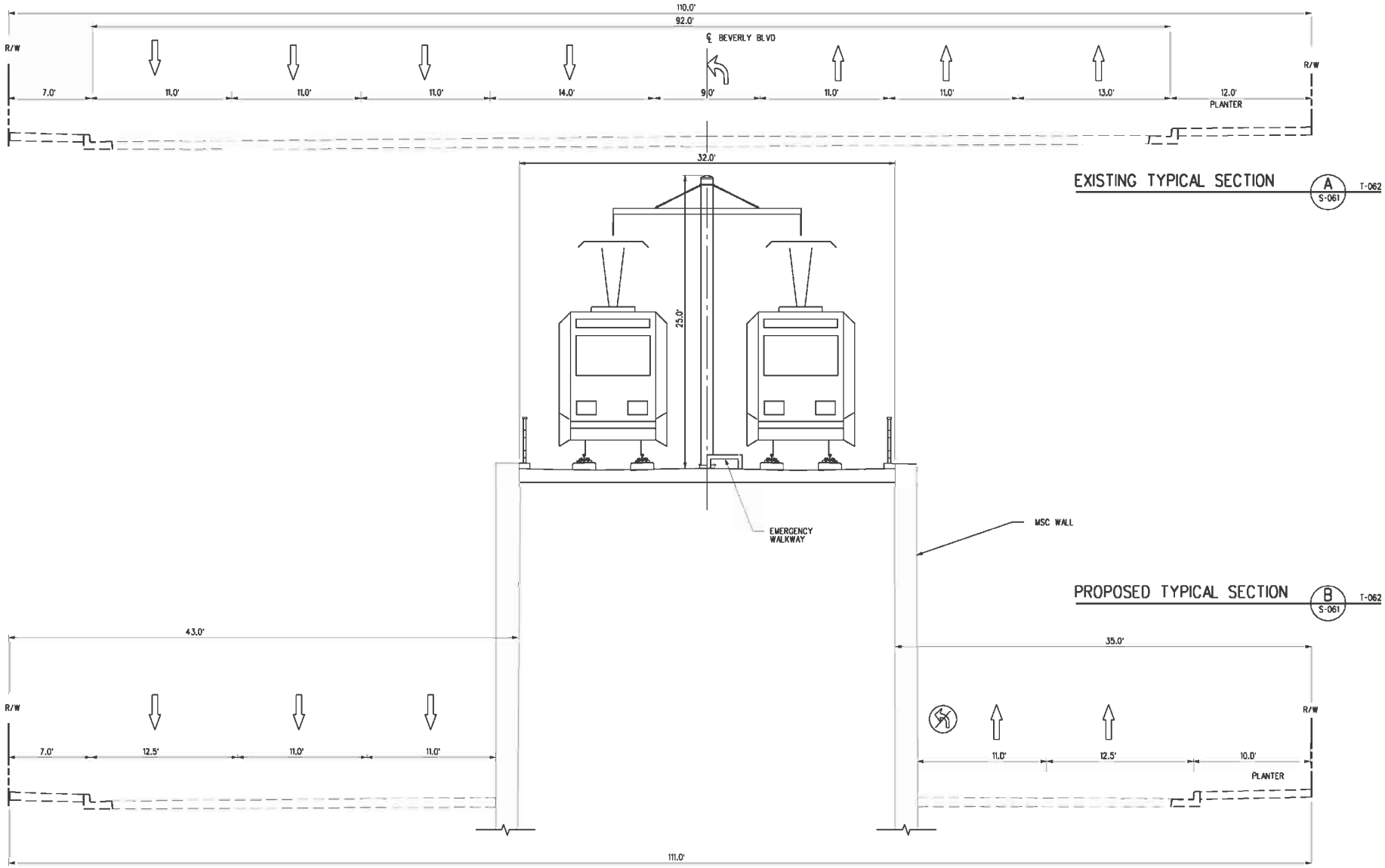
Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD
SECTIONS
SHEET 10 OF 19

CONTRACT NO PS4320-2003
DRAWING NO S-060 REV 0
SCALE NO SCALE
SHEET NO

DATE PLOTTED = 10/23/2009 11:39:33 AM
TIME PLOTTED
PLOT DRIVER = PDF.pc3
PEN TABLE = MTA_A.pctb

USER=grams 11:39:33 AM 10/23/2009 w:\60039033_eastside2_lc_part_2\cad\civil\sheet\S-060.dwg



REV	DATE	BY	APP	REQ NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. ARAIN
DRAWN BY J. VARIAS
CHECKED BY B. BALDERRAMA
IN CHARGE S. FIALKOFF
DATE 07/03/09

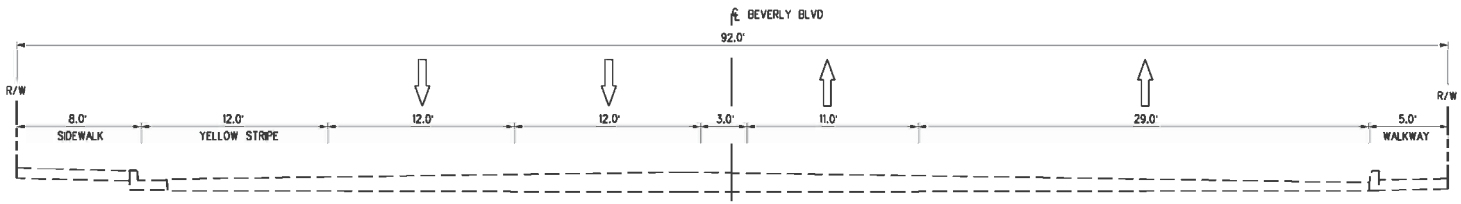
Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD
SECTIONS
SHEET 11 OF 19

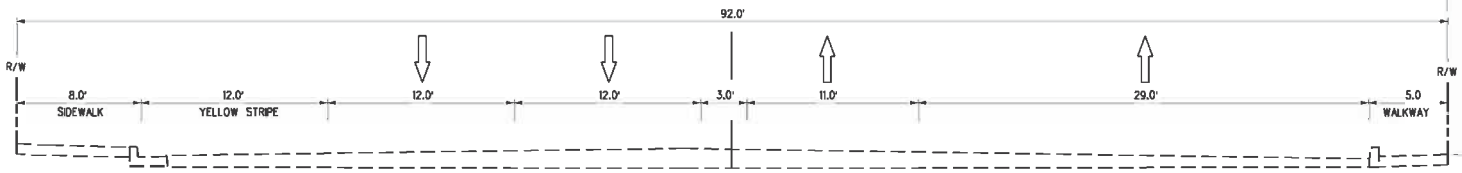
CONTRACT NO PS4320-2003
DRAWING NO S-061
REV 0
SCALE NO SCALE
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 11:39:34 AM
PLOT DRIVER = PDF_HOT4.PC3
PEN TABLE = MTA_M_POS.TBL

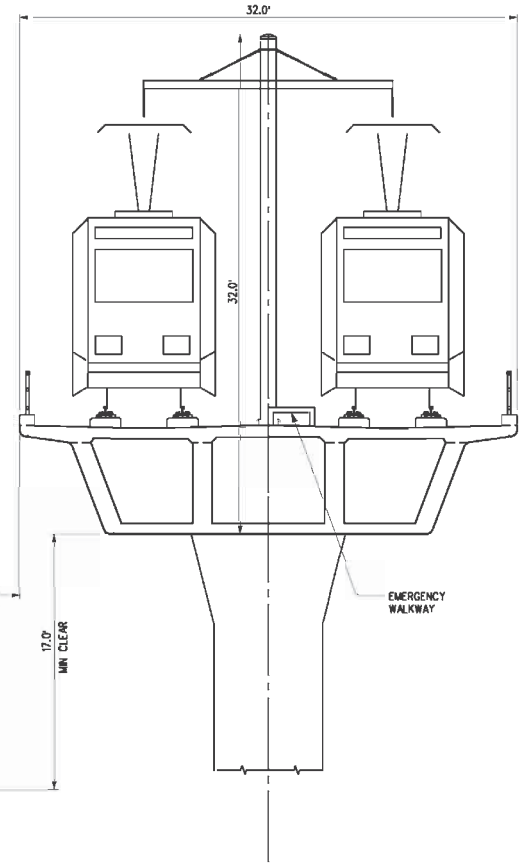
USER=grams 11:39:34 AM 10/23/2009 w:\60039033_eastside2_lo_part_2\cadd\civil\sheet\CLS-061.dwg



EXISTING TYPICAL SECTION (A / S-062) T-062



PROPOSED TYPICAL SECTION (B / S-062) T-062



REV	DATE	BY	APP	REQ NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. ARAIN
DRAWN BY J. VARIAS
CHECKED BY B. BALDERRAMA
IN CHARGE S. FIALKOFF
DATE 07/03/09

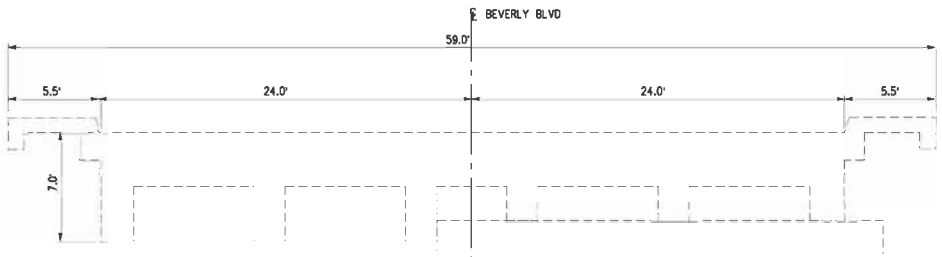
Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD
SECTIONS
SHEET 12 OF 19

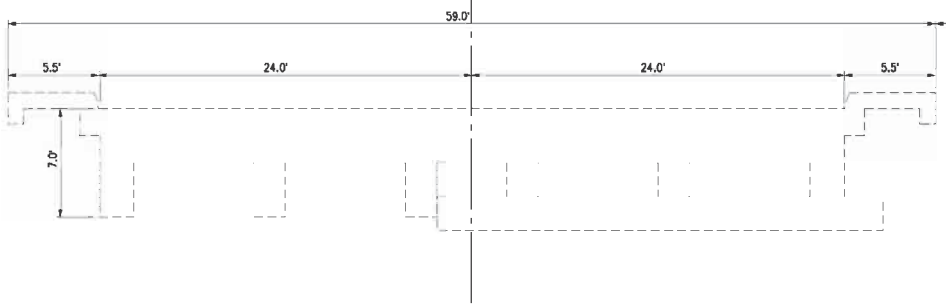
CONTRACT NO PS4320-2003
DRAWING NO S-062 REV 0
SCALE NO SCALE
SHEET NO

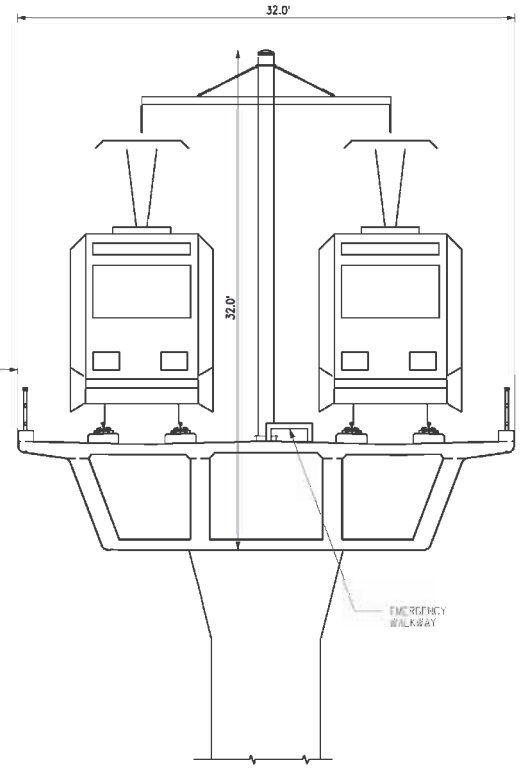
DATE PLOTTED = 10/23/2009 PLOT DRIVER = PDF_HOT4_BW.pltt
TIME PLOTTED = 11:39:35 AM PEN TABLE = MTA_A_port.tbl

USER=arains 11:39:35 AM 10/23/2009 w:\60039033_eastside2_to_part_2\cad\civil\sheet\CES-062.dwg



EXISTING TYPICAL SECTION (A / S-063) T-063





PROPOSED TYPICAL SECTION (B / S-063) T-063

REV	DATE	BY	APP	REQ NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. ARAIN
DRAWN BY J. VARIAS
CHECKED BY B. BALDERRAMA
IN CHARGE S. FIALKOFF
DATE 07/03/09

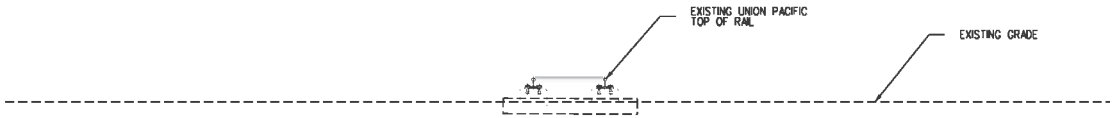
Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD
SECTIONS
SHEET 13 OF 19

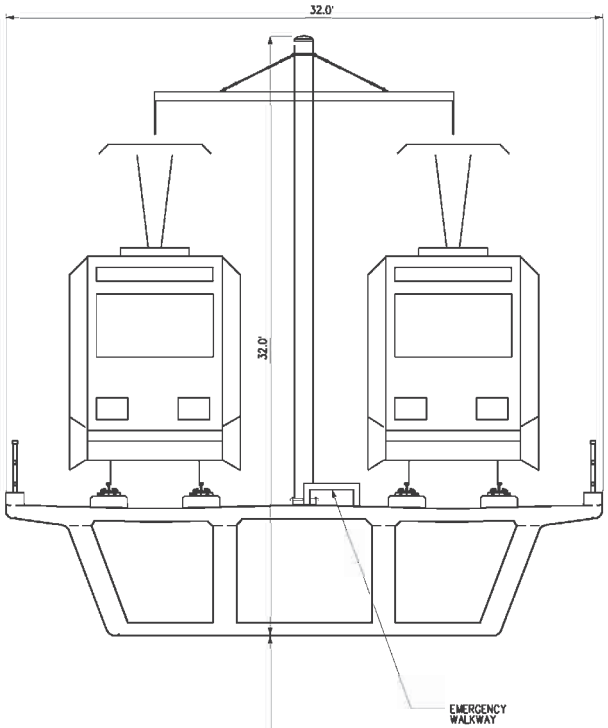
CONTRACT NO PS4320-2003
DRAWING NO S-063 REV 0
SCALE NO SCALE
SHEET NO

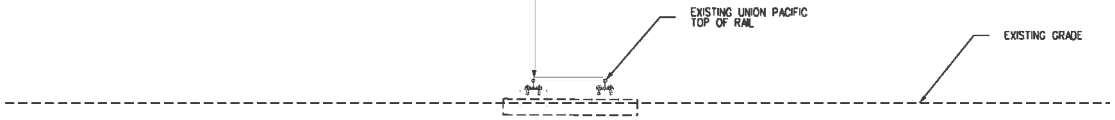
DATE PLOTTED = 10/23/2009 PLOT DRIVER = PDF_HOLF_BW.pltr
TIME PLOTTED = 11:39:36 AM PEN TABLE = MTA_LJ_PDF.tbl

USER=arains 11:39:36 AM 10/23/2009 w:\60039033_eastside2_lc_part_2\cadd\civil\sheet\CLS-063.plg



EXISTING TYPICAL SECTION (A / S-064) T-063





PROPOSED TYPICAL SECTION (B / S-064) T-063

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. ARAIN
DRAWN BY J. VARIAS
CHECKED BY B. BALDERRAMA
IN CHARGE S. FIALKOFF
DATE 07/03/09

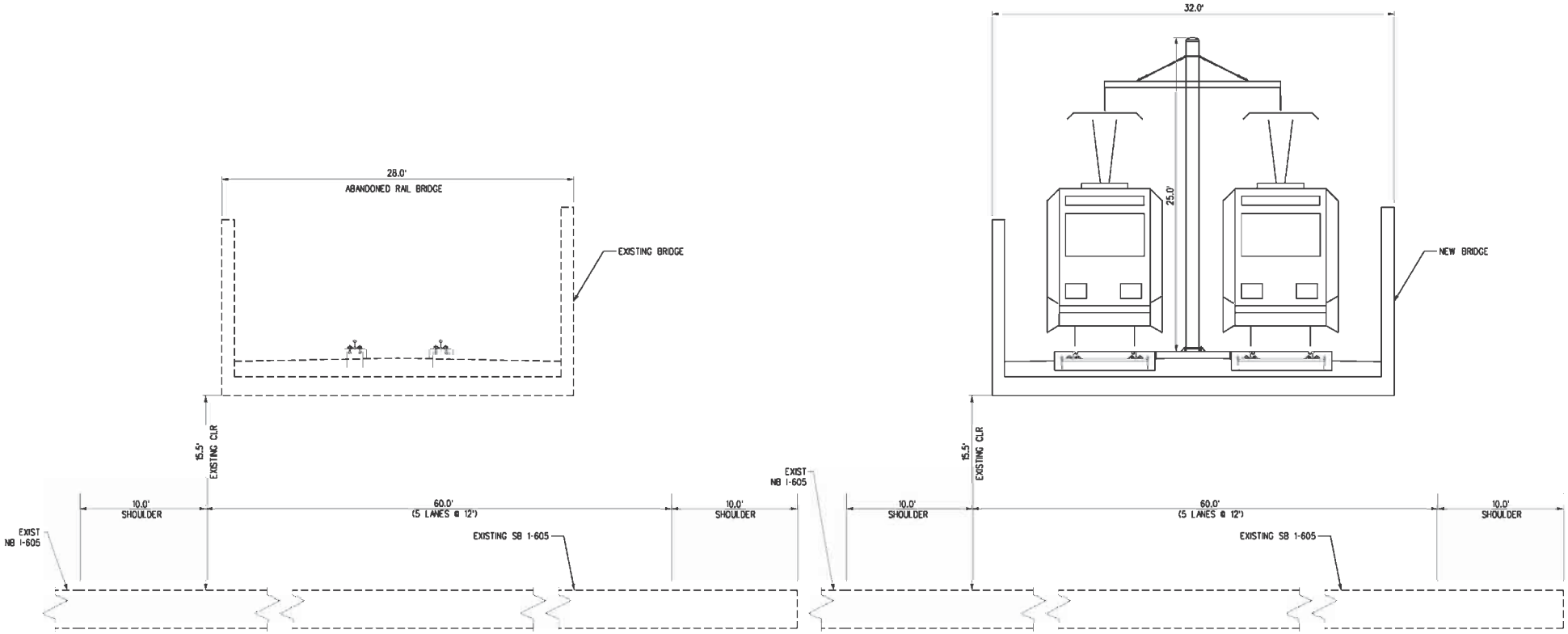
Metropolitan Transportation Authority
Metro
CDM AECOM JOINT VENTURE

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD
SECTIONS
SHEET 14 OF 19

CONTRACT NO PS4320-2003
DRAWING NO S-064 REV 0
SCALE NO SCALE
SHEET NO

DATE PLOTTED = 10/23/2009 11:39:37 AM
TIME PLOTTED
PLOT DRIVER = PDF_HOTF4_BW.pltr
PEN TABLE = MTA_Import.tbl

USER-grams 11:39:37 AM 10/23/2009 w:\60039033_eastside2_lc_part_2\cadd\civil\sheet\CLS-064.plg



EXISTING TYPICAL SECTION (A / S-065) T-064

PROPOSED TYPICAL SECTION (B / S-065) T-064

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. ARAIN
DRAWN BY J. VARIAS
CHECKED BY B. BALDERRAMA
IN CHARGE S. FIALKOFF
DATE 07/03/09

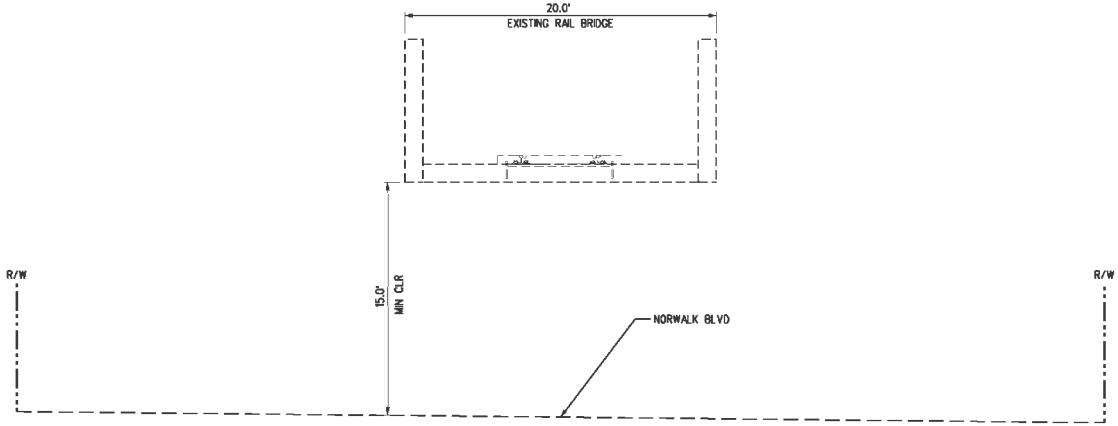
Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD
SECTIONS
SHEET 15 OF 19

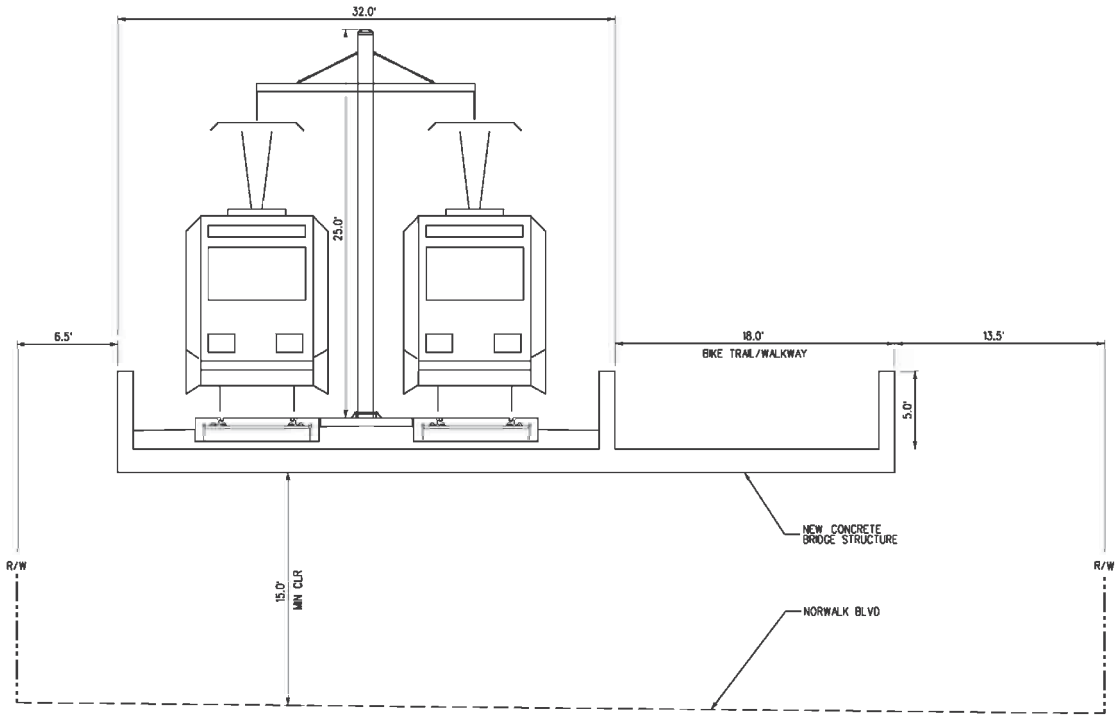
CONTRACT NO PS4320-2003
DRAWING NO S-065 REV 0
SCALE NO SCALE
SHEET NO

DATE PLOTTED = 10/23/2009 PLOT DRIVER = PDF_HOT4.PMP.PLT
TIME PLOTTED = 11:39:38 AM PEN TABLE = MTA_LJ_PDF1.TBL

USER-grams 11:39:38 AM 10/23/2009 w:\60039033_eastside2_lo_part_2\cad\civil\sheet\CLS-065.plg



EXISTING TYPICAL SECTION (A / S-066) T-065



PROPSED TYPICAL SECTION (B / S-066) T-065

REV	DATE	BY	APP	REQ NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY: S. ARAIN
DRAWN BY: J. VARIAS
CHECKED BY: B. BALDERRAMA
IN CHARGE: S. FIALKOFF
DATE: 07/03/09

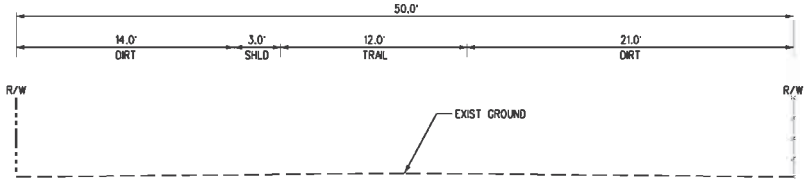
Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD
SECTIONS
SHEET 16 OF 19

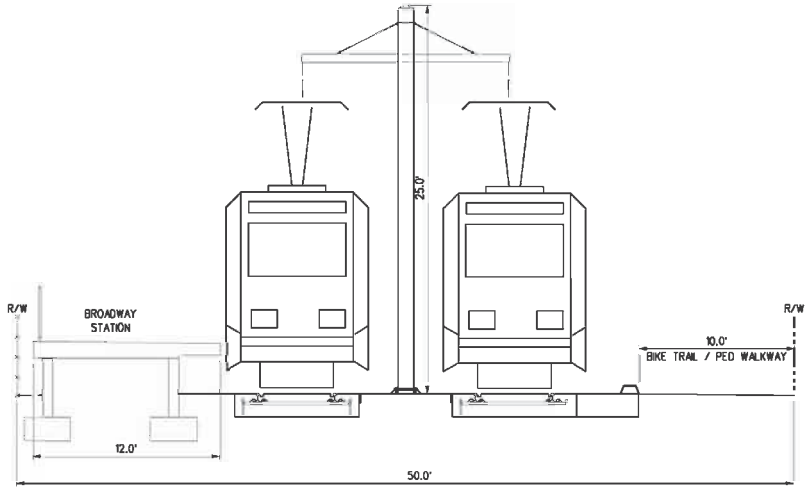
CONTRACT NO: PS4320-2003
DRAWING NO: S-066 REV: 0
SCALE: NO SCALE
SHEET NO:

DATE PLOTTED = 10/23/2009 PLOT DRIVER = PDF_HOLF4_BW.pltr
TIME PLOTTED = 11:39:40 AM PEN TABLE = MTA_LJ_PORT.tbl

USER=arains 11:39:40 AM 10/23/2009 w:\60039033_eastside2_lc_part_2\cadd\civil\sheet\CS-066.dwg



EXISTING TYPICAL SECTION (A / S-067) T-066



PROPOSED TYPICAL SECTION (B / S-067) T-066

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY: S. ARAIN
DRAWN BY: J. VARIAS
CHECKED BY: B. BALDERRAMA
IN CHARGE: S. FIALKOFF
DATE: 07/03/09

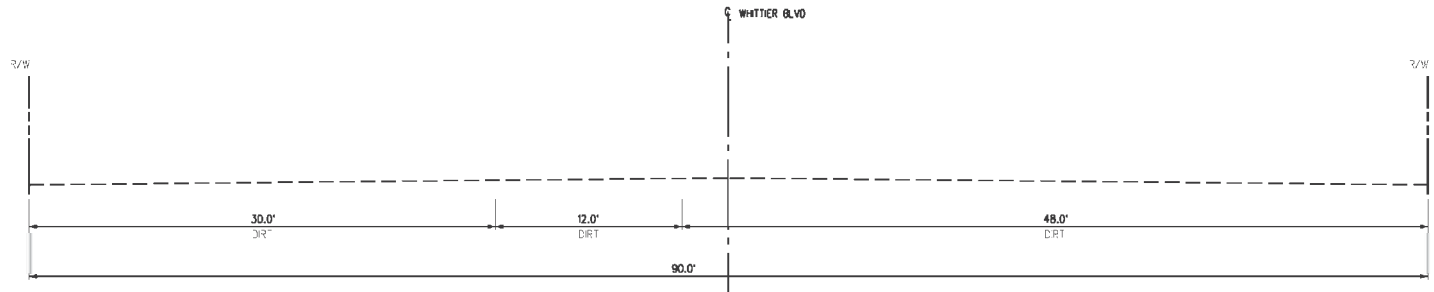
Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD
SECTIONS
SHEET 17 OF 19

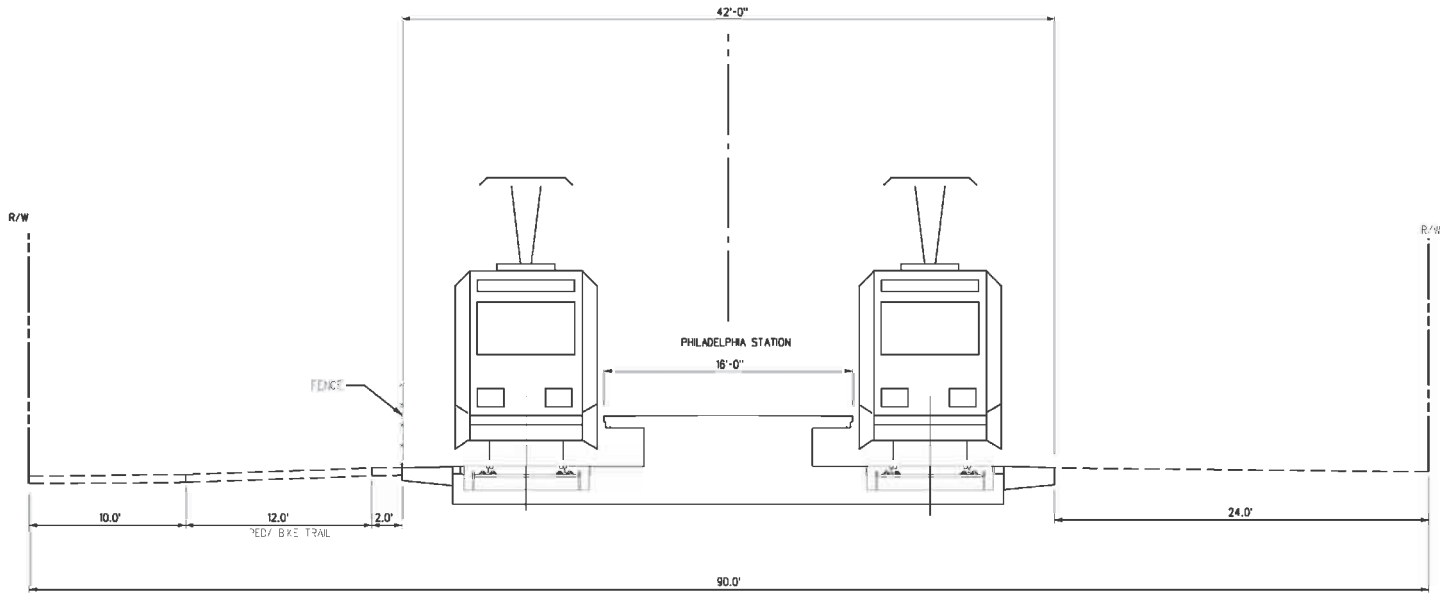
CONTRACT NO: PS4320-2003
DRAWING NO: S-067 REV: 0
SCALE: NO SCALE
SHEET NO:

DATE PLOTTED = 10/23/2009 11:39:41 AM
TIME PLOTTED
PLOT DRIVER = PDF_HOLF4.BW.pltt
PEN TABLE = MTA_LJ_pen.tbl

USER=grams 11:39:41 AM 10/23/2009 w:\60039033_eastside2_lc_part_2\cad\civil\sheet\S-067.dwg



EXISTING TYPICAL SECTION (A / S-068) T-067



PROPOSED TYPICAL SECTION (B / S-068) T-067

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

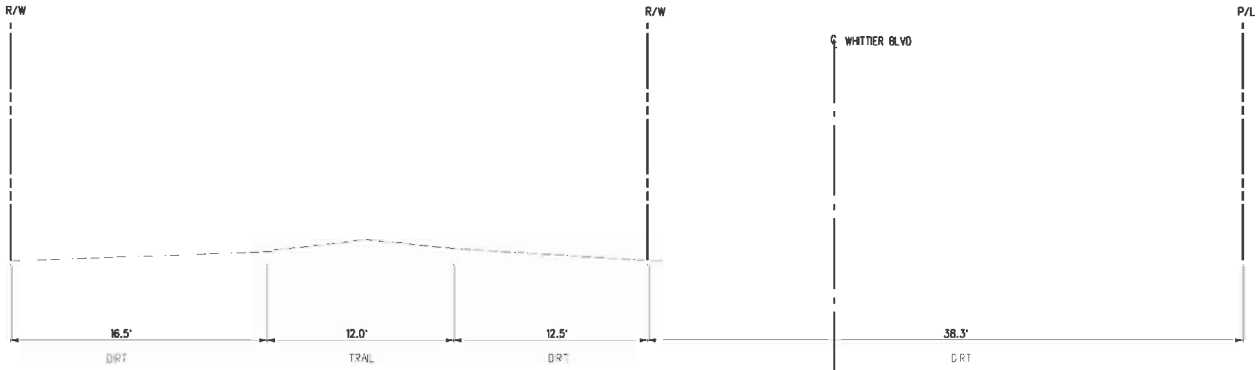
DESIGNED BY S. ARAIN
DRAWN BY J. VARIAS
CHECKED BY B. BALDERRAMA
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

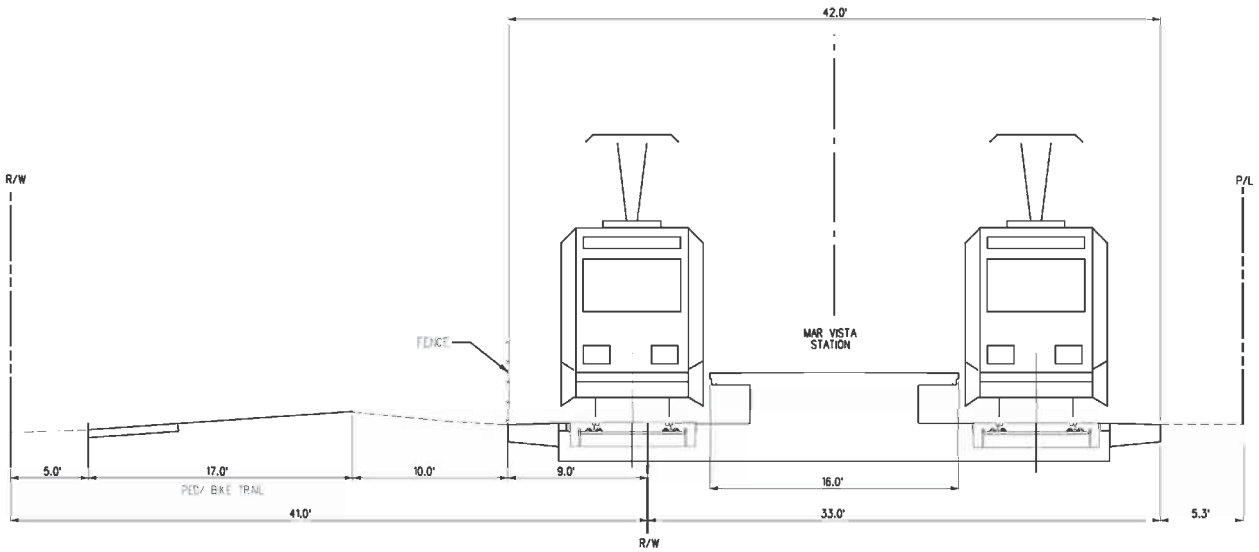
EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD
SECTIONS
SHEET 18 OF 19

CONTRACT NO PS4320-2003
DRAWING NO S-068 REV 0
SCALE NO SCALE
SHEET NO

DATE PLOTTED = 10/23/2009 TIME PLOTTED = 11:39:42 AM
PLOT DRIVER = PDF_HOTF4_BW.pltf PEN TABLE = MTA_LJ_pen1.tbl
USER=arains 11:39:42 AM 10/23/2009 w:\60039033_eastside2_ic_part1_2\cad\civil\sheet\CS-068.dgn



EXISTING TYPICAL SECTION (A / S-069) T-068 T-118 T-168



PROPOSED TYPICAL SECTION (B / S-069) T-068 T-118 T-168

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

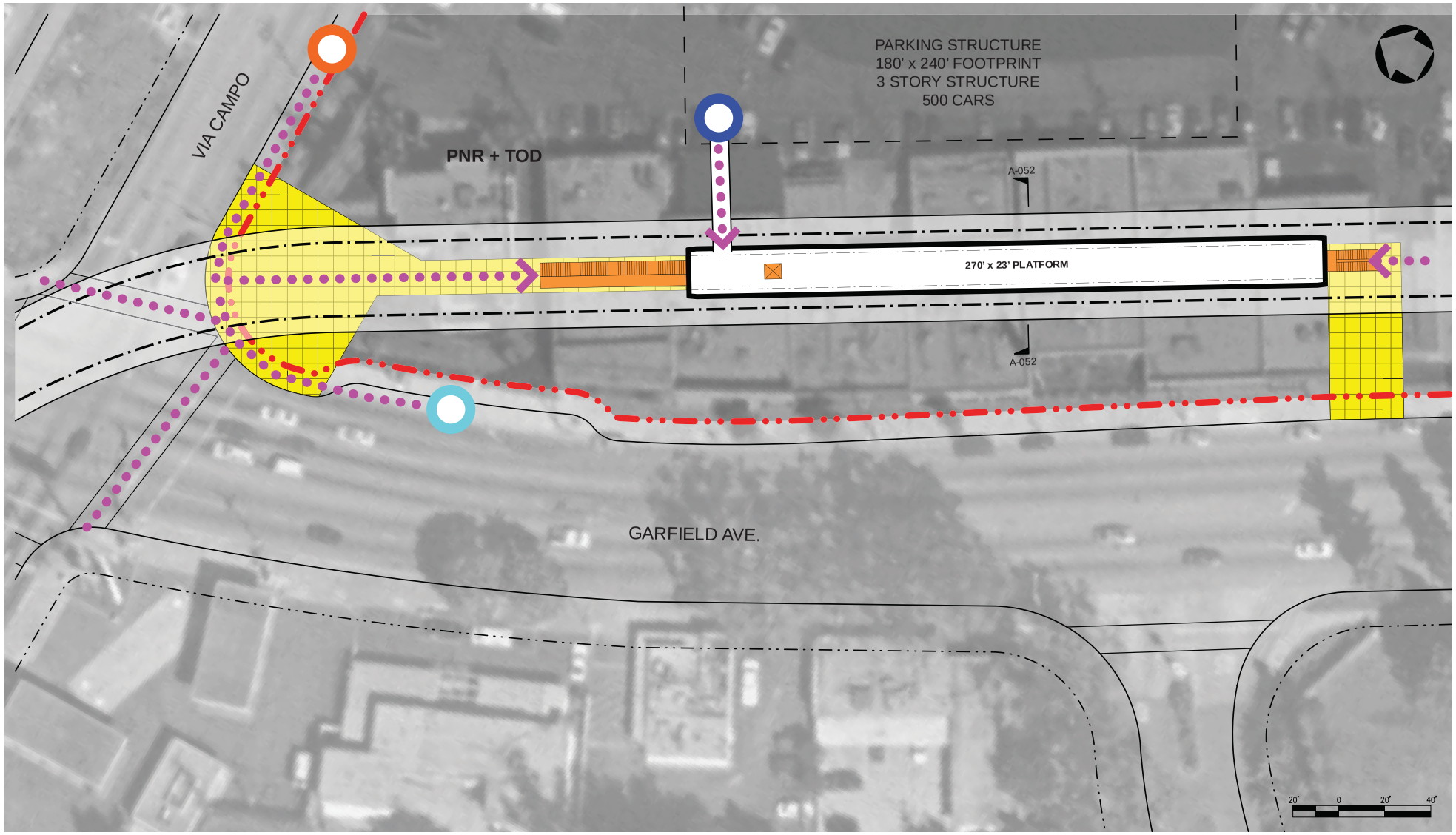
DESIGNED BY S. ARAIN
DRAWN BY J. VARIAS
CHECKED BY B. BALDERRAMA
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD
SECTIONS
SHEET 19 OF 19

CONTRACT NO PS4320-2003
DRAWING NO S-069 REV 0
SCALE NO SCALE
SHEET NO

DATE PLOTTED = 10/23/2009 11:39:43 AM
PLOT DRIVER = PDF-mono14.pc3
PEN TABLE = MTA_A.ctb
USER=arains 11:39:43 AM 10/23/2009 w:\60039033_eastside2_la_part1_2\cadd\civil\sheet\S-069.dwg



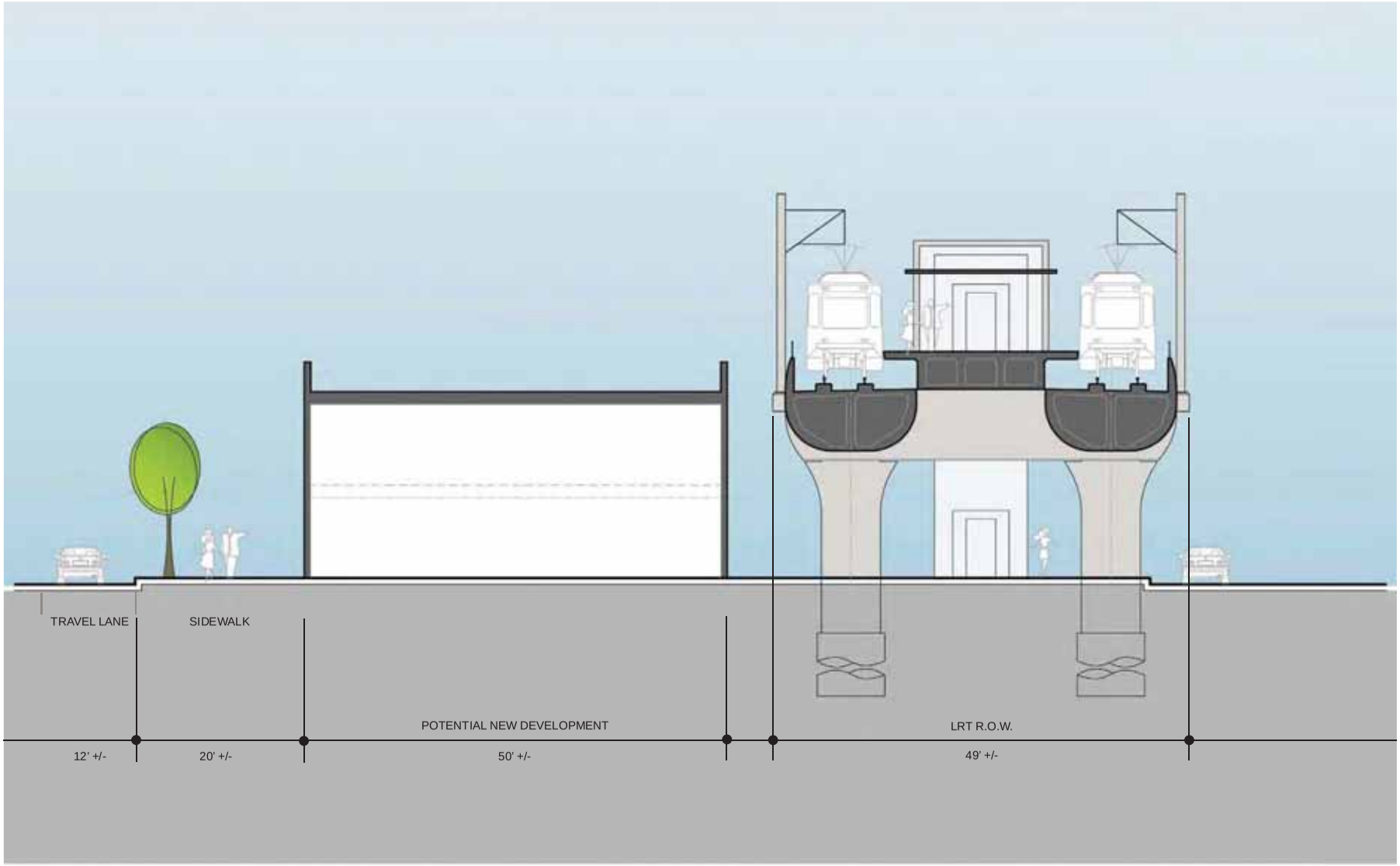
REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. SCHWARZKOPF
DRAWN BY S. GODKIN
CHECKED BY S. SCHWARZKOPF
IN CHARGE V. DAVIES
DATE 06/29/09

Metro
Metropolitan Transportation Authority
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD.
GARFIELD AVE. STATION
LOCATION PLAN

CONTRACT NO PS4320-2003
DRAWING NO A-051
REV 0
SCALE 1⊠ = 40⊠
SHEET NO



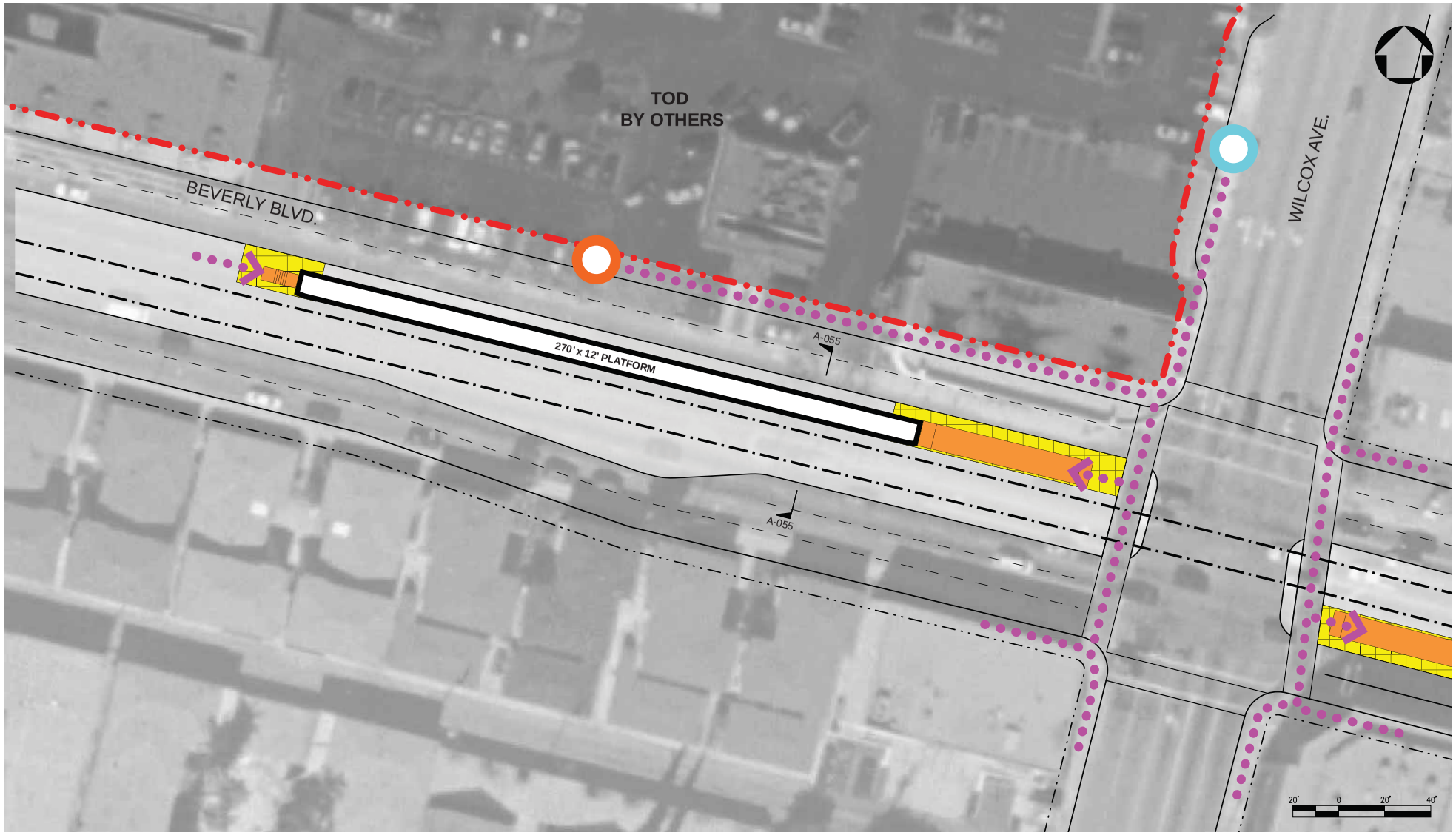
REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. SCHWARZKOPF
DRAWN BY S. GODKIN
CHECKED BY S. SCHWARZKOPF
IN CHARGE V. DAVIES
DATE 06/29/09

Metro
Metropolitan Transportation Authority
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD.
GARFIELD AVE. STATION
SECTION

CONTRACT NO PS4320-2003
DRAWING NO A-052
REV 0
SCALE NO SCALE
SHEET NO



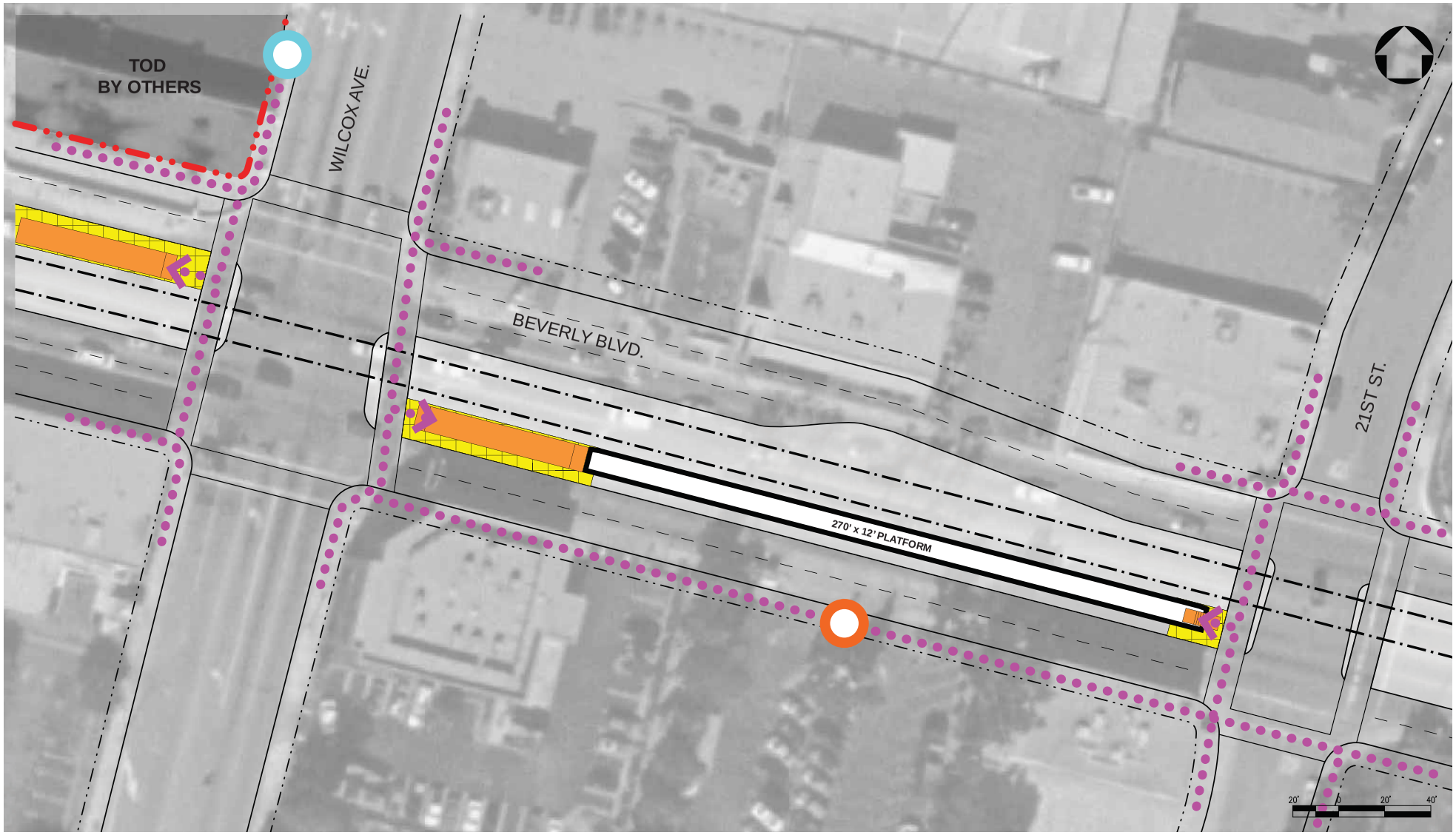
REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. SCHWARZKOPF
DRAWN BY S. GODKIN
CHECKED BY S. SCHWARZKOPF
IN CHARGE V. DAVIES
DATE 06/29/09

Metro
Metropolitan Transportation Authority
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD.
WILCOX AVE. STATION
LOCATION PLAN 1 OF 2

CONTRACT NO PS4320-2003
DRAWING NO A-053
REV 0
SCALE 1⊠ = 40⊠
SHEET NO



REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

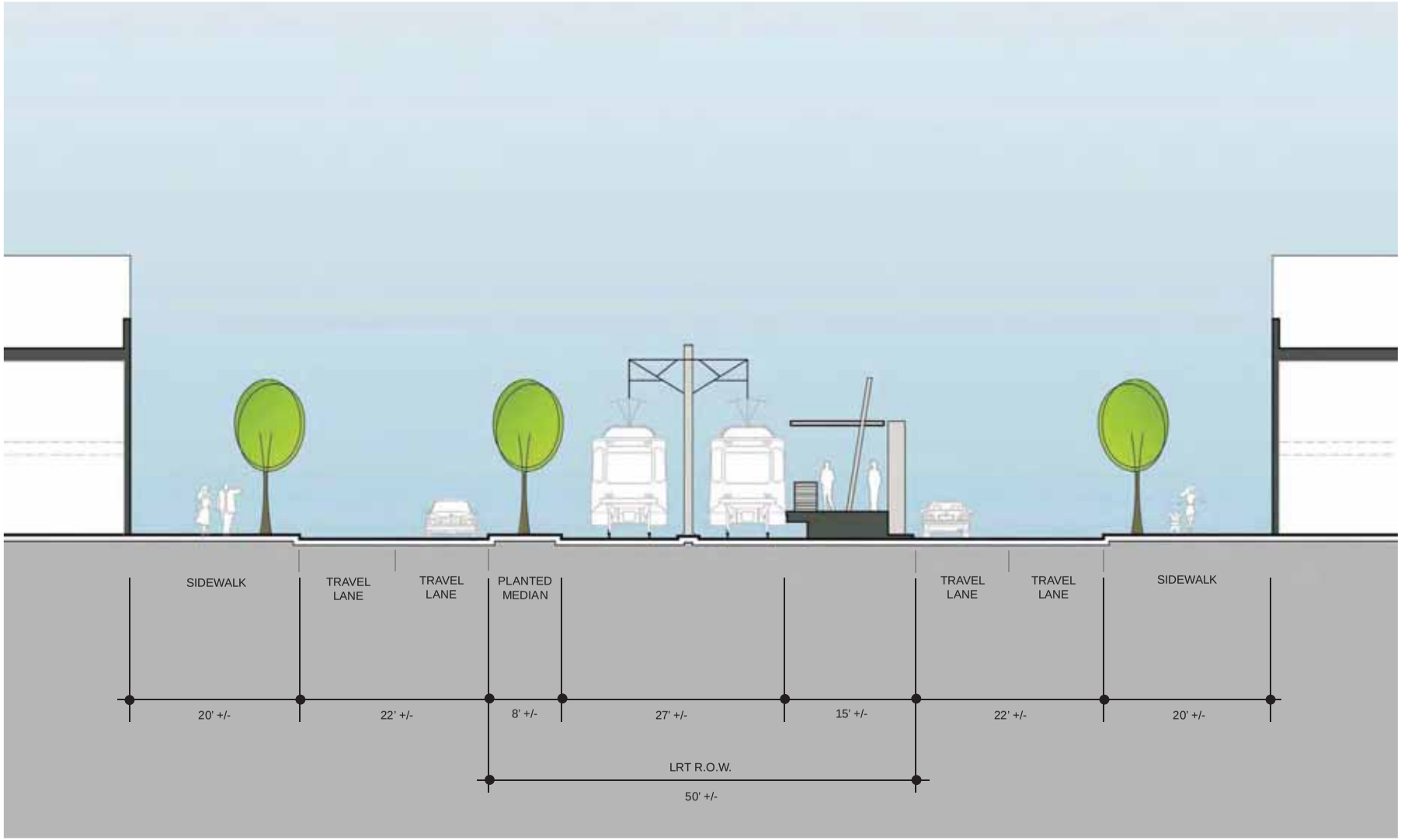
DESIGNED BY S. SCHWARZKOPF
DRAWN BY S. GODKIN
CHECKED BY S. SCHWARZKOPF
IN CHARGE V. DAVIES
DATE 06/29/09

Metro
Metropolitan Transportation Authority

CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD.
WILCOX AVE. STATION
LOCATION PLAN 2 OF 2

CONTRACT NO PS4320-2003
DRAWING NO A-054
REV 0
SCALE 1⊠ = 40⊠
SHEET NO



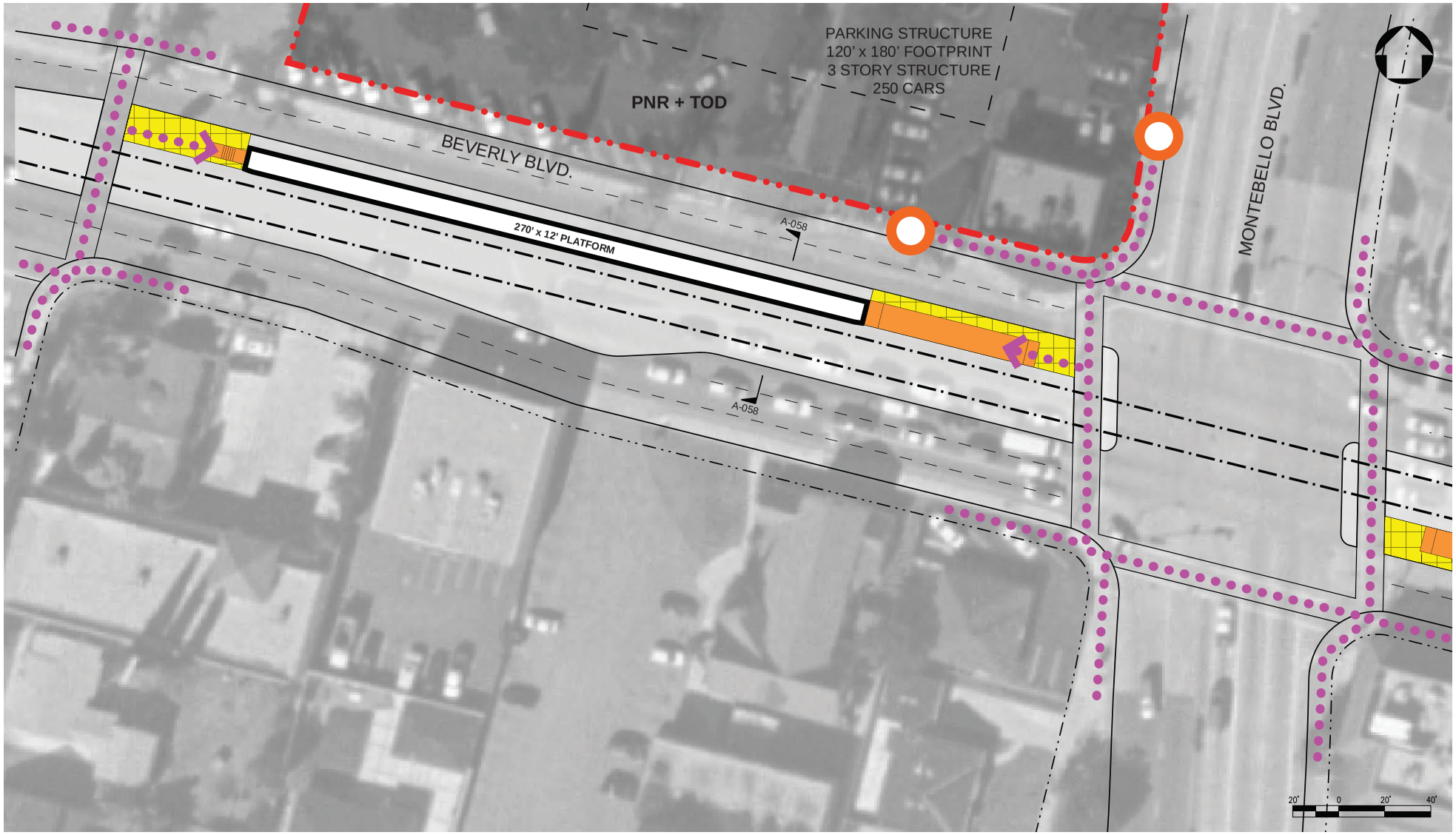
REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. SCHWARZKOPF
DRAWN BY S. GODKIN
CHECKED BY S. SCHWARZKOPF
IN CHARGE V. DAVIES
DATE 06/29/09

Metro
Metropolitan Transportation Authority
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD.
WILCOX AVE. STATION
SECTION

CONTRACT NO PS4320-2003
DRAWING NO A-055
REV 0
SCALE NO SCALE
SHEET NO



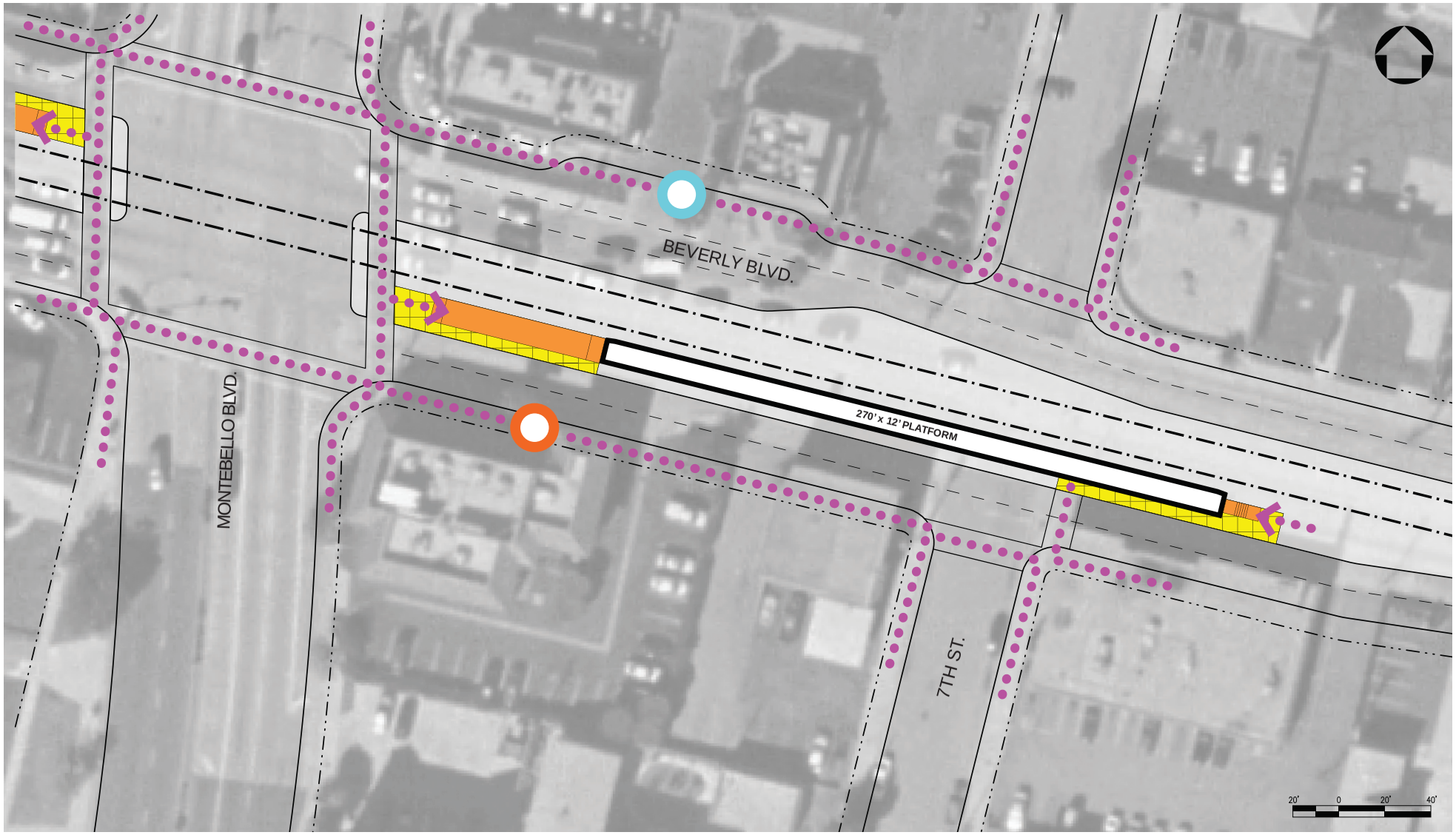
REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. SCHWARZKOPF
DRAWN BY S. GODKIN
CHECKED BY S. SCHWARZKOPF
IN CHARGE V. DAVIES
DATE 06/29/09

Metro
Metropolitan Transportation Authority
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD.
MONTEBELLO BLVD. STATION
LOCATION PLAN 1 OF 2

CONTRACT NO PS4320-2003
DRAWING NO A-056
REV 0
SCALE 1⊠= 40⊠
SHEET NO



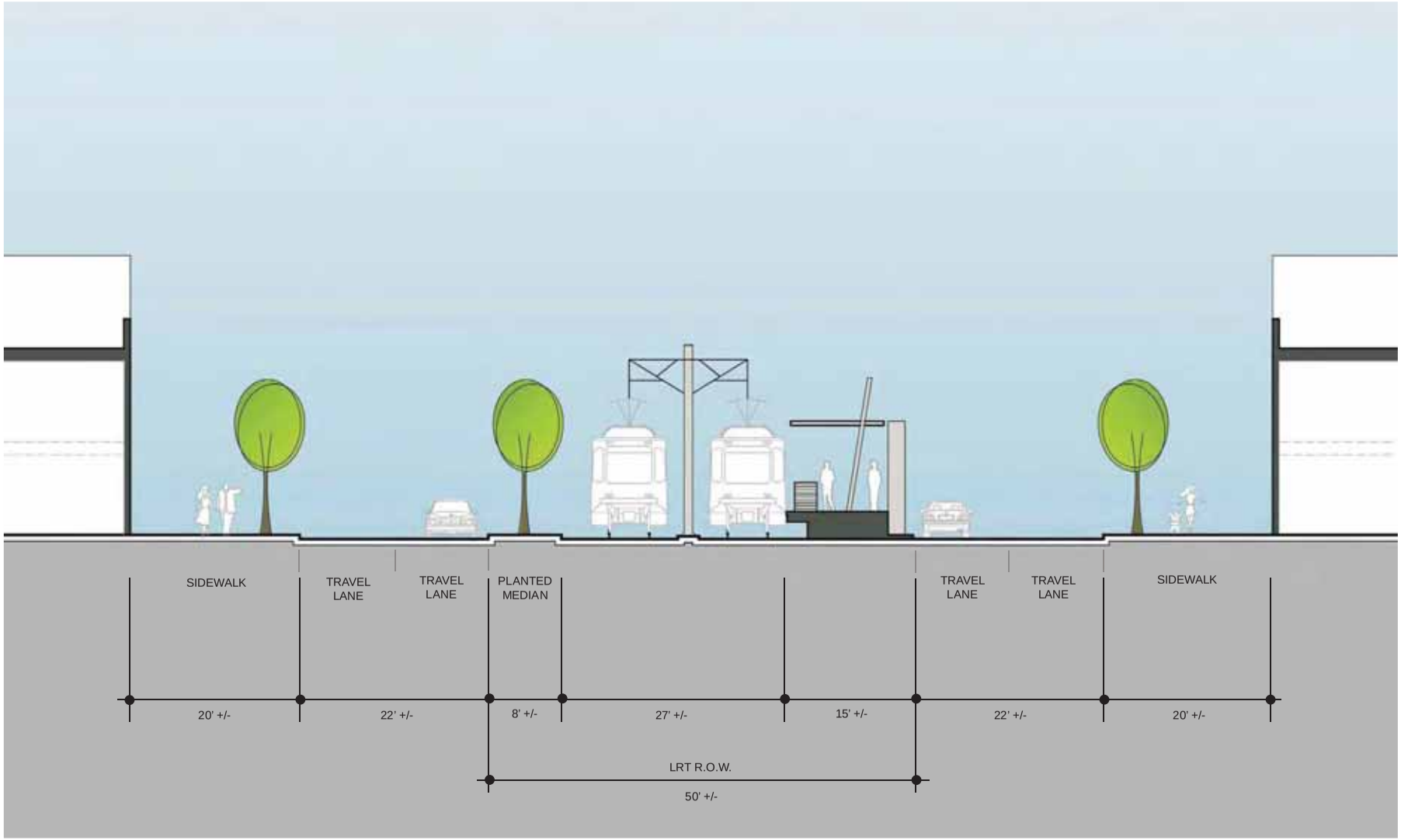
REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. SCHWARZKOPF
DRAWN BY S. GODKIN
CHECKED BY S. SCHWARZKOPF
IN CHARGE V. DAVIES
DATE 06/29/09

Metro
Metropolitan Transportation Authority
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD.
MONTEBELLO BLVD. STATION
LOCATION PLAN 2 OF 2

CONTRACT NO PS4320-2003
DRAWING NO A-057
REV 0
SCALE 1⊠= 40⊠
SHEET NO



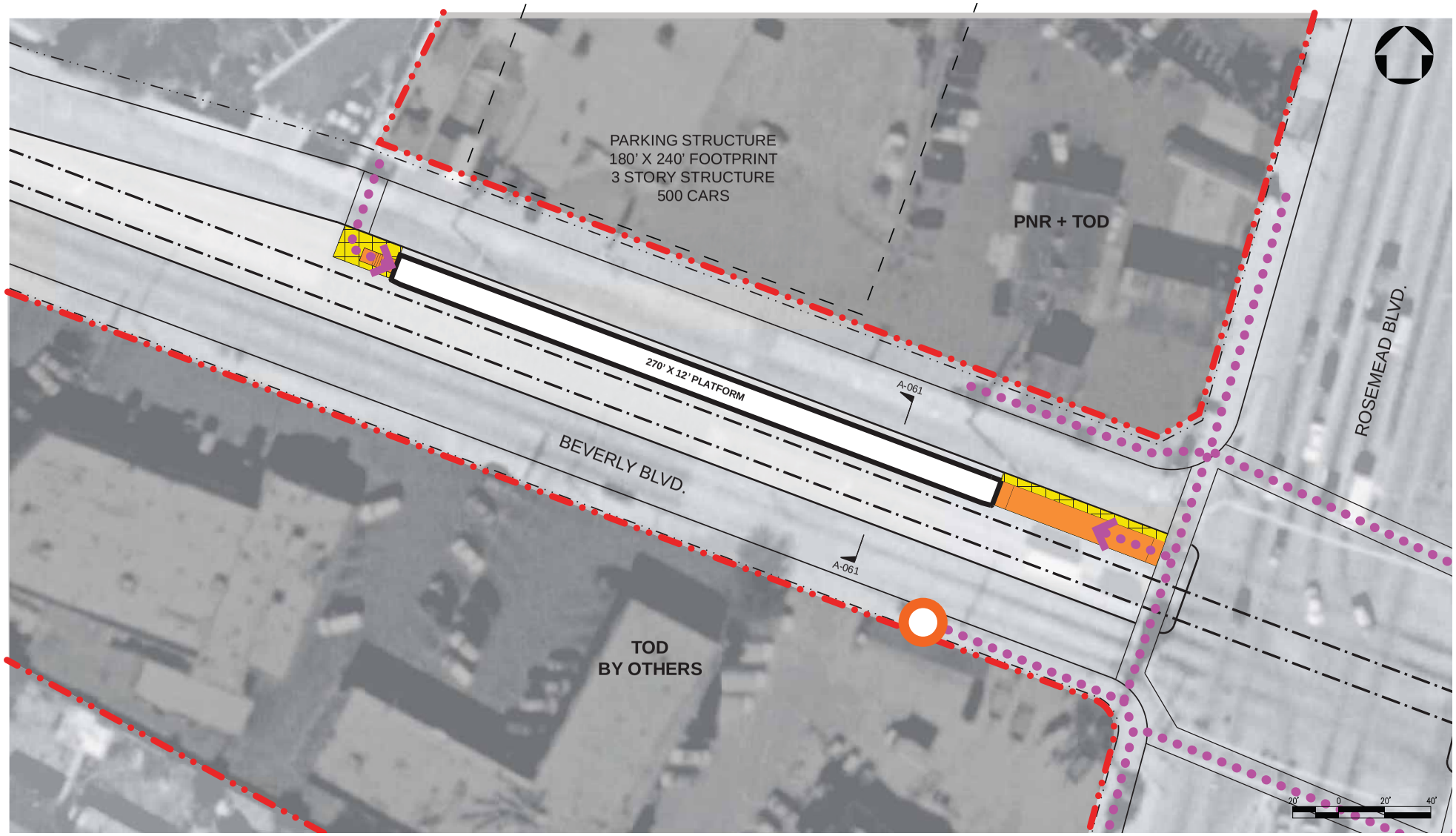
REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. SCHWARZKOPF
DRAWN BY S. GODKIN
CHECKED BY S. SCHWARZKOPF
IN CHARGE V. DAVIES
DATE 06/29/09

Metro
Metropolitan Transportation Authority
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD.
MONTEBELLO BLVD. STATION
SECTION

CONTRACT NO PS4320-2003
DRAWING NO A-058
REV 0
SCALE NO SCALE
SHEET NO



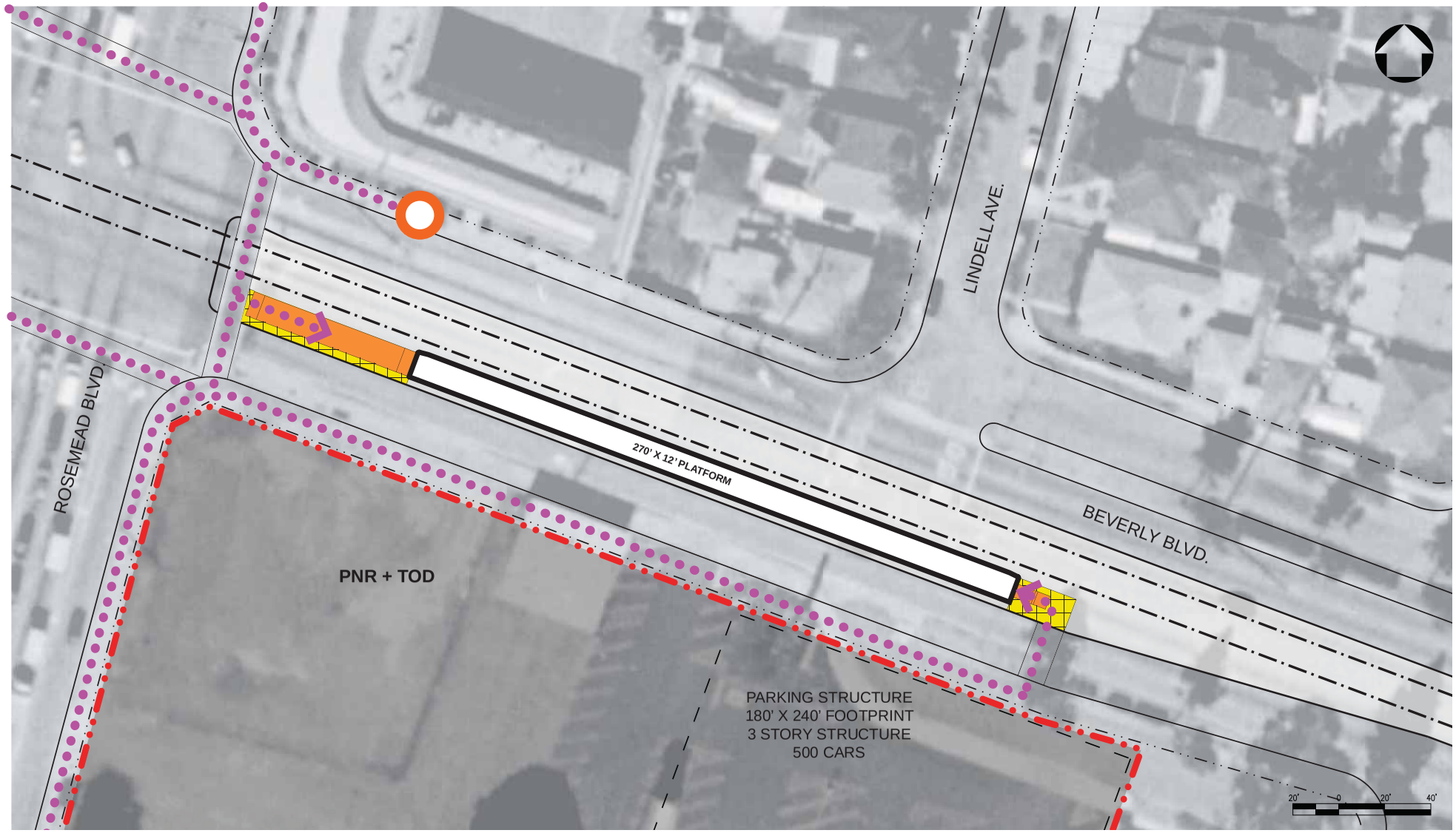
REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY R. ESCOBEDO
DRAWN BY L. VAZQUEZ
CHECKED BY L. CHAVEZ
IN CHARGE F. VILLALOBOS
DATE 06/29/09

Metro
Metropolitan Transportation Authority
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD.
ROSEMEAD BLVD. STATION
LOCATION PLAN 1 OF 2

CONTRACT NO PS4320-2003
DRAWING NO A-059
REV 0
SCALE 1⊠= 40⊠
SHEET NO



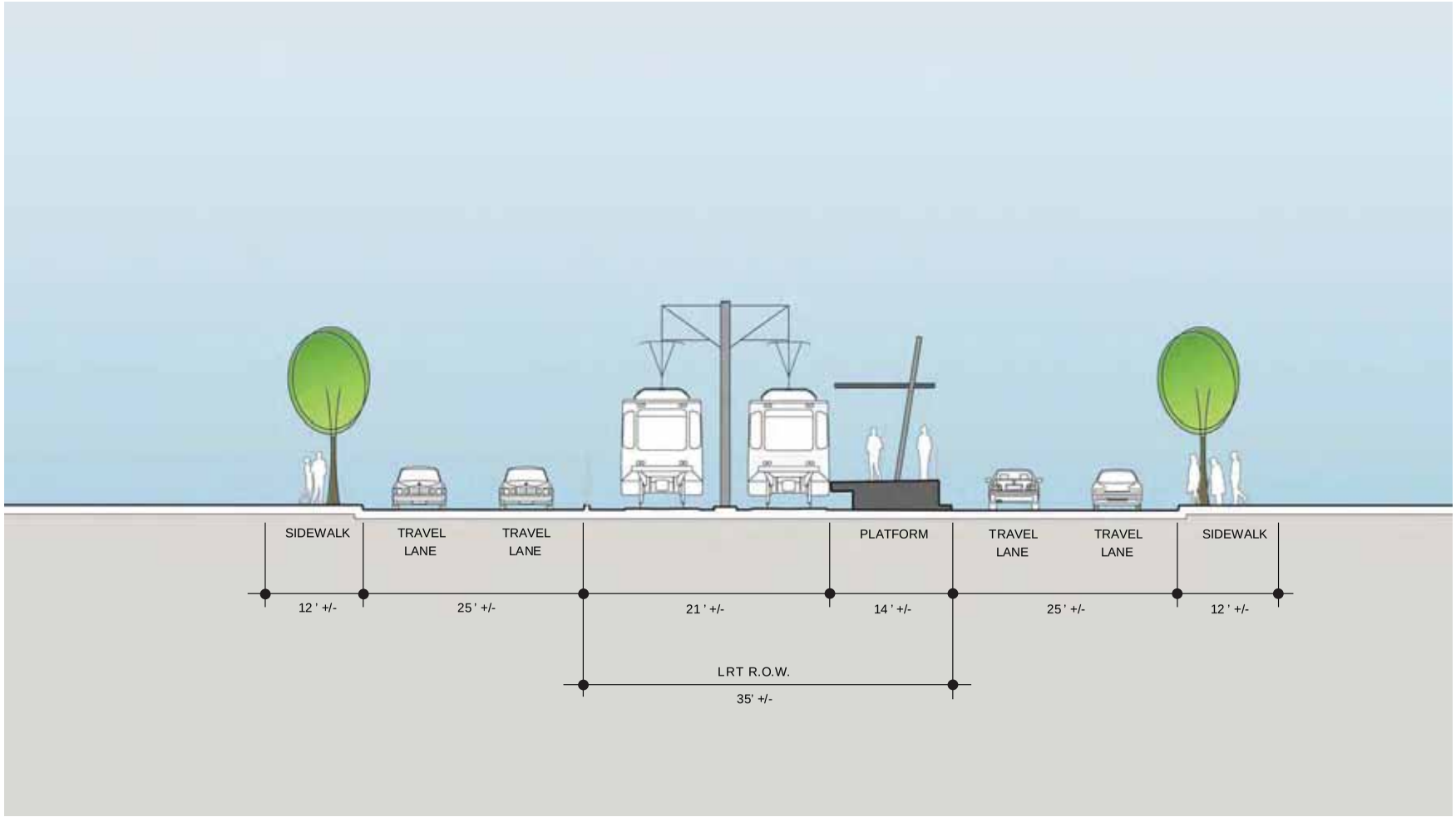
REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY R. ESCOBEDO
DRAWN BY L. VAZQUEZ
CHECKED BY L. CHAVEZ
IN CHARGE F. VILLALOBOS
DATE 06/29/09

Metro
Metropolitan Transportation Authority
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD.
ROSEMEAD BLVD. STATION
LOCATION PLAN 2 OF 2

CONTRACT NO PS4320-2003
DRAWING NO A-060
REV 0
SCALE 1⊠= 40⊠
SHEET NO



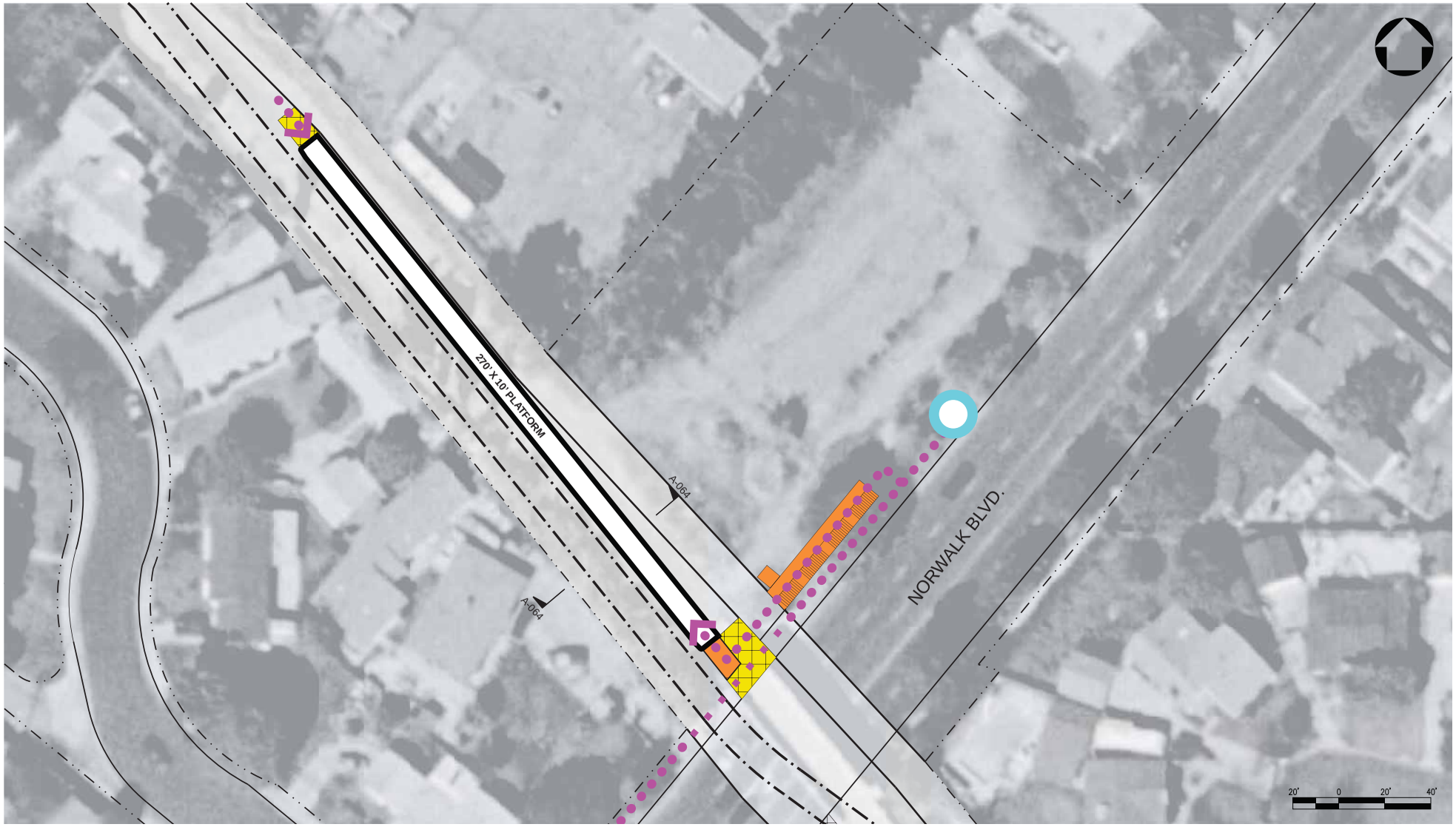
REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY R. ESCOBEDO
DRAWN BY L. VAZQUEZ
CHECKED BY L. CHAVEZ
IN CHARGE F. VILLALOBOS
DATE 06/29/09

Metro
Metropolitan Transportation Authority
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD.
ROSEMEAD BLVD. STATION
SECTION

CONTRACT NO PS4320-2003
DRAWING NO A-061
REV 0
SCALE NO SCALE
SHEET NO



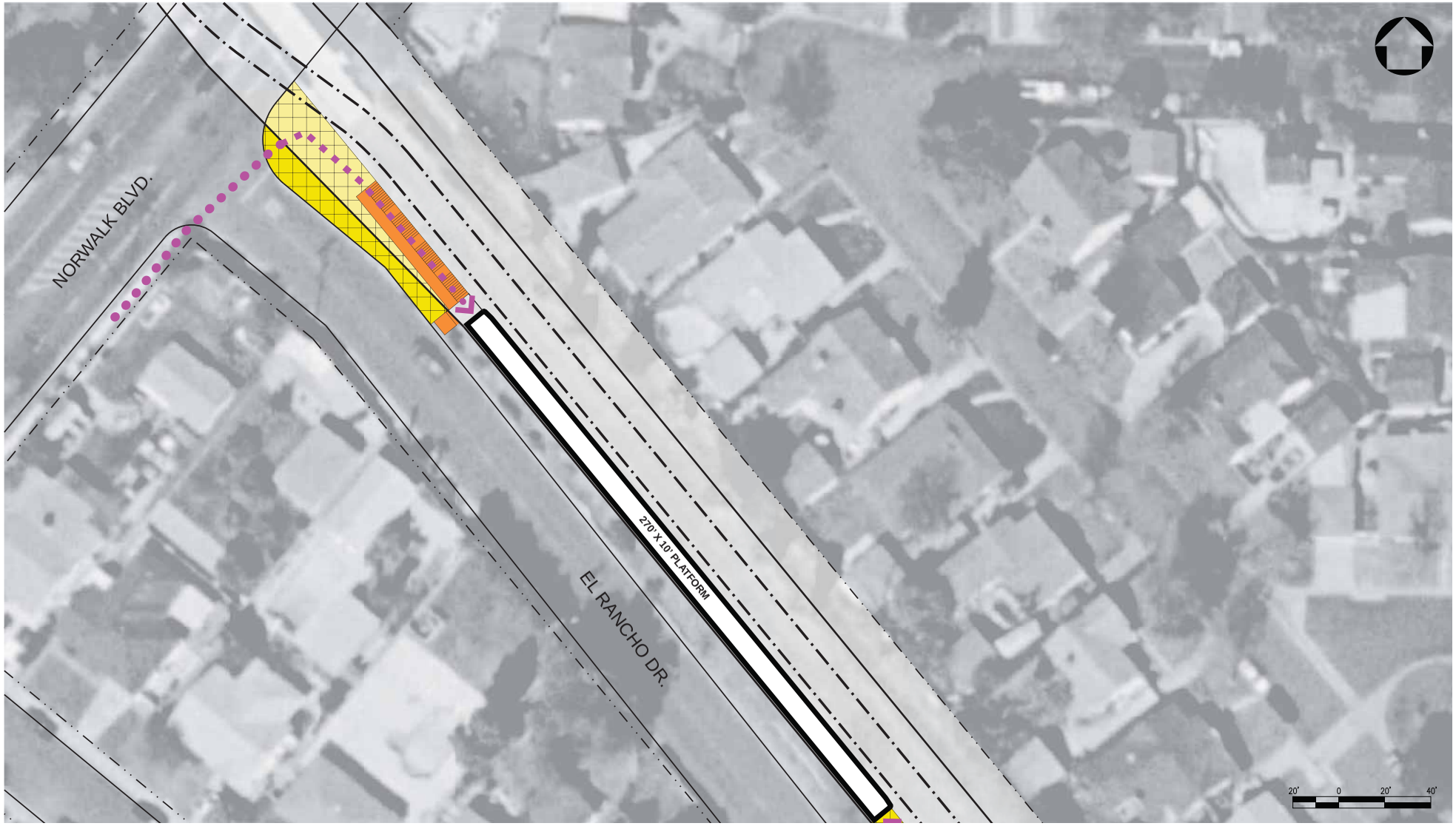
REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY R. ESCOBEDO
DRAWN BY L. VAZQUEZ
CHECKED BY L. CHAVEZ
IN CHARGE F. VILLALOBOS
DATE 06/29/09

Metro
Metropolitan Transportation Authority
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD.
NORWALK AVE. STATION
LOCATION PLAN 1 OF 2

CONTRACT NO PS4320-2003
DRAWING NO A-062
REV 0
SCALE 1⊠= 40⊠
SHEET NO



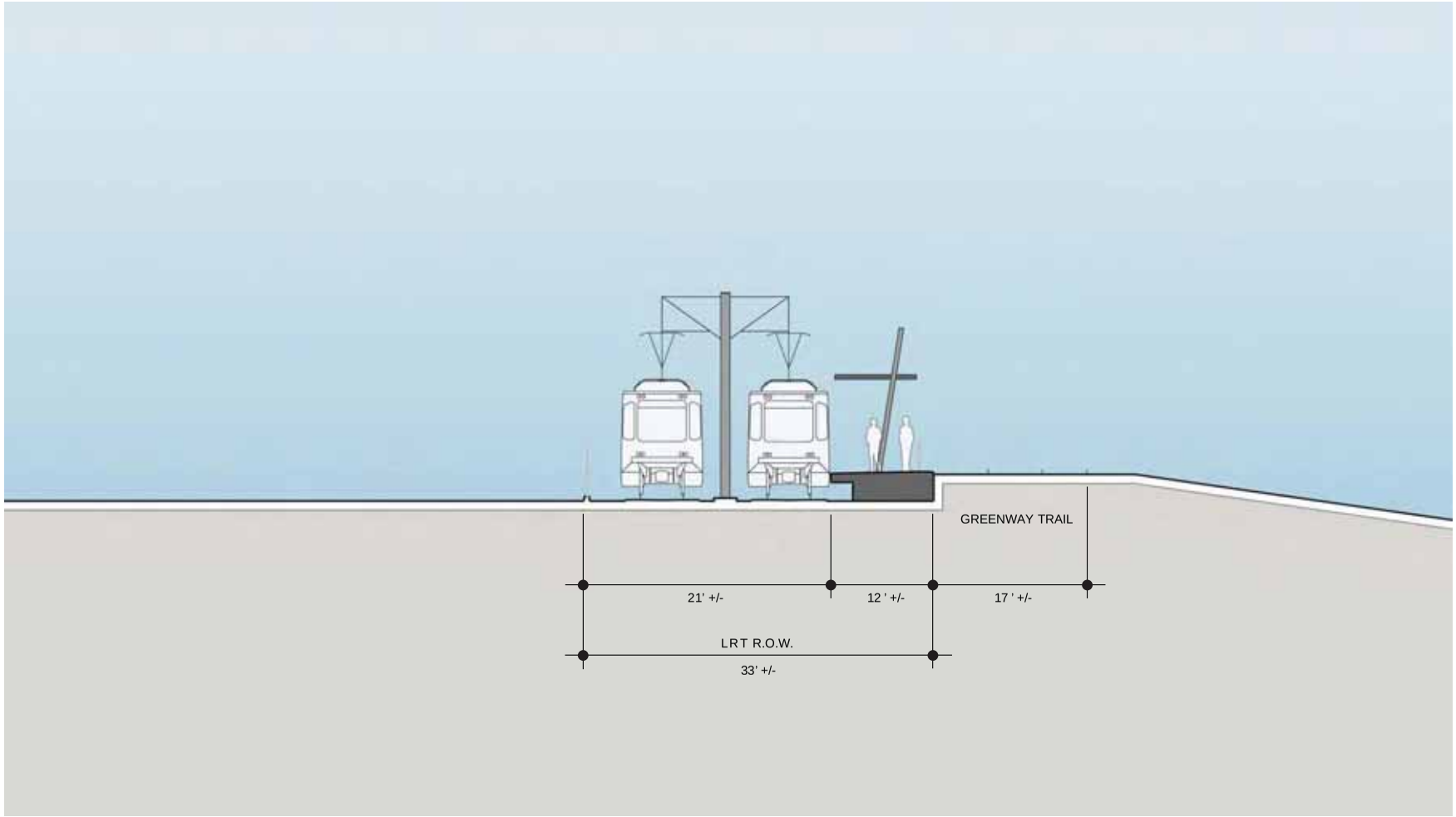
REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY R. ESCOBEDO
DRAWN BY L. VAZQUEZ
CHECKED BY L. CHAVEZ
IN CHARGE F. VILLALOBOS
DATE 06/29/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD.
NORWALK AVE. STATION
LOCATION PLAN 2 OF 2

CONTRACT NO PS4320-2003
DRAWING NO A-063
REV 0
SCALE 1⊠= 40⊠
SHEET NO



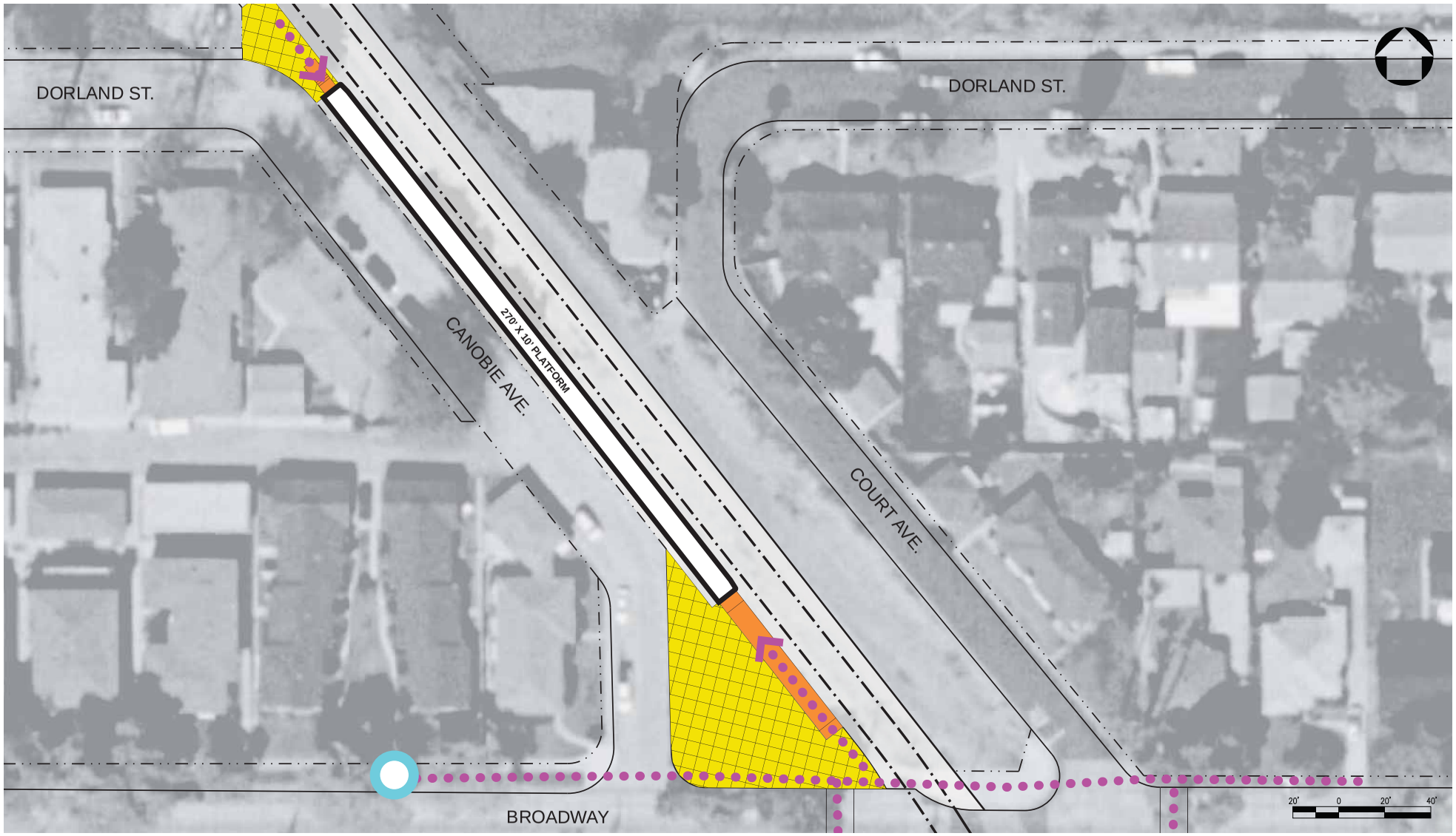
REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY R. ESCOBEDO
DRAWN BY L. VAZQUEZ
CHECKED BY L. CHAVEZ
IN CHARGE F. VILLALOBOS
DATE 06/29/09

Metro
Metropolitan Transportation Authority
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD.
NORWALK AVE. STATION
SECTION

CONTRACT NO PS4320-2003
DRAWING NO A-064
REV 0
SCALE NO SCALE
SHEET NO



REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY R. ESCOBEDO
DRAWN BY L. VAZQUEZ
CHECKED BY L. CHAVEZ
IN CHARGE F. VILLALOBOS
DATE 06/29/09

Metro
Metropolitan Transportation Authority
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD.
BROADWAY STATION
LOCATION PLAN 1 OF 2

CONTRACT NO PS4320-2003
DRAWING NO A-065
REV 0
SCALE 1⊠= 40⊠
SHEET NO

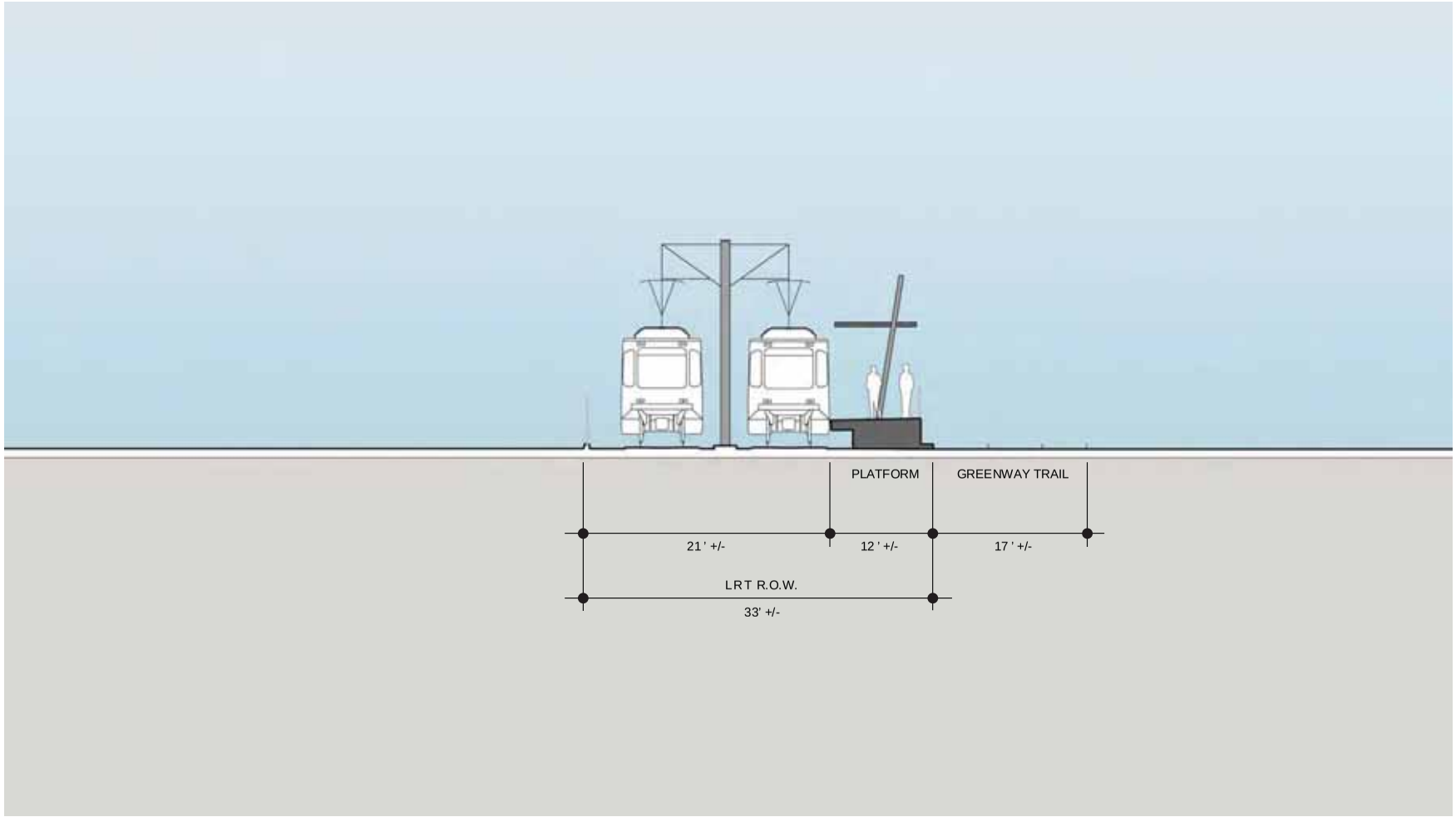
REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY R. ESCOBEDO
DRAWN BY L. VAZQUEZ
CHECKED BY L. CHAVEZ
IN CHARGE F. VILLALOBOS
DATE 06/29/09

Metro
Metropolitan Transportation Authority
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD.
BROADWAY STATION
LOCATION PLAN 2 OF 2

CONTRACT NO PS4320-2003
DRAWING NO A-066
REV 0
SCALE 1⊠= 40⊠
SHEET NO



REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY R. ESCOBEDO
DRAWN BY L. VAZQUEZ
CHECKED BY L. CHAVEZ
IN CHARGE F. VILLALOBOS
DATE 06/29/09

Metro
Metropolitan Transportation Authority
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD.
BROADWAY STATION
SECTION

CONTRACT NO PS4320-2003
DRAWING NO A-067
REV 0
SCALE NO SCALE
SHEET NO

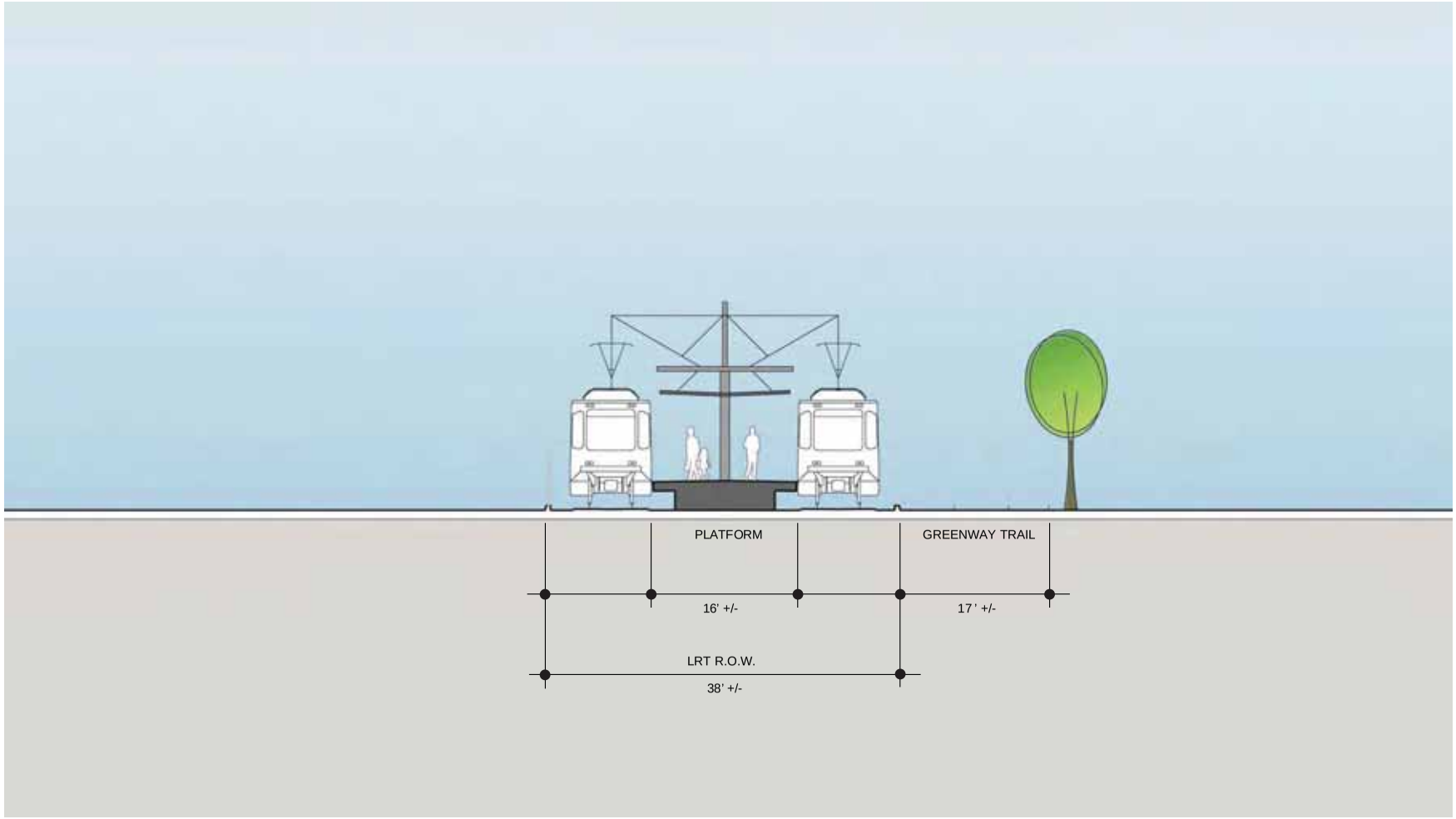
REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY R. ESCOBEDO
DRAWN BY L. VAZQUEZ
CHECKED BY L. CHAVEZ
IN CHARGE F. VILLALOBOS
DATE 06/29/09

Metro
Metropolitan Transportation Authority
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD.
PHILADELPHIA ST. STATION
LOCATION PLAN

CONTRACT NO PS4320-2003
DRAWING NO A-068
REV 0
SCALE 1⊠= 40⊠
SHEET NO



REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

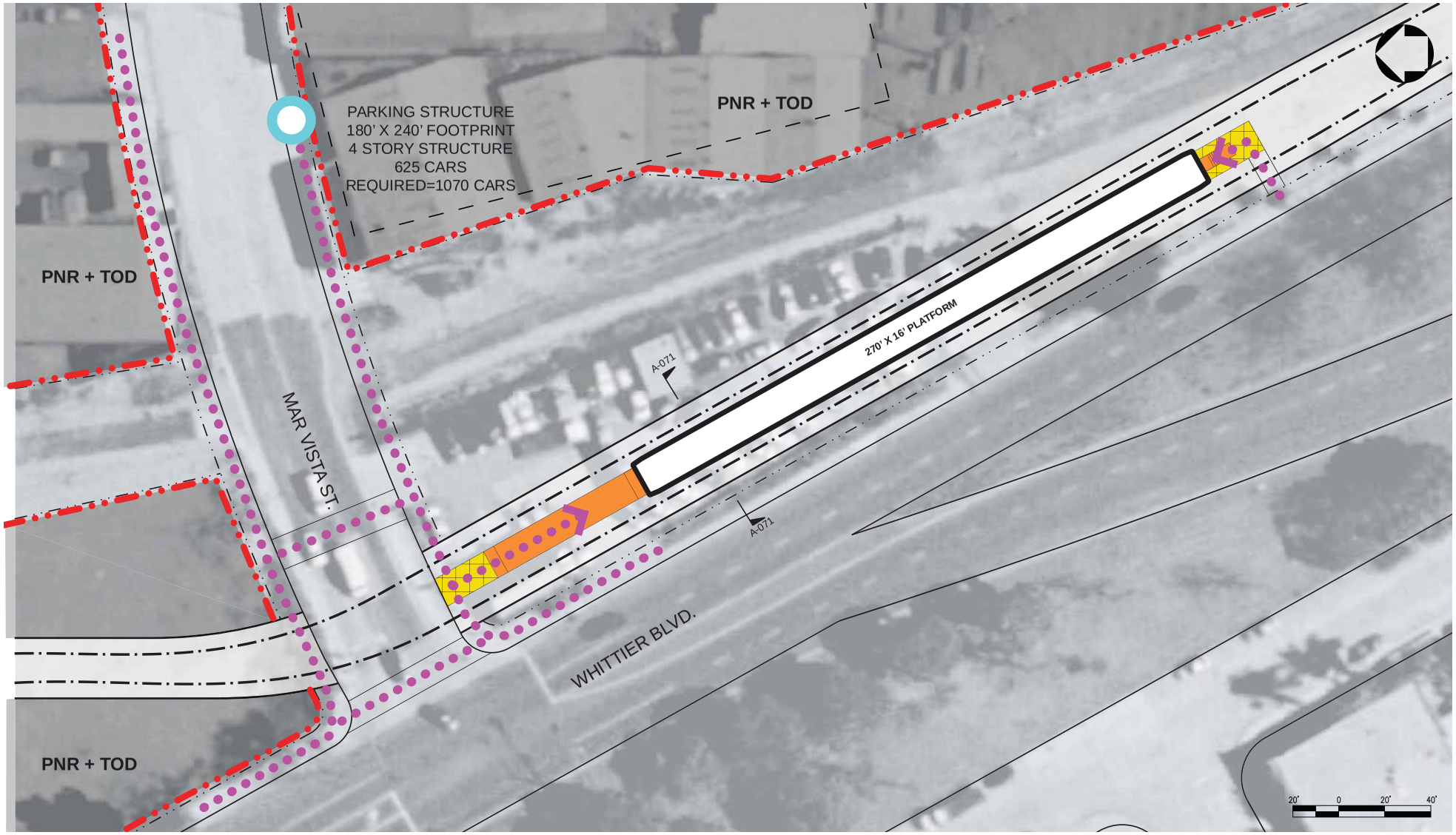
DESIGNED BY R. ESCOBEDO
DRAWN BY L. VAZQUEZ
CHECKED BY L. CHAVEZ
IN CHARGE F. VILLALOBOS
DATE 06/29/09

Metro
Metropolitan Transportation Authority

CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD.
PHILADELPHIA ST. STATION
SECTION

CONTRACT NO PS4320-2003
DRAWING NO A-069
REV 0
SCALE NO SCALE
SHEET NO



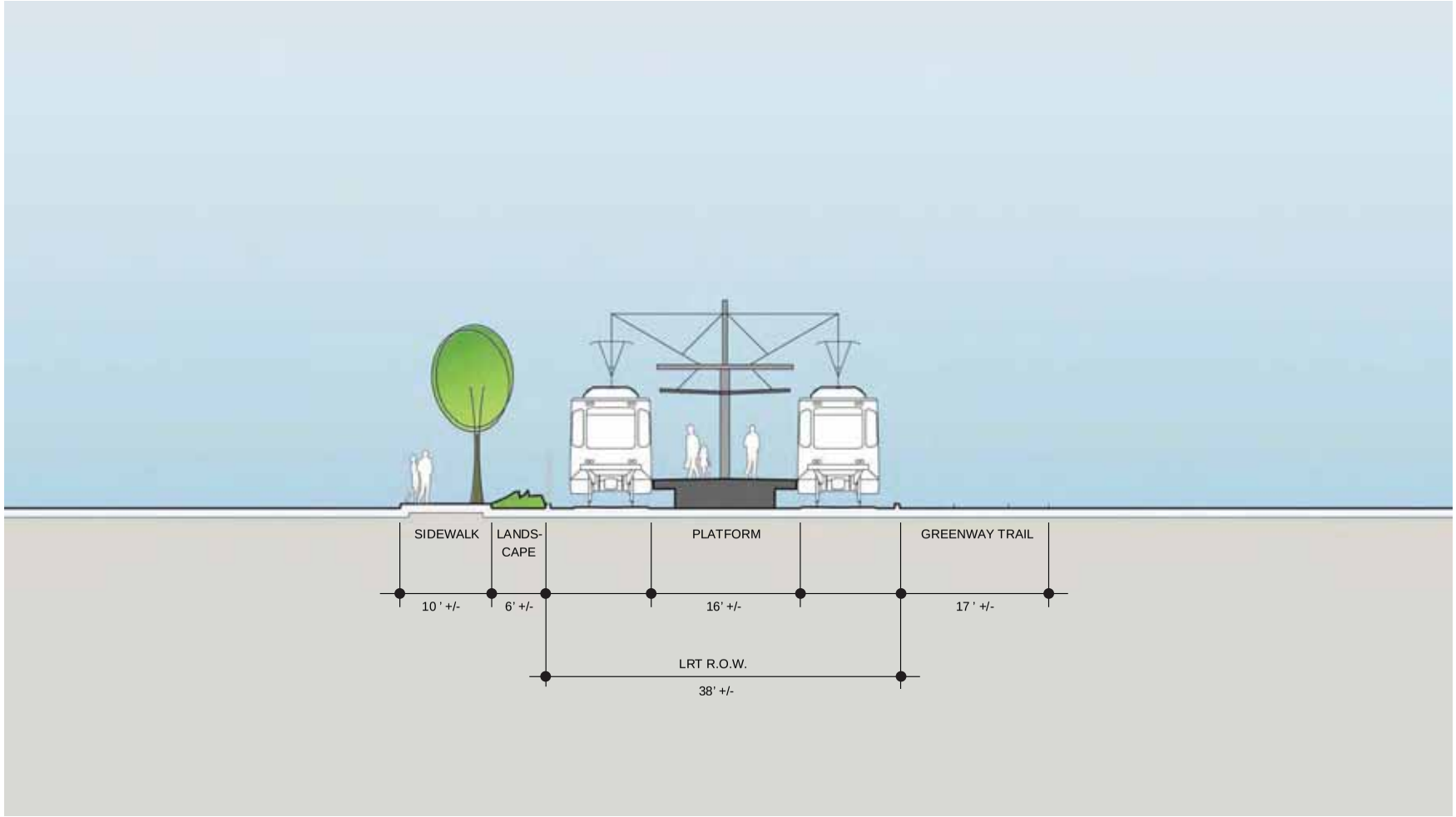
REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY R. ESCOBEDO
DRAWN BY L. VAZQUEZ
CHECKED BY L. CHAVEZ
IN CHARGE F. VILLALOBOS
DATE 06/29/09

Metro
Metropolitan Transportation Authority
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD.
MAR VISTA ST. STATION
LOCATION PLAN

CONTRACT NO PS4320-2003
DRAWING NO A-070
REV 0
SCALE 1⊠= 40⊠
SHEET NO



REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY R. ESCOBEDO
DRAWN BY L. VAZQUEZ
CHECKED BY L. CHAVEZ
IN CHARGE F. VILLALOBOS
DATE 06/29/09

Metro
Metropolitan Transportation Authority
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD.
MAR VISTA ST. STATION
SECTION

CONTRACT NO PS4320-2003
DRAWING NO A-071
REV 0
SCALE NO SCALE
SHEET NO

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD / WHITTIER BLVD
(BEVERLY/MONTEBELLO/WHITTIER)
ALIGNMENT
SHEET 1 OF 18

CONTRACT NO PS4320-2003
DRAWING NO T-101
REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 12:03:36 PM
PLOT DRIVER = Raster-half-pdf.plt
PEN TABLE = MTA-HI-COLOR.tbl

USER=arains 12:03:36 PM 10/23/2009 w:\60039033_eastside2_to_part_2\cadd\rail\sheet\CET-101.plg

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD / WHITTIER BLVD
(BEVERLY/MONTEBELLO/WHITTIER)
ALIGNMENT
SHEET 2 OF 18

CONTRACT NO PS4320-2003
DRAWING NO T-102
REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 12:03:57 PM
PLOT DRIVER = Raster-half-pdf.plt
PEN TABLE = MTA-H-COLOR.tbl

USER=arains 12:03:57 PM 10/23/2009 w:\60039033_eastside2_to_part_2\cadd\rail\sheet\CET-102.plg

HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro

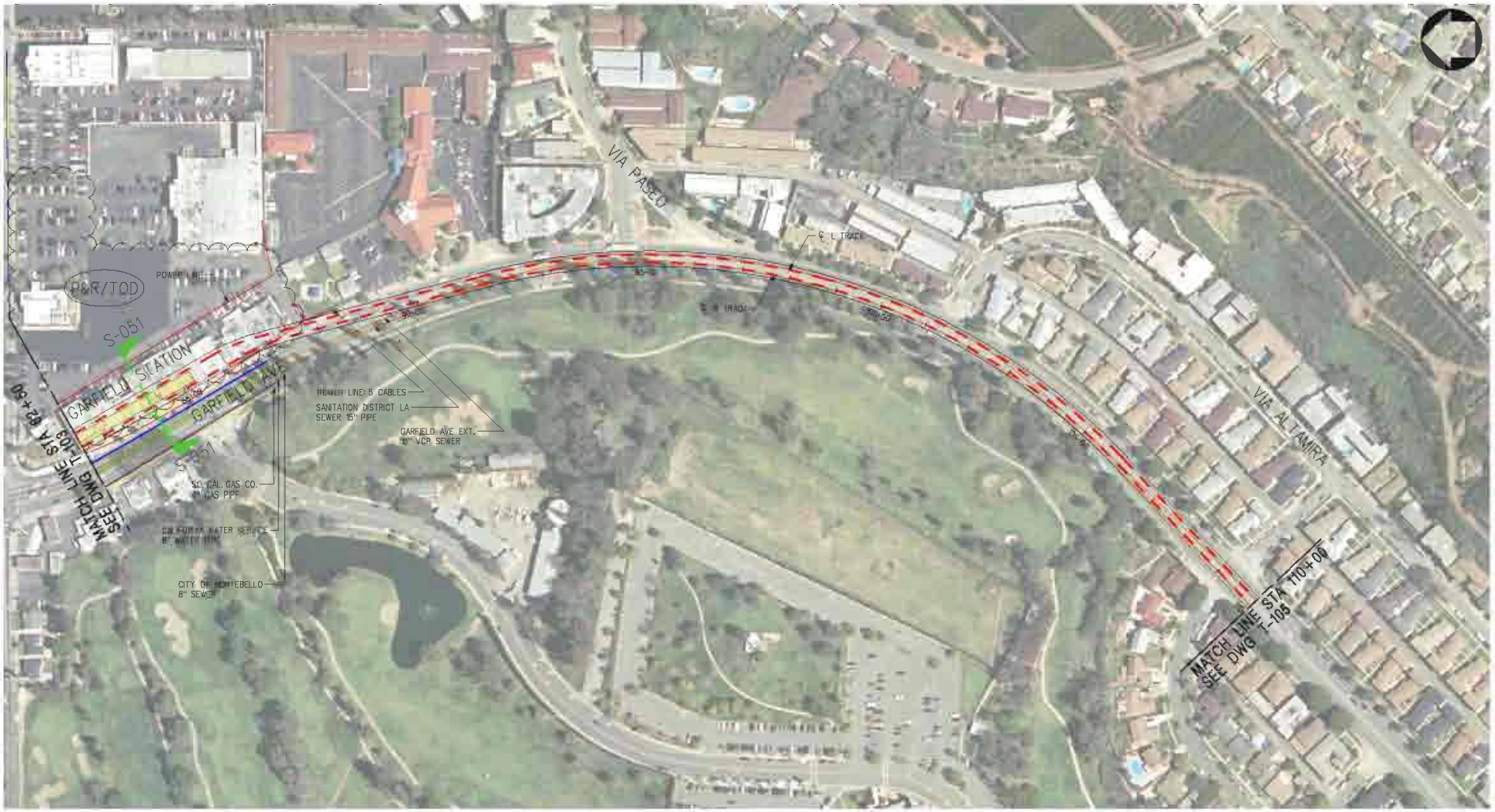
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD / WHITTIER BLVD
(BEVERLY/MONTEBELLO/WHITTIER)
ALIGNMENT
SHEET 3 OF 18

CONTRACT NO PS4320-2003
DRAWING NO T-103
REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 12:04:18 PM
PLOT DRIVER = Raster-half.pdf.plt
PENTABLE = MTA-H-COLOR.tbl

USER=arains 12:04:18 PM 10/23/2009 w:\60039033_eastside2_to_part_2\cadd\rail\sheet\CET-103.plg



HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD / WHITTIER BLVD
(BEVERLY/MONTEBELLO/WHITTIER)
ALIGNMENT
SHEET 4 OF 18

CONTRACT NO PS4320-2003
DRAWING NO T-104
REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 12:04:38 PM
PLOT DRIVER = Raster-half.pdf.plt
PENT TABLE = MTA-H-COLOR.tbl

USER=arains 12:04:38 PM 10/23/2009 w:\60039033_eastside2_to_par1_2\cadd\rail\sheet\CET-104.plg

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD / WHITTIER BLVD
(BEVERLY/MONTEBELLO/WHITTIER)
ALIGNMENT
SHEET 5 OF 18

CONTRACT NO PS4320-2003
DRAWING NO T-105 REV 0
SCALE HORIZ: 1"=100'
SHEET NO

USER-drains 12:05:00 PM 10/23/2009 w:\60039033_eastside2_le_part_2\cadd\roll\sheet\CET-105.plt

PLOT DRIVER = Raster-half_pdf.pltr
PEN TABLE = WA-bl-COLOR.TBL
DATE PLOTTED = 10/23/2009
TIME PLOTTED = 12:05:00 PM

HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

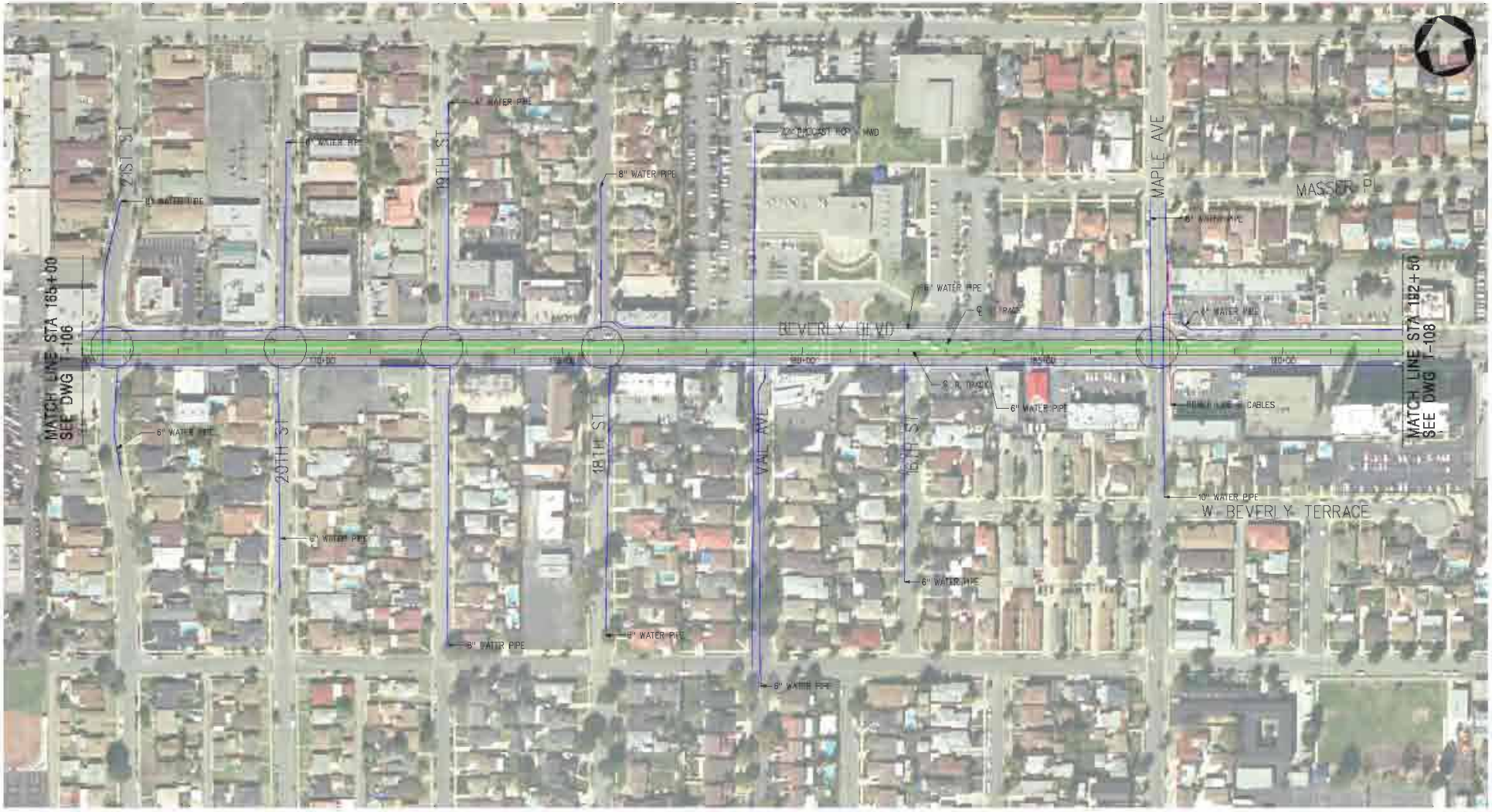
Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD / WHITTIER BLVD
(BEVERLY/MONTEBELLO/WHITTIER)
ALIGNMENT
SHEET 6 OF 18

CONTRACT NO PS4320-2003
DRAWING NO T-106
REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 12:05:23 PM
PLOT DRIVER = Raster.hplf.pdf.plt
PEN TABLE = WA.al.cdot.ctb

12:05:23 PM 10/23/2009 w:\60039033_eastside2_le_part_2\cadd\roll\sheet\CET106.plg
USER-drains



HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD / WHITTIER BLVD
(BEVERLY/MONTEBELLO/WHITTIER)
ALIGNMENT
SHEET 7 OF 18

CONTRACT NO PS4320-2003
DRAWING NO T-107
REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 12:05:44 PM
PLOT DRIVER = Raster.half_pdf.plt
PEN TABLE = WA-J-COLOR.TBL
USER=drains 12:05:44 PM 10/23/2009 w:\60039033_eastside2_ie_part_2\cadd\roll\sheet\CET-107.plg

HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD / WHITTIER BLVD
(BEVERLY/MONTEBELLO/WHITTIER)
ALIGNMENT
SHEET 8 OF 18

CONTRACT NO PS4320-2003
DRAWING NO T-108
REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 12:06:06 PM
PLOT DRIVER = Raster.hcl1f.pdf.plt
PEN TABLE = WA-J-COLOR.TBL
USER=drains 12:06:06 PM 10/23/2009 w:\60039033_eastside2_le_part_2\cadd\roll\sheet\CET108.plg

HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD / WHITTIER BLVD
(BEVERLY/MONTEBELLO/WHITTIER)
ALIGNMENT
SHEET 9 OF 18

CONTRACT NO PS4320-2003
DRAWING NO T-109 REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 12:06:28 PM
PLOT DRIVER = Raster_half_pdf.plt
PEN TABLE = WHA_LCD_CM.TBL

USER=drains 12:06:28 PM 10/23/2009 w:\60039033_eastside2_le_part_2\cadd\roll\sheet\CET-109.plg

HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD / WHITTIER BLVD
(BEVERLY/MONTEBELLO/WHITTIER)
ALIGNMENT
SHEET 10 OF 18

CONTRACT NO PS4320-2003
DRAWING NO T-110
REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 12:06:49 PM
PLOT DRIVER = Raster_half_pdf.plt
PEN TABLE = WHA_BLACK.ctb
USER=drains 12:06:49 PM 10/23/2009 w:\60039033_eastside2_la_part_2\cadd\roll\sheet\CET-110.plg

HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

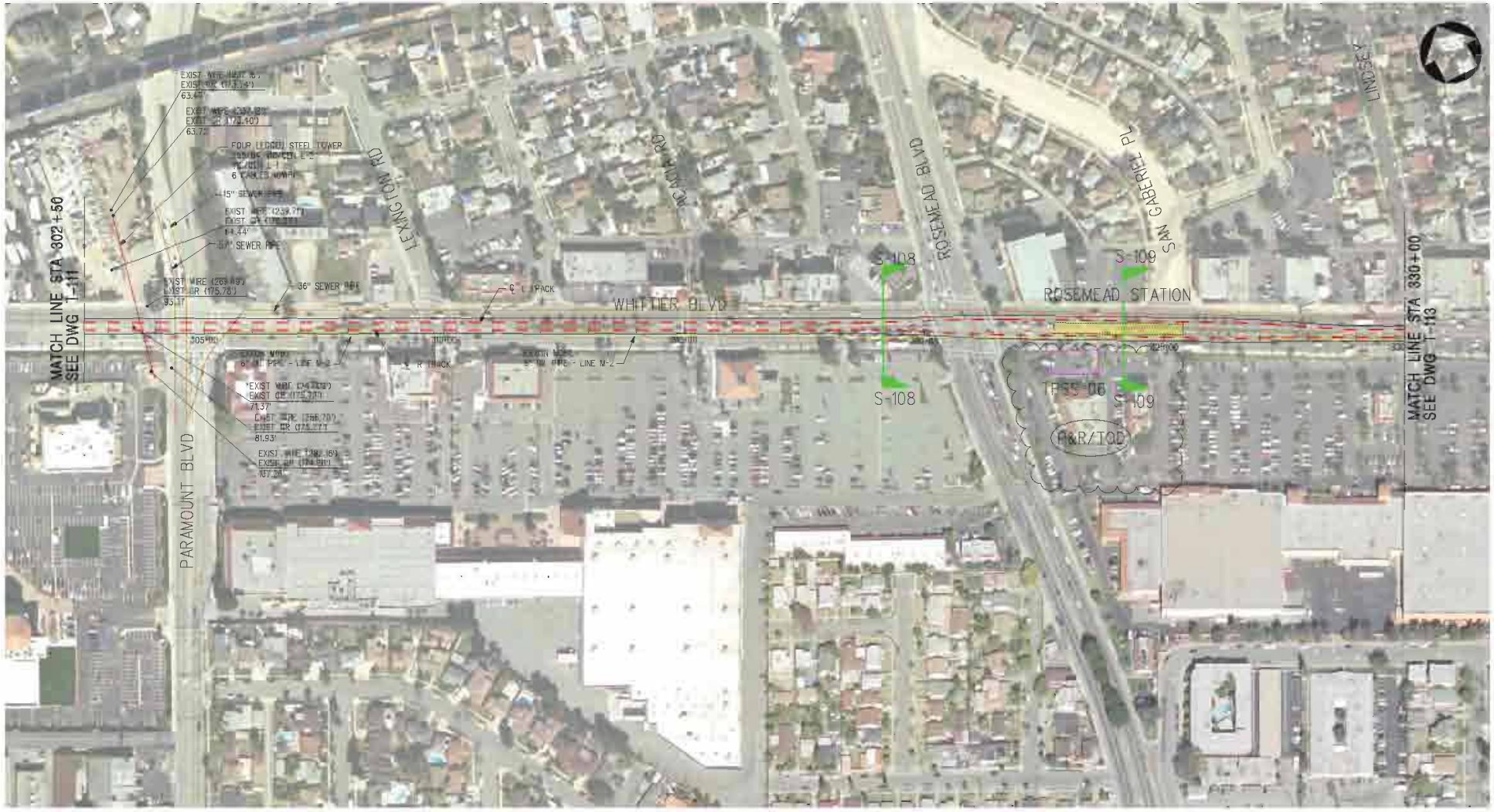
Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD / WHITTIER BLVD
(BEVERLY/MONTEBELLO/WHITTIER)
ALIGNMENT
SHEET 11 OF 18

CONTRACT NO PS4320-2003
DRAWING NO T-111
REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 12:07:13 PM
PLOT DRIVER = Raster.chrlf.pdf.plt
PEN TABLE = WIN_3_COLOR.TBL

USER=drains 12:07:13 PM 10/23/2009 w:\60039033_eastside2_le_part_2\cadd\roll\sheet\CET-111.plg



REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY: W. ABREGO
DRAWN BY: S. ARAIN
CHECKED BY: J. AL-MASHAT
IN CHARGE: S. FIALKOFF
DATE: 07/03/09

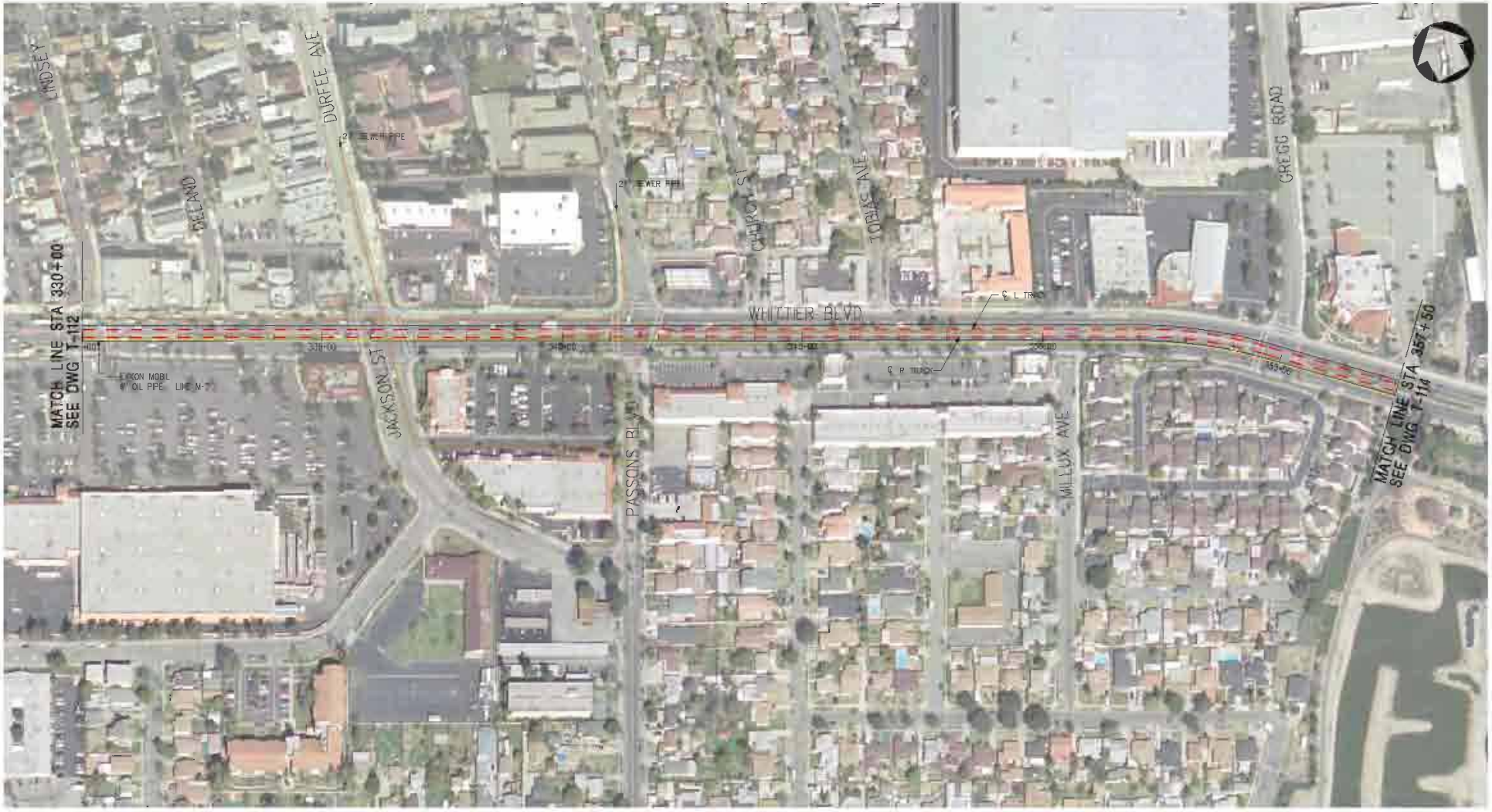
Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD / WHITTIER BLVD
(BEVERLY/MONTEBELLO/WHITTIER)
ALIGNMENT
SHEET 12 OF 18

CONTRACT NO: PS4320-2003
DRAWING NO: T-112
REV: 0
SCALE: HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 12:07:34 PM
PLOT DRIVER = Raster_half_pdf.plt
PEN TABLE = WHA_bl_COLOR.tbl

USER=drains 12:07:34 PM 10/23/2009 w:\60039033_eastside2_la_part_2\cadd\roll\sheet\CET-112.plg



HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

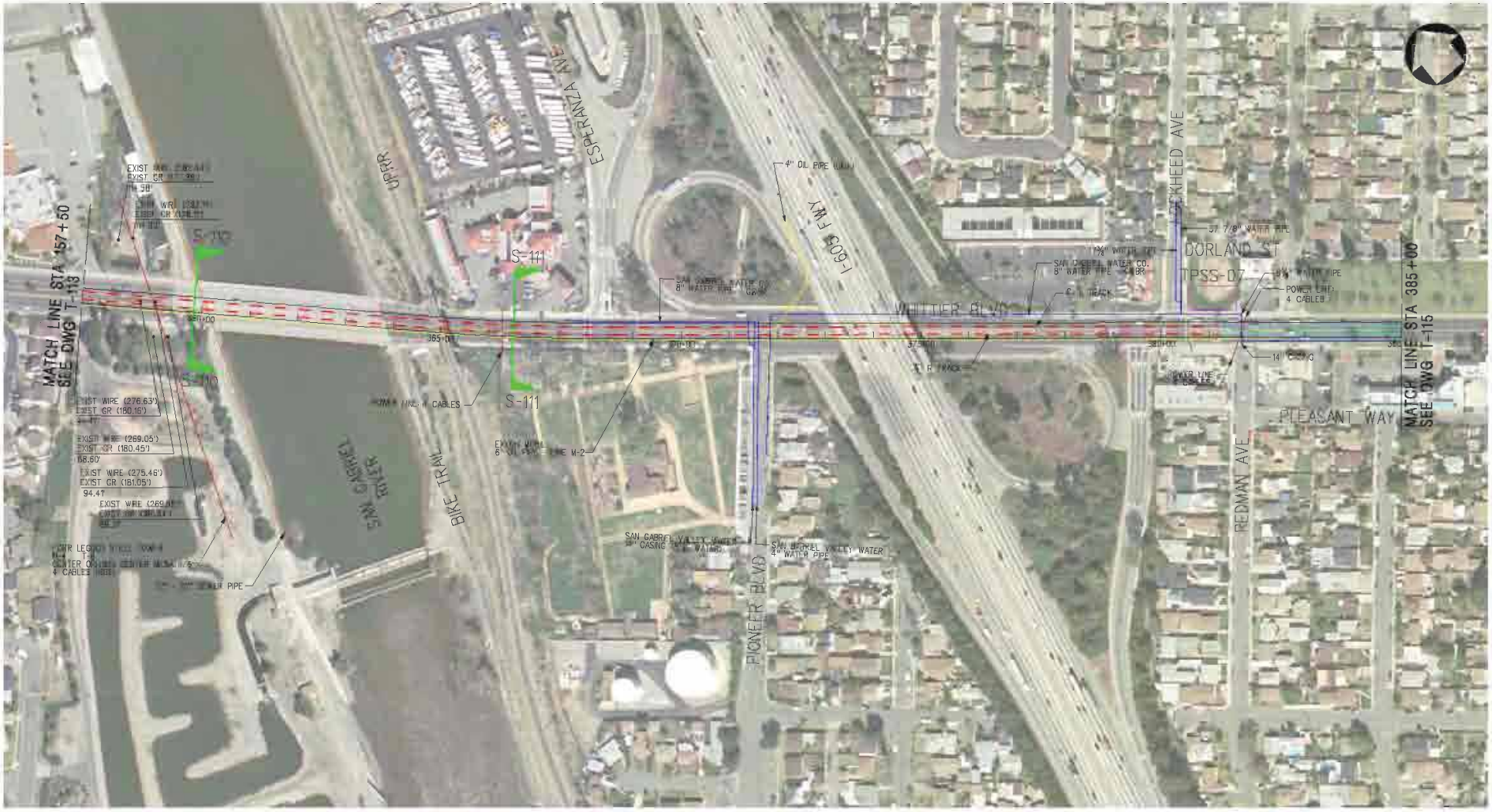
Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD / WHITTIER BLVD
(BEVERLY/MONTEBELLO/WHITTIER)
ALIGNMENT
SHEET 13 OF 18

CONTRACT NO PS4320-2003
DRAWING NO T-113 REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 12:07:56 PM
PLOT DRIVER = Raster_half_pdf.plt
PEN TABLE = WHA_bl_color.tbl

USER=drains 12:07:56 PM 10/23/2009 w:\60039033_eastside2_la_part_2\cadd\roll\sheet\CET-113.plg



HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD / WHITTIER BLVD
(BEVERLY/MONTEBELLO/WHITTIER)
ALIGNMENT
SHEET 14 OF 18

CONTRACT NO PS4320-2003
DRAWING NO T-114
REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 12:08:19 PM
PLOT DRIVER = Raster.hplf.pdf.plt
PEN TABLE = WHITE.tbl,COLOR.tbl

USER=drains 12:08:19 PM 10/23/2009 w:\60039033_eastside2_la_part_2\cadd\roll\sheet\CET-114.plg

HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

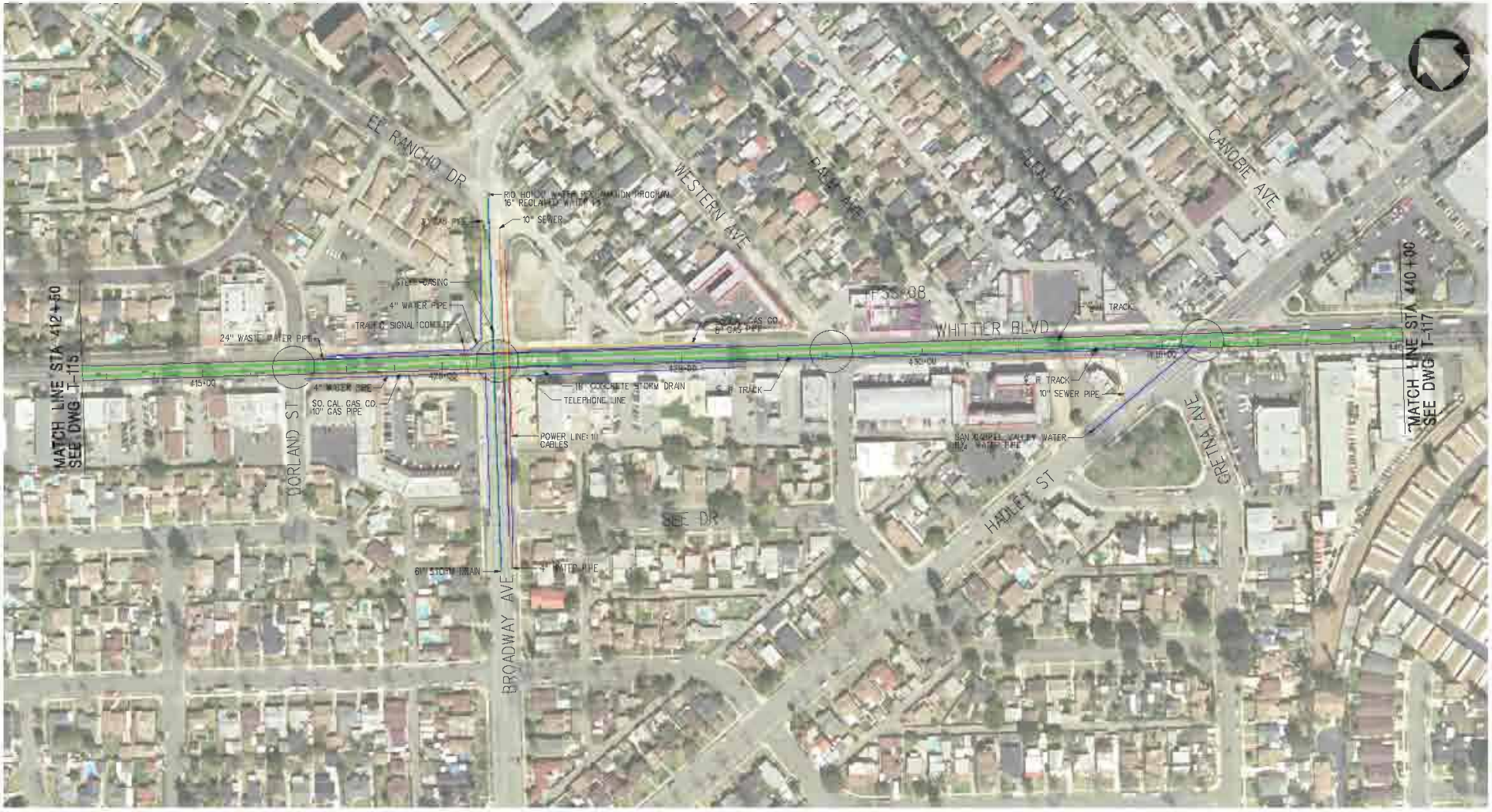
Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD / WHITTIER BLVD
(BEVERLY/MONTEBELLO/WHITTIER)
ALIGNMENT
SHEET 15 OF 18

CONTRACT NO PS4320-2003
DRAWING NO T-115 REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 12:08:43 PM
PLOT DRIVER = Raster.hplf.pdf.plt
PEN TABLE = WYA_LOCLOW.TBL

USER=drains 12:08:43 PM 10/23/2009 w:\60039033_eastside2_le_part_2\cadd\roll\sheet\CET-115.plg



HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD / WHITTIER BLVD
(BEVERLY/MONTEBELLO/WHITTIER)
ALIGNMENT
SHEET 16 OF 18

CONTRACT NO PS4320-2003
DRAWING NO T-116 REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 12:09:06 PM
PLOT DRIVER = Raster-half_pdf.plt
PEN TABLE = WA-bl-color.tbl

USER-drains 12:09:06 PM 10/23/2009 w:\60039033_eastside2_le_part_2\cadd\roll\sheet\CET-116.plg

HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD / WHITTIER BLVD
(BEVERLY/MONTEBELLO/WHITTIER)
ALIGNMENT
SHEET 17 OF 18

CONTRACT NO PS4320-2003
DRAWING NO T-117 REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 12:09:29 PM
PLOT DRIVER = Raster_half_pdf.plt
PEN TABLE = WA_AL_COLOR.TBL

USER-drains 12:09:29 PM 10/23/2009 w:\60039033_eastside2_le_part_2\cadd\roll\sheet\CET-117.plg

HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

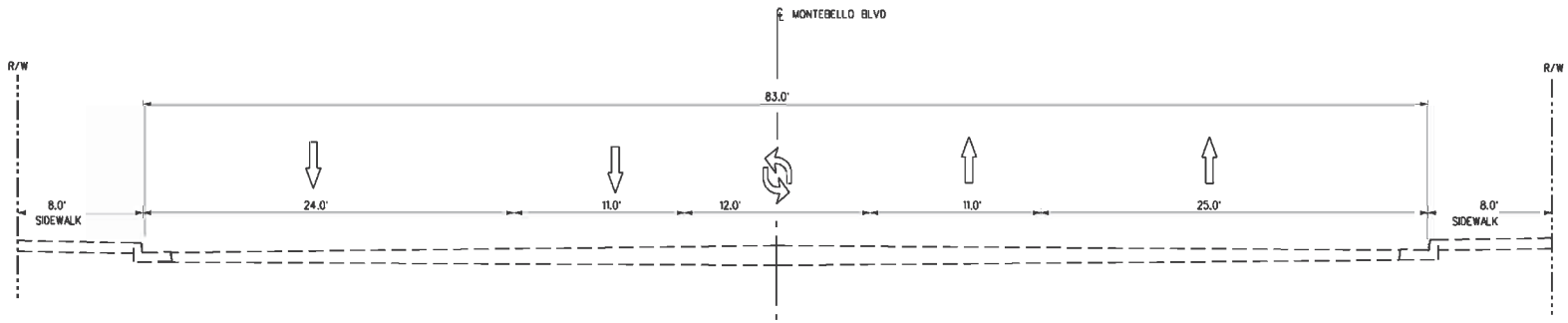
DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

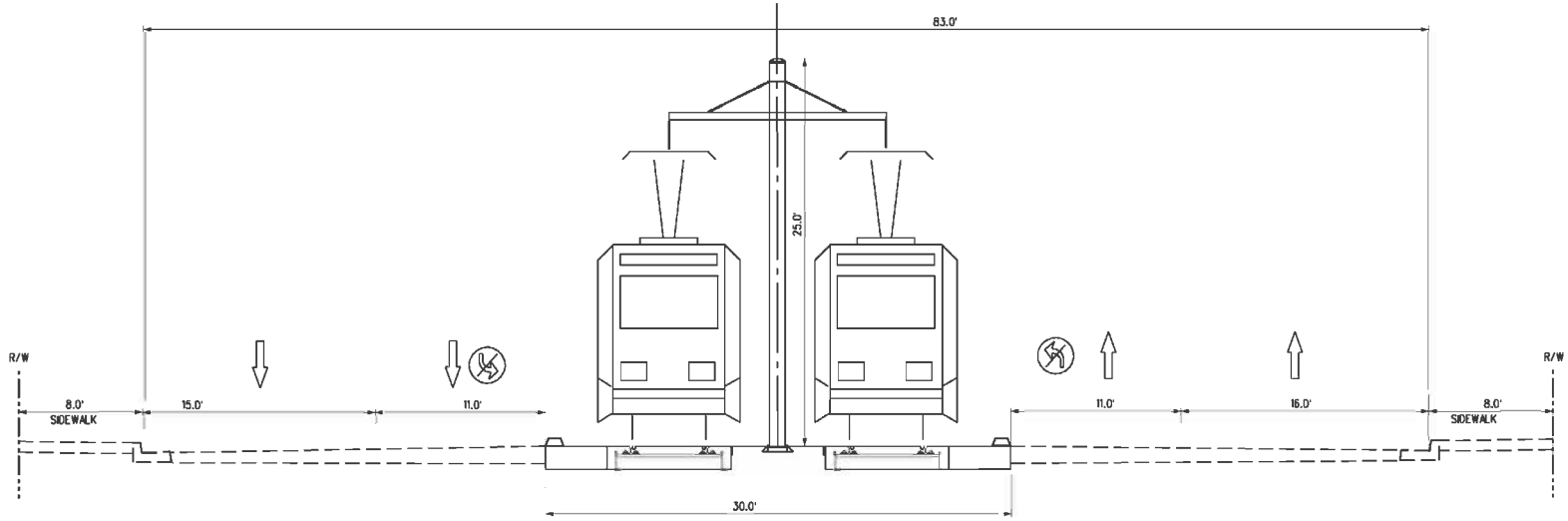
EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD / WHITTIER BLVD
(BEVERLY/MONTEBELLO/WHITTIER)
ALIGNMENT
SHEET 18 OF 18

CONTRACT NO PS4320-2003
DRAWING NO T-118
REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 12:09:50 PM
PLOT DRIVER = Raster-half-pdf.plt
PEN TABLE = WHA-BLCOLOR.TBL
USER-drains 12:09:50 PM 10/23/2009 w:\60039033_eastside2_la_part_2\cadd\roll\sheet\CET-118.plg



EXISTING TYPICAL SECTION (A / S-101) T-108



PROPOSED TYPICAL SECTION (B / S-101) T-108

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. ARAIN
DRAWN BY J. VARIAS
CHECKED BY B. BALDERRAMA
IN CHARGE S. FIALKOFF
DATE 07/03/09

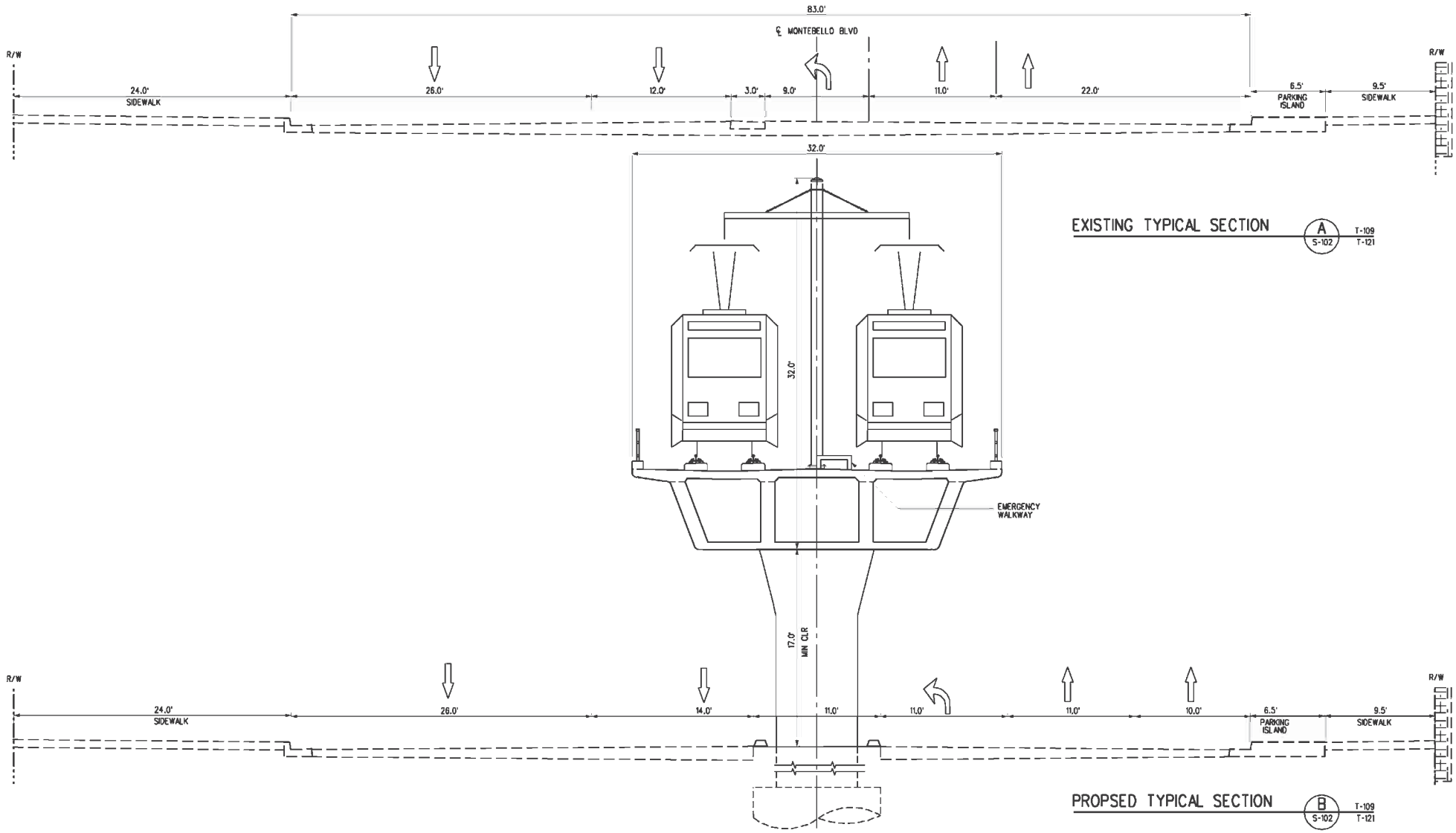
Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD/ WHITTIER BLVD
(BEVERLY/ MONTEBELLO/ WHITTIER)
SECTIONS
SHEET 1 OF 14

CONTRACT NO PS4320-2003
DRAWING NO S-101 REV 0
SCALE NO SCALE
SHEET NO

DATE PLOTTED = 10/23/2009 11:39:44 AM
TIME PLOTTED
PLOT DRIVER = PDF_HOTF4_BW.pltf
PEN TABLE = MTA_LJ_pen1.tbl

USER=grams 11:39:44 AM 10/23/2009 w:\60039033_eastside2_lo_part_2\cad\civil\sheet\CS-101.dgn



REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. ARAIN
DRAWN BY J. VARIAS
CHECKED BY B. BALDERRAMA
IN CHARGE S. FIALKOFF
DATE 07/03/09

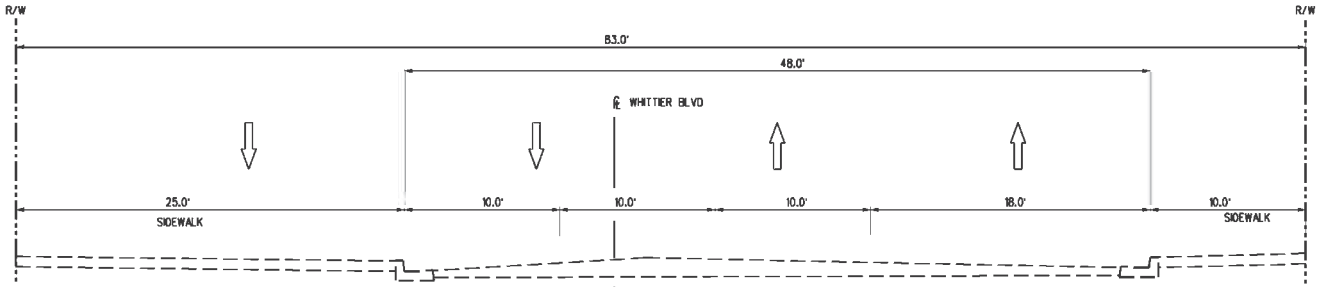
Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD/ WHITTIER BLVD
(BEVERLY/ MONTEBELLO/ WHITTIER)
SECTIONS
SHEET 2 OF 14

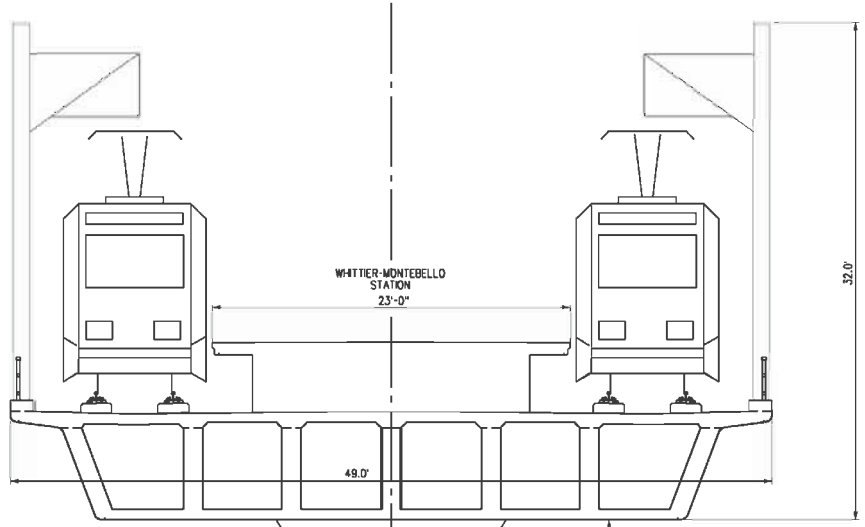
CONTRACT NO PS4320-2003
DRAWING NO S-102
REV 0
SCALE NO SCALE
SHEET NO

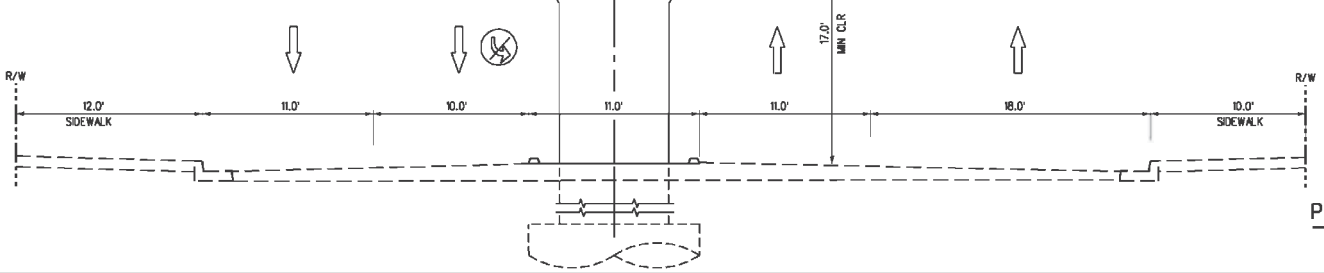
DATE PLOTTED = 10/23/2009
TIME PLOTTED = 11:39:45 AM
PLOT DRIVER = PDF_HOTF4_BW.pltf
PEN TABLE = MTA_LJ_pen1.tbl

USER=grams 11:39:45 AM 10/23/2009 w:\60039033_eastside2_la_part1_2\cad\civil\sheet\cs-102.dgn



EXISTING TYPICAL SECTION (A / S-103) T-109 T-121





PROPOSED TYPICAL SECTION (B / S-103) T-109 T-121

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

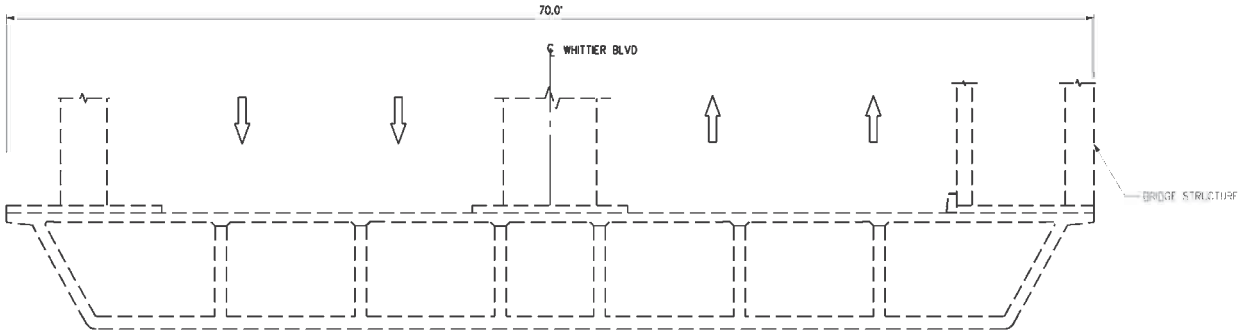
DESIGNED BY S. ARAIN
DRAWN BY J. VARIAS
CHECKED BY B. BALDERRAMA
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

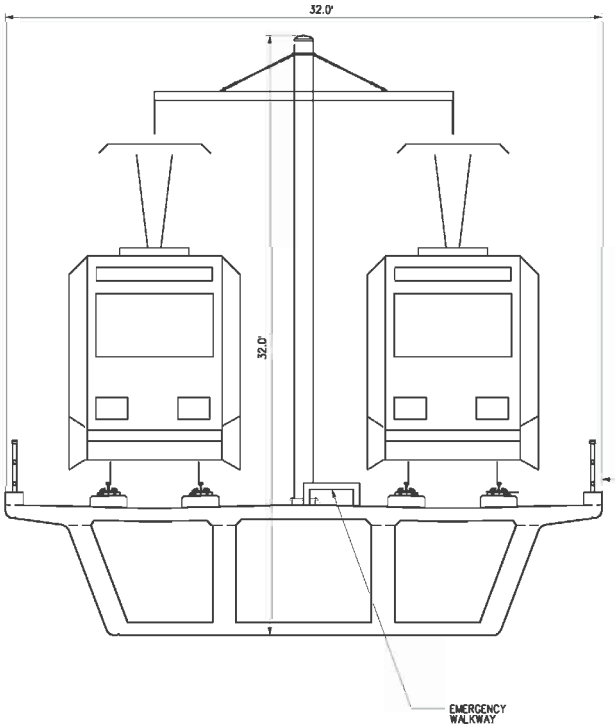
EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD/ WHITTIER BLVD
(BEVERLY/ MONTEBELLO/ WHITTIER)
SECTIONS
SHEET 3 OF 14

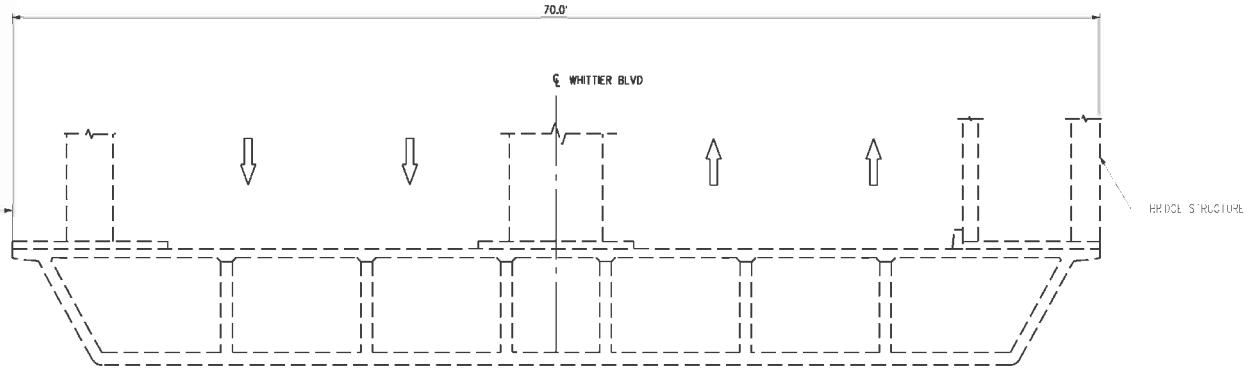
CONTRACT NO PS4320-2003
DRAWING NO S-103 REV 0
SCALE NO SCALE
SHEET NO

DATE PLOTTED = 10/23/2009 TIME PLOTTED = 11:39:47 AM
PLOT DRIVER = PDF_HOTFIX.PLT PEN TABLE = MTA_LJ_PDF.TBL
USER=grams 11:39:47 AM 10/23/2009 w:\60039033_eastside2_ic_part1_2\cadd\civil\sheet\CS-103.dgn



EXISTING TYPICAL SECTION (A / S-104) T-110 T-122





PROPOSED TYPICAL SECTION (B / S-104) T-110 T-122

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

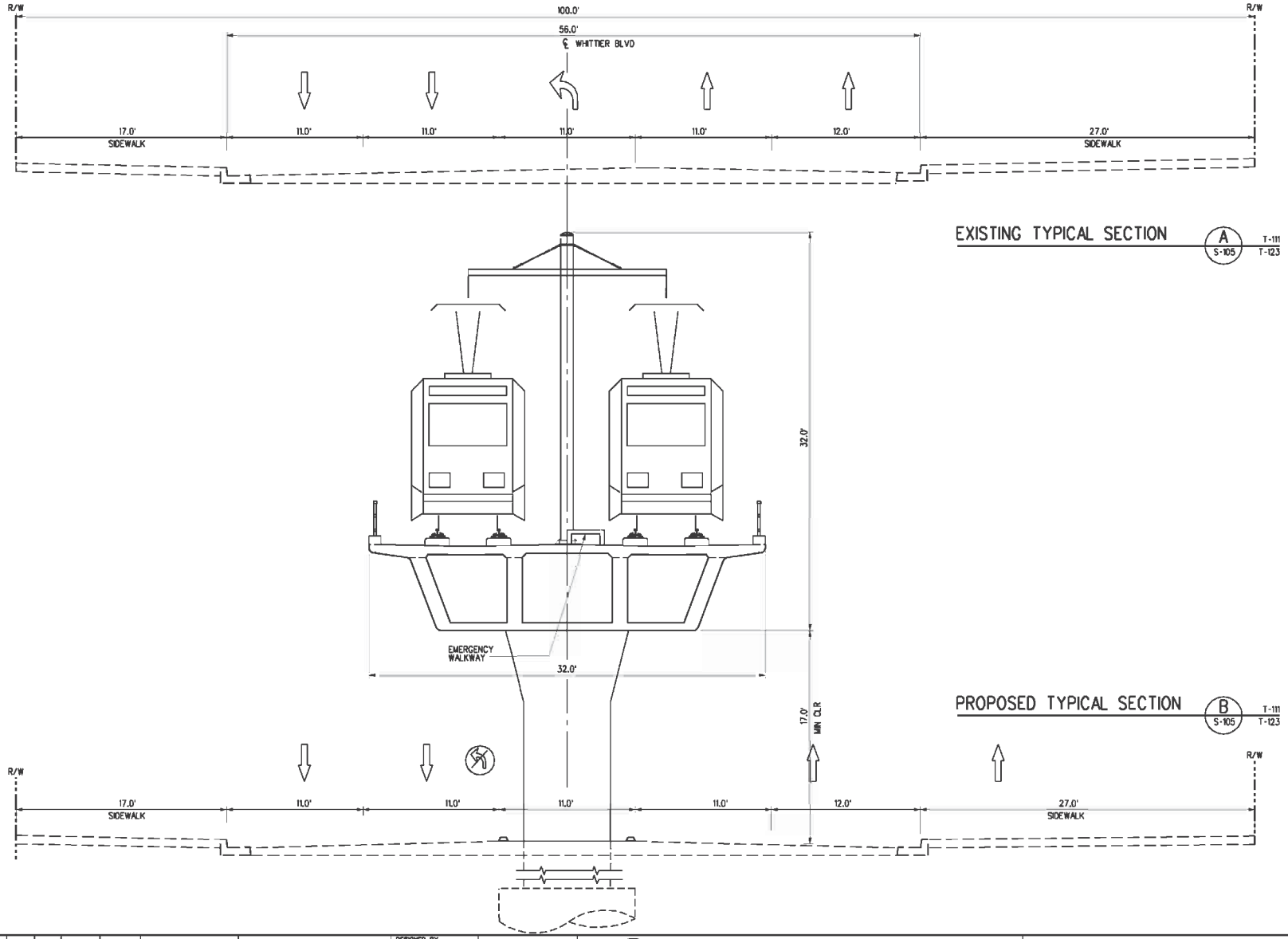
DESIGNED BY S. ARAIN
DRAWN BY J. VARIAS
CHECKED BY B. BALDERRAMA
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD/ WHITTIER BLVD
(BEVERLY/ MONTEBELLO/ WHITTIER)
SECTIONS
SHEET 4 OF 14

CONTRACT NO PS4320-2003
DRAWING NO S-104 REV 0
SCALE NO SCALE
SHEET NO

DATE PLOTTED = 10/23/2009 TIME PLOTTED = 11:39:48 AM
PLOT DRIVER = PDF_HOT4_BW.pltr PEN TABLE = MTA_A_pen1.tbl
USER=arains 11:39:48 AM 10/23/2009 w:\60039033_eastside2_la_part_2\cadd\civil\sheet\CS-104.dgn



REV	DATE	BY	APP	REQ NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

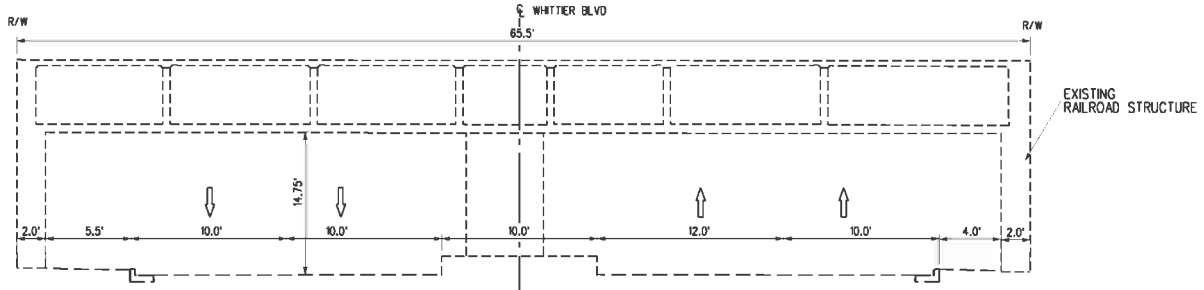
DESIGNED BY S. ARAIN
DRAWN BY J. VARIAS
CHECKED BY B. BALDERRAMA
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

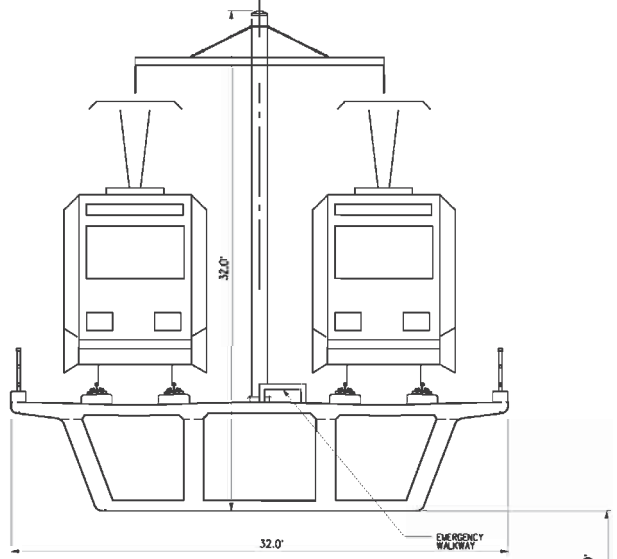
EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD/ WHITTIER BLVD
(BEVERLY/ MONTEBELLO/ WHITTIER)
SECTIONS
SHEET 5 OF 14

CONTRACT NO PS4320-2003
DRAWING NO S-105
REV 0
SCALE NO SCALE
SHEET NO

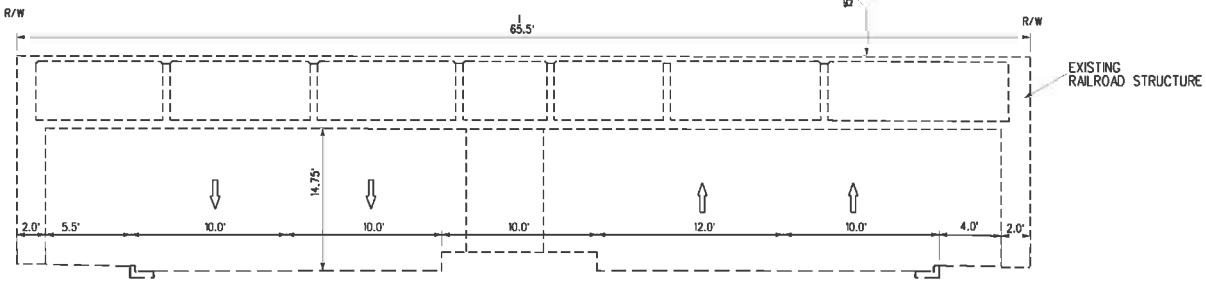
DATE PLOTTED = 10/23/2009
TIME PLOTTED = 11:39:49 AM
PLOT DRIVER = PDF_HOLF4_BW.pltt
PEN TABLE = MTA_LJ_PORT.tbl
USER=grams 11:39:49 AM 10/23/2009 w:\60039033_eastside2_la_part_2\cad\civil\sheet\CS-105.dgn



EXISTING TYPICAL SECTION (A / S-106) T-111 T-123



PROPOSED TYPICAL SECTION (B / S-106) T-111 T-123



REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. ARAIN
DRAWN BY J. VARIAS
CHECKED BY B. BALDERRAMA
IN CHARGE S. FIALKOFF
DATE 07/03/09

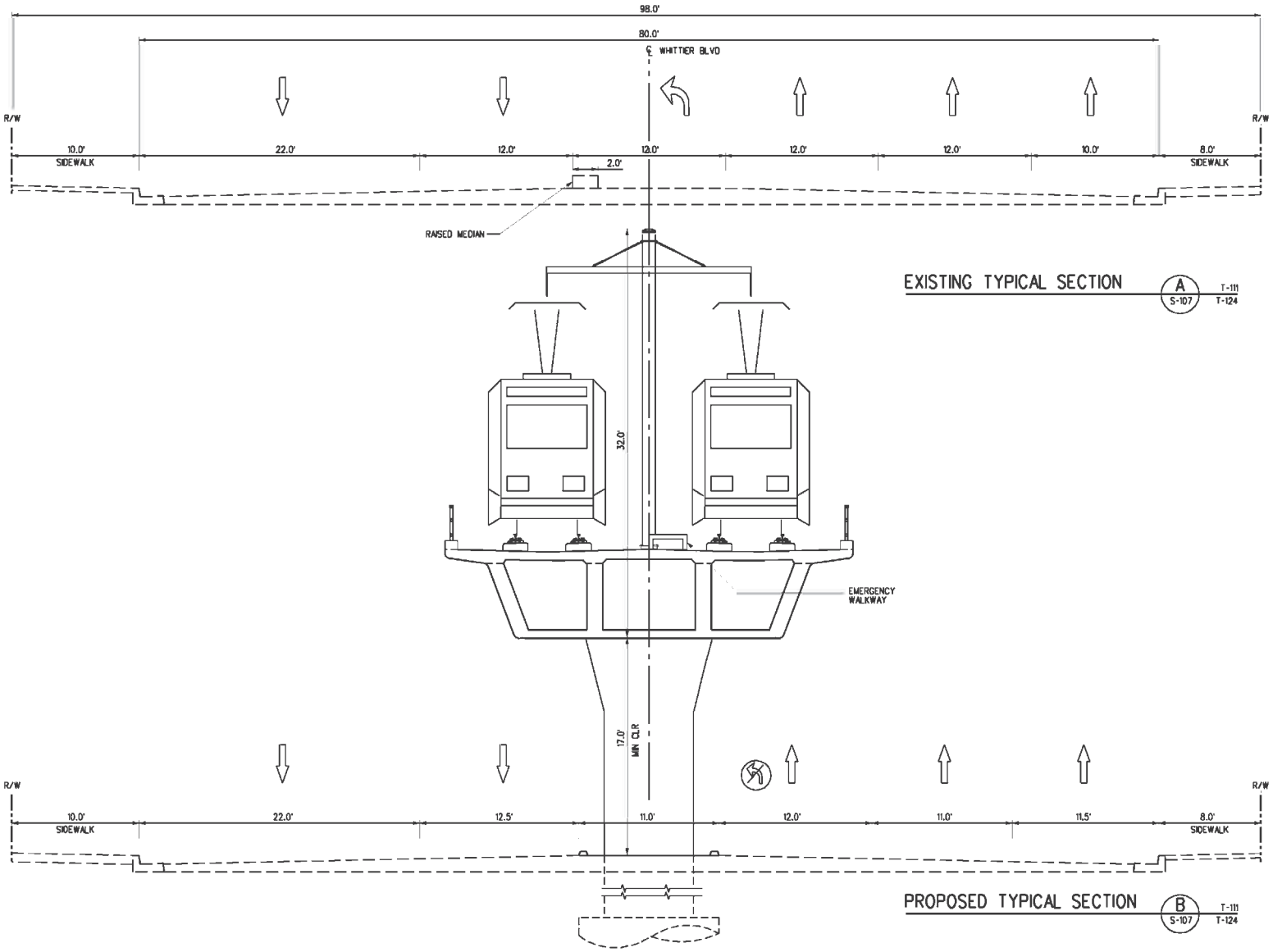
Metropolitan Transportation Authority
Metro
CDM AECOM JOINT VENTURE

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD/ WHITTIER BLVD
(BEVERLY/ MONTEBELLO/ WHITTIER)
SECTIONS
SHEET 6 OF 14

CONTRACT NO PS4320-2003
DRAWING NO S-106 REV 0
SCALE NO SCALE
SHEET NO

DATE PLOTTED = 10/23/2009 PLOT DRIVER = PDF_HOTF4_BW.pltr
TIME PLOTTED = 11:39:50 AM PEN TABLE = MTA_LJ_port.tbl

USER=grams 11:39:50 AM 10/23/2009 w:\60039033_eastside2_lc_part_2\cadd\civil\sheet\S-106.dgn



REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. ARAIN
DRAWN BY J. VARIAS
CHECKED BY B. BALDERRAMA
IN CHARGE S. FIALKOFF
DATE 07/03/09

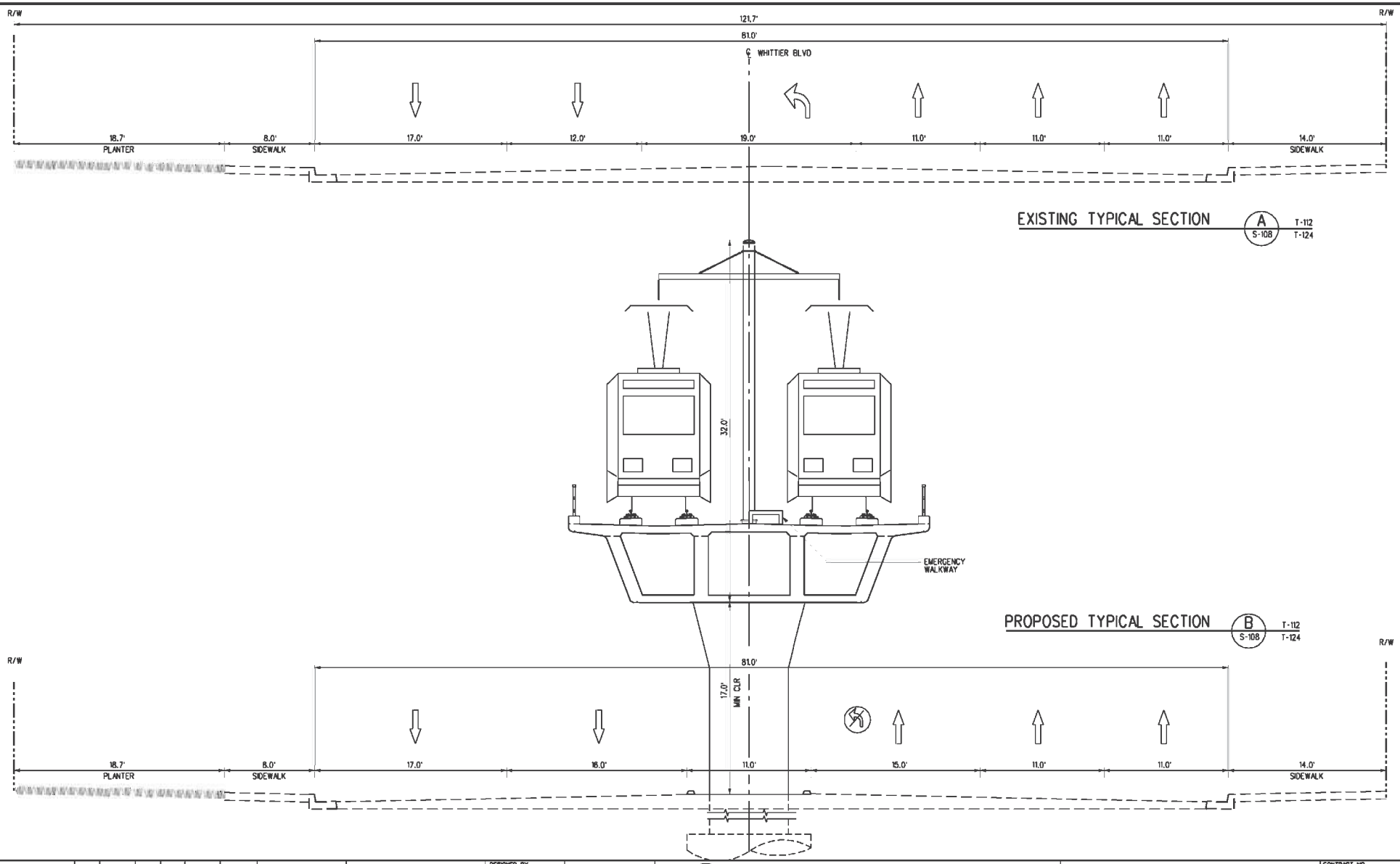
Metropolitan Transportation Authority
Metro
CDM AECOM JOINT VENTURE

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD/ WHITTIER BLVD
(BEVERLY/ MONTEBELLO/ WHITTIER)
SECTIONS
SHEET 7 OF 14

CONTRACT NO PS4320-2003
DRAWING NO S-107
REV 0
SCALE NO SCALE
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 11:39:52 AM
PLOT DRIVER = PDF_HOTF4_BW.pltt
PEN TABLE = MTA_LJ_pen.tbl

USER=grams 11:39:52 AM 10/23/2009 w:\60039033_eastside2_lc_part1_2\cad\civil\sheet\CS-107.dgn



REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

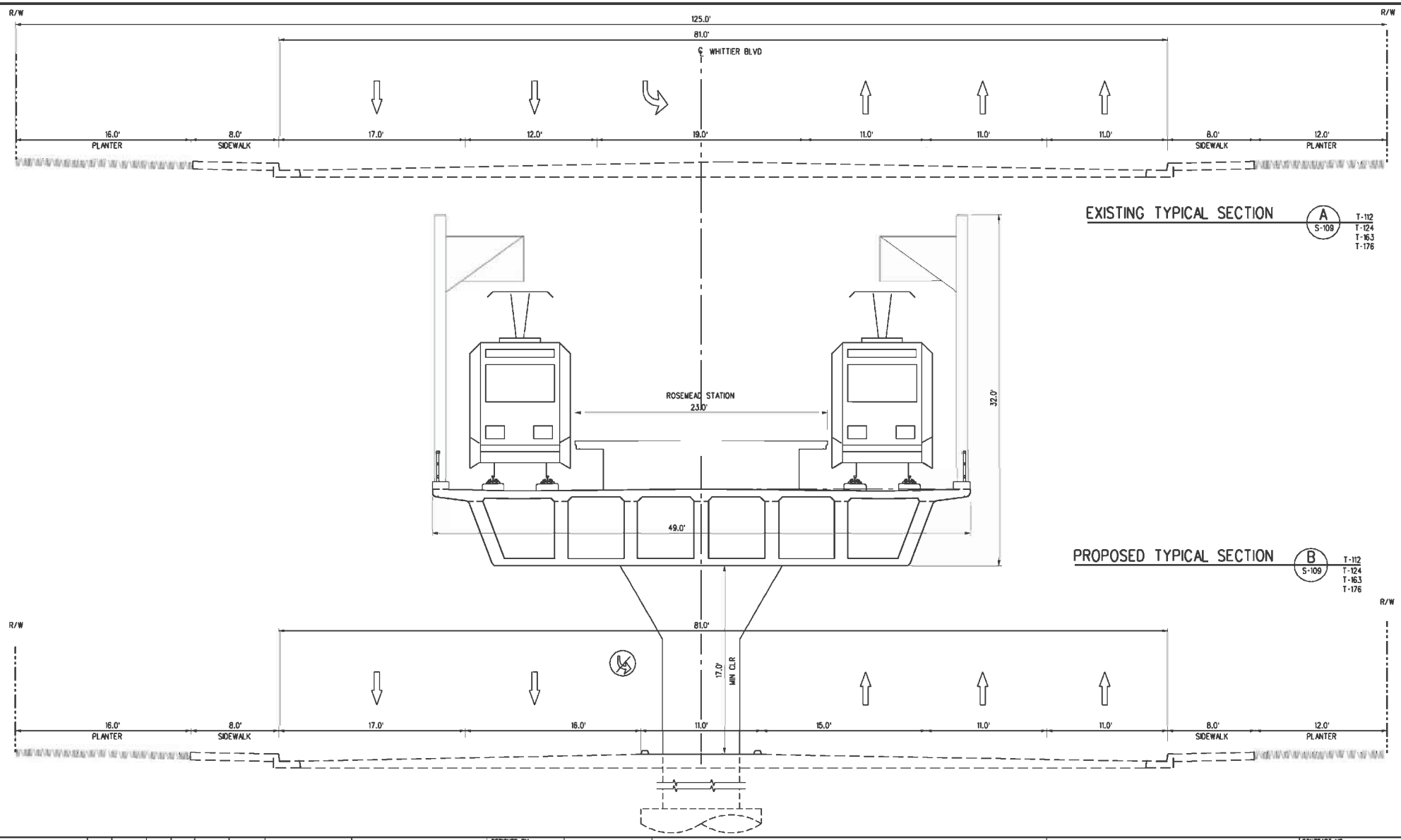
DESIGNED BY S. ARAIN
DRAWN BY J. VARIAS
CHECKED BY B. BALDERRAMA
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM JOINT VENTURE

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD/ WHITTIER BLVD
(BEVERLY/ MONTEBELLO/ WHITTIER)
SECTIONS
SHEET 8 OF 14

CONTRACT NO PS4320-2003
DRAWING NO S-108
REV 0
SCALE NO SCALE
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 11:39:53 AM
PLOT DRIVER = PDF_HOLF4_BW.pltr
PEN TABLE = MTA_LJ_PCT.tbl
USER=grams 11:39:53 AM 10/23/2009 w:\60039033_eastside2_la_part_2\cad\civil\sheet\CS-108.dgn



REV	DATE	BY	APP	REQ NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. ARAIN
DRAWN BY J. VARIAS
CHECKED BY B. BALDERRAMA
IN CHARGE S. FIALKOFF
DATE 07/03/09

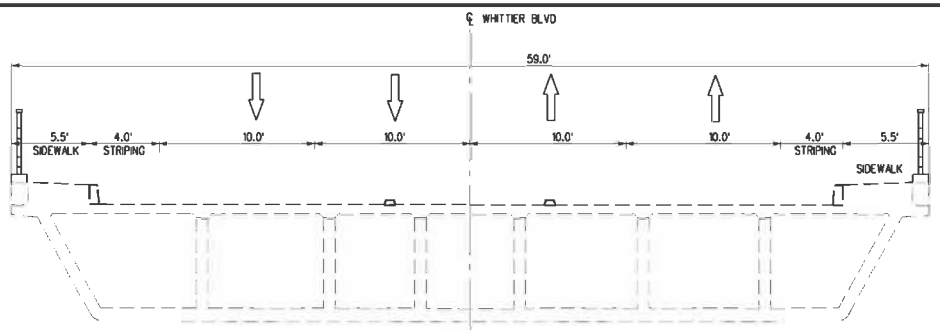
Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD/ WHITTIER BLVD
(BEVERLY/ MONTEBELLO/ WHITTIER)
SECTIONS
SHEET 9 OF 14

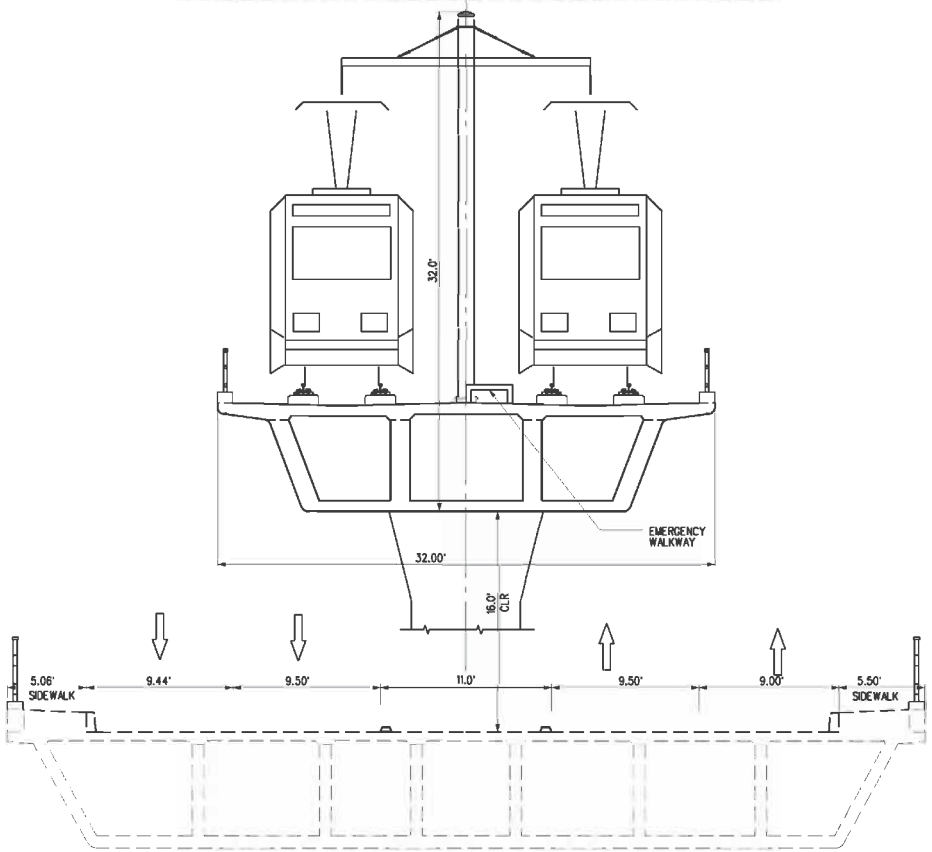
CONTRACT NO PS4320-2003
DRAWING NO S-109
REV 0
SCALE NO SCALE
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 11:39:54 AM
PLOT DRIVER = PDF_HOTFIX.PLT
PEN TABLE = MTA_LJ_PCT.TBL

USER=grams 11:39:54 AM 10/23/2009 w:\60039033_eastside2_lc_part1_2\cadd\civil\sheet\CS-109.dgn



EXISTING TYPICAL SECTION (A / S-110) T-114 T-126 T-164 T-177



PROPOSED TYPICAL SECTION (B / S-110) T-114 T-126 T-164 T-177

REV	DATE	BY	APP	REQ NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

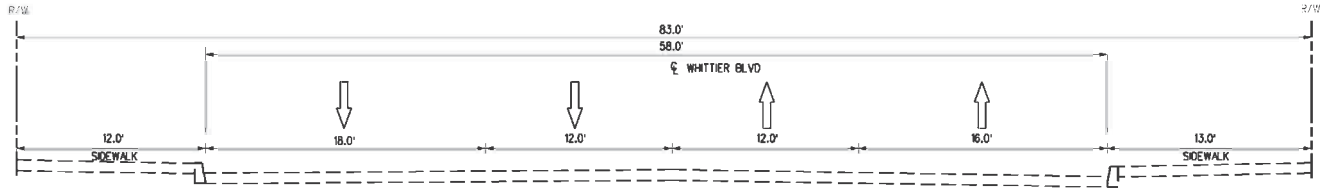
DESIGNED BY S. ARAIN
DRAWN BY J. VARIAS
CHECKED BY B. BALDERRAMA
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD/ WHITTIER BLVD
(BEVERLY/ MONTEBELLO/ WHITTIER)
SECTIONS
SHEET 10 OF 14

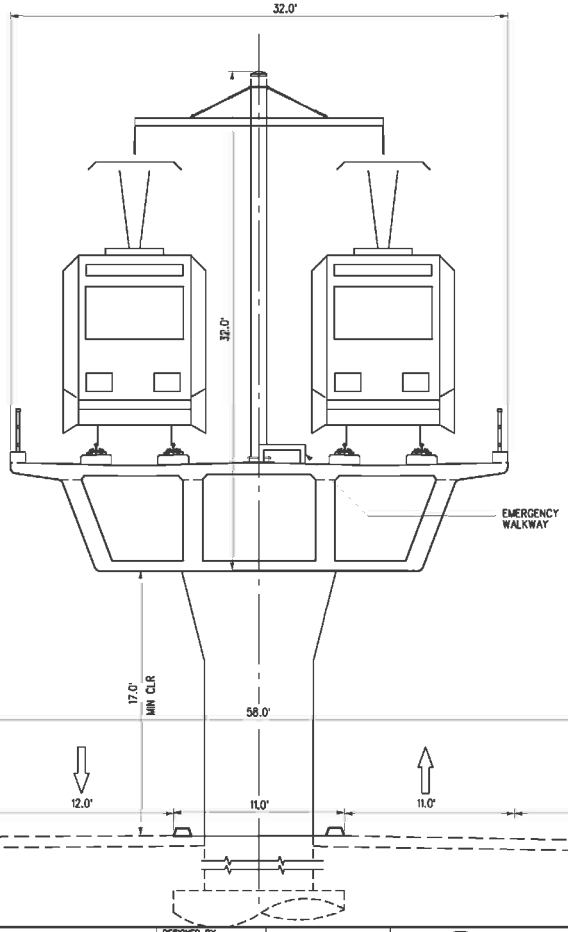
CONTRACT NO PS4320-2003
DRAWING NO S-110 REV 0
SCALE NO SCALE
SHEET NO

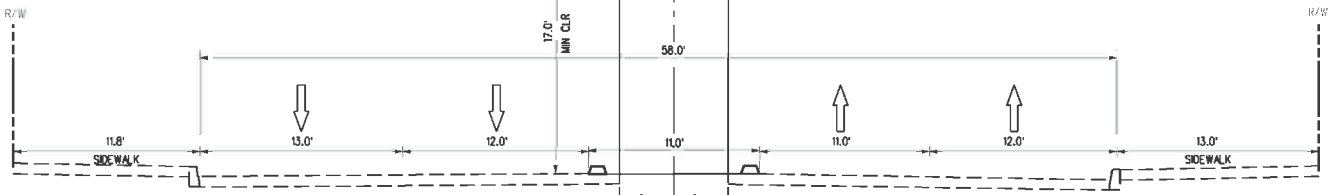
DATE PLOTTED = 10/23/2009 TIME PLOTTED = 11:39:55 AM
PLOT DRIVER = PDF_HOTF_BW.pltr PEN TABLE = MTA_LJ_pen.tbl
USER=arains 11:39:55 AM 10/23/2009 w:\60039033_eastside2_lc_part_2\cadd\civil\sheet\CLS-110.dgn



EXISTING TYPICAL SECTION

A / S-111 — T-114, T-126, T-164, T-177





PROPOSED TYPICAL SECTION

B / S-111 — T-114, T-126, T-164, T-177

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

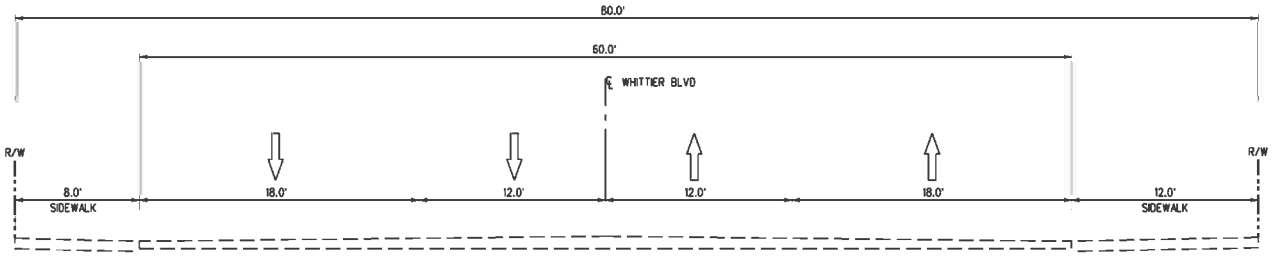
DESIGNED BY: S. ARAIN
DRAWN BY: J. VARIAS
CHECKED BY: B. BALDERRAMA
IN CHARGE: S. FIALKOFF
DATE: 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

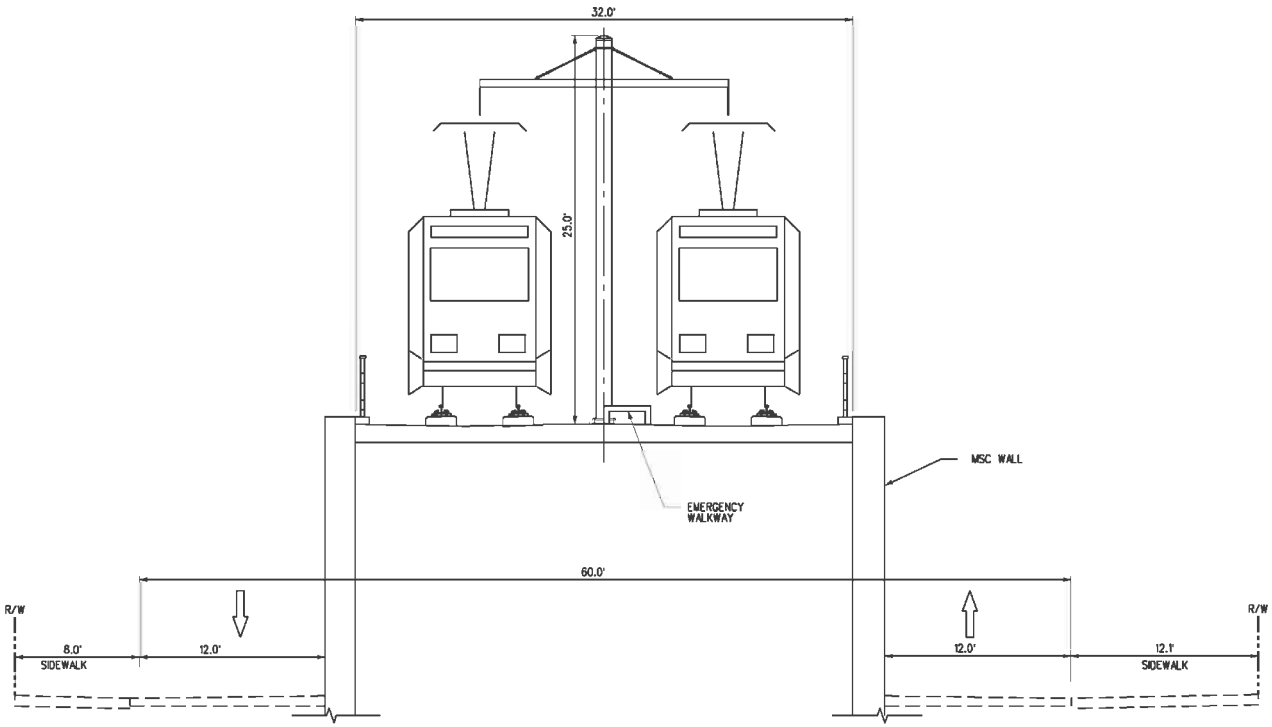
EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD/ WHITTIER BLVD
(BEVERLY/ MONTEBELLO/ WHITTIER)
SECTIONS
SHEET 11 OF 14

CONTRACT NO: PS4320-2003
DRAWING NO: S-111 REV: 0
SCALE: NO SCALE
SHEET NO:

DATE PLOTTED = 10/23/2009 TIME PLOTTED = 11:39:57 AM
PLOT DRIVER = PDF_HOT4.PC3 PEN TABLE = MTA_M_COT.TBL
USER=arains 11:39:57 AM 10/23/2009 w:\60039033_eastside2_lc_part_2\cadd\civil\sheet\CLS-11.pg



EXISTING TYPICAL SECTION (A / S-112) T-115 T-127 T-165 T-178



PROPOSED TYPICAL SECTION (B / S-112) T-115 T-127 T-165 T-178

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

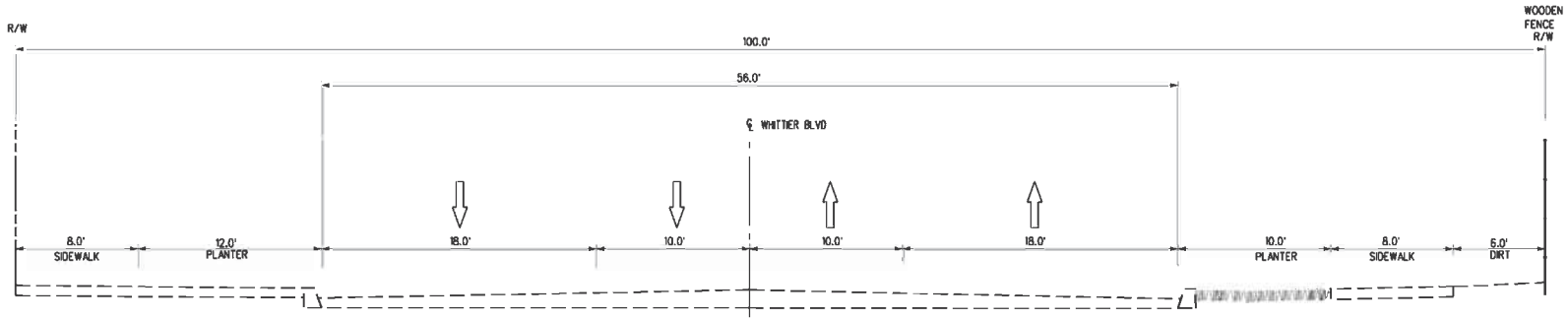
DESIGNED BY S. ARAIN
DRAWN BY J. VARIAS
CHECKED BY B. BALDERRAMA
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM JOINT VENTURE

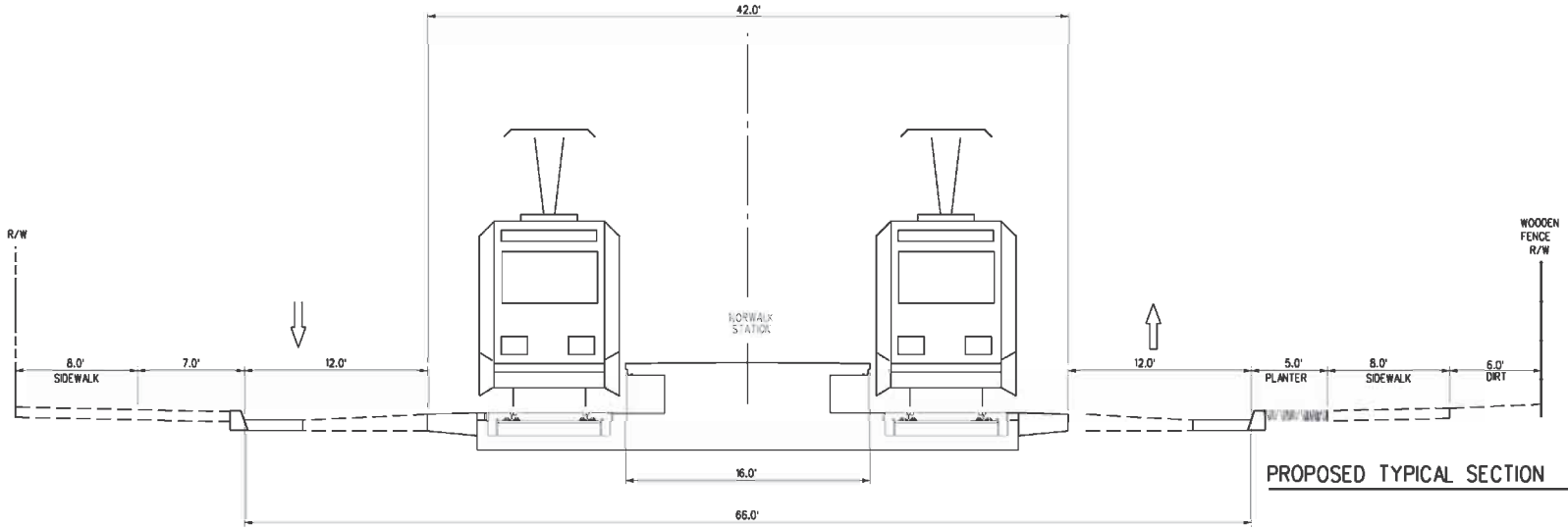
EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD/ WHITTIER BLVD
(BEVERLY/ MONTEBELLO/ WHITTIER)
SECTIONS
SHEET 12 OF 14

CONTRACT NO PS4320-2003
DRAWING NO S-112 REV 0
SCALE NO SCALE
SHEET NO

DATE PLOTTED = 10/23/2009 TIME PLOTTED = 11:39:58 AM
PLOT DRIVER = PDF_HOTF4_BW.pltr PEN TABLE = MTA_LJ_pen1.tbl
USER=grams 11:39:58 AM 10/23/2009 w:\60039033_eastside2_lc_part_2\cadd\civil\sheet\CLS-112.plg



EXISTING TYPICAL SECTION (A / S-113) T-115 T-127 T-165 T-178



PROPOSED TYPICAL SECTION (B / S-113) T-115 T-127 T-165 T-178

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

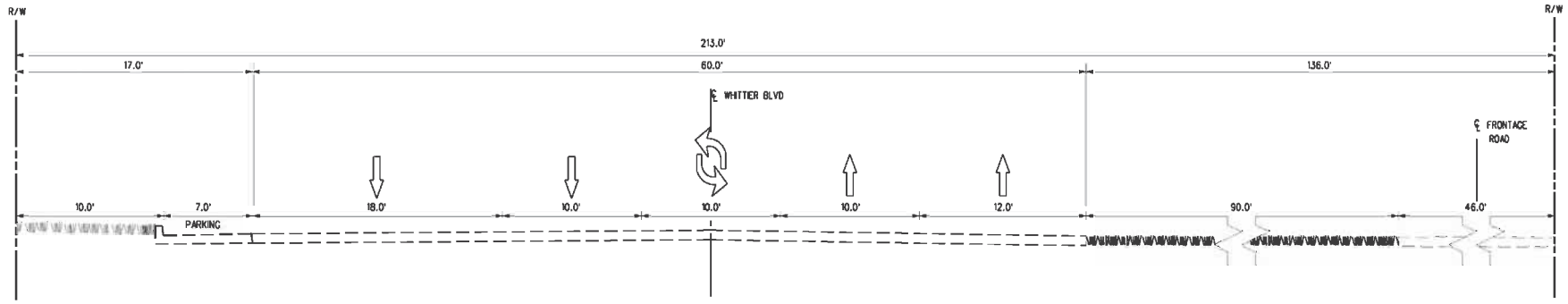
DESIGNED BY S. ARAIN
DRAWN BY J. VARIAS
CHECKED BY B. BALDERRAMA
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

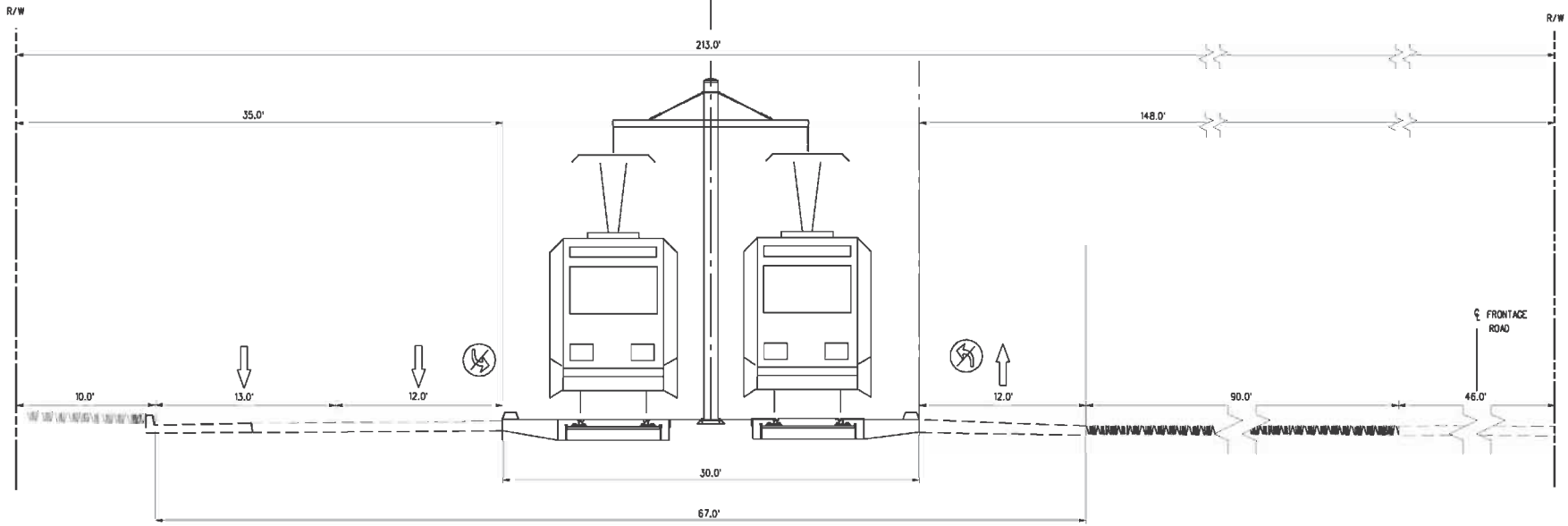
EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD/ WHITTIER BLVD
(BEVERLY/ MONTEBELLO/ WHITTIER)
SECTIONS
SHEET 13 OF 14

CONTRACT NO PS4320-2003
DRAWING NO S-113 REV 0
SCALE NO SCALE
SHEET NO

DATE PLOTTED = 10/23/2009 TIME PLOTTED = 11:39:59 AM
PLOT DRIVER = PDF_HOTF4_BW.pltr PEN TABLE = MTA_LJ_pen.tbl
USER-grams 11:39:59 AM 10/23/2009 w:\60039033_eastside2_lo_part_2\cadd\civil\sheet\CLS-113.plg



EXISTING TYPICAL SECTION (A / S-114) T-118 T-168



PROPOSED TYPICAL SECTION (B / S-114) T-118 T-168

REV	DATE	BY	APP	REQ NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

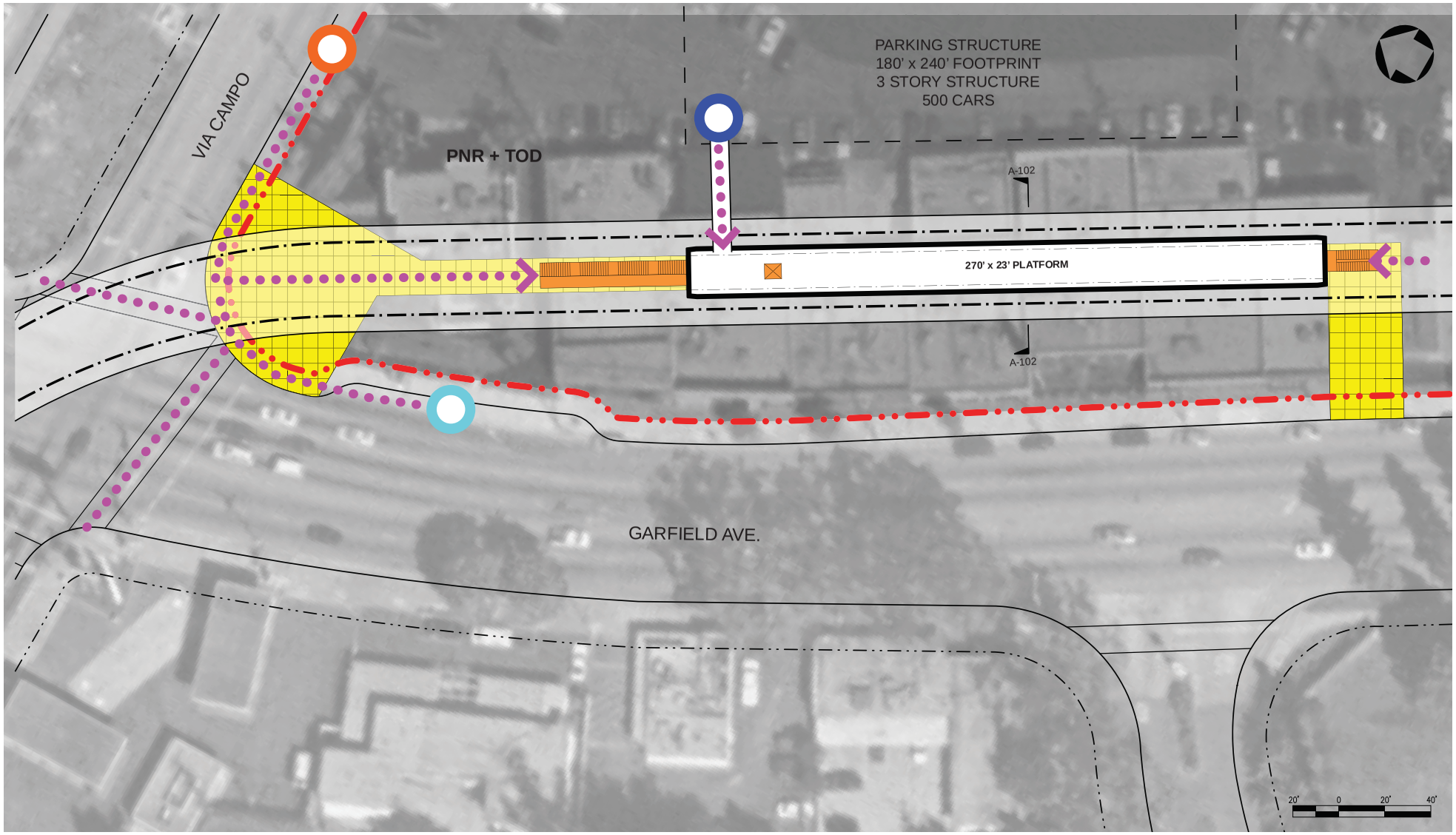
DESIGNED BY S. ARAIN
DRAWN BY J. VARIAS
CHECKED BY B. BALDERRAMA
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD/ WHITTIER BLVD
(BEVERLY/ MONTEBELLO/ WHITTIER)
SECTIONS
SHEET 14 OF 14

CONTRACT NO PS4320-2003
DRAWING NO S-114 REV 0
SCALE NO SCALE
SHEET NO

DATE PLOTTED = 10/23/2009 TIME PLOTTED = 11:40:00 AM
PLOT DRIVER = PDF.pc3 PEN TABLE = MTA_A.pcf.tbl
USER-grams 10/23/2009 11:40:00 AM w:\60039033_eastside2_lc_part_2\cadd\civil\sheet\CLS-114.dgn



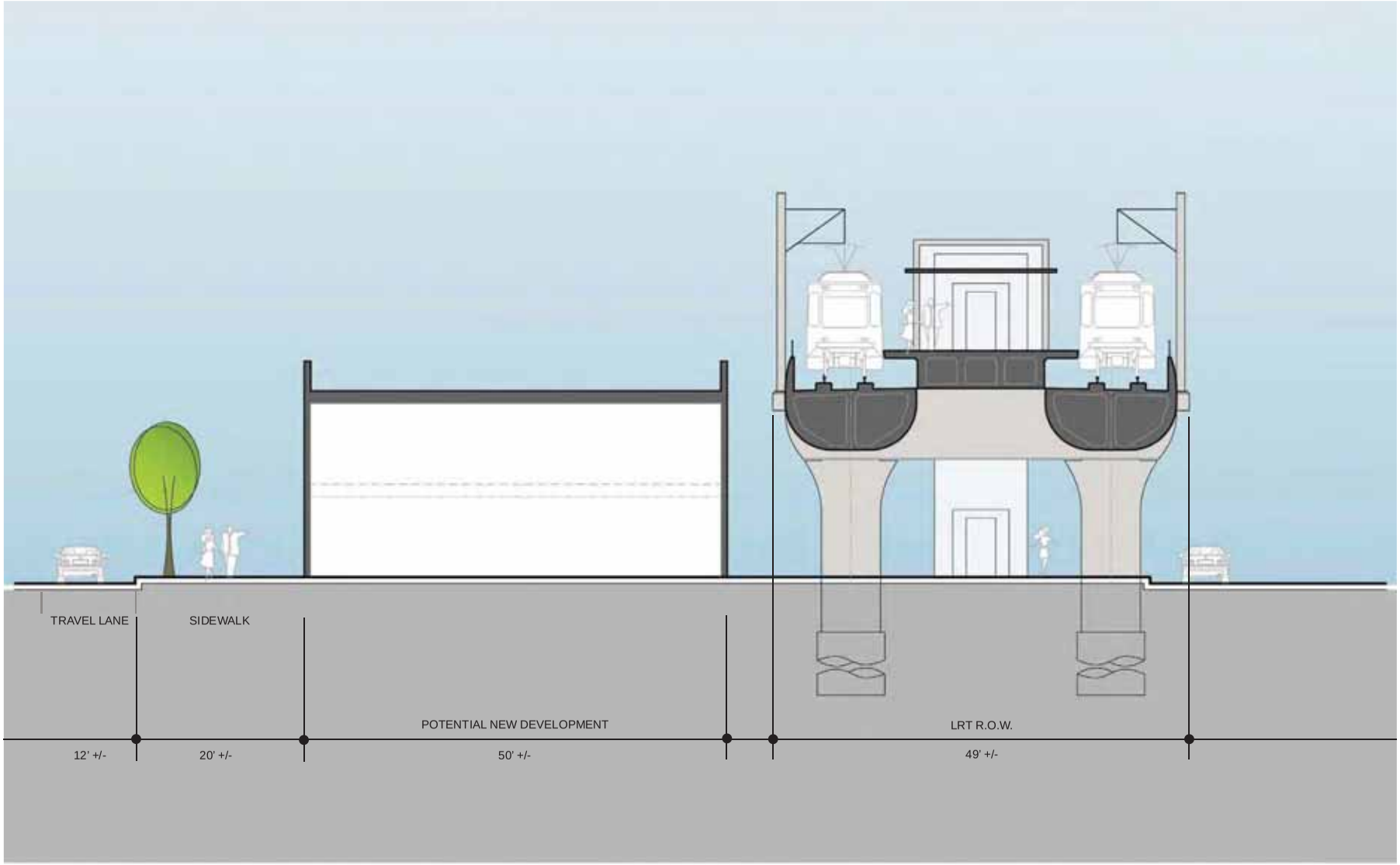
REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. SCHWARZKOPF
DRAWN BY S. GODKIN
CHECKED BY S. SCHWARZKOPF
IN CHARGE V. DAVIES
DATE 06/29/09

Metro
Metropolitan Transportation Authority
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD. / WHITTIER BLVD.
(BEVERLY / MONTEBELLO / WHITTIER)
GARFIELD AVE. STATION
LOCATION PLAN

CONTRACT NO PS4320-2003
DRAWING NO A-101
REV 0
SCALE 1⊠ = 40⊠
SHEET NO



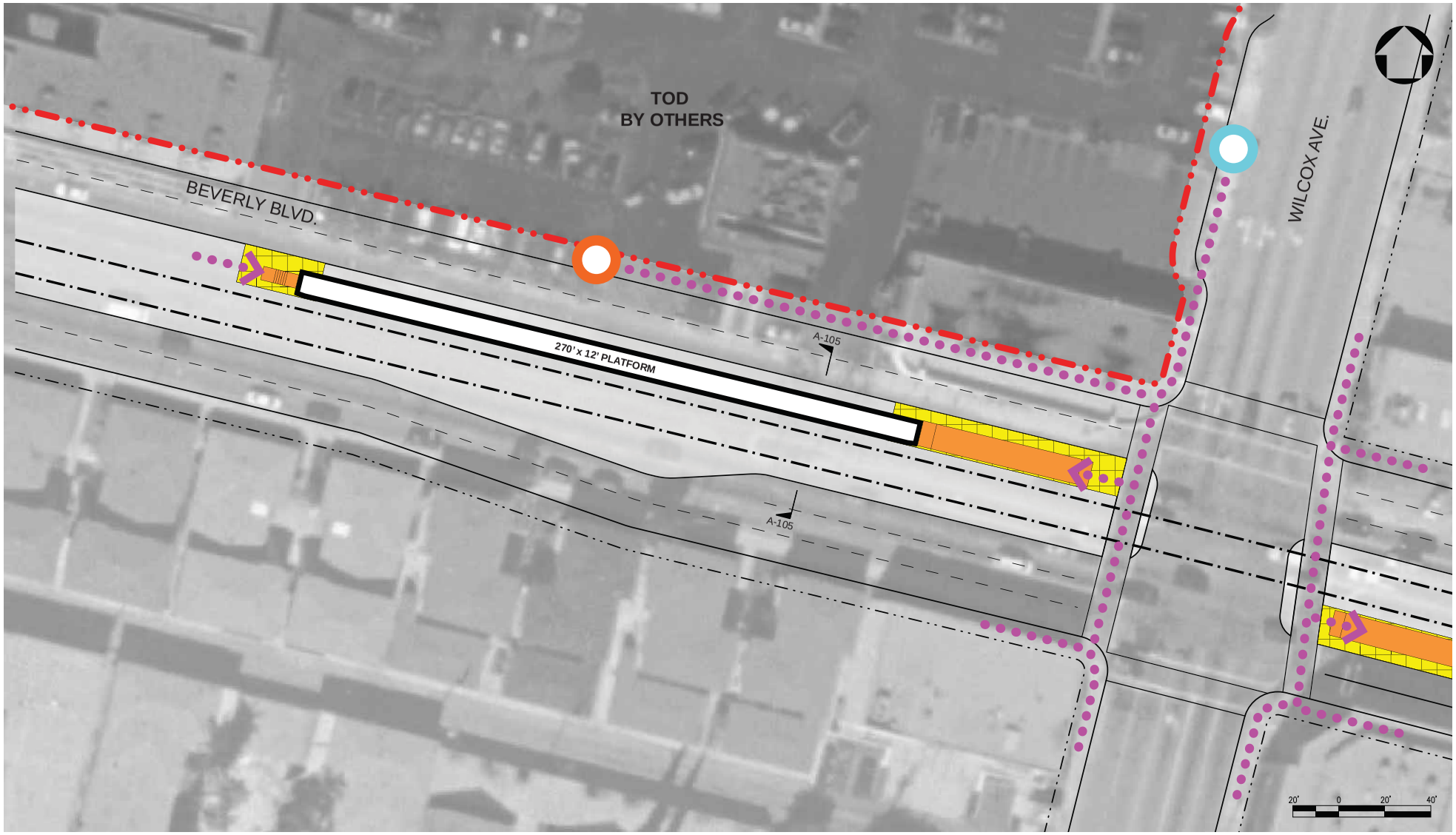
REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. SCHWARZKOPF
DRAWN BY S. GODKIN
CHECKED BY S. SCHWARZKOPF
IN CHARGE V. DAVIES
DATE 06/29/09

Metro
Metropolitan Transportation Authority
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD. / WHITTIER BLVD.
(BEVERLY / MONTEBELLO / WHITTIER)
GARFIELD AVE. STATION
SECTION

CONTRACT NO PS4320-2003
DRAWING NO A-102
REV 0
SCALE NO SCALE
SHEET NO



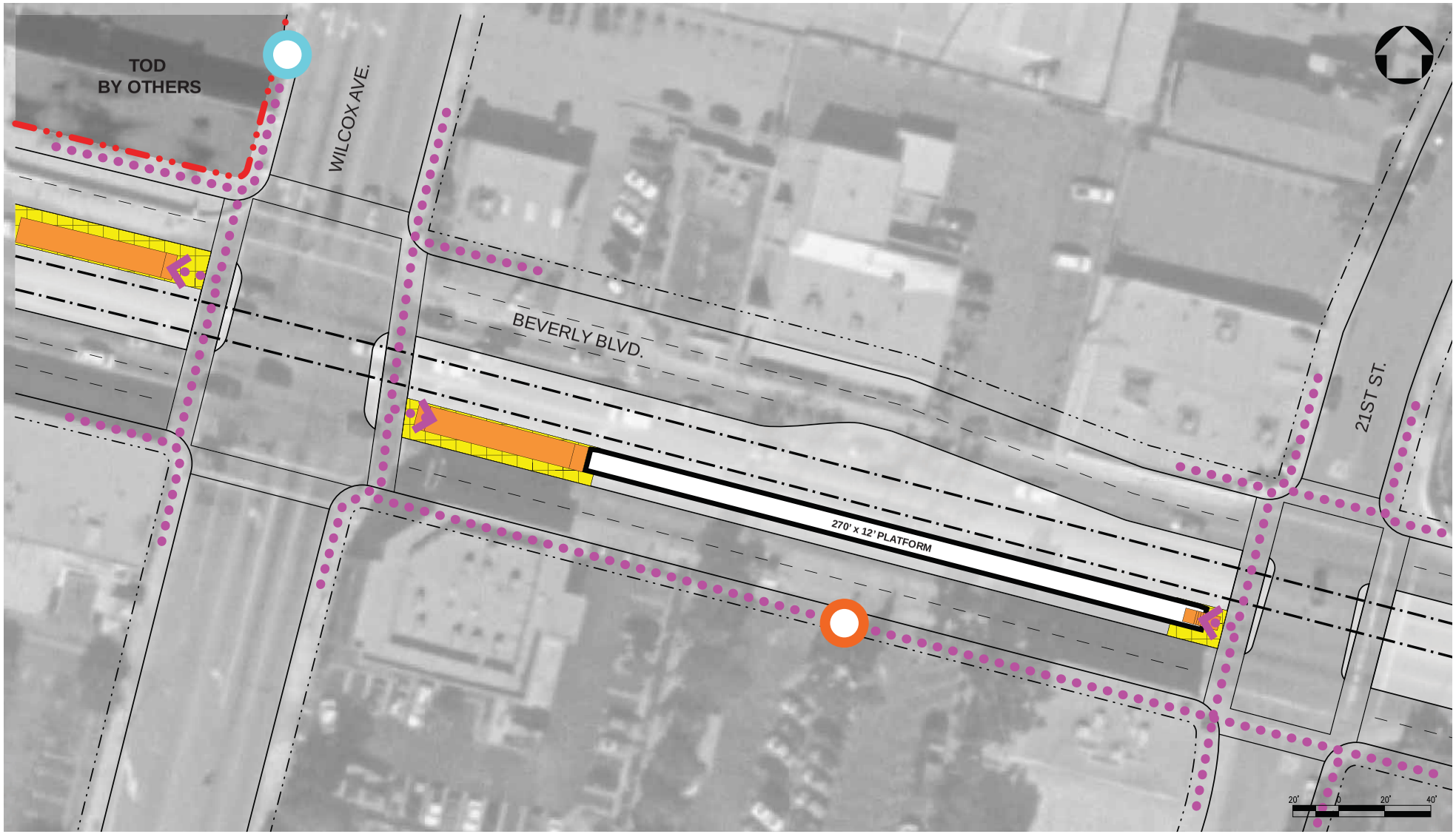
REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. SCHWARZKOPF
DRAWN BY S. GODKIN
CHECKED BY S. SCHWARZKOPF
IN CHARGE V. DAVIES
DATE 06/29/09

Metro
Metropolitan Transportation Authority
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD. / WHITTIER BLVD.
(BEVERLY / MONTEBELLO / WHITTIER)
WILCOX AVE. STATION
LOCATION PLAN 1 OF 2

CONTRACT NO PS4320-2003
DRAWING NO A-103
REV 0
SCALE 1⊠= 40⊠
SHEET NO



REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

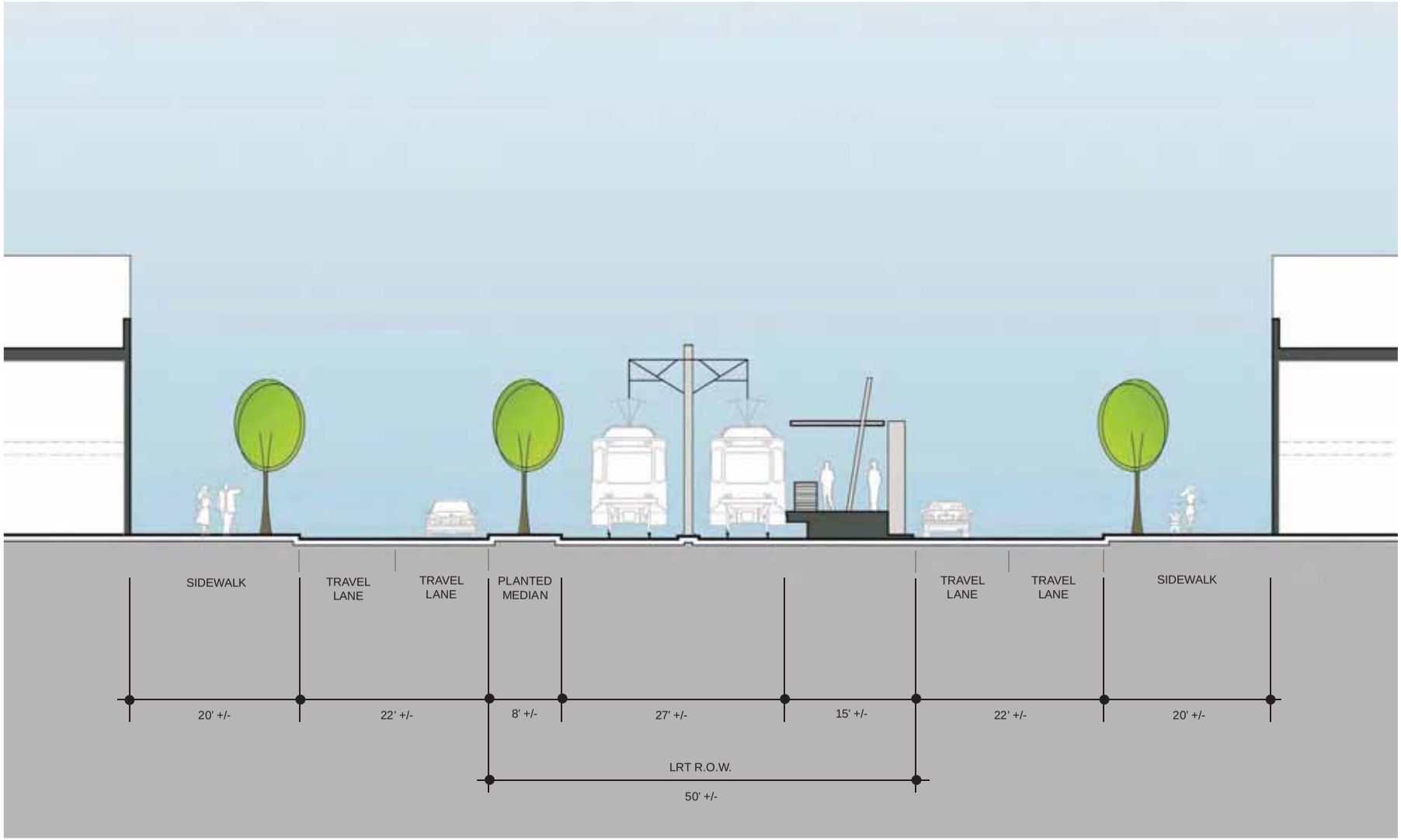
DESIGNED BY S. SCHWARZKOPF
DRAWN BY S. GODKIN
CHECKED BY S. SCHWARZKOPF
IN CHARGE V. DAVIES
DATE 06/29/09

Metro
Metropolitan Transportation Authority

CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD. / WHITTIER BLVD.
(BEVERLY / MONTEBELLO / WHITTIER)
WILCOX AVE. STATION
LOCATION PLAN 2 OF 2

CONTRACT NO PS4320-2003
DRAWING NO A-104
REV 0
SCALE 1⊠ = 40⊠
SHEET NO



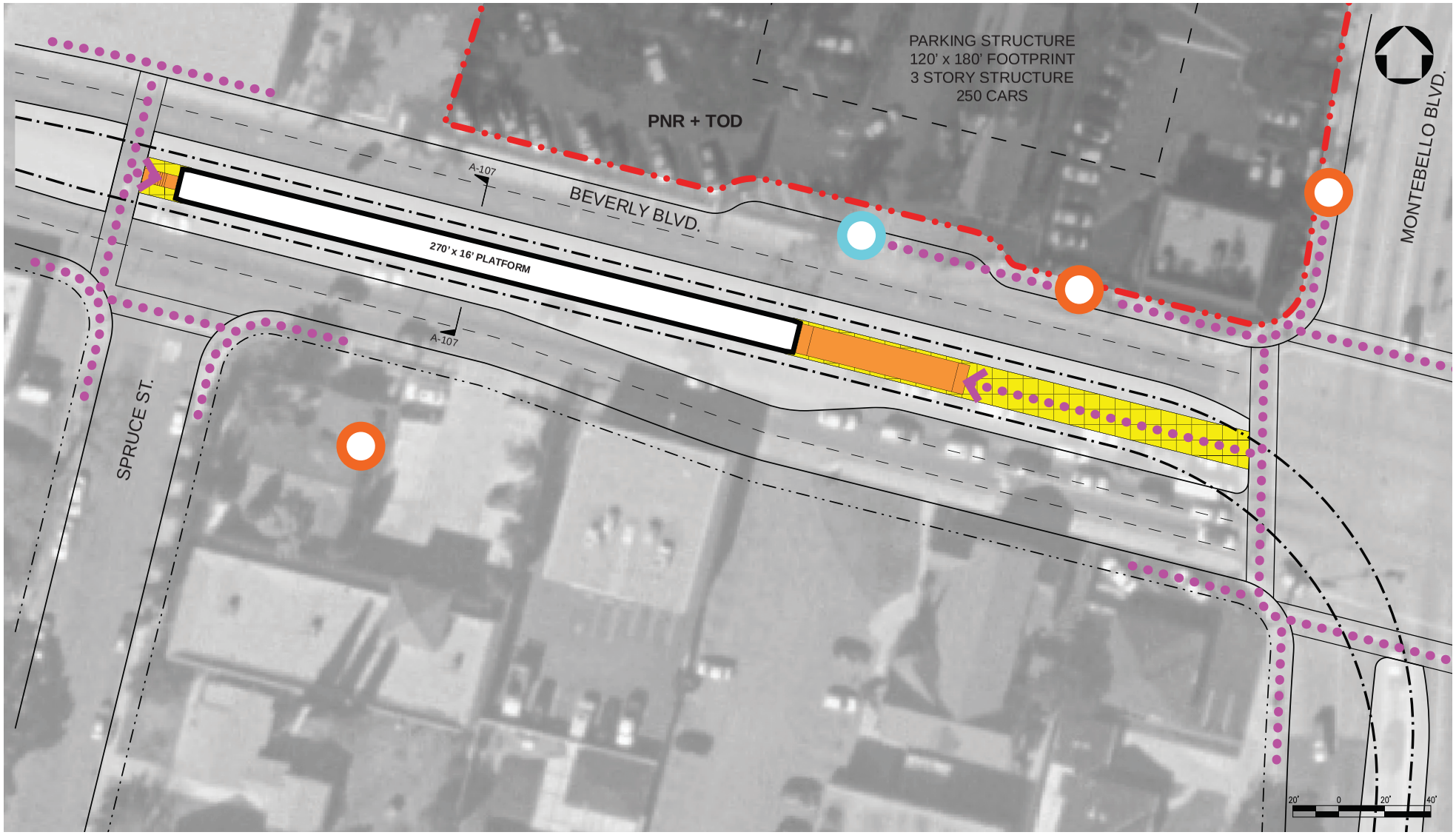
REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. SCHWARZKOPF
DRAWN BY S. GODKIN
CHECKED BY S. SCHWARZKOPF
IN CHARGE V. DAVIES
DATE 06/29/09

Metro
Metropolitan Transportation Authority
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD. / WHITTIER BLVD.
(BEVERLY / MONTEBELLO / WHITTIER)
WILCOX AVE. STATION
SECTION

CONTRACT NO PS4320-2003
DRAWING NO A-105
REV 0
SCALE NO SCALE
SHEET NO



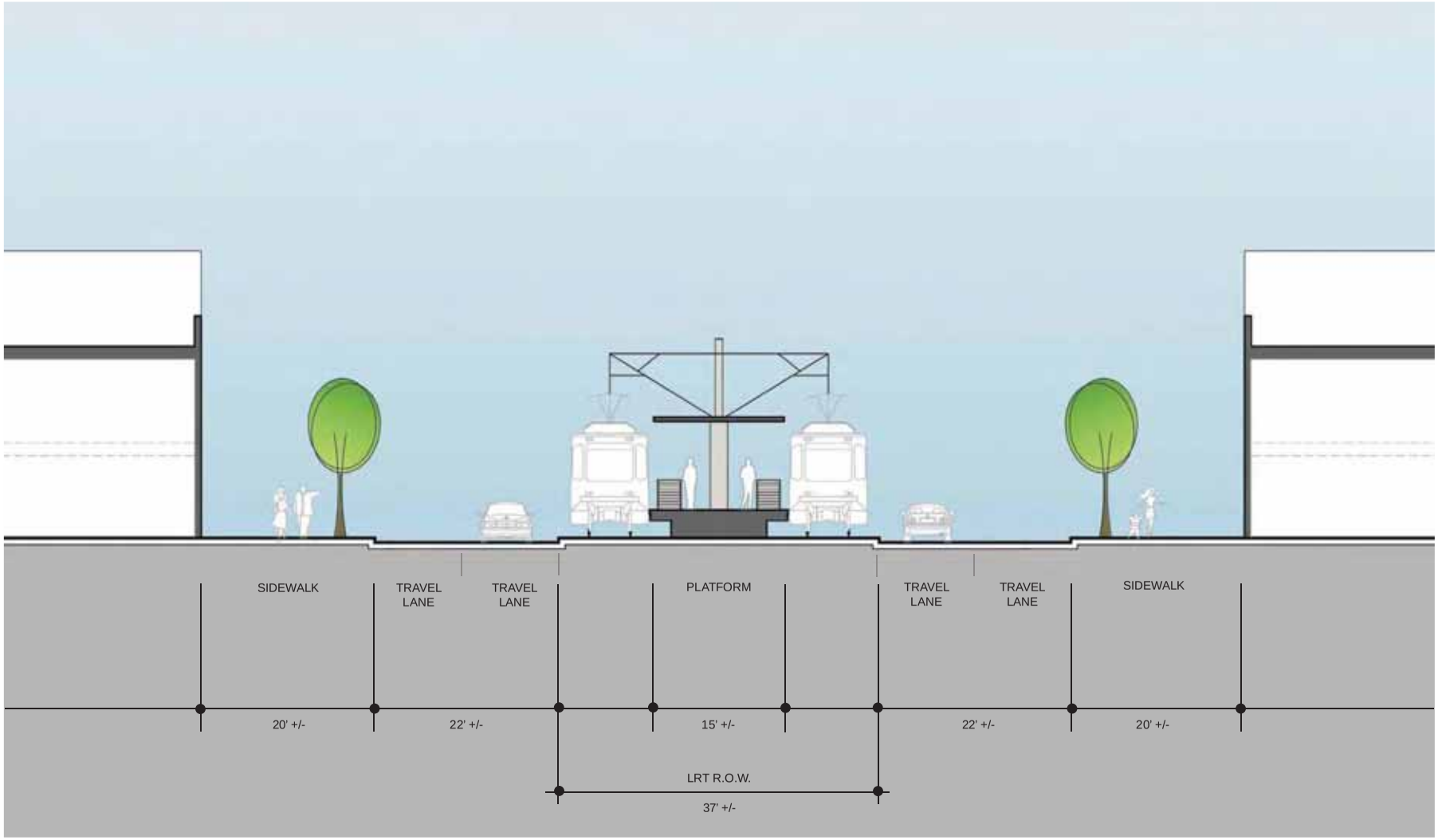
REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. SCHWARZKOPF
DRAWN BY S. GODKIN
CHECKED BY S. SCHWARZKOPF
IN CHARGE V. DAVIES
DATE 06/29/09

Metro
Metropolitan Transportation Authority
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD. / WHITTIER BLVD.
(BEVERLY / MONTEBELLO / WHITTIER)
BEVERLY-MONTEBELLO STATION
LOCATION PLAN

CONTRACT NO PS4320-2003
DRAWING NO A-106
REV 0
SCALE 1⊠ = 40⊠
SHEET NO



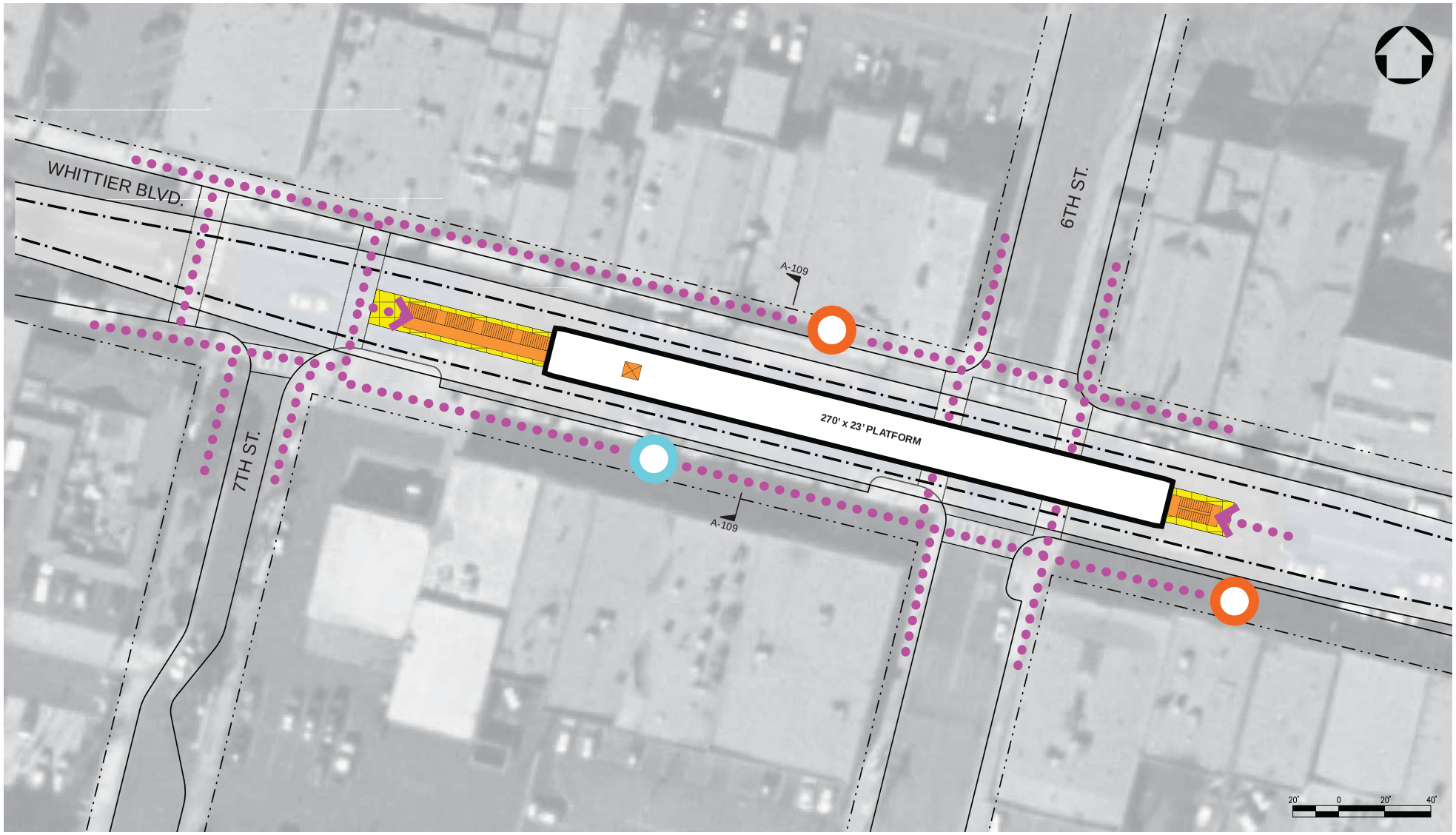
REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. SCHWARZKOPF
DRAWN BY S. GODKIN
CHECKED BY S. SCHWARZKOPF
IN CHARGE V. DAVIES
DATE 06/29/09

Metro
Metropolitan Transportation Authority
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD. / WHITTIER BLVD.
(BEVERLY / MONTEBELLO / WHITTIER)
BEVERLY-MONTEBELLO STATION
SECTION

CONTRACT NO PS4320-2003
DRAWING NO A-107
REV 0
SCALE NO SCALE
SHEET NO



REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. SCHWARZKOPF
DRAWN BY S. GODKIN
CHECKED BY S. SCHWARZKOPF
IN CHARGE V. DAVIES
DATE 06/29/09

Metro
Metropolitan Transportation Authority
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD. / WHITTIER BLVD.
(BEVERLY / MONTEBELLO / WHITTIER)
WHITTIER-MONTEBELLO STATION
LOCATION PLAN

CONTRACT NO PS4320-2003
DRAWING NO A-108
REV 0
SCALE 1⊠= 40⊠
SHEET NO

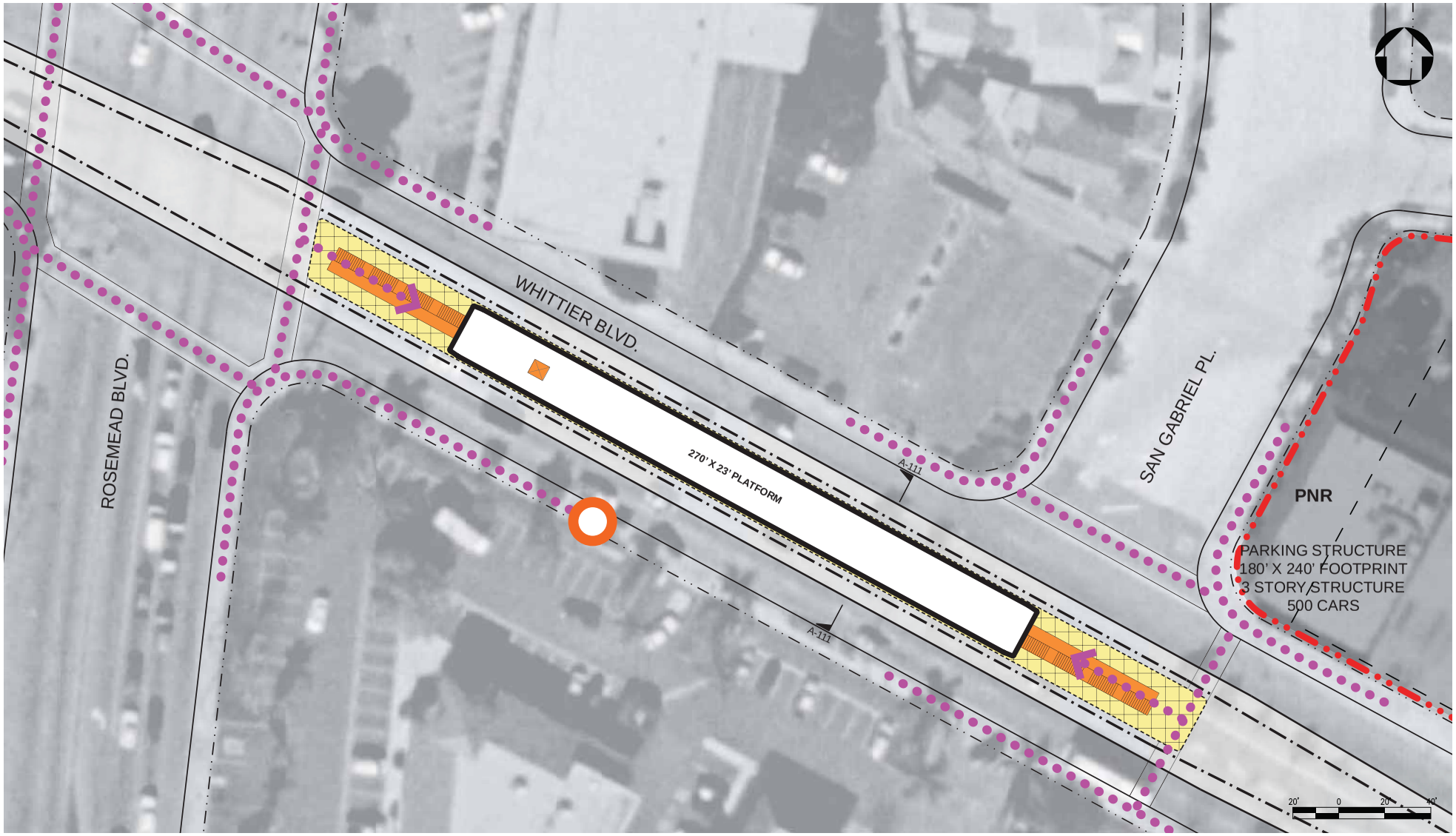
REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. SCHWARZKOPF
DRAWN BY S. GODKIN
CHECKED BY S. SCHWARZKOPF
IN CHARGE V. DAVIES
DATE 06/29/09

Metro
Metropolitan Transportation Authority
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD. / WHITTIER BLVD.
(BEVERLY / MONTEBELLO / WHITTIER)
WHITTIER-MONTEBELLO STATION
SECTION

CONTRACT NO PS4320-2003
DRAWING NO A-109
REV 0
SCALE NO SCALE
SHEET NO



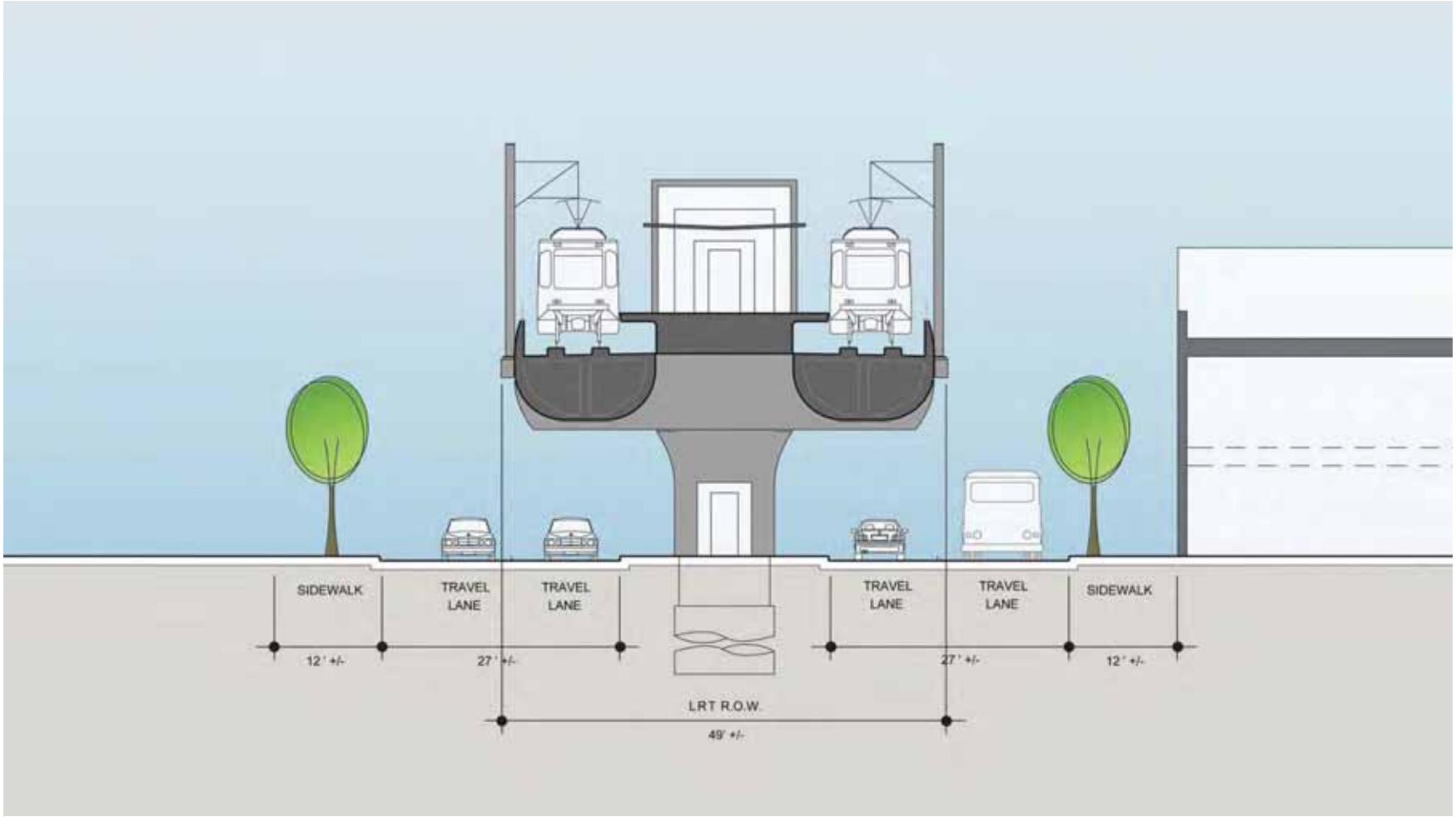
REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY R. ESCOBEDO
DRAWN BY L. VAZQUEZ
CHECKED BY L. CHAVEZ
IN CHARGE F. VILLALOBOS
DATE 06/29/09

Metro
Metropolitan Transportation Authority
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD. / WHITTIER BLVD.
(BEVERLY / MONTEBELLO / WHITTIER)
ROSEMEAD BLVD. STATION
LOCATION PLAN

CONTRACT NO PS4320-2003
DRAWING NO A-110
REV 0
SCALE 1⊠= 40⊠
SHEET NO



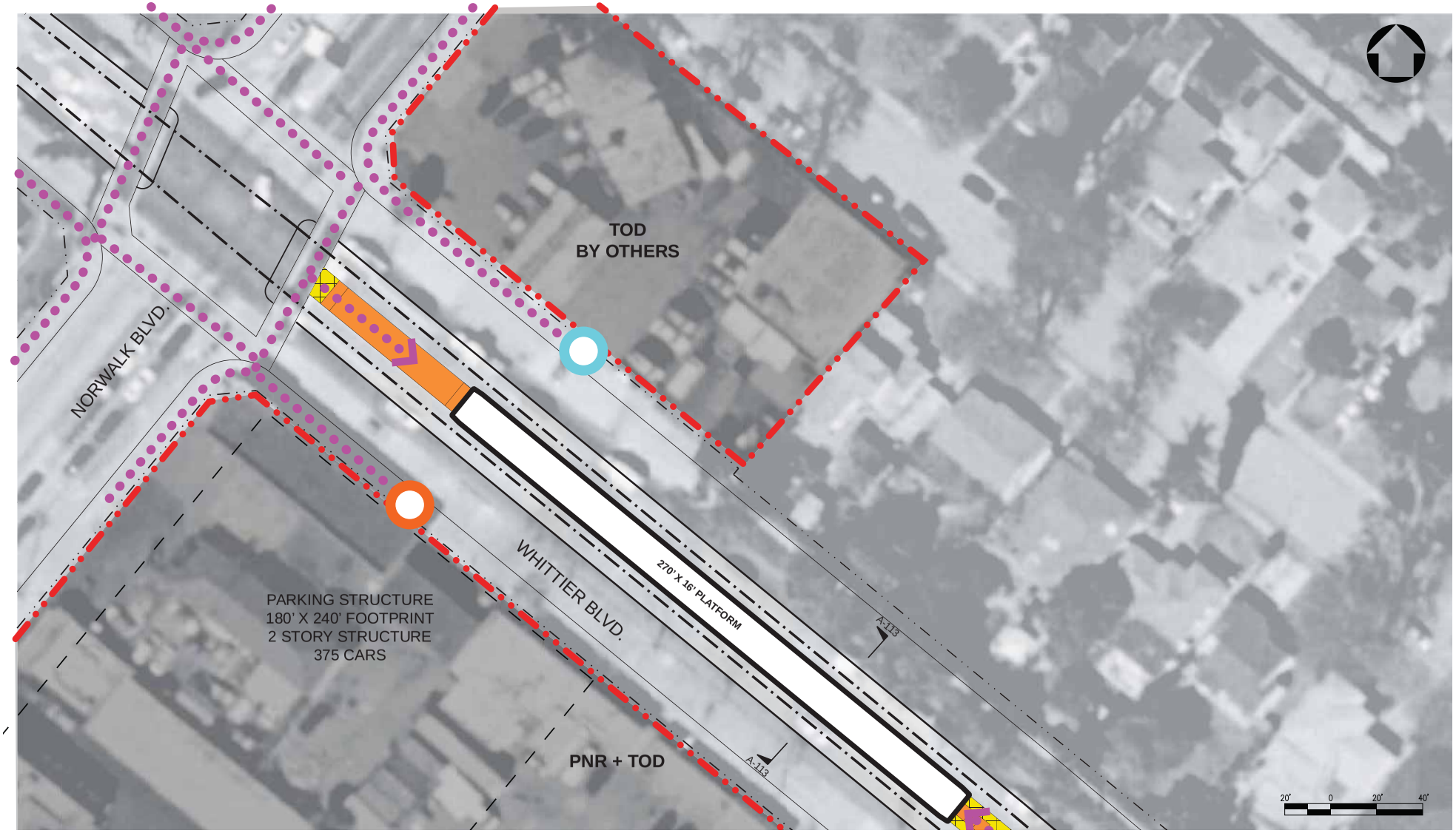
REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY R. ESCOBEDO
DRAWN BY L. VAZQUEZ
CHECKED BY L. CHAVEZ
IN CHARGE F. VILLALOBOS
DATE 06/29/09

Metro
Metropolitan Transportation Authority
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD. / WHITTIER BLVD.
(BEVERLY / MONTEBELLO / WHITTIER)
ROSEMEAD BLVD. STATION
SECTION

CONTRACT NO PS4320-2003
DRAWING NO A-111
REV 0
SCALE NO SCALE
SHEET NO



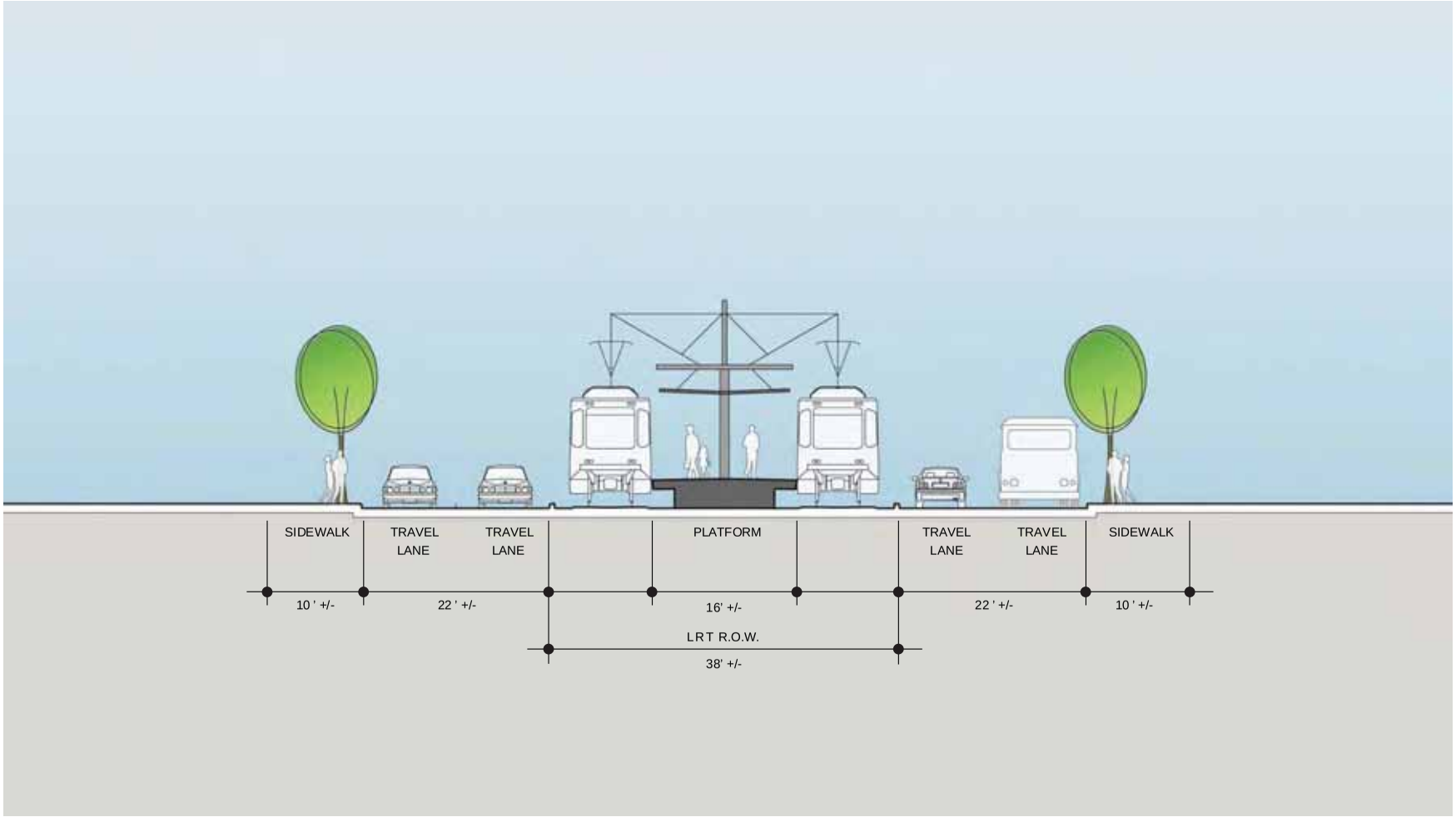
REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY R. ESCOBEDO
DRAWN BY L. VAZQUEZ
CHECKED BY L. CHAVEZ
IN CHARGE F. VILLALOBOS
DATE 06/29/09

Metro
Metropolitan Transportation Authority
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD. / WHITTIER BLVD.
(BEVERLY / MONTEBELLO / WHITTIER)
NORWALK AVE. STATION
LOCATION PLAN

CONTRACT NO PS4320-2003
DRAWING NO A-112
REV 0
SCALE 1⊠= 40⊠
SHEET NO



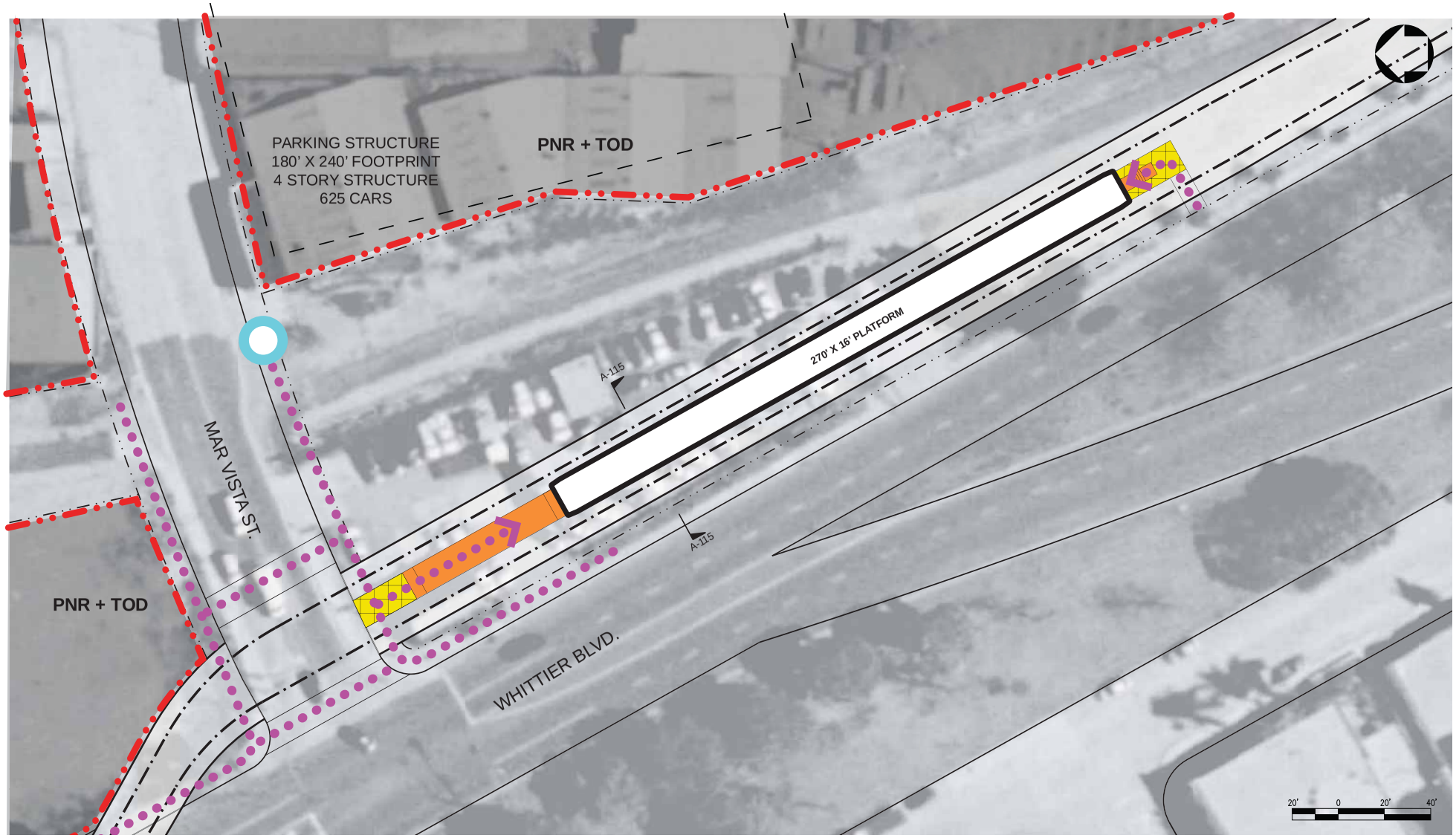
REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY R. ESCOBEDO
DRAWN BY L. VAZQUEZ
CHECKED BY L. CHAVEZ
IN CHARGE F. VILLALOBOS
DATE 06/29/09

Metro
Metropolitan Transportation Authority
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD. / WHITTIER BLVD.
(BEVERLY / MONTEBELLO / WHITTIER)
NORWALK AVE. STATION
SECTION

CONTRACT NO PS4320-2003
DRAWING NO A-113
REV 0
SCALE NO SCALE
SHEET NO



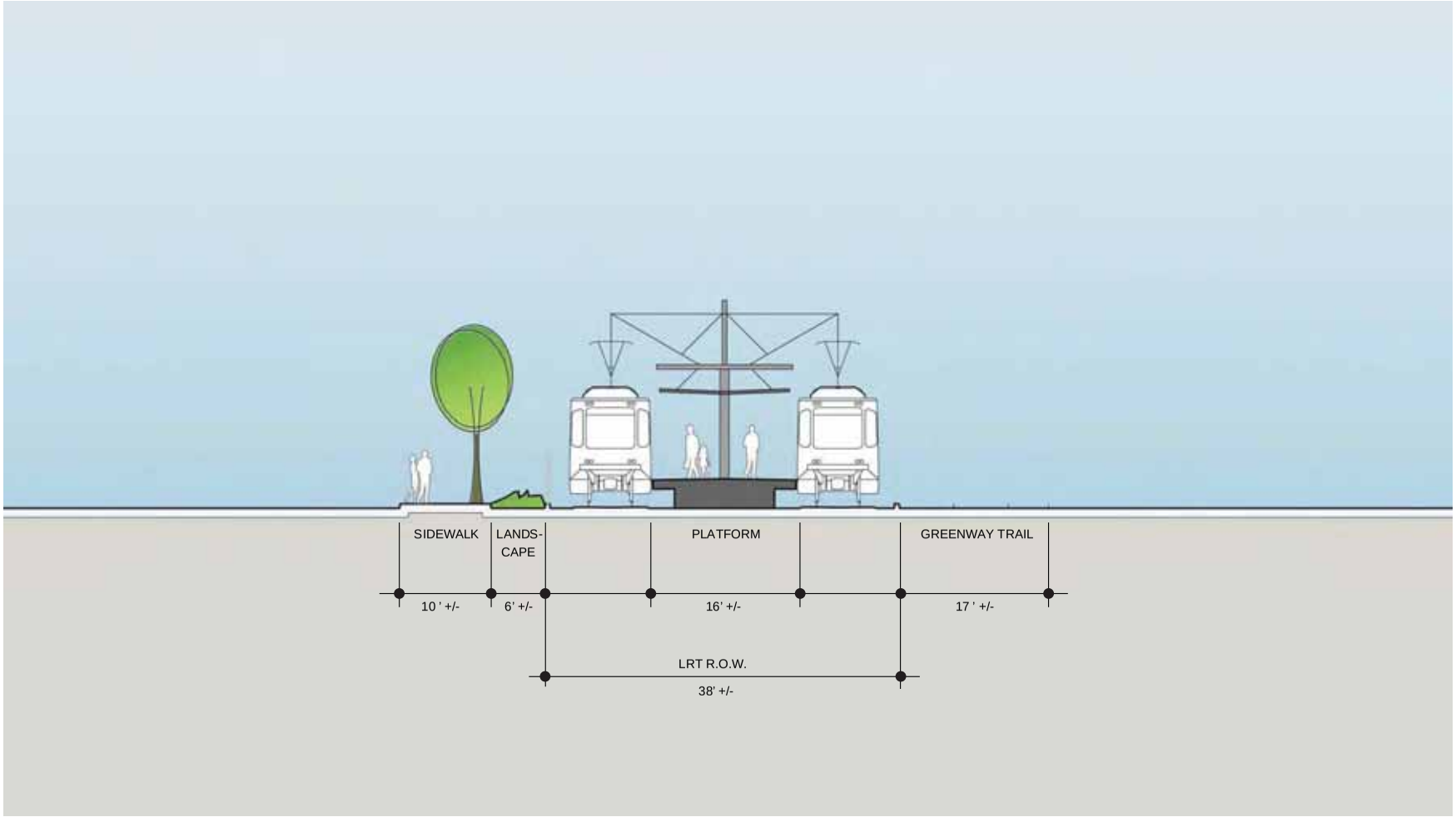
REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY R. ESCOBEDO
DRAWN BY L. VAZQUEZ
CHECKED BY L. CHAVEZ
IN CHARGE F. VILLALOBOS
DATE 06/29/09

Metro
Metropolitan Transportation Authority
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD. / WHITTIER BLVD.
(BEVERLY / MONTEBELLO / WHITTIER)
MAR VISTA ST. STATION
LOCATION PLAN

CONTRACT NO PS4320-2003
DRAWING NO A-114
REV 0
SCALE 1⊠= 40⊠
SHEET NO



REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY R. ESCOBEDO
DRAWN BY L. VAZQUEZ
CHECKED BY L. CHAVEZ
IN CHARGE F. VILLALOBOS
DATE 06/29/09

Metro
Metropolitan Transportation Authority
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD. / WHITTIER BLVD.
(BEVERLY / MONTEBELLO / WHITTIER)
MAR VISTA ST. STATION
SECTION

CONTRACT NO PS4320-2003
DRAWING NO A-115
REV 0
SCALE NO SCALE
SHEET NO

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD / WHITTIER BLVD
(BEVERLY/ROSEMEAD/WHITTIER)
ALIGNMENT
SHEET 1 OF 18

CONTRACT NO PS4320-2003
DRAWING NO T-151 REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 12:10:10 PM
PLOT DRIVER = Raster.hplf_pdf.pltr
PEN TABLE = WA-A-COLOR.TBL
USER=drains 12:10:10 PM 10/23/2009 w:\60039033_eastside2_le_part_2\cadd\roll\sheet\CET-151.plg

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD / WHITTIER BLVD
(BEVERLY/ROSEMEAD/WHITTIER)
ALIGNMENT
SHEET 2 OF 18

CONTRACT NO PS4320-2003
DRAWING NO T-152 REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 12:10:31 PM
PLOT DRIVER = Raster_half_pdf.plt
PEN TABLES = WHITE.COLOR.TBL

USER-drams 12:10:31 PM 10/23/2009 w:\60039033_eastside2_ip_part_2\cadd\roll\sheet\CET-152.plg

HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

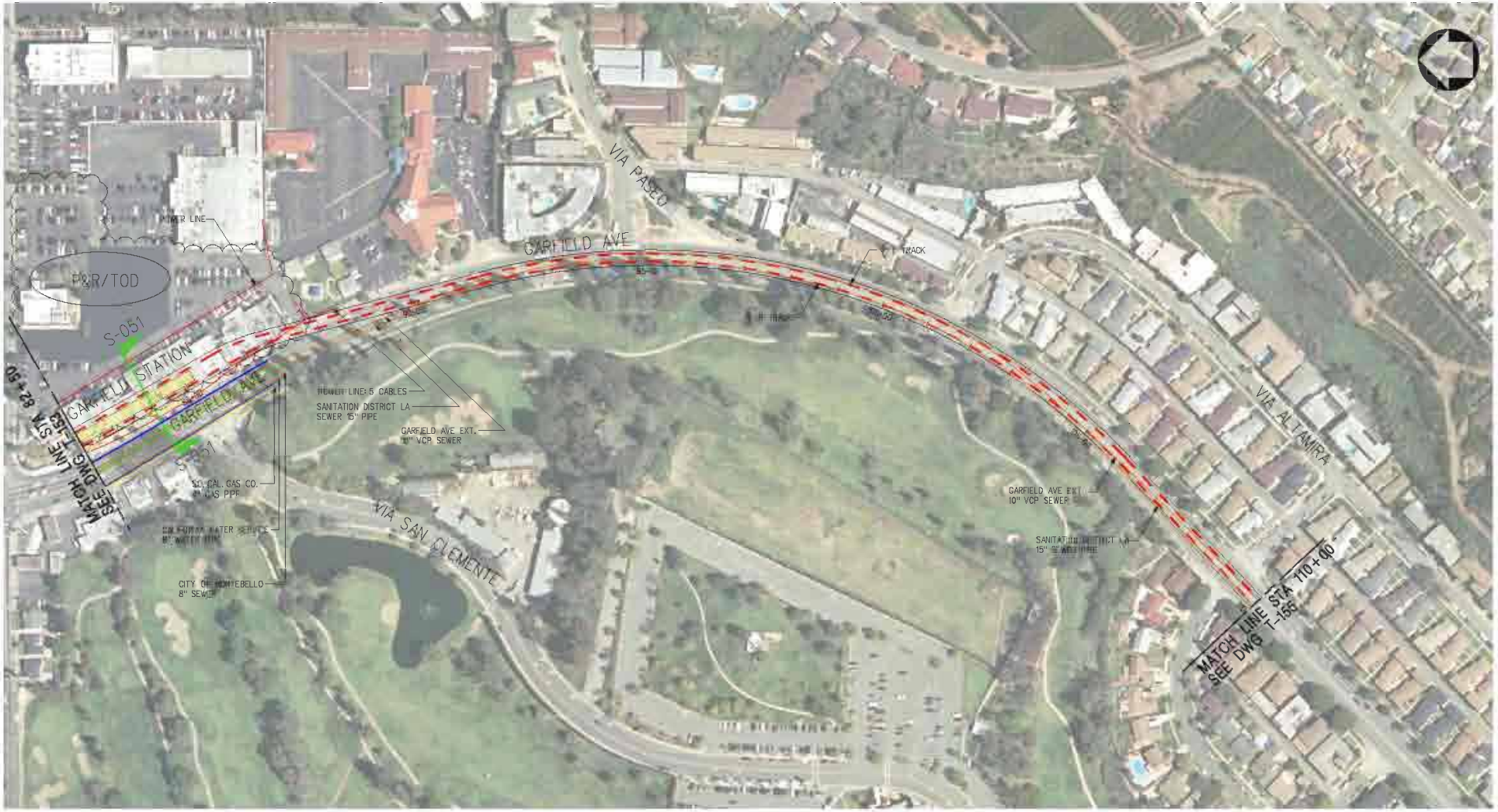
Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD / WHITTIER BLVD
(BEVERLY/ROSEMEAD/WHITTIER)
ALIGNMENT
SHEET 3 OF 18

CONTRACT NO PS4320-2003
DRAWING NO T-153 REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 12:10:51 PM
PLOT DRIVER = Raster_half_pdf.plt
PEN TABLES = WA_al_colors.tbl

USER=drains 12:10:51 PM 10/23/2009 w:\60039033_eastside2_le_part_2\cadd\roll\sheet\CET-153.jpg



HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD / WHITTIER BLVD
(BEVERLY/ROSEMEAD/WHITTIER)
ALIGNMENT
SHEET 4 OF 18

CONTRACT NO PS4320-2003
DRAWING NO T-154
REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 12:11:10 PM
PLOT DRIVER = Raster-half.pdf.plt
PEN TABLE = MTA-H-COLOR.tbl
USER=arains 12:11:10 PM 10/23/2009 w:\60039033_eastside2_to_part_2\cadd\rail\sheet\CET-154.plg

HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD / WHITTIER BLVD
(BEVERLY/ROSEMEAD/WHITTIER)
ALIGNMENT
SHEET 5 OF 18

CONTRACT NO PS4320-2003
DRAWING NO T-155 REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 12:11:32 PM
PLOT DRIVER = Raster_half_pdf.plt
PEN TABLE = WHA_bl_COLOR.TBL

USER=drains 12:11:32 PM 10/23/2009 w:\60039033_eastside2_la_part_2\cadd\roll\sheet\CET-155.plg

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

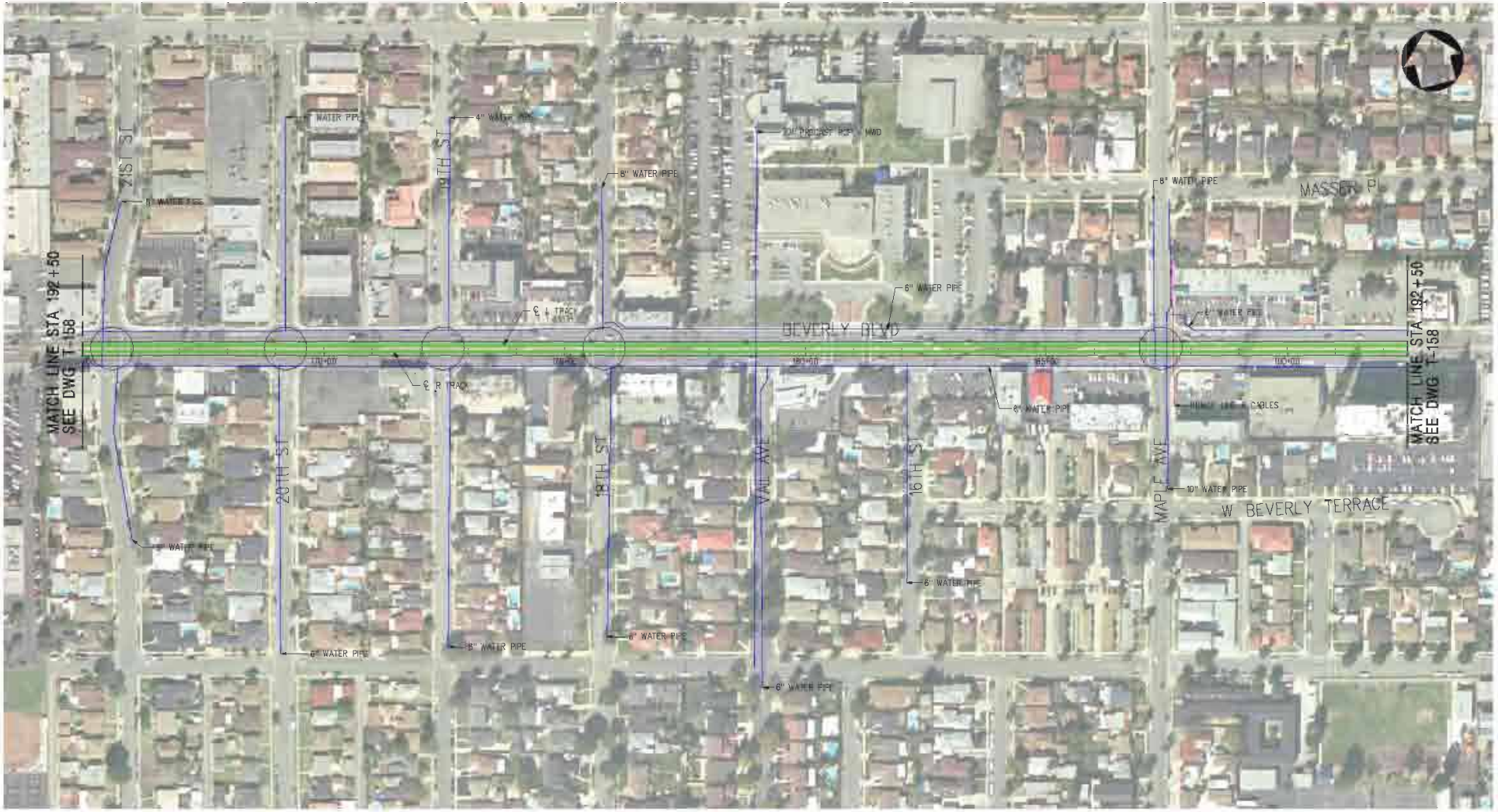
DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD / WHITTIER BLVD
(BEVERLY/ROSEMEAD/WHITTIER)
ALIGNMENT
SHEET 6 OF 18

CONTRACT NO PS4320-2003
DRAWING NO T-156
REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 12:11:54 PM
PLOT DRIVER = Raster-half.pdf.plt
PEN TABLE = MTA-HI-COLOR.tbl
USER=arains 12:11:54 PM 10/23/2009 w:\60039033_eastside2_to_part_2\cadd\rail\sheet\CET-156.plg



HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD / WHITTIER BLVD
(BEVERLY/ROSEMEAD/WHITTIER)
ALIGNMENT
SHEET 7 OF 18

CONTRACT NO PS4320-2003
DRAWING NO T-157
REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 12:12:15 PM
PLOT DRIVER = Raster-half.pdf.plt
PEN TABLE = MTA-H-COLOR.tbl

USER=arains 12:12:15 PM 10/23/2009 w:\60039033_eastside2_lo_par1_2\cadd\rail\sheet\CET-157.plg

HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD / WHITTIER BLVD
(BEVERLY/ROSEMEAD/WHITTIER)
ALIGNMENT
SHEET 8 OF 18

CONTRACT NO PS4320-2003
DRAWING NO T-158
REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 12:12:36 PM
PLOT DRIVER = Raster-half.pdf.plt
PEN TABLE = MTA-H-COLOR.tbl

USER-arains 12:12:36 PM 10/23/2009 w:\60039033_eastside2_lo_part_2\cadd\rail\sheet\CET-158.plg

REV	DATE	BY	APP	REQ NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY: W. ABREGO
DRAWN BY: S. ARAIN
CHECKED BY: J. AL-MASHAT
IN CHARGE: S. FIALKOFF
DATE: 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD / WHITTIER BLVD
(BEVERLY/ROSEMEAD/WHITTIER)
ALIGNMENT
SHEET 9 OF 18

CONTRACT NO: PS4320-2003
DRAWING NO: T-159
REV: 0
SCALE: HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 12:12:58 PM
PLOT DRIVER = Raster_hp16_pdf.pltr
PEN TABLE = MTA_LL_COLOR.tbl
USER=drains 12:12:58 PM 10/23/2009 w:\60039033_eastside2_lg_part_2\cadd\rail\street\CET-159.plg

HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD / WHITTIER BLVD
(BEVERLY/ROSEMEAD/WHITTIER)
ALIGNMENT
SHEET 10 OF 18

CONTRACT NO PS4320-2003
DRAWING NO T-160
REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 12:13:20 PM
PLOT DRIVER = Raster.hplf_pdf.pltr
PEN TABLE = WIN_3_COLOR.TBL

USER=grains 12:13:20 PM 10/23/2009 w:\60039033_eastside2_le_part_2\cadd\roll\sheet\CET160.plg

HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD / WHITTIER BLVD
(BEVERLY/ROSEMEAD/WHITTIER)
ALIGNMENT
SHEET 11 OF 18

CONTRACT NO PS4320-2003
DRAWING NO T-161 REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 12:13:42 PM
PLOT DRIVER = Raster.hplf.pdf.plt
PEN TABLE = WHITE.CDM.tbl

USER=drains 12:13:42 PM 10/23/2009 w:\60039033_eastside2_le_part_2\cadd\roll\sheet\CET-161.plg

HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY: W. ABREGO
DRAWN BY: S. ARAIN
CHECKED BY: J. AL-MASHAT
IN CHARGE: S. FIALKOFF
DATE: 07/03/09

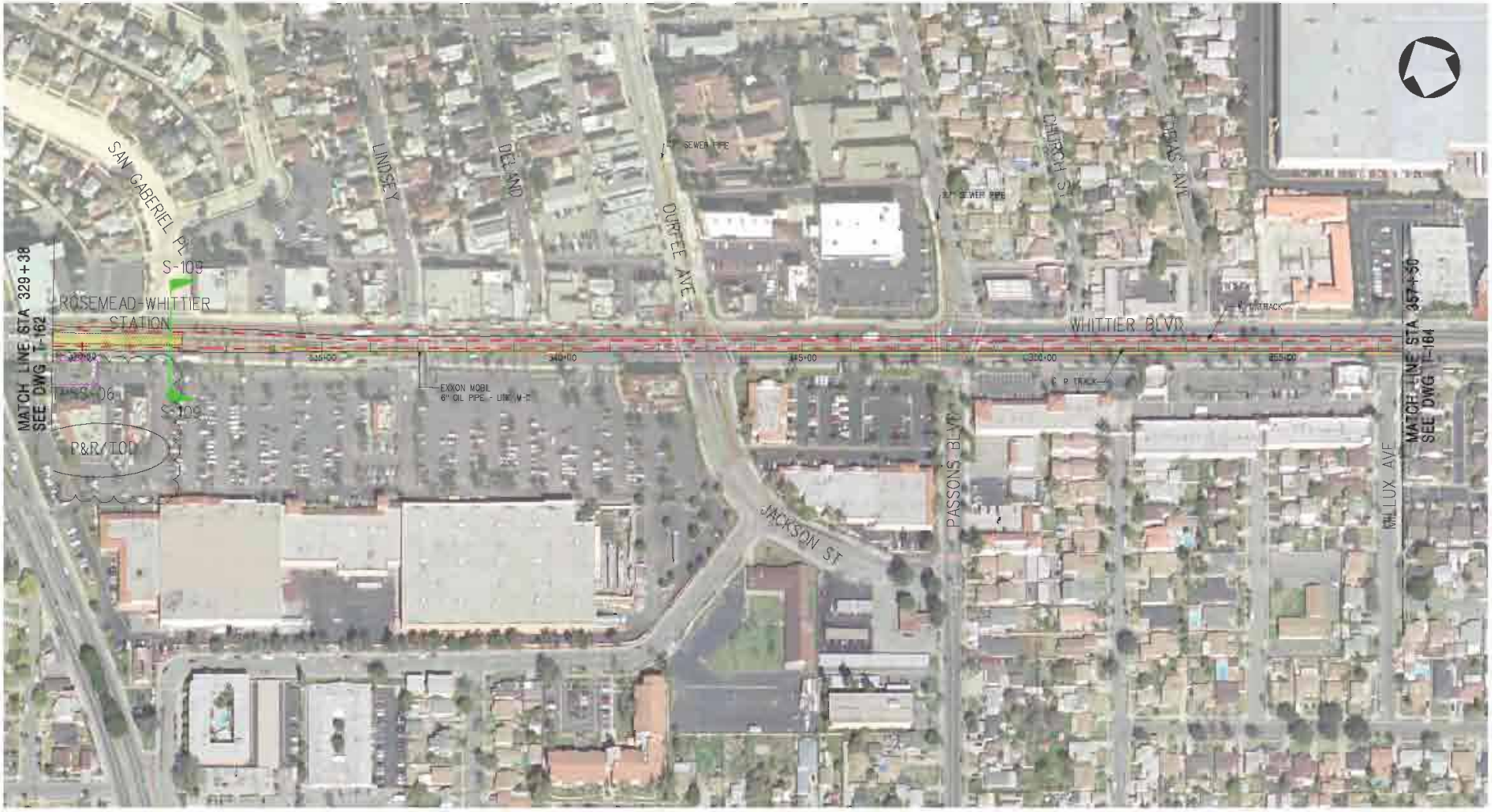
Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD / WHITTIER BLVD
(BEVERLY/ROSEMEAD/WHITTIER)
ALIGNMENT
SHEET 12 OF 18

CONTRACT NO: PS4320-2003
DRAWING NO: T-162
REV: 0
SCALE: HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 12:14:03 PM
PLOT DRIVER = Raster.hplf.pdf.plt
PEN TABLE = WA.ul.colors.tbl

USER=drains 12:14:03 PM 10/23/2009 w:\60039033_eastside2_le_part_2\cadd\roll\sheet\CET162.plg



HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD / WHITTIER BLVD
(BEVERLY/ROSEMEAD/WHITTIER)
ALIGNMENT
SHEET 13 OF 18

CONTRACT NO PS4320-2003
DRAWING NO T-163 REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 12:14:25 PM
PLOT DRIVER = Raster-half.pdf.plt
PEN TABLE = WHA-bl-color.tbl

USER-drains 12:14:25 PM 10/23/2009 w:\60039033_eastside2_le_part_2\cadd\roll\sheet\CET-163.plg

HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD / WHITTIER BLVD
(BEVERLY/ROSEMEAD/WHITTIER)
ALIGNMENT
SHEET 14 OF 18

CONTRACT NO PS4320-2003
DRAWING NO T-164
REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 12:14:47 PM
PLOT DRIVER = Raster-half.pdf.plt
PEN TABLE = MTA-H-COLOR.tbl
USER=arains 12:14:47 PM 10/23/2009 w:\60039033_eastside2_lo_part_2\cadd\roll\sheet\CET-164.plg

HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

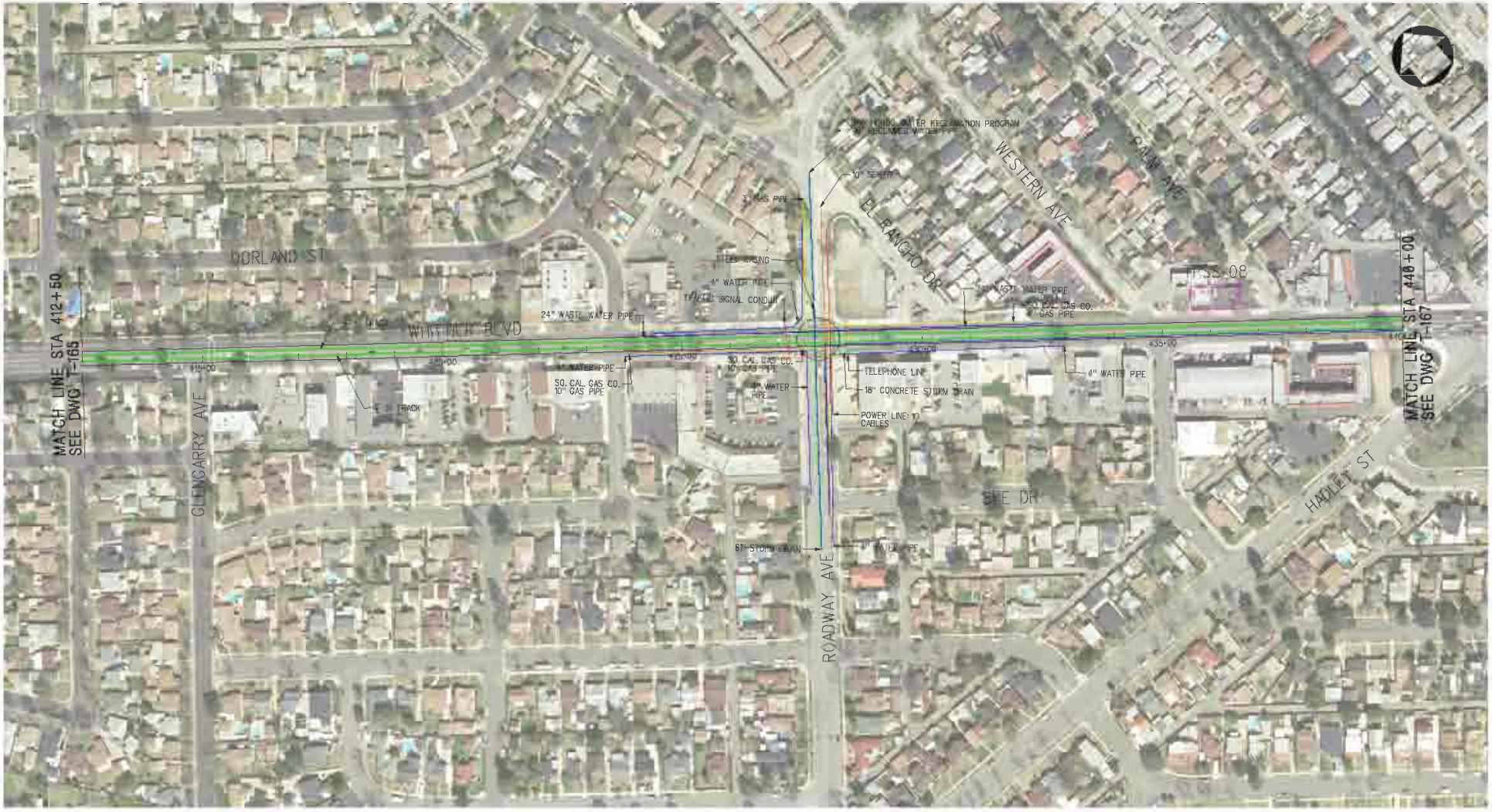
DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD / WHITTIER BLVD
(BEVERLY/ROSEMEAD/WHITTIER)
ALIGNMENT
SHEET 15 OF 18

CONTRACT NO PS4320-2003
DRAWING NO T-165
REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 12:15:10 PM
PLOT DRIVER = Raster-half-pdf.plt
PEN TABLE = MTA-H-COLOR.tbl
USER=arains 12:15:10 PM 10/23/2009 w:\60039033_eastside2_to_part_2\cadd\rail\sheet\CET-165.plg



HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD / WHITTIER BLVD
(BEVERLY/ROSEMEAD/WHITTIER)
ALIGNMENT
SHEET 16 OF 18

CONTRACT NO PS4320-2003
DRAWING NO T-166 REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 12:15:32 PM
PLOT DRIVER = Raster.half_pdf.plt
PEN TABLES = WHA_bl_color.tbl

USER=drains 12:15:32 PM 10/23/2009 w:\60039033_eastside2_le_part_2\cadd\roll\sheet\CET166.plg

HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD / WHITTIER BLVD
(BEVERLY/ROSEMEAD/WHITTIER)
ALIGNMENT
SHEET 17 OF 18

CONTRACT NO PS4320-2003
DRAWING NO T-167
REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 12:15:57 PM
PLOT DRIVER = Raster.hplf.pdf.plt
PEN TABLE = WHA-LA-COLOR.TBL
USER=drains 12:15:57 PM 10/23/2009 w:\60039033_eastside2_la_part_2\cadd\roll\sheet\CET167.plg

HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

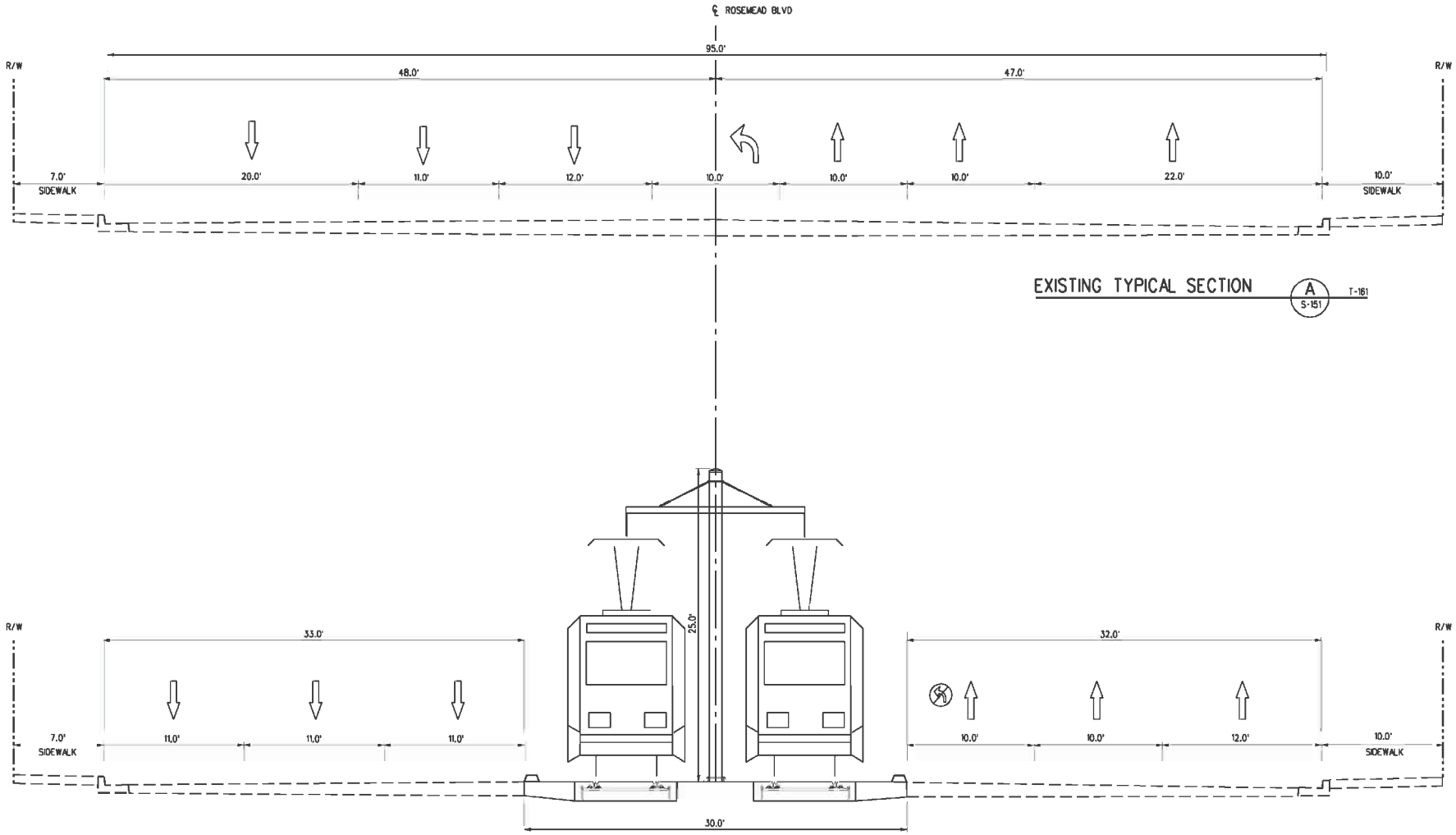
Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD / WHITTIER BLVD
(BEVERLY/ROSEMEAD/WHITTIER)
ALIGNMENT
SHEET 18 OF 18

CONTRACT NO PS4320-2003
DRAWING NO T-168
REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 12:16:19 PM
PLOT DRIVER = Raster.hdf8.pdf.plt
PEN TABLE = WYA_LCOLOR.TBL

USER=drains 12:16:19 PM 10/23/2009 w:\60039033_eastside2_le_part_2\cadd\roll\sheet\CET168.plg



REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. ARAIN
DRAWN BY J. VARIAS
CHECKED BY B. BALDERRAMA
IN CHARGE S. FIALKOFF
DATE 09/22/08

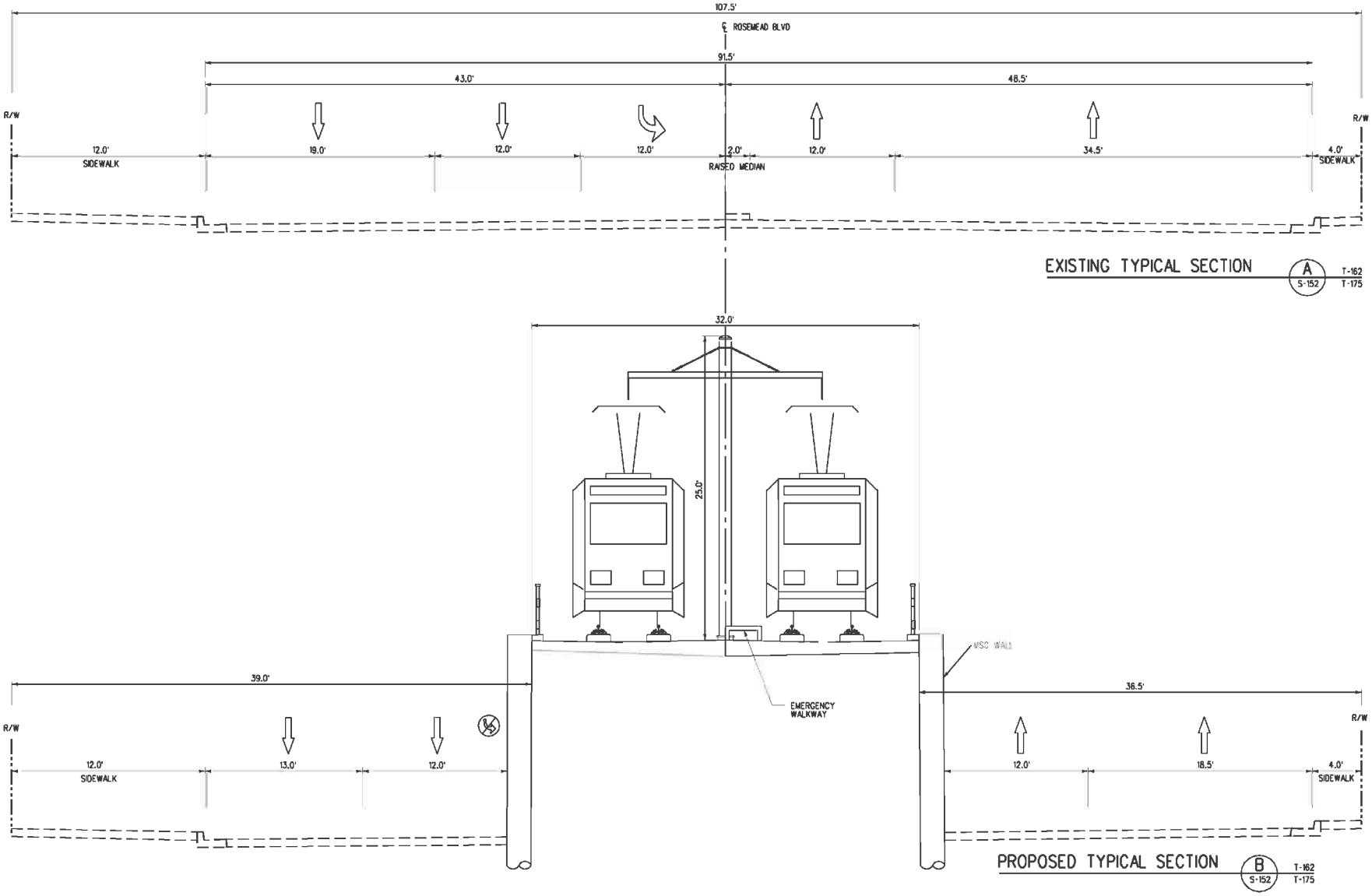
Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD/ WHITTIER BLVD
(BEVERLY/ROSEMEAD/WHITTIER)
SECTIONS
SHEET 1 OF 3

CONTRACT NO PS4320-2003
DRAWING NO S-151
REV 0
SCALE NO SCALE
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 11:40:01 AM
PLOT DRIVER = PDF_HOT4.PRT
PEN TABLE = MTA_LJ_PDF.TBL

USER=grams 11:40:01 AM 10/23/2009 w:\60039033_eastside2_lc_part_2\cadd\civil\sheet\CLS-151.dgn



REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. ARAIN
DRAWN BY J. VARIAS
CHECKED BY B. BALDERRAMA
IN CHARGE S. FIALKOFF
DATE 09/22/08

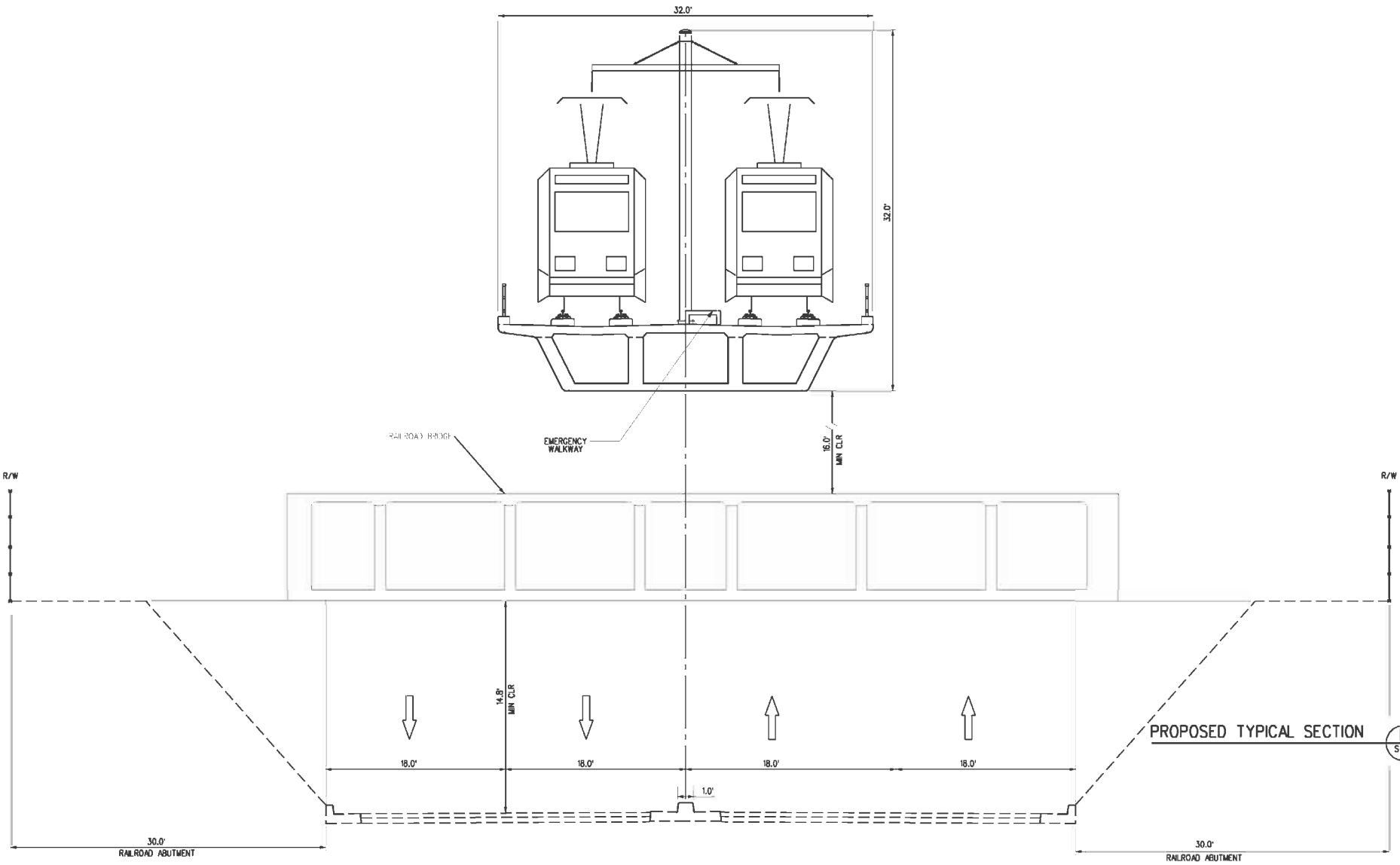
Metropolitan Transportation Authority
Metro
CDM AECOM JOINT VENTURE

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD/ WHITTIER BLVD
(BEVERLY/ROSEMEAD/WHITTIER)
SECTIONS
SHEET 2 OF 3

CONTRACT NO PS4320-2003
DRAWING NO S-152
REV 0
SCALE NO SCALE
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 11:40:03 AM
PLOT DRIVER = PDF_HOTF4_BW.pltt
PEN TABLE = MTA_A_pen.tbl

USER=grams 10/23/2009 11:40:03 AM w:\60039033_eastside2_la_part1_2\cad\civil\sheet\S-152.dgn



REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

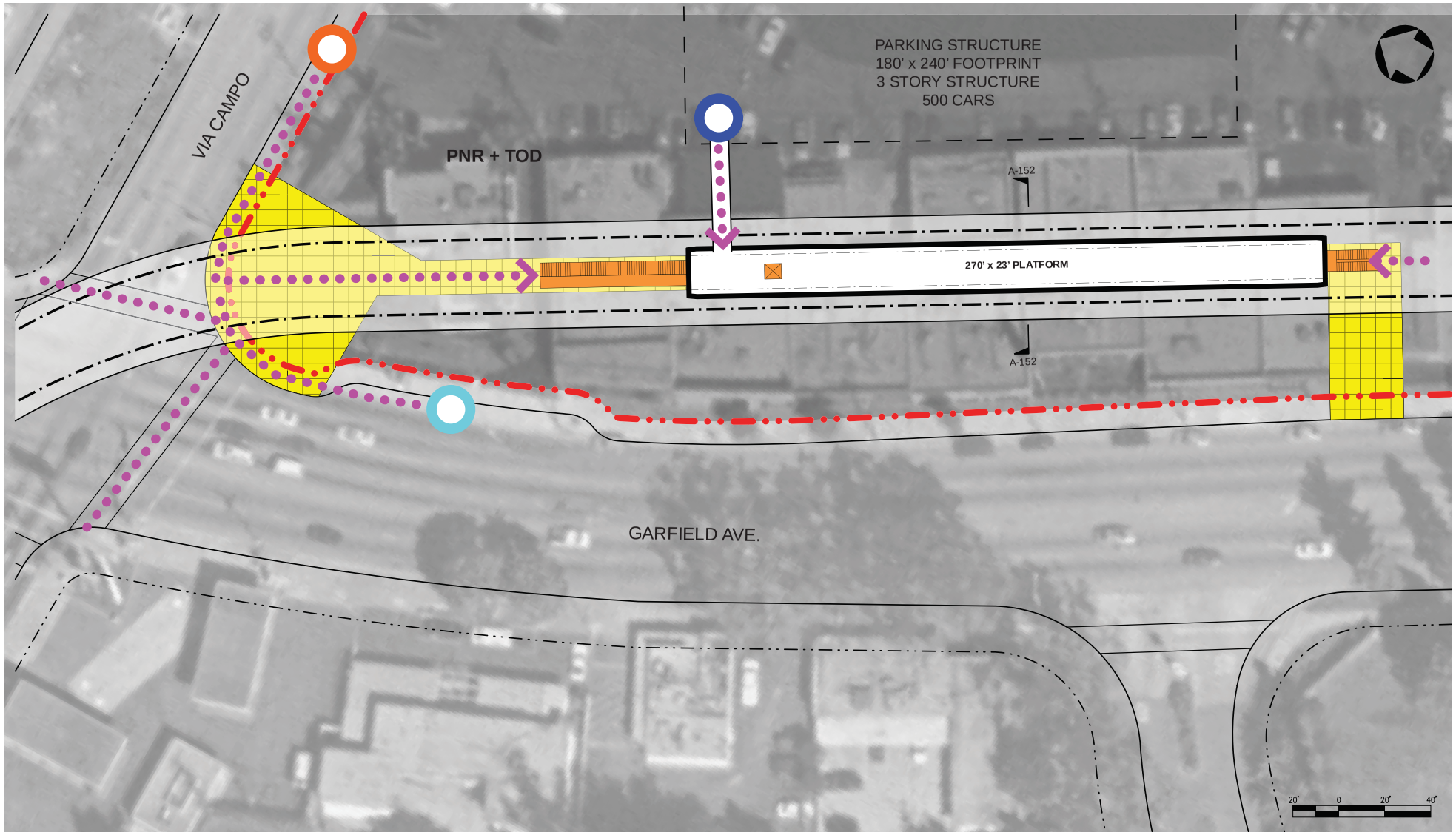
DESIGNED BY S. ARAIN
DRAWN BY J. VARIAS
CHECKED BY B. BALDERRAMA
IN CHARGE S. FIALKOFF
DATE 09/22/08

Metropolitan Transportation Authority
Metro
CDM AECOM JOINT VENTURE

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD/ WHITTIER BLVD
(BEVERLY/ROSEMEAD/WHITTIER)
SECTIONS
SHEET 3 OF 3

CONTRACT NO PS4320-2003
DRAWING NO S-153
REV 0
SCALE NO SCALE
SHEET NO

DATE PLOTTED = 10/23/2009 TIME PLOTTED = 11:40:04 AM
PLOT DRIVER = PDF_HOLF4.BW.pltr PEN TABLE = MTA_LJ_pen1.tbl
USER=grams 11:40:04 AM 10/23/2009 w:\60039033_eastside2_lc_part1_2\cad\civil\sheet\CS-153.dgn



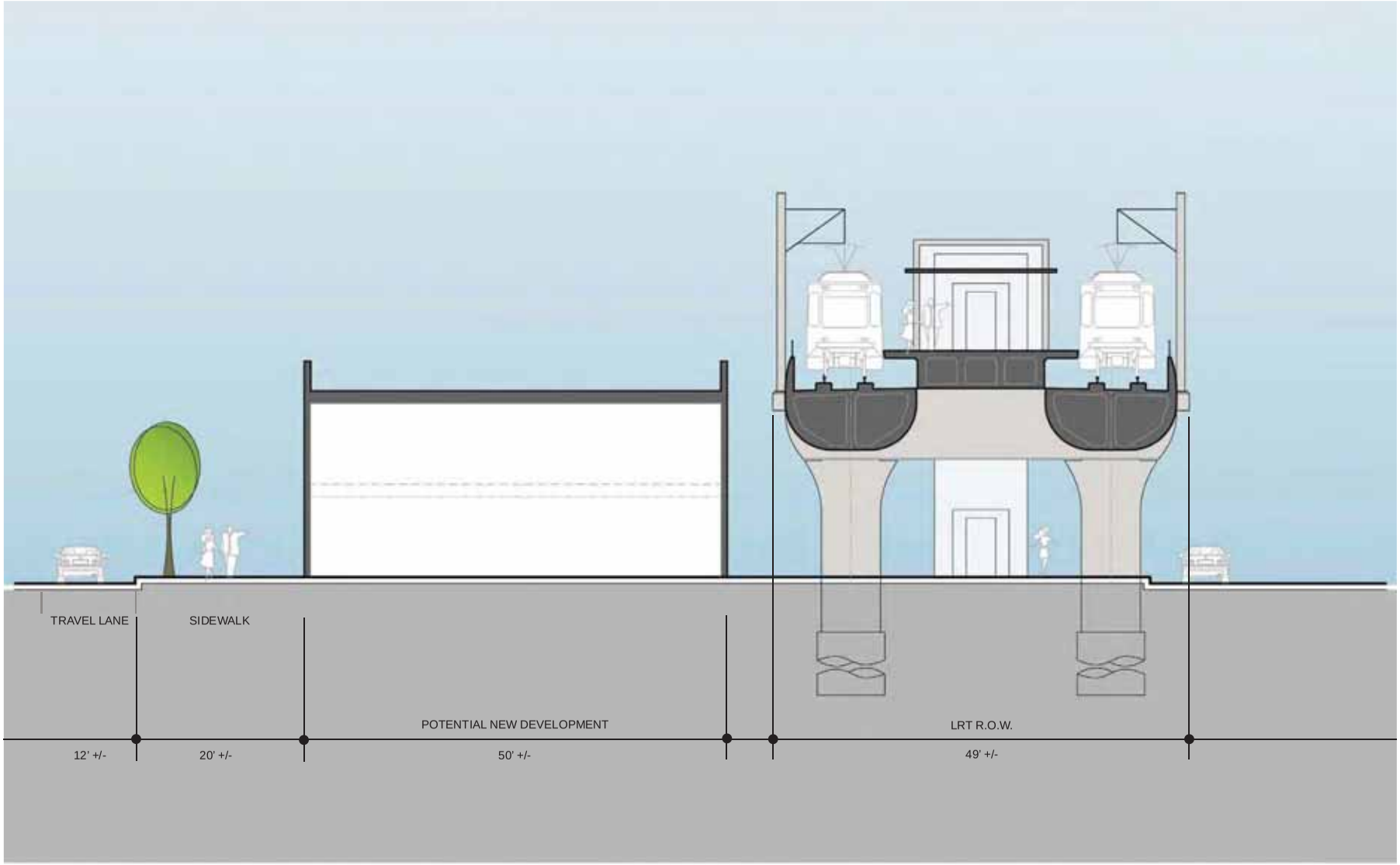
REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. SCHWARZKOPF
DRAWN BY S. GODKIN
CHECKED BY S. SCHWARZKOPF
IN CHARGE V. DAVIES
DATE 06/29/09

Metro
Metropolitan Transportation Authority
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD. / WHITTIER BLVD.
(BEVERLY / ROSEMEAD / WHITTIER)
GARFIELD AVE. STATION
LOCATION PLAN

CONTRACT NO PS4320-2003
DRAWING NO A-151
REV 0
SCALE 1⊠= 40⊠
SHEET NO



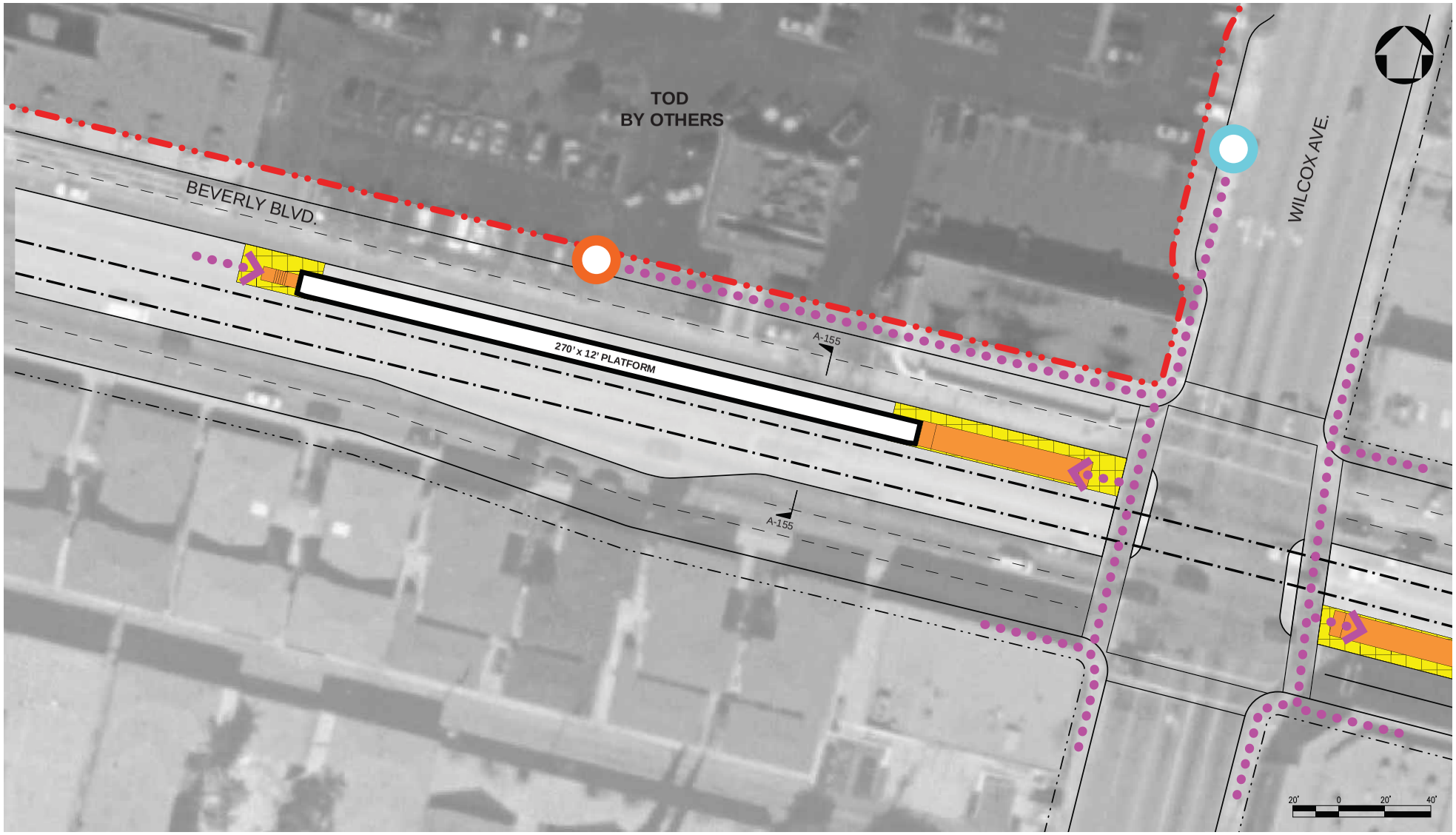
REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. SCHWARZKOPF
DRAWN BY S. GODKIN
CHECKED BY S. SCHWARZKOPF
IN CHARGE V. DAVIES
DATE 06/29/09

Metro
Metropolitan Transportation Authority
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD. / WHITTIER BLVD.
(BEVERLY / ROSEMEAD / WHITTIER)
GARFIELD AVE. STATION
SECTION

CONTRACT NO PS4320-2003
DRAWING NO A-152
REV 0
SCALE NO SCALE
SHEET NO



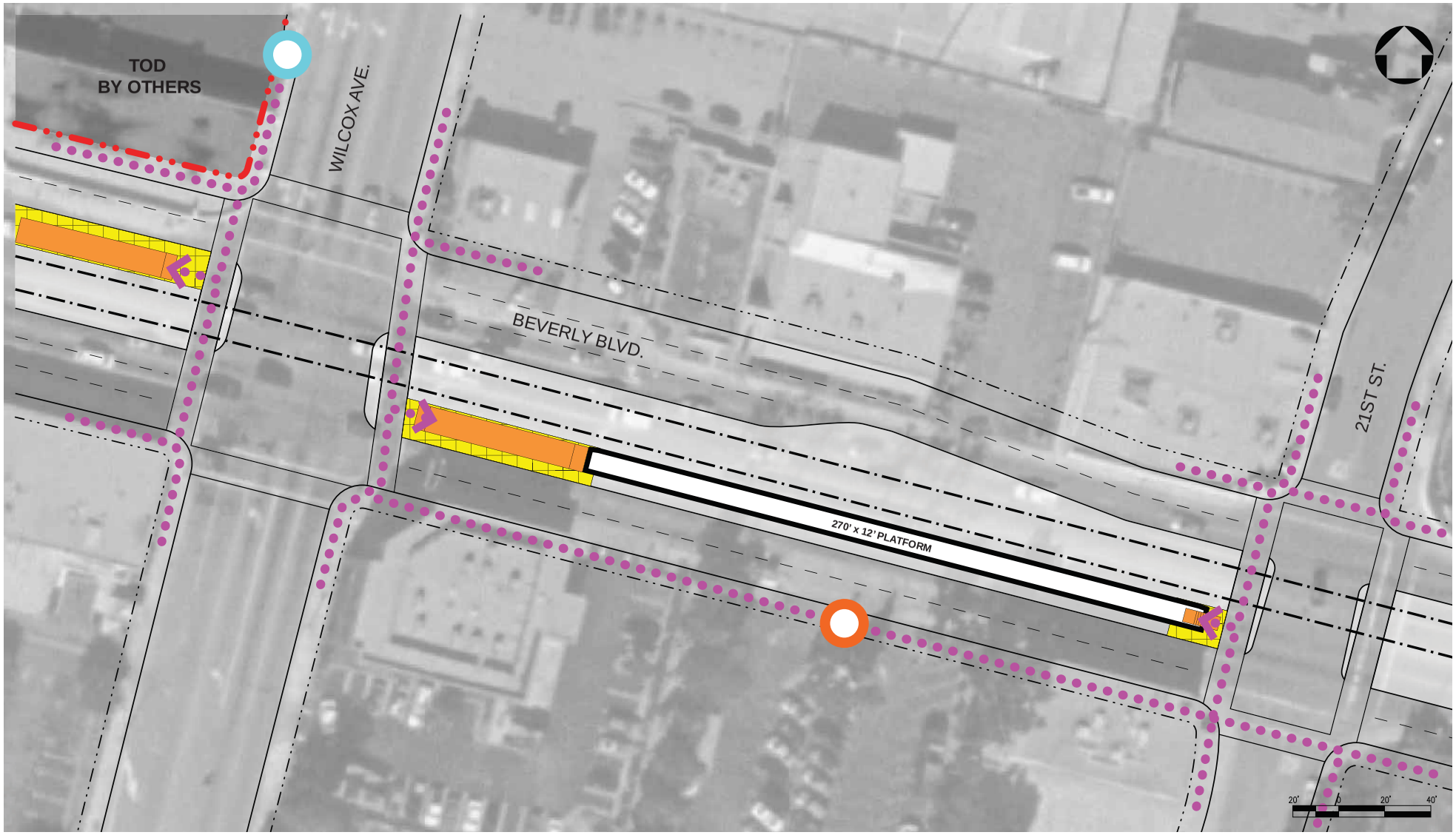
REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. SCHWARZKOPF
DRAWN BY S. GODKIN
CHECKED BY S. SCHWARZKOPF
IN CHARGE V. DAVIES
DATE 06/29/09

Metro
Metropolitan Transportation Authority
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD. / WHITTIER BLVD.
(BEVERLY / ROSEMEAD / WHITTIER)
WILCOX AVE. STATION
LOCATION PLAN 1 OF 2

CONTRACT NO PS4320-2003
DRAWING NO A-153
REV 0
SCALE 1⊠ = 40⊠
SHEET NO



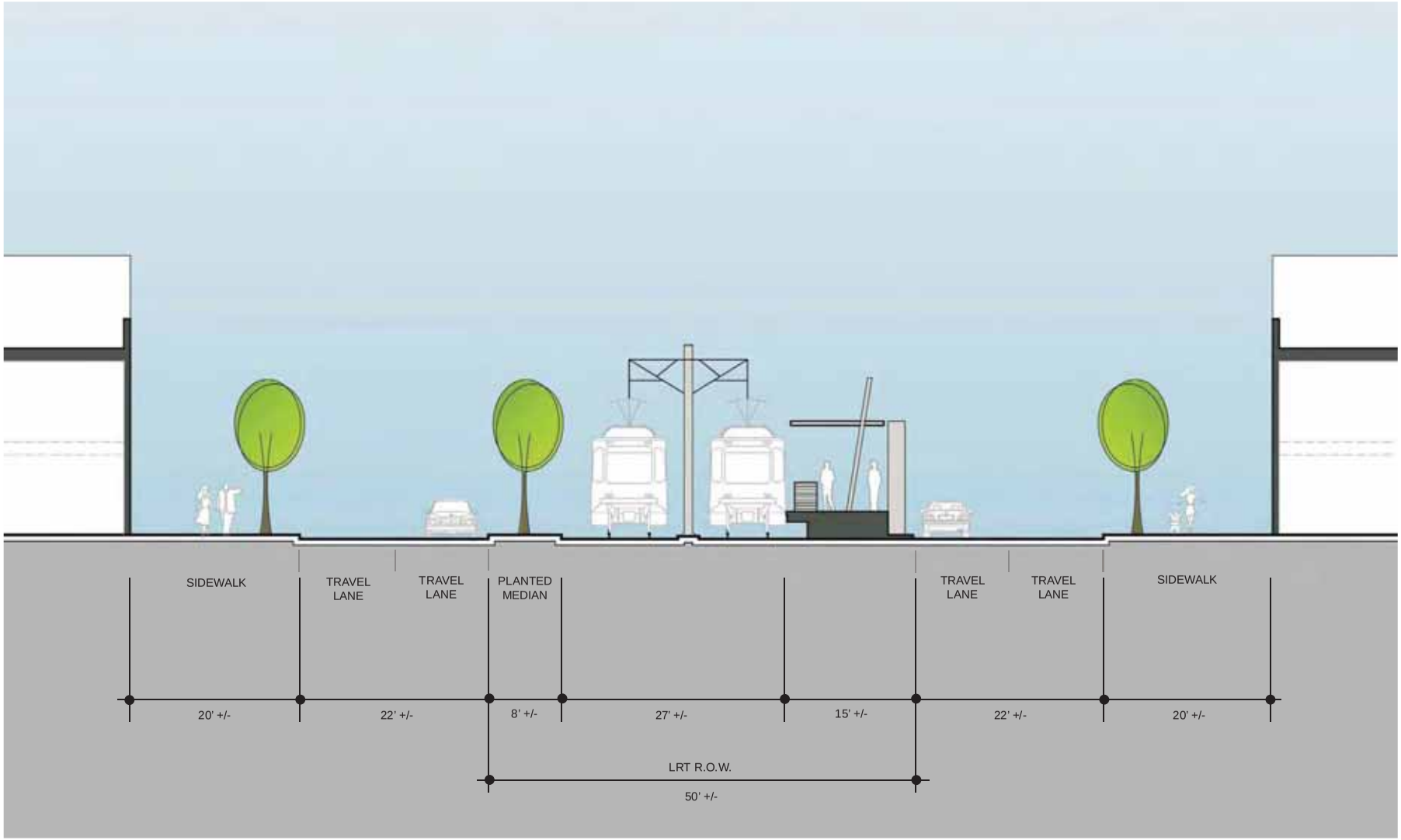
REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. SCHWARZKOPF
DRAWN BY S. GODKIN
CHECKED BY S. SCHWARZKOPF
IN CHARGE V. DAVIES
DATE 06/29/09

Metro
Metropolitan Transportation Authority
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD. / WHITTIER BLVD.
(BEVERLY / ROSEMEAD / WHITTIER)
WILCOX AVE. STATION
LOCATION PLAN 2 OF 2

CONTRACT NO PS4320-2003
DRAWING NO A-154
REV 0
SCALE 1⊠= 40⊠
SHEET NO



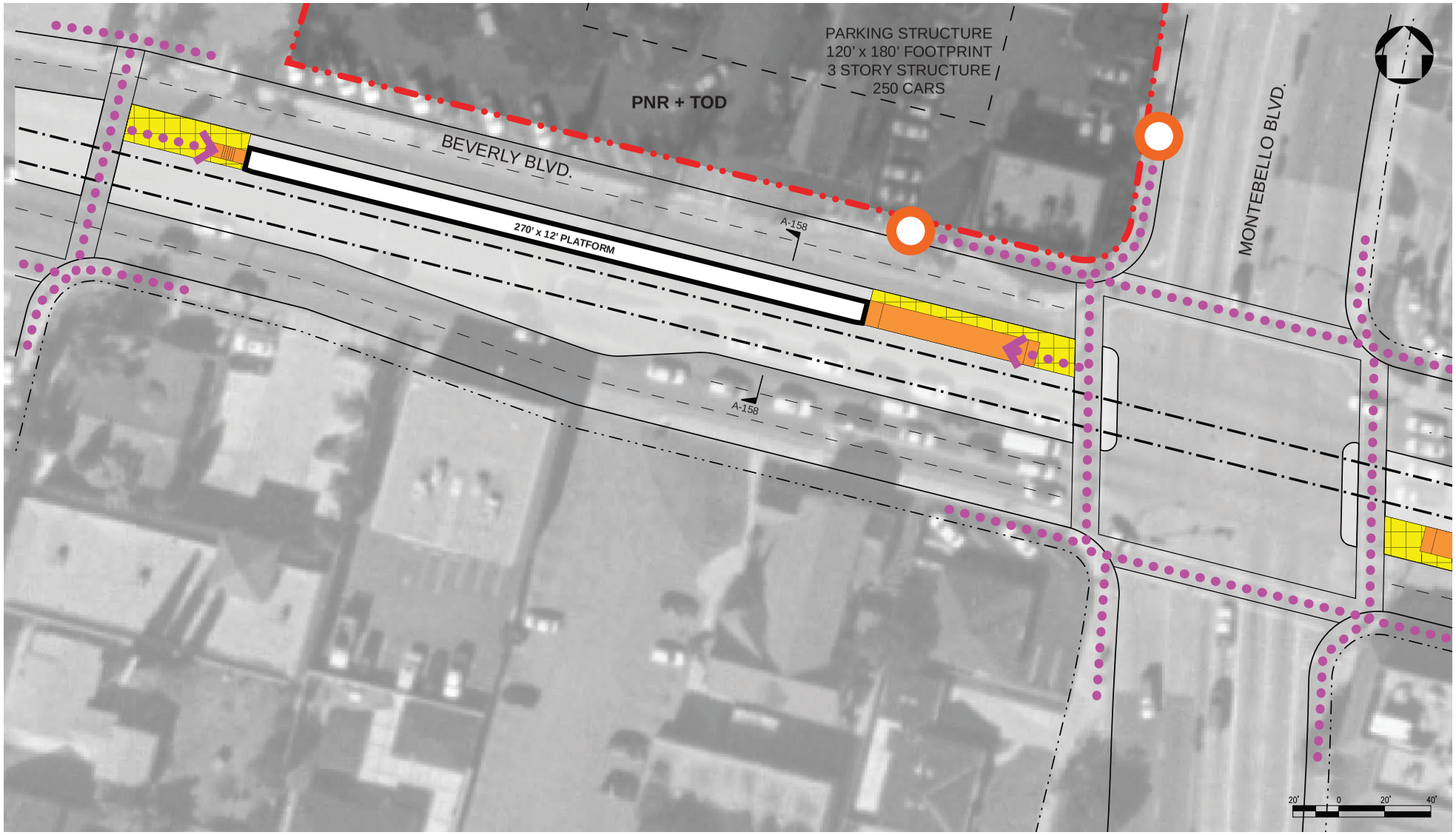
REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. SCHWARZKOPF
DRAWN BY S. GODKIN
CHECKED BY S. SCHWARZKOPF
IN CHARGE V. DAVIES
DATE 06/29/09

Metro
Metropolitan Transportation Authority
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD. / WHITTIER BLVD.
(BEVERLY / ROSEMEAD / WHITTIER)
WILCOX AVE. STATION
SECTION

CONTRACT NO PS4320-2003
DRAWING NO A-155
REV 0
SCALE NO SCALE
SHEET NO



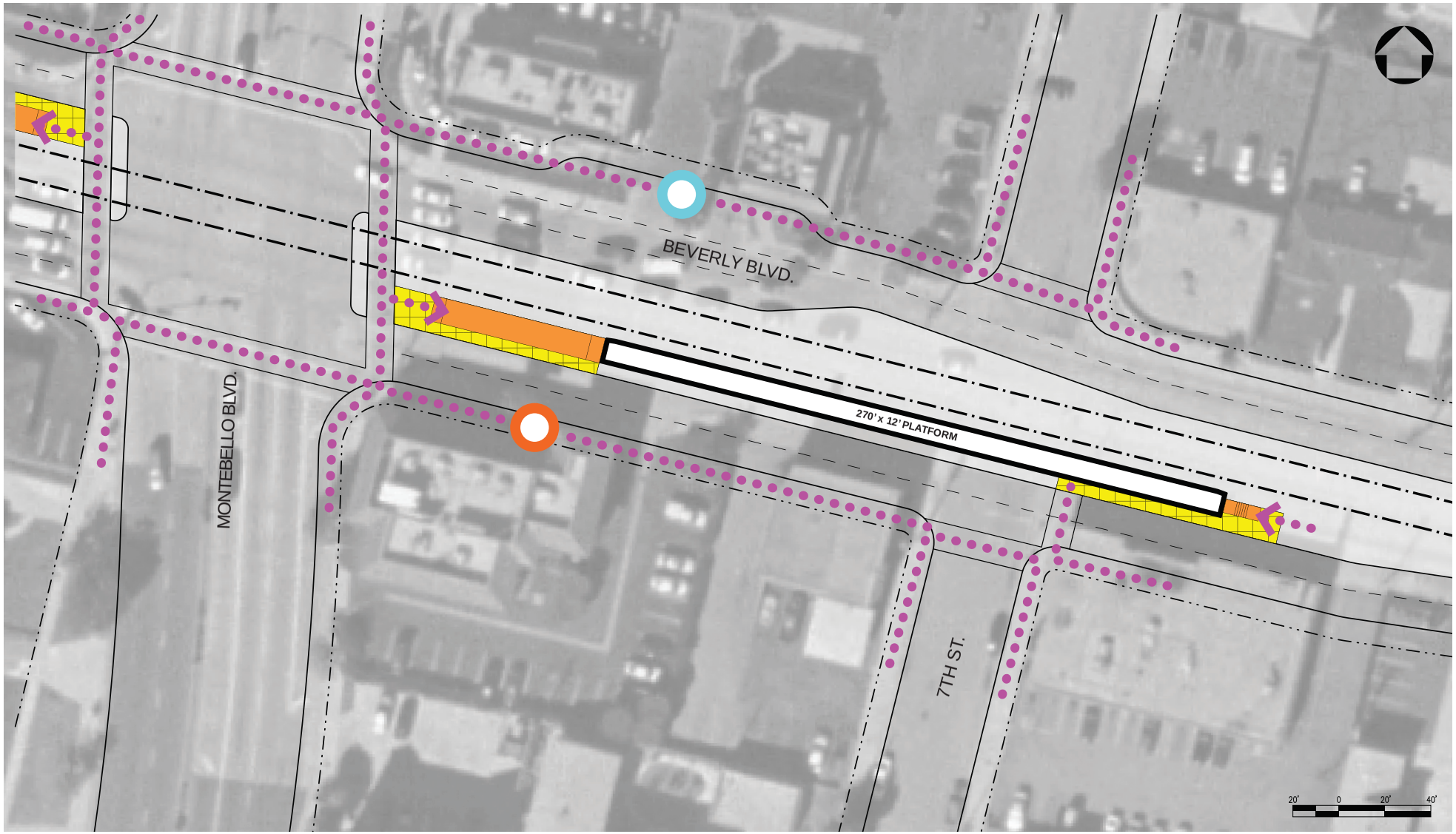
REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. SCHWARZKOPF
DRAWN BY S. GODKIN
CHECKED BY S. SCHWARZKOPF
IN CHARGE V. DAVIES
DATE 06/29/09

Metro
Metropolitan Transportation Authority
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD. / WHITTIER BLVD.
(BEVERLY / ROSEMEAD / WHITTIER)
MONTEBELLO BLVD. STATION
LOCATION PLAN 1 OF 2

CONTRACT NO PS4320-2003
DRAWING NO A-156
REV 0
SCALE 1⊠= 40⊠
SHEET NO



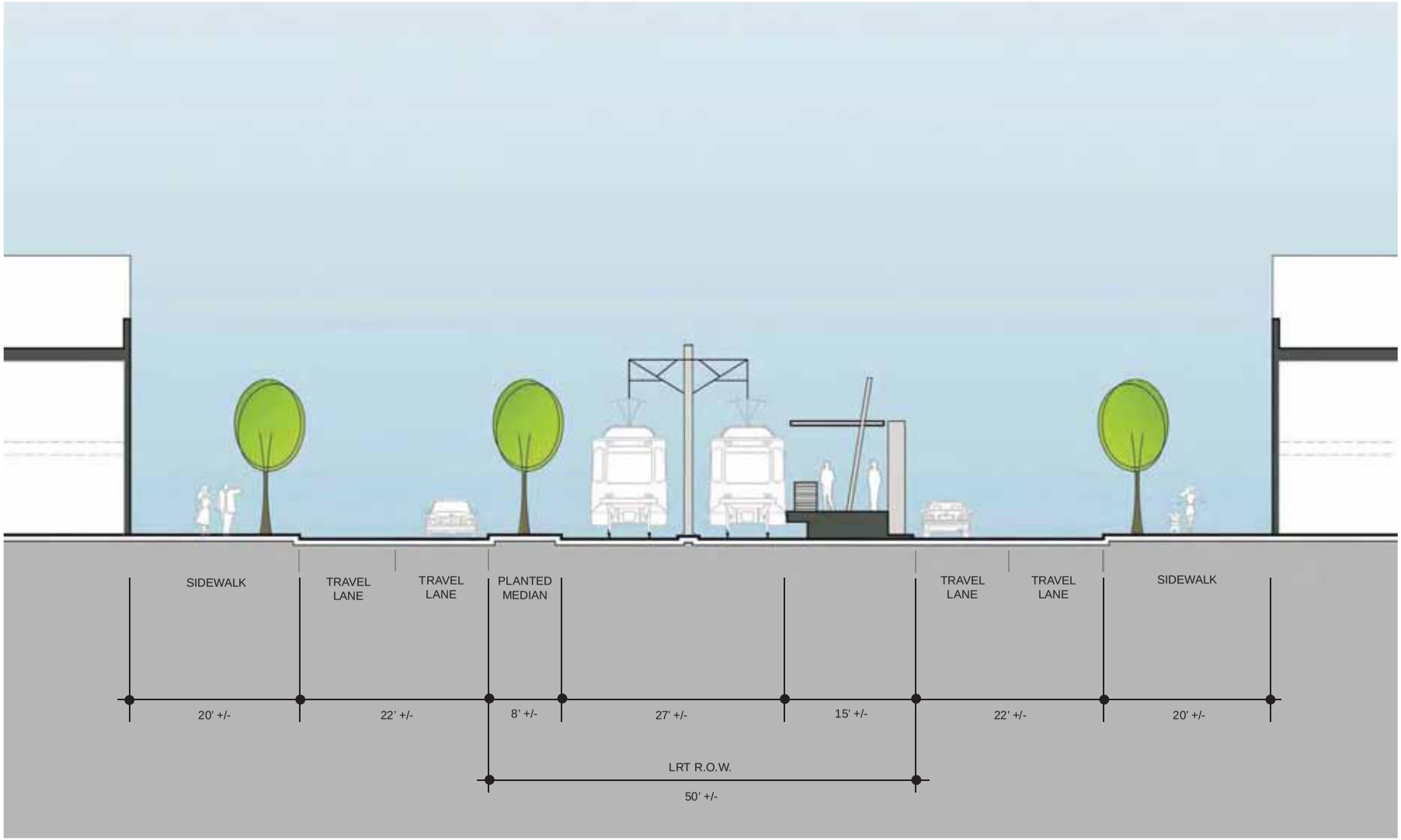
REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. SCHWARZKOPF
DRAWN BY S. GODKIN
CHECKED BY S. SCHWARZKOPF
IN CHARGE V. DAVIES
DATE 06/29/09

Metro
Metropolitan Transportation Authority
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD. / WHITTIER BLVD.
(BEVERLY / ROSEMEAD / WHITTIER)
MONTEBELLO BLVD. STATION
LOCATION PLAN 2 OF 2

CONTRACT NO PS4320-2003
DRAWING NO A-157
REV 0
SCALE 1⊠ = 40⊠
SHEET NO



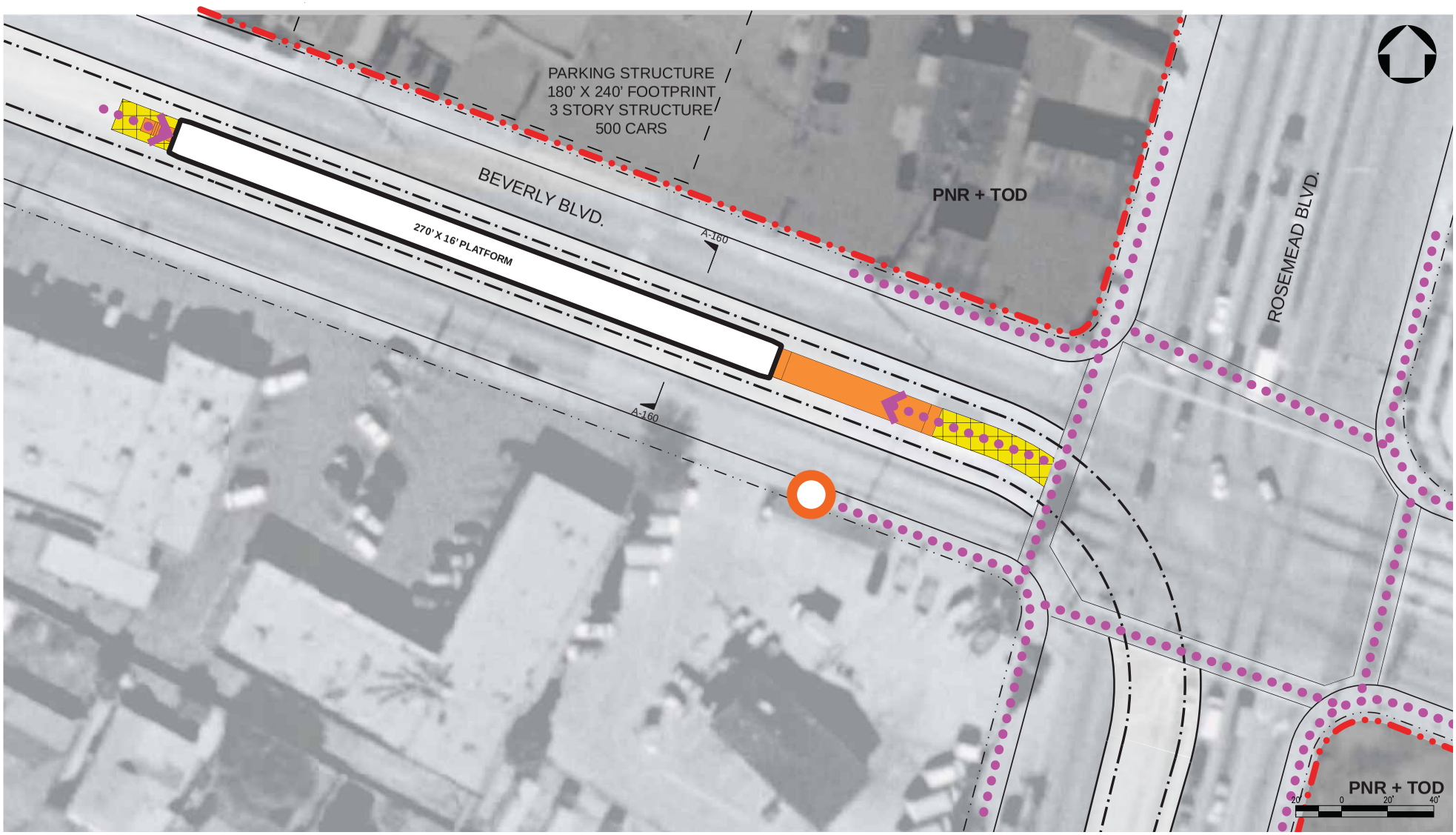
REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. SCHWARZKOPF
DRAWN BY S. GODKIN
CHECKED BY S. SCHWARZKOPF
IN CHARGE V. DAVIES
DATE 06/29/09

Metro
Metropolitan Transportation Authority
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD. / WHITTIER BLVD.
(BEVERLY / ROSEMEAD / WHITTIER)
MONTEBELLO BLVD. STATION
SECTION

CONTRACT NO PS4320-2003
DRAWING NO A-158
REV 0
SCALE NO SCALE
SHEET NO



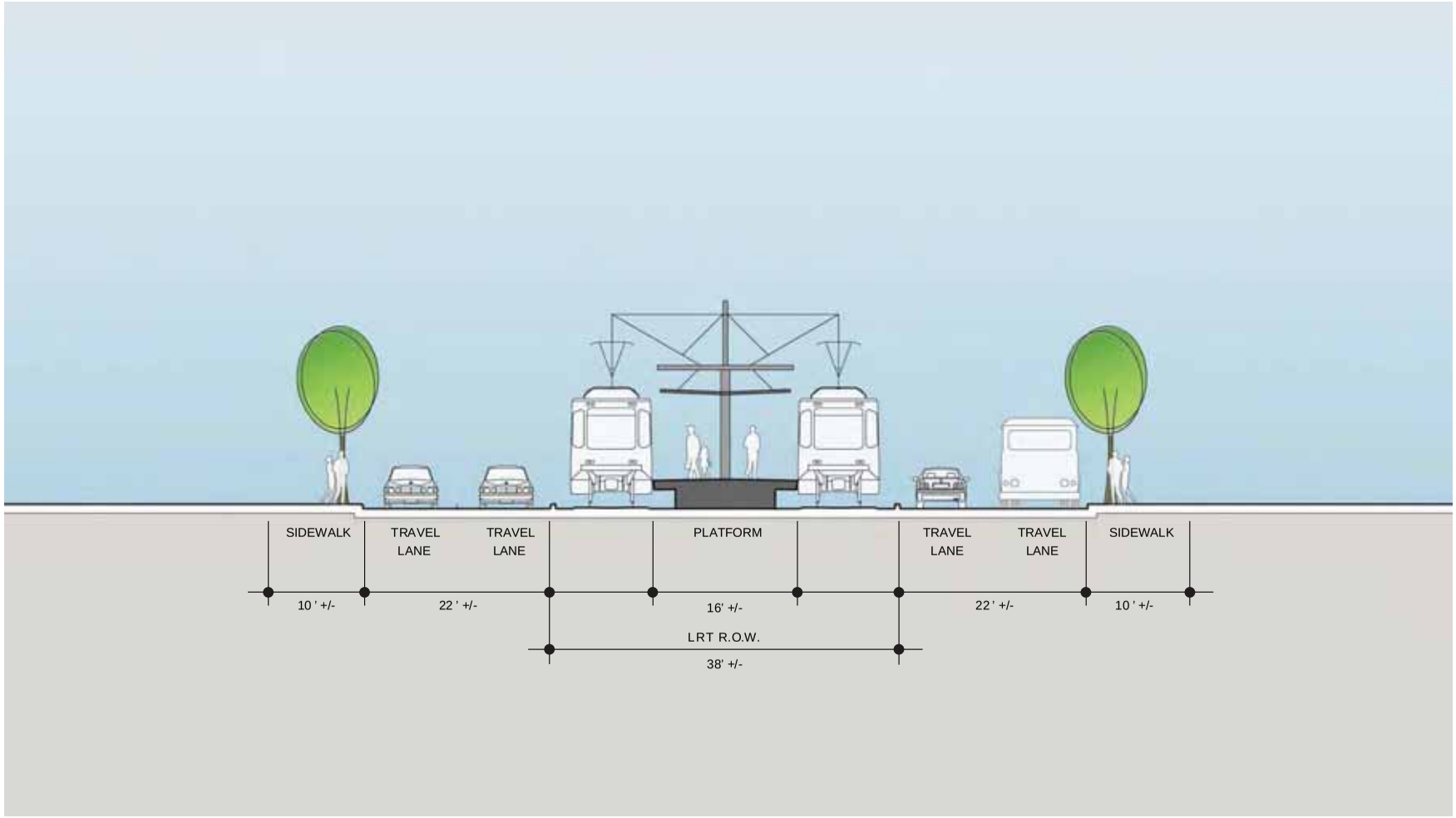
REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY R. ESCOBEDO
DRAWN BY L. VAZQUEZ
CHECKED BY L. CHAVEZ
IN CHARGE F. VILLALOBOS
DATE 06/29/09

Metro
Metropolitan Transportation Authority
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD. / WHITTIER BLVD.
(BEVERLY / ROSEMEAD / WHITTIER)
BEVERLY-ROSEMEAD STATION
LOCATION PLAN

CONTRACT NO PS4320-2003
DRAWING NO A-159
REV 0
SCALE 1⊠= 40⊠
SHEET NO



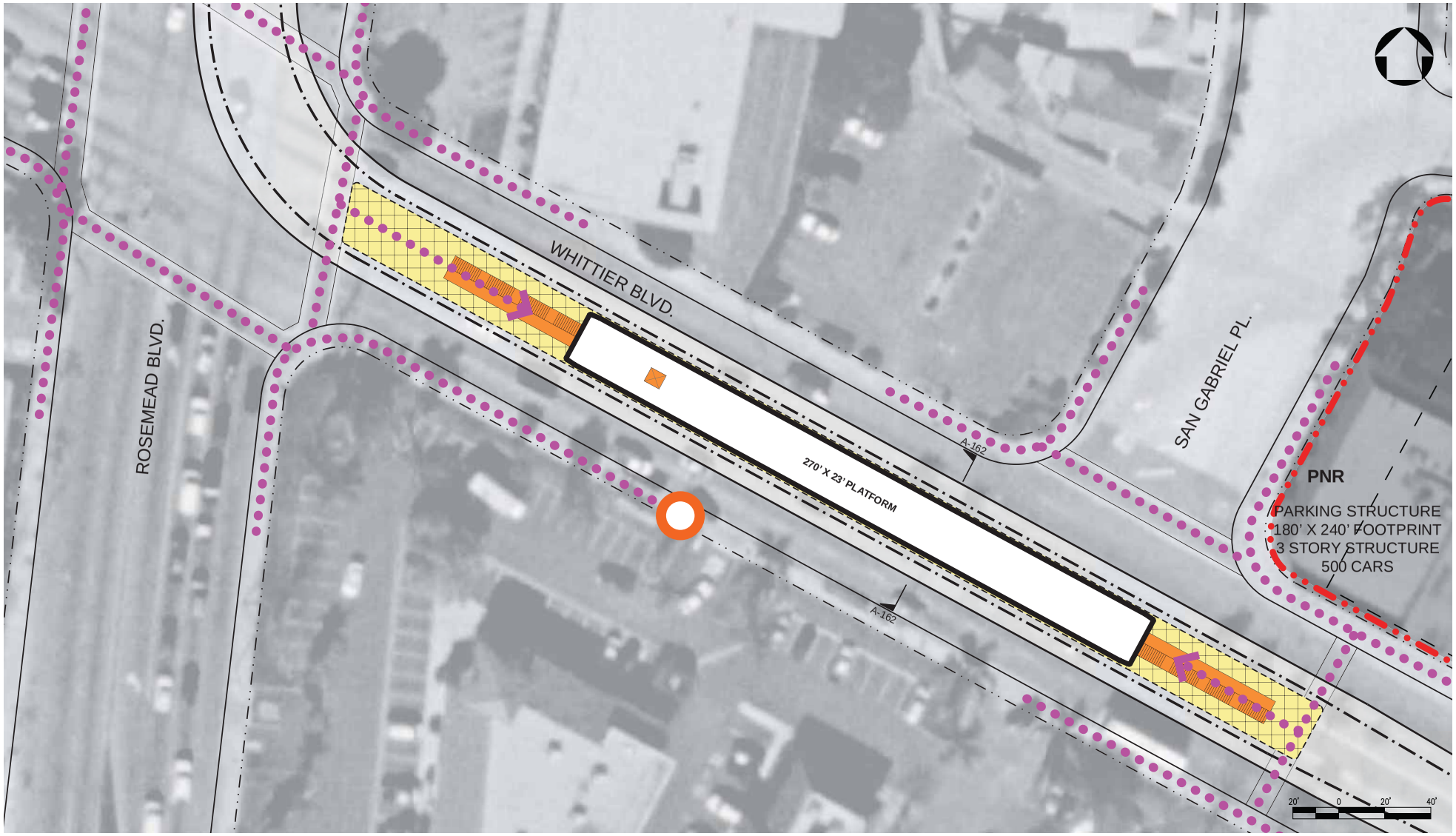
REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY R. ESCOBEDO
DRAWN BY L. VAZQUEZ
CHECKED BY L. CHAVEZ
IN CHARGE F. VILLALOBOS
DATE 06/29/09

Metro
Metropolitan Transportation Authority
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD. / WHITTIER BLVD.
(BEVERLY / ROSEMEAD / WHITTIER)
BEVERLY-ROSEMEAD STATION
SECTION

CONTRACT NO PS4320-2003
DRAWING NO A-160
REV 0
SCALE NO SCALE
SHEET NO



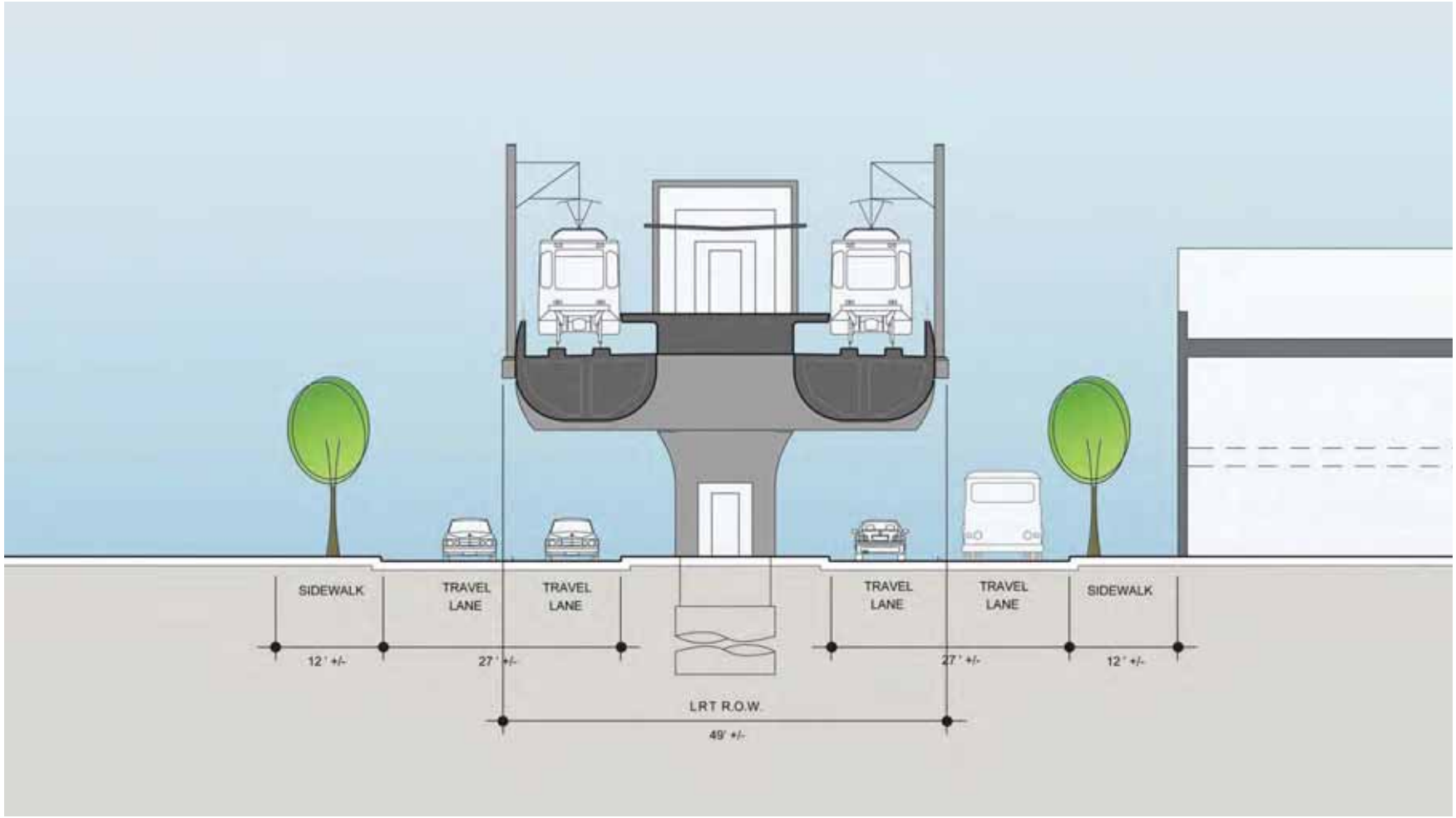
REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY R. ESCOBEDO
DRAWN BY L. VAZQUEZ
CHECKED BY L. CHAVEZ
IN CHARGE F. VILLALOBOS
DATE 06/29/09

Metro
Metropolitan Transportation Authority
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD. / WHITTIER BLVD.
(BEVERLY / ROSEMEAD / WHITTIER)
WHITTIER-ROSEMEAD STATION
LOCATION PLAN

CONTRACT NO PS4320-2003
DRAWING NO A-161
REV 0
SCALE 1⊠= 40⊠
SHEET NO



REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

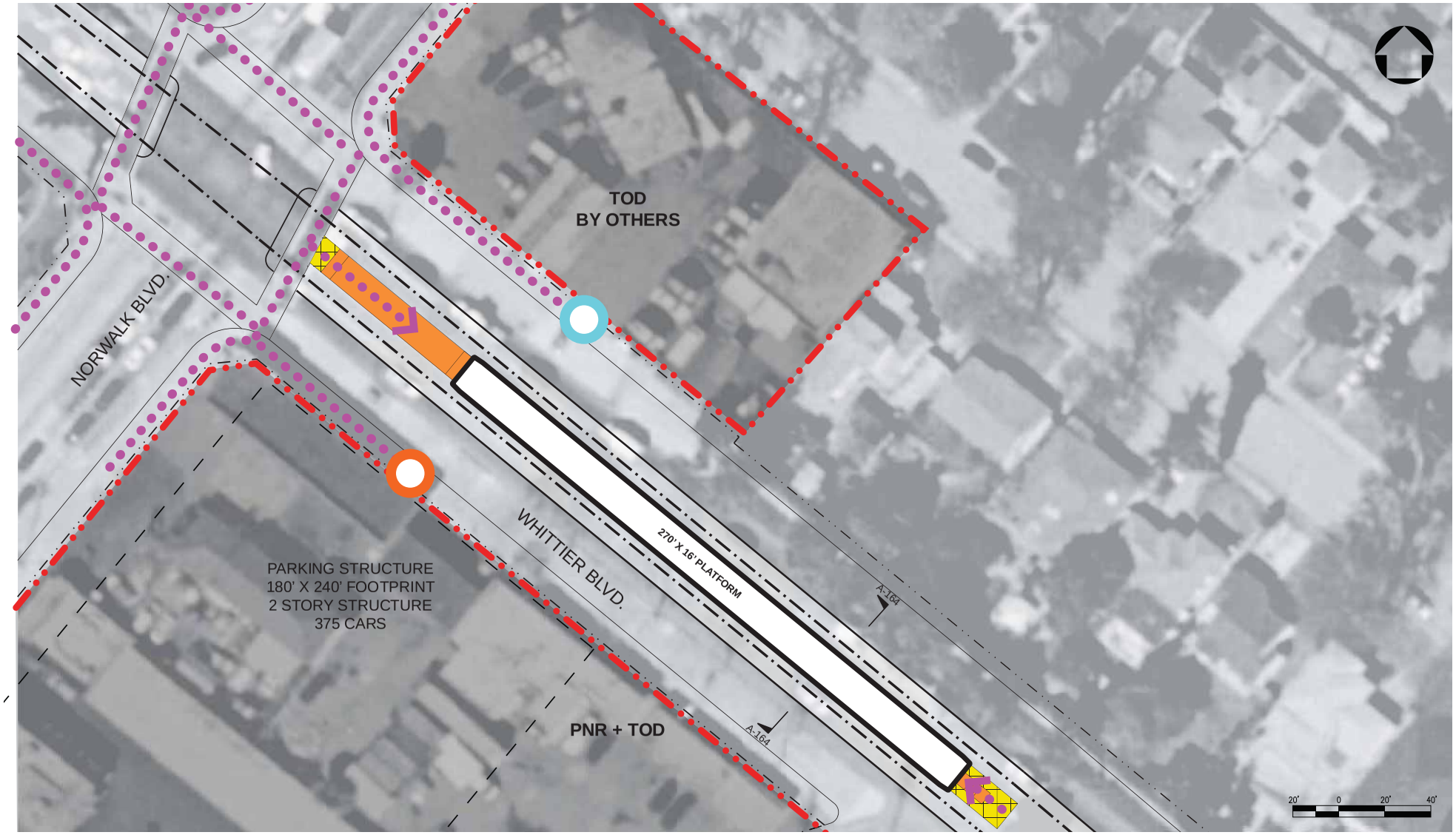
DESIGNED BY R. ESCOBEDO
DRAWN BY L. VAZQUEZ
CHECKED BY L. CHAVEZ
IN CHARGE F. VILLALOBOS
DATE 06/29/09

Metro
Metropolitan Transportation Authority

CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD. / WHITTIER BLVD.
(BEVERLY / ROSEMEAD / WHITTIER)
WHITTIER-ROSEMEAD STATION
SECTION

CONTRACT NO PS4320-2003
DRAWING NO A-162
REV 0
SCALE NO SCALE
SHEET NO



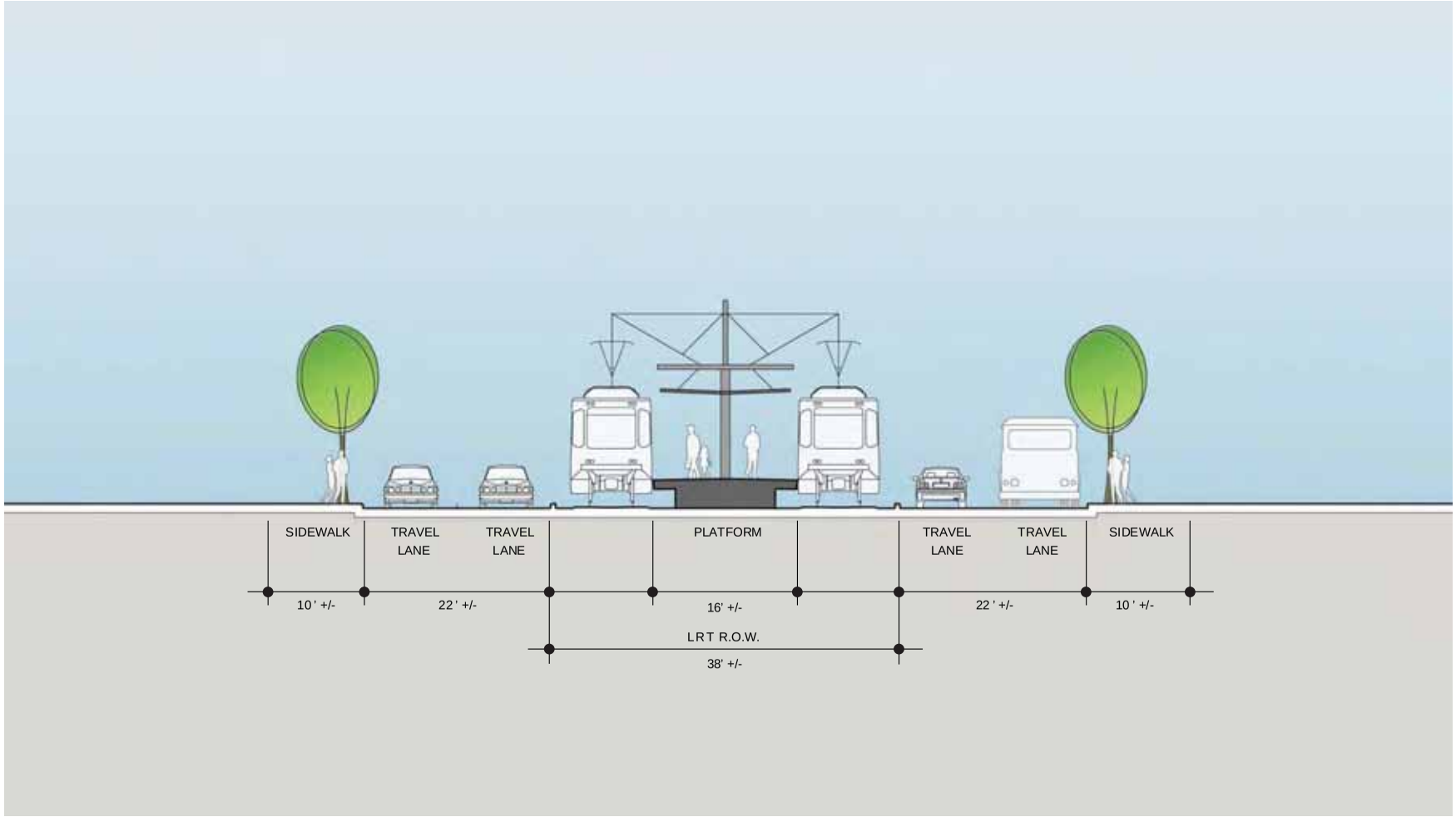
REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY R. ESCOBEDO
DRAWN BY L. VAZQUEZ
CHECKED BY L. CHAVEZ
IN CHARGE F. VILLALOBOS
DATE 06/29/09

Metro
Metropolitan Transportation Authority
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD. / WHITTIER BLVD.
(BEVERLY / ROSEMEAD / WHITTIER)
NORWALK AVE. STATION
LOCATION PLAN

CONTRACT NO PS4320-2003
DRAWING NO A-163
REV 0
SCALE 1⊠= 40⊠
SHEET NO



REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY R. ESCOBEDO
DRAWN BY L. VAZQUEZ
CHECKED BY L. CHAVEZ
IN CHARGE F. VILLALOBOS
DATE 06/29/09

Metro
Metropolitan Transportation Authority
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD. / WHITTIER BLVD.
(BEVERLY / ROSEMEAD / WHITTIER)
NORWALK AVE. STATION
SECTION

CONTRACT NO PS4320-2003
DRAWING NO A-164
REV 0
SCALE NO SCALE
SHEET NO

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

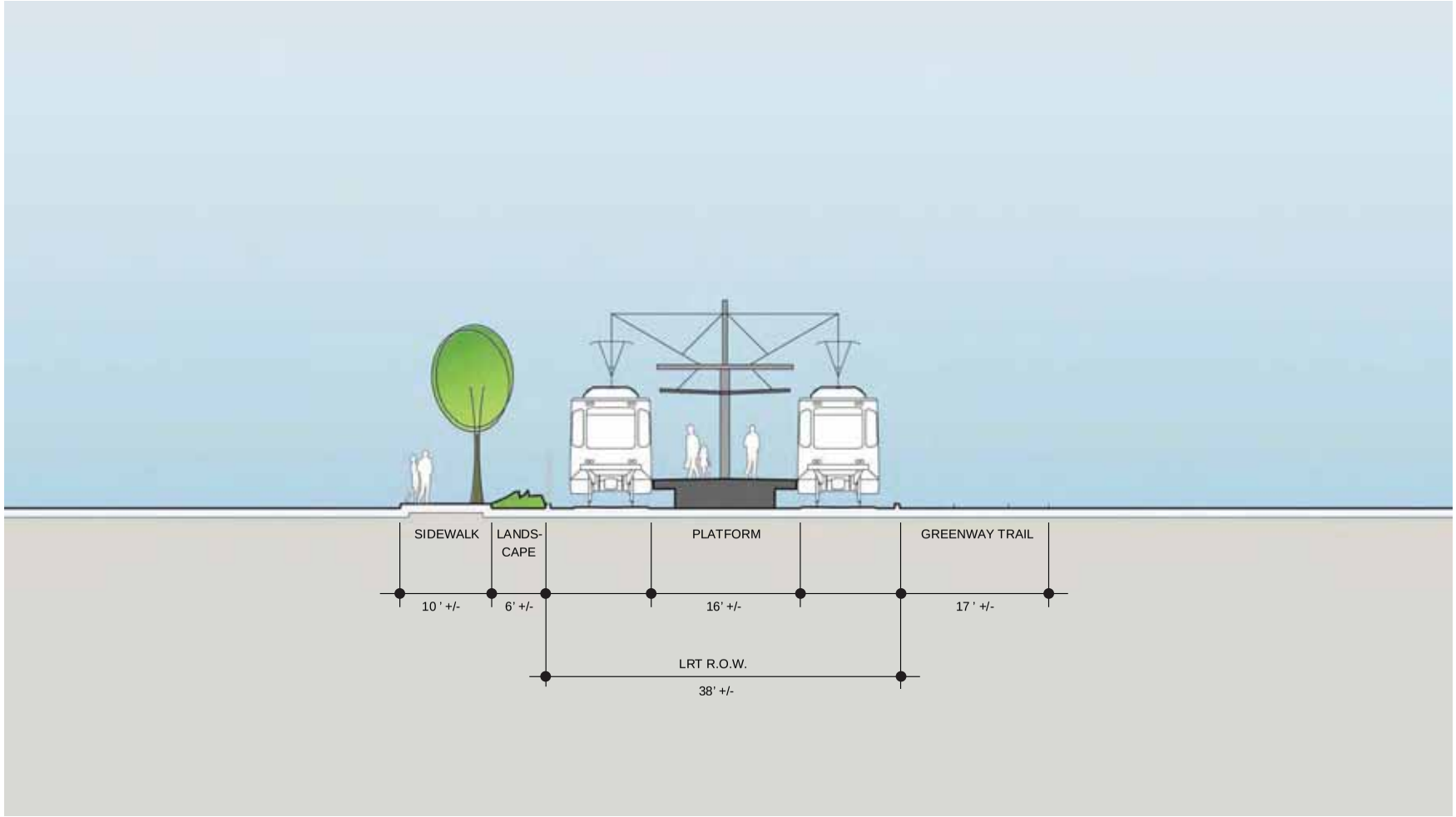
DESIGNED BY R. ESCOBEDO
DRAWN BY L. VAZQUEZ
CHECKED BY L. CHAVEZ
IN CHARGE F. VILLALOBOS
DATE 06/29/09

Metro Metropolitan Transportation Authority

CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD. / WHITTIER BLVD.
(BEVERLY / ROSEMEAD / WHITTIER)
MAR VISTA ST. STATION
LOCATION PLAN

CONTRACT NO PS4320-2003
DRAWING NO A-165
REV 0
SCALE 1⊠= 40⊠
SHEET NO



REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY R. ESCOBEDO
DRAWN BY L. VAZQUEZ
CHECKED BY L. CHAVEZ
IN CHARGE F. VILLALOBOS
DATE 06/29/09

Metro
Metropolitan Transportation Authority
CDM AECOM

EASTSIDE PHASE 2 - PART 1
BEVERLY BLVD. / WHITTIER BLVD.
(BEVERLY / ROSEMEAD / WHITTIER)
MAR VISTA ST. STATION
SECTION

CONTRACT NO PS4320-2003
DRAWING NO A-166
REV 0
SCALE NO SCALE
SHEET NO

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
WASHINGTON BLVD
ALIGNMENT
SHEET 1 OF 19

CONTRACT NO PS4320-2003
DRAWING NO T-201
REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 12:16:38 PM
PLOT DRIVER = Raster-half-pdf.plt
PEN TABLE = MTA-H-COLOR.tbl

USER=arains 12:16:38 PM 10/23/2009 w:\60039033_eastside2_to_part_2\cadd\rail\sheet\CET-201.plg

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
WASHINGTON BLVD
ALIGNMENT
SHEET 2 OF 19

CONTRACT NO PS4320-2003
DRAWING NO T-202
REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 12:16:59 PM
PLOT DRIVER = Raster-half-pdf.plt
PEN TABLE = MTA-H-COLOR.tbl

USER=arains 12:16:59 PM 10/23/2009 w:\60039033_eastside2_to_part_2\cadd\roll\sheet\CET-202.plg

HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

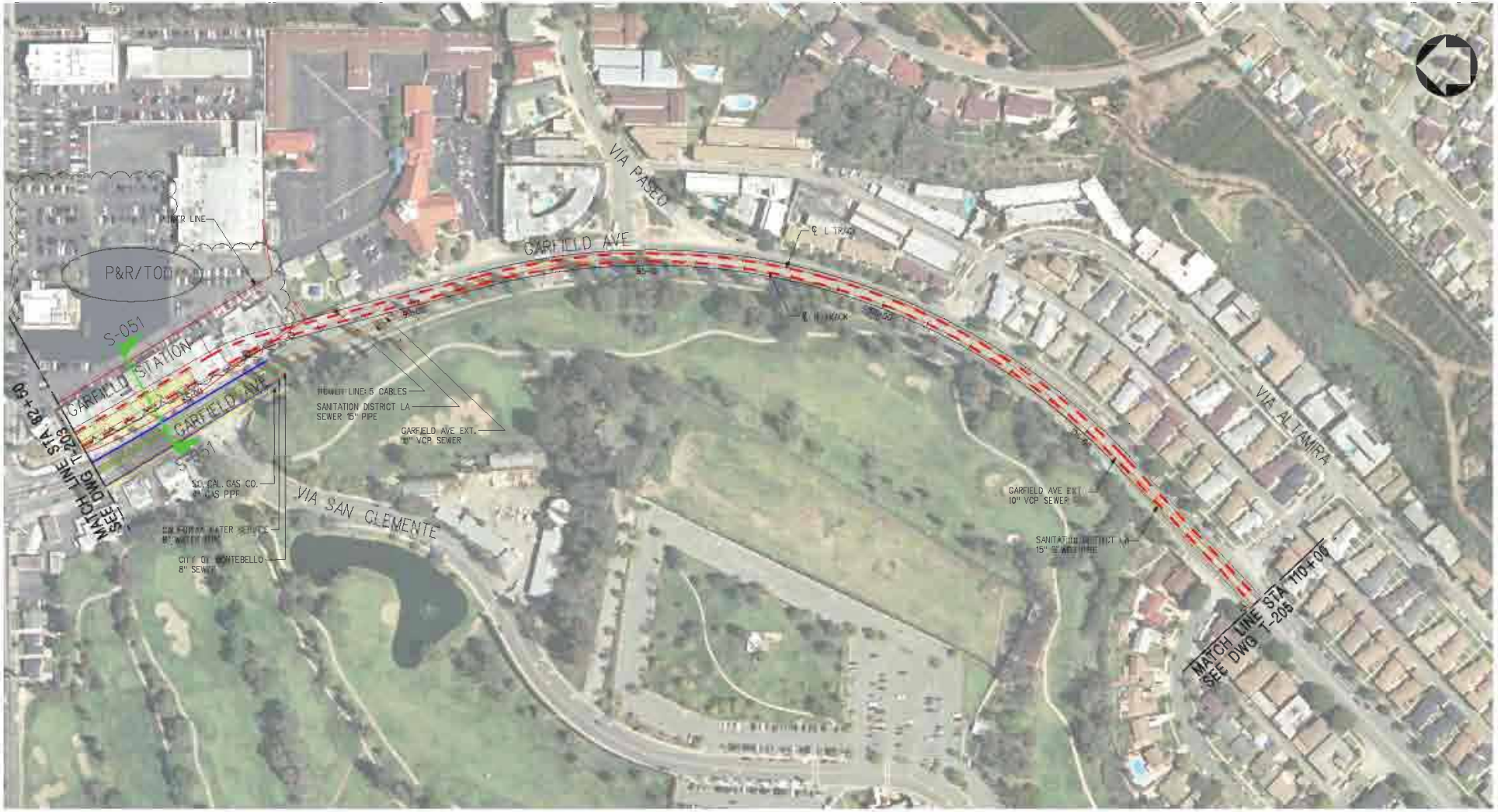
DESIGNED BY
DRAWN BY
CHECKED BY
IN CHARGE
DATE

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
WASHINGTON BLVD
ALIGNMENT
SHEET 3 OF 19

CONTRACT NO PS4320-2003
DRAWING NO T-203
REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 12:17:19 PM
PLOT DRIVER = Raster-half.pdf.plt
PEN TABLE = MTA-H-COLOR.tbl
USER=aranns 12:17:19 PM 10/23/2009 w:\60039033_eastside2_to_part_2\cadd\rail\sheet\CET-203.plg



HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
WASHINGTON BLVD
ALIGNMENT
SHEET 4 OF 19

CONTRACT NO PS4320-2003
DRAWING NO T-204
REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 12:17:39 PM
PLOT DRIVER = Raster-half.pdf.plt
PENT TABLE = MTA-H-COLOR.tbl

USER=arains 12:17:39 PM 10/23/2009 w:\60039033_eastside2_to_part_2\cadd\roll\sheet\CET-204.plg

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
WASHINGTON BLVD
ALIGNMENT
SHEET 5 OF 19

CONTRACT NO PS4320-2003
DRAWING NO T-205 REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 12:18:00 PM
PLOT DRIVER = Raster.hplf.pdf.plt
PEN TABLE = WA-3-COLOR.TBL

USER=drains 12:18:00 PM 10/23/2009 w:\60039033_eastside2_la_part_2\cadd\roll\sheet\CET-205.plg

HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
WASHINGTON BLVD
ALIGNMENT
SHEET 6 OF 19

CONTRACT NO PS4320-2003
DRAWING NO T-206
REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 12:18:23 PM
PLOT DRIVER = Raster-half.pdf.plt
PENT TABLE = MTA-H-COLOR.tbl

USER=arains 12:18:23 PM 10/23/2009 w:\60039033_eastside2_to_part_2\cadd\rail\sheet\CET-206.pg

HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

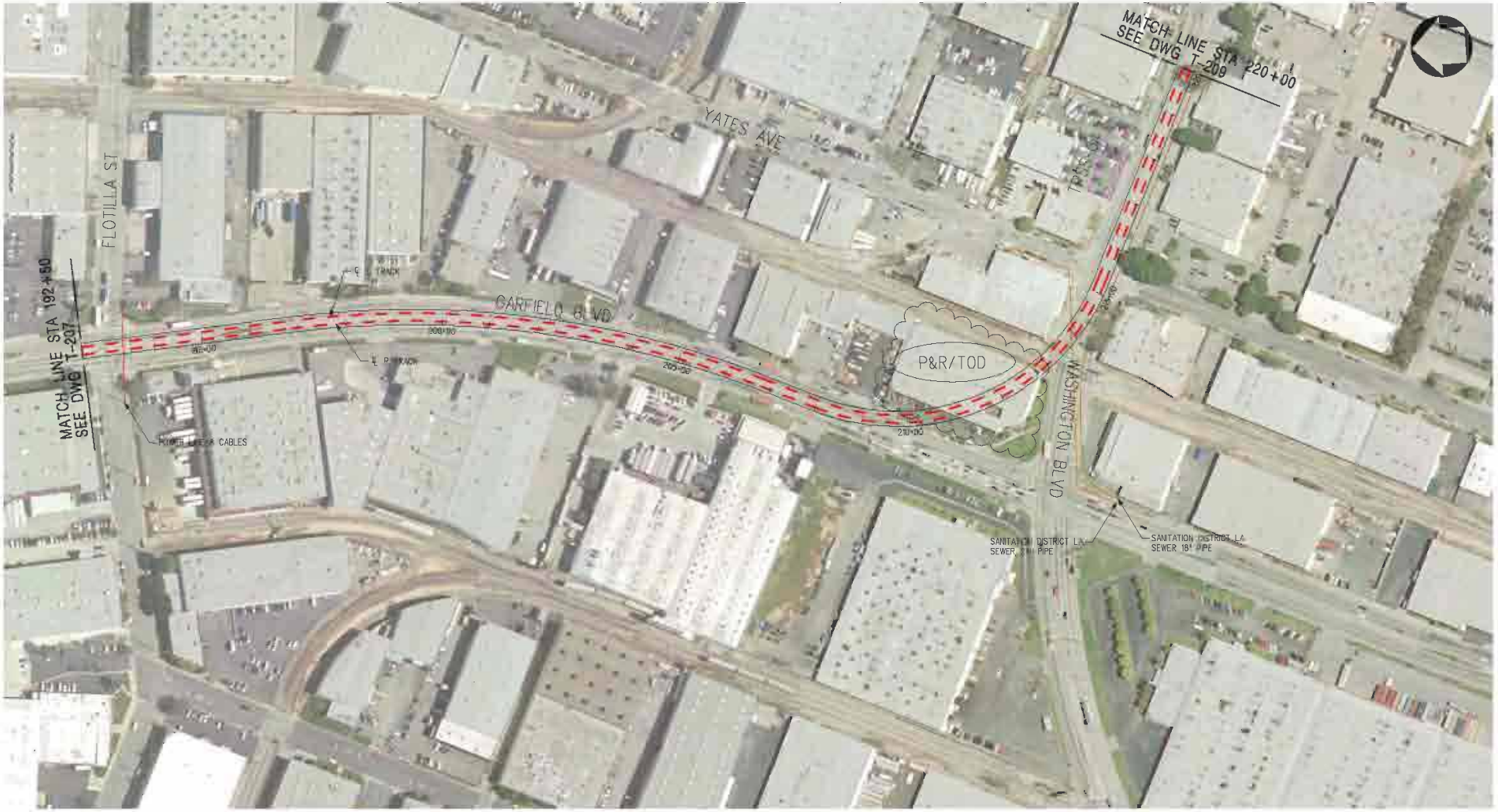
Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
WASHINGTON BLVD
ALIGNMENT
SHEET 7 OF 19

CONTRACT NO PS4320-2003
DRAWING NO T-207
REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 12:18:44 PM
PLOT DRIVER = Raster-half.pdf.plt
PEN TABLE = MTA-H-COLOR.tbl

USER=arains 12:18:44 PM 10/23/2009 w:\60039033_eastside2_to_part_2\cadd\roll\sheet\CET-207.plg



HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
WASHINGTON BLVD
ALIGNMENT
SHEET 8 OF 19

CONTRACT NO PS4320-2003
DRAWING NO T-208
REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 12:19:05 PM
PLOT DRIVER = Raster-half.pdf.plt
PEN TABLE = MTA-H-COLOR.tbl
USER=arains 12:19:05 PM 10/23/2009 w:\60039033_eastside2_lo_part_2\cadd\rail\sheet\CET-208.plg

HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
WASHINGTON BLVD
ALIGNMENT
SHEET 9 OF 19

CONTRACT NO PS4320-2003
DRAWING NO T-209 REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 12:19:26 PM
PLOT DRIVER = Raster.half_pdf.plt
PEN TABLE = WA_AL_COLOR.TBL

USER=drains 12:19:26 PM 10/23/2009 w:\60039033_eastside2_la_part_2\cadd\roll\sheet\CET-209.plg

HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
WASHINGTON BLVD
ALIGNMENT
SHEET 10 OF 19

CONTRACT NO PS4320-2003
DRAWING NO T-210 REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 12:19:46 PM
PLOT DRIVER = Raster_half_pdf.plt
PEN TABLE = WA_LCDLCN.TBL

USER=drains 12:19:46 PM 10/23/2009 w:\60039033_eastside2_la_part_2\cadd\roll\sheet\CT-210.plg

HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

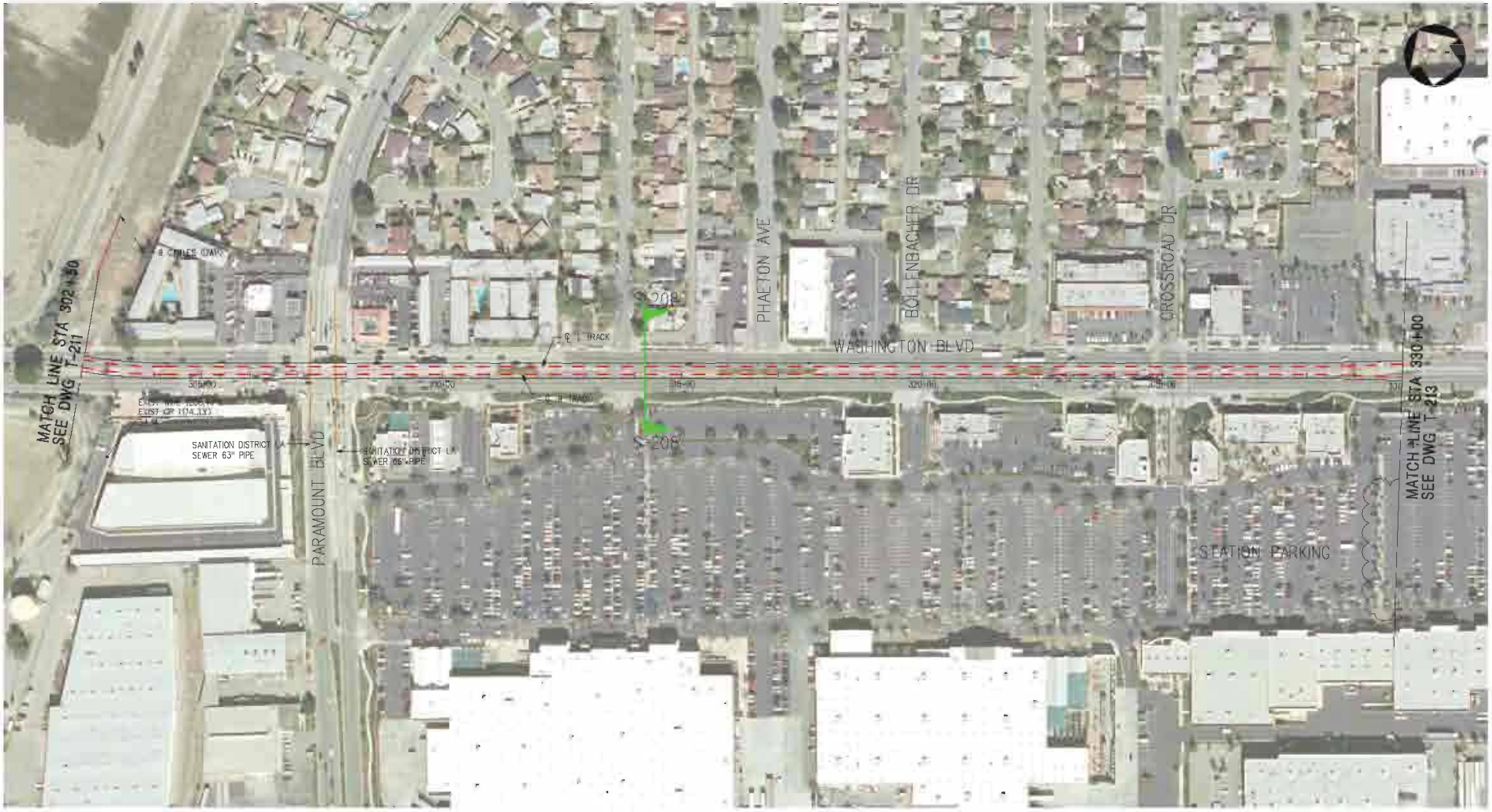
Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
WASHINGTON BLVD
ALIGNMENT
SHEET 11 OF 19

CONTRACT NO PS4320-2003
DRAWING NO T-211
REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 12:20:10 PM
PLOT DRIVER = Raster-half.pdf.plt
PENT TABLE = MTA-H-COLOR.tbl

USER=arains 12:20:10 PM 10/23/2009 w:\60039033_eastside2_to_par1_2\cadd\roll\sheet\CET-211.plg



HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
WASHINGTON BLVD
ALIGNMENT
SHEET 12 OF 19

CONTRACT NO PS4320-2003
DRAWING NO T-212 REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 12:20:33 PM
PLOT DRIVER = Raster.hplf_pdf.plt
PEN TABLE = WA-3_COLOR.TBL

USER=drains 12:20:33 PM 10/23/2009 w:\60039033_eastside2_le_part_2\cadd\roll\sheet\CET-212.plg

HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

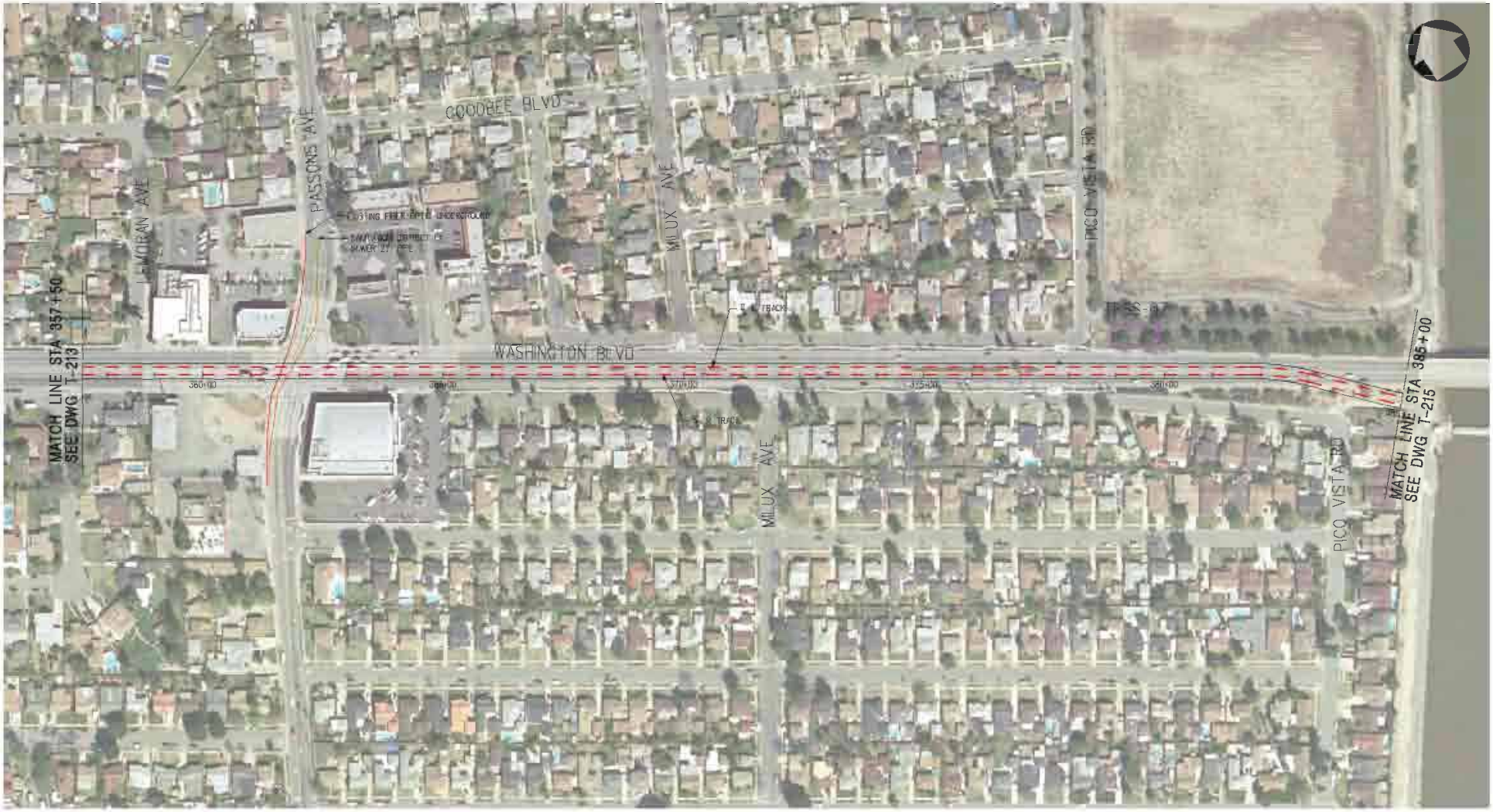
Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
WASHINGTON BLVD
ALIGNMENT
SHEET 13 OF 19

CONTRACT NO PS4320-2003
DRAWING NO T-213 REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 12:20:54 PM
PLOT DRIVER = Raster_half_pdf.plt
PEN TABLE = WA_bl_color.tbl

USER=drains 12:20:54 PM 10/23/2009 w:\60039033_eastside2_la_part_2\cadd\roll\sheet\CET-213.plg



HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

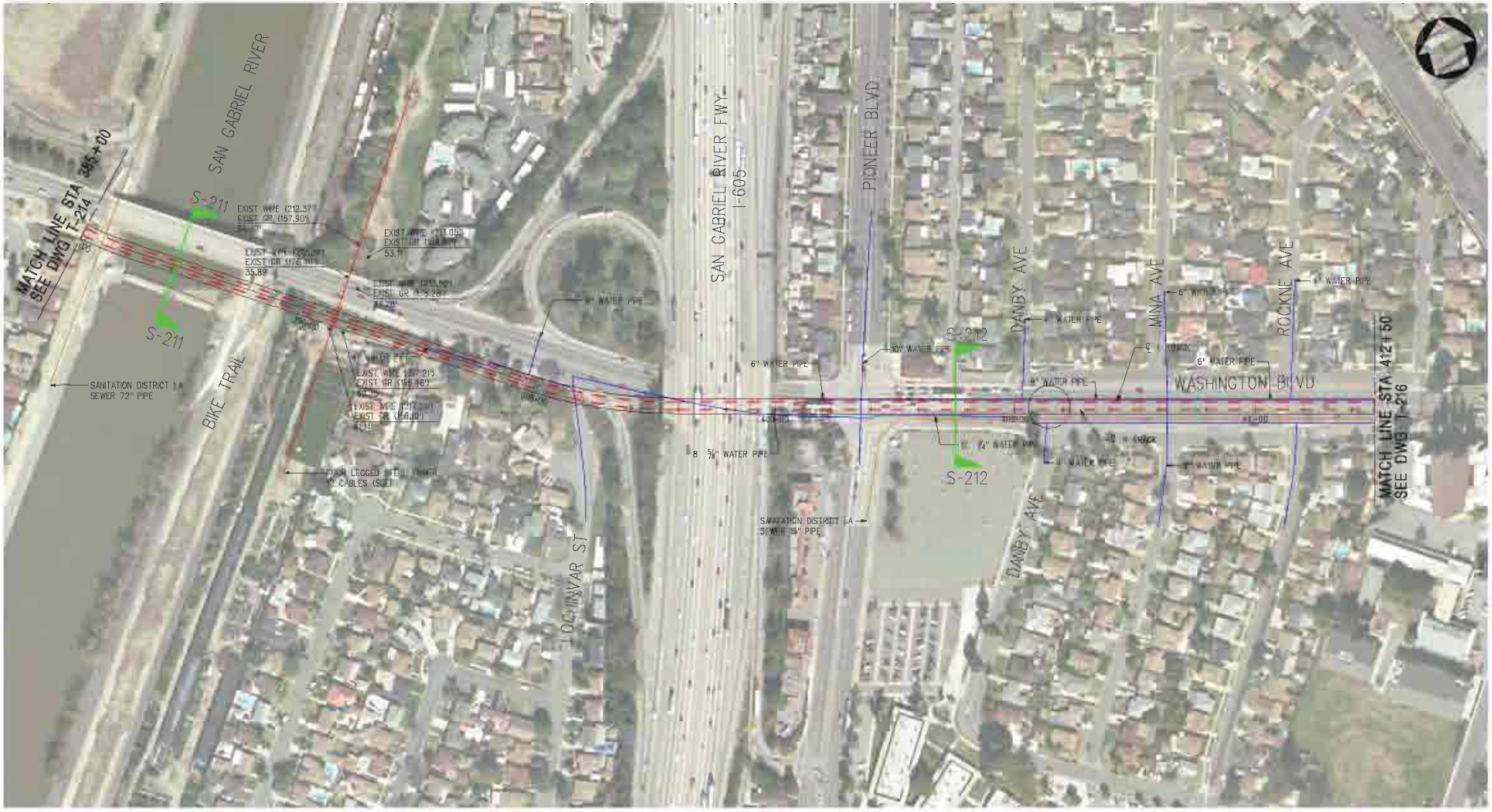
DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
WASHINGTON BLVD
ALIGNMENT
SHEET 14 OF 19

CONTRACT NO PS4320-2003
DRAWING NO T-214 REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 12:21:16 PM
PLOT DRIVER = Raster-half_pdf.plt
PEN TABLE = WA-3_COLOR.TBL
USER-drains 12:21:16 PM 10/23/2009 w:\60039033_eastside2_le_part_2\cadd\roll\sheet\CET-214.plg



HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
WASHINGTON BLVD
ALIGNMENT
SHEET 15 OF 19

CONTRACT NO PS4320-2003
DRAWING NO T-215 REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 12:21:39 PM
PLOT DRIVER = Raster.hplf_pdf.pltr
PEN TABLES = WA_LCDLOW.TBL

USER=drains 12:21:39 PM 10/23/2009 w:\60039033_eastside2_le_part_2\cadd\roll\sheet\CET-215.plg

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
WASHINGTON BLVD
ALIGNMENT
SHEET 16 OF 19

CONTRACT NO PS4320-2003
DRAWING NO T-216 REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 12:22:01 PM
PLOT DRIVER = Raster_half_pdf.plt
PEN TABLE = WA_bl_color.tbl

USER=drains 12:22:01 PM 10/23/2009 w:\60039033_eastside2_la_part_2\cadd\roll\sheet\CET-216.plg

HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
WASHINGTON BLVD
ALIGNMENT
SHEET 17 OF 19

CONTRACT NO PS4320-2003
DRAWING NO T-217 REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 12:22:23 PM
PLOT DRIVER = Raster.half_pdf.plt
PEN TABLE = WA_3_COLOR.TBL

USER=drains 12:22:23 PM 10/23/2009 w:\60039033_eastside2_la_part_2\cadd\roll\sheet\CET-217.plg

HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY W. ABREGO
DRAWN BY S. ARAIN
CHECKED BY J. AL-MASHAT
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
WASHINGTON BLVD
ALIGNMENT
SHEET 18 OF 19

CONTRACT NO PS4320-2003
DRAWING NO T-218
REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 12:22:44 PM
PLOT DRIVER = Raster_half_pdf.plt
PEN TABLE = WA_bl_color.tbl

USER=drains 12:22:44 PM 10/23/2009 w:\60039033_eastside2_la_part_2\cadd\roll\sheet\CET-218.plg

HORIZONTAL SCALE

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY
DRAWN BY
CHECKED BY
IN CHARGE
DATE

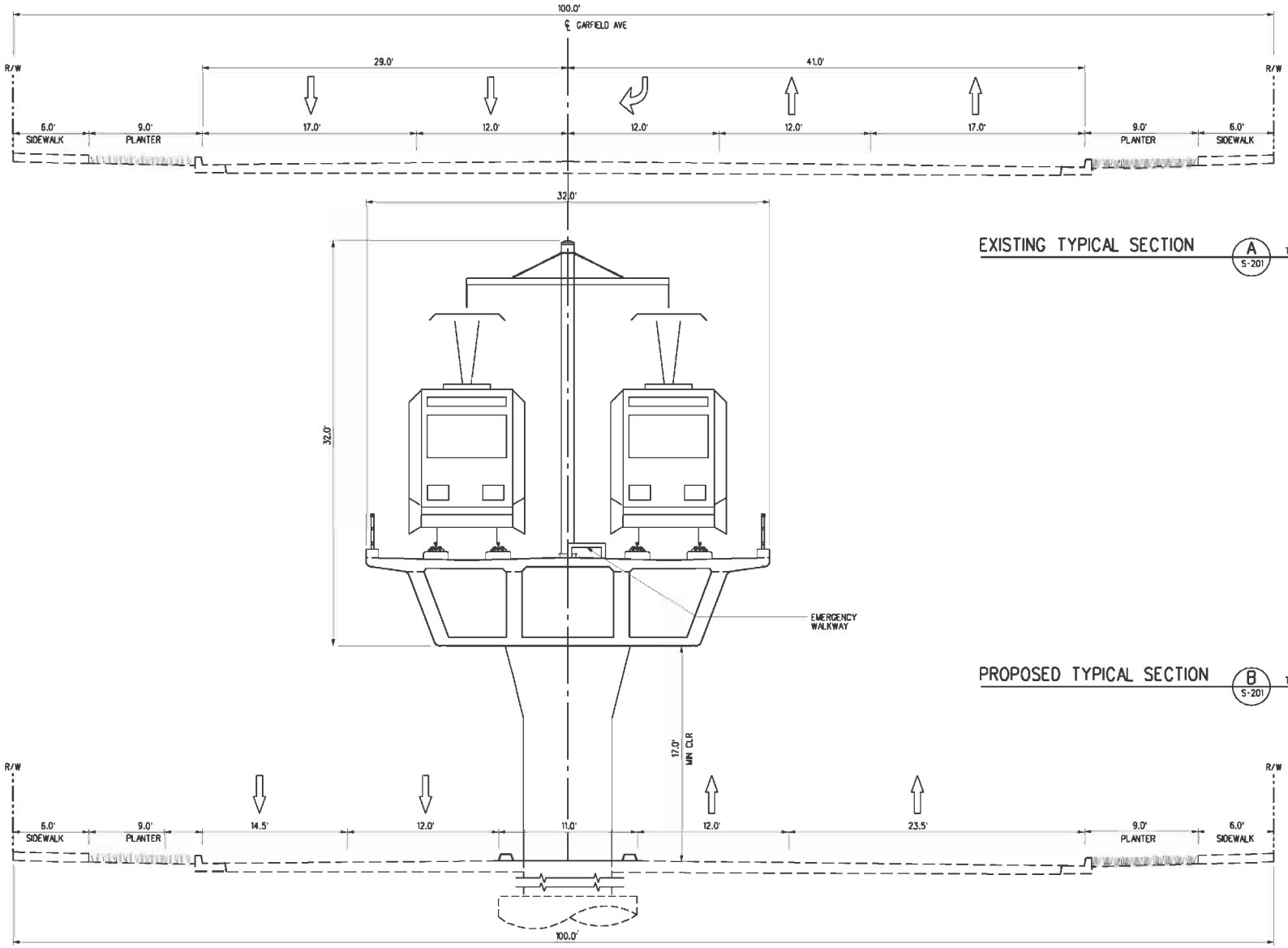
Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
WASHINGTON BLVD
ALIGNMENT
SHEET 19 OF 19

CONTRACT NO PS4320-2003
DRAWING NO T-219
REV 0
SCALE HORIZ: 1"=100'
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 12:23:05 PM
PLOT DRIVER = Raster_half_pdf.plt
PEN TABLE = WA_bl_colors.tbl

USER-drains 12:23:05 PM 10/23/2009 w:\60039033_eastside2_la_part_2\cadd\roll\sheet\CET-219.plg



EXISTING TYPICAL SECTION A S-201 T-205

PROPOSED TYPICAL SECTION B S-201 T-205

REV	DATE	BY	APP	REQ NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. ARAIN
DRAWN BY J. VARIAS
CHECKED BY B. BALDERRAMA
IN CHARGE S. FIALKOFF
DATE 07/03/09

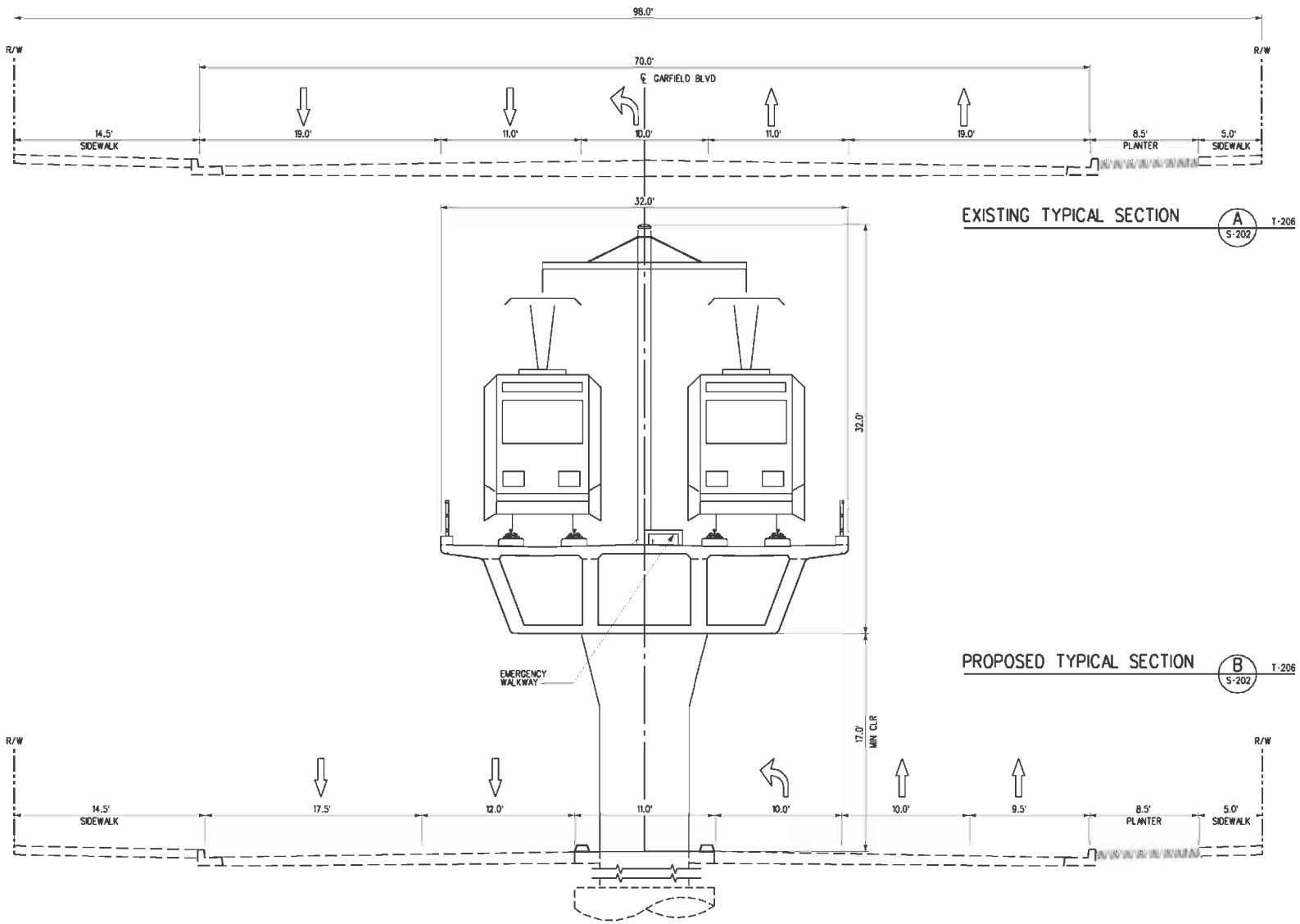
Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
WASHINGTON BLVD
SECTIONS
SHEET 1 OF 14

CONTRACT NO PS4320-2003
DRAWING NO S-201 REV 0
SCALE NO SCALE
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 11:40:05 AM
PLOT DRIVER = PDF_HOTF4_BW.pltt
PEN TABLE = MTA_LJ_pen1.tbl

USER=arains 11:40:05 AM 10/23/2009 w:\60039033_eastside2_to_part_2\cad\civil\sheet\S-201.plg



REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. ARAIN
DRAWN BY J. VARIAS
CHECKED BY B. BALDERRAMA
IN CHARGE S. FIALKOFF
DATE 07/03/09

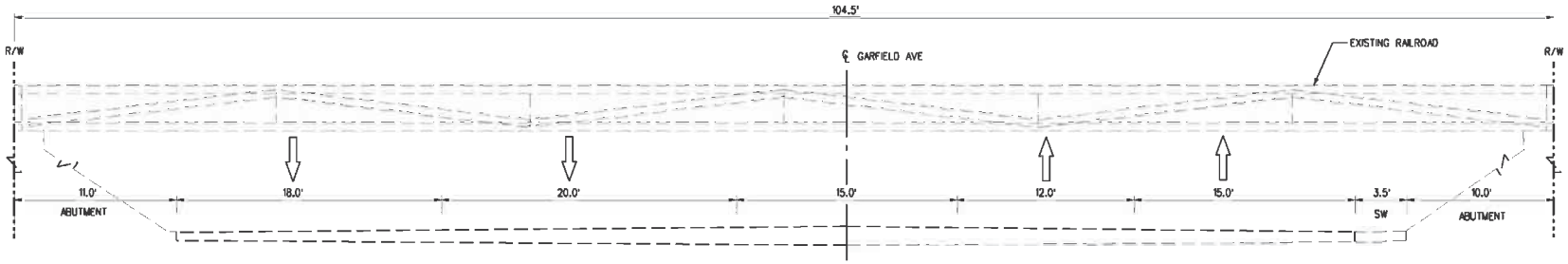
Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
WASHINGTON BLVD
SECTIONS
SHEET 2 OF 14

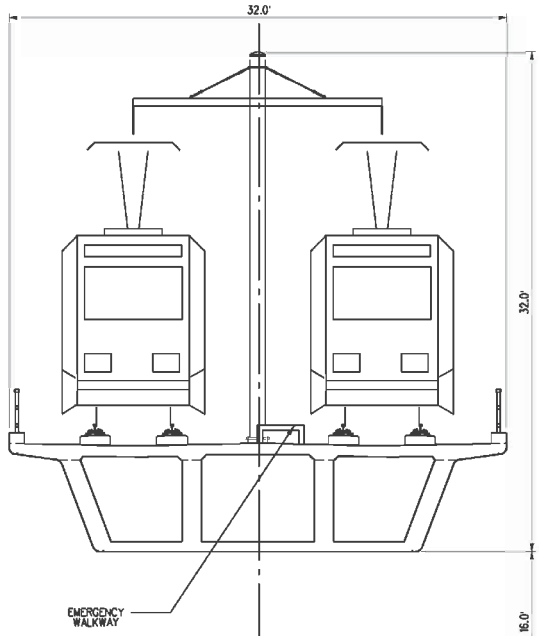
CONTRACT NO PS4320-2003
DRAWING NO S-202
REV 0
SCALE NO SCALE
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 11:40:06 AM
PLOT DRIVER = PDF_HOLF4.PRT
PEN TABLE = MTA_LJ_GOT.TBL

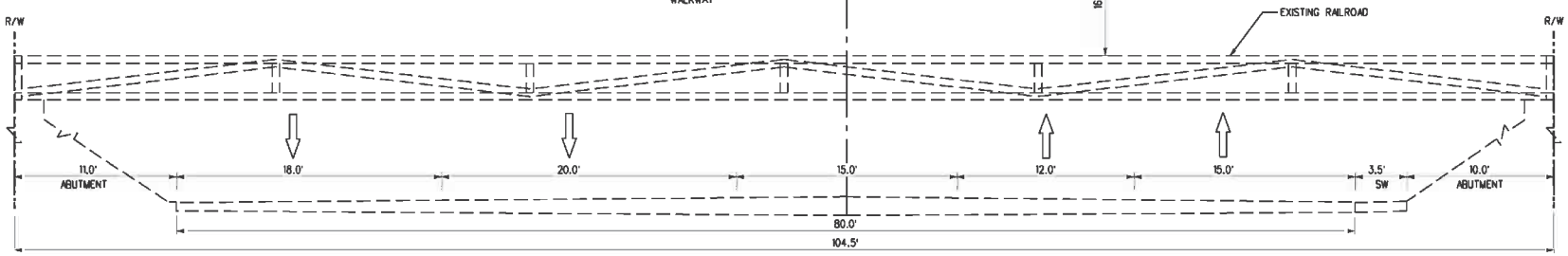
USER=grams 11:40:06 AM 10/23/2009 w:\60039033_eastside2_lc_part_2\cadd\civil\sheet\CLS-202.dgn



EXISTING TYPICAL SECTION (A / S-203) T-207



PROPOSED TYPICAL SECTION (B / S-203) T-207



REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

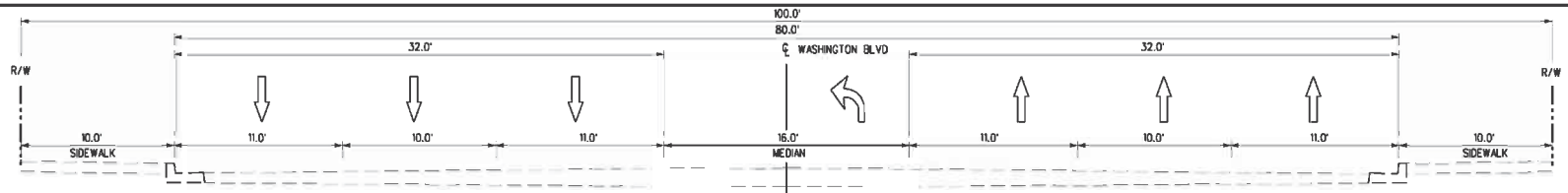
DESIGNED BY S. ARAIN
DRAWN BY J. VARIAS
CHECKED BY B. BALDERRAMA
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

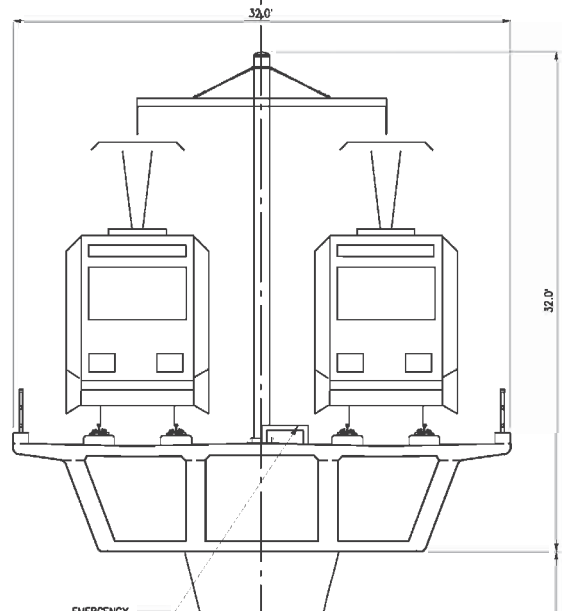
EASTSIDE PHASE 2 - PART 1
WASHINGTON BLVD
SECTIONS
SHEET 3 OF 14

CONTRACT NO PS4320-2003
DRAWING NO S-203 REV 0
SCALE NO SCALE
SHEET NO

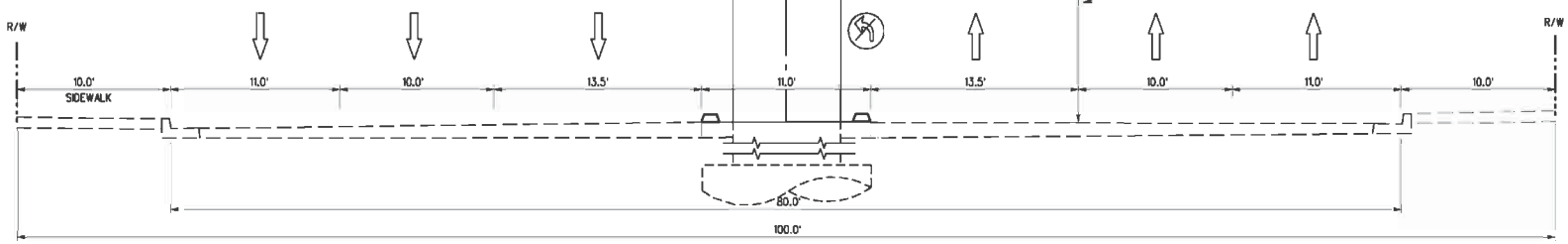
DATE PLOTTED = 10/23/2009 11:40:07 AM
PLOT DRIVER = PDF_HOLF4.BW.pltr
PEN TABLE = MTA_M_port.tbl
USER=grams 11:40:07 AM 10/23/2009 w:\60039033_eastside2_lc_part_2\cad\civil\sheet\CLS-203.dgn



EXISTING TYPICAL SECTION (A / S-204) T-209



PROPOSED TYPICAL SECTION (B / S-204) T-209



REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. ARAIN
DRAWN BY J. VARIAS
CHECKED BY B. BALDERRAMA
IN CHARGE S. FIALKOFF
DATE 07/03/09

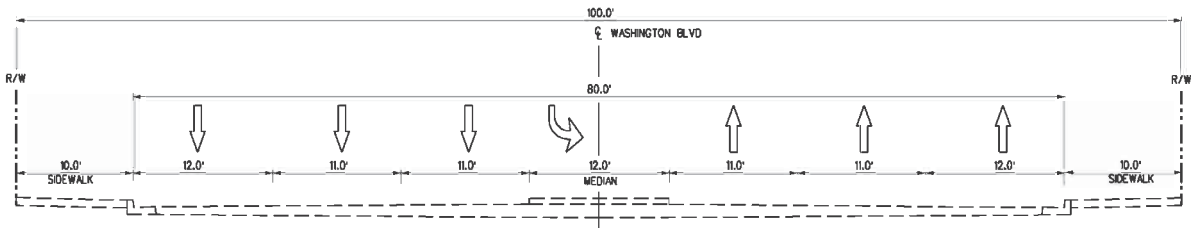
Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
WASHINGTON BLVD
SECTIONS
SHEET 4 OF 14

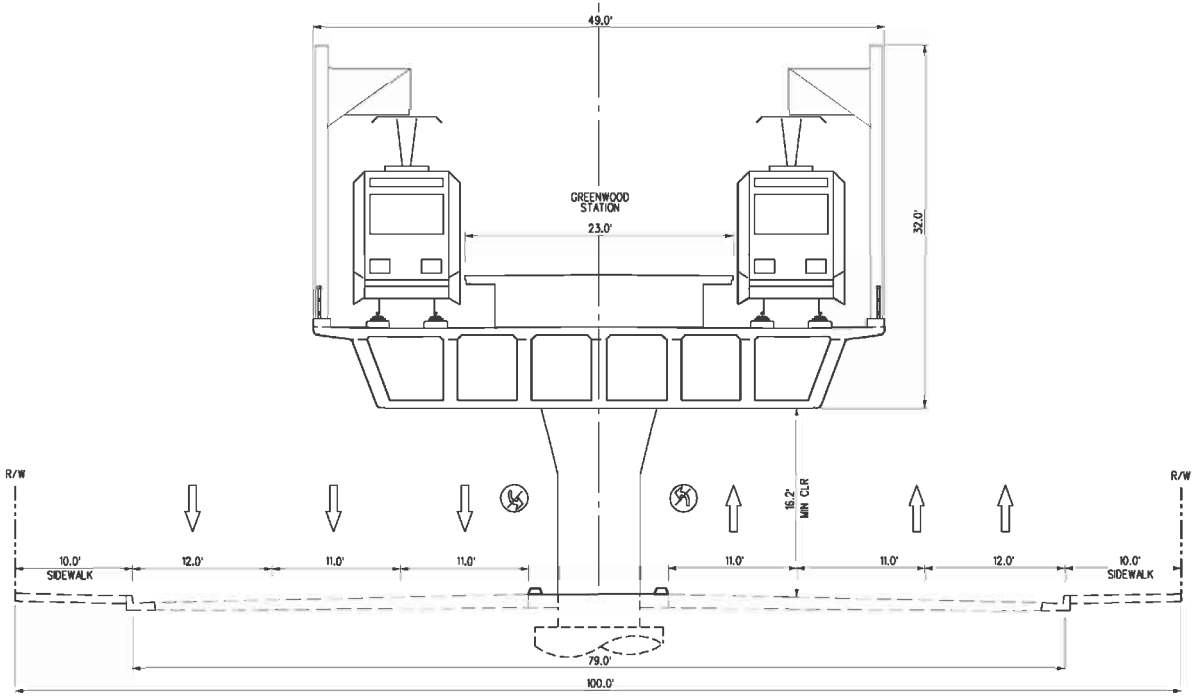
CONTRACT NO PS4320-2003
DRAWING NO S-204 REV 0
SCALE NO SCALE
SHEET NO

DATE PLOTTED = 10/23/2009 11:40:08 AM
PLOT DRIVER = PDF_HOTF_BW.PIT
PEN TABLE = MTA_LPOT.TBL

USER-grams 11:40:08 AM 10/23/2009 w:\60039033_eastside2_to_part_2\cad\civil\sheet\CLS-204.dgn



EXISTING TYPICAL SECTION (A / S-205) T-210



PROPOSED TYPICAL SECTION (B / S-205) T-210

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

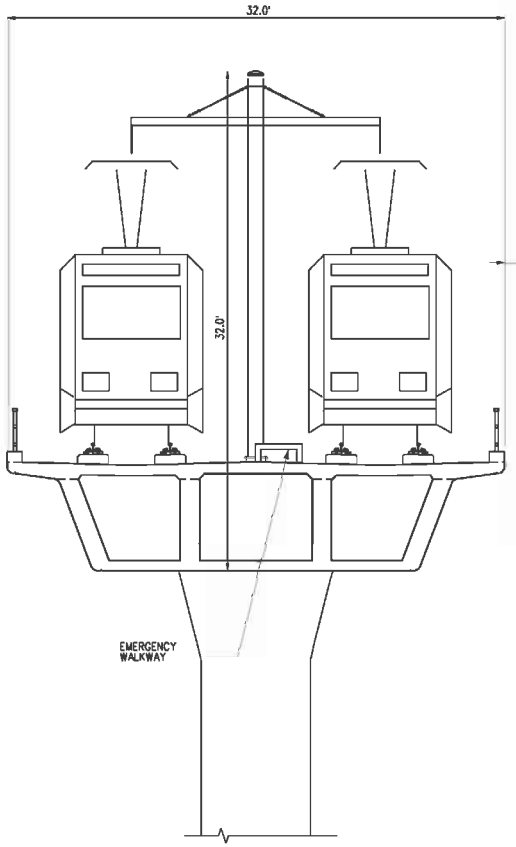
DESIGNED BY: S. ARAIN
DRAWN BY: J. VARIAS
CHECKED BY: B. BALDERRAMA
IN CHARGE: S. FIALKOFF
DATE: 07/03/09

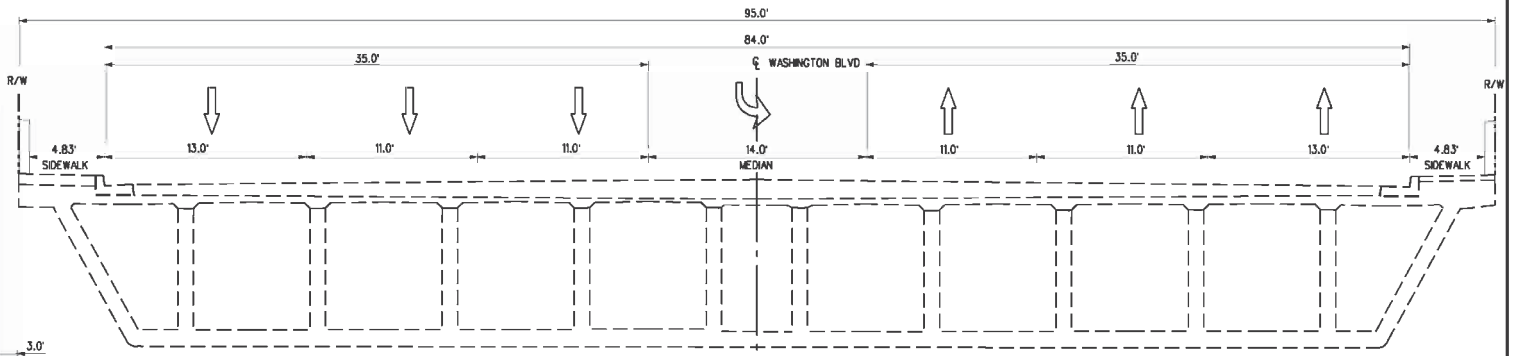
Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
WASHINGTON BLVD
SECTIONS
SHEET 5 OF 14

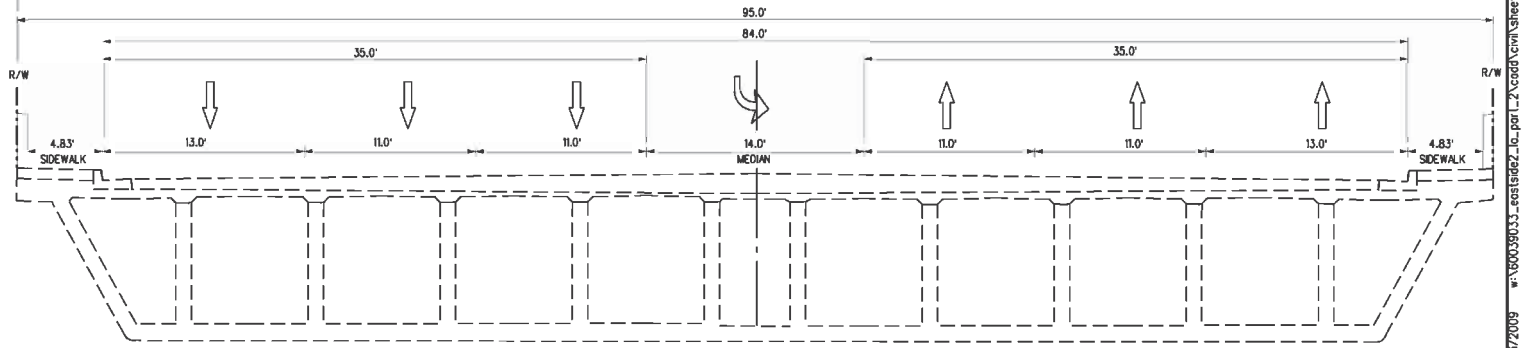
CONTRACT NO: PS4320-2003
DRAWING NO: S-205 REV: 0
SCALE: NO SCALE
SHEET NO:

DATE PLOTTED = 10/23/2009 TIME PLOTTED = 11:40:10 AM
PLOT DRIVER = PDF_HOTF_BW.PLT PEN TABLE = MTA_LPOT.TBL
USER=arains 11:40:10 AM 10/23/2009 w:\60039033_eastside2_lc_part_2\cadd\civil\sheet\S-205.dgn





EXISTING TYPICAL SECTION (A / S-206) T-211



PROPOSED TYPICAL SECTION (B / S-206) T-211

REV	DATE	BY	APP	REQ NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

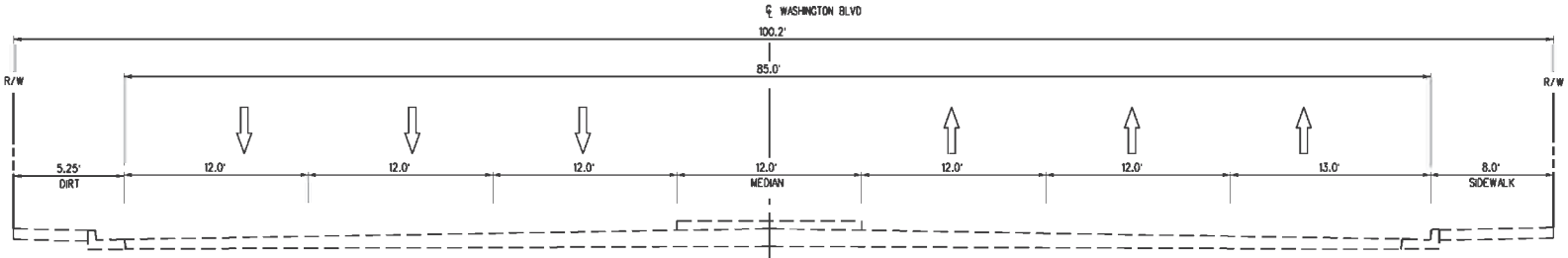
DESIGNED BY: S. ARAIN
DRAWN BY: J. VARIAS
CHECKED BY: B. BALDERRAMA
IN CHARGE: S. FIALKOFF
DATE: 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

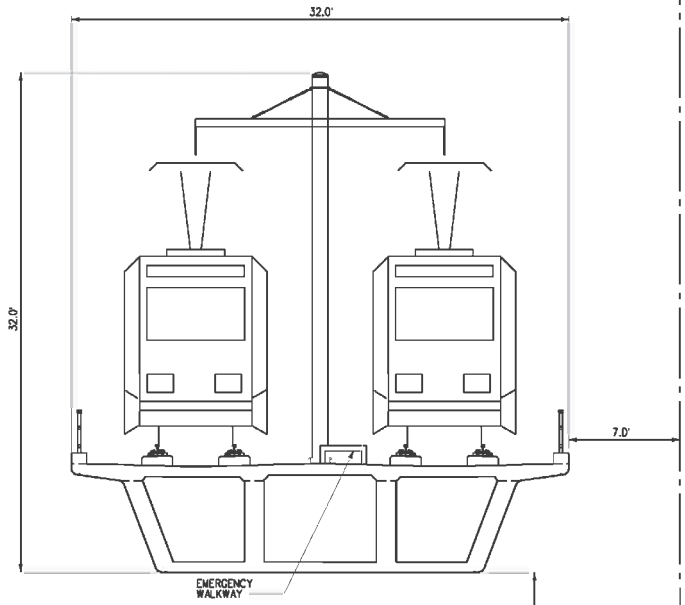
EASTSIDE PHASE 2 - PART 1
WASHINGTON BLVD
SECTIONS
SHEET 6 OF 14

CONTRACT NO: PS4320-2003
DRAWING NO: S-206 REV: 0
SCALE: NO SCALE
SHEET NO:

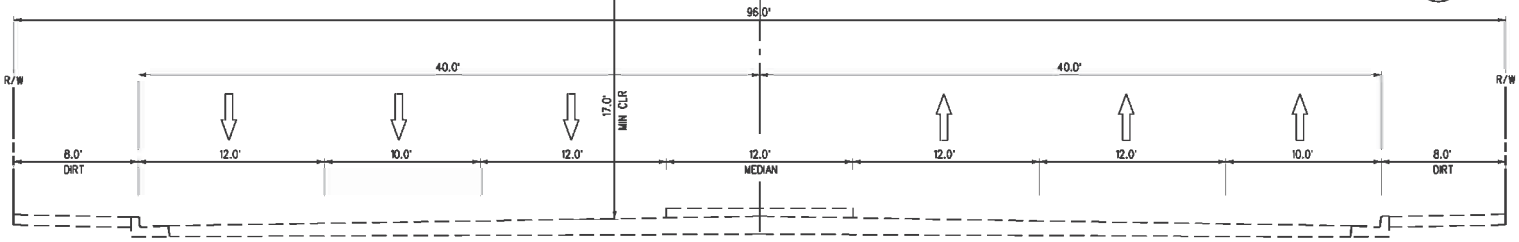
DATE PLOTTED = 10/23/2009 TIME PLOTTED = 11:40:11 AM
PLOT DRIVER = PDF_HOT4_BW.pltr MTA_LJ_pdf.tbl
PEN TABLE =
USER=grams 10/23/2009 w:\60039033_eastside2_lo_part_2\cad\civil\sheet\CS-206.dwg



EXISTING TYPICAL SECTION (A / S-207) T-211



PROPOSED TYPICAL SECTION (B / S-207) T-211



REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

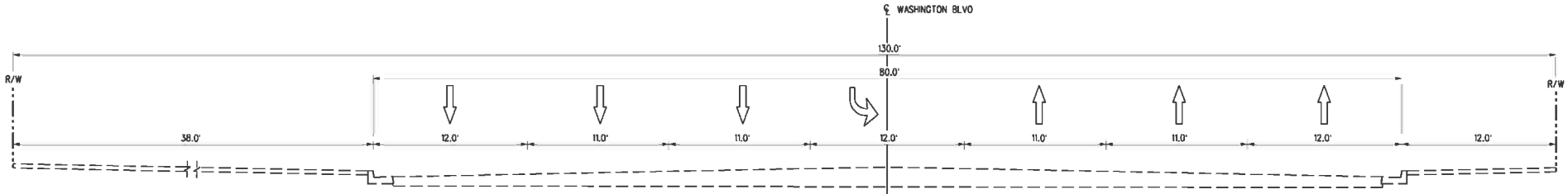
DESIGNED BY S. ARAIN
DRAWN BY J. VARIAS
CHECKED BY B. BALDERRAMA
IN CHARGE S. FIALKOFF
DATE 07/03/09

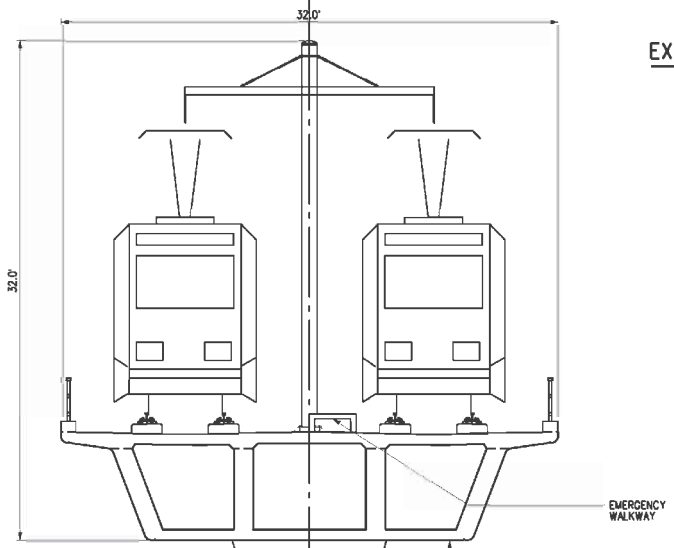
Metropolitan Transportation Authority
Metro
CDM AECOM JOINT VENTURE

EASTSIDE PHASE 2 - PART 1
WASHINGTON BLVD
SECTIONS
SHEET 7 OF 14

CONTRACT NO PS4320-2003
DRAWING NO S-207 REV 0
SCALE NO SCALE
SHEET NO

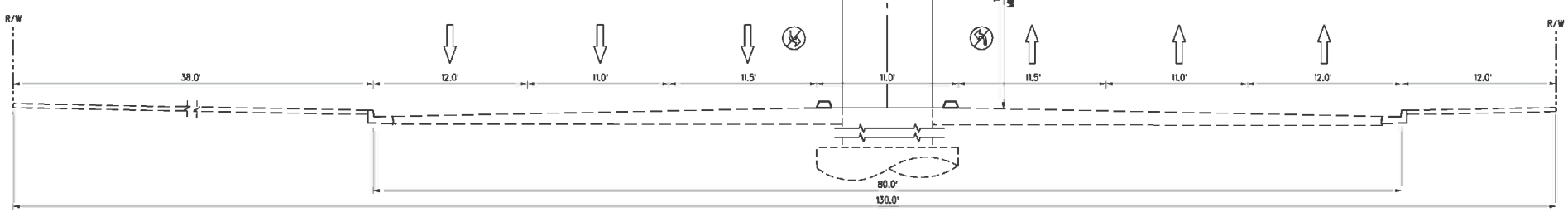
DATE PLOTTED = 10/23/2009 TIME PLOTTED = 11:40:12 AM
PLOT DRIVER = PDF_Hotfix_Wizard.pltr PEN TABLE = MTA_Ultra_Color.tbl
USER=grams 11:40:12 AM 10/23/2009 w:\60039033_eastside2_to_part1_2\cad\civil\sheet\CES-207.dgn





EXISTING TYPICAL SECTION (A / S-208) T-212

PROPOSED TYPICAL SECTION (B / S-208) T-212



REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

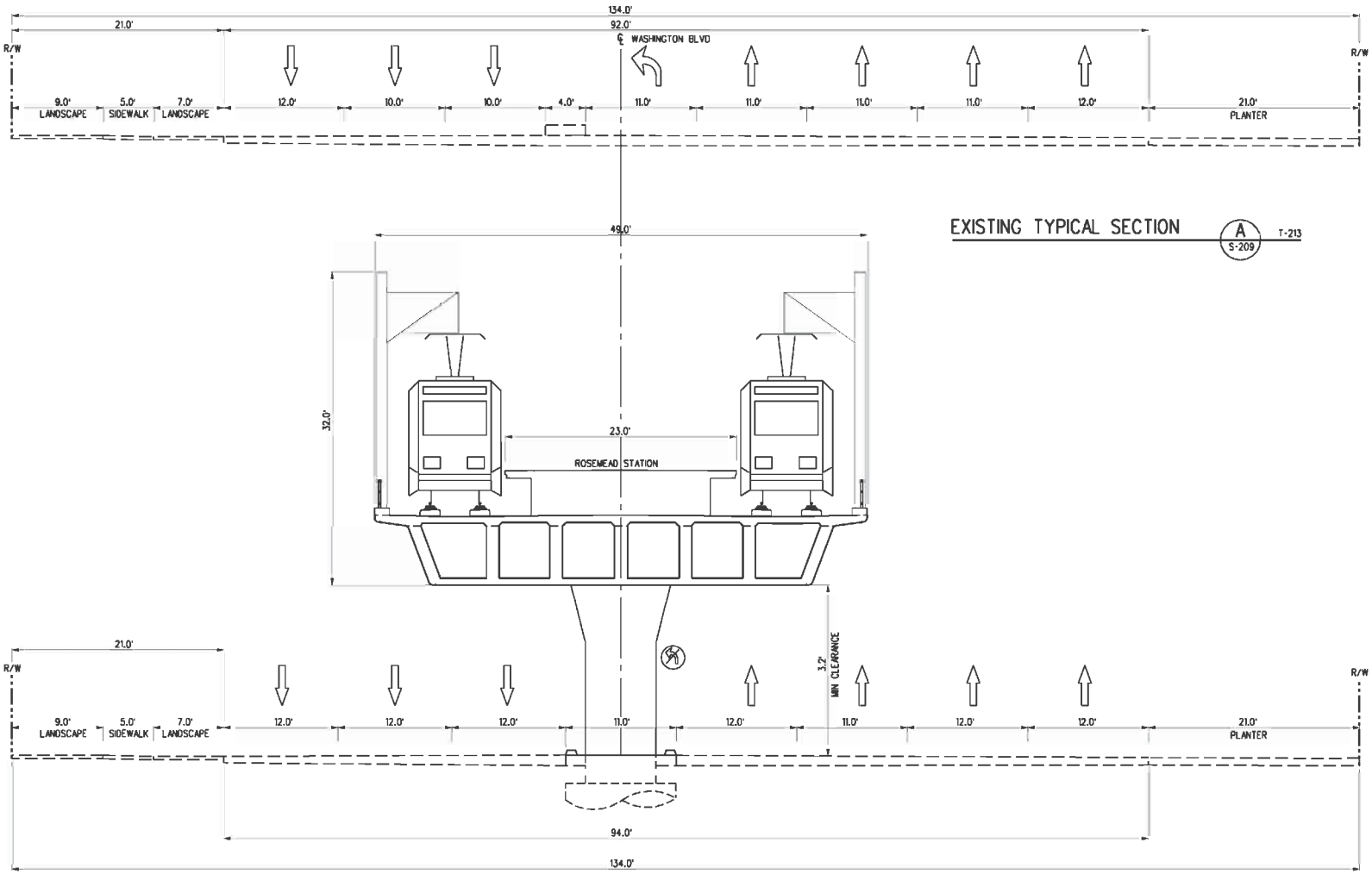
DESIGNED BY S. ARAIN
DRAWN BY J. VARIAS
CHECKED BY B. BALDERRAMA
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
WASHINGTON BLVD
SECTIONS
SHEET 8 OF 14

CONTRACT NO PS4320-2003
DRAWING NO S-208 REV 0
SCALE NO SCALE
SHEET NO

DATE PLOTTED = 10/23/2009 TIME PLOTTED = 11:40:13 AM
PLOT DRIVER = PDF_HOLF4_BW.pltf PEN TABLE = MTA_M_pen1.tbl
USER=arains 11:40:13 AM 10/23/2009 w:\60039033_eastside2_lc_part_2\cad\civil\sheet\CLS-208.dgn



EXISTING TYPICAL SECTION (A / S-209) T-213

PROPOSED TYPICAL SECTION (B / S-209) T-213

REV	DATE	BY	APP	REQ NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. ARAIN
DRAWN BY J. VARIAS
CHECKED BY B. BALDERRAMA
IN CHARGE S. FIALKOFF
DATE 07/03/09

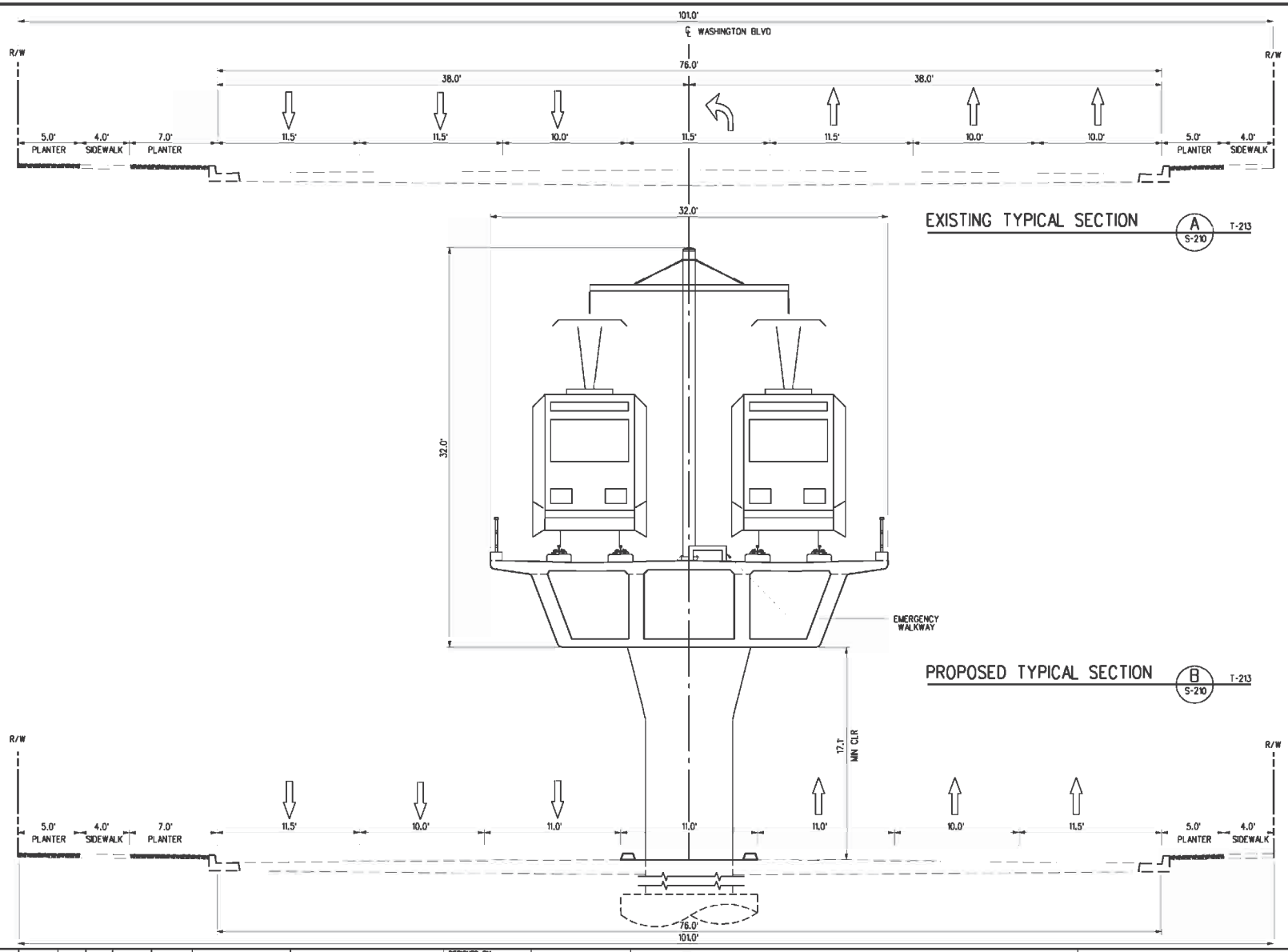
Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
WASHINGTON BLVD
SECTIONS
SHEET 9 OF 14

CONTRACT NO PS4320-2003
DRAWING NO S-209 REV 0
SCALE NO SCALE
SHEET NO

DATE PLOTTED = 10/23/2009 TIME PLOTTED = 11:40:15 AM
PLOT DRIVER = PDF_HOTF4.PRF PEN TABLE = MTA_LAPORT.TBL

USER-grams 11:40:15 AM 10/23/2009 w:\60039033_eastside2_la_part_2\cadd\civil\sheet\DES-209.dgn



REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. ARAIN
DRAWN BY J. VARIAS
CHECKED BY B. BALDERRAMA
IN CHARGE S. FIALKOFF
DATE 07/03/09

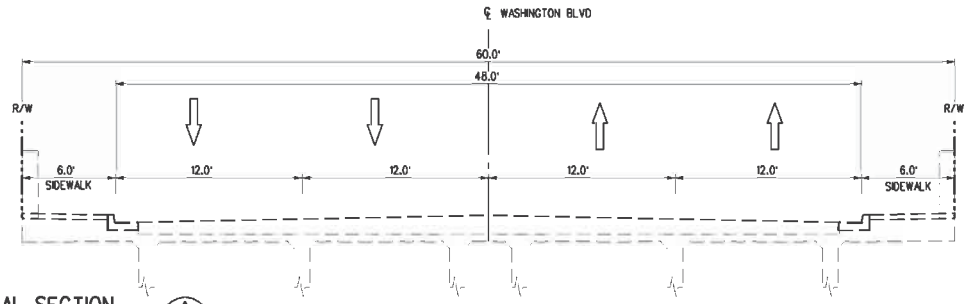
Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
WASHINGTON BLVD
SECTIONS
SHEET 10 OF 14

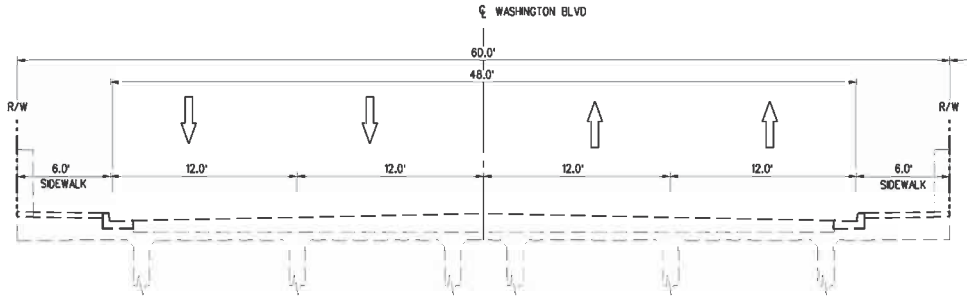
CONTRACT NO PS4320-2003
DRAWING NO S-210
REV 0
SCALE NO SCALE
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 11:40:16 AM
PLOT DRIVER = PDF_HOTF4.PRT
PEN TABLE = MTA_LJ_POT.TBL

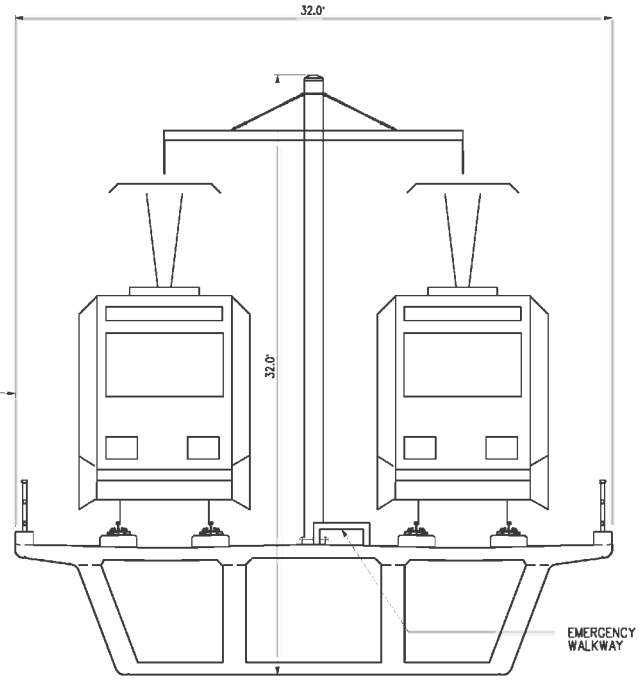
USER=grams 11:40:16 AM 10/23/2009 w:\60039033_eastside2_lc_part_2\cadd\civil\sheet\CLS-210.dgn



EXISTING TYPICAL SECTION (A / S-211) T-215



PROPOSED TYPICAL SECTION (B / S-211) T-215



REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

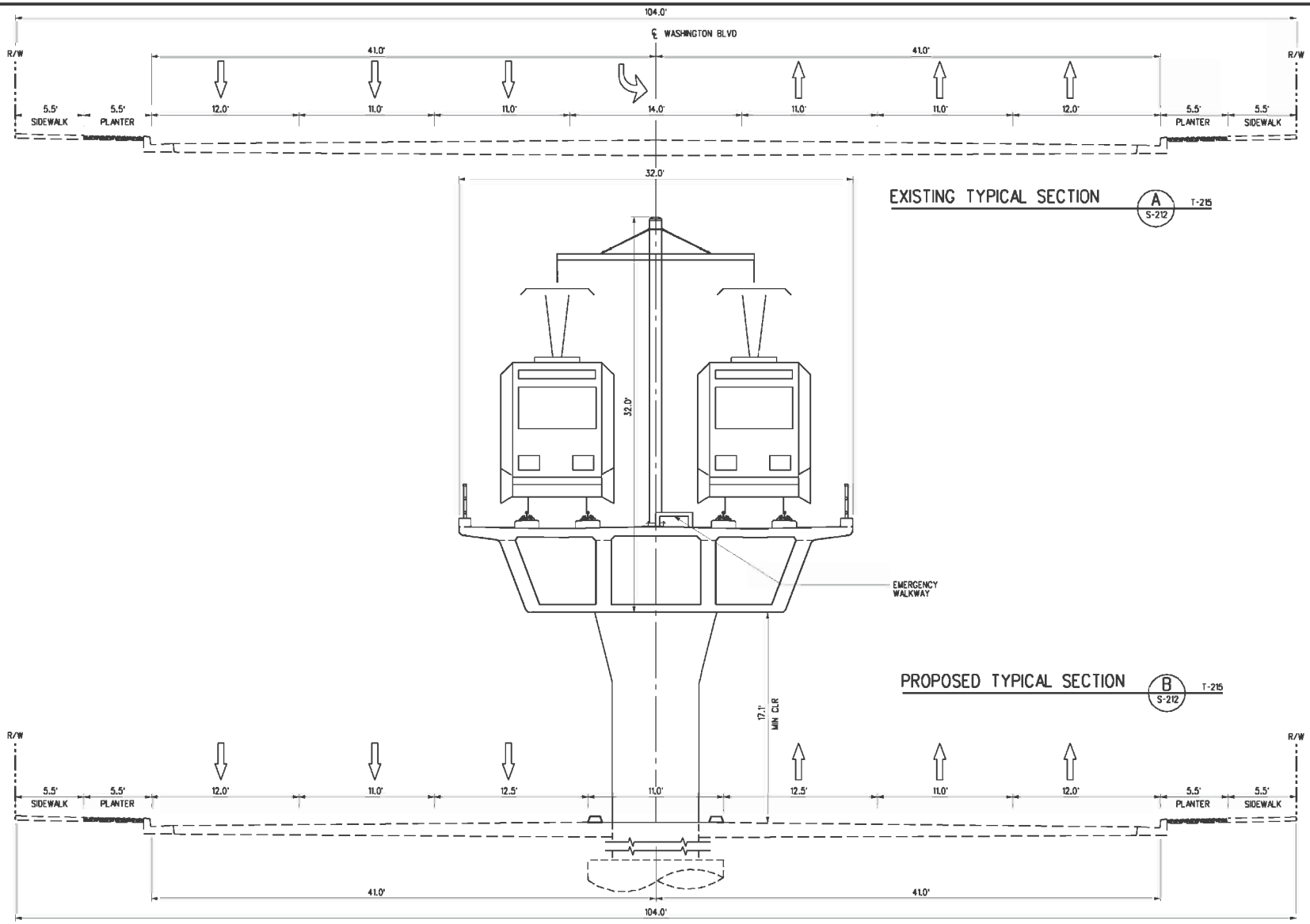
DESIGNED BY S. ARAIN
DRAWN BY J. VARIAS
CHECKED BY B. BALDERRAMA
IN CHARGE S. FIALKOFF
DATE 07/03/09

Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
WASHINGTON BLVD
SECTIONS
SHEET 11 OF 14

CONTRACT NO PS4320-2003
DRAWING NO S-211 REV 0
SCALE NO SCALE
SHEET NO

DATE PLOTTED = 10/23/2009 TIME PLOTTED = 11:40:17 AM
PLOT DRIVER = PDF_HOT4.PLT PEN TABLE = MTA_LPOT.TBL
USER=arains 11:40:17 AM 10/23/2009 w:\60039033_eastside2_lc_part_2\cadd\civil\sheet\CLS-211.plg



REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. ARAIN
DRAWN BY J. VARIAS
CHECKED BY B. BALDERRAMA
IN CHARGE S. FIALKOFF
DATE 07/03/09

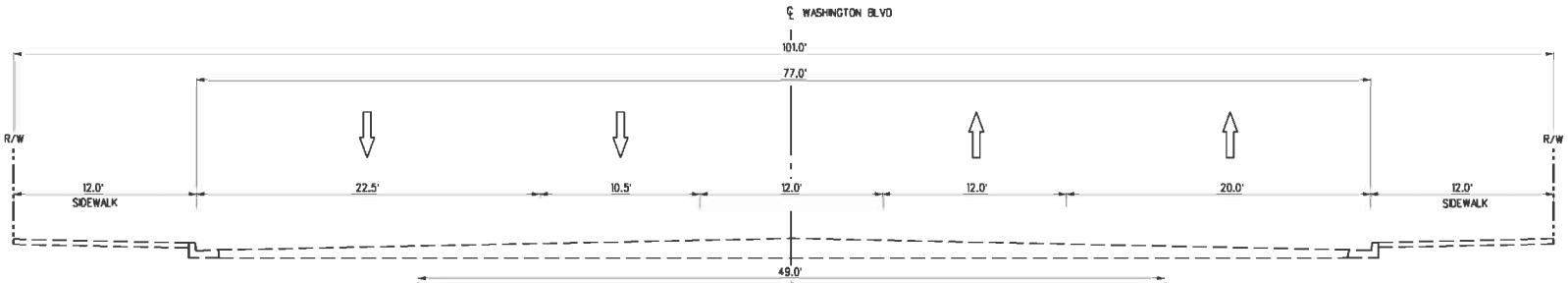
Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
WASHINGTON BLVD
SECTIONS
SHEET 12 OF 14

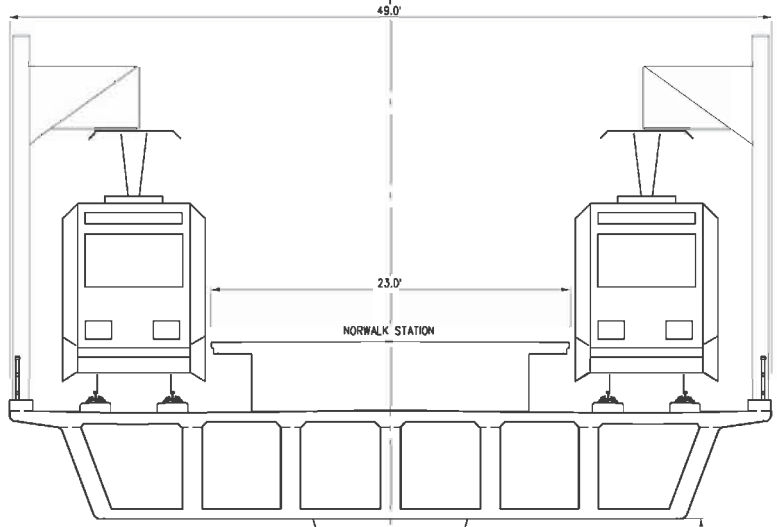
CONTRACT NO PS4320-2003
DRAWING NO S-212
REV 0
SCALE NO SCALE
SHEET NO

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 11:40:18 AM
PLOT DRIVER = PDF_HOT4.PRT.pltt
PEN TABLE = MTA_M_port.tbl

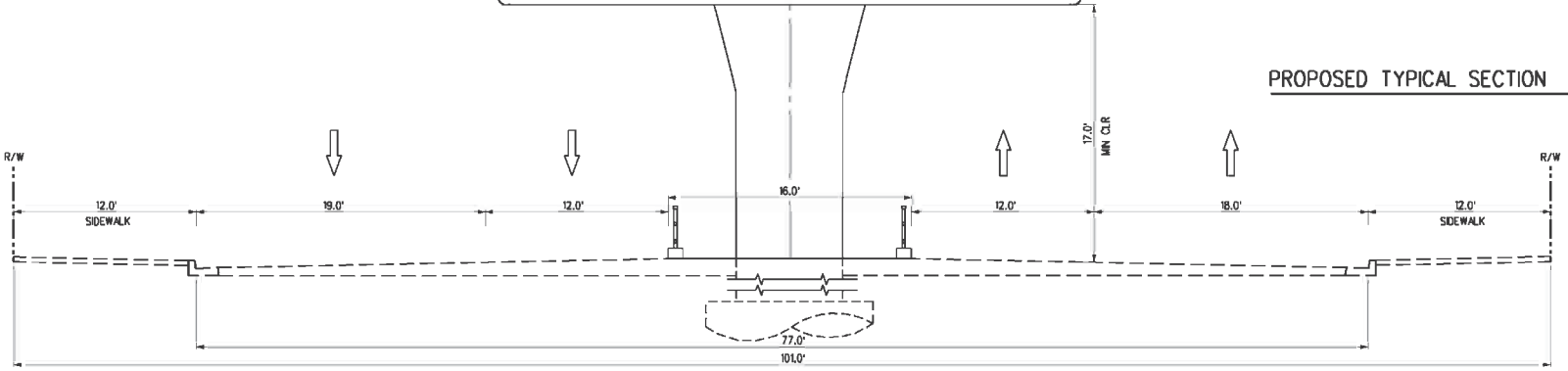
USER=arains 11:40:18 AM 10/23/2009 w:\60039033_eastside2_lc_part_2\cadd\civil\sheet\CLS-212.plg



EXISTING TYPICAL SECTION (A / S-213) T-216



PROPOSED TYPICAL SECTION (B / S-213) T-216



REV	DATE	BY	APP	REQ NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY: S. ARAIN
DRAWN BY: J. VARIAS
CHECKED BY: B. BALDERRAMA
IN CHARGE: S. FIALKOFF
DATE: 07/03/09

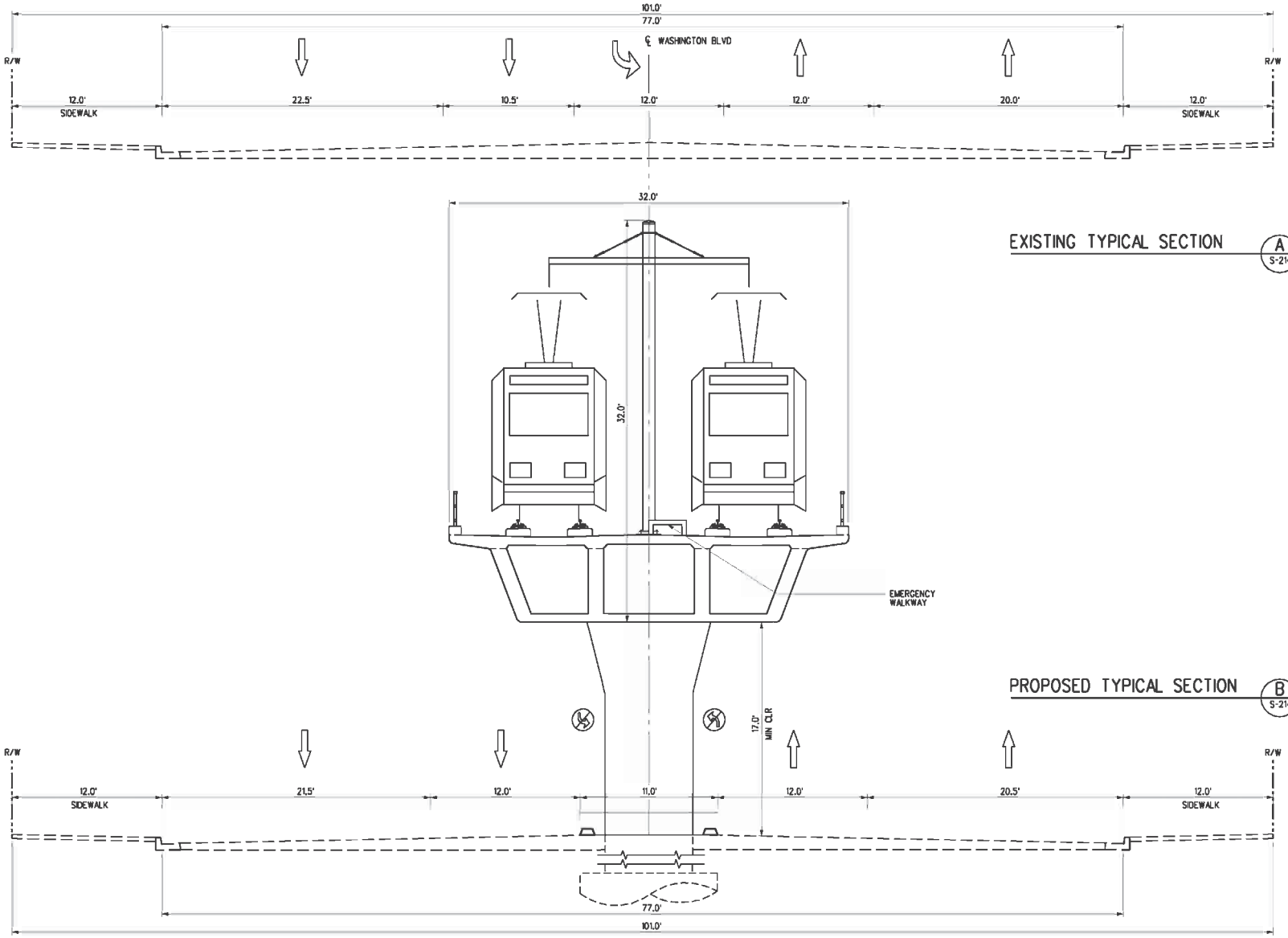
Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
WASHINGTON BLVD
SECTIONS
SHEET 13 OF 14

CONTRACT NO: PS4320-2003
DRAWING NO: S-213
REV: 0
SCALE: NO SCALE
SHEET NO:

DATE PLOTTED = 10/23/2009
TIME PLOTTED = 11:40:20 AM
PLOT DRIVER = PDF_HOLF_BW.pltr
PEN TABLE = MTA_LJ_pen.tbl

USER=arains TIME=11:40:20 AM 10/23/2009 w:\60039033_eastside2_lc_part1_2\cad\civil\sheet\CLS-213.dgn



EXISTING TYPICAL SECTION A S-214 T-218

PROPOSED TYPICAL SECTION B S-214 T-218

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. ARAIN
DRAWN BY J. VARIAS
CHECKED BY B. BALDERRAMA
IN CHARGE S. FIALKOFF
DATE 07/03/09

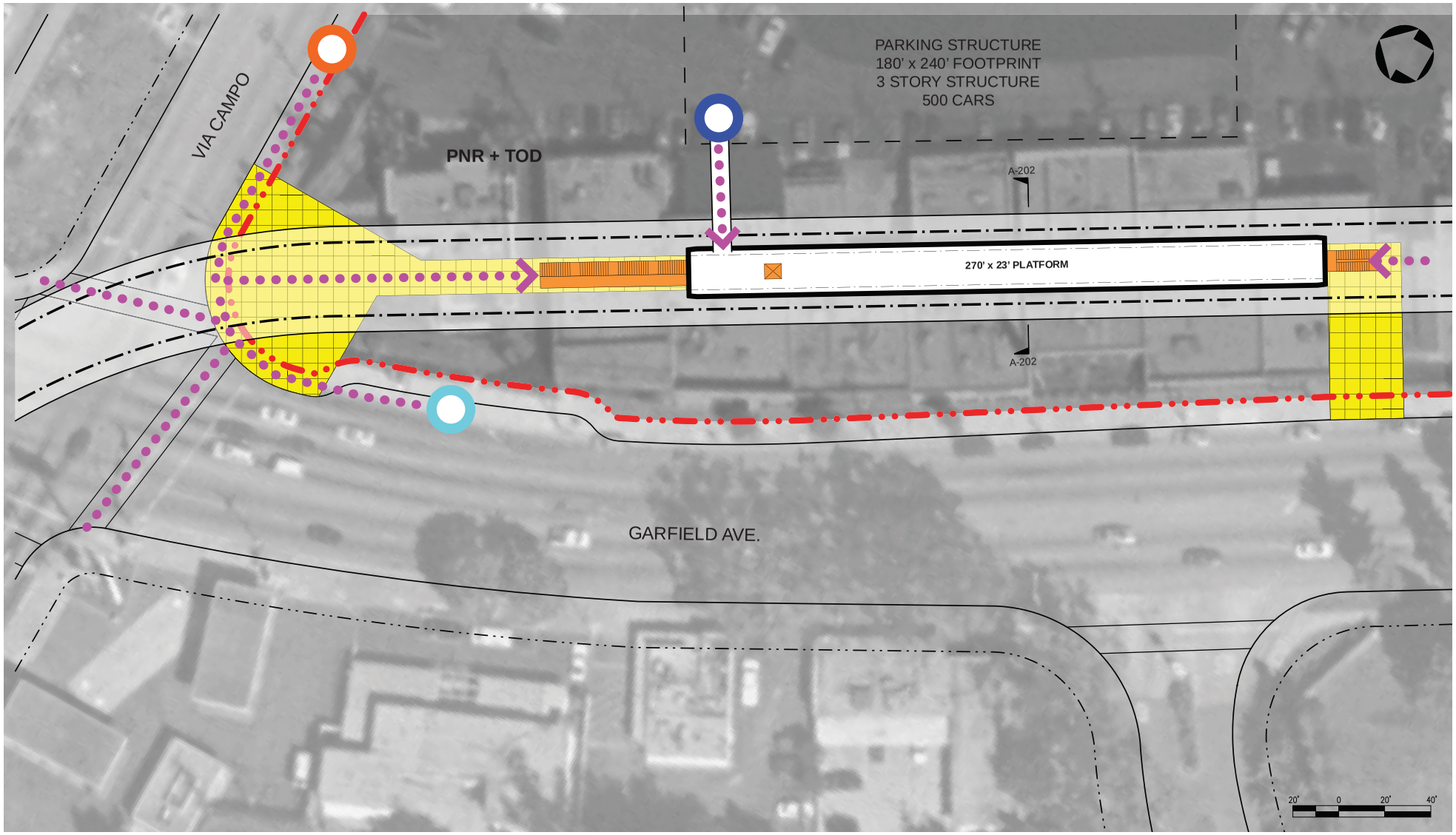
Metropolitan Transportation Authority
Metro
CDM AECOM

EASTSIDE PHASE 2 - PART 1
WASHINGTON BLVD
SECTIONS
SHEET 14 OF 14

CONTRACT NO PS4320-2003
DRAWING NO S-214 REV 0
SCALE NO SCALE
SHEET NO

DATE PLOTTED = 10/23/2009 TIME PLOTTED = 11:40:21 AM
PLOT DRIVER = PDF_HOLF4_BW.pltt PEN TABLE = MTA_LJ_pen1.tbl

USER=grams 11:40:21 AM 10/23/2009 w:\60039033_eastside2_lc_part_2\cadd\civil\sheet\CLS-214.plg



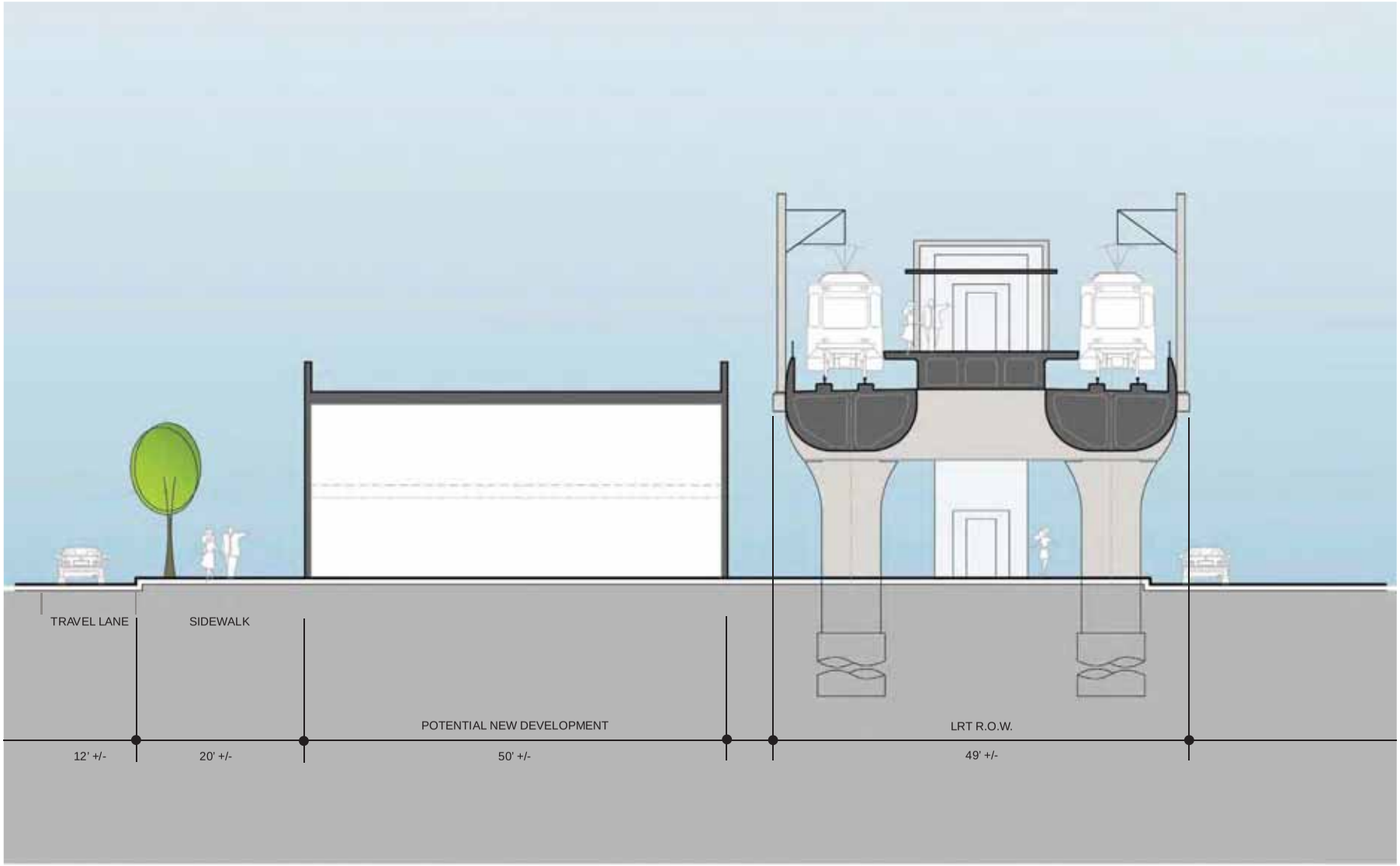
REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. SCHWARZKOPF
DRAWN BY S. GODKIN
CHECKED BY S. SCHWARZKOPF
IN CHARGE V. DAVIES
DATE 06/29/09

Metro
Metropolitan Transportation Authority
CDM AECOM

EASTSIDE PHASE 2 - PART 1
WASHINGTON BLVD.
GARFIELD AVE. STATION
LOCATION PLAN

CONTRACT NO PS4320-2003
DRAWING NO A-201
REV 0
SCALE 1⊠ = 40⊠
SHEET NO



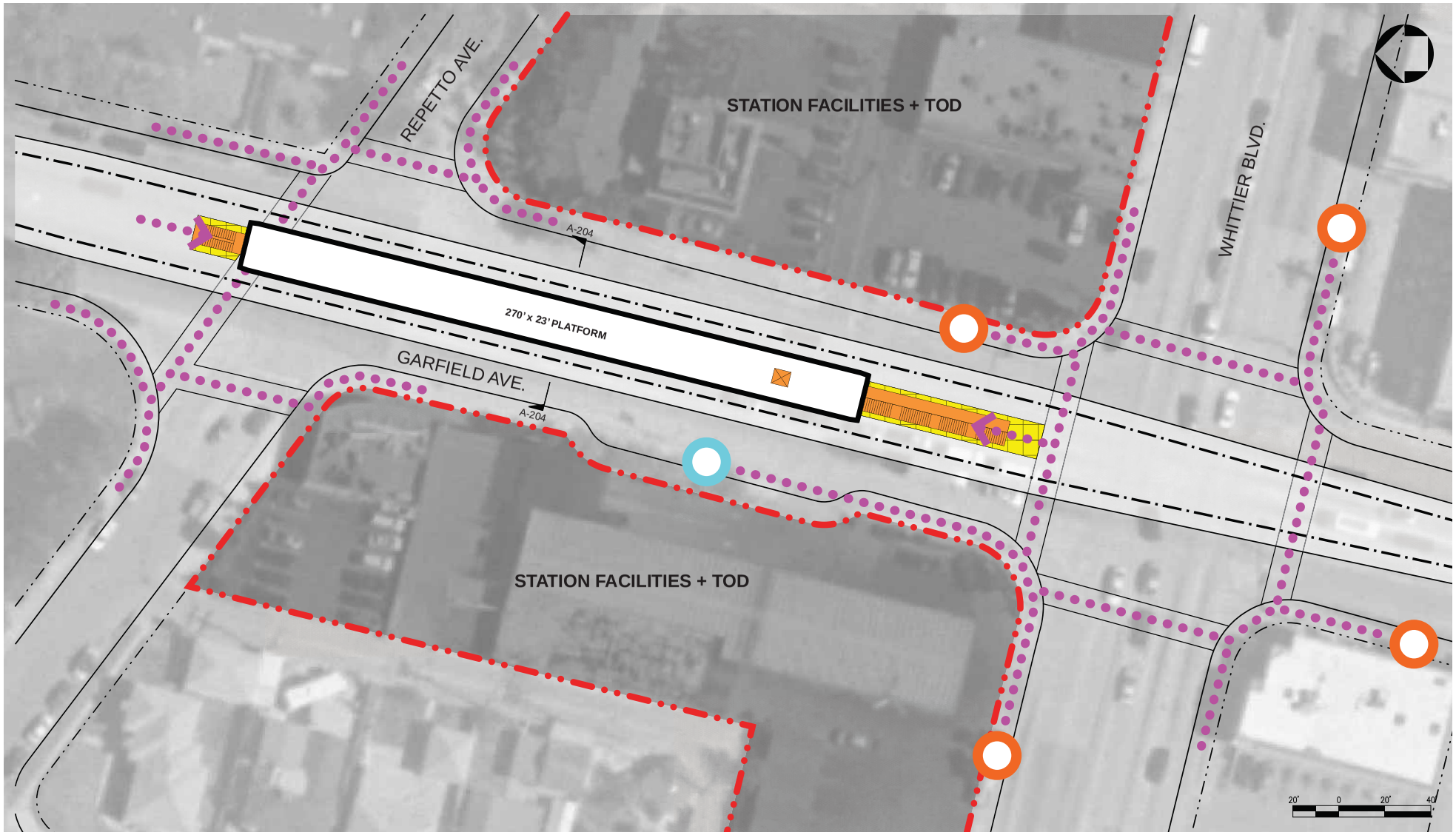
REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. SCHWARZKOPF
DRAWN BY S. GODKIN
CHECKED BY S. SCHWARZKOPF
IN CHARGE V. DAVIES
DATE 06/29/09

Metro
Metropolitan Transportation Authority
CDM AECOM

EASTSIDE PHASE 2 - PART 1
WASHINGTON BLVD.
GARFIELD AVE. STATION
SECTION

CONTRACT NO PS4320-2003
DRAWING NO A-202
REV 0
SCALE NO SCALE
SHEET NO



REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. SCHWARZKOPF
DRAWN BY S. GODKIN
CHECKED BY S. SCHWARZKOPF
IN CHARGE V. DAVIES
DATE 06/29/09

Metro
Metropolitan Transportation Authority
CDM AECOM

EASTSIDE PHASE 2 - PART 1
WASHINGTON BLVD.
WHITTIER BLVD. STATION
LOCATION PLAN

CONTRACT NO PS4320-2003
DRAWING NO A-203
REV 0
SCALE 1⊠ = 40⊠
SHEET NO

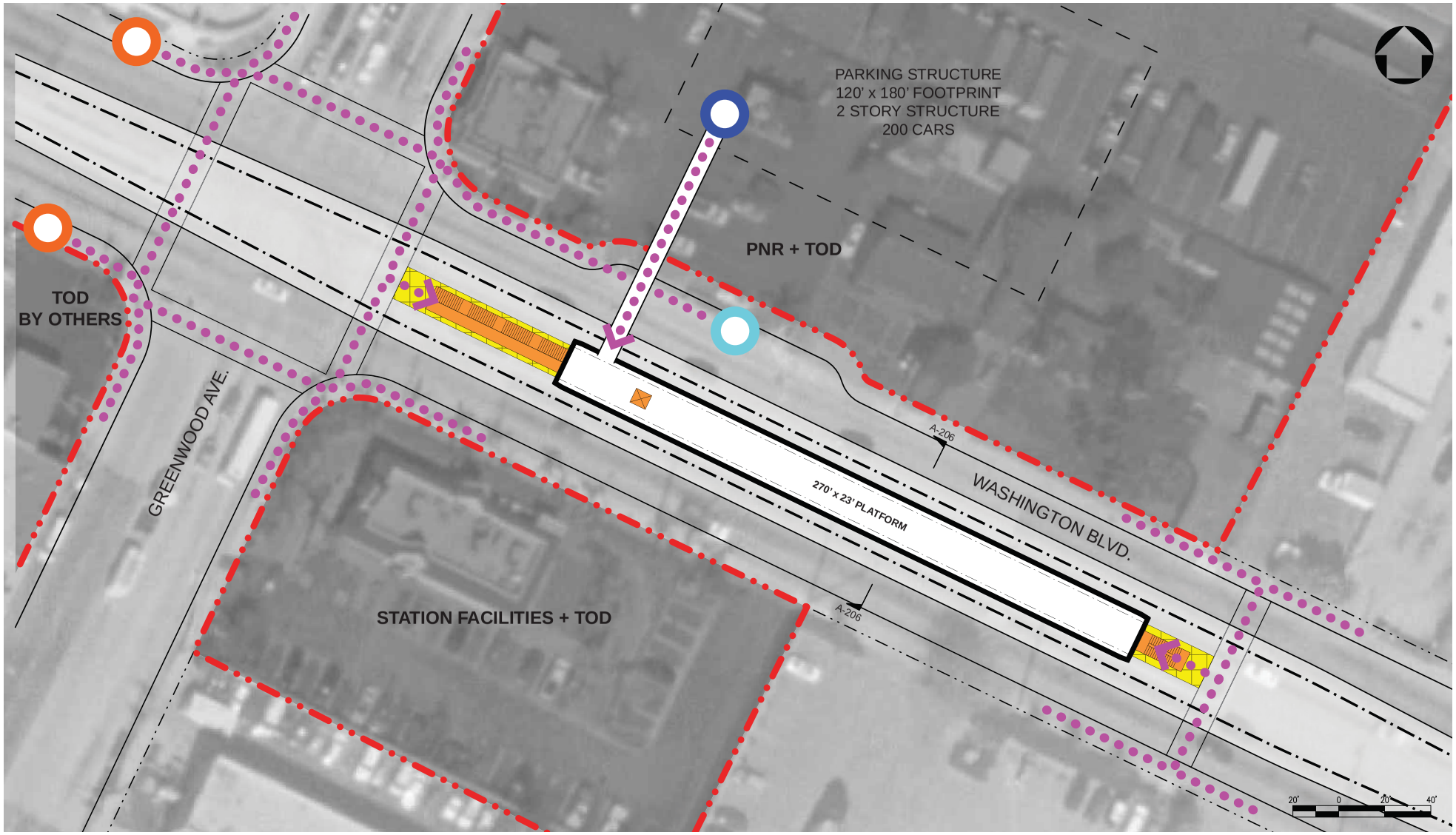
REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. SCHWARZKOPF
DRAWN BY S. GODKIN
CHECKED BY S. SCHWARZKOPF
IN CHARGE V. DAVIES
DATE 06/29/09

Metro
Metropolitan Transportation Authority
CDM AECOM

EASTSIDE PHASE 2 - PART 1
WASHINGTON BLVD.
WHITTIER BLVD. STATION
SECTION

CONTRACT NO PS4320-2003
DRAWING NO A-204
REV 0
SCALE NO SCALE
SHEET NO



REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. SCHWARZKOPF
DRAWN BY S. GODKIN
CHECKED BY S. SCHWARZKOPF
IN CHARGE V. DAVIES
DATE 06/29/09

Metro
Metropolitan Transportation Authority
CDM AECOM

EASTSIDE PHASE 2 - PART 1
WASHINGTON BLVD.
GREENWOOD AVE. STATION
LOCATION PLAN

CONTRACT NO PS4320-2003
DRAWING NO A-205
REV 0
SCALE 1⊠ = 40⊠
SHEET NO

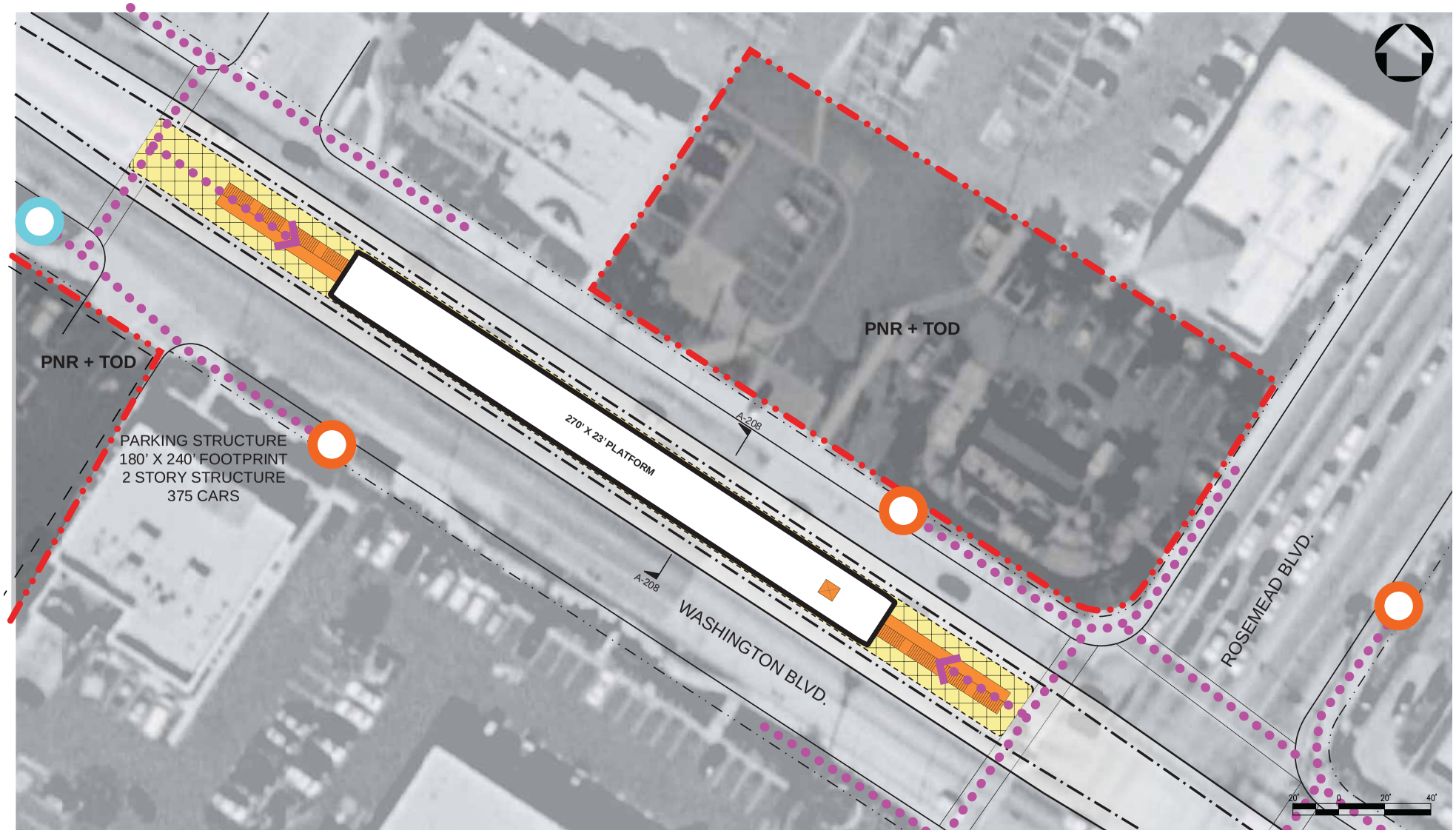
REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY S. SCHWARZKOPF
DRAWN BY S. GODKIN
CHECKED BY S. SCHWARZKOPF
IN CHARGE V. DAVIES
DATE 06/29/09

Metro
Metropolitan Transportation Authority
CDM AECOM

EASTSIDE PHASE 2 - PART 1
WASHINGTON BLVD.
GREENWOOD AVE. STATION
SECTION

CONTRACT NO PS4320-2003
DRAWING NO A-206
REV 0
SCALE NO SCALE
SHEET NO



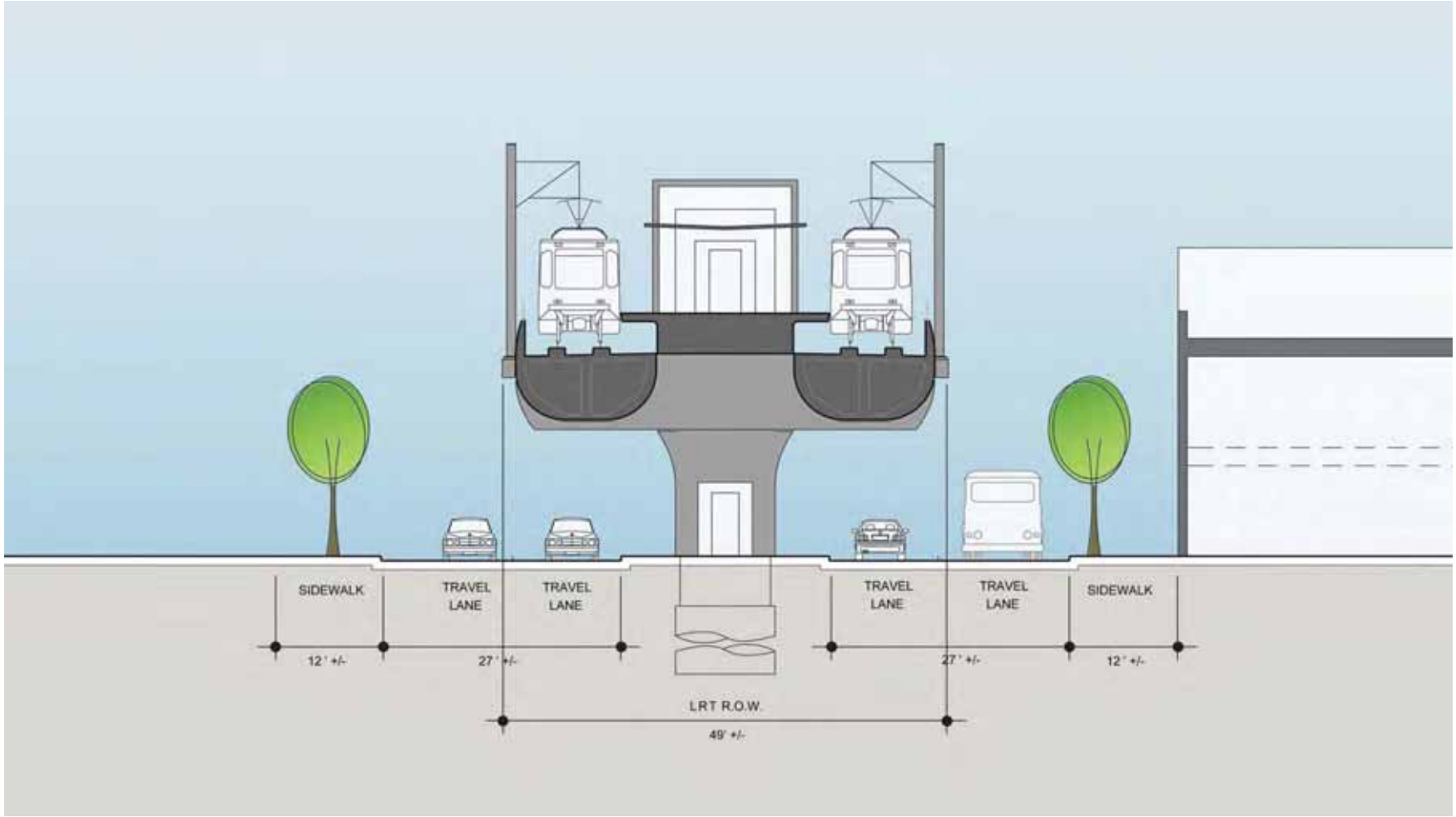
REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY R. ESCOBEDO
DRAWN BY L. VAZQUEZ
CHECKED BY L. CHAVEZ
IN CHARGE F. VILLALOBOS
DATE 06/29/09

Metro
Metropolitan Transportation Authority
CDM AECOM

EASTSIDE PHASE 2 - PART 1
WASHINGTON BLVD.
ROSEMEAD BLVD. STATION
LOCATION PLAN

CONTRACT NO PS4320-2003
DRAWING NO A-207
REV 0
SCALE 1⊠= 40⊠
SHEET NO



REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

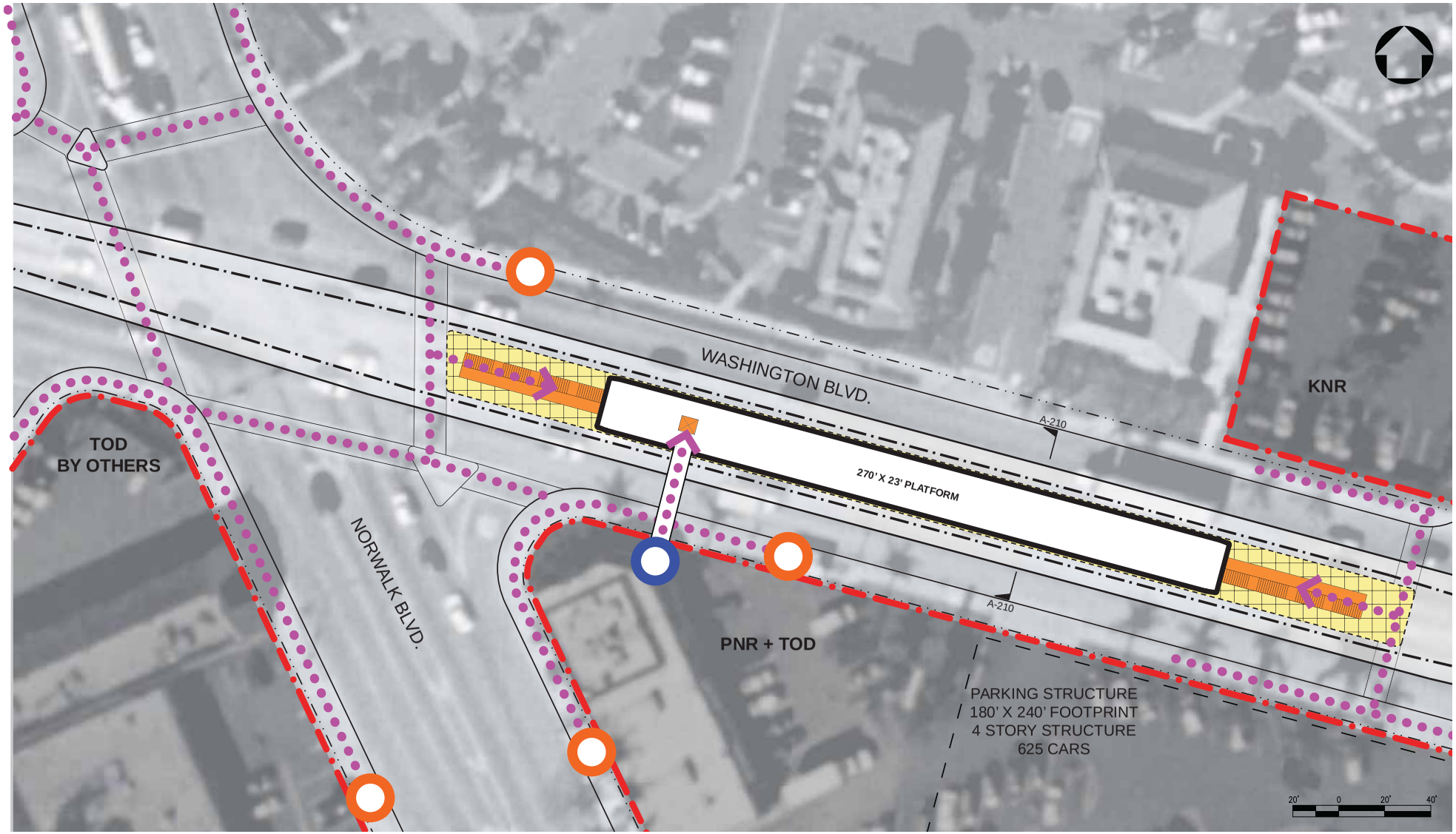
DESIGNED BY R. ESCOBEDO
DRAWN BY L. VAZQUEZ
CHECKED BY L. CHAVEZ
IN CHARGE F. VILLALOBOS
DATE 06/29/09

Metro
Metropolitan Transportation Authority

CDM AECOM

EASTSIDE PHASE 2 - PART 1
WASHINGTON BLVD.
ROSEMEAD BLVD. STATION
SECTION

CONTRACT NO PS4320-2003
DRAWING NO A-208
REV 0
SCALE NO SCALE
SHEET NO



REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

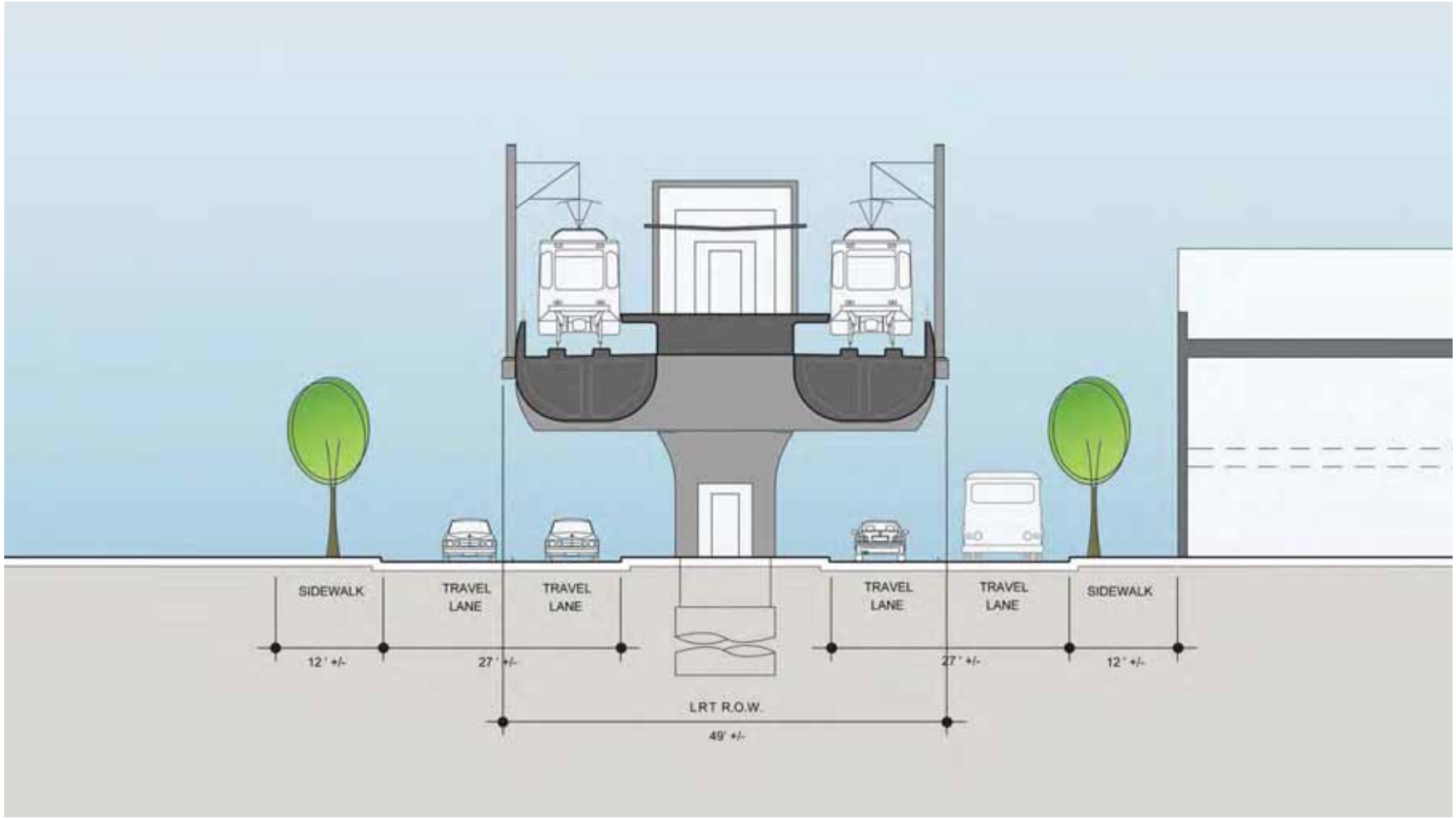
DESIGNED BY R. ESCOBEDO
DRAWN BY L. VAZQUEZ
CHECKED BY L. CHAVEZ
IN CHARGE F. VILLALOBOS
DATE 06/29/09

Metro
Metropolitan Transportation Authority

CDM AECOM

EASTSIDE PHASE 2 - PART 1
WASHINGTON BLVD.
NORWALK AVE. STATION
LOCATION PLAN

CONTRACT NO PS4320-2003
DRAWING NO A-209
REV 0
SCALE 1⊠= 40⊠
SHEET NO



REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

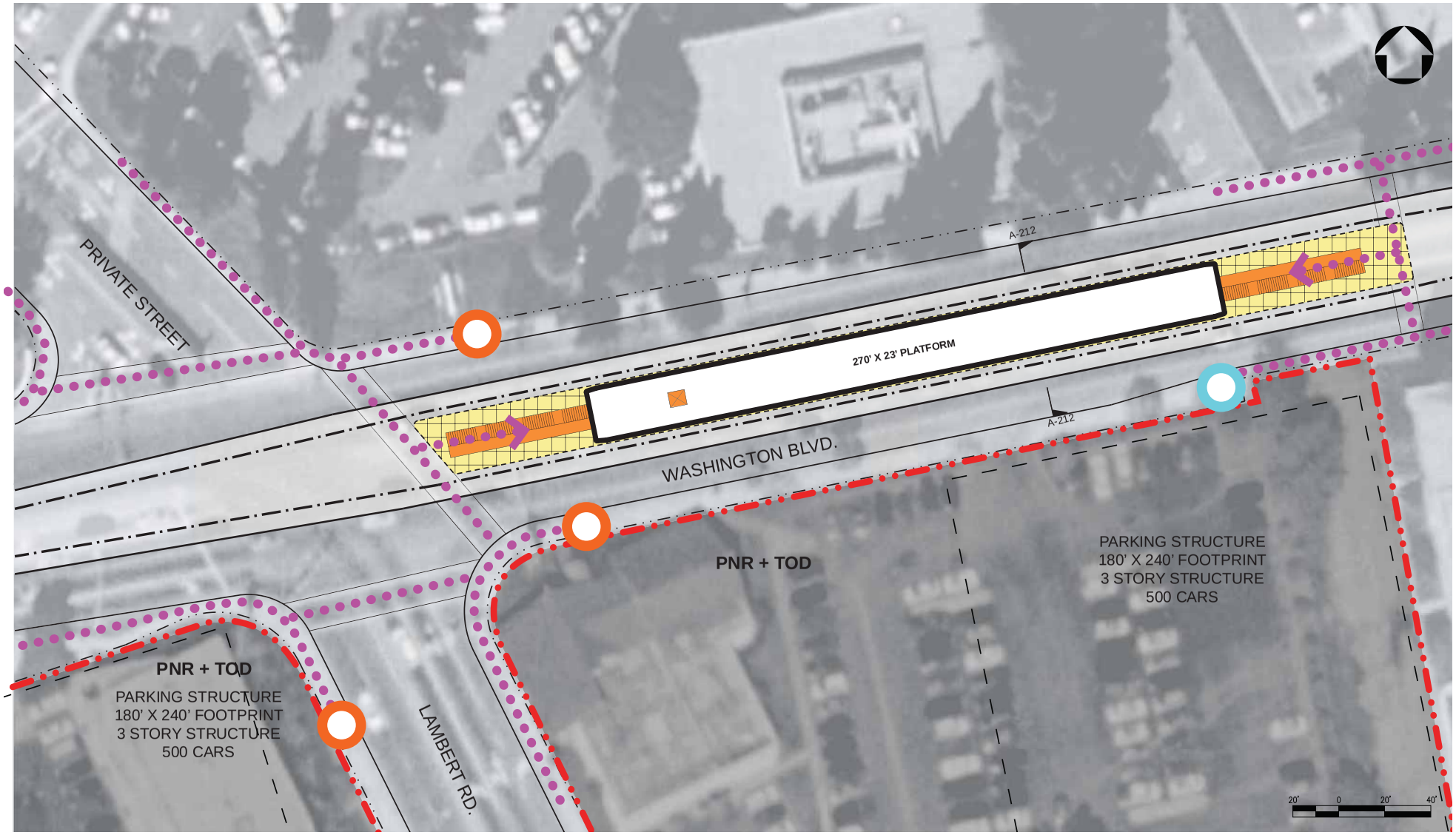
DESIGNED BY R. ESCOBEDO
DRAWN BY L. VAZQUEZ
CHECKED BY L. CHAVEZ
IN CHARGE F. VILLALOBOS
DATE 06/29/09

Metro
Metropolitan Transportation Authority

CDM AECOM

EASTSIDE PHASE 2 - PART 1
WASHINGTON BLVD.
NORWALK AVE. STATION
SECTION

CONTRACT NO PS4320-2003
DRAWING NO A-210
REV 0
SCALE NO SCALE
SHEET NO



REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

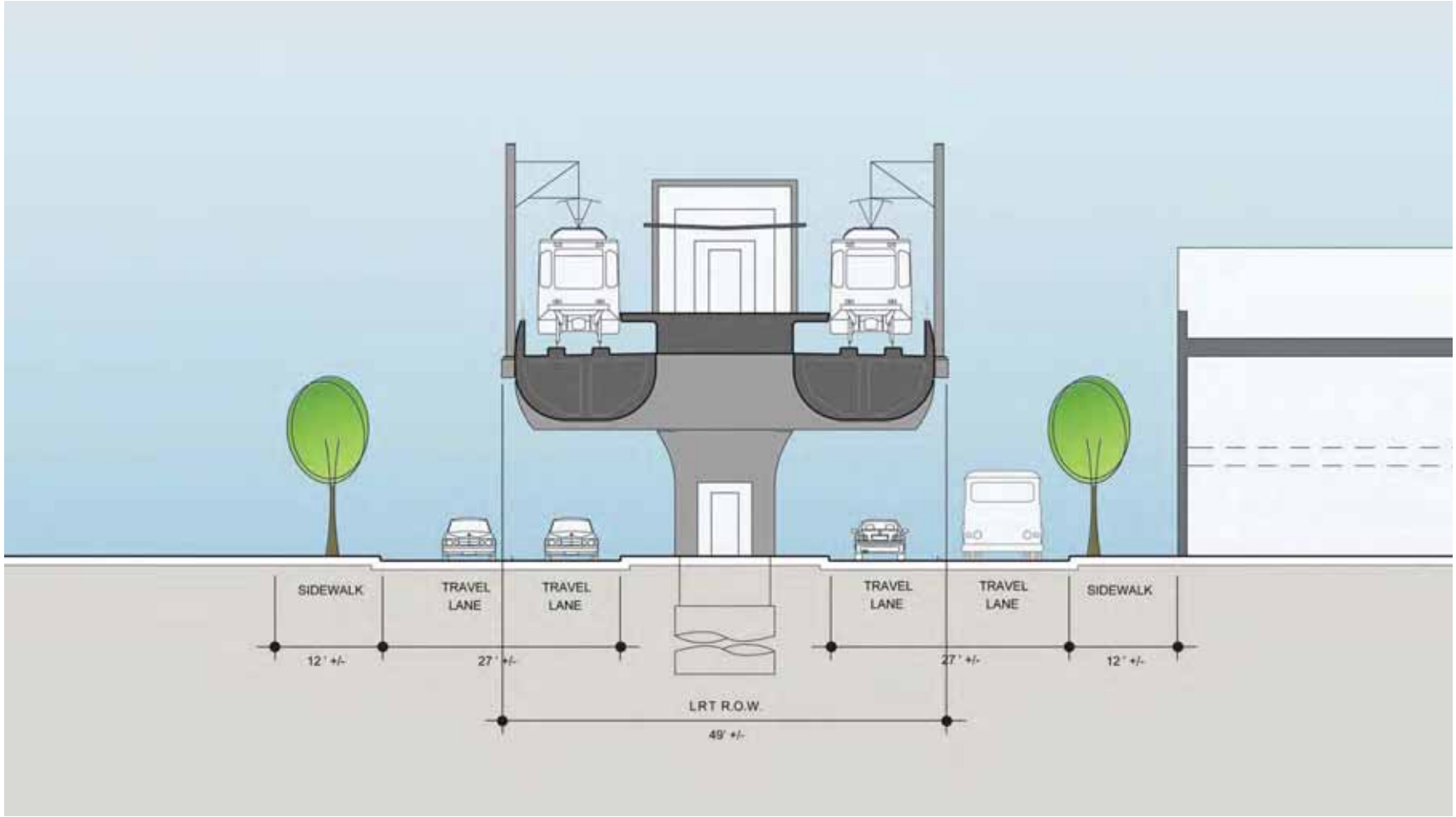
DESIGNED BY R. ESCOBEDO
DRAWN BY L. VAZQUEZ
CHECKED BY L. CHAVEZ
IN CHARGE F. VILLALOBOS
DATE 06/29/09

Metro Metropolitan Transportation Authority

CDM AECOM

EASTSIDE PHASE 2 - PART 1
WASHINGTON BLVD.
LAMBERT RD. STATION
LOCATION PLAN

CONTRACT NO PS4320-2003
DRAWING NO A-211
REV 0
SCALE 1⊠= 40⊠
SHEET NO



REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION
0	10/20/09						ISSUED FOR FINAL

DESIGNED BY R. ESCOBEDO
DRAWN BY L. VAZQUEZ
CHECKED BY L. CHAVEZ
IN CHARGE F. VILLALOBOS
DATE 06/29/09

Metro
Metropolitan Transportation Authority

CDM AECOM

EASTSIDE PHASE 2 - PART 1
WASHINGTON BLVD.
LAMBERT RD. STATION
SECTION

CONTRACT NO PS4320-2003
DRAWING NO A-212
REV 0
SCALE NO SCALE
SHEET NO

APPENDIX B:

Phase 2 Ridership Technical Report

RIDERSHIP TECHNICAL REPORT

This appendix summarizes the ridership forecasting effort for the alternatives supporting the Conceptual Engineering portion of the Eastside Transit Corridor Phase 2 Study for Los Angeles County Metropolitan Transportation Authority. A list of alternatives for which forecasts were prepared is presented along with an overview of the methodology used and the Quality Assurance/Quality Control (QA/QC) procedures followed at the time the forecasts were produced.

Alternatives/Results
Forecasts were prepared for the following (Section headings where results can be found in this Appendix are shown in parentheses):

Project No Build with corridor equilibrated headways from the Interim Model version Regional No Build
Baseline or Transportation System Management (TSM) alternative
Light Rail Transit (LRT) on SR-60 with terminus at Peck (Section 1.0)
LRT with revised Beverly run times (Section 2.0)
LRT with Beverly-Montebello-Whittier alignment (Section 3.1)
LRT with Beverly-Rosemead-Whittier alignment (Section 3.2)
LRT with revised Washington run times (Section 4.0)

For each of these alternatives results for an average weekday in 2030 have been summarized in this Appendix. These results, listed by the section numbers above, include:

Project boardings (total and station level) and transportation system user benefits estimates in the "Summary" section
Station level boardings by time period and mode of access for each build alternative

Given the schedule and budget constraints of the Conceptual Engineering effort, the "single" TSM assumption to compare to all corridors (Washington, Beverly, SR-60, etc.) was carried forward from the Alternatives Analysis. Comparisons to more refined "corridor specific" TSMs (e.g., a TSM with service specific to SR 60 will be compared to the SR 60 build alternative) will be necessary prior to any forecast reviews with FTA.

Travel Forecasting Methodology
The interim version of the Metro Transportation Analysis Model, developed by Metro staff and Parsons Brinkerhoff, was used for the Conceptual Engineering round of forecasts. This version of the model was validated by comparing transit boardings from the observed boarding data for the calibration year (2001 with 2006 validation for BRT routes) and by comparing district-to-district transit flows to data obtained from the regional on-board survey. Key findings from this effort, which are as presented in the Eastside Transit Corridor Phase 2 Ridership Technical Report (October 2008), follow:

Metro bus boardings by service type and urban rail ridership by route appear to be reasonable.
Urban rail ridership by line match observed values to within plus or minus 20 percent and overall urban rail ridership is matched to within 1 percent.
Bus Rapid Transit (BRT) ridership is underestimated by 24 percent.

These model results suggest that the Interim Metro Transportation Analysis Model has a reasonable understanding of the overall demand for transit. Given that the model includes significant adjustments to the underlying trip tables and the that some specific services such as the BRT and Transitway routes are not well-represented, development of the final model is still necessary.
In the meantime, the Interim model should be sufficient to support on-going rail planning given the understanding that there is a band of uncertainty of at least 20 percent around each result. It should be noted that nationwide experience with forecasting models suggest that 20 percent uncertainty is not unusual, even for forecasts to support projects in more advanced stages of development.

In the Conceptual Engineering round of forecasts there was a shorter SR 60 LRT alternative that was evaluated with a terminus at Peck Road. This shortening of the line led to a greater than expected reduction in park and ride trips. After some analysis and consultation with Metro staff direction was given to model this alternative with two park and ride lots at SR-60/Peck Road as a temporary measure to overcome some issues with the station choice algorithm in the Interim Model.

Quality Assurance/Quality Control Procedures
AECOM typically employs the following QA/QC procedures for travel demand forecasting projects.

Inputs and/or assumptions received for use in forecasts (e.g., proposed alternative service plans, etc.) are typically reviewed for reasonableness and applicability. Forecasts prepared by staff (the Originator) are considered draft, labeled so, and are typically reviewed by the travel forecasting task manager (the Discipline Reviewer/Technical Department Manager) prior to transmission to the overall project manager or client.

In cases where forecasts support projects seeking Federal Transit Administration (FTA) Section 5309 New Starts or Small Starts funding, FTA's QA/QC procedures are followed, including the Front-Line Quality Control Checks on User Benefits, the latest (at the time of the forecasts) Guidance and Reporting Instructions for the Section 5309 New Starts Criteria, and applicable risk analysis procedures.

Draft forecasts are typically reviewed using an informal "Delphi Process" where the client and/or other stakeholders assess the forecast for reasonableness given local conditions and assumptions. In cases where forecasts support projects seeking New Starts or Small Starts funding, this process includes FTA review of forecasting assumptions, procedures, and results.

These procedures were generally followed for the Conceptual Engineering alternatives at the time the forecasts were produced except that the review component with FTA was not present given schedule and budget constraints. While FTA's QA/QC procedures were generally followed, further analysis will be required with comparable Baseline alternatives if the project becomes a potential candidate for the New Starts program.

In addition to these procedures another round of QA/QC (utilizing the Study Report QC Report Checklist) is anticipated when the Conceptual Engineering alternatives are documented.

PHASE 2 RIDERSHIP RESULTS

Summary

Los Angeles Eastside Transit Corridor Phase 2 Project
Year 2030 Project Boardings and User Benefits

REGULAR FORECASTS

Run →	DEIS/DEIR Beverly					DEIS/DEIR Beverly-Rosemead-Whittier					DEIS/DEIR Beverly-Montebello-Whittier				
Daily Gold Line Boardings	**61,962**					**61,538**					**61,667**				
Pomona Freeway Flyer Boardings															
Beverly Rapid Boardings															
Whittier Rapid Boardings															
Washinton Rapid Boardings															
Project Boardings	**12,780**					**12,406**					**12,696**				
	HBW	**HBO**	**NHB**	**HBU**	**Total**	**HBW**	**HBO**	**NHB**	**HBU**	**Total**	**HBW**	**HBO**	**NHB**	**HBU**	**Total**
New Riders	-	-	-	-	5,017	-	-	-	-	5,060	-	-	-	-	5,191
User Benefits (hours)	2,560	2,093	382	207	5,241	2,536	2,178	395	228	5,336	2,599	2,221	407	244	5,470
User Benefits per Project Boarding (min)	-	-	-	-	24.6	-	-	-	-	25.8	-	-	-	-	25.9
% of benefits that are coverage related	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
% of benefits capped prices	-1.1%	-4.9%	-0.5%	-1.5%	-2.6%	-0.8%	-4.8%	-0.5%	-1.1%	-2.4%	-0.7%	-4.7%	-0.4%	-1.1%	-2.3%

NOTE: User Benefits for TSM are w.r.t. Project No Build. Build alternatives are w.r.t TSM.

Los Angeles Eastside Transit Corridor Phase 2 Project
Year 2030 Project Boardings and User Benefits

REGULAR FORECASTS

Run →	DEIS/DEIR Washington					SR-60 LRT (Double Peck Terminus)				
Daily Gold Line Boardings	**65,155**					**62,004**				
Pomona Freeway Flyer Boardings										
Beverly Rapid Boardings										
Whittier Rapid Boardings										
Washinton Rapid Boardings										
Project Boardings	**15,660**					**12,267**				
	HBW	**HBO**	**NHB**	**HBU**	**Total**	**HBW**	**HBO**	**NHB**	**HBU**	**Total**
New Riders	-	-	-	-	6,281	-	-	-	-	3,835
User Benefits (hours)	3,384	2,227	408	274	6,293	2,224	897	135	218	3,474
User Benefits per Project Boarding (min)	-	-	-	-	24.1	-	-	-	-	17.0
% of benefits that are coverage related	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
% of benefits capped prices	-2.1%	-5.0%	-1.1%	-1.0%	-3.0%	-0.7%	-1.7%	-0.5%	-0.4%	-0.9%

NOTE: User Benefits for TSM are w.r.t. Project No Build. Build alternatives are w.r.t TSM.

1.0 SR-60 LRT

LACMTA Eastside Phase 2

2030 Average Weekday Summary - Alternative 1 (SR-60) LRT (Double Peck Terminus)

	Station Name	Eastbound (Read Up)		Eastbound Boardings			Westbound (Read Down)		Westbound Boardings			Total Boardings		
		Dist (mi)	Time (min)	Peak	Off-Peak	Daily	Dist (mi)	Time (min)	Peak	Off-Peak	Daily	Peak	Off-Peak	Daily
Phase 2	Peck/SR60 (Second Station)	0.1	0.1	0	0	0	-	-	821	442	1,263	821	442	**1,263**
	Peck/SR60	0.7	1.7	107	52	159	0.1	0.1	851	456	1,307	958	508	**1,466**
	Santa Anita/SR60	2.4	3.9	42	29	71	0.7	1.7	603	331	934	645	360	**1,005**
	Paramount/SR60	2.3	3.8	123	98	221	2.4	3.9	724	312	1,036	847	410	**1,256**
	Garfield/SR60	1.5	3.5	214	125	339	2.3	3.8	1,012	373	1,385	1,226	498	**1,724**
	Subtotal	**7.0**	**13.0**	**486**	**303**	**789**	**5.5**	**9.5**	**4,011**	**1,914**	**5,924**	**4,496**	**2,217**	**6,713**
Phase 1	Pomona/Atlantic (Atlantic)	0.4	1.5	1,261	304	1,565	1.5	3.5	1,683	549	2,232	2,944	853	**3,796**
	Third St./Mednick (East LA Civic Center)	0.4	2.0	171	34	205	0.4	1.5	528	146	674	699	180	**879**
	Third St./Ford (Maravilla)	1.4	4.0	188	113	301	0.4	2.0	418	158	576	606	271	**877**
	Third St./Indiana (Indiana)	1.3	3.3	435	150	584	1.4	4.0	1,154	351	1,504	1,588	500	**2,088**
	First St./Soto (Soto)	0.6	1.6	637	214	851	1.3	3.3	1,413	452	1,864	2,050	666	**2,715**
	First St./Boyle (Mariachi/Plaza)	0.4	1.4	281	118	399	0.6	1.6	410	166	576	691	284	**975**
	First St./Utah (Pico/Aliso)	0.8	2.8	76	34	110	0.4	1.4	129	63	192	205	97	**302**
	First St./Alameda (Little Tokyo)	0.5	3.0	1,121	278	1,398	0.8	2.8	1,119	497	1,616	2,240	774	**3,014**
	Subtotal	**5.8**	**19.6**	**4,169**	**1,244**	**5,413**	**6.8**	**20.1**	**6,852**	**2,379**	**9,231**	**11,021**	**3,623**	**14,644**
Existing Gold Line Stations	Union Station	0.6	3.0	7,662	1,697	9,359	0.5	3.0	6,901	1,961	8,862	14,563	3,658	**18,221**
	Chinatown	1.6	3.0	738	138	876	0.6	3.0	524	170	694	1,262	308	**1,569**
	Lincoln Heights/Cypress Park	0.6	1.0	904	383	1,287	1.6	3.0	512	193	704	1,416	576	**1,991**
	Heritage Square/Arroyo	0.9	2.0	737	317	1,054	0.6	1.0	394	94	487	1,131	410	**1,541**
	Southwest Museum	1.5	4.0	517	148	664	0.9	2.0	135	56	191	652	203	**855**
	Highland Park	2.1	3.0	1,843	451	2,294	1.5	4.0	527	262	789	2,370	713	**3,083**
	Mission	1.5	3.0	517	77	593	2.1	3.0	267	94	361	783	171	**954**
	Filmore	0.6	1.0	513	118	631	1.5	3.0	487	169	656	1,000	287	**1,286**
	Del Mar	0.5	2.0	1,143	473	1,616	0.6	1.0	1,001	349	1,349	2,144	822	**2,965**
	Memorial Park	1.1	2.0	1,078	282	1,359	0.5	2.0	997	290	1,287	2,075	572	**2,646**
	Lake Ave.	1.0	2.0	939	216	1,155	1.1	2.0	566	175	741	1,505	391	**1,896**
	Allen Ave.	1.7	3.0	488	131	618	1.0	2.0	183	70	253	670	201	**871**
	Sierra Madre Villa	-	-	1,483	468	1,951	1.7	3.0	626	198	823	2,109	665	**2,774**
	Subtotal	**13.7**	**29.0**	**18,560**	**4,894**	**23,454**	**14.2**	**32.0**	**13,116**	**4,079**	**17,194**	**31,676**	**8,973**	**40,648**
		26.5	**61.6**	**23,214**	**6,441**	**29,655**	**26.5**	**61.6**	**23,978**	**8,371**	**32,349**	**47,192**	**14,812**	**62,004**

Project Boardings **12,267**

2030 Average Weekday Station Access Volumes - Alternative 1 (SR-60) LRT (Double Peck Terminus)

	Station Name	By Access (Production End Station Activity)						By Egress (Attraction End Station Activity)						Equivalent Boardings					
		Walk	Bus	PNR	KNR	Rail	Total	Walk	Bus	PNR	KNR	Rail	Total	Walk	Bus	PNR	KNR	Rail	Total
Phase 2	Peck/SR60 (Second Station)	208	34	2,163	121	0	2,526	-	-	-	-	-	-	104	17	1,082	60	0	1,263
	Peck/SR60	211	46	2,231	125	0	2,614	271	46	-	-	0	317	241	46	1,116	63	0	1,466
	Santa Anita/SR60	0	41	1,650	123	0	1,814	0	195	-	-	0	195	0	118	825	61	0	1,005
	Paramount/SR60	276	614	849	141	0	1,879	85	548	-	-	0	633	180	581	424	70	0	1,256
	Garfield/SR60	277	1,283	685	124	0	2,369	315	763	-	-	0	1,078	296	1,023	343	62	0	1,724
	Subtotal	**972**	**2,017**	**7,578**	**634**	**0**	**11,202**	**670**	**1,553**	**-**	**-**	**0**	**2,223**	**821**	**1,785**	**3,789**	**317**	**0**	**6,713**
Phase 1	Pomona/Atlantic (Atlantic)	566	2,119	437	84	0	3,206	1,714	2,672	-	-	0	4,386	1,140	2,395	219	42	0	3,796
	Third St./Mednick (East LA Civic Center)	908	241	0	83	0	1,232	420	105	-	-	0	525	664	173	0	41	0	879
	Third St./Ford (Maravilla)	923	303	0	110	0	1,336	281	136	-	-	0	417	602	220	0	55	0	877
	Third St./Indiana (Indiana)	2,433	624	0	101	0	3,157	698	321	-	-	0	1,019	1,565	472	0	50	0	2,088
	First St./Soto (Soto)	2,007	951	0	62	0	3,020	1,145	1,265	-	-	0	2,410	1,576	1,108	0	31	0	2,715
	First St./Boyle (Mariachi/Plaza)	887	70	0	33	0	990	926	33	-	-	0	959	906	52	0	17	0	975
	First St./Utah (Pico/Aliso)	340	12	0	16	0	368	223	12	-	-	0	235	282	12	0	8	0	302
	First St./Alameda (Little Tokyo)	263	92	0	19	0	374	3,757	1,896	-	-	0	5,653	2,010	994	0	10	0	3,014
	Subtotal	**8,325**	**4,412**	**437**	**509**	**0**	**13,683**	**9,164**	**6,440**	**-**	**-**	**0**	**15,604**	**8,745**	**5,426**	**219**	**254**	**0**	**14,644**
Existing Gold Line Stations	Union Station	104	3,651	36	50	5,231	9,073	1,515	1,967	-	-	23,886	27,368	810	2,809	18	25	14,558	18,221
	Chinatown	659	951	0	17	0	1,628	1,416	94	-	-	0	1,510	1,038	523	0	9	0	1,569
	Lincoln Heights/Cypress Park	1,096	379	386	61	0	1,921	689	1,372	-	-	0	2,061	892	875	193	31	0	1,991
	Heritage Square/Arroyo	1,150	471	589	105	0	2,315	388	378	-	-	0	766	769	425	295	52	0	1,541
	Southwest Museum	762	606	0	99	0	1,467	109	133	-	-	0	242	435	369	0	50	0	855
	Highland Park	2,172	1,951	1,121	229	0	5,473	434	258	-	-	0	692	1,303	1,105	561	114	0	3,083
	Mission	500	617	0	237	0	1,354	418	135	-	-	0	553	459	376	0	119	0	954
	Filmore	660	393	0	150	0	1,203	1,038	331	-	-	0	1,369	849	362	0	75	0	1,286
	Del Mar	616	387	1,868	165	0	3,036	2,779	115	-	-	0	2,894	1,697	251	934	82	0	2,965
	Memorial Park	762	1,347	0	151	0	2,260	1,464	1,568	-	-	0	3,032	1,113	1,458	0	75	0	2,646
	Lake Ave.	1,309	642	0	235	0	2,185	1,106	500	-	-	0	1,606	1,207	571	0	117	0	1,896
	Allen Ave.	671	374	0	258	0	1,303	391	47	-	-	0	438	531	211	0	129	0	871
	Sierra Madre Villa	307	955	2,381	257	0	3,901	579	1,067	-	-	0	1,646	443	1,011	1,191	129	0	2,774
	Subtotal	**10,768**	**12,725**	**6,382**	**2,014**	**5,231**	**37,119**	**12,326**	**7,966**	**-**	**-**	**23,886**	**44,177**	**11,547**	**10,345**	**3,191**	**1,007**	**14,558**	**40,648**
	Total	**20,066**	**19,154**	**14,397**	**3,157**	**5,231**	**62,004**	**22,160**	**15,958**	**-**	**-**	**23,886**	**62,004**	**21,113**	**17,556**	**7,199**	**1,578**	**14,558**	**62,004**

LACMTA Eastside Phase 2

2030 Average Weekday Project Boardings by Station - Alternative 1 (SR-60) LRT (Double Peck Terminus)

	Station Name	Eastbound (Read Up)		Eastbound Boardings			Westbound (Read Down)		Westbound Boardings			Total Boardings		
		Dist (mi)	Time (min)	Peak	Off-Peak	Daily	Dist (mi)	Time (min)	Peak	Off-Peak	Daily	Peak	Off-Peak	Daily
Phase 2	Peck/SR60 (Second Station)	0.1	0.1	0	0	0	-	-	821	442	1,263	821	442	**1,263**
	Peck/SR60	0.7	1.7	111	52	162	0.1	0.1	851	456	1,307	962	507	**1,469**
	Santa Anita/SR60	2.4	3.9	41	29	70	0.7	1.7	602	331	933	643	360	**1,003**
	Paramount/SR60	2.3	3.8	122	98	219	2.4	3.9	724	312	1,036	845	410	**1,255**
	Garfield/SR60	1.5	3.5	215	127	341	2.3	3.8	1,012	372	1,384	1,227	499	**1,726**
	Subtotal	8.6	15.7	**488**	**305**	**793**	**7.1**	**12.2**	**4,010**	**1,913**	**5,923**	**4,498**	**2,218**	**6,716**
Phase 1	Pomona/Atlantic (Atlantic)	0.4	1.5	118	58	176	1.5	3.5	561	243	804	679	301	**980**
	Third St./Mednick (East LA Civic Center)	0.4	2.0	13	23	36	0.4	1.5	29	24	54	42	48	**90**
	Third St./Ford (Maravilla)	1.4	4.0	8	8	15	0.4	2.0	7	3	10	15	11	**25**
	Third St./Indiana (Indiana)	1.3	3.3	21	15	36	1.4	4.0	52	41	92	72	56	**128**
	First St./Soto (Soto)	0.6	1.6	14	12	27	1.3	3.3	137	89	226	151	101	**252**
	First St./Boyle (Mariachi/Plaza)	0.4	1.4	3	3	6	0.6	1.6	25	16	40	28	19	**47**
	First St./Utah (Pico/Aliso)	0.8	2.8	1	1	2	0.4	1.4	5	5	10	5	6	**11**
	First St./Alameda (Little Tokyo)	0.5	3.0	3	2	5	0.8	2.8	501	224	725	504	226	**730**
	Subtotal	**5.8**	**19.6**	**181**	**122**	**302**	**6.8**	**20.1**	**1,316**	**645**	**1,961**	**1,496**	**767**	**2,263**
Existing Gold Line Stations	Union Station	0.6	3.0	86	36	123	0.5	3.0	1,974	781	2,755	2,060	817	**2,877**
	Chinatown	1.6	3.0	4	1	5	0.6	3.0	21	12	33	24	13	**38**
	Lincoln Heights/Cypress Park	0.6	1.0	4	5	9	1.6	3.0	75	37	112	79	42	**121**
	Heritage Square/Arroyo	0.9	2.0	4	4	9	0.6	1.0	17	3	19	21	7	**28**
	Southwest Museum	1.5	4.0	3	2	4	0.9	2.0	1	1	2	4	2	**6**
	Highland Park	2.1	3.0	9	5	14	1.5	4.0	4	7	11	13	13	**25**
	Mission	1.5	3.0	2	1	2	2.1	3.0	4	3	6	6	3	**9**
	Filmore	0.6	1.0	1	1	2	1.5	3.0	12	6	18	13	6	**20**
	Del Mar	0.5	2.0	3	4	7	0.6	1.0	25	15	40	28	19	**47**
	Memorial Park	1.1	2.0	3	2	4	0.5	2.0	35	17	52	38	18	**56**
	Lake Ave.	1.0	2.0	2	1	3	1.1	2.0	13	7	20	15	8	**23**
	Allen Ave.	1.7	3.0	1	1	2	1.0	2.0	4	2	6	5	3	**8**
	Sierra Madre Villa	-	-	3	1	4	1.7	3.0	18	9	27	21	10	**31**
	Subtotal	**13.7**	**29.0**	**123**	**63**	**187**	**14.2**	**32.0**	**2,202**	**899**	**3,101**	**2,325**	**962**	**3,288**
		28.1	**64.3**	**792**	**490**	**1,282**	**28.1**	**64.3**	**7,528**	**3,457**	**10,985**	**8,320**	**3,947**	**12,267**

Project Boardings **12,267**

2.0 Beverly Boulevard LRT

LACMTA Eastside Phase 2

2030 Average Weekday Summary - DEIS/DEIR Beverly

	Station Name	Eastbound (Read Up)		Eastbound Boardings			Westbound (Read Down)		Westbound Boardings			Total Boardings		
		Dist (mi)	Time (min)	Peak	Off-Peak	Daily	Dist (mi)	Time (min)	Peak	Off-Peak	Daily	Peak	Off-Peak	Daily
Phase 2	Whittier Greenway/Mar Vista	0.4	1.0	208	106	314	-	-	690	281	971	898	387	**1,285**
	Whittier Greenway/Philadelphia	0.6	1.6	252	102	353	0.4	1.0	508	172	679	759	273	**1,032**
	Whittier Greenway/Broadway	0.7	1.8	71	40	111	0.6	1.6	102	33	134	173	72	**245**
	Whittier Greenway/Norwalk	1.8	4.7	112	55	167	0.7	1.8	197	77	274	309	132	**440**
	Beverly/Rosemead	1.5	4.7	236	105	341	1.8	4.7	533	316	849	769	420	**1,189**
	Beverly/Montebello	1.0	3.3	317	163	480	1.5	4.7	430	290	720	747	452	**1,199**
	Beverly/Wilcox	1.5	3.3	314	136	450	1.0	3.3	506	228	734	819	364	**1,183**
	Garfield/SR60	1.5	3.6	198	76	273	1.5	3.3	592	288	880	790	364	**1,153**
	Subtotal	**9.0**	**24.0**	**1,706**	**781**	**2,487**	**7.5**	**20.4**	**3,557**	**1,682**	**5,239**	**5,263**	**2,463**	**7,725**
Phase 1	Pomona/Atlantic (Atlantic)	0.4	1.5	859	261	1,119	1.5	3.6	1,280	483	1,763	2,139	743	**2,882**
	Third St./Mednick (East LA Civic Center)	0.4	2.0	183	43	226	0.4	1.5	521	158	678	704	200	**904**
	Third St./Ford (Maravilla)	1.4	4.0	161	102	263	0.4	2.0	338	161	499	499	263	**762**
	Third St./Indiana (Indiana)	1.3	3.3	448	159	607	1.4	4.0	1,127	334	1,461	1,575	493	**2,068**
	First St./Soto (Soto)	0.6	1.6	672	223	895	1.3	3.3	1,369	427	1,796	2,041	650	**2,691**
	First St./Boyle (Mariachi/Plaza)	0.4	1.4	288	120	408	0.6	1.6	405	163	568	692	283	**975**
	First St./Utah (Pico/Aliso)	0.8	2.8	80	36	115	0.4	1.4	128	62	189	207	97	**304**
	First St./Alameda (Little Tokyo)	0.5	3.0	1,158	296	1,454	0.8	2.8	871	433	1,304	2,029	729	**2,758**
	Subtotal	**5.8**	**19.6**	**3,847**	**1,238**	**5,085**	**6.8**	**20.2**	**6,038**	**2,219**	**8,256**	**9,885**	**3,457**	**13,341**
Existing Gold Line Stations	Union Station	0.6	3.0	8,130	1,840	9,970	0.5	3.0	6,201	1,704	7,905	14,331	3,544	**17,875**
	Chinatown	1.6	3.0	743	139	882	0.6	3.0	527	166	692	1,269	305	**1,574**
	Lincoln Heights/Cypress Park	0.6	1.0	913	393	1,306	1.6	3.0	505	189	694	1,418	581	**1,999**
	Heritage Square/Arroyo	0.9	2.0	740	320	1,060	0.6	1.0	396	91	487	1,136	411	**1,547**
	Southwest Museum	1.5	4.0	519	148	667	0.9	2.0	140	54	193	658	202	**860**
	Highland Park	2.1	3.0	1,857	458	2,314	1.5	4.0	522	266	788	2,379	723	**3,102**
	Mission	1.5	3.0	536	77	613	2.1	3.0	273	89	362	809	166	**975**
	Filmore	0.6	1.0	538	121	658	1.5	3.0	500	169	669	1,038	290	**1,327**
	Del Mar	0.5	2.0	1,160	486	1,646	0.6	1.0	1,010	351	1,361	2,169	837	**3,006**
	Memorial Park	1.1	2.0	1,085	287	1,372	0.5	2.0	1,006	291	1,297	2,091	578	**2,669**
	Lake Ave.	1.0	2.0	947	219	1,165	1.1	2.0	569	172	741	1,515	391	**1,906**
	Allen Ave.	1.7	3.0	490	130	620	1.0	2.0	181	72	253	671	202	**873**
	Sierra Madre Villa	-	-	1,767	590	2,357	1.7	3.0	633	198	831	2,400	788	**3,187**
	Subtotal	**13.7**	**29.0**	**19,421**	**5,206**	**24,627**	**14.2**	**32.0**	**12,460**	**3,810**	**16,270**	**31,881**	**9,015**	**40,896**
		28.5	**72.6**	**24,974**	**7,224**	**32,198**	**28.5**	**72.6**	**22,054**	**7,710**	**29,764**	**47,028**	**14,934**	**61,962**

Project Boardings **12,780**

2030 Average Weekday Station Access Volumes - DEIS/DEIR Beverly

	Station Name	By Access (Production End Station Activity)						By Egress (Attraction End Station Activity)						Equivalent Boardings					
		Walk	Bus	PNR	KNR	Rail	Total	Walk	Bus	PNR	KNR	Rail	Total	Walk	Bus	PNR	KNR	Rail	Total
Phase 2	Whittier Greenway/Mar Vista	258	301	1,305	77	0	1,941	323	305	0	0	0	628	291	303	653	39	0	1,285
	Whittier Greenway/Philadelphia	112	287	869	59	0	1,327	271	466	0	0	0	737	192	376	435	30	0	1,032
	Whittier Greenway/Broadway	150	31	0	69	0	250	142	97	0	0	0	239	146	64	0	34	0	245
	Whittier Greenway/Norwalk	342	88	0	54	0	484	96	300	0	0	0	396	219	194	0	27	0	440
	Beverly/Rosemead	402	226	1,035	66	0	1,729	242	407	0	0	0	649	322	316	517	33	0	1,189
	Beverly/Montebello	319	406	459	54	0	1,238	493	667	0	0	0	1,160	406	536	230	27	0	1,199
	Beverly/Wilcox	389	875	0	62	0	1,326	329	711	0	0	0	1,040	359	793	0	31	0	1,183
	Garfield/SR60	292	521	870	118	0	1,802	262	242	0	0	0	504	277	382	435	59	0	1,153
	Subtotal	**2,264**	**2,735**	**4,538**	**560**	**0**	**10,097**	**2,159**	**3,194**	**0**	**0**	**0**	**5,353**	**2,212**	**2,964**	**2,269**	**280**	**0**	**7,725**
Phase 1	Pomona/Atlantic (Atlantic)	598	1,458	532	84	0	2,672	1,623	1,468	0	0	0	3,091	1,110	1,463	266	42	0	2,882
	Third St./Mednick (East LA Civic Center)	941	322	0	81	0	1,343	375	89	0	0	0	464	658	205	0	40	0	904
	Third St./Ford (Maravilla)	937	161	0	103	0	1,201	282	40	0	0	0	322	610	100	0	52	0	762
	Third St./Indiana (Indiana)	2,472	559	0	101	0	3,131	748	256	0	0	0	1,004	1,610	408	0	50	0	2,068
	First St./Soto (Soto)	2,037	948	0	62	0	3,047	1,144	1,190	0	0	0	2,334	1,590	1,069	0	31	0	2,691
	First St./Boyle (Mariachi/Plaza)	894	70	0	34	0	998	919	33	0	0	0	952	906	52	0	17	0	975
	First St./Utah (Pico/Aliso)	342	12	0	16	0	370	225	13	0	0	0	238	284	12	0	8	0	304
	First St./Alameda (Little Tokyo)	266	85	0	20	0	370	3,403	1,742	0	0	0	5,145	1,834	913	0	10	0	2,758
	Subtotal	**8,486**	**3,613**	**532**	**501**	**0**	**13,132**	**8,719**	**4,831**	**0**	**0**	**0**	**13,550**	**8,602**	**4,222**	**266**	**250**	**0**	**13,341**
Existing Gold Line Stations	Union Station	106	3,907	36	50	5,508	9,608	1,448	1,961	0	0	22,732	26,141	777	2,934	18	25	14,120	17,875
	Chinatown	662	955	0	18	0	1,635	1,415	97	0	0	0	1,512	1,039	526	0	9	0	1,574
	Lincoln Heights/Cypress Park	1,101	382	389	61	0	1,932	697	1,369	0	0	0	2,066	899	875	194	31	0	1,999
	Heritage Square/Arroyo	1,155	474	593	105	0	2,327	389	377	0	0	0	766	772	426	297	52	0	1,547
	Southwest Museum	766	608	0	99	0	1,473	112	134	0	0	0	246	439	371	0	50	0	860
	Highland Park	2,183	1,960	1,136	228	0	5,508	435	260	0	0	0	695	1,309	1,110	568	114	0	3,102
	Mission	500	656	0	241	0	1,397	415	137	0	0	0	552	458	396	0	120	0	975
	Filmore	662	455	0	151	0	1,268	1,041	345	0	0	0	1,386	852	400	0	75	0	1,327
	Del Mar	618	389	1,924	165	0	3,096	2,801	115	0	0	0	2,916	1,710	252	962	82	0	3,006
	Memorial Park	765	1,352	0	154	0	2,271	1,476	1,591	0	0	0	3,067	1,121	1,472	0	77	0	2,669
	Lake Ave.	1,313	645	0	238	0	2,196	1,106	509	0	0	0	1,615	1,209	577	0	119	0	1,906
	Allen Ave.	672	375	0	261	0	1,309	388	48	0	0	0	436	530	212	0	131	0	873
	Sierra Madre Villa	308	967	3,169	268	0	4,713	581	1,080	0	0	0	1,661	445	1,024	1,585	134	0	3,187
	Subtotal	**10,813**	**13,126**	**7,247**	**2,039**	**5,508**	**38,733**	**12,305**	**8,022**	**0**	**0**	**22,732**	**43,059**	**11,559**	**10,574**	**3,623**	**1,020**	**14,120**	**40,896**
	Total	**21,563**	**19,474**	**12,317**	**3,100**	**5,508**	**61,962**	**23,183**	**16,047**	**0**	**0**	**22,732**	**61,962**	**22,373**	**17,761**	**6,158**	**1,550**	**14,120**	**61,962**

LACMTA Eastside Phase 2

2030 Average Weekday Summary - DEIS/DEIR Beverly

	Station Name	Eastbound (Read Up)		Eastbound Boardings			Westbound (Read Down)		Westbound Boardings			Total Boardings		
		Dist (mi)	Time (min)	Peak	Off-Peak	Daily	Dist (mi)	Time (min)	Peak	Off-Peak	Daily	Peak	Off-Peak	Daily
Phase 2	Whittier Greenway/Mar Vista	0.4	1.0	208	106	314	-	-	690	281	971	898	387	**1,285**
	Whittier Greenway/Philadelphia	0.6	1.6	254	99	353	0.4	1.0	508	171	679	762	270	**1,032**
	Whittier Greenway/Broadway	0.7	1.8	67	41	108	0.6	1.6	101	32	134	168	73	**241**
	Whittier Greenway/Norwalk	1.8	4.7	111	54	165	0.7	1.8	197	77	274	308	131	**439**
	Beverly/Rosemead	1.5	4.7	236	105	342	1.8	4.7	533	315	848	769	420	**1,189**
	Beverly/Montebello	1.0	3.3	317	165	482	1.5	4.7	430	290	719	747	454	**1,201**
	Beverly/Wilcox	1.5	3.3	317	134	452	1.0	3.3	506	229	735	823	363	**1,186**
	Garfield/SR60	1.5	3.6	196	76	272	1.5	3.3	591	287	879	787	364	**1,151**
	Subtotal	9.0	24.0	**1,706**	**781**	**2,488**	**7.5**	**20.4**	**3,556**	**1,682**	**5,238**	**5,262**	**2,463**	**7,725**
Phase 1	Pomona/Atlantic (Atlantic)	0.4	1.5	116	58	174	1.5	3.5	412	191	603	528	249	**777**
	Third St./Mednick (East LA Civic Center)	0.4	2.0	45	32	77	0.4	1.5	26	22	49	71	54	**125**
	Third St./Ford (Maravilla)	1.4	4.0	20	14	33	0.4	2.0	6	3	10	26	17	**43**
	Third St./Indiana (Indiana)	1.3	3.3	66	29	94	1.4	4.0	53	25	78	119	54	**173**
	First St./Soto (Soto)	0.6	1.6	54	25	79	1.3	3.3	121	66	187	175	91	**266**
	First St./Boyle (Mariachi/Plaza)	0.4	1.4	14	7	20	0.6	1.6	25	15	39	39	21	**60**
	First St./Utah (Pico/Aliso)	0.8	2.8	3	2	5	0.4	1.4	5	4	9	8	6	**14**
	First St./Alameda (Little Tokyo)	0.5	3.0	8	4	11	0.8	2.8	297	158	455	304	162	**466**
	Subtotal	**5.8**	**19.6**	**325**	**169**	**494**	**6.8**	**20.1**	**945**	**485**	**1,430**	**1,270**	**654**	**1,924**
Existing Gold Line Stations	Union Station	0.6	3.0	297	94	390	0.5	3.0	1,593	513	2,106	1,889	607	**2,496**
	Chinatown	1.6	3.0	19	2	21	0.6	3.0	24	13	37	43	15	**58**
	Lincoln Heights/Cypress Park	0.6	1.0	14	12	26	1.6	3.0	79	30	109	93	42	**135**
	Heritage Square/Arroyo	0.9	2.0	18	10	28	0.6	1.0	20	2	22	38	12	**50**
	Southwest Museum	1.5	4.0	11	5	15	0.9	2.0	2	1	2	12	5	**18**
	Highland Park	2.1	3.0	40	14	54	1.5	4.0	6	8	14	46	22	**68**
	Mission	1.5	3.0	8	1	9	2.1	3.0	5	3	7	13	3	**16**
	Filmore	0.6	1.0	5	1	6	1.5	3.0	16	6	22	21	7	**28**
	Del Mar	0.5	2.0	16	7	23	0.6	1.0	32	16	49	49	23	**72**
	Memorial Park	1.1	2.0	15	3	18	0.5	2.0	45	18	63	59	21	**81**
	Lake Ave.	1.0	2.0	12	2	15	1.1	2.0	18	8	25	30	10	**40**
	Allen Ave.	1.7	3.0	6	1	7	1.0	2.0	5	3	7	11	4	**15**
	Sierra Madre Villa	-	-	18	4	21	1.7	3.0	23	10	33	40	14	**54**
	Subtotal	**13.7**	**29.0**	**479**	**155**	**635**	**14.2**	**32.0**	**1,865**	**631**	**2,496**	**2,344**	**786**	**3,130**
		28.5	**72.6**	**2,510**	**1,106**	**3,616**	**28.5**	**72.5**	**6,366**	**2,797**	**9,163**	**8,876**	**3,903**	**12,780**

Project Boardings **12,780**

3.0 Beverly/Whittier Boulevards LRT

3.1 Montebello Boulevard Option

LACMTA Eastside Phase 2

2030 Average Weekday Summary - DEIS/DEIR Beverly-Montebello-Whittier

	Station Name	Eastbound (Read Up)		Eastbound Boardings			Westbound (Read Down)		Westbound Boardings			Total Boardings		
		Dist (mi)	Time (min)	Peak	Off-Peak	Daily	Dist (mi)	Time (min)	Peak	Off-Peak	Daily	Peak	Off-Peak	Daily
Phase 2	Whittier Greenway/Mar Vista	1.7	4.3	281	127	408	-	-	909	342	1,250	1,189	469	**1,658**
	Whittier Greenway/Norwalk	1.3	2.6	127	81	208	1.7	4.3	257	84	341	384	164	**548**
	Whittier/Rosemead	1.5	3.3	359	146	504	1.3	2.6	556	246	802	915	391	**1,306**
	Whittier/Montebello	0.6	2.9	238	50	287	1.5	3.3	429	191	619	666	240	**906**
	Beverly/Montebello	1.0	3.2	248	160	408	0.6	2.9	321	240	560	569	399	**968**
	Beverly/Wilcox	1.5	3.3	298	129	427	1.0	3.2	469	209	678	767	338	**1,104**
	Garfield/SR60	1.4	3.7	188	78	266	1.5	3.3	563	315	878	751	393	**1,144**
	Subtotal	**9.0**	**23.3**	**1,738**	**769**	**2,506**	**7.6**	**19.6**	**3,502**	**1,625**	**5,126**	**5,239**	**2,393**	**7,632**
Phase 1	Pomona/Atlantic (Atlantic)	0.4	1.5	821	248	1,069	1.4	3.7	1,240	486	1,725	2,061	733	**2,794**
	Third St./Mednick (East LA Civic Center)	0.4	2.0	180	41	221	0.4	1.5	513	151	664	693	192	**885**
	Third St./Ford (Maravilla)	1.4	4.0	163	95	258	0.4	2.0	340	150	490	503	245	**747**
	Third St./Indiana (Indiana)	1.3	3.3	451	157	607	1.4	4.0	1,126	333	1,459	1,577	489	**2,066**
	First St./Soto (Soto)	0.6	1.6	668	226	894	1.3	3.3	1,367	424	1,791	2,035	649	**2,684**
	First St./Boyle (Mariachi/Plaza)	0.4	1.4	288	121	409	0.6	1.6	405	163	568	693	284	**976**
	First St./Utah (Pico/Aliso)	0.8	2.8	79	37	116	0.4	1.4	128	61	189	207	98	**305**
	First St./Alameda (Little Tokyo)	0.5	3.0	1,159	295	1,454	0.8	2.8	863	428	1,291	2,022	723	**2,744**
	Subtotal	**5.8**	**19.6**	**3,809**	**1,217**	**5,025**	**6.7**	**20.3**	**5,980**	**2,195**	**8,175**	**9,789**	**3,411**	**13,200**
Existing Gold Line Stations	Union Station	0.6	3.0	8,136	1,843	9,978	0.5	3.0	6,174	1,683	7,857	14,310	3,526	**17,835**
	Chinatown	1.6	3.0	742	140	882	0.6	3.0	521	167	688	1,262	307	**1,569**
	Lincoln Heights/Cypress Park	0.6	1.0	913	392	1,305	1.6	3.0	507	186	693	1,420	578	**1,998**
	Heritage Square/Arroyo	0.9	2.0	739	320	1,059	0.6	1.0	400	91	491	1,139	411	**1,550**
	Southwest Museum	1.5	4.0	518	148	666	0.9	2.0	139	56	195	657	204	**861**
	Highland Park	2.1	3.0	1,857	457	2,314	1.5	4.0	522	267	788	2,379	724	**3,102**
	Mission	1.5	3.0	535	78	613	2.1	3.0	273	87	360	808	165	**973**
	Filmore	0.6	1.0	521	120	641	1.5	3.0	489	170	659	1,010	290	**1,299**
	Del Mar	0.5	2.0	1,158	488	1,646	0.6	1.0	1,005	350	1,354	2,163	837	**3,000**
	Memorial Park	1.1	2.0	1,086	288	1,373	0.5	2.0	1,006	287	1,293	2,091	575	**2,666**
	Lake Ave.	1.0	2.0	946	218	1,164	1.1	2.0	564	176	740	1,510	394	**1,904**
	Allen Ave.	1.7	3.0	491	131	622	1.0	2.0	178	72	249	669	202	**871**
	Sierra Madre Villa	0.0	0.0	1,781	594	2,374	1.7	3.0	640	197	837	2,420	791	**3,211**
	Subtotal	**13.7**	**29.0**	**19,420**	**5,214**	**24,634**	**14.2**	**32.0**	**12,415**	**3,787**	**16,202**	**31,835**	**9,001**	**40,836**
		28.5	**71.9**	**24,966**	**7,199**	**32,165**	**28.5**	**71.9**	**21,896**	**7,606**	**29,502**	**46,862**	**14,805**	**61,667**

Project Boardings **12,696**

2030 Average Weekday Station Access Volumes - DEIS/DEIR Beverly-Montebello-Whittier

	Station Name	By Access (Production End Station Activity)						By Egress (Attraction End Station Activity)						Equivalent Boardings					
		Walk	Bus	PNR	KNR	Rail	Total	Walk	Bus	PNR	KNR	Rail	Total	Walk	Bus	PNR	KNR	Rail	Total
Phase 2	Whittier Greenway/Mar Vista	279	359	1,762	99	0	2,500	486	329	0	0	0	815	383	344	881	50	0	1,658
	Whittier Greenway/Norwalk	386	126	0	85	0	596	149	351	0	0	0	500	267	238	0	42	0	548
	Whittier/Rosemead	420	331	774	68	0	1,594	298	719	0	0	0	1,017	359	525	387	34	0	1,306
	Whittier/Montebello	246	427	238	38	0	948	180	684	0	0	0	864	213	555	119	19	0	906
	Beverly/Montebello	254	363	553	51	0	1,221	426	288	0	0	0	714	340	325	276	26	0	968
	Beverly/Wilcox	378	854	0	56	0	1,288	329	591	0	0	0	920	354	722	0	28	0	1,104
	Garfield/SR60	288	487	909	113	0	1,797	259	231	0	0	0	490	274	359	455	57	0	1,144
	Subtotal	**2,251**	**2,947**	**4,236**	**510**	**0**	**9,944**	**2,128**	**3,192**	**0**	**0**	**0**	**5,320**	**2,190**	**3,069**	**2,118**	**255**	**0**	**7,632**
Phase 1	Pomona/Atlantic (Atlantic)	595	1,339	559	82	0	2,574	1,617	1,396	0	0	0	3,013	1,106	1,367	279	41	0	2,794
	Third St./Mednick (East LA Civic Center)	942	303	0	80	0	1,325	358	87	0	0	0	445	650	195	0	40	0	885
	Third St./Ford (Maravilla)	937	133	0	103	0	1,173	284	37	0	0	0	321	610	85	0	52	0	747
	Third St./Indiana (Indiana)	2,476	557	0	101	0	3,134	745	252	0	0	0	997	1,610	405	0	50	0	2,066
	First St./Soto (Soto)	2,038	948	0	63	0	3,049	1,142	1,177	0	0	0	2,319	1,590	1,062	0	32	0	2,684
	First St./Boyle (Mariachi/Plaza)	895	70	0	34	0	999	920	33	0	0	0	953	907	52	0	17	0	976
	First St./Utah (Pico/Aliso)	342	12	0	16	0	370	226	13	0	0	0	239	284	12	0	8	0	305
	First St./Alameda (Little Tokyo)	267	85	0	20	0	371	3,382	1,735	0	0	0	5,117	1,824	910	0	10	0	2,744
	Subtotal	**8,491**	**3,446**	**559**	**499**	**0**	**12,995**	**8,673**	**4,731**	**0**	**0**	**0**	**13,404**	**8,582**	**4,089**	**279**	**250**	**0**	**13,200**
Existing Gold Line Stations	Union Station	106	3,910	36	50	5,525	9,628	1,444	1,954	0	0	22,644	26,042	775	2,932	18	25	14,085	17,835
	Chinatown	662	955	0	18	0	1,635	1,407	96	0	0	0	1,503	1,034	526	0	9	0	1,569
	Lincoln Heights/Cypress Park	1,101	382	389	61	0	1,933	696	1,366	0	0	0	2,062	898	874	195	31	0	1,998
	Heritage Square/Arroyo	1,156	473	593	105	0	2,327	392	381	0	0	0	773	774	427	297	52	0	1,550
	Southwest Museum	766	608	0	99	0	1,473	113	135	0	0	0	248	439	372	0	50	0	861
	Highland Park	2,184	1,960	1,135	228	0	5,508	437	259	0	0	0	696	1,311	1,110	568	114	0	3,102
	Mission	500	656	0	242	0	1,398	412	135	0	0	0	547	456	395	0	121	0	973
	Filmore	662	396	0	151	0	1,209	1,042	347	0	0	0	1,389	852	371	0	75	0	1,299
	Del Mar	618	388	1,922	165	0	3,093	2,792	114	0	0	0	2,906	1,705	251	961	82	0	3,000
	Memorial Park	765	1,352	0	154	0	2,271	1,472	1,588	0	0	0	3,060	1,119	1,470	0	77	0	2,666
	Lake Ave.	1,313	644	0	239	0	2,196	1,105	507	0	0	0	1,612	1,209	576	0	119	0	1,904
	Allen Ave.	672	375	0	261	0	1,309	386	46	0	0	0	432	529	211	0	131	0	871
	Sierra Madre Villa	308	968	3,203	268	0	4,748	585	1,088	0	0	0	1,673	447	1,028	1,602	134	0	3,211
	Subtotal	**10,815**	**13,068**	**7,278**	**2,042**	**5,525**	**38,728**	**12,282**	**8,017**	**0**	**0**	**22,644**	**42,943**	**11,548**	**10,542**	**3,639**	**1,021**	**14,085**	**40,836**
	Total	**21,557**	**19,461**	**12,073**	**3,051**	**5,525**	**61,667**	**23,084**	**15,939**	**0**	**0**	**22,644**	**61,667**	**22,320**	**17,700**	**6,036**	**1,526**	**14,085**	**61,667**

LACMTA Eastside Phase 2

2030 Average Weekday Summary - DEIS/DEIR Beverly-Montebello-Whittier

	Station Name	Eastbound (Read Up)		Eastbound Boardings			Westbound (Read Down)		Westbound Boardings			Total Boardings		
		Dist (mi)	Time (min)	Peak	Off-Peak	Daily	Dist (mi)	Time (min)	Peak	Off-Peak	Daily	Peak	Off-Peak	Daily
Phase 2	Whittier Greenway/Mar Vista	1.7	4.3	282	127	409	-	-	909	341	1,250	1,191	469	**1,659**
	Whittier Greenway/Norwalk	1.3	2.6	127	80	207	1.7	4.3	257	83	340	383	163	**547**
	Whittier/Rosemead	1.5	3.3	362	145	507	1.3	2.6	556	246	802	918	391	**1,310**
	Whittier/Montebello	0.6	2.9	235	48	283	1.5	3.3	428	191	620	664	239	**903**
	Beverly/Montebello	1.0	3.2	247	160	407	0.6	2.9	321	240	561	568	401	**968**
	Beverly/Wilcox	1.5	3.3	301	126	427	1.0	3.2	468	209	677	769	335	**1,104**
	Garfield/SR60	1.4	3.7	188	79	267	1.5	3.3	562	315	878	750	395	**1,145**
	Subtotal	9.0	23.3	**1,741**	**767**	**2,508**	**7.6**	**19.6**	**3,501**	**1,626**	**5,128**	**5,243**	**2,393**	**7,636**
Phase 1	Pomona/Atlantic (Atlantic)	0.4	1.5	46	31	77	1.4	3.7	27	23	50	73	54	**127**
	Third St./Mednick (East LA Civic Center)	0.4	2.0	21	13	33	0.4	1.5	7	3	10	27	16	**44**
	Third St./Ford (Maravilla)	1.4	4.0	68	29	97	0.4	2.0	54	25	79	121	54	**175**
	Third St./Indiana (Indiana)	1.3	3.3	55	25	81	1.4	4.0	123	66	188	178	91	**269**
	First St./Soto (Soto)	0.6	1.6	15	7	21	1.3	3.3	25	15	40	40	21	**61**
	First St./Boyle (Mariachi/Plaza)	0.4	1.4	3	2	5	0.6	1.6	5	4	9	8	6	**14**
	First St./Utah (Pico/Aliso)	0.8	2.8	8	4	12	0.4	1.4	293	154	447	301	158	**459**
	First St./Alameda (Little Tokyo)	0.5	3.0	268	91	359	0.8	2.8	1,382	478	1,860	1,650	569	**2,219**
	Subtotal	**5.8**	**19.6**	**483**	**201**	**684**	**6.7**	**20.3**	**1,916**	**768**	**2,684**	**2,399**	**969**	**3,368**
Existing Gold Line Stations	Union Station	0.6	3.0	363	44	407	0.5	3.0	462	239	701	825	283	**1,108**
	Chinatown	1.6	3.0	15	12	26	0.6	3.0	79	30	109	94	42	**135**
	Lincoln Heights/Cypress Park	0.6	1.0	19	10	29	1.6	3.0	20	2	22	39	13	**51**
	Heritage Square/Arroyo	0.9	2.0	11	5	16	0.6	1.0	2	1	2	13	5	**19**
	Southwest Museum	1.5	4.0	42	14	55	0.9	2.0	6	8	14	48	22	**69**
	Highland Park	2.1	3.0	8	1	9	1.5	4.0	5	3	7	13	3	**17**
	Mission	1.5	3.0	5	1	6	2.1	3.0	16	6	22	21	7	**28**
	Filmore	0.6	1.0	17	7	24	1.5	3.0	33	17	50	50	24	**74**
	Del Mar	0.5	2.0	15	3	18	0.6	1.0	46	18	64	61	21	**82**
	Memorial Park	1.1	2.0	13	3	16	0.5	2.0	19	8	26	32	10	**42**
	Lake Ave.	1.0	2.0	7	2	8	1.1	2.0	5	3	7	11	4	**16**
	Allen Ave.	1.7	3.0	19	3	22	1.0	2.0	24	11	34	43	14	**57**
	Sierra Madre Villa	-	-	0	0	0	1.7	3.0	0	0	0	0	0	**0**
	Subtotal	**13.7**	**29.0**	**534**	**104**	**638**	**14.2**	**32.0**	**716**	**344**	**1,059**	**1,249**	**448**	**1,698**
		28.5	**71.9**	**2,758**	**1,072**	**3,831**	**28.5**	**71.9**	**6,133**	**2,739**	**8,871**	**8,891**	**3,811**	**12,702**

Project Boardings **12,696**

3.2 Rosemead Boulevard Option

LACMTA Eastside Phase 2

2030 Average Weekday Summary - DEIS/DEIR Beverly-Rosemead-Whittier

	Station Name	Eastbound (Read Up)		Eastbound Boardings			Westbound (Read Down)		Westbound Boardings			Total Boardings		
		Dist (mi)	Time (min)	Peak	Off-Peak	Daily	Dist (mi)	Time (min)	Peak	Off-Peak	Daily	Peak	Off-Peak	Daily
Phase 2	Whittier Greenway/Mar Vista	1.7	4.4	266	124	390	-	-	806	289	1,095	1,072	413	**1,485**
	Whittier Greenway/Norwalk	1.3	2.8	99	82	181	1.7	4.4	240	76	316	339	158	**496**
	Whittier/Rosemead	0.8	3.0	288	96	384	1.3	2.8	494	160	654	781	256	**1,037**
	Beverly/Rosemead	1.4	4.5	160	108	267	0.8	3.0	448	287	734	607	394	**1,001**
	Beverly/Montebello	1.0	3.3	330	157	487	1.4	4.5	422	287	709	752	444	**1,196**
	Beverly/Wilcox	1.5	3.3	306	128	434	1.0	3.3	485	203	688	791	331	**1,122**
	Garfield/SR60	1.5	3.7	194	78	271	1.5	3.3	554	304	857	747	381	**1,128**
	Subtotal	**9.2**	**25.0**	**1,641**	**772**	**2,413**	**7.7**	**21.3**	**3,447**	**1,605**	**5,052**	**5,088**	**2,377**	**7,464**
Phase 1	Pomona/Atlantic (Atlantic)	0.4	1.5	860	251	1,111	1.5	3.7	1,286	507	1,793	2,146	758	**2,904**
	Third St./Mednick (East LA Civic Center)	0.4	2.0	178	40	217	0.4	1.5	518	150	668	696	189	**885**
	Third St./Ford (Maravilla)	1.4	4.0	159	97	256	0.4	2.0	340	152	491	498	249	**747**
	Third St./Indiana (Indiana)	1.3	3.3	452	156	608	1.4	4.0	1,126	333	1,459	1,578	489	**2,067**
	First St./Soto (Soto)	0.6	1.6	666	223	889	1.3	3.3	1,367	425	1,792	2,032	648	**2,680**
	First St./Boyle (Mariachi/Plaza)	0.4	1.4	288	120	407	0.6	1.6	405	163	567	692	282	**974**
	First St./Utah (Pico/Aliso)	0.8	2.8	79	35	114	0.4	1.4	127	63	190	206	97	**303**
	First St./Alameda (Little Tokyo)	0.5	3.0	1,157	297	1,454	0.8	2.8	865	429	1,294	2,022	726	**2,748**
	Subtotal	**5.8**	**19.6**	**3,837**	**1,217**	**5,053**	**6.8**	**20.3**	**6,033**	**2,220**	**8,253**	**9,869**	**3,437**	**13,306**
Existing Gold Line Stations	Union Station	0.6	3.0	8,102	1,832	9,934	0.5	3.0	6,178	1,688	7,865	14,279	3,520	**17,799**
	Chinatown	1.6	3.0	740	141	880	0.6	3.0	524	169	693	1,263	310	**1,573**
	Lincoln Heights/Cypress Park	0.6	1.0	913	392	1,305	1.6	3.0	503	187	690	1,416	578	**1,994**
	Heritage Square/Arroyo	0.9	2.0	739	319	1,058	0.6	1.0	400	90	490	1,139	409	**1,548**
	Southwest Museum	1.5	4.0	518	149	667	0.9	2.0	139	55	194	657	204	**860**
	Highland Park	2.1	3.0	1,855	456	2,311	1.5	4.0	525	264	789	2,380	720	**3,100**
	Mission	1.5	3.0	533	78	611	2.1	3.0	274	92	366	807	170	**977**
	Filmore	0.6	1.0	520	120	640	1.5	3.0	483	167	650	1,003	287	**1,290**
	Del Mar	0.5	2.0	1,160	487	1,647	0.6	1.0	1,009	350	1,359	2,169	837	**3,006**
	Memorial Park	1.1	2.0	1,085	288	1,372	0.5	2.0	1,004	287	1,291	2,088	575	**2,663**
	Lake Ave.	1.0	2.0	947	219	1,165	1.1	2.0	563	175	738	1,510	393	**1,903**
	Allen Ave.	1.7	3.0	491	130	621	1.0	2.0	183	72	254	673	202	**875**
	Sierra Madre Villa	0.0	0.0	1,769	587	2,355	1.7	3.0	634	197	830	2,402	783	**3,185**
	Subtotal	**13.7**	**29.0**	**19,368**	**5,195**	**24,563**	**14.2**	**32.0**	**12,416**	**3,791**	**16,206**	**31,784**	**8,985**	**40,769**
		28.7	**73.6**	**24,845**	**7,183**	**32,028**	**28.7**	**73.6**	**21,895**	**7,615**	**29,510**	**46,740**	**14,798**	**61,538**

Project Boardings **12,406**

2030 Average Weekday Station Access Volumes - DEIS/DEIR Beverly-Rosemead-Whittier

	Station Name	By Access (Production End Station Activity)						By Egress (Attraction End Station Activity)						Equivalent Boardings					
		Walk	Bus	PNR	KNR	Rail	Total	Walk	Bus	PNR	KNR	Rail	Total	Walk	Bus	PNR	KNR	Rail	Total
Phase 2	Whittier Greenway/Mar Vista	268	356	1,481	84	0	2,189	474	306	0	0	0	780	371	331	741	42	0	1,485
	Whittier Greenway/Norwalk	365	117	0	66	0	548	141	303	0	0	0	444	253	210	0	33	0	496
	Whittier/Rosemead	278	415	489	54	0	1,236	145	693	0	0	0	838	211	554	245	27	0	1,037
	Beverly/Rosemead	301	191	1,088	69	0	1,649	202	151	0	0	0	353	251	171	544	35	0	1,001
	Beverly/Montebello	297	411	414	50	0	1,173	499	719	0	0	0	1,218	398	565	207	25	0	1,196
	Beverly/Wilcox	378	814	0	59	0	1,251	328	665	0	0	0	993	353	740	0	30	0	1,122
	Garfield/SR60	288	486	864	116	0	1,755	258	243	0	0	0	501	273	364	432	58	0	1,128
	Subtotal	**2,174**	**2,791**	**4,337**	**499**	**0**	**9,801**	**2,045**	**3,082**	**0**	**0**	**0**	**5,127**	**2,110**	**2,936**	**2,168**	**250**	**0**	**7,464**
Phase 1	Pomona/Atlantic (Atlantic)	592	1,500	543	83	0	2,718	1,628	1,461	0	0	0	3,089	1,110	1,481	271	42	0	2,904
	Third St./Mednick (East LA Civic Center)	939	300	0	81	0	1,320	363	86	0	0	0	449	651	193	0	40	0	885
	Third St./Ford (Maravilla)	937	131	0	104	0	1,171	283	39	0	0	0	322	610	85	0	52	0	747
	Third St./Indiana (Indiana)	2,471	556	0	101	0	3,128	752	253	0	0	0	1,005	1,611	405	0	50	0	2,067
	First St./Soto (Soto)	2,035	948	0	62	0	3,045	1,137	1,178	0	0	0	2,315	1,586	1,063	0	31	0	2,680
	First St./Boyle (Mariachi/Plaza)	893	70	0	34	0	997	918	33	0	0	0	951	905	52	0	17	0	974
	First St./Utah (Pico/Aliso)	342	12	0	16	0	370	223	13	0	0	0	236	283	12	0	8	0	303
	First St./Alameda (Little Tokyo)	266	85	0	20	0	370	3,386	1,739	0	0	0	5,125	1,826	912	0	10	0	2,748
	Subtotal	**8,475**	**3,601**	**543**	**500**	**0**	**13,119**	**8,689**	**4,803**	**0**	**0**	**0**	**13,492**	**8,582**	**4,202**	**271**	**250**	**0**	**13,306**
Existing Gold Line Stations	Union Station	106	3,896	35	50	5,480	9,568	1,443	1,951	0	0	22,635	26,029	774	2,924	18	25	14,058	17,799
	Chinatown	661	955	0	18	0	1,634	1,414	97	0	0	0	1,511	1,038	526	0	9	0	1,573
	Lincoln Heights/Cypress Park	1,100	381	388	61	0	1,931	694	1,363	0	0	0	2,057	897	872	194	31	0	1,994
	Heritage Square/Arroyo	1,155	474	593	105	0	2,326	390	379	0	0	0	769	773	426	296	52	0	1,548
	Southwest Museum	765	608	0	99	0	1,472	113	135	0	0	0	248	439	372	0	50	0	860
	Highland Park	2,182	1,958	1,135	228	0	5,504	437	259	0	0	0	696	1,309	1,109	568	114	0	3,100
	Mission	500	656	0	241	0	1,397	419	137	0	0	0	556	460	396	0	121	0	977
	Filmore	662	395	0	151	0	1,208	1,031	340	0	0	0	1,371	846	368	0	76	0	1,290
	Del Mar	617	388	1,923	165	0	3,093	2,803	115	0	0	0	2,918	1,710	251	962	83	0	3,006
	Memorial Park	764	1,352	0	154	0	2,270	1,471	1,584	0	0	0	3,055	1,118	1,468	0	77	0	2,663
	Lake Ave.	1,313	645	0	239	0	2,196	1,104	505	0	0	0	1,609	1,208	575	0	119	0	1,903
	Allen Ave.	672	375	0	261	0	1,309	393	47	0	0	0	440	532	211	0	131	0	875
	Sierra Madre Villa	308	967	3,167	267	0	4,710	582	1,078	0	0	0	1,660	445	1,023	1,583	134	0	3,185
	Subtotal	**10,806**	**13,049**	**7,242**	**2,041**	**5,480**	**38,618**	**12,292**	**7,992**	**0**	**0**	**22,635**	**42,919**	**11,549**	**10,521**	**3,621**	**1,020**	**14,058**	**40,769**
	Total	**21,455**	**19,441**	**12,122**	**3,040**	**5,480**	**61,538**	**23,027**	**15,876**	**0**	**0**	**22,635**	**61,538**	**22,241**	**17,659**	**6,061**	**1,520**	**14,058**	**61,538**

LACMTA Eastside Phase 2

2030 Average Weekday Summary - DEIS/DEIR Beverly-Rosemead-Whittier

	Station Name	Eastbound (Read Up)		Eastbound Boardings			Westbound (Read Down)		Westbound Boardings			Total Boardings		
		Dist (mi)	Time (min)	Peak	Off-Peak	Daily	Dist (mi)	Time (min)	Peak	Off-Peak	Daily	Peak	Off-Peak	Daily
Phase 2	Whittier Greenway/Mar Vista	1.7	4.4	264	123	387	-	-	806	289	1,095	1,070	412	**1,482**
	Whittier Greenway/Norwalk	1.3	2.8	102	82	184	1.7	4.4	240	76	316	342	157	**500**
	Whittier/Rosemead	0.8	3.0	287	95	382	1.3	2.8	493	160	653	781	255	**1,036**
	Beverly/Rosemead	1.4	4.5	158	108	266	0.8	3.0	447	287	734	605	395	**1,000**
	Beverly/Montebello	1.0	3.3	328	157	485	1.4	4.5	421	287	708	749	444	**1,193**
	Beverly/Wilcox	1.5	3.3	310	127	437	1.0	3.3	486	204	689	795	331	**1,126**
	Garfield/SR60	1.5	3.7	193	79	272	1.5	3.3	553	303	857	746	382	**1,129**
	Subtotal	9.2	25.0	**1,642**	**771**	**2,413**	**7.7**	**21.3**	**3,447**	**1,605**	**5,052**	**5,089**	**2,377**	**7,465**
Phase 1	Pomona/Atlantic (Atlantic)	0.4	1.5	44	30	74	1.4	3.7	26	22	49	70	52	**123**
	Third St./Mednick (East LA Civic Center)	0.4	2.0	20	13	32	0.4	1.5	7	3	10	26	16	**42**
	Third St./Ford (Maravilla)	1.4	4.0	65	28	93	0.4	2.0	52	25	77	117	53	**170**
	Third St./Indiana (Indiana)	1.3	3.3	53	24	78	1.4	4.0	120	64	184	173	89	**262**
	First St./Soto (Soto)	0.6	1.6	14	6	20	1.3	3.3	24	15	39	38	21	**59**
	First St./Boyle (Mariachi/Plaza)	0.4	1.4	3	2	5	0.6	1.6	5	4	9	8	6	**14**
	First St./Utah (Pico/Aliso)	0.8	2.8	8	4	12	0.4	1.4	290	153	443	297	157	**454**
	First St./Alameda (Little Tokyo)	0.5	3.0	254	88	342	0.8	2.8	1,358	477	1,835	1,613	565	**2,178**
	Subtotal	**5.8**	**19.6**	**462**	**195**	**657**	**6.7**	**20.3**	**1,882**	**763**	**2,645**	**2,344**	**959**	**3,302**
Existing Gold Line Stations	Union Station	0.6	3.0	344	47	391	0.5	3.0	442	241	683	786	287	**1,074**
	Chinatown	1.6	3.0	14	11	25	0.6	3.0	77	29	106	91	41	**132**
	Lincoln Heights/Cypress Park	0.6	1.0	18	10	28	1.6	3.0	19	2	22	37	12	**49**
	Heritage Square/Arroyo	0.9	2.0	11	5	15	0.6	1.0	2	1	2	12	5	**18**
	Southwest Museum	1.5	4.0	39	13	53	0.9	2.0	6	8	13	45	21	**66**
	Highland Park	2.1	3.0	8	1	9	1.5	4.0	5	3	7	13	3	**16**
	Mission	1.5	3.0	5	1	6	2.1	3.0	15	6	21	20	7	**27**
	Filmore	0.6	1.0	16	7	23	1.5	3.0	32	16	48	48	23	**71**
	Del Mar	0.5	2.0	14	3	17	0.6	1.0	44	18	62	58	21	**79**
	Memorial Park	1.1	2.0	12	3	15	0.5	2.0	18	7	25	30	10	**40**
	Lake Ave.	1.0	2.0	6	1	8	1.1	2.0	5	2	7	11	4	**15**
	Allen Ave.	1.7	3.0	17	3	20	1.0	2.0	23	10	33	39	13	**53**
	Sierra Madre Villa	-	-	0	0	0	1.7	3.0	0	0	0	0	0	**0**
	Subtotal	**13.7**	**29.0**	**505**	**105**	**609**	**14.2**	**32.0**	**688**	**342**	**1,030**	**1,192**	**447**	**1,639**
		28.7	**73.6**	**2,608**	**1,071**	**3,679**	**28.6**	**73.6**	**6,017**	**2,711**	**8,728**	**8,624**	**3,783**	**12,407**

Project Boardings **12,406**

4.0 Washington Boulevard LRT

LACMTA Eastside Phase 2

2030 Average Weekday Summary - DEIS/DEIR Washington

	Station Name	Eastbound (Read Up)		Eastbound Boardings			Westbound (Read Down)		Westbound Boardings			Total Boardings		
		Dist (mi)	Time (min)	Peak	Off-Peak	Daily	Dist (mi)	Time (min)	Peak	Off-Peak	Daily	Peak	Off-Peak	Daily
Phase 2	Washington/Lambert	1.4	2.1	410	184	594	-	-	1,013	417	1,430	1,423	601	**2,024**
	Washington/E. of Norwalk	1.7	2.7	313	160	472	1.4	2.1	710	371	1,080	1,022	530	**1,552**
	Washington/Rosemead	1.5	2.9	281	93	374	1.7	2.7	451	205	655	731	298	**1,029**
	Washington/So. Greenwood	1.9	3.4	412	209	620	1.5	2.9	401	224	624	812	432	**1,244**
	Garfield/Whittier	1.4	2.8	698	293	991	1.9	3.4	829	327	1,156	1,527	619	**2,146**
	Garfield/SR60	1.5	3.6	261	132	393	1.4	2.8	736	375	1,110	996	507	**1,503**
	Subtotal	**9.4**	**17.5**	**2,373**	**1,070**	**3,442**	**7.9**	**13.9**	**4,138**	**1,917**	**6,055**	**6,511**	**2,986**	**9,497**
Phase 1	Pomona/Atlantic (Atlantic)	0.4	1.5	944	280	1,224	1.5	3.6	1,373	529	1,901	2,316	809	**3,125**
	Third St./Mednick (East LA Civic Center)	0.4	2.0	206	60	266	0.4	1.5	540	177	716	746	237	**982**
	Third St./Ford (Maravilla)	1.4	4.0	200	114	313	0.4	2.0	400	152	552	600	265	**865**
	Third St./Indiana (Indiana)	1.3	3.3	473	171	644	1.4	4.0	1,124	340	1,464	1,597	511	**2,107**
	First St./Soto (Soto)	0.6	1.6	677	237	914	1.3	3.3	1,374	435	1,808	2,050	672	**2,722**
	First St./Boyle (Mariachi/Plaza)	0.4	1.4	296	127	423	0.6	1.6	412	167	579	708	294	**1,001**
	First St./Utah (Pico/Aliso)	0.8	2.8	79	37	116	0.4	1.4	131	63	193	210	99	**309**
	First St./Alameda (Little Tokyo)	0.5	3.0	1,191	299	1,490	0.8	2.8	929	456	1,385	2,120	755	**2,875**
	Subtotal	**5.8**	**19.6**	**4,064**	**1,324**	**5,387**	**6.8**	**20.2**	**6,281**	**2,316**	**8,597**	**10,344**	**3,640**	**13,984**
Existing Gold Line Stations	Union Station	0.6	3.0	8,341	1,924	10,265	0.5	3.0	6,404	1,778	8,182	14,745	3,702	**18,447**
	Chinatown	1.6	3.0	748	141	889	0.6	3.0	529	171	699	1,277	312	**1,588**
	Lincoln Heights/Cypress Park	0.6	1.0	921	397	1,318	1.6	3.0	522	196	718	1,443	593	**2,036**
	Heritage Square/Arroyo	0.9	2.0	748	323	1,070	0.6	1.0	401	90	491	1,149	413	**1,561**
	Southwest Museum	1.5	4.0	523	151	673	0.9	2.0	140	55	194	662	205	**867**
	Highland Park	2.1	3.0	1,876	463	2,339	1.5	4.0	526	268	794	2,402	731	**3,133**
	Mission	1.5	3.0	542	78	619	2.1	3.0	272	92	364	814	169	**983**
	Filmore	0.6	1.0	524	122	645	1.5	3.0	490	170	659	1,013	291	**1,304**
	Del Mar	0.5	2.0	1,167	492	1,659	0.6	1.0	1,015	355	1,369	2,182	846	**3,028**
	Memorial Park	1.1	2.0	1,094	291	1,385	0.5	2.0	1,013	294	1,307	2,107	585	**2,692**
	Lake Ave.	1.0	2.0	954	220	1,174	1.1	2.0	569	176	745	1,523	396	**1,919**
	Allen Ave.	1.7	3.0	494	131	624	1.0	2.0	179	73	252	673	203	**876**
	Sierra Madre Villa	0.0	0.0	1,799	607	2,405	1.7	3.0	642	199	840	2,440	805	**3,245**
	Subtotal	**13.7**	**29.0**	**19,728**	**5,336**	**25,064**	**14.2**	**32.0**	**12,699**	**3,913**	**16,611**	**32,427**	**9,249**	**41,675**
		28.9	**66.1**	**26,164**	**7,729**	**33,893**	**28.9**	**66.1**	**23,117**	**8,145**	**31,262**	**49,281**	**15,874**	**65,155**

Project Boardings **15,660**

2030 Average Weekday Station Access Volumes - DEIS/DEIR Washington

	Station Name	By Access (Production End Station Activity)						By Egress (Attraction End Station Activity)						Equivalent Boardings					
		Walk	Bus	PNR	KNR	Rail	Total	Walk	Bus	PNR	KNR	Rail	Total	Walk	Bus	PNR	KNR	Rail	Total
Phase 2	Washington/Lambert	448	259	2,012	141	0	2,860	846	341	0	0	0	1,187	647	300	1,006	71	0	2,024
	Washington/E. of Norwalk	407	273	1,255	124	0	2,059	209	836	0	0	0	1,045	308	555	628	62	0	1,552
	Washington/Rosemead	302	208	676	109	0	1,294	165	598	0	0	0	763	233	403	338	54	0	1,029
	Washington/So. Greenwood	465	123	296	62	0	945	671	872	0	0	0	1,543	568	497	148	31	0	1,244
	Garfield/Whittier	776	1,305	0	80	0	2,161	1,324	807	0	0	0	2,131	1,050	1,056	0	40	0	2,146
	Garfield/SR60	290	944	1,058	125	0	2,417	266	322	0	0	0	588	278	633	529	63	0	1,503
	Subtotal	**2,686**	**3,112**	**5,297**	**641**	**0**	**11,736**	**3,482**	**3,775**	**0**	**0**	**0**	**7,257**	**3,084**	**3,444**	**2,648**	**320**	**0**	**9,497**
Phase 1	Pomona/Atlantic (Atlantic)	623	1,619	604	85	0	2,931	1,695	1,623	0	0	0	3,318	1,159	1,621	302	43	0	3,125
	Third St./Mednick (East LA Civic Center)	977	427	0	81	0	1,485	382	97	0	0	0	479	679	262	0	41	0	982
	Third St./Ford (Maravilla)	945	301	0	100	0	1,346	291	92	0	0	0	383	618	197	0	50	0	865
	Third St./Indiana (Indiana)	2,531	603	0	101	0	3,234	700	280	0	0	0	980	1,615	442	0	50	0	2,107
	First St./Soto (Soto)	2,081	913	0	62	0	3,057	1,169	1,217	0	0	0	2,386	1,625	1,065	0	31	0	2,722
	First St./Boyle (Mariachi/Plaza)	910	71	0	33	0	1,014	955	33	0	0	0	988	932	52	0	17	0	1,001
	First St./Utah (Pico/Aliso)	346	12	0	16	0	374	230	13	0	0	0	243	288	13	0	8	0	309
	First St./Alameda (Little Tokyo)	277	95	0	20	0	392	3,506	1,851	0	0	0	5,357	1,891	973	0	10	0	2,875
	Subtotal	**8,688**	**4,041**	**604**	**499**	**0**	**13,833**	**8,927**	**5,207**	**0**	**0**	**0**	**14,134**	**8,808**	**4,624**	**302**	**250**	**0**	**13,984**
Existing Gold Line Stations	Union Station	114	4,181	39	54	5,829	10,216	1,519	2,045	0	0	23,113	26,677	816	3,113	19	27	14,471	18,447
	Chinatown	670	962	0	18	0	1,650	1,429	97	0	0	0	1,526	1,050	529	0	9	0	1,588
	Lincoln Heights/Cypress Park	1,114	387	395	61	0	1,957	700	1,414	0	0	0	2,114	907	900	197	31	0	2,036
	Heritage Square/Arroyo	1,164	480	600	107	0	2,351	388	383	0	0	0	771	776	432	300	53	0	1,561
	Southwest Museum	770	614	0	100	0	1,484	113	137	0	0	0	250	441	376	0	50	0	867
	Highland Park	2,200	1,978	1,149	230	0	5,558	443	264	0	0	0	707	1,322	1,121	575	115	0	3,133
	Mission	504	665	0	243	0	1,412	419	134	0	0	0	553	461	400	0	121	0	983
	Filmore	665	396	0	151	0	1,213	1,048	347	0	0	0	1,395	857	372	0	76	0	1,304
	Del Mar	621	391	1,940	167	0	3,119	2,821	115	0	0	0	2,936	1,721	253	970	83	0	3,028
	Memorial Park	769	1,367	0	154	0	2,289	1,486	1,608	0	0	0	3,094	1,127	1,487	0	77	0	2,692
	Lake Ave.	1,321	650	0	240	0	2,211	1,116	510	0	0	0	1,626	1,219	580	0	120	0	1,919
	Allen Ave.	676	378	0	263	0	1,316	388	47	0	0	0	435	532	213	0	131	0	876
	Sierra Madre Villa	309	978	3,253	269	0	4,810	584	1,096	0	0	0	1,680	447	1,037	1,627	135	0	3,245
	Subtotal	**10,897**	**13,427**	**7,375**	**2,057**	**5,829**	**39,586**	**12,453**	**8,198**	**0**	**0**	**23,113**	**43,764**	**11,675**	**10,813**	**3,688**	**1,028**	**14,471**	**41,675**
	Total	**22,272**	**20,580**	**13,277**	**3,197**	**5,829**	**65,155**	**24,862**	**17,180**	**0**	**0**	**23,113**	**65,155**	**23,567**	**18,880**	**6,638**	**1,598**	**14,471**	**65,155**

LACMTA Eastside Phase 2

2030 Average Weekday Summary - DEIS/DEIR Washington

	Station Name	Eastbound (Read Up)		Eastbound Boardings			Westbound (Read Down)		Westbound Boardings			Total Boardings		
		Dist (mi)	Time (min)	Peak	Off-Peak	Daily	Dist (mi)	Time (min)	Peak	Off-Peak	Daily	Peak	Off-Peak	Daily
Phase 2	Washington/Lambert	1.4	2.1	407	185	592	-	-	1,013	417	1,430	1,420	602	**2,022**
	Washington/E. of Norwalk	1.7	2.7	315	161	475	1.4	2.1	710	370	1,080	1,024	531	**1,556**
	Washington/Rosemead	1.5	2.9	276	94	370	1.7	2.7	450	204	655	727	298	**1,025**
	Washington/So. Greenwood	1.9	3.4	414	209	623	1.5	2.9	401	223	624	814	432	**1,247**
	Garfield/Whittier	1.4	2.8	695	294	989	1.9	3.4	829	326	1,155	1,524	620	**2,144**
	Garfield/SR60	1.5	3.6	263	130	393	1.4	2.8	735	374	1,110	999	504	**1,503**
	Subtotal	**9.4**	**17.5**	**2,369**	**1,072**	**3,441**	**7.9**	**13.9**	**4,139**	**1,916**	**6,054**	**6,508**	**2,988**	**9,496**
Phase 1	Pomona/Atlantic (Atlantic)	0.4	1.5	157	86	243	0.4	1.5	459	216	675	616	303	**919**
	Third St./Mednick (East LA Civic Center)	0.4	2.0	65	50	115	0.4	2.0	32	26	58	97	76	**173**
	Third St./Ford (Maravilla)	1.4	4.0	36	17	53	1.4	4.0	7	4	11	43	22	**64**
	Third St./Indiana (Indiana)	1.3	3.3	91	45	136	1.3	3.3	50	28	78	141	73	**213**
	First St./Soto (Soto)	0.6	1.6	74	39	113	0.6	1.6	141	74	215	215	112	**328**
	First St./Boyle (Mariachi/Plaza)	0.4	1.4	19	10	29	0.4	1.4	31	17	48	50	27	**77**
	First St./Utah (Pico/Aliso)	0.8	2.8	4	3	7	0.8	2.8	6	5	11	10	8	**18**
	First St./Alameda (Little Tokyo)	0.5	3.0	12	6	18	0.5	3.0	333	177	510	345	183	**528**
	Subtotal	**5.8**	**19.6**	**458**	**256**	**713**	**5.8**	**19.6**	**1,059**	**547**	**1,606**	**1,516**	**803**	**2,319**
Existing Gold Line Stations	Union Station	0.6	3.0	460	158	618	0.5	3.0	1,836	568	2,405	2,296	726	**3,023**
	Chinatown	1.6	3.0	26	4	30	0.6	3.0	28	15	43	54	19	**73**
	Lincoln Heights/Cypress Park	0.6	1.0	21	17	37	1.6	3.0	95	36	131	116	53	**169**
	Heritage Square/Arroyo	0.9	2.0	26	13	39	0.6	1.0	24	3	27	50	16	**65**
	Southwest Museum	1.5	4.0	15	6	21	0.9	2.0	2	1	2	16	7	**23**
	Highland Park	2.1	3.0	60	18	78	1.5	4.0	7	10	17	67	28	**95**
	Mission	1.5	3.0	12	1	13	2.1	3.0	6	3	9	17	4	**22**
	Filmore	0.6	1.0	7	1	8	1.5	3.0	19	8	27	26	9	**35**
	Del Mar	0.5	2.0	24	10	35	0.6	1.0	38	20	58	62	30	**92**
	Memorial Park	1.1	2.0	22	5	27	0.5	2.0	52	22	75	74	27	**101**
	Lake Ave.	1.0	2.0	19	4	23	1.1	2.0	22	9	31	41	13	**53**
	Allen Ave.	1.7	3.0	9	2	11	1.0	2.0	6	3	8	14	5	**19**
	Sierra Madre Villa	0.0	0.0	27	5	33	1.7	3.0	29	13	42	57	18	**75**
	Subtotal	**13.7**	**29.0**	**727**	**243**	**971**	**14.2**	**32.0**	**2,162**	**712**	**2,874**	**2,890**	**955**	**3,845**
		28.9	**66.1**	**3,554**	**1,571**	**5,125**	**27.9**	**65.5**	**7,360**	**3,175**	**10,535**	**10,914**	**4,746**	**15,660**

Project Boardings **15,660**

APPENDIX C

Basis of Capital Cost Estimate Refinement & Capital Cost Estimate Spreadsheets

1.0 COST ESTIMATE METHODOLOGY

Definition of Alternatives

Capital cost estimates were prepared for the four transit alternatives based upon the Conceptual Engineering drawings developed (Appendix A).

Capital Cost Methodology

The Conceptual Engineering cost estimates were based upon the methodology developed for and used in the Eastside Transit Corridor Phase 2 Alternatives Analysis Report (January 2009). These unit costs categories are summarized in Table 1 below.

Table 1

Unit Cost Category
Guideway:
At-grade in mixed traffic
Aerial Typical Span
Aerial Long Span LRT Bridge
Track:
Direct fixation
Embedded
Switches No. 8 Diamond Double Crossover Fixed
Switches No. 8 Diamond Single Crossover Fixed
Stations:
At-grade station, Center Platform
At-grade station, Split Platform
LRT Station Elevated Center Platform
Support Facility:
Heavy Maintenance
Sitework:
Site Utilities: Aerial Guideway
Site Utilities: At-Grade Guideway within Street
Site structures: Sound Walls
Landscaping & Bike Path
Systems & Controls:
Signal Substation & Cables

Ductbank & Pullboxes
Traction Power: Hardware Procurement
Traction Power: Building Installation
Traction power distribution: Overhead Catenary System (OCS) Pole
Traction power distribution: Ductbank Pullboxes
Traction power distribution: OCS Poles Foundations
Communications: Communications Equipment Installation
Communications: Ductbank & Pullboxes
Fare Collection: Ticket Vending Machines, Total Corridor Length Times Cost Multiplier
Central Control
ROW & Land Purchase:
Right Of Way Purchase
Vehicles:
Light Rail
Bus
Professional Services:
Preliminary Engineering
Final Design
Project Management for Design and Construction

In addition to using the unit costs developed for the Alternatives Analysis Report, several new unit cost categories were identified to reflect refinements considered in the Conceptual Engineering Plans. These are summarized in Table 2 below.

Table 2

Unit Cost Category
Guideway:
At-grade exclusive right-of-way
Double Mechanically Stabilized Earth (MSE) Walls
Retaining Walls
Track:
Ballasted
Switches No. 8 Diamond Single Crossovers
Switches No. 8 Diamond Double Crossovers

Stations:
Automobile Parking Lot Structure Stall
Elevators & Escalators
Sitework:
Demolition, Clearing Within Street
Site structures: Retaining walls
Landscaping Street Scape, Urban Design Features
Sitework:
Demolition, Clearing Within Street
Site Utilities: Aerial Guideway
Site Utilities: At-Grade Guideway within Street
Retaining walls
Landscaping Street Scape, Urban Design Features
Systems & Controls:
Traffic Signals: Major Intersection
Traffic Signals: Minor Intersection
Traffic Signals: Aerial Intersection
Traffic Signals: Grade Crossings

These new unit prices were taken from recent contractor negotiated bids on both the Exposition Corridor and Orange Lines and then escalated to 2008 dollars. To ensure the unit prices were consistent with industry pricing, the unit costs were compared against other light rail projects currently being built and planned in the United States[1]. Several of the new unit prices were developed from Caltrans Cost Data. The development of these additional unit costs are shown in Section 4.

Quantities

These unit costs were then multiplied by their subsequent quantities in units of either Route Feet, Square Feet, or Each. Combined together, the cost were developed for each of the identified cost categories. Quantities were identified from three sources.

.

- Conceptual Engineering Drawings dated July 20, 2009, Appendix A
- Ridership Technical Report, Appendix B

[1] 1.) UTA Draper Corridor, Salt Lake City Utah 2.) CTA Circle Line Alternative, Chicago Illinois 3.) San Diego MTS Mission Valley East, San Diego CA

- Operating and Maintenance Cost Estimate Technical Memorandum, Appendix E

Cost Categories

Unit costs were aggregated into larger categories of cost consistent with the Federal Transit Administration's (FTA's) Standardized Cost Categories (SCC). The cost categories sub-totals were rounded to the nearest hundred thousand dollars. This rounding reflects the accuracy of costing the work at the conceptual engineering. Future refinements to the alignments and additional engineering scope will be reflected in the estimates accuracy and a reduction of the rounding.

Consistent with the use of FTA's SCC, contingencies were applied to each of the categories reflecting the current level of the development of the design for each alternative. The development and basis of these contingencies are from the Cost Methodology developed for the Alternatives Analysis level cost estimates for consistency.

2.0 Results

Capital Cost estimates for the various alternatives are indicated in Table 3.

Table 3 – Cost Estimates

Alternative	Construction Cost*	Project Costs**
SR 60	$901,964	$1,877,336
Beverly Boulevard	$707,846	$1,482,225
Beverly/Montebello/Whittier Boulevard.	$884,829	$1,590,633
Beverly/Rosemead/Whittier Boulevard.	$785,023	$1,508,697
Washington Boulevard	$1,247,314	$2,202,862

* 2008 Year Of Cost X $1,000. Includes Construction with Allocated Contingencies

**2008 Year Of Cost X $1,000. Includes ROW, Vehicles, Professional Services, Unallocated Contingencies

3.0 Discussion

The Conceptual Engineering Capital Cost estimate developed was based upon alignment refinements that were made to each of the alternative originally identified in the Eastside Transit Corridor Phase 2 Alternatives Analysis Report. Refinements that affected the capital cost estimates are identified below by alternative.

SR-60 Alternative:

1. Alignment length was reduced from Crossroads Station to Peck Road Station. The alignment was reduced to increase the cost effectiveness ratio. The 1.25 mile length reduction decreased the costs in the systems and guideway categories.
2. Stations were reduced from 5 to 4 stations, reducing the costs in stations category. The reduction was a product of the alignment reduction.
3. Parking spaces at each of the stations was increased and assumed to be structured parking due to right of way constraints. The parking requirements increased due to the refinement in ridership forecasting. This dictated the number of parking spaces required at each station. The change to structured parking also increased the costs in the stations category.
4. Real estate requirements were decreased at two stations. Crossroads Station was removed and a reduction in real estate at Santa Anita Station. But overall Right of Way was increased, due to the increase in parking forecasted. Most of SR-60's ridership would come from Park and Ride facilities and demanded a large allocation for parking real estate at each of the 4 stations.
5. Additional real estate was also required due to the need to take residential housing along the SR60 alignment. This change occurred because the need to acquire slopes along the Caltrans ROW.
6. Number of light rail train vehicles were increased, based upon the direction of Metro Operating Planning staff, to assume 3 car trains for weekday peak hours, spare, and gap trains.

Beverly Boulevard Alternative:

1. At-grade crossings in the Whittier Greenway were identified and priced. All intersections along the alignment were priced to reflect the requirements that installing light rail would entail. Including the replacement of mast arms, street lights and traffic cabinets.
2. Number of light rail train vehicles was increased, based upon the direction of Metro Operations Planning staff, to assume 3 car trains for weekday peak hours, spare, and gap trains.
3. Parking spaces at each of the stations was increased and assumed to be structured parking due to right of way constraints. The parking requirements increased due to the refinement in ridership forecasting. This dictated the number of parking

spaces required at each station. The change to structured parking also increased the costs to the stations category.

4. Additional real estate was required for the increase in parking demand as well as the identified Traction Power Substation (TPSS) stationing along the alignment.

Beverly/Whittier Boulevard Alternative (Via Montebello Boulevard):

1. At grade to aerial guideway transitions were added along Montebello Boulevard between Beverly and Whittier Boulevards. Aerial transitions and elevated guideway were used to decrease the travel time for the alignment. This increased the cost of retained fill Mechanically Stabilized Earth(MSE) walls for the guideway.
2. The aerial alignments changed the at grade stations to elevated at Montebello Station and Rosemead Boulevards Stations on Whittier Boulevard. This increased the station costs of the alignment.
3. Number of light rail train vehicles has been increased based upon direction by Metro Operations Planning staff to assume 3-car trains for weekday peak hours, spare, and gap trains.
4. The parking requirements increased due to the refinement in ridership forecasting. Parking spaces at each of the stations was increased because of the increase. The new spaces are assumed to be structured parking due to the alignments right of way constraints. The change to structured parking also increased the costs in the stations category.
5. Additional real estate was required for the increase in parking demand as well as the identified TPSS stationing along the alignment.

Beverly/Whittier Boulevard Alternative (Via Rosemead Boulevard):

1. Aerial alignment was added along Whittier Boulevard between Rosemead Boulevard and Norwalk. Aerial guideway was used to decrease the travel time for the alignment. This increased the costs of the guideway costs.
2. At-grade aerial transition were added along Rosemead Boulevard between Beverly and Whittier Boulevards was added. Aerial transitions and elevated guideway were used to decrease the travel time for the alignment. This increased the cost of retained fill MSE walls for the guideway.
3. The aerial alignments changed the at grade station to elevated at Rosemead Station on Whittier Boulevard. This increased the station costs of the alignment.
4. Parking spaces at each of the stations was increased and assumed to be structured parking due to right of way constraints. The parking requirements increased due to the refinement in ridership forecasting. This dictated the number of parking spaces required at each station. The change to structured parking also increased the costs to the stations category.

5. Number of light rail train vehicles has been increased based upon direction by Metro staff, to assume 3-car trains for weekday peak hours, spare, and gap trains.
6. Additional real estate was required for the increase in parking demand as well as the identified TPSS stationing along the alignment.

Washington Boulevard Alternative:

1. Number of light rail train vehicles has been increased based upon direction by Metro Operations Planning staff to assume 3-car trains for weekday peak hours, spare, and gap trains.
2. Parking spaces at each of the stations was increased and assumed to be structured parking due to right of way constraints. The parking requirements increased due to the refinement in ridership forecasting. This dictated the number of parking spaces required at each station. The change to structured parking also increased the costs to the stations category.
3. Additional real estate was required for the increase in parking demand as well as the identified TPSS stationing along the alignment.

4.0 Unit Costs

At-grade Exclusive Right-of-Way $480/RF

At-grade Exclusive ROW is assumed to cover building the railbed. It does not include any part of the track structure, which is covered in ballasted track. Constituent tasks include demolition, excavation, underdrain placement, subgrade preparation & subbase installation. The unit of measure is route feet. Unit Prices based upon costs identified in the Exposition Corridor Phase 2 Draft Environmental Impact Report (DEIR). Costs were escalated to year 2008 dollars.

Mechanically Stabilized Earth (MSE) Wall $2,600/RF

A MSE Wall is assumed to be a retained fill structure using two walls held together by a geotextile fabric placed between the fill lifts and hold up the track section. The unit of measure is route feet. Unit Price based upon Caltrans 2008 Bid Costs See Figure 1.

Cast In Place 6'-Foot Retaining Wall $700/RF

A cast in place wall is a single 6'-foot retaining wall made of concrete. Components of the unit cost include excavation, form placement, rebar, pouring concrete and backfill. The unit of measure is in route feet. Unit Prices based upon costs identified in the Exposition Corridor Phase 2 DEIR. Costs were escalated to year 2008 dollars.

Ballasted Track $460/RF

This unit cost is composed of the cost of two rail track feet. Included in this cost is the placement of crushed rock (ballasting), rail ties, and continuously welded rail. The price is in route feet. Unit prices based upon costs identified in the Exposition Corridor Phase 2 DEIR. Costs were escalated to year 2008 dollars.

Switches No. 8 Diamond Single Crossovers $980,000/EA

This unit price includes the placement of single directional switch used to allow trains to cross from one track to another. Unit cost is identified per each element. Unit prices are based upon costs identified in the Exposition Corridor Phase 2 DEIR. Costs were escalated to 2008 Dollars.

Switches No. 8 Diamond Double Crossovers $580,000/EA

This unit price includes the placement of a bi-directional switch used to allow trains to cross from one track to another. Unit cost is identified per each element. Unit prices are based upon costs identified in the Exposition Corridor Phase 2 DEIR. Costs were escalated to 2008 Dollars.

Automobile Parking Lot Structure Stall $23,000/EA

Parking Lot Structure Stall includes the cost to build an above ground multistory parking structure. Unit costs were identified on a per-each-parking-space required basis. Unit Prices based upon costs identified in the Exposition Corridor Phase 2 DEIR Costs were escalated to 2008 Dollars and compared against recent Metrolink Parking Structure Bids.

Elevators & Escalators $250,000/EA

Elevators & Escalators include the cost to install elevators and escalators into the Aerial Station. Unit prices are based upon costs identified in the Exposition Corridor Phase 2 DEIR. Costs were escalated to year 2008 dollars

Demolition, Clearing Within Existing Roadways $150/RF

Demolition included the cost to remove the existing street and to place at-grade track within the street ROW. Costs include sawcut, asphalt & aggregate base removal and curb and gutter removal. Unit costs are identified on a route foot basis. Unit prices were based upon Caltrans Bid Costs. See Figure 2.

Site Structures: Retaining Walls $180/RF

Site retaining walls are assumed to be single three-foot tall concrete masonry block walls. Constituent tasks for building include excavation, rebar placement, block placement and backfill. This cost is in route feet. Unit prices based upon costs identified in the Exposition Corridor Phase 2 DEIR. Costs were escalated to year 2008 Dollars.

Landscape, Streetscape, Urban Design Features $400/RF

Landscape, Streetscape and Urban Design Features cover all costs for placement of beautification elements along the corridor rail. This includes planter boxes, trees and shrubbery, irrigation, street lights, trash cans, and fencing. This cost is in route feet. Unit

prices are based on costs identified on Metro Gold Line Eastside Extension for urban design elements. Costs were escalated to year 2008 Dollars.

Traffic Signals: Minor Intersection $150,000/EA

Traffic signals at minor intersection (4 lanes) include the cost to replace street and traffic light pole and mast arms, resignalize the intersection and replace traffic loop detectors. The cost was assumed to cover 4 pole arms. The cost is counted by the number of minor intersections identified prices are based upon Caltrans 2008 bid costs.

Traffic Signals: Major Intersection $300,000/EA

Traffic signals at major intersection (6 lanes) include the cost to replace & relocate street and traffic light poles and mast arms, resignalize the intersection and replace traffic loop detectors. The cost was assumed to cover replacing 4 poles and mast arms. The cost is counted by the number of major intersections identified on the plans. Unit prices are based upon Caltrans 2008 bid costs.

Traffic Signals: Aerial Intersection $60,000/EA

Traffic signals at aerial intersection include the cost to replace and relocate street and traffic light masts arms. The cost was assumed to cover replacing 4 mast arms per intersection. The cost is counted by number of major intersections identified on the plans. Unit prices are based upon Caltrans 2008 bid costs.

Traffic Signals: Grade Crossings $250,000/EA

Traffic signal grade crossings include the cost to install 4 quadrant gates, 2 pedestrian gates per intersection and resignalizing the intersection. The cost was determined by the number of grade crossings identified in the plans. Unit prices are based on costs established on current Metrolink Sealed Corridor Grade Crossing Projects.

5.0 Cost Estimate Summary

6.0 Cost Estimate Analysis By Alternative

AECOM

JOB TITLE Eastside Phase II

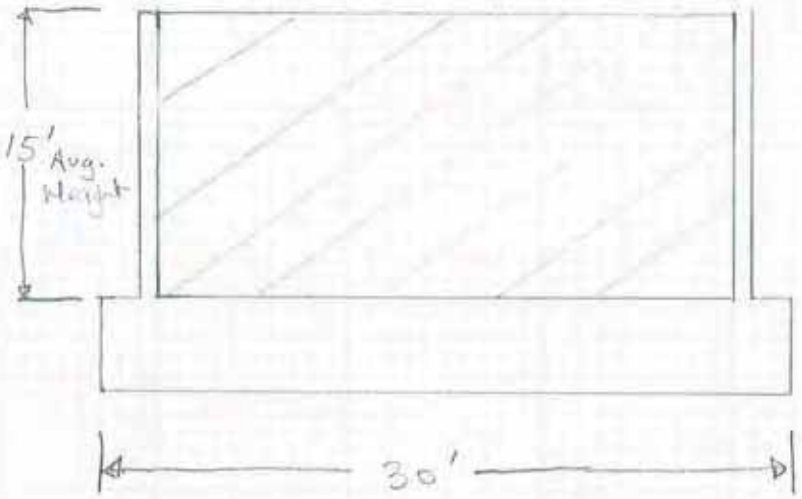
JOB NO. CALCULATION NO. ORIGINATOR K Boulelk DATE July 2, 2009

SHEET OF REVIEWER DATE

Figure I Transition Structure Estimate

Assumptions 1) 15' Average Height of MSE Wall

*2.) Caltrans Cost Contracts 2008
State of California Business
& Housing Agency
http://www.dot.ca.gov/hq/esc/oe
/awards/2008ccdb.pdf



MSE Wall $60/S.F Per Caltrans Contract Costs 2008 *

30' x $60/S.F. = $1800/L.F.

Structural Backfill $50/cyd Per Caltrans Contract Costs 2008 *

$50 \times \frac{15 \times 30}{27} = \$833/L.F.$

$2633 L.F. MSE Wall

≅ $2600 L.F.

AECOM

JOB TITLE Eastside Phase II

JOB NO. CALCULATION NO. ORIGINATOR K Bartelle DATE July 2, 2009

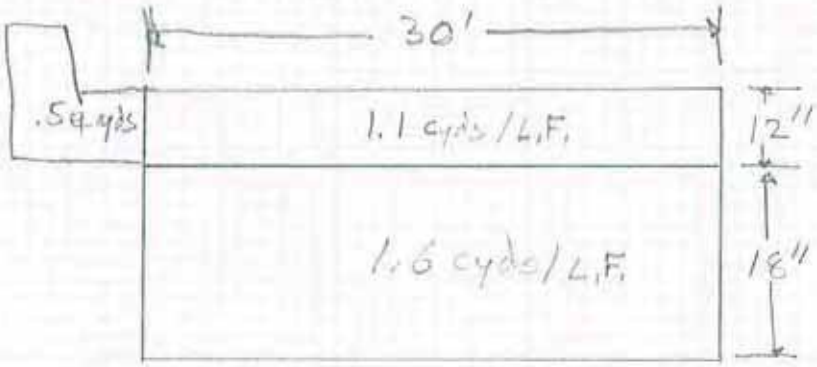
SHEET OF REVIEWER DATE

Figure 2

Demolition of Street

Assume 1.) 30' Demolition

2) Curb & Gutter Removal Both Sides of Street



	Quantity	Unit	*Unit Cost	Sub-total
Saw cut	2	L.F.	$2	$4
Remove AC & Base	2.7	CYDS	$50	$135
Remove Concrete Curb & Gutter	.10	CYDS	$50	$5.3
			Total	$144/L.F.

≅ 150/L.F

*Unit Costs Per Caltrans Cost Contracts 2008
State of California Business & Housing Agency

5.0 Cost Estimate Summary

		SR-60	Beverly Blvd	Beverly Whittie	Beverly Rosem	Washington Blvd
10 GUIDEWAY & TRACK ELEMENTS (X$1000)						
10.01	Guideway: Exclusive At-grade	0.00	7,500.00	875.00	875.00	0.00
10.03	Guideway: At-grade in mixed traffic	750.00	12,750.00	12,375.00	17,874.99	750.00
10.04	Guideway: Aerial structure & Retained Fill	581,875.00	245,500.00	434,125.00	315,000.00	817,875.00
10.08	Guideway: Retained Cut or Fill	2,875.00	12,375.00	12,000.00	11,750.00	2,875.00
10.09	Track: Direct fixation	25,781.00	13,195.00	21,010.50	15,631.00	35,322.00
10.10	Track: Embedded	1,073.87	17,052.00	16,544.50	23,852.50	1,116.50
10.11	Track: Ballasted	0.00	5,785.50	710.50	609.00	0.00
10.12	Track: Switches	4,567.50	6,597.50	6,090.00	7,003.50	6,902.00
	Sub-Total:	**616,922.37**	**320,755.00**	**503,730.50**	**392,595.99**	**864,840.50**
20 STATIONS, STOPS, TERMINALS (X$1000)						
20.01	At-grade station, stop, shelter, mall, terminal, platform	0.00	42,000.00	20,750.00	32,000.00	0.00
20.02	Aerial station, stop, shelter, mall, terminal, platform	36,000.00	9,000.00	27,000.00	9,000.00	54,000.00
20.06	Automobile parking multi-story structure	98,750.00	64,375.00	68,500.00	77,375.00	80,125.00
20.07	Elevators, Escalators	3,750.00	937.50	2,875.00	1,000.00	5,625.00
	Total:	**138,500.00**	**116,312.50**	**119,125.00**	**119,375.00**	**139,750.00**
30 SUPPORT FACILITIES (X$1000)						
30.03	Heavy Maintenance Facility	19,550.00	39,123.00	44,200.00	39,100.00	27,140.00
	Sub-Total:	**19,550.00**	**39,123.00**	**44,200.00**	**39,100.00**	**27,140.00**
40 SITEWORK & SPECIAL CONDITIONS (X$1000)						
40.01	Demolition, Clearing, Earthwork	260.00	3,510.00	3,510.00	4,940.00	260.00
40.02	Site Utilities	21,060.00	30,680.00	29,770.00	31,590.00	28,470.00
40.03	Hazmat	0.00	0.00	0.00	0.00	0.00
40.04	Environmental	0.00	0.00	0.00	0.00	0.00
40.05	Site Structures	52.00	6,760.00	829.30	1,197.14	52.00
40.06	Pedestrian / bike access and accommodation, landscaping	650.00	23,270.00	23,504.00	23,670.40	24,570.00
	Sub-Total:	**22,022.00**	**64,220.00**	**57,613.30**	**61,397.54**	**53,352.00**
50 SYSTEMS (X$1000)						
50.01	Train control and signals (Route Feet)	20,800.00	33,410.00	25,870.00	33,800.00	36,660.00
50.02	Traffic signals and crossing protection (Route Feet)	650.00	8,710.00	5,460.00	6,890.00	7,800.00
50.03	Traction power supply: substations (Route Feet)	22,230.00	27,820.00	27,690.00	28,080.00	30,420.00
50.04	Traction power distribution: catenary and third rail (Route Feet)	30,550.00	34,580.00	38,090.00	38,610.00	41,730.00
50.05	Communications (Route Feet)	26,260.00	32,890.00	32,760.00	33,280.00	36,010.00
50.06	Fare collection system and equipment (Each)	4,420.00	8,944.00	7,800.00	7,800.00	6,760.00
50.07	Central Control (Each)	3,120.00	3,120.00	3,120.00	3,120.00	3,120.00
	Sub-Total:	**108,030.00**	**149,474.00**	**140,790.00**	**151,580.00**	**162,500.00**
	Construction Costs Total:	**905,024.37**	**689,884.50**	**865,458.80**	**764,048.54**	**1,247,582.50**
60 ROW, LAND, IMPROVEMENTS (X$1000)		472,080.00	348,880.00	223,580.00	274,400.00	357,840.00
70 Vehicles (X$1000)		66,150.00	132,300.00	132,300.00	132,300.00	91,875.00
80 Professional Services (X$1000)		248,506.60	190,079.31	236,977.02	210,654.46	342,358.15
90 10% Contingency (X$1000)		169,176.10	136,114.38	145,831.58	138,140.30	203,965.56
	10-50 Total Construction Costs (X$1000)	**905,024.37**	**689,884.50**	**865,458.80**	**764,048.54**	**1,247,582.50**
	Total Project Costs:	**1,860,937.06**	**1,497,258.19**	**1,604,147.40**	**1,519,543.30**	**2,243,621.21**

6.0 Cost Estimate Analysis By Alternative

MAIN WORKSHEET-BUILD ALTERNATIVE

(Rev.11, May 2, 2008)

Metro Eastside Phase II

Alternative 1 Route 60LRT

Today's Date	8/27/09
Yr of Base Year $	2008
Yr of Revenue Ops	2008

	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)	**6.89**	499,358	117,564	**616,922**	**$ 89,571**	**68%**	**33%**	**616,922**
10.01 Guideway: At-grade exclusive right-of-way	0.00	0.00	0	0				0
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)	0.00	0.00	0	0				0
10.03 Guideway: At-grade in mixed traffic	0.22	600.00	150	750	$ 3,443			750
10.04 Guideway: Aerial structure	6.50	465500.00	116,375	581,875	$ 89,530			581,875
10.05 Guideway: Built-up fill	0.00	0.00	0	0				0
10.06 Guideway: Underground cut & cover	0.00	0.00	0	0				0
10.07 Guideway: Underground tunnel	0.00	0.00	0	0				0
10.08 Guideway: Retained cut or fill	0.17	2300.00	575	2,875	$ 16,867			2,875
10.09 Track: Direct fixation		25,400	381	25,781				25,781
10.10 Track: Embedded		1,058	16	1,074				1,074
10.11 Track: Ballasted		0	0	0				0
10.12 Track: Special (switches, turnouts)		4,500	68	4,568				4,567
10.13 Track: Vibration and noise dampening		0	0	0				0
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	**4**	110,800	27,700	**138,500**	**$ 34,625**	**15%**	**7%**	**138,500**
20.01 At-grade station, stop, shelter, mall, terminal, platform	0	0	0	0				0
20.02 Aerial station, stop, shelter, mall, terminal, platform	4	28800	7,200	36,000	$ 9,000			36,000
20.03 Underground station, stop, shelter, mall, terminal, platform	0	0	0	0				0
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.	0	0	0	0				0
20.05 Joint development		0	0	0				0
20.06 Automobile parking multi-story structure		79,000	19,750	98,750				98,750
20.07 Elevators, escalators		3,000	750	3,750				3,750
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	6.89	17,000	2,550	**19,550**	**$ 2,838**	**2%**	**1%**	**19,550**
30.01 Administration Building: Office, sales, storage, revenue counting				0				0
30.02 Light Maintenance Facility				0				0
30.03 Heavy Maintenance Facility		17,000	2,550	19,550				19,550
30.04 Storage or Maintenance of Way Building				0				0
30.05 Yard and Yard Track				0				0
40 SITEWORK & SPECIAL CONDITIONS	6.89	16,940	5,082	**22,022**	**$ 3,197**	**2%**	**1%**	**22,022**
40.01 Demolition, Clearing, Earthwork		200	60	260				260
40.02 Site Utilities, Utility Relocation		16,200	4,860	21,060				21,060
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments		0	0	0				0
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks		0	0	0				0
40.05 Site structures including retaining walls, sound walls		40	12	52				52
40.06 Pedestrian / bike access and accommodation, landscaping		500	150	650				650
40.07 Automobile, bus, van accessways including roads, parking lots				0				0
40.08 Temporary Facilities and other indirect costs during construction				0				0
50 SYSTEMS	6.89	83,100	24,930	**108,030**	**$ 15,685**	**12%**	**6%**	**108,030**
50.01 Train control and signals		16,000	4,800	20,800				20,800
50.02 Traffic signals and crossing protection		500	150	650				650
50.03 Traction power supply: substations		17,100	5,130	22,230				22,230
50.04 Traction power distribution: catenary and third rail		23,500	7,050	30,550				30,550
50.05 Communications		20,200	6,060	26,260				26,260
50.06 Fare collection system and equipment		3,400	1,020	4,420				4,420
50.07 Central Control		2,400	720	3,120				3,120
Construction Subtotal (10 - 50)	6.89	727,198	177,826	**905,024**	**$ 131,401**	**100%**	**49%**	**905,024**
60 ROW, LAND, EXISTING IMPROVEMENTS	6.89	337,200	134,880	**472,080**	**$ 68,542**		**25%**	**472,080**
60.01 Purchase or lease of real estate		337,200	134,880	472,080				472,080
60.02 Relocation of existing households and businesses				0				0
70 VEHICLES (number)	**18**	63,000	3,150	**66,150**	**$ 3,675**		**4%**	**66,150**
70.01 Light Rail	18	63,000	3,150	66,150	$ 3,675			66,150
70.02 Heavy Rail				0				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				0				0
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)	6.89	218,052	30,455	**248,507**	**$ 36,081**	**27%**	**13%**	**248,507**
80.01 Preliminary Engineering		21,805	3,271	25,076				25,076
80.02 Final Design		50,879	7,632	58,511				58,511
80.03 Project Management for Design and Construction		72,684	10,903	83,587				83,587
80.04 Construction Administration & Management		36,342	5,451	41,793				41,793
80.05 Professional Liability and other Non-Construction Insurance				0				0
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.		7,268	800	8,068				8,068
80.07 Surveys, Testing, Investigation, Inspection		14,537	2,181	16,717				16,717
80.08 Start up		14,537	218	14,755				14,755
Subtotal (10 - 80)	6.89	1,345,450	346,311	**1,691,761**	**$ 245,628**		**91%**	**1,691,761**
90 UNALLOCATED CONTINGENCY				**169,176**			**9%**	**169,176**
Subtotal (10 - 90)	6.89			**1,860,937**	**$ 270,190**		**100%**	**1,860,937**
100 FINANCE CHARGES				**0**			**0%**	**0**
Total Project Cost (10 - 100)	6.89			**1,860,937**	**$ 270,190**		**100%**	**1,860,937**

Allocated Contingency as % of Base Yr Dollars w/o Contingency	25.74%
Unallocated Contingency as % of Base Yr Dollars w/o Contingency	12.57%
Total Contingency as % of Base Yr Dollars w/o Contingency	38.31%
Unallocated Contingency as % of Subtotal (10 - 80)	10.00%
YOE Construction Cost per Mile (X000)	$131,401
YOE Total Project Cost per Mile Not Including Vehicles (X000)	$260,586
YOE Total Project Cost per Mile (X000)	$270,190

Alternative 1 Route 60LRT

	Unit	Quantity	Unit Cost	Base Year Dollars w/o Contingency (X000)
10 GUIDEWAY & TRACK ELEMENTS (route miles)		**35466.00**		$ 499,000
10.01 Guideway: At-grade exclusive right-of-way		0.00		$ -
Ballasted Track		0.00	$ 480	$ -
				$ -
				$ -
				$ -
				$ -
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)		0.00		$ -
				$ -
				$ -
				$ -
				$ -
				$ -
10.03 Guideway: At-grade in mixed traffic		1150.00		$ 600,000
Embedded Track in Roadway Semi Exclusive R/W	RF	1150.00	$ 560	$ 644,000
				$ -
				$ -
				$ -
10.04 Guideway: Aerial structure		34316.00		$ 465,500,000
Typical Span*	RF	33656.00	$ 13,400	$ 450,990,400
Long Span LRT Bridge	RF	660.00	$ 22,000	$ 14,520,000
				$ -
				$ -
				$ -
10.05 Guideway: Built-up fill		0.00		$ -
None				$ -
				$ -
				$ -
10.06 Guideway: Underground cut & cover		0.00		$ -
None				$ -
				$ -
10.07 Guideway: Underground tunnel		0.00		$ -
None				$ -
				$ -
10.08 Guideway: Retained cut or fill		900.00		$ 2,300,000
MSE Walls	RF	900.00	$ 2,600	$ 2,340,000
				$ -
				$ -
10.09 Track: Direct fixation		35,216.00		$ 25,400,000
10.04 +10.09	RF	35216.00	$ 720	$ 25,355,520
				$ -
				$ -
				$ -
				$ -
10.10 Track: Embedded		1,150.00		$ 1,058,000
10.03	RF	1150.00	$ 920	$ 1,058,000
				$ -
				$ -
				$ -
				$ -
10.11 Track: Ballasted				$ -
Ballasted Track	RF	0.00	$ 460	$ -
				$ -
				$ -
				$ -
				$ -
10.12 Track: Special (switches, turnouts)				$ 4,500,000
No. 8 Diamond Double Crossover Fixed	EA	1.00	$ 980,000	$ 980,000
No. 8 Diamond Single Crossover Fixed	EA	6.00	$ 580,000	$ 3,480,000
				$ -
10.13 Track: Vibration and noise dampening				$ -
None				$ -
				$ -
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)		**4**		**$ 110,800**
20.01 At-grade station, stop, shelter, mall, terminal, platform		0.00		$ -
				$ -
				$ -
				$ -
				$ -
				$ -
20.02 Aerial station, stop, shelter, mall, terminal, platform		4.00		$ 28,800,000
LRT Station Elevated	EA	4.00	$ 7,200,000	$ 28,800,000
				$ -
20.03 Underground station, stop, shelter, mall, terminal, platform		0.00		$ -
None				$ -
				$ -
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.		0.00		$ -
				$ -
				$ -
20.05 Joint development				$ -
				$ -
				$ -
20.06 Automobile parking multi-story structure				$ 79,000,000
Parking Lot At Grade	EA		$ 4,000	$ -
Parking Lot Structure Stalls	EA	3436.00	$ 23,000	$ 79,028,000
				$ -
20.07 Elevators, escalators				$ 3,000,000

Assume 1 Elevator & 2 Escalators Per Aerial Station	EA	12.00	$ 250,000	$ 3,000,000
				$ -
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS		35466.00		$ 17,000
30.01 Administration Building: Office, sales, storage, revenue counting				
30.02 Light Maintenance Facility				
30.03 Heavy Maintenance Facility	SF	27000	$ 630	$ 17,010,000
30.04 Storage or Maintenance of Way Building				
30.05 Yard and Yard Track				
40 SITEWORK & SPECIAL CONDITIONS		35466.00		$ 16,940
40.01 Demolition, Clearing, Earthwork				$ 200,000
Demolition, Clearing Within Street		1150.00	$ 150	$ 172,500
				$ -
				$ -
				$ -
				$ -
40.02 Site Utilities, Utility Relocation		36,366.00		$ 16,200,000
Aerial Guideway	RF	35216.00	$ 440	$ 15,495,040
At-Grade Guideway within Street	RF	1150.00	$ 580	$ 667,000
				$ -
				$ -
				$ -
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments				$ -
				$ -
				$ -
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks				$ -
				$ -
				$ -
				$ -
				$ -
40.05 Site structures including retaining walls, sound walls				$ 40,000
				$ -
Retaining Walls (Assume 20% At Grade Alignment Requires 3' Walls)	RF	230.00	$ 180.00	$ 41,400
40.06 Pedestrian / bike access and accommodation, landscaping				$ 500,000
				$ -
Landscaping Street Scape, Urban Design Features	RF	1150.00	$ 400.00	$ 460,000
				$ -
				$ -
				$ -
40.07 Automobile, bus, van accessways including roads, parking lots				$ -
				$ -
				$ -
				$ -
				$ -
				$ -
				$ -
40.08 Temporary Facilities and other indirect costs during construction				$ -
				$ -
				$ -
50 SYSTEMS		35466.00		$ 83,100
50.01 Train control and signals				$ 16,000,000
Signal Substation & Cables	RF	35466.00	$ 450	$ 15,959,700
Ductbank & Pullboxes	RF	35466.00	$ 130	$ 4,610,580
50.02 Traffic signals and crossing protection				$ 500,000
Major Intersection	EA	1.00	$ 300,000	$ 300,000
Minor Intersection	EA	1.00	$ 150,000	$ 150,000
				$ -
				$ -
				$ -
				$ -
				$ -
				$ -
				$ -
50.03 Traction power supply: substations				$ 17,100,000
Hardware Procurement	RF	35466.00	$ 430	$ 15,250,380
Building Installation	RF	35466.00	$ 52	$ 1,844,232
				$ -
50.04 Traction power distribution: catenary and third rail				$ 23,500,000
Catenary OCS Pole		35466.00	$ 470	$ 16,669,020
Ductbank Pullboxes		35466.00	$ 130	$ 4,610,580
OCS Poles Foundations		35466.00	$ 62	$ 2,198,892
50.05 Communications				$ 20,200,000
Communications Equipment Installation		35466.00	$ 440	$ 15,605,040
Ductbank & Pullboxes		35466.00	$ 130	$ 4,610,580
				$ -
50.06 Fare collection system and equipment				$ 3,400,000
Ticket Vending Machines, Total Corridor Length Times Cost Multiplier*	EA	4.00	$ 860,000	$ 3,440,000
				$ -
50.07 Central Control				$ 2,400,000
	EA	1.00	$ 2,400,000	$ 2,400,000
				$ -
Construction Subtotal (10 - 50)		35466.00		$ 726,840
60 ROW, LAND, EXISTING IMPROVEMENTS				$ 337,200
60.01 Purchase or lease of real estate				$ 337,200,000
				$ -
ROW	SF	1686129.00	$ 200	$ 337,225,800
				$ -
				$ -
				$ -
60.02 Relocation of existing households and businesses				$ -
				$ -
				$ -
				$ -
				$ -
				$ -

70 VEHICLES (number)		**18**		$ 63,000
70.01 Light Rail	EA	18	$ 3,500,000	$ 63,000,000
70.02 Heavy Rail				
70.03 Commuter Rail				
70.04 Bus			$ 450,000	$ -
70.05 Other				
70.06 Non-revenue vehicles				
70.07 Spare parts				
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)		35466.00		$ 218,100
80.01 Preliminary Engineering	21,805	3% 10-50		$ 21,805,200
80.02 Final Design	50,879	7% 10-50		$ 50,878,800
80.03 Project Management for Design and Construction	72,684	10% 10-50		$ 72,684,000
80.04 Construction Administration & Management	36,342	5% 10-50		$ 36,342,000
80.05 Professional Liability and other Non-Construction Insurance		0% 10-50		
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.	7,268	1% 10-50		$ 7,268,400
80.07 Surveys, Testing, Investigation, Inspection	14,537	2% 10-50		$ 14,536,800
80.08 Start up	14,537	1.5% 10-50		$ 14,536,800
				$ 1,345,140

* All Unit Prices Taken From Expo Phase 2 Cost Estimate

MAIN WORKSHEET-BUILD ALTERNATIVE

(Rev.11, May 2, 2008)

Metro Eastside Phase II

Alternative 2 Beverly Blvd.

Today's Date	7/17/09
Yr of Base Year $	2008
Yr of Revenue Ops	2008

	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)	**9.21**	264,500	56,255	**320,755**	**$ 34,812**	**46%**	**21%**	**320,755**
10.01 Guideway: At-grade exclusive right-of-way	2.35	6000.00	1,500	7,500	$ 3,191			7,500
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)	0.00	0.00	0	0				0
10.03 Guideway: At-grade in mixed traffic	3.45	10200.00	2,550	12,750	$ 3,697			12,750
10.04 Guideway: Aerial structure	2.60	196400.00	49,100	245,500	$ 94,409			245,500
10.05 Guideway: Built-up fill	0.00	0.00	0	0				0
10.06 Guideway: Underground cut & cover	0.00	0.00	0	0				0
10.07 Guideway: Underground tunnel	0.00	0.00	0	0				0
10.08 Guideway: Retained cut or fill	0.81	9900.00	2,475	12,375	$ 15,195			12,375
10.09 Track: Direct fixation		13,000	195	13,195				13,195
10.10 Track: Embedded		16,800	252	17,052				17,052
10.11 Track: Ballasted		5,700	86	5,786				5,785
10.12 Track: Special (switches, turnouts)		6,500	98	6,598				6,597
10.13 Track: Vibration and noise dampening		0	0	0				0
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	**8**	93,050	23,263	**116,313**	**$ 14,539**	**17%**	**8%**	**116,313**
20.01 At-grade station, stop, shelter, mall, terminal, platform	7	33600	8,400	42,000	$ 6,000			42,000
20.02 Aerial station, stop, shelter, mall, terminal, platform	1	7200	1,800	9,000	$ 9,000			9,000
20.03 Underground station, stop, shelter, mall, terminal, platform	0	0	0	0				0
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.	0	0	0	0				0
20.05 Joint development		0	0	0				0
20.06 Automobile parking multi-story structure		51,500	12,875	64,375				64,375
20.07 Elevators, escalators		750	188	938				938
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	9.21	34,020	5,103	**39,123**	**$ 4,246**	**6%**	**3%**	**39,123**
30.01 Administration Building: Office, sales, storage, revenue counting				0				0
30.02 Light Maintenance Facility				0				0
30.03 Heavy Maintenance Facility		34,020	5,103	39,123				39,123
30.04 Storage or Maintenance of Way Building				0				0
30.05 Yard and Yard Track				0				0
40 SITEWORK & SPECIAL CONDITIONS	9.21	49,400	14,820	**64,220**	**$ 6,970**	**9%**	**4%**	**64,220**
40.01 Demolition, Clearing, Earthwork		2,700	810	3,510				3,510
40.02 Site Utilities, Utility Relocation		23,600	7,080	30,680				30,680
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments		0	0	0				0
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks		0	0	0				0
40.05 Site structures including retaining walls, sound walls		5,200	1,560	6,760				6,760
40.06 Pedestrian / bike access and accommodation, landscaping		17,900	5,370	23,270				23,270
40.07 Automobile, bus, van accessways including roads, parking lots		0	0	0				0
40.08 Temporary Facilities and other indirect costs during construction		0	0	0				0
50 SYSTEMS	9.21	114,980	34,494	**149,474**	**$ 16,223**	**22%**	**10%**	**149,474**
50.01 Train control and signals		25,700	7,710	33,410				33,410
50.02 Traffic signals and crossing protection		6,700	2,010	8,710				8,710
50.03 Traction power supply: substations		21,400	6,420	27,820				27,820
50.04 Traction power distribution: catenary and third rail		26,600	7,980	34,580				34,580
50.05 Communications		25,300	7,590	32,890				32,890
50.06 Fare collection system and equipment		6,880	2,064	8,944				8,944
50.07 Central Control		2,400	720	3,120				3,120
Construction Subtotal (10 - 50)	9.21	555,950	133,935	**689,885**	**$ 74,875**	**100%**	**46%**	**689,884**
60 ROW, LAND, EXISTING IMPROVEMENTS	9.21	249,200	99,680	**348,880**	**$ 37,865**		**23%**	**348,880**
60.01 Purchase or lease of real estate		249,200	99,680	348,880				348,880
60.02 Relocation of existing households and businesses		0	0	0				0
70 VEHICLES (number)	**36**	126,000	6,300	**132,300**	**$ 3,675**		**9%**	**132,300**
70.01 Light Rail	36	126,000	6,300	132,300	$ 3,675			132,300
70.02 Heavy Rail				0				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				0				0
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)	9.21	166,785	23,294	**190,079**	**$ 20,630**	**28%**	**13%**	**190,079**
80.01 Preliminary Engineering		16,679	2,502	19,180				19,180
80.02 Final Design		38,917	5,837	44,754				44,754
80.03 Project Management for Design and Construction		55,595	8,339	63,934				63,934
80.04 Construction Administration & Management		27,798	4,170	31,967				31,967
80.05 Professional Liability and other Non-Construction Insurance				0				0
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.		5,560	612	6,171				6,171
80.07 Surveys, Testing, Investigation, Inspection		11,119	1,668	12,787				12,787
80.08 Start up		11,119	167	11,286				11,286
Subtotal (10 - 80)	9.21	1,097,935	263,209	**1,361,144**	**$ 147,728**		**91%**	**1,361,144**
90 UNALLOCATED CONTINGENCY				**136,114**			**9%**	**136,114**
Subtotal (10 - 90)	9.21			**1,497,258**	**$ 162,501**		**100%**	**1,497,258**
100 FINANCE CHARGES				**0**			**0%**	**0**
Total Project Cost (10 - 100)	9.21			**1,497,258**	**$ 162,501**		**100%**	**1,497,258**

Allocated Contingency as % of Base Yr Dollars w/o Contingency	23.97%
Unallocated Contingency as % of Base Yr Dollars w/o Contingency	12.40%
Total Contingency as % of Base Yr Dollars w/o Contingency	36.37%
Unallocated Contingency as % of Subtotal (10 - 80)	10.00%
YOE Construction Cost per Mile (X000)	$74,875
YOE Total Project Cost per Mile Not Including Vehicles (X000)	$148,142
YOE Total Project Cost per Mile (X000)	$162,501

Alternative 2 Beverly Blvd.

	Unit	Quantity	Unit Cost	Base Year Dollars w/o Contingency (X000)
10 GUIDEWAY & TRACK ELEMENTS (route miles)		**44349.00**		$ 264,500
10.01 Guideway: At-grade exclusive right-of-way		12409.00		$ 6,000,000
Ballasted Track		12409.00	$ 480.00	$ 5,956,320
				$ -
				$ -
				$ -
				$ -
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)		0.00		$ -
				$ -
				$ -
				$ -
				$ -
				$ -
10.03 Guideway: At-grade in mixed traffic		18210.00		$ 10,200,000
Embedded Track in Roadway Semi Exclusive R/W	RF	18210.00	$ 560.00	$ 10,197,600
				$ -
				$ -
				$ -
10.04 Guideway: Aerial structure		13730.00		$ 196,400,000
Typical Span*	RF	12290.00	$ 13,400.00	$ 164,686,000
Long Span LRT Bridge	RF	1440.00	$ 22,000.00	$ 31,680,000
				$ -
				$ -
				$ -
10.05 Guideway: Built-up fill		0.00		$ -
None				$ -
				$ -
				$ -
10.06 Guideway: Underground cut & cover		0.00		$ -
None				$ -
				$ -
10.07 Guideway: Underground tunnel		0.00		$ -
None				$ -
				$ -
10.08 Guideway: Retained cut or fill		4300.00		$ 9,900,000
MSE Walls	RF	3600.00	$ 2,600.00	$ 9,360,000
Retaining Walls	RF	700.00	$ 700.00	$ 490,000
				$ -
10.09 Track: Direct fixation		18,030.00		$ 13,000,000
10.04 +10.09	RF	18030.00	$ 720.00	$ 12,981,600
				$ -
				$ -
				$ -
				$ -
10.10 Track: Embedded		18,210.00		$ 16,800,000
10.03	RF	18210.00	$ 920.00	$ 16,753,200
				$ -
				$ -
				$ -
				$ -
10.11 Track: Ballasted				$ 5,700,000
Ballasted Track	RF	12409.00	$ 460.00	$ 5,708,140
				$ -
				$ -
				$ -
				$ -
10.12 Track: Special (switches, turnouts)				$ 6,500,000
No. 8 Diamond Double Crossover Power Operated Ballasted	EA	1.00	$ 760,000.00	$ 760,000
No. 8 Diamond Single Crossover Power Operated Embedded	EA	6.00	$ 480,000.00	$ 2,880,000
No. 8 Diamond Single Crossover Power Operated Ballasted	EA	4.00	$ 420,000.00	$ 1,680,000
No. 8 Diamond Single Crossover Power Operated Fixed	EA	2.00	$ 580,000.00	$ 1,160,000
10.13 Track: Vibration and noise dampening				$ -
None				$ -
				$ -
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)		**8**		**$ 93,050**
20.01 At-grade station, stop, shelter, mall, terminal, platform		7.00		$ 33,600,000
At-grade station, Center Platform		2.00	$ 3,800,000.00	$ 7,600,000
At-grade station, Split Platform		5.00	$ 5,200,000.00	$ 26,000,000
				$ -
				$ -
				$ -
20.02 Aerial station, stop, shelter, mall, terminal, platform		1.00		$ 7,200,000
LRT Station Elevated	EA	1.00	$ 7,200,000.00	$ 7,200,000
				$ -
20.03 Underground station, stop, shelter, mall, terminal, platform		0.00		$ -
None				$ -
				$ -
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.		0.00		$ -
				$ -
				$ -
20.05 Joint development				$ -
				$ -
				$ -
20.06 Automobile parking multi-story structure				$ 51,500,000
	EA			$ -
Parking Lot Structure Stalls	EA	2241.00	$ 23,000.00	$ 51,543,000
				$ -

20.07 Elevators, escalators				$ 750,000
Assume 1 Elevator & 2 Escalators Per Aerial Station	EA	3.00	$ 250,000.00	$ 750,000
				$ -
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS		44349.00		$ 34,020
30.01 Administration Building: Office, sales, storage, revenue counting				
30.02 Light Maintenance Facility				
30.03 Heavy Maintenance Facility	SF	54000	$ 630	$ 34,020,000
30.04 Storage or Maintenance of Way Building				
30.05 Yard and Yard Track				
40 SITEWORK & SPECIAL CONDITIONS				$ 49,400
40.01 Demolition, Clearing, Earthwork				$ 2,700,000
Demolition, Clearing Within Street		18210.00	$ 150.00	$ 2,731,500
				$ -
				$ -
				$ -
				$ -
40.02 Site Utilities, Utility Relocation		47,949.00		$ 23,600,000
Aerial Guideway	RF	17330.00	$ 440.00	$ 7,625,200
At-Grade Guideway within Street	RF	18210.00	$ 580.00	$ 10,561,800
Relocate Greenway	LF	12409.00	$ 440.00	$ 5,459,960
				$ -
				$ -
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments				$ -
Remove Contaminated Soil In ROW	RF	0.00	$ 160.00	$ -
				$ -
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks				$ -
Environmental Mitigation Within ROW	RF	0.00	$ 70.00	$ -
				$ -
				$ -
				$ -
40.05 Site structures including retaining walls, sound walls				$ 5,200,000
Soundwalls	RF	11859.00	$ 380.00	$ 4,506,420
Retaining Walls (Assume 20% At Grade Alignment Requires 3' Walls)	RF	3642.00	$ 180.00	$ 655,560
40.06 Pedestrian / bike access and accommodation, landscaping				$ 17,900,000
Landscaping & Bike Path	RF	12629.00	$ 340.00	$ 4,293,860
Landscaping Street Scape, Urban Design Features	RF	34100.00	$ 400.00	$ 13,640,000
				$ -
				$ -
				$ -
40.07 Automobile, bus, van accessways including roads, parking lots				$ -
				$ -
				$ -
				$ -
				$ -
				$ -
				$ -
40.08 Temporary Facilities and other indirect costs during construction				$ -
				$ -
				$ -
50 SYSTEMS		44349.00		$ 114,980
50.01 Train control and signals				$ 25,700,000
Signal Substation & Cables	RF	44349.00	$ 450.00	$ 19,957,050
Ductbank & Pullboxes	RF	44349.00	$ 130.00	$ 5,765,370
50.02 Traffic signals and crossing protection				$ 6,700,000
Major Intersection	EA	6.00	$ 300,000.00	$ 1,800,000
Minor Intersection	EA	17.00	$ 150,000.00	$ 2,550,000
Grade Crossings	EA	8.00	$ 250,000.00	$ 2,000,000
Aerial Intersection	EA	5.00	$ 60,000.00	$ 300,000
				$ -
				$ -
				$ -
				$ -
				$ -
50.03 Traction power supply: substations				$ 21,400,000
Hardware Procurement	RF	44349.00	$ 430.00	$ 19,070,070
Building Installation	RF	44349.00	$ 52.00	$ 2,306,148
				$ -
50.04 Traction power distribution: catenary and third rail				$ 26,600,000
Catenary OCS Pole		44349.00	$ 470.00	$ 20,844,030
Ductbank Pullboxes		44349.00	$ 130.00	$ 5,765,370
OCS Poles Foundations		44349.00	$ 62.00	$ 2,749,638
50.05 Communications				$ 25,300,000
Communications Equipment Installation		44349.00	$ 440.00	$ 19,513,560
Ductbank & Pullboxes		44349.00	$ 130.00	$ 5,765,370
				$ -
50.06 Fare collection system and equipment				$ 6,880,000
Ticket Vending Machines	EA	8.00	$ 860,000.00	$ 6,880,000
				$ -
50.07 Central Control				$ 2,400,000
	EA	1.00	$ 2,400,000.00	$ 2,400,000
				$ -
Construction Subtotal (10 - 50)		44349.00		$ 555,950
60 ROW, LAND, EXISTING IMPROVEMENTS		44349.00		$ 249,200
60.01 Purchase or lease of real estate				$ 249,200,000
				$ -
ROW	SF	1245954.00	$ 200.00	$ 249,190,800
				$ -
				$ -
				$ -
60.02 Relocation of existing households and businesses				$ -
				$ -
				$ -
				$ -

				$ -
				$ -
70 VEHICLES (number)		**36**		$ 126,000
70.01 Light Rail	EA	36	$ 3,500,000	$ 126,000,000
70.02 Heavy Rail				
70.03 Commuter Rail				
70.04 Bus			$ 450,000	$ -
70.05 Other				
70.06 Non-revenue vehicles				
70.07 Spare parts				
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)		44349.00		$ 166,785
80.01 Preliminary Engineering	16,679	3% 10-50		$ 16,679
80.02 Final Design	38,917	7% 10-50		$ 38,917
80.03 Project Management for Design and Construction	55,595	10% 10-50		$ 55,595
80.04 Construction Administration & Management	27,798	5% 10-50		$ 27,798
80.05 Professional Liability and other Non-Construction Insurance		0% 10-50		
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.	5,560	1% 10-50		$ 5,560
80.07 Surveys, Testing, Investigation, Inspection	11,119	2% 10-50		$ 11,119
80.08 Start up	11,119	1.5% 10-50		$ 11,119
				$ 1,097,935

MAIN WORKSHEET-BUILD ALTERNATIVE

(Rev.11, May 2, 2008)

Metro Eastside Phase II

Alternative 3A Beverly Whittier Montebello Blvd.

Today's Date	8/27/09
Yr of Base Year $	2008
Yr of Revenue Ops	2008

	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)	**9.08**	411,200	92,531	**503,731**	**$ 55,482**	**58%**	**31%**	**503,731**
10.01 Guideway: At-grade exclusive right-of-way	0.27	700.00	175	875	$ 3,213			875
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)	0.00	0.00	0	0				0
10.03 Guideway: At-grade in mixed traffic	3.36	9900.00	2,475	12,375	$ 3,687			12,375
10.04 Guideway: Aerial structure	4.75	347300.00	86,825	434,125	$ 91,395			434,125
10.05 Guideway: Built-up fill	0.00	0.00	0	0				0
10.06 Guideway: Underground cut & cover	0.00	0.00	0	0				0
10.07 Guideway: Underground tunnel	0.00	0.00	0	0				0
10.08 Guideway: Retained cut or fill	0.70	9600.00	2,400	12,000	$ 17,124			12,000
10.09 Track: Direct fixation		20,700	311	21,011				21,011
10.10 Track: Embedded		16,300	245	16,545				16,545
10.11 Track: Ballasted		700	11	711				711
10.12 Track: Special (switches, turnouts)		6,000	90	6,090				6,090
10.13 Track: Vibration and noise dampening		0	0	0				0
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	**7**	95,300	23,825	**119,125**	**$ 17,018**	**14%**	**7%**	**119,125**
20.01 At-grade station, stop, shelter, mall, terminal, platform	4	16600	4,150	20,750	$ 5,188			20,750
20.02 Aerial station, stop, shelter, mall, terminal, platform	3	21600	5,400	27,000	$ 9,000			27,000
20.03 Underground station, stop, shelter, mall, terminal, platform	0	0	0	0				0
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.	0	0	0	0				0
20.05 Joint development		0	0	0				0
20.06 Automobile parking multi-story structure		54,800	13,700	68,500				68,500
20.07 Elevators, escalators		2,300	575	2,875				2,875
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	9.08	34,000	10,200	**44,200**	**$ 4,868**	**5%**	**3%**	**44,200**
30.01 Administration Building: Office, sales, storage, revenue counting				0				0
30.02 Light Maintenance Facility				0				0
30.03 Heavy Maintenance Facility		34,000	10,200	44,200				44,200
30.04 Storage or Maintenance of Way Building				0				0
30.05 Yard and Yard Track				0				0
40 SITEWORK & SPECIAL CONDITIONS	9.08	44,318	13,295	**57,613**	**$ 6,346**	**7%**	**4%**	**57,613**
40.01 Demolition, Clearing, Earthwork		2,700	810	3,510				3,510
40.02 Site Utilities, Utility Relocation		22,900	6,870	29,770				29,770
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments		0	0	0				0
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks		0	0	0				0
40.05 Site structures including retaining walls, sound walls		638	191	829				829
40.06 Pedestrian / bike access and accommodation, landscaping		18,080	5,424	23,504				23,504
40.07 Automobile, bus, van accessways including roads, parking lots		0	0	0				0
40.08 Temporary Facilities and other indirect costs during construction		0	0	0				0
50 SYSTEMS	9.08	108,300	32,490	**140,790**	**$ 15,507**	**16%**	**9%**	**140,790**
50.01 Train control and signals		19,900	5,970	25,870				25,870
50.02 Traffic signals and crossing protection		4,200	1,260	5,460				5,460
50.03 Traction power supply: substations		21,300	6,390	27,690				27,690
50.04 Traction power distribution: catenary and third rail		29,300	8,790	38,090				38,090
50.05 Communications		25,200	7,560	32,760				32,760
50.06 Fare collection system and equipment		6,000	1,800	7,800				7,800
50.07 Central Control		2,400	720	3,120				3,120
Construction Subtotal (10 - 50)	9.08	693,118	172,341	**865,459**	**$ 95,324**	**100%**	**54%**	**865,459**
60 ROW, LAND, EXISTING IMPROVEMENTS	9.08	159,700	63,880	**223,580**	**$ 24,626**		**14%**	**223,580**
60.01 Purchase or lease of real estate		159,700	63,880	223,580				223,580
60.02 Relocation of existing households and businesses		0	0	0				0
70 VEHICLES (number)	**36**	126,000	6,300	**132,300**	**$ 3,675**		**8%**	**132,300**
70.01 Light Rail	36	126,000	6,300	132,300	$ 3,675			132,300
70.02 Heavy Rail	0	0	0	0				0
70.03 Commuter Rail	0	0	0	0				0
70.04 Bus	0	0	0	0				0
70.05 Other				0				0
70.06 Non-revenue vehicles				0				0
70.07 Spare parts				0				0
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)	9.08	207,935	29,042	**236,977**	**$ 26,101**	**27%**	**15%**	**236,976**
80.01 Preliminary Engineering		20,794	3,119	23,913				23,912
80.02 Final Design		48,518	7,278	55,796				55,796
80.03 Project Management for Design and Construction		69,312	10,397	79,709				79,708
80.04 Construction Administration & Management		34,656	5,198	39,854				39,854
80.05 Professional Liability and other Non-Construction Insurance				0				0
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.		6,931	762	7,694				7,694
80.07 Surveys, Testing, Investigation, Inspection		13,862	2,079	15,942				15,942
80.08 Start up		13,862	208	14,070				14,070
Subtotal (10 - 80)	9.08	1,186,753	271,563	**1,458,316**	**$ 160,622**		**91%**	**1,458,315**
90 UNALLOCATED CONTINGENCY				**145,832**			**9%**	**145,831**
Subtotal (10 - 90)	9.08			**1,604,147**	**$ 176,684**		**100%**	**1,604,146**
100 FINANCE CHARGES				**0**			**0%**	**0**
Total Project Cost (10 - 100)	9.08			**1,604,147**	**$ 176,684**		**100%**	**1,604,146**

Allocated Contingency as % of Base Yr Dollars w/o Contingency	22.88%
Unallocated Contingency as % of Base Yr Dollars w/o Contingency	12.29%
Total Contingency as % of Base Yr Dollars w/o Contingency	35.17%
Unallocated Contingency as % of Subtotal (10 - 80)	10.00%
YOE Construction Cost per Mile (X000)	$95,324
YOE Total Project Cost per Mile Not Including Vehicles (X000)	$162,113
YOE Total Project Cost per Mile (X000)	$176,684

Alternative 3A Beverly Montebello Whittier Blvd.

	Unit	Quantity	Unit Cost	Base Year Dollars w/o Contingency (X000)
10 GUIDEWAY & TRACK ELEMENTS (route miles)		**44238.00**		$ 411,200
10.01 Guideway: At-grade exclusive right-of-way		1438.00		$ 700,000
Ballasted Track		1438.00	$ 480.00	$ 690,240
				$ -
				$ -
				$ -
				$ -
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)		0.00		$ -
				$ -
				$ -
				$ -
				$ -
				$ -
10.03 Guideway: At-grade in mixed traffic		17720.00		$ 9,900,000
Embedded Track in Roadway Semi Exclusive R/W	RF	17720.00	$ 560.00	$ 9,923,200
				$ -
				$ -
				$ -
10.04 Guideway: Aerial structure		25080.00		$ 347,300,000
Typical Span*	RF	23780.00	$ 13,400.00	$ 318,652,000
Long Span LRT Bridge	RF	1300.00	$ 22,000.00	$ 28,600,000
				$ -
				$ -
				$ -
10.05 Guideway: Built-up fill		0.00		$ -
None				$ -
				$ -
				$ -
10.06 Guideway: Underground cut & cover		0.00		$ -
None				$ -
				$ -
10.07 Guideway: Underground tunnel		0.00		$ -
None				$ -
				$ -
10.08 Guideway: Retained cut or fill		3700.00		$ 9,600,000
MSE Walls	RF	3700.00	$ 2,600.00	$ 9,620,000
				$ -
				$ -
10.09 Track: Direct fixation		28,780.00		$ 20,700,000
10.04 +10.09	RF	28780.00	$ 720.00	$ 20,721,600
				$ -
				$ -
				$ -
				$ -
10.10 Track: Embedded		17,720.00		$ 16,300,000
10.03	RF	17720.00	$ 920.00	$ 16,302,400
				$ -
				$ -
				$ -
				$ -
10.11 Track: Ballasted				$ 700,000
Ballasted Track	RF	1438.00	$ 460.00	$ 661,480
				$ -
				$ -
				$ -
				$ -
10.12 Track: Special (switches, turnouts)				$ 6,000,000
No. 8 Diamond Double Crossover Power Operated Ballasted	EA	1.00	$ 760,000.00	$ 760,000
No. 8 Diamond Single Crossover Power Operated Embedded	EA	6.00	$ 480,000.00	$ 2,880,000
No. 8 Diamond Single Crossover Power Operated Ballasted	EA	0.00	$ 420,000.00	$ -
No. 8 Diamond Single Crossover Power Operated Fixed	EA	4.00	$ 580,000.00	$ 2,320,000
10.13 Track: Vibration and noise dampening				$ -
None				$ -
				$ -
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)		**7**		**$ 95,300**
20.01 At-grade station, stop, shelter, mall, terminal, platform		4.00		$ 16,600,000
At-grade station, Center Platform		3.00	$ 3,800,000.00	$ 11,400,000
At-grade station, Split Platform		1.00	$ 5,200,000.00	$ 5,200,000
				$ -
				$ -
				$ -
20.02 Aerial station, stop, shelter, mall, terminal, platform		3.00		$ 21,600,000
LRT Station Elevated	EA	3.00	$ 7,200,000.00	$ 21,600,000
				$ -
20.03 Underground station, stop, shelter, mall, terminal, platform		0.00		$ -
None				$ -
				$ -
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.		0.00		$ -
				$ -
				$ -
20.05 Joint development				$ -
				$ -
				$ -
20.06 Automobile parking multi-story structure				$ 54,800,000
	EA		$ 4,000.00	$ -
Parking Lot Structure Stalls	EA	2383.00	$ 23,000.00	$ 54,809,000
				$ -

20.07 Elevators, escalators				$ 2,300,000
Assume 1 Elevator & 2 Escalators Per Aerial Station	EA	9.00	$ 250,000.00	$ 2,250,000
				$ -
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS		44238.00		$ 34,000
30.01 Administration Building: Office, sales, storage, revenue counting				
30.02 Light Maintenance Facility				
30.03 Heavy Maintenance Facility	SF	54000	$ 630	$ 34,020,000
30.04 Storage or Maintenance of Way Building				
30.05 Yard and Yard Track				
40 SITEWORK & SPECIAL CONDITIONS		44238.00		$ 44,318
40.01 Demolition, Clearing, Earthwork				$ 2,700,000
Demlolition, Clearing Within Street		17720.00	$ 150.00	$ 2,658,000
				$ -
				$ -
				$ -
				$ -
40.02 Site Utilities, Utility Relocation		46,500.00		$ 22,900,000
Aerial Guideway	RF	28780.00	$ 440.00	$ 12,663,200
At-Grade Guideway within Street	RF	17720.00	$ 580.00	$ 10,277,600
Relocate 48" DW Line	LF		$ 270.00	$ -
				$ -
				$ -
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments				$ -
Remove Contaminated Soil In ROW	RF		$ 160.00	$ -
				$ -
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks				$ -
Environmental Mitigation Within ROW	RF		$ 70.00	$ -
				$ -
				$ -
				$ -
40.05 Site structures including retaining walls, sound walls				$ 637,920
Soundwalls	RF	0.00	$ 380.00	$ -
Retaining Walls (Assume 20% At Grade Alignment Requires 3' Walls)	RF	3544.00	$ 180.00	$ 637,920
40.06 Pedestrian / bike access and accommodation, landscaping				$ 18,080,000
Bike Path	RF	0.00	$ 280.00	$ -
Landscaping Street Scape, Urban Design Features	RF	45200.00	$ 400.00	$ 18,080,000
				$ -
				$ -
				$ -
40.07 Automobile, bus, van accessways including roads, parking lots				$ -
				$ -
				$ -
				$ -
				$ -
				$ -
				$ -
40.08 Temporary Facilities and other indirect costs during construction				$ -
				$ -
				$ -
50 SYSTEMS		44238.00		$ 108,300
50.01 Train control and signals				$ 19,900,000
Signal Substation & Cables	RF	44238.00	$ 450.00	$ 19,907,100
Ductbank & Pullboxes	RF	44238.00	$ 130.00	$ 5,750,940
50.02 Traffic signals and crossing protection				$ 4,200,000
Major Intersection	EA	4.00	$ 300,000.00	$ 1,200,000
Minor Intersection	EA	15.00	$ 150,000.00	$ 2,250,000
Grade Crossings	EA	0.00	$ 250,000.00	$ -
Areial Intersection	EA	12.00	$ 60,000.00	$ 720,000
				$ -
				$ -
				$ -
				$ -
				$ -
50.03 Traction power supply: substations				$ 21,300,000
Hardware Procurement	RF	44238.00	$ 430.00	$ 19,022,340
Building Installation	RF	44238.00	$ 52.00	$ 2,300,376
				$ -
50.04 Traction power distribution: catenary and third rail				$ 29,300,000
Catenary OCS Pole	RF	44238.00	$ 470.00	$ 20,791,860
Ductbank Pullboxes	RF	44238.00	$ 130.00	$ 5,750,940
OCS Poles Foundations	RF	44238.00	$ 62.00	$ 2,742,756
50.05 Communications				$ 25,200,000
Communications Equipment Installation	RF	44238.00	$ 440.00	$ 19,464,720
Ductbank & Pullboxes	RF	44238.00	$ 130.00	$ 5,750,940
				$ -
50.06 Fare collection system and equipment				$ 6,000,000
Ticket Vending Machines, Total Corridor Length Times Cost Multiplier*	EA	7.00	$ 860,000.00	$ 6,020,000
				$ -
50.07 Central Control				$ 2,400,000
	EA	1.00	$ 2,400,000.00	$ 2,400,000
				$ -
Construction Subtotal (10 - 50)		44238.00		$ 693,118
60 ROW, LAND, EXISTING IMPROVEMENTS		44238.00		$ 159,700
60.01 Purchase or lease of real estate				$ 159,700,000
	SF			$ -
ROW	SF	798713.00	$ 200.00	$ 159,742,600
				$ -
				$ -
				$ -
60.02 Relocation of existing households and businesses				$ -
				$ -
				$ -
				$ -

				$ -
				$ -
70 VEHICLES (number)		**36**		$ 126,000
70.01 Light Rail	EA	36	$ 3,500,000	$ 126,000,000
70.02 Heavy Rail				
70.03 Commuter Rail				
70.04 Bus				$ -
70.05 Other				
70.06 Non-revenue vehicles				
70.07 Spare parts				
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)				$ 200,000
80.01 Preliminary Engineering	20,794	3% 10-50		$ 20,794
80.02 Final Design	48,518	7% 10-50		$ 48,518
80.03 Project Management for Design and Construction	69,312	10% 10-50		$ 69,312
80.04 Construction Administration & Management	34,656	5% 10-50		$ 34,656
80.05 Professional Liability and other Non-Construction Insurance		0% 10-50		
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.	6,931	1% 10-50		$ 6,931
80.07 Surveys, Testing, Investigation, Inspection	13,862	2% 10-50		$ 13,862
80.08 Start up	13,862	1.5% 10-50		$ 13,862
				$ 1,178,818

* All Unit Prices Taken From Expo Phase 2 Cost Estimate

MAIN WORKSHEET-BUILD ALTERNATIVE

(Rev.11, May 2, 2008)

Metro Eastside Phase II

Alternative 3B Beverly, Whittier, Rosemead, Blvd.

Today's Date	8/27/09
Yr of Base Year $	2008
Yr of Revenue Ops	2008

	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)	**9.17**	322,800	69,796	**392,596**	**$ 42,806**	**51%**	**26%**	**392,596**
10.01 Guideway: At-grade exclusive right-of-way	0.27	700.00	175	875	$ 3,286			875
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)	0.00	0.00	0	0				0
10.03 Guideway: At-grade in mixed traffic	4.84	14300.00	3,575	17,875	$ 3,690			17,875
10.04 Guideway: Aerial structure	3.38	252000.00	63,000	315,000	$ 93,229			315,000
10.05 Guideway: Built-up fill	0.00	0.00	0	0				0
10.06 Guideway: Underground cut & cover	0.00	0.00	0	0				0
10.07 Guideway: Underground tunnel	0.00	0.00	0	0				0
10.08 Guideway: Retained cut or fill	0.68	9400.00	2,350	11,750	$ 17,233			11,750
10.09 Track: Direct fixation		15,400	231	15,631				15,631
10.10 Track: Embedded		23,500	353	23,853				23,852
10.11 Track: Ballasted		600	9	609				609
10.12 Track: Special (switches, turnouts)		6,900	104	7,004				7,003
10.13 Track: Vibration and noise dampening		0	0	0				0
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	**7**	95,500	23,875	**119,375**	**$ 17,054**	**16%**	**8%**	**119,375**
20.01 At-grade station, stop, shelter, mall, terminal, platform	6	25600	6,400	32,000	$ 5,333			32,000
20.02 Aerial station, stop, shelter, mall, terminal, platform	1	7200	1,800	9,000	$ 9,000			9,000
20.03 Underground station, stop, shelter, mall, terminal, platform	0	0	0	0				0
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.	0	0	0	0				0
20.05 Joint development		0	0	0				0
20.06 Automobile parking multi-story structure		61,900	15,475	77,375				77,375
20.07 Elevators, escalators		800	200	1,000				1,000
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	9.17	34,000	5,100	**39,100**	**$ 4,263**	**5%**	**3%**	**39,100**
30.01 Administration Building: Office, sales, storage, revenue counting				0				0
30.02 Light Maintenance Facility				0				0
30.03 Heavy Maintenance Facility		34,000	5,100	39,100				39,100
30.04 Storage or Maintenance of Way Building				0				0
30.05 Yard and Yard Track				0				0
40 SITEWORK & SPECIAL CONDITIONS	9.17	47,229	14,169	**61,398**	**$ 6,694**	**8%**	**4%**	**61,398**
40.01 Demolition, Clearing, Earthwork		3,800	1,140	4,940				4,940
40.02 Site Utilities, Utility Relocation		24,300	7,290	31,590				31,590
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments		0	0	0				0
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks		0	0	0				0
40.05 Site structures including retaining walls, sound walls		921	276	1,197				1,197
40.06 Pedestrian / bike access and accommodation, landscaping		18,208	5,462	23,670				23,670
40.07 Automobile, bus, van accessways including roads, parking lots		0	0	0				0
40.08 Temporary Facilities and other indirect costs during construction		0	0	0				0
50 SYSTEMS	9.17	116,600	34,980	**151,580**	**$ 16,527**	**20%**	**10%**	**151,580**
50.01 Train control and signals		26,000	7,800	33,800				33,800
50.02 Traffic signals and crossing protection		5,300	1,590	6,890				6,890
50.03 Traction power supply: substations		21,600	6,480	28,080				28,080
50.04 Traction power distribution: catenary and third rail		29,700	8,910	38,610				38,610
50.05 Communications		25,600	7,680	33,280				33,280
50.06 Fare collection system and equipment		6,000	1,800	7,800				7,800
50.07 Central Control		2,400	720	3,120				3,120
Construction Subtotal (10 - 50)	9.17	616,129	147,920	**764,049**	**$ 83,306**	**100%**	**50%**	**764,048**
60 ROW, LAND, EXISTING IMPROVEMENTS	9.17	196,000	78,400	**274,400**	**$ 29,918**		**18%**	**274,400**
60.01 Purchase or lease of real estate		196,000	78,400	274,400				274,400
60.02 Relocation of existing households and businesses		0	0	0				0
70 VEHICLES (number)	**36**	126,000	6,300	**132,300**	**$ 3,675**		**9%**	**132,300**
70.01 Light Rail	36	126,000	6,300	132,300	$ 3,675			132,300
70.02 Heavy Rail				0				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				0				0
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)	9.17	184,839	25,816	**210,654**	**$ 22,968**	**28%**	**14%**	**210,654**
80.01 Preliminary Engineering		18,484	2,773	21,256				21,256
80.02 Final Design		43,129	6,469	49,598				49,598
80.03 Project Management for Design and Construction		61,613	9,242	70,855				70,855
80.04 Construction Administration & Management		30,806	4,621	35,427				35,427
80.05 Professional Liability and other Non-Construction Insurance				0				0
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.		6,161	678	6,839				6,839
80.07 Surveys, Testing, Investigation, Inspection		12,323	1,848	14,171				14,171
80.08 Start up		12,323	185	12,507				12,507
Subtotal (10 - 80)	9.17	1,122,968	258,435	**1,381,403**	**$ 150,618**		**91%**	**1,381,402**
90 UNALLOCATED CONTINGENCY				**138,140**			**9%**	**138,140**
Subtotal (10 - 90)	9.17			**1,519,543**	**$ 165,679**		**100%**	**1,519,543**
100 FINANCE CHARGES				**0**			**0%**	**0**
Total Project Cost (10 - 100)	9.17			**1,519,543**	**$ 165,679**		**100%**	**1,519,543**

Allocated Contingency as % of Base Yr Dollars w/o Contingency	23.01%
Unallocated Contingency as % of Base Yr Dollars w/o Contingency	12.30%
Total Contingency as % of Base Yr Dollars w/o Contingency	35.31%
Unallocated Contingency as % of Subtotal (10 - 80)	10.00%
YOE Construction Cost per Mile (X000)	$83,306
YOE Total Project Cost per Mile Not Including Vehicles (X000)	$151,254
YOE Total Project Cost per Mile (X000)	$165,679

Alternative 3B Beverly Rosemead Whittier Blvd.

	Unit	Quantity	Unit Cost	Base Year Dollars w/o Contingency (X000)
10 GUIDEWAY & TRACK ELEMENTS (route miles)		**44826.00**		$ 322,800
10.01 Guideway: At-grade exclusive right-of-way		1406.00		$ 700,000
Ballasted Track		1406.00	$ 480.00	$ 674,880
				$ -
				$ -
				$ -
				$ -
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)		0.00		$ -
				$ -
				$ -
				$ -
				$ -
				$ -
10.03 Guideway: At-grade in mixed traffic		25580.00		$ 14,300,000
Embedded Track in Roadway Semi Exclusive R/W	RF	25580.00	$ 560.00	$ 14,324,800
				$ -
				$ -
				$ -
10.04 Guideway: Aerial structure		17840.00		$ 252,000,000
Typical Span*	RF	16340.00	$ 13,400.00	$ 218,956,000
Long Span LRT Bridge	RF	1500.00	$ 22,000.00	$ 33,000,000
				$ -
				$ -
				$ -
10.05 Guideway: Built-up fill		0.00		$ -
None				$ -
				$ -
				$ -
10.06 Guideway: Underground cut & cover		0.00		$ -
None				$ -
				$ -
10.07 Guideway: Underground tunnel		0.00		$ -
None				$ -
				$ -
10.08 Guideway: Retained cut or fill		3600.00		$ 9,400,000
MSE Walls	RF	3600.00	$ 2,600.00	$ 9,360,000
				$ -
				$ -
10.09 Track: Direct fixation		21,440.00		$ 15,400,000
10.04 +10.09	RF	21440.00	$ 720.00	$ 15,436,800
				$ -
				$ -
				$ -
				$ -
10.10 Track: Embedded		25,580.00		$ 23,500,000
10.03	RF	25580.00	$ 920.00	$ 23,533,600
				$ -
				$ -
				$ -
				$ -
10.11 Track: Ballasted				$ 600,000
Ballasted Track	RF	1406.00	$ 460.00	$ 646,760
				$ -
				$ -
				$ -
				$ -
10.12 Track: Special (switches, turnouts)				$ 6,900,000
No. 8 Diamond Double Crossover Power Operated Ballasted	EA	1.00	$ 760,000.00	$ 760,000
No. 8 Diamond Single Crossover Power Operated Embedded	EA	8.00	$ 480,000.00	$ 3,840,000
No. 8 Diamond Single Crossover Power Operated Ballasted	EA	0.00	$ 420,000.00	$ -
No. 8 Diamond Single Crossover Power Operated Fixed	EA	4.00	$ 580,000.00	$ 2,320,000
10.13 Track: Vibration and noise dampening				$ -
None				$ -
				$ -
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)		**7**		**$ 95,500**
20.01 At-grade station, stop, shelter, mall, terminal, platform		6.00		$ 25,600,000
At-grade station, Center Platform		4.00	$ 3,800,000.00	$ 15,200,000
At-grade station, Split Platform		2.00	$ 5,200,000.00	$ 10,400,000
				$ -
				$ -
				$ -
20.02 Aerial station, stop, shelter, mall, terminal, platform		1.00		$ 7,200,000
LRT Station Elevated	EA	1.00	$ 7,200,000.00	$ 7,200,000
				$ -
20.03 Underground station, stop, shelter, mall, terminal, platform		0.00		$ -
None				$ -
				$ -
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.		0.00		$ -
				$ -
				$ -
20.05 Joint development				$ -
				$ -
				$ -
20.06 Automobile parking multi-story structure				$ 61,900,000
			$ 4,000.00	$ -
Parking Lot Structure Stalls	EA	2690.00	$ 23,000.00	$ 61,870,000
				$ -

20.07 Elevators, escalators				$ 800,000
Assume 1 Elevator & 2 Escalators Per Aerial Station	EA	3.00	$ 250,000.00	$ 750,000
				$ -
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS		44826.00		$ 34,000
30.01 Administration Building: Office, sales, storage, revenue counting				
30.02 Light Maintenance Facility				
30.03 Heavy Maintenance Facility	SF	54000	$ 630	$ 34,020,000
30.04 Storage or Maintenance of Way Building				
30.05 Yard and Yard Track				
40 SITEWORK & SPECIAL CONDITIONS		44826.00		$ 47,229
40.01 Demolition, Clearing, Earthwork				$ 3,800,000
Demolition, Clearing Within Street	RF	25580.00	$ 150.00	$ 3,837,000
				$ -
				$ -
				$ -
				$ -
40.02 Site Utilities, Utility Relocation		47,020.00		$ 24,300,000
Aerial Guideway	RF	21440.00	$ 440.00	$ 9,433,600
At-Grade Guideway within Street	RF	25580.00	$ 580.00	$ 14,836,400
				$ -
				$ -
				$ -
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments				$ -
Remove Contaminated Soil In ROW	RF	0.00	$ 160.00	$ -
				$ -
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks				$ -
Environmental Mitigation Within ROW	RF	0.00	$ 70.00	$ -
				$ -
				$ -
				$ -
40.05 Site structures including retaining walls, sound walls				$ 920,880
Soundwalls	RF	0.00	$ 380.00	$ -
Retaining Walls (Assume 20% At Grade Alignment Requires 3' Walls)	RF	5116.00	$ 180.00	$ 920,880
40.06 Pedestrian / bike access and accommodation, landscaping				$ 18,208,000
Landscaping & Bike Path	RF	0.00	$ 280.00	$ -
Landscaping Street Scape, Urban Design Features	RF	45520.00	$ 400.00	$ 18,208,000
				$ -
				$ -
				$ -
40.07 Automobile, bus, van accessways including roads, parking lots				$ -
				$ -
				$ -
				$ -
				$ -
				$ -
				$ -
40.08 Temporary Facilities and other indirect costs during construction				$ -
				$ -
				$ -
50 SYSTEMS		44826.00		$ 116,600
50.01 Train control and signals				$ 26,000,000
Signal Substation & Cables	RF	44826.00	$ 450.00	$ 20,171,700
Ductbank & Pullboxes	RF	44826.00	$ 130.00	$ 5,827,380
50.02 Traffic signals and crossing protection				$ 5,300,000
Major Intersection	EA	7.00	$ 300,000.00	$ 2,100,000
Minor Intersection	EA	19.00	$ 150,000.00	$ 2,850,000
Grade Crossings	EA	0.00	$ 250,000.00	$ -
Areial Intersection	EA	6.00	$ 60,000.00	$ 360,000
				$ -
				$ -
				$ -
				$ -
				$ -
50.03 Traction power supply: substations				$ 21,600,000
Hardware Procurement	RF	44826.00	$ 430.00	$ 19,275,180
Building Installation	RF	44826.00	$ 52.00	$ 2,330,952
				$ -
50.04 Traction power distribution: catenary and third rail				$ 29,700,000
Catenary OCS Pole		44826.00	$ 470.00	$ 21,068,220
Ductbank Pullboxes		44826.00	$ 130.00	$ 5,827,380
OCS Poles Foundations		44826.00	$ 62.00	$ 2,779,212
50.05 Communications				$ 25,600,000
Communications Equipment Installation		44826.00	$ 440.00	$ 19,723,440
Ductbank & Pullboxes		44826.00	$ 130.00	$ 5,827,380
				$ -
50.06 Fare collection system and equipment				$ 6,000,000
Ticket Vending Machines, Total Corridor Length Times Cost Multiplier*	EA	7.00	$ 860,000.00	$ 6,020,000
				$ -
50.07 Central Control				$ 2,400,000
	EA	1.00	$ 2,400,000.00	$ 2,400,000
				$ -
Construction Subtotal (10 - 50)		44826.00		$ 616,129
60 ROW, LAND, EXISTING IMPROVEMENTS		44826.00		$ 196,000
60.01 Purchase or lease of real estate				$ 196,000,000
				$ -
ROW	SF	980135.00	$ 200.00	$ 196,027,000
				$ -
				$ -
				$ -
60.02 Relocation of existing households and businesses				$ -
				$ -
				$ -
				$ -

				$ -
				$ -
70 VEHICLES (number)		**36**		$ 126,000
70.01 Light Rail	EA	36	$ 3,500,000	$ 126,000,000
70.02 Heavy Rail				
70.03 Commuter Rail				
70.04 Bus			$ 450,000	$ -
70.05 Other				
70.06 Non-revenue vehicles				
70.07 Spare parts				
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)		44826.00		$ 200,000
80.01 Preliminary Engineering	18,484	3% 10-50		$ 18,484
80.02 Final Design	43,129	7% 10-50		$ 43,129
80.03 Project Management for Design and Construction	61,613	10% 10-50		$ 61,613
80.04 Construction Administration & Management	30,806	5% 10-50		$ 30,806
80.05 Professional Liability and other Non-Construction Insurance		0% 10-50		
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.	6,161	1% 10-50		$ 6,161
80.07 Surveys, Testing, Investigation, Inspection	12,323	2% 10-50		$ 12,323
80.08 Start up	12,323	1.5% 10-50		$ 12,323
				$ 1,138,129

* All Unit Prices Taken From Expo Phase 2 Cost Estimate

MAIN WORKSHEET-BUILD ALTERNATIVE

(Rev.11, May 2, 2008)

Metro Eastside Phase II

Alternative 5 Washington LRT

Today's Date	8/27/09
Yr of Base Year $	2008
Yr of Revenue Ops	2008

	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**	699,900	164,941	**864,841**	**$ 92,371**	**69%**	**39%**	**864,841**
10.01 Guideway: At-grade exclusive right-of-way	0.00	0.00	0	0				0
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)	0.00	0.00	0	0				0
10.03 Guideway: At-grade in mixed traffic	0.22	600.00	150	750	$ 3,443			750
10.04 Guideway: Aerial structure	8.97	654300.00	163,575	817,875	$ 91,134			817,875
10.05 Guideway: Built-up fill	0.00	0.00	0	0				0
10.06 Guideway: Underground cut & cover	0.00	0.00	0	0				0
10.07 Guideway: Underground tunnel	0.00	0.00	0	0				0
10.08 Guideway: Retained cut or fill	0.17	2300.00	575	2,875	$ 16,867			2,875
10.09 Track: Direct fixation		34,800	522	35,322				35,322
10.10 Track: Embedded		1,100	17	1,117				1,117
10.11 Track: Ballasted		0	0	0				0
10.12 Track: Special (switches, turnouts)		6,800	102	6,902				6,902
10.13 Track: Vibration and noise dampening		0	0	0				0
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	**6**	111,800	27,950	**139,750**	**$ 23,292**	**11%**	**6%**	**139,750**
20.01 At-grade station, stop, shelter, mall, terminal, platform	0	0	0	0				0
20.02 Aerial station, stop, shelter, mall, terminal, platform	6	43200	10,800	54,000	$ 9,000			54,000
20.03 Underground station, stop, shelter, mall, terminal, platform	0	0	0	0				0
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.	0	0	0	0				0
20.05 Joint development		0	0	0				0
20.06 Automobile parking multi-story structure		64,100	16,025	80,125				80,125
20.07 Elevators, escalators		4,500	1,125	5,625				5,625
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	9.36	23,600	3,540	**27,140**	**$ 2,899**	**2%**	**1%**	**27,140**
30.01 Administration Building: Office, sales, storage, revenue counting				0				0
30.02 Light Maintenance Facility				0				0
30.03 Heavy Maintenance Facility		23,600	3,540	27,140				27,140
30.04 Storage or Maintenance of Way Building				0				0
30.05 Yard and Yard Track				0				0
40 SITEWORK & SPECIAL CONDITIONS	9.36	41,040	12,312	**53,352**	**$ 5,698**	**4%**	**2%**	**53,352**
40.01 Demolition, Clearing, Earthwork		200	60	260				260
40.02 Site Utilities, Utility Relocation		21,900	6,570	28,470				28,470
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments				0				0
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks				0				0
40.05 Site structures including retaining walls, sound walls		40	12	52				52
40.06 Pedestrian / bike access and accommodation, landscaping		18,900	5,670	24,570				24,570
40.07 Automobile, bus, van accessways including roads, parking lots				0				0
40.08 Temporary Facilities and other indirect costs during construction				0				0
50 SYSTEMS	9.36	125,000	37,500	**162,500**	**$ 17,356**	**13%**	**7%**	**162,500**
50.01 Train control and signals		28,200	8,460	36,660				36,660
50.02 Traffic signals and crossing protection		6,000	1,800	7,800				7,800
50.03 Traction power supply: substations		23,400	7,020	30,420				30,420
50.04 Traction power distribution: catenary and third rail		32,100	9,630	41,730				41,730
50.05 Communications		27,700	8,310	36,010				36,010
50.06 Fare collection system and equipment		5,200	1,560	6,760				6,760
50.07 Central Control		2,400	720	3,120				3,120
Construction Subtotal (10 - 50)	9.36	1,001,340	246,243	**1,247,583**	**$ 133,250**	**100%**	**56%**	**1,247,583**
60 ROW, LAND, EXISTING IMPROVEMENTS	9.36	255,600	102,240	**357,840**	**$ 38,220**		**16%**	**357,840**
60.01 Purchase or lease of real estate		255,600	102,240	357,840				357,840
60.02 Relocation of existing households and businesses				0				0
70 VEHICLES (number)	**25**	87,500	4,375	**91,875**	**$ 3,675**		**4%**	**91,875**
70.01 Light Rail	25	87,500	4,375	91,875	$ 3,675			91,875
70.02 Heavy Rail				0				0
70.03 Commuter Rail				0				0
70.04 Bus	0	0	0	0				0
70.05 Other				0				0
70.06 Non-revenue vehicles				0				0
70.07 Spare parts				0				0
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)	9.36	300,402	41,956	**342,358**	**$ 36,566**	**27%**	**15%**	**342,357**
80.01 Preliminary Engineering		30,040	4,506	34,546				34,546
80.02 Final Design		70,094	10,514	80,608				80,608
80.03 Project Management for Design and Construction		100,134	15,020	115,154				115,154
80.04 Construction Administration & Management		50,067	7,510	57,577				57,577
80.05 Professional Liability and other Non-Construction Insurance				0				0
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.		10,013	1,101	11,115				11,115
80.07 Surveys, Testing, Investigation, Inspection		20,027	3,004	23,031				23,031
80.08 Start up		20,027	300	20,327				20,327
Subtotal (10 - 80)	9.36	1,644,842	394,814	**2,039,656**	**$ 217,849**		**91%**	**2,039,655**
90 UNALLOCATED CONTINGENCY				**203,966**			**9%**	**203,965**
Subtotal (10 - 90)	9.36			**2,243,621**	**$ 239,634**		**100%**	**2,243,620**
100 FINANCE CHARGES				**0**			**0%**	**0**
Total Project Cost (10 - 100)	9.36			**2,243,621**	**$ 239,634**		**100%**	**2,243,620**

Allocated Contingency as % of Base Yr Dollars w/o Contingency	24.00%
Unallocated Contingency as % of Base Yr Dollars w/o Contingency	12.40%
Total Contingency as % of Base Yr Dollars w/o Contingency	36.40%
Unallocated Contingency as % of Subtotal (10 - 80)	10.00%
YOE Construction Cost per Mile (X000)	$133,250
YOE Total Project Cost per Mile Not Including Vehicles (X000)	$229,821
YOE Total Project Cost per Mile (X000)	$239,634

Alternative 5 Washington LRT

	Unit	Quantity	Unit Cost	Base Year Dollars w/o Contingency (X000)
10 GUIDEWAY & TRACK ELEMENTS (route miles)		**48535.00**		$ 699,900
10.01 Guideway: At-grade exclusive right-of-way		0.00		$ -
Ballasted Track		0.00	$ 480.00	$ -
				$ -
				$ -
				$ -
				$ -
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)		0.00		$ -
				$ -
				$ -
				$ -
				$ -
				$ -
10.03 Guideway: At-grade in mixed traffic		1150.00		$ 600,000
Embedded Track in Roadway Semi Exclusive R/W	RF	1150.00	$ 560.00	$ 644,000
				$ -
				$ -
				$ -
10.04 Guideway: Aerial structure		47385.00		$ 654,300,000
Typical Span*	RF	45135.00	$ 13,400.00	$ 604,809,000
Long Span LRT Bridge	RF	2250.00	$ 22,000.00	$ 49,500,000
				$ -
				$ -
				$ -
10.05 Guideway: Built-up fill		0.00		$ -
None				$ -
				$ -
				$ -
10.06 Guideway: Underground cut & cover		0.00		$ -
None				$ -
				$ -
10.07 Guideway: Underground tunnel		0.00		$ -
None				$ -
				$ -
10.08 Guideway: Retained cut or fill		900.00		$ 2,300,000
MSE Walls	RF	900.00	$ 2,600.00	$ 2,340,000
				$ -
				$ -
10.09 Track: Direct fixation		48,285.00		$ 34,800,000
10.04 +10.09	RF	48285.00	$ 720.00	$ 34,765,200
				$ -
				$ -
				$ -
				$ -
10.10 Track: Embedded		1,150.00		$ 1,100,000
10.03	RF	1150.00	$ 920.00	$ 1,058,000
				$ -
				$ -
				$ -
				$ -
10.11 Track: Ballasted				$ -
Ballasted Track	RF	0.00	$ 460.00	$ -
				$ -
				$ -
				$ -
				$ -
10.12 Track: Special (switches, turnouts)				$ 6,800,000
No. 8 Diamond Double Crossover Fixed	EA	1.00	$ 980,000.00	$ 980,000
No. 8 Diamond Single Crossover Fixed	EA	10.00	$ 580,000.00	$ 5,800,000
				$ -
10.13 Track: Vibration and noise dampening				$ -
None				$ -
				$ -
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)		**6**		**$ 111,800**
20.01 At-grade station, stop, shelter, mall, terminal, platform		0.00		$ -
				$ -
				$ -
				$ -
				$ -
				$ -
20.02 Aerial station, stop, shelter, mall, terminal, platform		6.00		$ 43,200,000
LRT Station Elevated	EA	6.00	$ 7,200,000.00	$ 43,200,000
				$ -
20.03 Underground station, stop, shelter, mall, terminal, platform		0.00		$ -
None				$ -
				$ -
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.		0.00		$ -
				$ -
				$ -
20.05 Joint development				$ -
				$ -
				$ -
20.06 Automobile parking multi-story structure				$ 64,100,000
		500.00	$ 4,000.00	$ 2,000,000
Parking Lot Structure Stalls	EA	2702.00	$ 23,000.00	$ 62,146,000
				$ -

20.07 Elevators, escalators				$ 4,500,000
Assume 1 Elevator & 2 Escalators Per Aerial Station	EA	18.00	$ 250,000.00	$ 4,500,000
				$ -
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS		48535.00		$ 23,600
30.01 Administration Building: Office, sales, storage, revenue counting				
30.02 Light Maintenance Facility				
30.03 Heavy Maintenance Facility	SF	37500	$ 630	$ 23,625,000
30.04 Storage or Maintenance of Way Building				
30.05 Yard and Yard Track				
40 SITEWORK & SPECIAL CONDITIONS		48535.00		$ 41,040
40.01 Demolition, Clearing, Earthwork				$ 200,000
Demolition, Clearing Within Street	RF	1150.00	$ 150.00	$ 172,500
				$ -
				$ -
				$ -
				$ -
40.02 Site Utilities, Utility Relocation		49,435.00		$ 21,900,000
Aerial Guideway	RF	48285.00	$ 440.00	$ 21,245,400
At-Grade Guideway within Street	RF	1150.00	$ 580.00	$ 667,000
				$ -
				$ -
				$ -
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments				$ -
Remove Contaminated Soil In ROW	RF		$ 160.00	$ -
				$ -
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks				$ -
Environmental Mitigation Within ROW	RF		$ 70.00	$ -
				$ -
				$ -
				$ -
40.05 Site structures including retaining walls, sound walls				$ 40,000
				$ -
Retaining Walls (Assume 20% At Grade Alignment Requires 3' Walls)	RF	230.00	$ 180.00	$ 41,400
40.06 Pedestrian / bike access and accommodation, landscaping				$ 18,900,000
				$ -
Landscaping Street Scape, Urban Design Features	RF	47185.00	$ 400.00	$ 18,874,000
				$ -
				$ -
				$ -
40.07 Automobile, bus, van accessways including roads, parking lots				$ -
				$ -
				$ -
				$ -
				$ -
				$ -
				$ -
40.08 Temporary Facilities and other indirect costs during construction				$ -
				$ -
				$ -
50 SYSTEMS		48535.00		$ 125,000
50.01 Train control and signals				$ 28,200,000
Signal Substation & Cables	RF	48535.00	$ 450.00	$ 21,840,750
Ductbank & Pullboxes	RF	48535.00	$ 130.00	$ 6,309,550
50.02 Traffic signals and crossing protection				$ 6,000,000
Major Intersection	EA	1.00	$ 300,000.00	$ 300,000
Minor Intersection	EA	1.00	$ 150,000.00	$ 150,000
Aerial Intersection	EA	22.00	$ 250,000.00	$ 5,500,000
				$ -
				$ -
				$ -
				$ -
				$ -
				$ -
50.03 Traction power supply: substations				$ 23,400,000
Hardware Procurement	RF	48535.00	$ 430.00	$ 20,870,050
Building Installation	RF	48535.00	$ 52.00	$ 2,523,820
				$ -
50.04 Traction power distribution: catenary and third rail				$ 32,100,000
Catenary OCS Pole	RF	48535.00	$ 470.00	$ 22,811,450
Ductbank Pullboxes	RF	48535.00	$ 130.00	$ 6,309,550
OCS Poles Foundations	RF	48535.00	$ 62.00	$ 3,009,170
50.05 Communications				$ 27,700,000
Communications Equipment Installation	RF	48535.00	$ 440.00	$ 21,355,400
Ductbank & Pullboxes	RF	48535.00	$ 130.00	$ 6,309,550
				$ -
50.06 Fare collection system and equipment				$ 5,200,000
Ticket Vending Machines, Total Corridor Length Times Cost Multiplier*	EA	6.00	$ 860,000.00	$ 5,160,000
				$ -
50.07 Central Control				$ 2,400,000
	EA	1.00	$ 2,400,000.00	$ 2,400,000
				$ -
Construction Subtotal (10 - 50)		48535.00		$ 1,001,340
60 ROW, LAND, EXISTING IMPROVEMENTS		48535.00		$ 255,600
60.01 Purchase or lease of real estate				$ 255,600,000
ROW	SF	1278190.00	$ 200.00	$ 255,638,000
				$ -
				$ -
				$ -
60.02 Relocation of existing households and businesses				$ -
				$ -
				$ -
				$ -

				$ -
				$ -
70 VEHICLES (number)		**25**		$ 87,500
70.01 Light Rail	EA	25	$ 3,500,000	$ 87,500,000
70.02 Heavy Rail				
70.03 Commuter Rail				
70.04 Bus			$ 450,000	$ -
70.05 Other				
70.06 Non-revenue vehicles				
70.07 Spare parts				
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)		48535.00		$ 300,000
80.01 Preliminary Engineering	30,040	3% 10-50		$ 30,040
80.02 Final Design	70,094	7% 10-50		$ 70,094
80.03 Project Management for Design and Construction	100,134	10% 10-50		$ 100,134
80.04 Construction Administration & Management	50,067	5% 10-50		$ 50,067
80.05 Professional Liability and other Non-Construction Insurance		0% 10-50		
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.	10,013	1% 10-50		$ 10,013
80.07 Surveys, Testing, Investigation, Inspection	20,027	2% 10-50		$ 20,027
80.08 Start up	20,027	1.5% 10-50		$ 20,027
				$ 1,644,440

* All Unit Prices Taken From Expo Phase 2 Cost Estimate

APPENDIX D:

Preliminary Operating Plan Technical Memorandum

Eastside Transit Corridor Phase 2
Preliminary Operating Plan Technical Memorandum

Prepared By: HDR Engineering, Inc.

INTRODUCTION

In 2007, the Los Angeles County Metropolitan Transportation Authority (Metro) initiated the Eastside Transit Corridor Phase 2 Alternatives Analysis (AA) process to evaluate alternatives for the second phase of the Metro Gold Line Eastside Extension currently under construction and anticipated to be operational in 2009. The AA Report, completed in January 2009, provided a detailed overview of the Study Area's transportation needs and how they would be served by each of the five proposed Refined Alternatives under consideration at the time. In January 2009, the Metro Board approved four Final Alternatives for further study.

This technical memorandum is an update the Preliminary Operating Plan Technical Memorandum (dated October 15, 2008) developed for the AA phase. This report will cover the approach in developing the operating and maintenance (O&M) cost methodology to estimate the potential costs for each alternative and the operating and maintenance cost results.

OPERATING ASSUMPTIONS AND PLANS

This technical memorandum documents general operating assumptions and plans for each of the Eastside Transit Corridor Phase 2 alternatives based on service levels projected for Year 2030. These assumptions include: operating agency, span of service, vehicle capacity/loading standards, vehicle performance, and station dwell times. The operating plans include station-to-station run time estimates and operating requirements for each build alternative.

Operating Assumptions

Existing transit services in the Eastside Transit Corridor Phase 2 study area are operated by Metro, Montebello Bus Lines, Norwalk Transit System, Monterey Park Spirit Bus and Foothill Transit Zone. Metro provides local and express bus service throughout the study area. The other transit providers offer local bus service in municipalities where the Eastside Transit Corridor Phase 2 extension would operate.

Metro is assumed to be the operating agency for the proposed extension that would connect to Phase 1 of the Metro Gold Line Eastside Extension currently under construction.

Span of Service

The span of service for the proposed light rail transit (LRT) alternatives will be comparable to the weekday, Saturday and Sunday and holiday schedules for current Gold Line schedules, respectively. Table 1 below, summarizes the assumed span of service.

Table 1 METRO LRT Span of Service

DAY OF WEEK	TIME PERIOD	HOURS
Monday-Sunday	Early AM	4:00 - 6:30 a.m.
	AM Peak Period	6:30 - 8:30 a.m.
	Midday	8:30 a.m. - 4:00 p.m.
	PM Peak Period	4:00 – 7:00 p.m.
	Early Evening	7:00 - 8:00 p.m.
	Late Evening	8:00 p.m. - 1:30 a.m.

Service Frequency

Table 2 below, summarizes the assumed service frequency.

Table 2 METRO LRT Service Frequency

DAY OF WEEK	FREQUENCY	HOURS
Weekdays	5 minutes	6:30 - 8:30 a.m., 4:00 – 7:00 p.m.
	10 minutes	8:30 a.m. - 4:00 p.m., 7:00 - 8:00 p.m.
	15 minutes	4:00 - 6:30 a.m., 8:00 p.m. - 1:30 a.m.
Saturday & Sunday	10 minutes	9:00 a.m.– 6:30 p.m.
	15 minutes	7:00 - 9:00 a.m., 6:30 - 7:30 p.m.
	20 minutes	4:00 – 7:00 a.m., 7:30 p.m. – 1:00 a.m.

The assumed service frequencies for LRT operations are based on Metro's Draft 2008 Long Range Transportation Plan criteria.

Vehicle Capacity and Passenger Load Standards

Vehicle capacity and passenger loading standards have been established in order to determine the service frequency and fleet requirements for each of the LRT alternatives. Table 3 summarizes the assumed vehicle capacity (seats) and passenger loading standards for all modes.

Table 3 Vehicle Capacity and Peak Hour Passenger Loading Standards

TRANSIT MODE	SEATS	LOAD STANDARD
LRT	76	190% of seats (a)

(a) Metro load factor

The above load standards were used to determine the appropriate peak hour service frequency for the project alternatives. The projected AM or PM peak hour maximum line loads can be divided by the load standard (e.g., 76 * 1.90 = 144 for LRT) to determine the peak hour throughput required for that route. During off-peak hours, the load standard for all modes will be a maximum of 100 percent (i.e., no standees).

Metro's current load factor standard for LRT = 190% of seated load (144 passengers per light rail vehicle) applied to the peak hour, peak direction maximum load point. However, Metro is expected to reduce its load factor to 175% standard due to overcrowding and increased incidence of wheelchairs, bicycles and strollers. A standard of 190% of seated load will be applied for the Eastside Transit Corridor Phase 2 project based on the load factor that is currently adopted by Metro.

The train consist expected for the design year is based on Metro's expectation for 3-car trains to meet service requirements by Year 2030. Three-car trains will be operated for all weekday and weekend service periods. Metro anticipates, as part of revenue service, a need for a 3-car gap train at each end of the alignment ready to pull into service as a result of a late train and one 3-car train as a maintenance spare due to a failure of a vehicle to operate in service.

Vehicle Performance

LRT vehicles are assumed to have a normal service maximum acceleration rate of about 2.5 miles per hour per second (mphps) from 0 and 30 miles per hour (mph), decreasing to an average acceleration rate of 1.0 mphps from 0 to 65 mph. Normal service braking is assumed to be a constant 2.5 mphps from 65 mph to 0 mph. LRT vehicles are assumed to have a maximum speed of 65 mph. However, sections of the alignment will have speed restrictions due to horizontal and vertical curves and station spacing. Station-to-station LRT time estimates have been developed based on these criteria and are included below.

Station Dwell Times and End-of-Line Layovers

The average station dwell times (i.e., time to allow passengers to board and alight the transit vehicle) for the LRT alternatives are assumed to be 20 seconds at all of the proposed stations, not including the end of line station.

Transit operations plans will include time for end-of-line layovers. Layovers will provide sufficient time for drivers to take breaks as required by union agreement as well as provide for schedule recovery (i.e., a late train can "catch up" to its schedule). Operations plans will include layovers at least 5 minutes for LRT at each end-of-line station. Metro currently uses drop-back operators at most terminal stations for rail operations.

Average Intersection Delay

The average intersection delay assumes a comparable level of signal priority for LRT operations for at-grade alignments. Non-signalized intersections, driveways and other crossings will be signal or gate-controlled and no delay will be incurred. Average intersection delay for existing minor signalized intersections (i.e. major collectors and minor arterials) are assumed to be between 10 seconds, while a 30 second delay is assumed at major arterial intersections.

Operating Plans

Operating plans were developed for the following alternatives:

- State Route(SR)60 LRT
- Beverly Boulevard LRT
- Beverly/Whittier Boulevards LRT(Rosemead and Montebello Boulevards options)
- Washington Boulevard LRT

One-Way Run Time Estimates

Table 4 SR-60 LRT Station-to-Station Run Times

Station		Speed (mph)	Distance (miles) Increment	Distance (miles) Total	Run Time (hr:min:sec)	Delay Time (hr:min:sec)	Dwell Time (hr:min:sec)	Total Time (hr:min:sec)
East 3rd / Atlantic / Pomona				0.00			00:00:20	00:00:20
		35	0.55		00:01:04	00:00:20		
	At-Grade to Aerial			0.55			00:00:00	00:01:44
		55	0.93		00:01:23	00:00:00		
Route 60 east of Garfield				1.48			00:00:20	00:03:27
		45	2.31		00:03:27	00:00:00		
Route 60 at Paramount				3.79			00:00:20	00:07:14
		45	2.39		00:03:33	00:00:00		
Route 60 at Santa Anita				6.18			00:00:20	00:11:07
		55	0.74		00:01:21	00:00:00		
Route 60 at Peck				6.92			00:00:00	00:12:28
				6.92	**00:10:48**	**00:00:20**	**00:01:20**	**00:12:28**
						Avg. Speed =	33.3	mph
						Avg. Station Spacing=	1.4	miles

a) Run-times based on one-way travel.

Table 5 Beverly Boulevard LRT Station-to-Station Run Times

Station		Max. Speed (mph)	Distance (miles) Location	Increment	Total	Run Time (hr:min:sec)	Delay Time (hr:min:sec)	Dwell Time (hr:min:sec)	Total Time (hr:min:sec)
Atlantic			1000.00		0.00			00:00:20	00:00:20
		35		0.38		00:00:47	00:00:20		
	At-Grade to Aerial		3000.00		0.38			00:00:00	00:01:27
		40		0.98		00:01:31	00:00:00		
	TS (R=250.00')		8158.04		1.36			00:00:00	00:02:58
	Curve 1	20		0.05		00:00:09	00:00:00		
	ST		8423.92		1.41			00:00:00	00:03:07
		20		0.04		00:00:12	00:00:00		
Garfield			8648.92		1.45			00:00:20	00:03:39
		25		0.05		00:00:12	00:00:00		
	TS (R=400.00')		8891.11		1.49			00:00:00	00:03:51
	Curve 2	25		0.02		00:00:03	00:00:00		
	ST		8992.18		1.51			00:00:00	00:03:54
		40		0.66		00:01:03	00:00:00		
	TS (R=300.00')		12495.67		2.18			00:00:00	00:04:57
	Curve 3	25		0.10		00:00:14	00:00:00		
	ST		13017.17		2.28			00:00:00	00:05:11
		35		0.13		00:00:15	00:00:00		
	At-Grade to Aerial		13700.00		2.41			00:00:00	00:05:26
		35		0.51		00:00:59	00:00:10		
Wilcox			16385.32		2.91			00:00:20	00:06:55
		35		1.00		00:01:58	00:01:00		
Montebello			21668.94		3.91			00:00:20	00:10:13
		35		1.51		00:02:50	00:01:30		
Rosemead			29650.44		5.43			00:00:20	00:14:53
		35		0.39		00:00:48	00:00:30		
	Aerial to At-Grade		31700.00		5.81			00:00:00	00:16:11
		35		0.11		00:00:12	00:00:10		
	TS (R=450.00')		32286.35		5.93			00:00:00	00:16:33
	Curve 4	25		0.02		00:00:03	00:00:00		
	ST		32388.70		5.94			00:00:00	00:16:36
		25		0.03		00:00:04	00:00:00		
	TS (R=450.00')		32529.20		5.97			00:00:00	00:16:40
	Curve 5	25		0.02		00:00:03	00:00:00		
	ST		32630.55		5.99			00:00:00	00:16:43
		25		0.22		00:00:32	00:00:00		
	TS (R=450.00')		33795.59		6.21			00:00:00	00:17:15
	Curve 6	25		0.06		00:00:08	00:00:00		
	ST		34097.31		6.27			00:00:00	00:17:23
		35		0.23		00:00:25	00:00:00		
	Aerial to At-Grade		35300.00		6.50			00:00:00	00:17:48
		35		0.76		00:01:25	00:00:00		
Norwalk			39289.94		7.25			00:00:20	00:19:33
		35		0.70		00:01:27	00:00:00		
Broadway			42996.00		7.95			00:00:20	00:21:20
		35		0.62		00:01:18	00:00:00		
Philadelphia			46257.28		8.57			00:00:20	00:22:58
		35		0.21		00:00:30	00:00:00		
	TS (R=500.00')		47375.63		8.78			00:00:00	00:23:28
	Curve 7	30		0.05		00:00:05	00:00:00		
	ST		47616.84		8.83			00:00:00	00:23:33
		35		0.10		00:00:11	00:00:00		
	TS (R=500.00')		48136.76		8.93			00:00:00	00:23:44
	Curve 8	30		0.05		00:00:08	00:00:00		
	ST		48389.43		8.98			00:00:00	00:23:52
		10		0.01		00:00:06	00:00:00		
Mar Vista			48450.00		8.99			00:00:00	00:23:58
					8.99	**00:17:38**	**00:03:40**	**00:02:40**	**00:23:58**
							Avg. Speed =	22.5	mph
							Avg. Station Spacing=	1.1	miles

a) Run-times based on one-way travel.

Table 6 Beverly/Whittier Boulevards LRT (Rosemead Boulevard Option) Station-to-Station Run Times

Station		Max. Speed (mph)	Distance (miles) Location	Increment	Total	Run Time (hr:min:sec)	Delay Time (hr:min:sec)	Dwell Time (hr:min:sec)	Total Time (hr:min:sec)
Atlantic			1000.00		0.00			00:00:20	00:00:20
		35		0.38		00:00:47	00:00:20		
	At-Grade to Aerial		3000.00		0.38			00:00:00	00:01:27
		40		0.98		00:01:31	00:00:00		
	TS (R=250.00')		8158.04		1.36			00:00:00	00:02:58
	Curve 1	20		0.05		00:00:09	00:00:00		
	ST		8423.92		1.41			00:00:00	00:03:07
		20		0.04		00:00:12	00:00:00		
Garfield			8648.92		1.45			00:00:20	00:03:39
		25		0.05		00:00:12	00:00:00		
	TS (R=400.00')		8891.11		1.49			00:00:00	00:03:51
	Curve 2	25		0.02		00:00:03	00:00:00		
	ST		8992.18		1.51			00:00:00	00:03:54
		40		0.66		00:01:03	00:00:00		
	TS (R=300.00')		12495.67		2.18			00:00:00	00:04:57
	Curve 3	25		0.10		00:00:14	00:00:00		
	ST		13017.17		2.28			00:00:00	00:05:11
		35		0.28		00:00:30	00:00:00		
	Aerial to At-Grade		14500.00		2.56			00:00:00	00:05:41
		35		0.38		00:00:46	00:00:10		
Wilcox			16520.32		2.94			00:00:20	00:06:57
		35		0.98		00:01:56	00:01:00		
Montebello			21703.23		3.92			00:00:20	00:10:13
		35		1.40		00:02:38	00:01:30		
Rosemead/Beverly			29079.31		5.32			00:00:20	00:14:41
		10		0.08		00:00:32	00:00:30		
	TS (R=150.00')		29515.40		5.40			00:00:00	00:15:43
	Curve 4	10		0.04		00:00:15	00:00:00		
	ST		29734.31		5.44			00:00:00	00:15:58
		35		0.32		00:00:37	00:00:00		
	Aerial to At-Grade		31400.00		5.76			00:00:00	00:16:35
		40		0.29		00:00:32	00:00:00		
	TS (R=150.00')		32950.34		6.05			00:00:00	00:17:07
	Curve 5	10		0.04		00:00:14	00:00:00		
	ST		33141.38		6.09			00:00:00	00:17:21
		5		0.00		00:00:03	00:00:00		
Rosemead/Whittier			33157.15		6.09			00:00:20	00:17:44
		40		1.05		00:01:45	00:00:00		
	Aerial to At-Grade		38700.00		7.14			00:00:00	00:19:29
		35		0.24		00:00:31	00:00:10		
Norwalk			39951.68		7.38			00:00:20	00:20:30
		35		1.53		00:02:46	00:01:00		
	TS (R=350.00')		48032.12		8.91			00:00:00	00:24:16
	Curve 6	20		0.13		00:00:23	00:00:00		
	ST		48696.70		9.03			00:00:00	00:24:39
		20		0.04		00:00:07	00:00:00		
	TS (R=350.00')		48902.28		9.07			00:00:00	00:24:46
	Curve 7	20		0.02		00:00:04	00:00:00		
	ST		49002.99		9.09			00:00:00	00:24:50
		10		0.01		00:00:05	00:00:00		
Mar Vista			49041.26		9.10			00:00:00	00:24:55
					9.10	**00:17:55**	**00:04:40**	**00:02:20**	**00:24:55**
							Avg. Speed =	21.9	mph
							Avg. Station Spacing=	1.3	miles

a) Run-times based on one-way travel.

Table 7 Beverly/Whittier Boulevards LRT (Montebello Boulevard Option) Station-to-Station Run Times

Station		Max. Speed (mph)	Distance (miles) Location	Increment	Total	Run Time (hr:min:sec)	Delay Time (hr:min:sec)	Dwell Time (hr:min:sec)	Total Time (hr:min:sec)
Atlantic			1000.00		0.00			00:00:20	00:00:20
		35		0.38		00:00:47	00:00:20		
	At-Grade to Aerial		3000.00		0.38			00:00:00	00:01:27
		40		0.98		00:01:31	00:00:00		
	TS (R=250.00')		8158.04		1.36			00:00:00	00:02:58
	Curve 1	20		0.05		00:00:09	00:00:00		
	ST		8423.92		1.41			00:00:00	00:03:07
		20		0.04		00:00:12	00:00:00		
Garfield			8648.92		1.45			00:00:20	00:03:39
		25		0.05		00:00:12	00:00:00		
	TS (R=400.00')		8891.11		1.49			00:00:00	00:03:51
	Curve 2	25		0.02		00:00:03	00:00:00		
	ST		8992.18		1.51			00:00:00	00:03:54
		40		0.66		00:01:03	00:00:00		
	TS (R=300.00')		12495.67		2.18			00:00:00	00:04:57
	Curve 3	25		0.10		00:00:14	00:00:00		
	ST		13017.17		2.28			00:00:00	00:05:11
		35		0.28		00:00:30	00:00:00		
	Aerial to At-Grade		14500.00		2.56			00:00:00	00:05:41
		35		0.38		00:00:46	00:00:10		
Wilcox			16520.32		2.94			00:00:20	00:06:57
		35		0.95		00:01:52	00:01:00		
Beverly Montebello			21526.88		3.89			00:00:20	00:10:09
		10		0.01		00:00:05	00:00:30		
	TS (R=150.00')		21565.16		3.89			00:00:00	00:10:44
	Curve 4	10		0.04		00:00:16	00:00:00		
	ST		21801.06		3.94			00:00:00	00:11:00
		35		0.21		00:00:26	00:00:00		
	At-Grade to Aerial		22899.68		4.15			00:00:00	00:11:26
		35		0.25		00:00:29	00:00:00		
	TS (R=100.00')		24227.31		4.40			00:00:00	00:11:55
	Curve 5	10		0.03		00:00:11	00:00:00		
	ST		24387.39		4.43			00:00:00	00:12:06
		10		0.10		00:00:36	00:00:00		
Whittier Montebello			24892.39		4.53			00:00:20	00:13:02
		35		0.54		00:01:04	00:00:00		
	TS (R=500.00')		27733.65		5.06			00:00:00	00:14:06
	Curve 6	20		0.02		00:00:04	00:00:00		
	ST		27840.43		5.08			00:00:00	00:14:10
		20		0.02		00:00:03	00:00:00		
	TS (R=500.00')		27942.49		5.10			00:00:00	00:14:13
	Curve 7	20		0.02		00:00:04	00:00:00		
	ST		28049.27		5.12			00:00:00	00:14:17
		35		0.93		00:01:45	00:00:00		
Rosemead			32960.01		6.05			00:00:20	00:16:22
		45		1.09		00:01:40	00:00:00		
	Aerial to At-Grade		38700.00		7.14			00:00:00	00:18:02
		45		0.20		00:00:25	00:00:10		
Norwalk			39754.54		7.34			00:00:20	00:18:57
		35		1.57		00:02:49	00:01:00		
	TS (R=350.00')		48032.12		8.91			00:00:00	00:22:46
	Curve 8	20		0.02		00:00:03	00:00:00		
	ST		48132.83		8.93			00:00:00	00:22:49
		20		0.02		00:00:04	00:00:00		
	TS (R=350.00')		48238.41		8.95			00:00:00	00:22:53
	Curve 9	20		0.02		00:00:03	00:00:00		
	ST		48339.11		8.97			00:00:00	00:22:56
		20		0.10		00:00:21	00:00:00		
Mar Vista			48844.11		9.06			00:00:00	00:23:17
					9.06	**00:17:47**	**00:03:10**	**00:02:20**	**00:23:17**
							Avg. Speed =	23.4	mph
							Avg. Station Spacing=	1.3	miles

a) Run-times based on one-way travel.

Table 8 Washington Boulevard LRT Station-to-Station Run Times

Station		Max. Speed (mph)	Distance (miles) Location	Increment	Total	Run Time (hr:min:sec)	Delay Time (hr:min:sec)	Dwell Time (hr:min:sec)	Total Time (hr:min:sec)
Atlantic			1000.00		0.00			00:00:20	00:00:20
		35		0.38		00:00:47	00:00:20		
	At-Grade to Aerial		3000.00		0.38			00:00:00	00:01:27
		40		0.98		00:01:31	00:00:00		
	TS (R=250.00')		8158.04		1.36			00:00:00	00:02:58
	Curve 1	20		0.05		00:00:09	00:00:00		
	ST		8423.92		1.41			00:00:00	00:03:07
		20		0.05		00:00:10	00:00:00		
Garfield			8714.29		1.46			00:00:20	00:03:37
		20		0.03		00:00:10	00:00:00		
	TS (R=350.00')		8879.23		1.49			00:00:00	00:03:47
	Curve 2	20		0.02		00:00:03	00:00:00		
	ST		8964.17		1.51			00:00:00	00:03:50
		40		1.16		00:01:49	00:00:00		
	TS (R=500.00')		15082.12		2.67			00:00:00	00:05:39
	Curve 3	30		0.11		00:00:13	00:00:00		
	ST		15676.11		2.78			00:00:00	00:05:52
		30		0.05		00:00:13	00:00:00		
Whittier			15964.25		2.83			00:00:20	00:06:25
		55		0.97		00:01:29	00:00:00		
	TS (R=450.00')		21110.78		3.81			00:00:00	00:07:54
	Curve 4	25		0.13		00:00:19	00:00:00		
	ST		21812.99		3.94			00:00:00	00:08:13
		55		0.75		00:01:14	00:00:00		
Greenwood			25768.34		4.69			00:00:20	00:09:47
		55		0.47		00:00:56	00:00:00		
	TS (R=550.00')		28249.88		5.16			00:00:00	00:10:43
	Curve 5	25		0.01		00:00:02	00:00:00		
	ST		28323.67		5.17			00:00:00	00:10:45
		25		0.02		00:00:03	00:00:00		
	TS (R=350.00')		28433.25		5.20			00:00:00	00:10:48
	Curve 6	25		0.02		00:00:04	00:00:00		
	ST		28563.67		5.22			00:00:00	00:10:52
		55		0.94		00:01:27	00:00:00		
Rosemead			33525.57		6.16			00:00:20	00:12:39
		55		1.70		00:02:24	00:00:00		
Norwalk			42480.17		7.86			00:00:20	00:15:23
		55		1.41		00:02:05	00:00:00		
Lambert			49915.23		9.26			00:00:00	00:17:28
					9.26	**00:15:08**	**00:00:20**	**00:02:00**	**00:17:28**
							Avg. Speed =	31.8	mph
							Avg. Station Spacing=	1.5	miles

a) Run-times based on one-way travel.

Operating Requirements

Table 9 TSM Alternative Operating Requirements

Route	From	To	Run Time (min)	Distance (Miles)	Day	---Headway--- Peak	Base	Eve.	---Train Consist--- Peak	Base	Eve.	Peak LRVs	-----Annual Revenue----- Car-Miles	Car-Hours	Train-Hours	Lay Over	Cycle Time	---Trains--- Peak	Base	Eve.
Gold	Pomona/Atlantic	Sierra Madre Villa	57.0	19.5	M-F	5.0	10.0	15.0	3	3	3	75	4,249,700	219,840	73,280	5.5	125.0	25	13	9
					Sat	10.0	15.0	20.0	3	3	3		574,900	32,210	10,740			13	9	7
					Sun	10.0	15.0	20.0	3	3	3		652,300	36,550	12,180			13	9	7
ESTIMATED TOTALS:												75	5,476,900	288,600	96,200			25	13	9
DIFFERENCE FROM EXISTING GOLD LINE:												57	3,764,900	213,700	53,660			16	7	5
READY CARS:												9								
PEAK REVENUE TOTAL:												84								
MAINTENANCE SPARES:												17								
TOTAL FLEET:												101								

a) Maintenance spare ratio is 20% of peak revenue total.
b) Ready cars include 4 existing cars and an additional 5 ready cars.

Table 10 SR-60 LRT Operating Requirements

Route	From	To	Run Time (min)	Distance (Miles)	Day	---Headway--- Peak	Base	Eve.	---Train Consist--- Peak	Base	Eve.	Peak LRVs	-----Annual Revenue----- Car-Miles	Car-Hours	Train-Hours	Lay Over	Cycle Time	---Trains--- Peak	Base	Eve.
Gold	Peck	Sierra Madre Villa	69.5	26.4	M-F	5.0	10.0	15.0	3	3	3	90	5,757,800	255,270	85,090	5.5	150.0	30	15	10
					Sat	10.0	15.0	20.0	3	3	3		779,000	36,890	12,300			15	10	8
					Sun	10.0	15.0	20.0	3	3	3		883,800	41,860	13,950			15	10	8
ESTIMATED TOTALS:												90	7,420,600	334,020	111,340			30	15	10
DIFFERENCE FROM TSM BASELINE:												15	1,943,700	45,420	15,140			5	2	1
READY CARS:												9								
PEAK REVENUE TOTAL:												99								
MAINTENANCE SPARES:												20								
TOTAL FLEET:												119								

a) Maintenance spare ratio is 20% of peak revenue total.

Table 11 Beverly Boulevard LRT Operating Requirements

Route	From	To	Run Time (min)	Distance (Miles)	---Headway--- Day	Peak	Base	Eve.	---Train Consist--- Peak	Base	Eve.	Peak LRVs	-----Annual Revenue----- Car-Miles	Car-Hours	Train-Hours	Lay Over	Cycle Time	---Trains--- Peak	Base	Eve.
Gold	Mar Vista	Sierra Madre Villa	81.0	28.5	M-F	5.0	10.0	15.0	3	3	3	105	6,208,900	303,280	101,090	6.5	175.0	35	18	12
					Sat	10.0	15.0	20.0	3	3	3		840,000	43,520	14,510			18	12	9
					Sun	10.0	15.0	20.0	3	3	3		953,100	49,380	16,460			18	12	9
ESTIMATED TOTALS:												105	8,002,000	396,180	132,060			35	18	12
DIFFERENCE FROM TSM BASELINE:												30	2,525,100	107,580	35,860			10	5	3
READY CARS:												9								
PEAK REVENUE TOTAL:												114								
MAINTENANCE SPARES:												23								
TOTAL FLEET:												137								

a) Maintenance spare ratio is 20% of peak revenue total.

Table 12 Beverly/Whittier Boulevards LRT (Rosemead Boulevard Option) Operating Requirements

Route	From	To	Run Time (min)	Distance (Miles)	---Headway--- Day	Peak	Base	Eve.	---Train Consist--- Peak	Base	Eve.	Peak LRVs	-----Annual Revenue----- Car-Miles	Car-Hours	Train-Hours	Lay Over	Cycle Time	---Trains--- Peak	Base	Eve.
Gold	Mar Vista	Sierra Madre Villa	81.9	28.6	M-F	5.0	10.0	15.0	3	3	3	105	6,232,900	303,280	101,090	5.6	175.0	35	18	12
					Sat	10.0	15.0	20.0	3	3	3		843,200	43,520	14,510			18	12	9
					Sun	10.0	15.0	20.0	3	3	3		956,800	49,380	16,460			18	12	9
ESTIMATED TOTALS:												105	8,032,900	396,180	132,060			35	18	12
DIFFERENCE FROM TSM BASELINE:												30	2,556,000	107,580	35,860			10	5	3
READY CARS:												9								
PEAK REVENUE TOTAL:												114								
MAINTENANCE SPARES:												23								
TOTAL FLEET:												137								

a) Maintenance spare ratio is 20% of peak revenue total.

Table 13 Beverly/Whittier Boulevards LRT (Montebello Boulevard Option) Operating Requirements

Route	From	To	Run Time (min)	Distance (Miles)	Day	---Headway--- Peak	Base	Eve.	---Train Consist--- Peak	Base	Eve.	Peak LRVs	-----Annual Revenue----- Car-Miles	Car-Hours	Train-Hours	Lay Over	Cycle Time	---Trains--- Peak	Base	Eve.
Gold	Philadelphia	Sierra Madre Villa	80.3	28.6	M-F	5.0	10.0	15.0	3	3	3	105	6,224,100	303,280	101,090	7.2	175.0	35	18	12
					Sat	10.0	15.0	20.0	3	3	3		842,100	43,520	14,510			18	12	9
					Sun	10.0	15.0	20.0	3	3	3		955,400	49,380	16,460			18	12	9
ESTIMATED TOTALS:												105	8,021,600	396,180	132,060			35	18	12
DIFFERENCE FROM TSM BASELINE:												30	2,544,700	107,580	35,860			10	5	3
READY CARS:												9								
PEAK REVENUE TOTAL:												114								
MAINTENANCE SPARES:												23								
TOTAL FLEET:												137								

a) Maintenance spare ratio is 20% of peak revenue total.

Table 14 Washington Boulevard LRT Operating Requirements

Route	From	To	Run Time (min)	Distance (Miles)	Day	---Headway--- Peak	Base	Eve.	---Train Consist--- Peak	Base	Eve.	Peak LRVs	-----Annual Revenue----- Car-Miles	Car-Hours	Train-Hours	Lay Over	Cycle Time	---Trains--- Peak	Base	Eve.
Gold	Lambert	Sierra Madre Villa	74.5	28.8	M-F	5.0	10.0	15.0	3	3	3	96	6,267,700	273,940	91,310	5.5	160.0	32	16	11
					Sat	10.0	15.0	20.0	3	3	3		848,000	38,840	12,950			16	11	8
					Sun	10.0	15.0	20.0	3	3	3		962,100	44,070	14,690			16	11	8
ESTIMATED TOTALS:												96	8,077,800	356,850	118,950			32	16	11
DIFFERENCE FROM TSM BASELINE:												21	2,600,900	68,250	22,750			7	3	2
READY CARS:												9								
PEAK REVENUE TOTAL:												105								
MAINTENANCE SPARES:												21								
TOTAL FLEET:												126								

a) Maintenance spare ratio is 20% of peak revenue total.

APPENDIX E:

Preliminary Operating and Maintenance Cost Estimate Technical Memorandum

Eastside Transit Corridor Phase 2
Preliminary Operating and Maintenance Cost Estimate Technical Memorandum

Prepared By: HDR Engineering, Inc.

Revised: August 21, 2009

INTRODUCTION

In January 2007, the Los Angeles County Metropolitan Transportation Authority (Metro) initiated the Eastside Transit Corridor Phase 2 Alternatives Analysis (AA) process to evaluate alternatives for the second phase of the Metro Gold Line Eastside Extension currently under construction and anticipate to be operational in 2009. The AA Report, completed in January 2009, provided a detailed overview of the Study Area's transportation needs and how they would be served by each of the five proposed Refined Alternatives under consideration at the time. In January 2009, the Metro Board approved four Final Alternatives and the initiation of Conceptual Engineering to refine and further evaluate the approved alternatives.

This technical memorandum is an update the Preliminary Operating and Maintenance Cost Estimate Technical Memorandum (dated October 15, 2008) developed for the Alternatives Analysis (AA) phase. This report will cover the approach in developing the operating and maintenance (O&M) cost methodology to estimate the potential costs for each alternative and the operating and maintenance cost results.

OPERATING AND MAINTENANCE COST ESTIMATE METHODOLOGY

Definition of Alternatives

Operating and maintenance (O&M) cost models were developed to estimate the annual operating and maintenance costs for the following alternatives:

- No-Build Alternative: The No-Build Alternative is a requirement of the National Environmental Policy Act (NEPA) regulations and serves as the baseline for establishing the environmental impacts of the alternatives, the financial condition of implementing and operating agencies, and the cost-effectiveness of the Transportation Systems Management (TSM) Alternative. The No-Build Alternative includes the region's current and planned improvements, including the Metro Gold Line Eastside Extension currently under construction.

- Baseline/TSM: The Baseline/TSM Alternative is defined as "the best that can be done" to address the identified transportation deficiencies in the corridor without constructing a Build Alternative, which include four light rail transit alternatives to connect to eastern portion of the Phase 1 Metro Gold Line Eastside Extension. While lower in cost than the Build Alternatives, the Baseline/TSM Alternative may still carry some significant costs, particularly when the transportation problems in the corridor are complex and the associated build options are capital intensive. The TSM/Baseline Alternative(s) may include transportation systems upgrades, such as intersection improvements, road widenings, traffic engineering actions, bus route restructuring, shortened bus headways, expanded use of articulated buses, reserved bus lanes, contra-flow lanes for buses and High Occupancy Vehicles (HOVs) on freeways, special bus ramps on freeways, expanded park-ride facilities, express and limited stop service, signalization improvements, transit signal priority, passenger information systems, and timed transfer operations. The key factor in designing the Baseline/TSM is that it must serve the same travel markets and provide as close a level of service as the Build Alternatives under study, absent a corresponding level of capital investment.

- State Route (SR) 60 LRT: The SR-60 LRT alignment begins as an eastward extension of the Phase 1 project across S. Atlantic Blvd., then transitions to an aerial configuration to follow the south side of Route 60, largely within the existing right-of-way, east to Peck Road.

- Beverly Blvd LRT: This LRT alignment begins as an eastward extension of the Phase 1 project across S. Atlantic Blvd., then turns south at Garfield Ave. The alignment then turns east at Beverly Blvd. and follows Beverly to the San Gabriel River where the route swings south and enters the Whittier Greenway, following that facility to a terminus at Mar Vista in Central Whittier.

- Beverly/Whittier Blvds LRT (Rosemead Blvd Option): This LRT alignment begins as an eastward extension of the Phase 1 project across S. Atlantic Blvd., then turns south at Garfield Ave. The alignment then turns east at Beverly Blvd. and follows Beverly to Rosemead Blvd., turns south on Rosemead Blvd., then turns east on Whittier Blvd to a terminus at Mar Vista.

- Beverly/Whittier Blvds LRT (Montebello Blvd Option: This LRT alignment begins as an eastward extension of the Phase 1 project across S. Atlantic Blvd., then turns south at Garfield Ave. The alignment then turns east at Beverly Blvd. and follows Beverly to Montebello Blvd., turns south on Montebello Blvd., then turns east on Whittier Blvd to a terminus at Mar Vista.

- Washington Blvd. LRT: This LRT alignment begins as an eastward extension of the Phase 1 project across S. Atlantic Blvd., then turns south at Garfield Ave. and follows Garfield south to Washington Blvd. The alignment continues east along Washington Blvd. to a terminus east of Lambert Rd. in the vicinity of the Washington/Whittier intersection.

Metro LRT Operations O&M Model

Since Metro currently operates LRT, O&M estimates were developed based on the Gold Line financial and operating data for fiscal year (FY)2008. The following sections include a general overview of the Metro LRT operations cost model structure and required inputs.

Structure and Inputs

Metro's Gold line LRT operating costs for fiscal year 2008 were derived from the Metro FY 2008 Adopted Budget (Activity Based Gold Line Cost Model) and were allocated to five variables: route miles, yards, annual revenue train-hours, annual revenue car-miles, and peak LRV cars.

The following equation summarizes the fully-allocated cost model used to estimate annual O&M costs for the study alternatives:

$$\text{Estimated Annual O\&M Cost} = \text{Route-Mile Unit Cost} \times \text{Projected Route-Miles} + \text{Yard Unit Cost} \times \text{Projected Yards} + \text{Train-Hour Unit Cost} \times \text{Projected Train-Hours} + \text{Car-Mile Unit Cost} \times \text{Projected Car Miles} + \text{Peak LRV Unit Cost} \times \text{Projected Peak LRV Cars}$$

Where:

- Route-Miles: Total number of directional route miles.
- Yards: Total number of maintenance and storage facilities.

- Annual Revenue Train-Hours: Total hours of revenue service operated by all trains in one year.
- Annual Revenue Car-Miles: Total miles of revenue service operated by all trains in one year.
- Peak LRV Cars: The maximum number of passengers vehicles scheduled in service at the same time.

FY 2008 expenses and units of service for each variable are presented in Table 1. Operating expenses assigned to each variable were summed and divided by FY 2008 units of service to derive unit costs.

Table 1 Metro LRT FY 2008 Expense Allocations and Unit Costs

	FULL ALLOCATION				
EXPENSE OBJECT	Rt.-Miles	Yards	Train-Hrs	Car-Miles	LRVs
Wages & Benefits	2,853,501	2,853,501	6,798,038	4,992,979	0
Materials & Supplies	257,125	257,125	0	1,062,268	50,832
Other	1,938	1,938	0	3,174	41,981
Services	356,453	356,453	0	30,819	0
Propulsion Power	0	0	0	2,089,821	0
Non-Revenue Vehicles	157,211	157,211	0	0	0
Facilities Maintenance	699,501	699,501	0	0	0
Transit Security	0	0	0	9,284,537	0
General Manager	0	598,727	0	0	0
Revenue	0	0	0	0	1,182,870
Service Development	0	0	0	0	363,484
Safety	0	0	0	0	372,854
Casualty & Liability	0	0	0	549,607	0
Workers' Comp	120,037	120,037	320,098	240,074	0
Utilities	0	371,710	0	371,710	0
Other Metro Operations	0	108,757	0	0	0
Building Costs	0	247,470	0	0	0
Copy Services	0	0	0	0	37,331
Support Department Costs	0	0	0	0	3,650,210
Total Operating Expenses:	4,445,764	5,772,428	7,118,136	18,624,989	5,699,562
FY2008 Units of Service	13.7	1.0	43,925	1,653,458	22
Unit Cost (operating expenses only)	$324,508	$5,772,428	$162.05	$11.26	$259,071

The unit costs derived from the fully allocated model were applied to the projected operating statistics generated for each project alternative to estimate total O&M costs.

Metro Bus Operations O&M Model

A second phase of the Metro Gold line Eastside Extension would have a significant impact on Metro local and express bus operations. O&M estimates were developed based on Metro's bus financial and operating data for fiscal year 2008. The following sections include a general overview of the Metro bus operations cost model structure and required inputs.

Structure and Inputs

Metro's bus operating costs for fiscal year 2008 were used from the Metro FY 2008 Adopted Budget (Activity Based Bus Cost Model) and were allocated to five variables: route miles, garages, annual revenue bus-hours, annual revenue bus-miles, and peak buses.

The following equation summarizes the fully-allocated cost model used to estimate annual O&M costs for the study alternatives:

$$\text{Estimated Annual O\&M Cost} = \text{Route-Mile Unit Cost} \times \text{Projected Route-Miles} + \text{Garage Unit Cost} \times \text{Projected Garages} + \text{Bus-Hour Unit Cost} \times \text{Projected Bus-Hours} + \text{Bus-Mile Unit Cost} \times \text{Projected Bus-Miles} + \text{Peak Buses Unit Cost} \times \text{Projected Peak Buses}$$

Where:

- Route-Miles: Total number of directional BRT route miles.
- Garages: number of bus storage and maintenance garages.
- Annual Revenue Bus-Hours: Total hours of revenue service operated by all trains in one year.
- Annual Revenue Bus-Miles: Total miles of revenue service operated by all trains in one year.
- Peak Buses: The maximum number of passengers vehicles scheduled in service at the same time.

FY 2008 expenses and units of service for each variable are presented in Table 2. Operating expenses assigned to each variable were summed and divided by FY 2006 units of service to derive unit costs.

Table 2 Metro Bus FY 2008 Expense Allocations and Unit Costs

	FULL ALLOCATION				
EXPENSE OBJECT	Rt.-Miles	Garages	Bus-Hrs	Bus-Miles	Buses
Wages & Benefits	0	0	339,799,542	120,784,155	0
Control Center	0	0	7,810,633	0	0
Services	0	0	55,996	1,387,101	0
Training	839,699	839,699	5,528,742	0	0
Scheduling & Planning	0	0	3,714,552	0	0
Fuel	0	0	0	53,833,804	0
Materials & Supplies	0	0	206,302	43,894,475	0
Fueling Contractor Reimb.	0	0	0	(2,222,023)	0
Maintenance Support	8,180,979	8,180,979	0	193,000	0
Power Plant Assembly	0	0	0	4,971,708	0
Accident Repair	0	0	0	1,940,677	0
Wheelchair Lifts	0	0	0	165,780	0
Painting	0	0	0	659,577	0
Windows	0	0	0	19,578	0
Non-Revenue Vehicles	2,570,170	2,570,170	0	0	0
Facility Maintenance	16,319,328	16,319,328	0	0	0
Transit Security	0	0	0	21,013,238	0
General Managers	0	13,766,337	0	0	0
Revenue	0	0	0	0	17,234,811
Service Development	0	0	0	0	6,947,388
Safety	0	0	0		1,731,373
Casualty & Liability	0	0	0	0	55,958,642
Workers' Comp	0	0	0	0	38,300,894
Transitional Duty Program	0	0	0	0	2,498,517
Utilities	0	0	0	7,159,937	0
Other Metro Operations	0	4,148,887	0	0	0
Building Costs	0	7,711,409	0	0	0
Copy Services	0	0	0	0	1,087,675
Support Department Costs	0	0	0	0	46,613,787
Purchased Transportation	0	0	38,254,175	0	0
Enterprise Fund Debt	0	0	0	0	2,240,099
Total Operating Expenses:	27,910,175	53,536,808	395,369,942	253,801,007	172,613,186
FY2008 Units of Service	4,527	15.0	7,776,000	96,458,000	2,675
Unit Cost (oper. expenses only)	$6,165	$3,569,121	$50.84	$2.63	$64,528

The unit costs derived from the fully allocated model were applied to the projected operating statistics generated for each project alternative to estimate total O&M costs.

Montebello Bus Lines Operations O&M Model

Since the Eastside Transit Corridor Phase 2 would affect Montebello Bus Lines operations, O&M estimates were developed based on fiscal year 2006 Montebello Bus Lines operating statistics and adjusted to FY 2008 dollars at 4% per annum for inflation. The following sections include a general overview of the Montebello Bus Lines operations cost model structure and required inputs.

Structure and Inputs

The Montebello Bus Lines O&M cost model uses the same five variables and cost equation as used for the Metro bus model. The Montebello bus cost model was based on FY 2006 National Transit Database reports. The Montebello Bus Lines fiscal year 2006 motor bus operating costs, reported by Object Class and Function, were allocated to five variables: route-miles, garages, annual revenue bus-hours, annual revenue bus-miles, and peak buses.

FY 2006 expenses and units of service for each variable are presented in Table 3. Operating expenses assigned to each variable were summed and divided by FY 2006 units of service to derive unit costs.

Table 3 Montebello Bus FY 2006 Expense Allocations and Unit Costs

	FULL ALLOCATION				
EXPENSE OBJECT	Rt-Miles	Garages	Bus-Hrs	Bus-Miles	Buses
501.01 Operators Salaries/Wages	0	0	5,430,492	0	0
501.02 Other Salaries/Wages	308,524	7,325	286,550	1,562,576	749,937
502.00 Fringe Benefits	5,859	225,126	4,140,848	1,296,425	756,648
503.00 Services	0	20,892	0	579,276	1,721,761
504.01 Fuel & Lubricants	0	0	0	2,125,472	138,936
504.02 Tires & Tubes	0	0	0	0	0
504.03 Other Materials & Supplies	16,401	49,204	0	1,129,723	120,710
505.00 Utilities	96,512	96,512	0	0	0
506.00 Casualty/Liability	0	0	0	1,083,060	0
507.00 Taxes	0	0	0	0	0
508.00 Purchased Transportation	0	0	354,030	0	0
509.00 Miscellaneous Expenses	0	41,416	0	25,255	142,391
510.00 Expense Transfers	0	0	0	0	0
Total Operating Expenses:	427,296	440,474	10,211,920	7,801,787	3,630,383
FY2006 Units of Service	222.8	2	253,239	2,793,960	77
Unit Cost (operating expenses only)	$1,918	$231,828	$40.33	$2.79	$47,148

The unit costs derived from the fully allocated model were applied to the projected operating statistics generated for each project alternative to estimate total O&M costs.

Norwalk Transit System Bus Operation O&M Model

Since the Eastside Transit Corridor Phase 2 would affect Norwalk Transit System bus operations, O&M estimates were developed based on fiscal year 2006 Norwalk Transit System bus operating statistics. The following sections include a general overview of the Norwalk Transit System bus operations cost model structure and required inputs.

Structure and Inputs

The Norwalk Transit System O&M cost model uses the same five variables and cost equation as used for the Metro bus model. The Norwalk Transit System bus cost model was based on FY 2006 National Transit Database reports. Norwalk Transit System fiscal year 2006 motor bus operating costs, reported by Object Class and Function, were allocated to five variables: garages, annual revenue bus-hours, annual revenue bus-miles, and peak buses.

FY 2006 expenses and units of service for each variable are presented in Table 4. Operating expenses assigned to each variable were summed and divided by FY 2006 units of service to derive unit costs.

Table 4 Norwalk Transit System FY 2006 Bus Expense Allocations and Unit Costs

	FULL ALLOCATION				
EXPENSE OBJECT	Rt-Miles	Garages	Bus-Hrs	Bus-Miles	Buses
501.01 Operators Salaries/Wages	0	0	2,527,586	0	0
501.02 Other Salaries/Wages	15,111	231,283	226,246	651,463	458,245
502.00 Fringe Benefits	3,018	127,642	1,443,437	390,331	320,873
503.00 Services	408	64,726	0	39,992	413,280
504.01 Fuel & Lubricants	0	0	0	848,249	0
504.02 Tires & Tubes	0	0	0	72,940	0
504.03 Other Materials & Supplies	0	0	0	767,572	203,530
505.00 Utilities	53,789	53,789	0	0	0
506.00 Casualty/Liability	0	0	0	277,383	0
507.00 Taxes	0	2,847	0	0	0
508.00 Purchased Transportation	0	0	0	0	0
509.00 Miscellaneous Expenses	790	113,983	0	30,689	82,697
510.00 Expense Transfers	0	0	0	0	0
Total Operating Expenses:	73,116	594,269	4,197,269	3,078,619	1,478,625
FY2006 Units of Service	167.0	1	100,371	1,274,412	36
Unit Cost (operating expenses only)	$438	$495,225	$41.82	$2.42	$41,073

The unit costs derived from the fully allocated model were applied to the projected operating statistics generated for each project alternative to estimate total O&M costs. The Monterey Park Spirit Bus also has motor bus service within the study area that would be affected. The Norwalk Transit System bus operations cost model and unit costs were used to determine estimated costs for Monterey Park Spirit Bus due to lack of data availability and similarities in bus size and operating characteristics.

Foothill Transit Zone Bus Operations O&M Model

Since the Eastside Transit Corridor Phase 2 would affect Foothill Transit Zone bus operations, O&M estimates were developed based on fiscal year 2006 Foothill Transit Zone bus operating statistics. The following sections include a general overview of the Foothill Transit Zone bus operations cost model structure and required inputs.

Structure and Inputs

The Foothill Transit Zone O&M cost model uses the same five variables and cost equation as used for the Metro bus model. The Foothill bus cost model was based on FY 2006 National Transit Database reports.

Foothill Transit Zone fiscal year 2006 motor bus operating costs, reported by Object Class and Function, were allocated to five variables: garages, annual revenue bus-hours, annual revenue bus-miles, and peak buses. FY 2006 expenses and units of service for each variable are presented in Table 4-5. Operating expenses assigned to each variable were summed and divided by FY 2006 units of service to derive unit costs.

Table 5 Foothill Transit Zone FY 2006 Bus Expense Allocations and Unit Costs

EXPENSE OBJECT	FULL ALLOCATION				
	Rt-Miles	Garages	Bus-Hours	Bus-Miles	Buses
501.01 Operators Salaries/Wages	0	0	0	0	0
501.02 Other Salaries/Wages	0	0	0	0	0
502.00 Fringe Benefits	0	0	0	0	0
503.00 Services	0	1,024,441	0	0	8,192,302
504.01 Fuel & Lubricants	0	0	0	9,764,546	0
504.02 Tires & Tubes	0	0	0	0	0
504.03 Other Materials & Supplies	0	0	0	0	0
505.00 Utilities	0	0	0	0	0
506.00 Casualty/Liability	0	0	0	0	0
507.00 Taxes	0	0	0	0	0
508.00 Purchased Transportation	0	0	39,364,590	0	0
509.00 Miscellaneous Expenses	0	0	0	0	0
510.00 Expense Transfers	0	0	0	0	0
Total Operating Expenses:	0	1,024,441	39,364,590	9,764,546	8,192,302
FY2006 Units of Service	894.3	2.0	736,395.0	11,895,676	306.0
Unit Cost (operating expenses only)	$0	$512,221	$53.46	$0.82	$26,772

The unit costs derived from the fully allocated model were applied to the projected operating statistics generated for each project alternative to estimate total O&M costs.

Results

There are four build alternatives being considered for this study that would connect to the first phase of the Metro Gold Line Eastside Extension at the Pomona/Atlantic station. Table 6 presents characteristics of each build alternative for Phase 2.

Table 6 Summary of Build Alternatives

Alternative	Phase 2 Description	Stations	Headway Peak	Headway Base	Headway Evening	Route Miles	Run Time
SR-60 LRT	Atlantic - Route 60 to Peck Road	5	5	10	15	6.92	0:12:28
Beverly Blvd LRT	Atlantic - Route 60 - Garfield Aerial - Beverly LRT - Whittier Greenway to Mar Vista	9	5	10	15	8.99	0:23:58
Beverly/Whittier Blvds LRT	(Rosemead Blvd Option): Atlantic - Route 60 - Garfield Aerial - Beverly/Rosemead/Whittier LRT to Mar Vista	8	5	10	15	9.10	0:24:55
	(Montebello Blvd Option): Atlantic - Route 60 - Garfield Aerial - Beverly/Montebello/Whittier LRT to Mar Vista	8	5	10	15	9.06	0:23:17
Washington Blvd LRT	Atlantic - Route 60 - Garfield Aerial - Washington LRT to Atlantic	7	5	10	15	9.26	0:17:28

(1) Run times based on one-way travel.

The estimated annual O&M costs of LRT and bus operations for each of the Eastside Transit Corridor Phase 2 project alternatives are summarized in this section. The annual O&M cost estimates are based on design year 2030 operating plans and ridership projections. These "future" cost estimates, however, are presented in 2008 dollars.

Estimated future costs for potential new or expanded Metro rail yards and bus garages were based on fractional unit estimates. Any expansions or additional maintenance/storage facilities were estimated using a fraction of about 150 buses per garage and 50 LRV's per yard for capacity. There were not any specific yard sites identified at the time of developing the O&M costs and assumptions were used solely for cost allocation. It was assumed that the LRV's would not require more than one additional yard or exceed a total of two yards.

LRT O&M Cost Estimates

There are four LRT alternatives considered for this study. Table 7 shows the system characteristics and estimated annual O&M costs for Metro operations for the FY 2008 Gold Line currently in service, the No-Build and TSM/Baseline alternatives and the four LRT project alternatives. Costs are presented in 2008 dollars.
Metro currently uses two 2-car gap trains beyond those directly scheduled for revenue service. Metro anticipates, as part of revenue service, a need for a 3-car gap train at each end of the alignment ready to pull into service as a result of a late train and one 3-car train as a maintenance spare due to a failure of a vehicle to operate in service. These ready cars were factored into the full allocation of estimated costs and have been included as part of the operating plans.

Table 7 METRO LRT Annual O&M Cost Estimates (2008 dollars)

System Scenario	FULL ALLOCATION Route Miles	Yards	Train Hours	Car Miles	Peak LRVs
FY 2008 Gold Line LRT Unit Costs	$324,508	$5,772,428	$162.05	$11.26	$259,071
FY 2008 Units	13.7	1.0	43,925	1,653,458	22
FY 2008 Cost by Variable	$4,445,764	$5,772,428	$7,118,136	$18,624,989	$5,699,562
Total FY 2008 Cost					$41,660,880
No-Build & TSM	19.5	2.0	96,200	5,476,900	84
O&M Cost by Variable	$6,327,913	$11,544,857	$15,589,407	$61,693,252	$21,761,964
Total Annual LRT O&M Cost					$116,917,393
Increment Over FY 2008					$75,256,513
SR-60 LRT Alternative	26.4	2.0	111,340	7,420,600	99
O&M Cost by Variable	$8,567,020	$11,544,857	$18,042,876	$83,587,604	$25,648,029
Total Annual LRT O&M Cost					$147,390,385
Increment Over TSM					$30,472,992
Beverly Blvd LRT Alternative	28.5	2.0	132,060	8,002,000	114
O&M Cost by Variable	$9,248,488	$11,544,857	$21,400,594	$90,136,647	$29,534,094
Total Annual LRT O&M Cost					$161,864,680
Increment Over TSM					$44,947,287
Beverly/Whittier Blvds LRT Alternative (Rosemead Blvd Option)	28.6	2.0	132,060	8,032,900	114
O&M Cost by Variable	$9,280,939	$11,544,857	$21,400,594	$90,484,713	$29,534,094
Total Annual LRT O&M Cost					$162,245,197
Increment Over TSM					$45,327,803
Beverly/Whittier Blvds LRT Alternative (Montebello Blvd Option)	28.6	2.0	132,060	8,021,600	114
O&M Cost by Variable	$9,280,939	$11,544,857	$21,400,594	$90,357,427	$29,534,094
Total Annual LRT O&M Cost					$162,117,910
Increment Over TSM					$45,200,517
Washington Blvd LRT Alternative	28.8	2.0	118,950	8,077,800	105
O&M Cost by Variable	$9,345,840	$11,544,857	$19,276,092	$90,990,478	$27,202,455
Total Annual LRT O&M Cost					$158,359,722
Increment Over TSM					$41,442,329

(1) Estimated peak LRVs do not include maintenance spares. Costs associated with maintenance spares are factored into yard costs.

Bus O&M Cost Estimates

Table 8 shows the system characteristics and estimated annual O&M costs for Metro bus, Montebello Bus Lines, Norwalk Transit System, Monterey Park Spirit Bus and Foothill Transit Zone bus operations for each of the study alternatives.

Table 8 Bus Annual O&M Cost Estimates

Alternative	FULL ALLOCATION Route Miles	Garages	-----Annual Revenue----- Bus-Miles	Bus Hours	Buses	Total O&M Cost	Incremental Cost
No Build							
Metro Bus	268.1	1	18,640	1,536	126		
O&M Cost by Variable	$1,652,909	$3,569,121	$947,739	$4,042	$8,130,565	$ 14,304,375	-
Montebello Bus Lines	165.6	2	6,011	636	56		
O&M Cost by Variable	$ 317,595	$ 440,474	$ 242,379	$ 1,776	$ 2,640,279	$ 3,642,502	-
Norwalk Transit System	44.4	1	1,715	126	7		
O&M Cost by Variable	$ 19,439	$ 495,225	$ 71,709	$ 304	$ 287,510	$ 874,187	-
Monterey Park Spirit Bus	4.4	1	118	18	1		
O&M Cost by Variable	$ 1,926	$ 495,225	$ 4,926	$ 43	$ 41,073	$ 543,193	-
Foothill Bus	23.4	2	422	42	3		
O&M Cost by Variable	$ -	$ 1,024,441	$ 22,580	$ 34	$ 80,317	$ 1,127,372	-
Total Corridor Bus Cost					193	**$ 20,491,629**	-
2030 TSM Baseline							
Metro Bus	290.7	1.4	26,820	2,154	177		
O&M Cost by Variable	$1,792,244	$4,996,769	$1,363,640	$5,668	$11,421,508	$19,579,828	$5,275,453
Montebello Bus Lines	179.7	2	7,610	786	69		
O&M Cost by Variable	$ 344,637	$ 463,656	$ 306,855	$ 2,195	$ 3,253,200	$ 4,370,543	$ 728,041
Norwalk Transit System	44.4	1	1,715	126	7		
O&M Cost by Variable	$ 19,439	$ 495,225	$ 71,709	$ 304	$ 287,510	$ 874,187	$ -
Monterey Park Spirit Bus	4.4	1	118	18	1		
O&M Cost by Variable	$ 1,926	$ 495,225	$ 4,926	$ 43	$ 41,073	$ 543,193	$ -
Foothill Bus	23.4	2	422	42	3		
O&M Cost by Variable	$ -	$ 1,024,441	$ 22,580	$ 34	$ 80,317	$ 1,127,372	$ -
Total Corridor Bus Cost					257	**$26,495,124**	**$6,003,495**
SR-60 LRT							
Metro Bus	290.7	1.1	20,336	1,665	137		
O&M Cost by Variable	$1,792,244	$3,926,033	$1,034,002	$4,381	$8,808,112	$15,564,772	($4,015,056)
Montebello Bus Lines	179.7	2	7,610	786	69		
O&M Cost by Variable	$ 344,637	$ 463,656	$ 306,855	$ 2,195	$ 3,253,200	$ 4,370,543	$ -
Norwalk Transit System	44.4	1	1,715	126	7		
O&M Cost by Variable	$ 19,439	$ 495,225	$ 71,709	$ 304	$ 287,510	$ 874,187	$ -
Monterey Park Spirit Bus	4.4	1	118	18	1		
O&M Cost by Variable	$ 1,926	$ 495,225	$ 4,926	$ 43	$ 41,073	$ 543,193	$ -
Foothill Bus	23.4	2	422	42	3		
O&M Cost by Variable	$ -	$ 1,024,441	$ 22,580	$ 34	$ 80,317	$ 1,127,372	$ -
Total Corridor Bus Cost					217	**$22,480,068**	**($4,015,056)**

Table 8 Bus Annual O&M Cost Estimates (continued)

Alternative	FULL ALLOCATION Route Miles	Garages	-----Annual Revenue----- Bus-Miles	Bus Hours	Buses	Total O&M Cost	Incremental Cost
Beverly Blvd LRT							
Metro Bus	292.7	1.1	20,580	1,689	139		
O&M Cost by Variable	$1,804,574	$3,926,033	$1,046,388	$4,444	$8,969,433	$15,750,872	($3,828,956)
Montebello Bus Lines	179.7	2	7,610	786	69		
O&M Cost by Variable	$ 344,637	$ 463,656	$ 306,855	$ 2,195	$ 3,253,200	$ 4,370,543	$ -
Norwalk Transit System	44.4	1	1,715	126	7		
O&M Cost by Variable	$ 19,439	$ 495,225	$ 71,709	$ 304	$ 287,510	$ 874,187	$ -
Monterey Park Spirit Bus	4.4	1	118	18	1		
O&M Cost by Variable	$ 1,926	$ 495,225	$ 4,926	$ 43	$ 41,073	$ 543,193	$ -
Foothill Bus	23.4	2	422	42	3		
O&M Cost by Variable	$ -	$ 1,024,441	$ 22,580	$ 34	$ 80,317	$ 1,127,372	$ -
Total Corridor Bus Cost					219	**$22,666,168**	**($3,828,956)**
Beverly/Whittier Blvds LRT Alternative (Rosemead Blvd Option)							
Metro Bus	292.7	1.1	20,580	1,689	139		
O&M Cost by Variable	$1,804,574	$3,926,033	$1,046,388	$4,444	$8,969,433	$15,750,872	($3,828,956)
Montebello Bus Lines	179.7	2	7,610	786	69		
O&M Cost by Variable	$ 344,637	$ 463,656	$ 306,855	$ 2,195	$ 3,253,200	$ 4,370,543	$ -
Norwalk Transit System	44.4	1	1,715	126	7		
O&M Cost by Variable	$ 19,439	$ 495,225	$ 71,709	$ 304	$ 287,510	$ 874,187	$ -
Monterey Park Spirit Bus	4.4	1	118	18	1		
O&M Cost by Variable	$ 1,926	$ 495,225	$ 4,926	$ 43	$ 41,073	$ 543,193	$ -
Foothill Bus	23.4	2	422	42	3		
O&M Cost by Variable	$ -	$ 1,024,441	$ 22,580	$ 34	$ 80,317	$ 1,127,372	$ -
Total Corridor Bus Cost					219	**$22,666,168**	**($3,828,956)**
Beverly/Whittier Blvds LRT Alternative (Montebello Blvd Option)							
Metro Bus	292.7	1.1	20,580	1,689	139		
O&M Cost by Variable	$1,804,574	$3,926,033	$1,046,388	$4,444	$8,969,433	$15,750,872	($3,828,956)
Montebello Bus Lines	179.7	2	7,610	786	69		
O&M Cost by Variable	$ 344,637	$ 463,656	$ 306,855	$ 2,195	$ 3,253,200	$ 4,370,543	$ -
Norwalk Transit System	44.4	1	1,715	126	7		
O&M Cost by Variable	$ 19,439	$ 495,225	$ 71,709	$ 304	$ 287,510	$ 874,187	$ -
Monterey Park Spirit Bus	4.4	1	118	18	1		
O&M Cost by Variable	$ 1,926	$ 495,225	$ 4,926	$ 43	$ 41,073	$ 543,193	$ -
Foothill Bus	23.4	2	422	42	3		
O&M Cost by Variable	$ -	$ 1,024,441	$ 22,580	$ 34	$ 80,317	$ 1,127,372	$ -
Total Corridor Bus Cost					219	**$22,666,168**	**($3,828,956)**
Washington LRT							
Metro Bus	294.1	1.1	20,931	1,698	139		
O&M Cost by Variable	$1,813,206	$3,926,033	$1,064,255	$4,468	$8,969,433	$15,777,394	($3,802,434)
Montebello Bus Lines	179.7	2	7,610	786	69		
O&M Cost by Variable	$ 344,637	$ 463,656	$ 306,855	$ 2,195	$ 3,253,200	$ 4,370,543	$ -
Norwalk Transit System	44.4	1	1,715	126	7		
O&M Cost by Variable	$ 19,439	$ 495,225	$ 71,709	$ 304	$ 287,510	$ 874,187	$ -
Monterey Park Spirit Bus	4.4	1	118	18	1		
O&M Cost by Variable	$ 1,926	$ 495,225	$ 4,926	$ 43	$ 41,073	$ 543,193	$ -
Foothill Bus	23.4	2	422	42	3		
O&M Cost by Variable	$ -	$ 1,024,441	$ 22,580	$ 34	$ 80,317	$ 1,127,372	$ -
Total Corridor Bus Cost					219	**$22,692,690**	**($3,802,434)**

(1) All Metro costs estimated in FY 2008 dollars.

(2) Cost for other transit providers are based on FY 2006 dollars and adjusted to FY 2008 dollars at 4% per annum for inflation.

Cost Summary and Incremental Costs

Table 9 summarizes the estimated annual O&M costs for each of the Eastside Transit Corridor Phase 2 project alternatives. Costs are presented in 2008 dollars. The incremental O&M costs for each of the Build Alternatives relative to the Baseline/TSM Alternative are also presented in Table 9.

Table 9 Eastside Transit Corridor Phase 2 Annual O&M Cost Estimates

Input Measure	No Build	Baseline/ TSM	SR-60 LRT	Beverly Blvd LRT	Beverly/Whitter Blvds LRT		Washington Blvd LRT
					Rosemead Option	Montebello Option	
Metro LRT Cost	$ 116,917,393	$ 116,917,393	$ 147,390,385	$ 161,864,680	$ 162,245,197	$ 162,117,910	$ 158,359,722
Metro Bus Cost	$ 14,304,375	$ 19,579,828	$ 15,564,772	$ 15,750,872	$ 15,750,872	$ 15,750,872	$ 15,777,394
Montebello Bus Lines Cost	$ 3,642,502	$ 4,370,543	$ 4,370,543	$ 4,370,543	$ 4,370,543	$ 4,370,543	$ 4,370,543
Norwalk Transit System Bus Cost	$ 874,187	$ 874,187	$ 874,187	$ 874,187	$ 874,187	$ 874,187	$ 874,187
Monterey Park Spirit Bus Cost	$ 543,193	$ 543,193	$ 543,193	$ 543,193	$ 543,193	$ 543,193	$ 543,193
Foothill Transit Zone Bus Cost	$ 1,127,372	$ 1,127,372	$ 1,127,372	$ 1,127,372	$ 1,127,372	$ 1,127,372	$ 1,127,372
Total Annual O&M Cost	**$ 137,409,023**	**$ 143,412,517**	**$ 169,870,453**	**$ 184,530,848**	**$ 184,911,365**	**$ 184,784,078**	**$ 181,052,412**
Incremental Annual O&M Cost	**$ -**	**$ 6,003,495**	**$ 26,457,936**	**$ 41,118,331**	**$ 41,498,847**	**$ 41,398,083**	**$ 37,639,895**

(1) All costs estimated in FY 2008 dollars.
(2) Incremental Cost of the TSM/Baseline Alternative is relative to the No-Build Alternative.
(3) Incremental cost of the build alternatives is relative to Baseline/TSM Alternative.

APPENDIX F:

Focus Group Invitee List

Eastside Transit Corridor Phase 2 - Focus Group Invitee List (April/May 2009)

Invited To Group No:	Focus Group	Organization/Affiliation	Prefix	First Name	Last Name	Title	City
1	Washington	City of Commerce	Mr.	Joe	Aguilar	Mayor	Commerce
1	Washington	City of Commerce	Honorable	Hugo	Argumedo	Council Member	Commerce
1	Washington	City of Commerce	Honorable	Tina	Baca Del Rio	Mayor Pro Tem	Commerce
1	Washington	City of Commerce	Honorable	Robert C.	Fierro	Council Member	Commerce
1	Washington	City of Commerce	Honorable	Lilia R.	Leon	Council Member	Commerce
1	Washington	City of Commerce	Mr.	Jorge	Rifa	City Administrator	Commerce
1	Washington	Commerce Industrial Council Chamber	Mr.	Eddie	Tafoya	Executive Director	Commerce
1	Washington	North Park Middle School	Mr.	John	Lopez	Principal	Pico Rivera
1	Washington	City of Santa Fe Springs	Mr.	Al	Fuentes	Redevelopment Consultant	Santa Fe Springs
1	Washington	City of Santa Fe Springs	Mr.	Tom	Lopez	Assistant Director of Public Works	Santa Fe Springs
1	Washington	City of Commerce	Mr.	Alex	Hamilton	Assistant Director, Community Development	Commerce
1	Washington	City of Downey	Mr.	Gerald	Caton	City Manager	Downey
1	Washington	City of Downey	Ms.	Linda	Haines	Director, Development Services	Downey
1	Washington	City of Downey	Mr.	Brian	Regland	Director, Public Works	Downey
1	Washington	City of Whittier	Council Member	Cathy	Warner	Council Member	Whittier
1	Washington	City of Whittier - Parking & Transportation Commission	Commissioner	Al	Martinez	Commissioner	Whittier
1	Washington	Management of Pico Rivera Marketplace	Mr.	Adam	Monteilh	Property Administrator	Los Angeles
1	Washington	Whittier Ridgeview Homeowners Association	Ms.	Laura	Westerman		Whittier
2	Whittier/Beverly	CA State Assemblymember Charles Calderon - 58th Assembly District	Ms.	Adrianna	Villa	Field Representative	City of Industry
2	Whittier/Beverly	Pico Rivera Chamber of Commerce	Ms.	Koko	Judge	Executive Director	Pico Rivera
2	Whittier/Beverly	Pico Rivera Resident	Mr.	John	Zeigler		
2	Whittier/Beverly	City of Whittier	Mr.	Jeff	Collier	Director of Community Development	Whittier
2	Whittier/Beverly	City of Whittier - Parking & Transportation Commission	Commissioner	Douglas	Halliday	Vice Chair	Whittier
2	Whittier/Beverly	City of Whittier - Parking & Transportation Commission	Commissioner	James	Snedden	Chair	Whittier
2	Whittier/Beverly	City of Whittier Planning Commission	Commissioner	Fernando	Dutra	Chair	Whittier
2	Whittier/Beverly	City of Whittier Planning Commission	Commissioner	Wesley A.	Murray	Vice Chair	Whittier
2	Whittier/Beverly	Management of Krikorian/ Village Walk	Mr.	Jeff	Kristoff		Redondo Beach
2	Whittier/Beverly	Whittier Area Chamber of Commerce	Ms.	Cheryl	Estep	President	Whittier
3	SR-60	Project Amiga	Ms.	Irene	Portillo	Executive Director	South El Monte
3	SR-60	Beverly Hospital	Mr.	Gary	Kiff	President	Montebello

Eastside Transit Corridor Phase 2 - Focus Group Invitee List (April/May 2009)

Invited To Group No:	Focus Group	Organization/Affiliation	Prefix	First Name	Last Name	Title	City
3	SR-60	C-21 Dynamic Brokers	Ms.	Diana	Bustamante	President	Montebello
3	SR-60	City of Montebello, Planning Commission	Mr.	Thomas	Calderon	Chair, Planning Commission	Montebello
3	SR-60	City of Montebello, Planning Commission	Ms.	Cynthia	Diaz	Planning Commissioner	Montebello
3	SR-60	City of Montebello, Planning Commission	Commissioner	Minerva	Gutierrez	Planning Commissioner	Montebello
3	SR-60	City of Montebello, Planning Commission	Commissioner	Maria	Halpern	Planning Commissioner	Montebello
3	SR-60	City of Montebello, Planning Commission	Ms.	Linda	Payan	Planning Commissioner	Montebello
3	SR-60	Kaiser Permanente	Ms.	Reyna	Del Haro	Director of Public Affairs	Baldwin Park
3	SR-60	Montebello Board of Realtors	Ms.	Irma	Acosta		Montebello
3	SR-60	Montebello Board of Realtors	Mr.	Jay	Avirom	President	Montebello
3	SR-60	Montebello Chamber of Commerce	Ms.	Andrea	Wagg	President	Montebello
3	SR-60	Montebello Town Center	Ms.	Tisha	Cabezas	Marketing Manager	Montebello
3	SR-60	Montebello Town Center	Mr.	Gregory	Millsap	Senior Manager, Property Management	Montebello
3	SR-60	Montebello Town Center	Mr.	Vaughn	Vencill	Security & Guest Services Manager	Montebello
3	SR-60	Montebello Unified School District	Mr.	David	Randall		Montebello
3	SR-60	Montebello Unified School District	Mr.	Edward	Velasquez	Superintendent	Montebello
3	SR-60	P&P Management	Ms.	Pamela	Manookian		Montebello
3	SR-60	Alhambra Unified School District	Mr.	Harold	Standerfer	Deputy Superintendent	Alhambra
3	SR-60	City of Monterey Park	Honorable	Mitchell	Ing	Mayor Pro Tem	Monterey Park
3	SR-60	City of Monterey Park	Honorable	David T.	Lau	Council Member	Monterey Park
3	SR-60	City of Monterey Park	Honorable	Betty	Tom Chu	Council Member	Monterey Park
3	SR-60	City of Monterey Park	Honorable	Benjamin "Frank"	Venti	Council Member	Monterey Park
3	SR-60	City of Monterey Park	Honorable	Anthony	Wong	Council Member	Monterey Park
3	SR-60	City of Monterey Park, Economic Development Advisory Committee	Mr.	Brian	Dowling	Economic Redevelopmnet Project Manager	Monterey Park
3	SR-60	City of Monterey Park, Economic Development Advisory Committee	Ms.	Cindy	Ota Lee	Chair	Monterey Park
3	SR-60	City of Monterey Park, Environmental Commission	Mr.	William	Wheeler		Monterey Park
3	SR-60	East Los Angeles College	Mr.	Ernest	Moreno	President	Monterey Park
3	SR-60	Economic Development Advisory Committee	Mr.	Dante	Terramani	Vice Chair	Monterey Park
3	SR-60	Montebello Unified School District	Mr.	Robert	Henke	Assistant Superintendent of Pupil & Community Services	Montebello
3	SR-60	Monterey Park Enviromental Commission	Ms.	Linda	Chu	Chair	Monterey Park

Eastside Transit Corridor Phase 2 - Focus Group Invitee List (April/May 2009)

Invited To Group No:	Focus Group	Organization/Affiliation	Prefix	First Name	Last Name	Title	City
3	SR-60	Monterey Park Enviromental Commission	Mr.	Joe	Reichenberger	Co-Chair	Monterey Park
3	SR-60	Monterey Park Planning Commission	Mr.	Wayne	Lee	Chair	Monterey Park
3	SR-60	Monterey Park Planning Commission	Mr.	Adolfo	Reta	Director of Development Services/Staff Liason	Monterey Park
3	SR-60	Monterey Park Recreation and Parks Commission	Mr.	Rick	Burroughs		Monterey Park
3	SR-60	Monterey Park Recreation and Parks Commission	Mr.	Harry	Panagiotes	Liaison	Monterey Park
3	SR-60	Monterey Park Traffic Commission	Mr.	Luis	Estrada		Monterey Park
3	SR-60	Monterey Park Traffic Commission	Mr.	Cesar	Vega	Liaison	Monterey Park
3	SR-60	Chamber Board of Directors	Ms.	Marissa	Castro-Salvati	Business Development	Monterey Park
3	SR-60	Chamber Board of Directors	Ms.	Nadine	Gomez	President	Rosemead
3	SR-60	City of Rosemead	Honorable	Sandra	Armenta	Council Member	Rosemead
3	SR-60	City of Rosemead	Ms.	Sheri	Bermejo	Planning Services Manager	Rosemead
3	SR-60	City of Rosemead	Honorable	Margaret	Clark	Mayor	Rosemead
3	SR-60	City of Rosemead	Mr.	Farid	Hentabli	Engineering Management Analyst	Rosemead
3	SR-60	City of Rosemead	Honorable	Polly	Low	Council Member	Rosemead
3	SR-60	City of Rosemead	Honorable	Steven	Ly	Council Member	Rosemead
3	SR-60	City of Rosemead	Mr.	Chris	Marcarello	Deputy Director of Public Service	Rosemead
3	SR-60	City of Rosemead	Honorable	Gary	Taylor	Mayor Pro Tem	Rosemead
3	SR-60	City of Rosemead	Commissioner	Truong	Cam	Planning Commissioner	Rosemead
3	SR-60	City of Rosemead	Commissioner	Todd	Kunioka	Planning Commissioner	Rosemead
3	SR-60	City of Rosemead	Commissioner	Daniel	Lopez	Planning Commissioner	Rosemead
3	SR-60	City of Rosemead	Commissioner	Allan	Vuu	Planning Commissioner	Rosemead
3	SR-60	City of Rosemead, Planning Commission	Commissioner	Ronald	Gay	Planning Commissioner	Rosemead
3	SR-60	Garvey School District	Mr.	Bob	Bruesch	Board President	Rosemead
3	SR-60	Garvey School District	Ms.	Virginia	Peterson	Superintendent	Rosemead
3	SR-60	Rosemead School Board	Ms.	Rhonda	Harmon	President	Rosemead
3	SR-60	Rosemead School District	Ms.	Amy	Enomoto-Perez	Superintendent	Rosemead
3	SR-60	University of the West	Mr.	Allen	Huang	President	Rosemead

Eastside Transit Corridor Phase 2 - Focus Group Invitee List (April/May 2009)

Invited To Group No:	Focus Group	Organization/Affiliation	Prefix	First Name	Last Name	Title	City
3	SR-60	1st District	Ms.	Gloria	Molina	Supervisor	El Monte
3	SR-60	Athens Recycling	Mr.	Dennis	Chiappetta		City of Industry
3	SR-60	Bank of the West	Ms.	Connie	Lainez	Branch Manager	South El Monte
3	SR-60	Cielito Lindo Restaurant	Mr.	Jose	Hernandez		South El Monte
3	SR-60	Cielito Lindo Restaurant	Ms.	Teresa	Hernandez		South El Monte
3	SR-60	Citizens Business Bank	Mr.	Craig	Ciebiera	Vice President	South El Monte
3	SR-60	Club Latino De Sur El Monte	Mr.	Carlos	Vega		South El Monte
3	SR-60	D.C. Corporation	Mr.	David	Cook		West Covina
3	SR-60	D.C. Corporation	Mr.	Don	Cook		West Covina
3	SR-60	El Monte City School District	Ms.	Elizabeth	Rivas	President	El Monte
3	SR-60	El Monte City School District	Mr.	Jeff	Seymour	Superintendent	El Monte
3	SR-60	El Monte Union High School District	Ms.	Kathy	Furnald	Superintendent	El Monte
3	SR-60	El Monte Union High School District	Mr.	Carlos	Salcedo	President	El Monte
3	SR-60	El Monte/ South El Monte Chamber of Commerce	Mr.	Richard	Nichols	Executive Director	El Monte
3	SR-60	Epiphany Church	Mr.	Antonio	Esteban	Father	South El Monte
3	SR-60	Faith Tabernacle	Mr.	David	Martinez	Pastor	South El Monte
3	SR-60	Fire Station 90	Mr.	Guy	Favatella	Captain	South El Monte
3	SR-60	Fire Station 90	Mr.	Frank	Reynoso	Captain	South El Monte
3	SR-60	Fire Station 90	Mr.	Ruben	Torrez	Captain	South El Monte
3	SR-60	Greater El Monte Community Hospital	Mr.	Samantha	Wong	Bus Development	South El Monte
3	SR-60	Mountain View School District	Ms.	Gloria	Diaz		El Monte
3	SR-60	Mountain View School District	Mr.	Joe	Moreno	President	El Monte
3	SR-60	Mountain View School District	Mr.	John	Stoddard	Superintendent	El Monte
3	SR-60	Pacific Ind Realty Inc.	Mr.	John	Wagner	President	South El Monte
3	SR-60	Primestor Development	Ms.	Vanessa	Delgado		Beverly Hills
3	SR-60	Primestor Development	Mr.	Arturo	Sneider		Beverly Hills
3	SR-60	Ramada Inn Suites	Mr.	Paul	Shih Hsiau Yen		South El Monte
3	SR-60	Ramada Inn Suites	Ms.	Paige	Yen		South El Monte
3	SR-60	Santa Anita Commercial Group, LLC.	Mr.	Ron	Jenkins		South El Monte
3	SR-60	Santa Anita Commercial Group, LLC.	Mr.	Jack	Owens		South El Monte
3	SR-60	SEMBOA	Mr.	Lawerence	Beard		South El Monte
3	SR-60	South El Monte Community Services Commissions	Ms.	Josie	Blanco	Commissioner	South El Monte
3	SR-60	South El Monte Community Services Commissions	Ms.	Hathyia	Chea	Commissioner	South El Monte
3	SR-60	South El Monte Community Services Commissions	Ms.	Yolanda	Del Rio	Commissioner	South El Monte
3	SR-60	South El Monte Community Services Commissions	Ms.	Cynthia	Flores	Commissioner	South El Monte

Eastside Transit Corridor Phase 2 - Focus Group Invitee List (April/May 2009)

Invited To Group No:	Focus Group	Organization/Affiliation	Prefix	First Name	Last Name	Title	City
3	SR-60	South El Monte Community Services Commissions	Mr.	Rudy	Lopez	Commissioner	South El Monte
3	SR-60	South El Monte Community Services Commissions	Ms.	Marissa	Martinez-Perez	Commissioner	South El Monte
3	SR-60	South El Monte Community Services Commissions	Ms.	Jacqueline	Tovar	Commissioner	South El Monte
3	SR-60	South El Monte Planning Commissioners	Commissioner	Joseph	Armendariz	Chairman	South El Monte
3	SR-60	South El Monte Planning Commissioners	Mr.	Joe	Jauregui	Commissioner	South El Monte
3	SR-60	South El Monte Planning Commissioners	Mr.	Lorenzo	Lauria	Commissioner	South El Monte
3	SR-60	South El Monte Planning Commissioners	Mr.	Salvador	Ramirez	Commissioner	South El Monte
3	SR-60	South El Monte Planning Commissioners	Mr.	Jeffery	Rubio	Vice Chairman	South El Monte
3	SR-60	South El Monte Senior Advisor Council	Mr.	John	Gonzales		South El Monte
3	SR-60	South El Monte Super Bingo	Ms.	Gloria	Gomez		South El Monte
3	SR-60	Temple Station Sheriff's Department	Mr.	Richard	Shaw	Captain	Temple City
3	SR-60	Temple Station Sheriff's Department	Mr.	John	Stilegenbaure	Sergeant	Temple City
3	SR-60	Valle Lindo School District	Ms.	Mary	Labrucherie	Superintendent	South El Monte
3	SR-60	Valle Lindo School District	Mr.	Rudy	Martinez	President	South El Monte
3	SR-60	City of El Monte	Mr.	Rene	Bobadilla		El Monte
3	SR-60	City of El Monte	Ms.	Deborah	Moraza	Transportation Services Manager	El Monte
3	SR-60	City of El Monte	Mr.	Eugene	Moy	Redevelopment Manager	El Monte
3	SR-60	City of El Monte	Mr.	James	Mussenden	City Manager	El Monte
3	SR-60	City of Industry	Mr.	Joshua	Nelson	Project Engineer	City of Industry
3	SR-60	City of Monterey Park	Ms.	Amy	Ho	Transportation Manager	Monterey Park
3	SR-60	City of Monterey Park	Mr.	Elias	Saykali	Director of Public Works	Monterey Park
3	SR-60	City of Pico Rivera	Mr.	Al	Cablay	Director of Public Works	Pico Rivera
3	SR-60	City of Rosemead	Ms.	Aileen	Flores	Public Affairs Manager	Rosemead
3	SR-60	City of South El Monte	Mr.	Manuel	Mancha	Director, Community Development	South El Monte
3	SR-60	City of South El Monte	Mr.	Anthony	Ybarra	City Manager	South El Monte
3	SR-60	City of South El Monte - Community Development	Mr.	Omar	Hernandez	Housing/Grants/Special Projects	South El Monte
3	SR-60	San Gabriel Valley Council of Governments	Mr.	Nick	Conway	Executive Director	Pasadena
3	SR-60	ELAC		Sonia	Lopez	Associate Dean, Student Activities	
3	SR-60	ELAC		Judy	Martinez	Social Science Commissioner, ASU Board Member	

Eastside Transit Corridor Phase 2 - Focus Group Invitee List (April/May 2009)

Invited To Group No:	Focus Group	Organization/Affiliation	Prefix	First Name	Last Name	Title	City
1,2,3	SR-60 Whittier/Beverly Washington	California State Assembly, District 49	Honorable	Mike	Eng	Assembly Member	El Monte
1,2,3	SR-60 Whittier/Beverly Washington	California State Assembly, District 49	Ms.	Monica	Aleman		El Monte
1,2,3	SR-60 Whittier/Beverly Washington	California State Assembly, District 50	Honorable	Hector	De La Torre	Assembly Member	South Gate
1,2,3	SR-60 Whittier/Beverly Washington	California State Assembly, District 56	Honorable	Tony	Mendoza	Assembly Member	Norwalk
1,2,3	SR-60 Whittier/Beverly Washington	California State Assembly, District 58	Honorable	Charles	Calderon	Assembly Member	City of Industry
1,2,3	SR-60 Whittier/Beverly Washington	California State Senate, District 24	Mr.	Henry	Lo		Los Angeles
1,2,3	SR-60 Whittier/Beverly Washington	California State Senate, District 24	Honorable	Gloria	Romero	Senator	Los Angeles
1,2,3	SR-60 Whittier/Beverly Washington	California State Senate, District 30	Honorable	Ron	Calderon	Senator	Montebello
1,2,3	SR-60 Whittier/Beverly Washington	CB Richard Ellis	Mr.	James	Rodriguez	First Vice President	Commerce
1,2,3	SR-60 Whittier/Beverly Washington	Los Angeles County Board of Supervisors, District 1	Ms.	Nicole	Englund	Planning Deputy	Los Angeles
1,2,3	SR-60 Whittier/Beverly Washington	Mexican American Opportunity Foundation (MAOF)	Mr.	Martin	Castro	President	Montebello
1,2,3	SR-60 Whittier/Beverly Washington	Our Lady of Miraculous Medal Catholic Church	Mr.	Joseph	Avila		Montebello
1,2,3	SR-60 Whittier/Beverly Washington	Our Lady of Miraculous Medal Catholic Church	Mr.	Tony	Miera		Monterey Park

Eastside Transit Corridor Phase 2 - Focus Group Invitee List (April/May 2009)

Invited To Group No:	Focus Group	Organization/Affiliation	Prefix	First Name	Last Name	Title	City
1,2,3	SR-60 Whittier/Beverly Washington	Rio Hondo College	Mr.	Russell	Castaneda-Calleros M.P.P.	Director, Government & Community Relations	Whittier
1,2,3	SR-60 Whittier/Beverly Washington	Rolled Steel Products	Mr.	Steven	Alperson		Los Angeles
1,2,3	SR-60 Whittier/Beverly Washington	Rotary International	Mr.	Ted	Jones	President	Montebello
1,2,3	SR-60 Whittier/Beverly Washington	U.S. House of Representatives, District 34	Honorable	Lucille	Roybal-Allard	Congress Member	Los Angeles
1,2,3	SR-60 Whittier/Beverly Washington	U.S. House of Representatives, District 38	Honorable	Grace	Napolitano	Congress Member	Santa Fe Springs
1,2,3	SR-60 Whittier/Beverly Washington	U.S. House of Representatives, District 39	Mr.	Jesse	Cheng		Cerritos
1,2,3	SR-60 Whittier/Beverly Washington	U.S. House of Representatives, District 39	Honorable	Linda	Sanchez	Congress Member	Cerritos
1,2,3	SR-60 Whittier/Beverly Washington	U.S. House of Representatives, District 42, Office of Congressman Gary Miller	Ms.	Kara	Etheridge	Transportation Representatives	Brea
1,2,3	SR-60 Whittier/Beverly Washington	U.S. Senate	Honorable	Barbara	Boxer	Senator	Los Angeles
1,2,3	SR-60 Whittier/Beverly Washington	U.S. Senate	Honorable	Dianne	Feinstein	Senator	Los Angeles
1,2,3	SR-60 Whittier/Beverly Washington		Mr.	Phillip	Pace	Property Owner	Montebello
1,2,3	SR-60 Whittier/Beverly Washington		Mr.	Ruben	Juarez	Resident	Pico Rivera
1,2,3	SR-60 Whittier/Beverly Washington		Mr.	David	Juarez	Resident	Pico Rivera

Eastside Transit Corridor Phase 2 - Focus Group Invitee List (April/May 2009)

Invited To Group No:	Focus Group	Organization/Affiliation	Prefix	First Name	Last Name	Title	City
1,2,3	SR-60 Whittier/Beverly Washington		Mr.	Chris	Schaefer	Resident	Whittier
1,2,3	SR-60 Whittier/Beverly Washington	City of Montebello	Honorable	Robert	Urteaga	Mayor Pro Tem	Montebello
1,2,3	SR-60 Whittier/Beverly Washington	City of Montebello	Honorable	Rosemarie	Vasquez	Mayor	Montebello
1,2,3	SR-60 Whittier/Beverly Washington	CA State Assemblymember Charles Calderon - 58th Assembly District	Ms.	Lisa	Herrera		Pico Rivera
1,2,3	SR-60 Whittier/Beverly Washington	City of Pico Rivera	Mr.	David	Armenta	Council Member	Pico Rivera
1,2,3	SR-60 Whittier/Beverly Washington	City of Pico Rivera	Mr.	Ron	Beilke	Council Member	Pico Rivera
1,2,3	SR-60 Whittier/Beverly Washington	City of Pico Rivera	Mr.	Jeff	Brauckmann	Director of Community Development	Pico Rivera
1,2,3	SR-60 Whittier/Beverly Washington	City of Pico Rivera	Mr.	Chuck	Fuentes	City Manager	Pico Rivera
1,2,3	SR-60 Whittier/Beverly Washington	City of Pico Rivera	Ms.	Christina	Gallagher	Assistant Planner	Pico Rivera
1,2,3	SR-60 Whittier/Beverly Washington	City of Pico Rivera	Ms.	Gracie	Gallegos	Mayor	Pico Rivera
1,2,3	SR-60 Whittier/Beverly Washington	City of Pico Rivera	Ms.	Julia	Gonzalez	Deputy Director of Community Development	Pico Rivera
1,2,3	SR-60 Whittier/Beverly Washington	City of Pico Rivera	Honorable	Gregory	Salcido	Council Member	Pico Rivera
1,2,3	SR-60 Whittier/Beverly Washington	El Rancho High School	Mr.	Sam	Genis	Principal	Pico Rivera

Eastside Transit Corridor Phase 2 - Focus Group Invitee List (April/May 2009)

Invited To Group No:	Focus Group	Organization/Affiliation	Prefix	First Name	Last Name	Title	City
1,2,3	SR-60 Whittier/Beverly Washington	El Rancho Unified School District, Dist. 1	Mr.	Norbert	Genis	Superintendent	Pico Rivera
1,2,3	SR-60 Whittier/Beverly Washington	Montebello Board of Realtors / City of Pico Rivera	Honorable	Bob	Archuleta	Immediate Past President / Mayor Pro Tem	Montebello
1,2,3	SR-60 Whittier/Beverly Washington	Pico Rivera Resident	Ms.	Patricia	Bell		Whittier
1,2,3	SR-60 Whittier/Beverly Washington	Sheriff's Station	Captain	Michael	Rothans		Pico Rivera
1,2,3	SR-60 Whittier/Beverly Washington	El Monte Union High School District	Mr.	Tony	Ortega		El Monte
1,2,3	SR-60 Whittier/Beverly Washington	Army Corps of Engineers	Mr.	Phillip	Serpa		Los Angeles
1,2,3	SR-60 Whittier/Beverly Washington	Caltrans, Office of Environmental Analysis	Mr.	Brian	Manor	Environmental Planner	Los Angeles
1,2,3	SR-60 Whittier/Beverly Washington	City of Los Angeles, Bureau of Engineering	Mr.	Buu	Luu		Los Angeles
1,2,3	SR-60 Whittier/Beverly Washington	City of Montebello	Mr.	Michael A.	Huntley	Director of Community Development	Montebello
1,2,3	SR-60 Whittier/Beverly Washington	City of Montebello	Ms.	Aurora	Jackson	Director of Transportation	Montebello
1,2,3	SR-60 Whittier/Beverly Washington	City of Montebello	Ms.	Ariel	Socarras		Montebello
1,2,3	SR-60 Whittier/Beverly Washington	City of Whittier	Mr.	Martin	Browne	Management Analyst	Whittier
1,2,3	SR-60 Whittier/Beverly Washington	City of Whittier	Ms.	Nancy	Mendez	Assistant City Manager	Whittier

Eastside Transit Corridor Phase 2 - Focus Group Invitee List (April/May 2009)

Invited To Group No:	Focus Group	Organization/Affiliation	Prefix	First Name	Last Name	Title	City
1,2,3	SR-60 Whittier/Beverly Washington	Gateway Cities of Council of Governments	Mr.	Richard	Powers	Executive Director	Paramount
1,2,3	SR-60 Whittier/Beverly Washington	Los Angeles County, Dept. of Public Works	Mr.	Vince	Aguilar		Alhambra
1,2,3	SR-60 Whittier/Beverly Washington	Los Angeles County, Dept. of Public Works	Ms.	Lisa	Chen		Alhambra
1,2,3	SR-60 Whittier/Beverly Washington	City of Whittier	Mr.	Chris	Magdosku	Assistant Director of Public Works	Whittier
1,2,3	SR-60 Whittier/Beverly Washington	City of Whittier	Mr.	Owen	Newcomer	Council Member	Whittier
1,2,3	SR-60 Whittier/Beverly Washington	City of Whittier	Mr.	David	Pelser	Director of Public Works	Whittier
1,2,3	SR-60 Whittier/Beverly Washington	City of Whittier	Mr.	Joe	Vinatieri	Council Member	Whittier
1,2,3	SR-60 Whittier/Beverly Washington	Presbyterian Intercommunity Hospital	Ms.	Julie	Reback	Vice President Marketing	Whittier
1,2,3	SR-60 Whittier/Beverly Washington	Whittier Area Chamber of Commerce	Ms.	Mary Ann	Bakotich	Executive Director	Whittier
1,2,3	SR-60 Whittier/Beverly Washington	Whittier City School District	Mr.	Bob	Mazzeo		
1,2,3	SR-60 Whittier/Beverly Washington	Whittier College	Mr.	Joe	Price	Professor	Whittier
1,2,3	SR-60 Whittier/Beverly Washington		Mr.	Tony	Bustamante	Redevelopment Consultant	Whittier
1,2,3	SR-60 Whittier/Beverly Washington		Mr.	Steve	Temblador	Resident	Whittier

Eastside Transit Corridor Phase 2 - Focus Group Invitee List (April/May 2009)

Invited To Group No:	Focus Group	Organization/Affiliation	Prefix	First Name	Last Name	Title	City
1,2,3	SR-60 Whittier/Beverly Washington	City of Montebello	Honorable	William	Molinari	Council Member	Montebello
1,2,3	SR-60 Whittier/Beverly Washington	City of Montebello	Honorable	Kathy	Salazar	Council Member	Montebello
1,2,3	SR-60 Whittier/Beverly Washington	City of Montebello	Honorable	Mary Anne	Saucedo-Rodriguez	Council Member	Montebello
1,2,3	SR-60 Whittier/Beverly Washington	Leauge of Women Voters	Ms.	Margo	Reeg		
1,2,3	SR-60 Whittier/Beverly Washington	Our Lady of Miraculous Medal Catholic Church	Mr.	Josheph	Lombardo		Monterey Park
1,2,3	SR-60 Whittier/Beverly Washington	Our Lady of Miraculous Medal Catholic Church	Mr.	Ed	Solorzano		Montebello
1,2,3	SR-60 Whittier/Beverly Washington	Pico Rivera Resident	Mr.	Harold	Pederson		Pico Rivera
1,2,3,4	Montebello Alignment	Beverly Hospital	Mr.	Gary	Kiff	President	Montebello
1,2,3,4	Montebello Alignment	C-21 Dynamic Brokers	Ms.	Diana	Bustamante	President	Montebello
1,2,3,4	Montebello Alignment	CA State Assemblymember Charles Calderon - 58th Assembly District	Ms.	Adrianna	Villa	Field Representative	City of Industry
1,2,3,4	Montebello Alignment	City of Montebello	Honorable	Robert	Urteaga	Mayor Pro Tem	Montebello
1,2,3,4	Montebello Alignment	City of Montebello	Honorable	Rosemarie	Vasquez	Mayor	Montebello
1,2,3,4	Montebello Alignment	City of Montebello, Planning Commission	Mr.	Thomas	Calderon	Chair, Planning Commission	Montebello
1,2,3,4	Montebello Alignment	City of Montebello, Planning Commission	Ms.	Cynthia	Diaz	Planning Commissioner	Montebello
1,2,3,4	Montebello Alignment	City of Montebello, Planning Commission	Commissioner	Minerva	Gutierrez	Planning Commissioner	Montebello
1,2,3,4	Montebello Alignment	City of Montebello, Planning Commission	Commissioner	Maria	Halpern	Planning Commissioner	Montebello
1,2,3,4	Montebello Alignment	City of Montebello, Planning Commission	Ms.	Linda	Payan	Planning Commissioner	Montebello

Eastside Transit Corridor Phase 2 - Focus Group Invitee List (April/May 2009)

Invited To Group No:	Focus Group	Organization/Affiliation	Prefix	First Name	Last Name	Title	City
1,2,3,4	Montebello Alignment	Kaiser Permanente	Ms.	Reyna	Del Haro	Director of Public Affairs	Baldwin Park
1,2,3,4	Montebello Alignment	Montebello Board of Realtors	Ms.	Irma	Acosta		Montebello
1,2,3,4	Montebello Alignment	Montebello Board of Realtors	Mr.	Jay	Avirom	President	Montebello
1,2,3,4	Montebello Alignment	Montebello Chamber of Commerce	Ms.	Andrea	Wagg	President	Montebello
1,2,3,4	Montebello Alignment	Montebello Town Center	Ms.	Tisha	Cabezas	Marketing Manager	Montebello
1,2,3,4	Montebello Alignment	Montebello Town Center	Mr.	Gregory	Millsap	Senior Manager, Property Management	Montebello
1,2,3,4	Montebello Alignment	Montebello Town Center	Mr.	Vaughn	Vencill	Security & Guest Services Manager	Montebello
1,2,3,4	Montebello Alignment	Montebello Unified School District	Mr.	David	Randall		Montebello
1,2,3,4	Montebello Alignment	Montebello Unified School District	Mr.	Edward	Velasquez	Superintendent	Montebello
1,2,3,4	Montebello Alignment	P&P Management	Ms.	Pamela	Manookian		Montebello

APPENDIX G:

Outreach Meeting Record

Appendix G - Outreach Meeting Record

TYPE	STAKEHOLDERS	CONTACT NAME	PURPOSE	MEETING DATE & TIME	LOCATION
COUNCIL BRIEFINGS & OPEN HOUSES					
City	**City of Whittier - City Council & Open House**	Martin Brown	Present AA Results and Next Steps	**Tues., May 12, 09 Open House 5:30 p.m. Council Meeting 6:30 p.m.**	Whittier City Hall, Council Chambers 13230 Penn Street, 1st Floor Whittier, 90602
City	**City of Rosemead - City Council & Open House**	Aileen Flores	Present AA Results and Next Steps	**Tues, April 28, 09 Open House 5:30 p.m.* Council Meeting 7:00 p.m.**	City Hall Council Chambers 8838 E. Valley Blvd., Rosemead
City	**City of Commerce - City Council & Open House**	Alex Hamilton	Present AA Results and Next Steps	**Tues., April 21, 09 Open House 5:30 p.m.* Council Meeting 6:30 p.m.**	Commerce City Hall, Council Chambers 2535 Commerce Way Commerce, 90040
City	**City of Monterey Park - City Council & Open House**	Amy Ho	Present AA Results and Next Steps	**Wed., April 15, 09 Open House: 5:00 p.m.* Council Meeting: 7:00 p.m.**	Council Chambers 320 West Newmark Ave., Monterey Park, CA 91754
City	**City of South El Monte - City Council & Open House**	Omar Hernandez	Present AA Results and Next Steps	**Tues., April 14, 09, Open House 5:00 p.m.* Council Meeting 6:30 p.m.**	South El Monte City Hall, Council Chambers 1415 N. Santa Anita Avenue South El Monte, 91733
City	**City of Pico Rivera - City Council & Open House**	Julia Gonzalez	Present AA Results and Next Steps	**Tues., April 14, 09 Open House: 5:00 p.m.* Council Meeting: 6:00 p.m.**	Pico Rivera Council Chambers 6615 Passons Blvd Pico Rivera, CA 90660
City	**City of Montebello - City Council & Open House**	Aurora Jackson (AJ)	Present AA Results and Next Steps	**Wed., April 8, 09, Open House 5:30 p.m.* Council Meeting 6:30 p.m.**	Montebello City Hall, Council Chambers 1600 W. Beverly Blvd. Montebello, 90640

Appendix G - Outreach Meeting Record

TYPE	STAKEHOLDERS	CONTACT NAME	PURPOSE	MEETING DATE & TIME	LOCATION
City	**City of Monterey Park - City Council Project Update**	Elias Saykali, Director of Public Works	Project Update	**Wed., Feb. 18, 2009 7:00 pm**	Monterey Park City Hall, Council Chambers 320 West Newmark Avenue
FOCUS GROUP MEETINGS					
Stakeholder	**Focus Group #4**	Aurora Jackson (AJ)	Review alignments specific to Montebello	**Thurs., July 9, 09 6:00 p.m.-8:00 p.m.**	Montebello Senior Center
Stakeholder	**Focus Group Meeting #3 (SR60)**	Omar Hernandez	Present Project Background, Lay Foundation for Visioning Session, Discuss Benefits of LRT and Parking and Station Loctations	**Thurs., June 4, 09 6:00 p.m. - 8:00 p.m.**	So. El Monte Senior Center
Stakeholder	**Focus Group Meeting #2 (Whittier/Beverly)**	Sandra Castleman	Present Project Background, Lay Foundation for Visioning Session, Discuss Benefits of LRT and Parking and Station Locations	**Wed., June 3, 09 6:00 p.m. - 8:00 p.m.**	Whittier Train Depot 7333 Greenleaf Ave. Whittier , CA 90601
Stakeholder	**Focus Group Meeting #1 (Washington)**	Lilian Gonzalez	Present Project Background, Lay Foundation for Visioning Session, Discuss Benefits of LRT and Parking and Station Locations	**Tues, June 2, 09 6:00 p.m. - 8:00 p.m.**	El Rancho High School 6501 Passons Blvd. Pico Rivera, CA 90660
COMMUNITY OPEN HOUSES					
Stakeholder	**Property Owners Open House**	Trese Childs	Provide project overview/updates to property and business owners along the alignments	**Wed., July 29, 09 6:00 p.m. - 8:00p.m.**	Montebello Golf Course - San Antonio Room 901 Via San Clemente Montebello, CA 90640
ELECTED OFFICIAL BRIEFINGS					
Regulatory	**Gateway COG Transportation Committee (per Richard Powers request)**	Karen Heit	Project update	**Wed., May 6, 09 4:30 p.m.**	Gateway Cities COG 16401 Paramount Blvd. Paramount, CA 9072

Appendix G - Outreach Meeting Record

TYPE	STAKEHOLDERS	CONTACT NAME	PURPOSE	MEETING DATE & TIME	LOCATION
Regulatory	**San Gabriel Valley COG Transportation Committee**	Kathy Boyd	Update on Eastside Phase 2 Project	**Thurs., April 16, 09 4:00 p.m.**	SCE CTAC 6090 N. Irwindale Ave Irwindale, CA 91702
Regulatory	**Gateway COG**	Karen Heit	Present AA Results and Next Steps, Including Portland Tour Info., Visioning Sessions and City Council Briefings/ Open Houses and Next Steps	**Thurs., April 2, 09 10:00 a.m.**	16401 Paramount Blvd. Paramount, CA 90723
Regulatory	**San Gabriel Valley COG**	Kathy Boyd	Present AA Results and Next Steps, Including Portland Tour Info., Visioning Sessions and City Council Briefings/ Open Houses and Next Steps	**Tues., March 31, 09 1:30 p.m. - 2:00 p.m.**	3452 E. Foothill Blvd., Suite 910 Pasadena, CA 91107
TECHNICAL ADVISORY COMMITTEE (TAC) MEETINGS					
TAC	**TAC Meeting**		Project meeting	**Tues., March 17, 09 10:00 a.m.**	
STAKEHOLDER MEETINGS					
Stakeholder	**Kaiser Permanente Baldwin Park Medical Center** Attending the meeting on behalf of Kaiser will be: Maggie Pierce, Executive Director, Baldwin Park Medical Center Lloyd Duplechan, Assistant Medical Center Administrator, Baldwin Park Medical Center Reyna Del Haro, Director of Public Affairs, Baldwin Park Medical Center Carl Cameron, Administrator, Montebello Medical Office Building Peter Becronis, Corporate Real Estate Manager, Southern California Region	Gloria Bañuelos Reyna Del Haro Director of Public Affairs	Project update	**Wed., July 22, 09 9:30 a.m. - 11:00 a.m.**	Kaiser Permanente Baldwin Park Medical Center 1011 Baldwin Park Blvd. Baldwin Park, CA 91706
Stakeholder	**Southern California Edison**	Judy Grissmeyer	Project overview/technical team discussion	**Thurs., July 30, 09 10:00 a.m.**	1000 Potrero Grande, Monterey Park CA 91754
City	**City One-on-One: South El Monte**	Omar Hernandez	Review all Project Input Received, Discuss Tech. Issues and Prioritize Alternatives	**Tues., July 21, 09 3:00 p.m.**	City Hall Conference Room

Appendix G - Outreach Meeting Record

TYPE	STAKEHOLDERS	CONTACT NAME	PURPOSE	MEETING DATE & TIME	LOCATION
City	**City One-on-One: Montebello & Monterey Park staff:** City of Montebello department heads, planning officers, public works officials, community development officers	Aurora Jackson (AJ)	Review all Project Input Received, Discuss Tech. Issues and Prioritize Alternatives	**Thurs., July 16, 09** **2:00 p.m. - 5:00 p.m.**	Transportation Center, 400 S. Taylor, Montebello, Ca
City	**City One-on-One: Commerce staff:** Robert Zarrilli, Director of Community Development Alex Hamilton, Assistant Director of Community Development Dan Gomez, Director of Transportation Martin Gombert, Acting Director of Transportation	Linda Wright	Review all Project Input Received, Discuss Tech. Issues and Prioritize Alternatives	**Thurs., July 9, 09** **2:00 p.m.**	City Hall Admin Conference Room 2535 Commerce Way, Commerce
City	**City One-on-One: Rosemead staff:** Jeff Allred, City Manager Brian Saeki, Director of Community Development Sheri Bermejo, City Planner	Aileen Flores	Review all Project Input Received, Discuss Tech. Issues and Prioritize Alternatives	**Wed., July 8, 09** **10:00 a.m.**	City Hall Conference Room
City	**City One-on-One: Pico Rivera staff:** Julia Gonzalez Art Cervantes, Public Works Deputy Director	Julia Gonzalez	Review all Project Input Received, Discuss Tech. Issues and Prioritize Alternatives	**Wed., July 8, 09** **3:00 p.m. - 4:00 p.m.**	City Hall Main Conference Room
Stakeholder	**Southern California Edison**	Judy Grissmeyer	Project overview/technical team discussion	**Tues., June 30, 09** **9:00 a.m.**	1000 Potrero Grande, Monterey Park CA 91754
Regulatory	**FTA/Metro Monthly Coodination meeting**	Tham Nguyen	Provide Overview of Alternatives Prioritization Process and Final Recommendation	**Wed., July 1, 09** **9:00 a.m. - 12:00 p.m.**	
Stakeholder	**Montebello Golf Course - Golf Commission**	Fernando Garcia, Golf Course Superintendent/Facilites Manager	Project update	**Wed., June 17, 09** **11:30 a.m.**	901 Via San Clemente Montebello, CA 90640
Interest Group	**SR-60 Coalition**	Monica Aleman		**Tues., June 16, 09** **2:00 p.m.**	320 W. Newmark, Monterey Park
City	**City One-on-One: Whittier City Staff:** Nancy Mendez - Assistant City Manager Jeff Collier - Director of Community Development Fran Shields - Director of Community Development David Pelser - Director of Public Works Chris Magdosku - Assistant Director of Public Works Martin Brown - Transit Manager, Transit Division	Martin Brown	Discussion on route alignments, TOD, Land Use, Traffic Patterns etc in Whittier.	**Mon., June 15, 09** **11:00 a.m.**	Whittier Council Chambers

Appendix G - Outreach Meeting Record

TYPE	STAKEHOLDERS	CONTACT NAME	PURPOSE	MEETING DATE & TIME	LOCATION
Interest Group	**CalPoly Students Presentation to the Whittier City Council - 5 Point Intersection**	Wes Murray/Whittier Planning Commission	5 Points Intersection Improvements Presentaiton	**Fri., June 12, 09 10:00 a.m.**	City of Whittier
Interest Group	**Union Pacific Technical Team**	Lupe Valdez, Director of Public Affairs	Project update /Technical team discussion	**Thurs., May 28, 09 10:00 a.m.**	13181 Crossroads Parkway, North Suite 500 in the City of Industry
Interest Group	**Commerce Industrial Council - Board of Directors**	Eddie Tafoya	Project update	**Tues., May 26, 09 12:00 p.m.**	Steven's Steak House 5332 E. Stevens Place Commerce, CA
Stakeholder	**Our Lady of Miraculous Medal Catholic Church**	Tony Miera, Controller	Project update	**Thurs., May 14, 09 10:00 a.m.**	820 N. Garfield Ave. Montebello, CA 90640
Institutional	**Cantwell Sacred Heart of Mary High School**	David Chambers, Principal Ana Marie Straight, Secretary	Project update	**Mon., May 11, 09 12:00 p.m.**	329 N. Garfield Ave. Montebello, CA 90640
Interest Group	**Whittier Greenway Trail (GWT)**	Maria Claver / Mary Sullens Nancy Mendez	Project update	**Mon., May 4, 09 3:30 p.m.**	Whittier Council Chambers 13230 Penn Street, 1st Floor Whittier, 90602
Stakeholder	**Montebello Town Center**	Greg Millsap, General Manager	Project update	**Thurs., May 7, 09 10:00 a.m.**	2134 Montebello Town Center
Interest Group	**Mexican American Opportunity Foundation (MAOF)**	Martin Castro, President & CEO	Project update	**Thurs., April 30, 09 10:00 a.m. - 10:30 a.m.**	MAOF Office 401 N. Garfield, Montebello
City	**City of Montebello - District Board of Realtors**	Bob Archuleta, Mayor Pro Tem Irma Acosta, Executive Asst.	Project update and impacts on industry	**Wed., Mar. 4, 09 8:30 a.m.**	Quiet Cannon 901 N. Villa San Clemente, Montebello
Regulatory	**SCAG**	Kimberly Yu	Present AA Results and Next Steps	**Thurs., Feb. 26, 09**	

APPENDIX H:

Acronym List

Appendix H: List of Acronyms

AA ..... Alternatives Analysis
ACE.....Advanced Conceptual Engineering
BRT..... Bus Rapid Transit
CBD .....Central Business District
CE .....Conceptual Engineering
CEQA..... California Environmental Quality Act
CERCLA .....Comprehensive Environmental Response Compensation and Liability Act
CO .....Carbon Monoxide
COV .....Council of Government
CTPP .....Census Transportation Planning Package
EIR/EIS.....Environmental Impact Report/ Environmental Impact Statement
EPA ..... Environmental Protection Agency
FHWA ..... Federal Highway Administration
FTA .....Federal Transit Administration
FY .....Fiscal Year
GCL .....Geo-synthetic Clay
HOV .....High Occupancy Vehicle
I-5 .....Interstate 5
I-10 .....Interstate 10
I-605 .....Interstate 605
I-710 .....Interstate 710
KNR .....Kiss and Ride
LRT ..... Light Rail Transit
LRV ..... Light Rail Vehicle
Metro.....Los Angeles County Metropolitan Transit Authority
MIS .....Major Investment Study
MSE .....Mechanically Stabilized Earth
NEPA..... National Environmental Policy Act
NO_2 .....Nitrogen Dioxide
NTD .....National Transit Database
O_3 ..... Ozone
OCS .....Overhead Catenary System
OHP .....Office of Historic Preservation
OII ....Operating Industries, Inc
O&M .....Operating and Maintenance
PNR .....Park and Ride
PM_{10} and $PM_{2.5}$ .....Particulate Matter
PSA ..... Project Study Area
QA/QC .....Quality Assurance/Quality Control
SCAG ..... Southern California Association of Governments
SCC ..... Standardized Cost Categories
SCE.....Southern California Edison

SR-60 ..... State Route 60
TAC..... Technical Advisory Committee
TOD..... Transit Oriented Development
TPSS .....Traction Power Substations
TSM.....Transportation System Management
UPRR .....Union Pacific Railroad
USACE..... United States Army Corps Engineers

Los Angeles County Metropolitan Transportation Authority

EASTSIDE TRANSIT CORRIDOR PHASE 2 STUDY

Alternatives Analysis (AA) Report

FINAL

January, 2009

Metro™

CDM | DMJM HARRIS | AECOM
A JOINT VENTURE

Preface

Project Context

The Metro Eastside Transit Corridor Phase 2 project is a continuation of the transit investment currently being made in the Metro Gold Line Eastside Extension from Union Station to East Los Angeles. The Los Angeles County Metropolitan Transportation Authority (Metro) and its predecessors have envisioned this connection between Downtown Los Angeles and the growing cities on the Eastside for nearly three decades. Phase 2 would expand upon the Metro Gold Line Eastside Extension investment and bring improved, high-capacity transit service as far east as cities of Whittier or El Monte, potentially passing through the cities of Commerce, Monterey Park, Montebello, Rosemead, South El Monte, and Pico Rivera.

Planning for the Eastside Transit Corridor began in the early 1980s. Early planning efforts identified an extension of the heavy rail Metro Red Line subway. In 1993, the Metro Board of Directors abodpted this as the Locally Preferred Alternative. The selected alternative would have followed a winding route from Union Station to 1st and Lorena St., adding a total of four new stations to the system. Long-term plans called for ultimately extending the subway to Whittier Blvd. A Final EIS/EIR was completed in 1994 and the Federal Transit Administration later issued a full funding grant agreement to Metro for the project. However, the 1998 Metropolitan Transportation Authority Reform and Accountability Act, as well as Metro's restructuring plan under the terms of the bus consent decree, led to tighter funding constraints and the cancellation of the Eastside subway project along with the postponement of several other transit projects across the county.

In 2000, with the construction of the Pasadena Blue Line light rail project (later renamed the Metro Gold Line) moving forward, Metro revisited the idea of rail transit on the Eastside with the Eastside Transit Corridor Study, Re-Evaluation/Major Investment Study (MIS). The Metro Board of Directors ultimately selected a light rail extension of the Metro Gold Line as the new Locally Preferred Alternative for the Eastside. The first phase of the extension is currently under construction and is expected to be complete by the end of 2009. In July of 2007, the Metro Board authorized an Alternatives Analysis (AA) study to explore transit solutions for beyond the interim terminus at Atlantic Blvd. This report contains the results of the AA study for the Eastside Transit Corridor Phase 2.

Purpose of the Alternatives Analysis Report

As defined by the Federal Transit Administration (FTA), the Alternatives Analysis study identifies a transportation need and study area, discusses all possible alternatives to

addressing the need, and provides the data and evaluation needed to select a locally preferred alternative or a refined set of alternatives for additional analysis. Some of the criteria addressed during the study include environmental impacts, costs, financial feasibility, technical feasibility, neighborhood effects, transportation benefits, and consistency with local land use plans. The Alternatives Analysis study represents the initial stage of the Federal New Starts program application process, whereby the project may receive funding from FTA to assist with construction and development costs.

Organization of the Report

This AA Report is divided into seven sections, preceded by an executive summary. The sections are as follows:

- Chapter 1.0 Purpose and Need
- Chapter 2.0 Alternatives Considered
- Chapter 3.0 Transportation Issues and Analysis
- Chapter 4.0 Affected Environment and Environmental Issues
- Chapter 5.0 Cost and Financial Analysis
- Chapter 6.0 Public Involvement Process and Agency Coordination
- Chapter 7.0 Comparative Analysis of Alternatives

Table of Contents

S. Executive Summary

S.1 Purpose and Need for Proposed Action S-1
S.2 Alternatives Considered S-23
S.3 Evaluation of Alternatives S-27
S.3.1 Transportation Impacts S-27
S.3.2 Environmental Issues S-32
S.3.3 Financial Feasibility S-39
S.3.4 Public and Agency Feedback S-44
S.4 Summary, Evaluation, and Recommendations S-46
S.5 Issues to Be Resolved S-53

1. Purpose and Need

1.1 Study Corridor Description 1-1
1.1.1 Project Study Area 1-1
1.1.2 Regional Context 1-4
1.1.3 The Mobility Problem 1-6
1.1.4 Corridor Alternatives 1-22
1.2 Planning Context and Background 1-23
1.2.1 Regional Transportation Plan 1-23
1.2.2 Systems Planning 1-23
1.2.3 Corridor Planning 1-24
1.3 Corridor Conditions and Needs 1-25
1.3.1 Highway Conditions 1-26
1.3.2 Roadway Conditions 1-27
1.3.3 Transportation Facilities and Services 1-32
1.3.4 Transportation System Performance 1-41
1.3.5 Potential Travel Markets 1-43
1.3.6 Community Factors 1-50
1.4 Goals and Objectives 1-53
1.5 Mobility Problem Summary 1-54
1.6 Role of the AA Study 1-62

2. Alternatives Considered

2.1 Screening and Selection Process 2-1
2.1.1 MTA/FTA Scoping 2-6
2.1.2 Screening Criteria 2-6
2.1.3 Evaluation Criteria Development 2-8
2.2 Screened Alternatives (Alternatives 1-5) 2-12

2.3 Refinement of Alternatives 2-12
2.3.1 Alternative 1 – SR-60 LRT 2-14
2.3.2 Alternative 2 – SR-60 Busway 2-25
2.3.3 Alternative 3 – Beverly LRT 2-28
2.3.4 Alternative 4 – Whittier LRT 2-50
2.3.5 Alternative 5 – Washington LRT 2-72
2.4 Final Alternatives 2-81
2.4.1 No-Build Alternative 2-81
2.4.2 Future Baseline/ TSM Transit Network 2-83
2.4.3 Final Alternative 1 – SR-60 LRT 2-88
2.4.4 Final Alternative 2 – SR-60 Busway 2-91
2.4.5 Final Alternative 3 – Beverly LRT 2-94
2.4.6 Final Alternative 4 – Whittier LRT 2-99
2.4.7 Final Alternative 5 – Washington LRT 2-104

3. Transportation Issues and Analysis

3.1 Transit Analysis 3-1
3.1.1 Service Levels 3-1
3.1.2 Operating Assumptions and Plans 3-4
3.1.3 Run Time Estimates 3-8
3.1.4 Ridership Results 3-13
3.2 Roadway and Highway Analysis 3-29
3.2.1 Traffic Congestion and Circulation 3-29
3.2.2 Access to Stations 3-33
3.3 Summary Transportation Analysis 3-39
3.3.1 Comparison by Alternative 3-39
3.3.2 Conclusions 3-45

4. Affected Environment and Environmental Issues

4.1 Land Use and Economic Development 4-1
4.1.1 Proximity to Existing Transit Supportive Land Use 4-2
4.1.2 Accessibility to Existing and Future Population and Employment 4-5
4.1.3 Conformance with Public Policy 4-13
4.1.4 Evaluation Methodology 4-18
4.1.5 Environmental Issues 4-18
4.1.6 Summary 4-18
4.2 Catalyst for Public/Private Economic Revitalization 4-19
4.3 Right-of-Way Acquisition 4-34
4.3.1 Affected Environment 4-34
4.3.2 Evaluation Methodology 4-35
4.3.3 Environmental Issues 4-36

4.3.4 Potential Community Construction Impacts 4-37
4.4 Community and Neighborhood (Quality of Life/Environmental Justice) 4-38
4.4.1 Community Cohesion 4-38
4.4.2 Service to Transit Dependent Populations 4-41
4.5 Visual and Aesthetic 4-48
4.5.1 Affected Environment 4-48
4.5.2 Evaluation Methodology 4-49
4.5.3 Environmental Issues 4-49
4.5.4 Summary 4-57
4.6 Cultural Resources 4-57
4.6.1 Governmental Policies Applicable to Cultural Resources 4-57
4.6.2 Evaluation Methodology 4-58
4.6.3 Existing Conditions 4-59
4.6.4 Cultural Resources Considerations for Evaluation in the Draft EIR/EIS 4-65
4.7 Air Quality 4-67
4.7.1 Meteorological Setting 4-68
4.7.2 Regulatory Setting 4-68
4.7.3 Air Quality Standards 4-69
4.7.4 Environmental Conditions 4-71
4.7.5 Air Quality Impacts 4-74
4.7.6 Evaluation Methodology 4-76
4.7.7 Environmental Issues 4-83
4.8 Noise and Vibration 4-86
4.8.1 Evaluation Methodology 4-86
4.8.2 Environmental Issues 4-90
4.9 Ecosystems 4-92
4.9.1 Affected Environment 4-93
4.9.2 Evaluation Methodology 4-95
4.9.3 Environmental Issues 4-97
4.9.4 Summary 4-98
4.10 Water Resources 4-98
4.10.1 Existing Conditions 4-99
4.10.2 Evaluation Methodology 4-106
4.10.3 Environmental Issues 4-107
4.10.4 Summary 4-108
4.11 Geology and Subsurface Conditions 4-109
4.11.1 Affected Environment 4-109
4.11.2 Evaluation Methodology 4-110
4.11.3 Environmental Issues 4-110
4.11.4 Summary 4-112
4.12 Hazardous Material and Waste 4-112

4.12.1 Affected Environment 4-112
4.12.2 Evaluation Methodology 4-116
4.12.3 Environmental Issues 4-116
4.12.4 Summary 4-117
4.13 Energy 4-118
4.13.1 Affected Environment 4-118
4.13.2 Evaluation Methodology 4-19
4.13.3 Environmental Issues 4-119
4.13.4 Summary 4-120
4.14 Parklands 4-120
4.14.1 Affected Environment 4-120
4.14.2 Evaluation Methodology 4-124
4.14.3 Environment Issues 4-124
4.14.4 Summary 4-127
4.15 Summary of Environmental Issues 4-127
4.15.1 No-Build Alternative 4-128
4.15.2 TSM Alternative 4-129
4.15.3 Alternative 1 – SR-60 LRT 4-130
4.15.4 Alternative 2 – SR-60 Busway 4-131
4.15.5 Alternative 3 – Beverly LRT 4-132
4.15.6 Alternative 4 – Whittier LRT 4-133
4.15.7 Alternative 5 – Washington LRT 4-135
4.15.8 Conclusions 4-136

5. Cost and Financial Analysis

5.1 Capital Costs 5-1
5.1.1 Capital Cost Estimating Approach 5-1
5.1.2 Capital Costs Results 5-3
5.2 Operating and Maintenance Costs 5-4
5.2.1 Operating and Maintenance Cost Estimating Approach 5-4
5.2.2 Operating and Maintenance Cost Results 5-15
5.3 Financial Feasibility 5-19
5.3.1 Fixed Guideway Project Funding Assumptions in the Metro 2008 Long Range Plan 5-19
5.3.2 Existing Dedicated Local Funding 5-20
5.3.3 Recent Local and State Efforts to Secure New Funding 5-21
5.3.4 Evaluation of Funding Sources 5-22
5.3.5 Conclusions 5-23

6. Public Involvement Process & Agency Coordination

6.1 Early Scoping Meetings 6-1

6.1.1 Notification 6-1
6.1.2 Early Scoping Summary 6-2
6.2 Community Workshops 6-3
6.2.1 Notification 6-4
6.2.2 Summary 6-4
6.3 Project Briefings 6-5
6.3.1 Elected Officials 6-5
6.3.2 Technical Advisory Committee 6-6
6.3.3 City Briefings/Work Sessions 6-6
6.3.4 Stakeholder Briefings 6-6
6.4 Outreach Summary 6-6

7. Comparative Analysis of Alternatives

7.1 Approach 7-1
7.2 Effectiveness in Improving Mobility 7-1
7.3 Transit Supportive Land Use 7-11
7.4 Cost Effectiveness and Financial Feasibility 7-13
7.4.1 Efficiency Metrics 7-13
7.4.2 TSM Data 7-13
7.4.3 Efficiency Results 7-14
7.4.4 Uptown Whittier Streetcar Loop 7-18
7.5 Environmental 7-19
7.6 Equity 7-21
7.7 Community Involvement Response 7-23
7.8 Summary of Key Comparison Measures 7-26
7.9 Trade-Offs Between Alternatives 7-31
7.10 Summary of Recommendations 7-32

List of Figures

S-1 Population and Employment Growth S-3
S-2 Project Study Area S-4
S-3 Freeway Level of Service S-6
S-4 2000 Work Trips to Eastside Study Area S-9
S-5 2000 Work Trips from Eastside Study Area S-10
S-6 Metro Rail System Map with Future Extensions and PSA S-12
S-7 Activity Centers within PSA S-14
S-8 2030 Regional Population Density S-17
S-9 2030 Regional Employment Density S-18
S-10 2030 Population Density in PSA S-20
S-11 2030 Employment Density in PSA S-21
S-12 Approvals Process S-24
S-13 Build Alternatives S-26
S-14 Alternative Travel Times S-28
S-15 Travel Time Savings S-28
S-16 Metro Gold Line Ridership S-29
S-17 Metro Gold Line Station Boardings S-30
S-18 Net New Transit Riders and User Benefits S-31
S-19 Land Uses Along Refined Alternatives S-34
S-20 Final Recommended Alternatives S-52

1.1 Project Study Area 1-2
1-2 Metro System Map 1-5
1-3 Eastside Study Area Growth 1-7
1-4 2005 Total Population in PSA 1-8
1-5 2030 Total Population in PSA 1-9
1-6 2005 Total Employment in PSA 1-10
1-7 2030 Total Employment in PSA 1-11
1-8 2005 Regional Population Density 1-13
1-9 2030 Regional Population Density 1-14
1-10 2005 Regional Employment Density 1-15
1-11 2030 Regional Employment Density 1-16
1-12 2005 Population Density in PSA 1-18
1-13 2030 Population Density in PSA 1-19
1-14 2005 Employment Density in PSA 1-20
1-15 2030 Employment Density in PSA 1-21
1-16 Highway Congestion – Existing A.M. Conditions 1-28
1-17 Highway Congestion – Existing P.M. Conditions 1-29

1-18 Regional System Map 1-33
1-19 Transportation System Map 1-37
1-20 Activity Centers within PSA 1-44
1-21 Potential Developments in PSA 1-47
1-22 Work Trips to PSA 1-51
1-23 Work Trips from PSA 1-52
1-24 2005 Low-income Households 1-55
1-25 2030 Low-income Households 1-56
1-26 Population Age 18 and Under 1-57
1-27 Population Age 65 and Over 1-58
1-28 Percentages of Zero Vehicle Households 1-59
1-29 Population Age 16 and Over Who Use Public Transportation 1-60

2-1 AA Screening Process 2-1
2-2 Evaluation Criteria in Initial & Final Screening 2-3
2-3 Typical Cross Section – Retained Cut along SR-60 Freeway 2-15
2-4 Typical Cross Section – Aerial Configuration Parallel to SR-60 Freeway 2-16
2-5 Urban Design Concept – Before, Town Center Drive, Montebello 2-18
2-6 Urban Design Concept – After, Aerial Station at Town Center Dr., Montebello 2-19
2-7 Urban Design Concept – Before, Santa Anita, South El Monte 2-21
2-8 Urban Design Concept – After, Aerial Station at Santa Anita, South El Monte 2-22
2-9 Urban Design Concept – Before, SR-60 Freeway east of Santa Anita 2-23
2-10 Urban Design Concept – After, Aerial Trackway along SR-60 Freeway east of Santa Anita 2-24
2-11 Urban Design Concept – Before, Garfield Ave. Aerial Station 2-30
2-12 Urban Design Concept – After, Garfield Ave. Aerial Station 2-31
2-13 Typical Section – Beverly Blvd. west of Montebello Blvd. 2-33
2-14 Prototype Plan – At-Grade Station with Split Far Side Platforms 2-34
2-15 Prototype Section – At-Grade LRT at Station with Four through Lanes 2-35
2-16 Urban Design Concept – Before, Beverly Blvd. at Montebello Blvd 2-36
2-17 Urban Design Concept – After, Side Platform Station on Beverly Blvd. at Montebello 2-37
2-18 Urban Design Concept – Before, Montebello City Hall 2-38
2-19 Urban Design Concept – After, Center Platform Station at Montebello City Hall 2-39
2-20 Typical Section – Whittier Greenway 2-42
2-21 Urban Design Concept – Before, Whittier Greenway Treatment 2-43
2-22 Urban Design Concept – After, Whittier Greenway Treatment 2-44
2-23 Urban Design Concept – Before, Land Bridge at Palm Park 2-45
2-24 Urban Design Concept – After, Land Bridge at Palm Park 2-46
2-25 Uptown Whittier Streetcar Loop 2-48
2-26 Typical Section – Uptown Whittier Streetcar Loop 2-49

2-27 Concept Plan – Aerial Trackway Column Placement in Whittier Blvd....2-54
2-28 Urban Design Concept – Before, Montebello Blvd....2-55
2-29 Urban Design Concept – After, Center Platform Station west of Montebello Blvd 2-56
2-30 Typical Section – Whittier Blvd. east ot Montebello Blvd. 2-57
2-31 Typical Section – Whittier Blvd. in Pico Rivera....2-59
2-32 Prototype Plan – Median Aerial Station at Major Intersection....2-60
2-33 Prototype Section – Aerial Station over Roadway Median....2-61
2-34 Prototype Section – Aerial Station behind Sidewalk....2-62
2-35 Urban Design Concept – Before, Whittier Blvd. east of Rosemead....2-63
2-36 Urban Design Concept – After, Media Aerial Staiton on Whittier Blvd. east of Rosemead....2-64
2-37 Urban Design Concept – Before, Whittier Blvd, east of Rosemead....2-65
2-38 Urban Design Concept – After, Side Aerial Station on Whittier Blvd. east of Rosemead....2-66
2-39 Typical Section – Whittier Blvd. west of Hadley....2-68
2-40 Typical Section – Whittier Blvd. east of Philadelphia....2-69
2-41 Urban Design Concept – Before, Whittier Blvd. east of Mar Vista 2-70
2-42 Urban Design Concept – After, Whittier Blvd. east of Mar Vista 2-71
2-43 Typical Section – Washington Blvd. near S. Greenwood....2-75
2-44 Typical Section – Washington Blvd. west of Rosemead 2-77
2-45 Typical Section – Washington Boulevard east of Norwalk....2-79
2-46 No-Build Alternative....2-82
2-47 Baseline/TSM Bus Improvements 2-85
2-48 SR-60 LRT Alternative....2-89
2-49 SR-60 BRT Alternative 2-92
2-50 Beverly LRT Alternative 2-95
2-51 Whittier LRT Alternative....2-100
2-52 Washington LRT Alternative 2-105

3-1 Station to Station Travel Times 3-9
3-2 Gold Line Project Boardings (Year 2030)....3-14
3-3 2030 Gold Line Station Boardings....3-15
3-4 Travel Time Savings 3-25
3-5 Build Alternative Forecast Ridership 3-41
3-6 Transportation User Benefits 3-41
3-7 User Benefits per Project Boarding 3-42
3-8 Forecast Travel Times 3-42
3-9 Travel Time Savings over No-Build 3-43
3-10 Vehicle Miles Traveled Reduction from No-Build....3-43

4-1 Land Uses along Refined Alternatives Alignments 4-4
4-2 2005 Employment Density Near Stations 4-7
4-3 2005 Population Density Near Stations 4-8
4-4 2030 Employment Density Near Stations 4-9
4-5 2030 Population Density Near Stations 4-10
4-6 Bike Parks and Trails Map 4-17
4-7 Map of Metro Joint Development Projects 4-20
4-8 ½ Mile Station Buffer of Percentage of Total Population Age 18 & Under 4-43
4-9 ½ Mile Station Buffer of Percentage of Total Population Age 65 & Over 4-44
4-10 ½ Mile Station Buffer of Percentage of Households with No Vehicle 4-45
4-11 ½ Mile Station Buffer of Percentage of Age 16+ Who Use Public Transportation . 4-46
4-12 ½ Mile Station Buffer 2005 Low-income Households 4-47
4-13 Whittier Greenway 4-52
4-14 Pomona Boulevard Towards Garfield Ave. 4-54
4-15 NRHP and OHP Resources Adjacent to Refined Alternatives 4-63
4-16 Relative Emissions Reductions by Alternative 4-85
4-17 Noise Impact Criteria for Transit Projects 4-87
4-18 Flood Zones in PSA 4-101
4-19 Superfund Sites in PSA 4-115
4-20 Parkland and Recreational Facilities in PSA 4-122

7-1 Station to Station Travel Times 7-7
7-2 Project and Total Gold Line Ridership (Year 2030) 7-8
7-3 Daily Ridership (Year 2030) 7-9
7-4 User Benefit Hours 7-10
7-5 Dollars per User Benefit Hour 7-16
7-6 Annual Riders per $ Capital 7-16
7-7 Dollars per Net New Rider 7-17
7-8 Daily Riders per Route Mile 7-18
7-9 Final Recommended Alternatives 7-34

List of Tables

S-1 Intersection and Freeway Levels of Service – Existing Conditions S-7
S-2 LOS Designations S-8
S-3 Transit Dependent Population Density within ½ Mile of Station Locations S-15
S-4 Population, Household, and Employment Growth S-19
S-5 Summary of Expected Impacts for Eastside Transit Corridor Phase 2 Project S-39
S-6 Preliminary Estimated Capital Cost S-40
S-7 Estimated Annual Operations & Maintenance Cost S-41
S-8 Costs and User Benefits S-42
S-9 Public Feedback on Choice of Alternatives S-45
S-10 Comparison of Alternatives S-47

1-1 Racial and Ethnic Composition 1-3
1-2 PSA Income Status 1-3
1-3 Population Age 1-4
1-4 Population, Household, and Employment Growth 1-7
1-5 Commuters and Mean Commuting Time in 1990 and 2000 1-22
1-6 LOS Designations 1-31
1-7 Intersection and Freeway Levels of Service – Existing Conditions 1-34
1-8 Intersection and Freeway Levels of Service – 2030 Conditions 1-35
1-9 Bus Transit Routes in PSA 1-39
1-10 Frequency (in Minutes) of Bus Transit Service in PSA 1-40
1-11 Performance Indicators, Measures, and Outcomes of Destination 2030 Goals 1-42
1-12 Activity Centers in PSA 1-45
1-13 Transit Dependent Demographic Information 1-54

2-1 Ranking of the Comparative Evaluation of Initial Screening 2-5
2-2 Goals, Objectives and Evaluation Criteria 2-9
2-3 Ranking of Screened Alternatives 2-13
2-4 Baseline/TSM Bus Improvements – North-South Services 2-86
2-5 Baseline/TSM Bus Improvements – East-West Services 2-87

3-1 Metro Busway & LRT Operating Hours 3-5
3-2 Metro Busway & LRT Service Frequency 3-6
3-3 Vehicle Capacity and Peak Hour Passenger Loading Standards 3-6
3-4 SR-60 Busway Alternative Station-to-Station Run Times 3-10
3-5 SR-60 LRT Alternative Station-to-Station Run Times 3-10
3-6 Beverly Alternative Station-to-Station Run Times 3-11
3-7 Whittier Alternative Station-to-Station Run Times 3-12

3-8 Washington Alternative Station-to-Station Run Times 3-12
3-9 2030 Station Boardings and Times – No-Build Alternative 3-16
3-10 2030 Station Boardings and Times – Future TSM/Baseline Alternative 3-17
3-11 2030 Station Boardings and Times – SR-60 LRT Alternative 3-18
3-12 2030 Station Boardings and Times – SR-60 Busway Alternative 3-19
3-13 2030 Station Boardings and Times – Beverly LRT Alternative 3-20
3-14 2030 Station Boardings and Times – Whittier LRT Alternative 3-22
3-15 2030 Station Boardings and Times – Washington LRT Alternative 3-23
3-16 2030 Project Riders and User Benefits 3-26
3-17 2030 Travel Times 3-27
3-18 2030 Average Weekday Daily Vehicle Miles Traveled 3-29
3-19 2030 Average Weekday Daily Transit Mode Share for Work Trips from/to/within Eastside PSA 3-29
3-20 Estimated Reduction in Roadway Capacity 3-32
3-21 Preliminary Roadway Capacity and Major Intersection Impact Categories 3-32

4-1 Land Uses within ½ Mile of Proposed Alternatives (in acres) 4-3
4-2 2005 and 2030 Population and Employment Density within ½ Mile of Station Alternatives 4-6
4-3 November Early Scoping Meetings Summary 4-38
4-4 April Project Update Meetings Summary 4-39
4-5 Transit Dependent Population Density ½ mile of Station Locations along Alternative Alignments 4-42
4-6 Cultural Resources Adjacent to the Refined Alternatives 4-62
4-7 National and California Ambient Air Quality Standards (NAAQS and CAAQS) 4-70
4-8 Federal and State Attainment Status in the SCAB 4-71
4-9 Pico Rivera #2 Air Monitoring Station 4-72
4-10 N. Main Street Air Monitoring Station 4-73
4-11 Los Angeles County Area Criteria Emissions per VMT 4-76
4-12 2030 No-Build Daily VMT, VHT and Average Speeds 4-77
4-13 2030 TSM Daily VMT, VHT and Average Speeds 4-78
4-14 2030 SR-60 LRT Daily VMT, VHT and Average Speeds 4-78
4-15 2030 SR-60 BRT Daily VMT, VHT and Average Speeds 4-79
4-16 2030 Beverly LRT Daily VMT, VHT and Average Speeds 4-79
4-17 2030 Whittier LRT Daily VMT, VHT and Average Speeds 4-80
4-18 2030 Washington LRT Daily VMT, VHT and Average Speeds 4-80
4-19 2030 Emissions Factors from EMFAC2007 4-81
4-20 2030 Emissions by Alternative 4-82
4-21 Alternative Daily NOx Reductions Relative to No-Build Emissions 4-83
4-22 FTA Ground-Bourne Vibration Impact Criteria 4-88
4-23 FTA Ground-Bourne Vibration Impact Criteria for Special Buildings 4-89

4-24 County of Los Angeles Mobile and Stationary Noise Restrictions 4-90
4-25 Noise-Sensitive Land Uses 4-91
4-26 Special Status Wildlife and Plant Species with Potential to Occur in the PSA 4-94
4-27 Alignment Segments Susceptible to Earthquake Liquefaction 4-111
4-28 Parkland and Recreational Facilities along Each Alignment Alternative 4-123
4-29 Expected Level of Impact for No-Build Alternative Implementation 4-128
4-30 Expected Level of Impact for TSM Alternative Implementation 4-129
4-31 Expected Level of Impact for Alternative 1 – SR-60 LRT Implementation 4-130
4-32 Expected Level of Impact for Alternative 2 – SR-60 Busway Implementation 4-132
4-33 Expected Level of Impact for Alternative 3 – Beverly LRT Implementation 4-133
4-34 Expected Level of Impact for Alternative 4 – Whittier LRT Implementation 4-134
4-35 Expected Level of Impact for Alternative 5 – Washington LRT Implementation 4-135
4-36 Summary of Expected Impacts for Eastside Transit Corridor Phase 2 Project Alternatives 4-137

5-1 Unit Prices 5-1
5-2 Cost Estimates 5-4
5-3 Metro LRT FY 2008 Expense Allocations and Unit Costs 5-7
5-4 Metro BRT FY 2008 Expense Allocations and Unit Costs 5-9
5-5 Metro Bus FY 2008 Expense Allocations and Unit Costs 5-11
5-6 Montebello Bus FY 2006 Expense Allocations and Unit Costs 5-12
5-7 Norwalk Transit System FY 2006 Bus Expense Allocations and Unit Costs 5-13
5-8 Foothill Transit Zone FY 2006 Bus Expense Allocations and Unit Cots 5-14
5-9 Metro LRT Annual O&M Cost Estimates (2008 dollars) 5-16
5-10 Metro BRT Annual O&M Cost Estimates (2008 dollars) 5-16
5-11 Bus Annual O&M Cost Estimates 5-17
5-12 Eastside Transit Corridor Phase 2 Annual O&M Estimates 5-19
5-13 Metro Long Range Plan Project Funding Assumptions 5-20
5-14 Funding Outlook 5-24

6-1 Comments Summary Totals 6-3
6-2 Summary of Support for Refined Alternatives 6-5
6-3 Outreach Meeting Record 6-7

7-1 Mobility, Accessibility, and Connectivity 7-2
7-2 Population Density, Employment Density, and Local Land Use Policies 7-12
7-3 Costs and User Benefits 7-15
7-4 Sustainability and Environmental Impacts 7-20
7-5 Transit-Supportive Demographics 7-22
7-6 Public Comments 7-25
7-7 Comparison of Alternatives 7-27

Appendices

Appendix A References
Appendix B List of Acronyms
Appendix C List of Preparers
Appendix D List of Technical Reports

S.0. EXECUTIVE SUMMARY

S.1. Purpose and Need for Proposed Action

Project and Study Area Description

The Eastside Transit Corridor Phase 2 project seeks to improve transit service to an area hampered by traffic congestion and currently not served by the rail system. Travel demand in the direction of downtown Los Angeles is particularly pronounced and projected to intensify in the coming years. Freeways and arterial streets in the area are frequently choked with traffic during peak hours, yet the area is expected to grow quickly over the next few decades. Bus service in the area is provided by the Los Angeles County Metropolitan Transportation Authority (Metro) and six other municipal operators (Montebello Bus Lines, Monterey Park Spirit Bus Lines, City of Commerce Lines, Norwalk Transit, Whittier Transit, and Foothill Transit). Despite the good transit coverage on major streets, buses frequently become stuck in the same traffic jams as automobiles. Expanded Metro Gold Line light rail service to downtown Los Angeles and Pasadena from Pomona and Atlantic Blvds. will begin by the end of 2009, but this new terminus is still beyond the reach of many Eastside communities. The goal of the Phase 2 project is to bridge this gap between the Metro Gold Line and the Eastside's activity centers not currently served by rail, as well as provide a high-quality backbone that will improve the effectiveness of transit service and accommodate future growth in a sustainable manner throughout the region. This Alternatives Analysis (AA) study evaluates existing and future transportation conditions within the study corridor and looks at alternatives to improve mobility by providing options to single occupancy driving, linking major centers within the corridor and improving connections between local transit and the regional transit network.

This study examines a wide variety of alternatives while being mindful of the physical and environmental constraints of working in a bustling urban area such as the Eastside Project Study Area (PSA), refer to Figure S-2. Particularly challenging is the lack of vacant rail rights-of-way for transit vehicles to use, and the narrow roadways throughout much of the PSA makes selection of a route difficult. This Alternatives Analysis study thus seeks solutions that negotiate these difficulties while maximizing benefits to the regional transit system and providing opportunities for land use improvements. Some solutions include placing tracks into spaces next to freeways, redesigning commercial boulevards into pedestrian-oriented transit districts, and incorporating transit into developing greenways. The study takes these constraints and potential solutions into account and employs a meticulous evaluation process to yield a refined set of alternatives that conveniently connect with the valuable Phase 1 investment and most effectively address the remaining transportation challenges on the Eastside.

Population and Employment

This area contained approximately 673,000 residents as of 2005, roughly 7% of the population of Los Angeles County, and this number is expected to grow to 830,000 by 2030 (see Figure S-1). Employment is expected to increase by 15%. Overall, the County is expected to grow from 10 million people in 2005 to 12.2 million in 2030, and this rapid growth will further constrict mobility if projects beyond Metro's Constrained Plan in the 2008 Long Range Transportation Plan are not implemented. A new transit project would bypass roadway congestion and offer Eastside residents and workers increased access to the other dense business and residential centers served by the Metro Rail system. Figure S-2 shows the cities within the PSA and the route of the Metro Gold Line Eastside Extension Phase 1, expected to be complete by the end of 2009.

Figure S-1 Population and Employment Growth

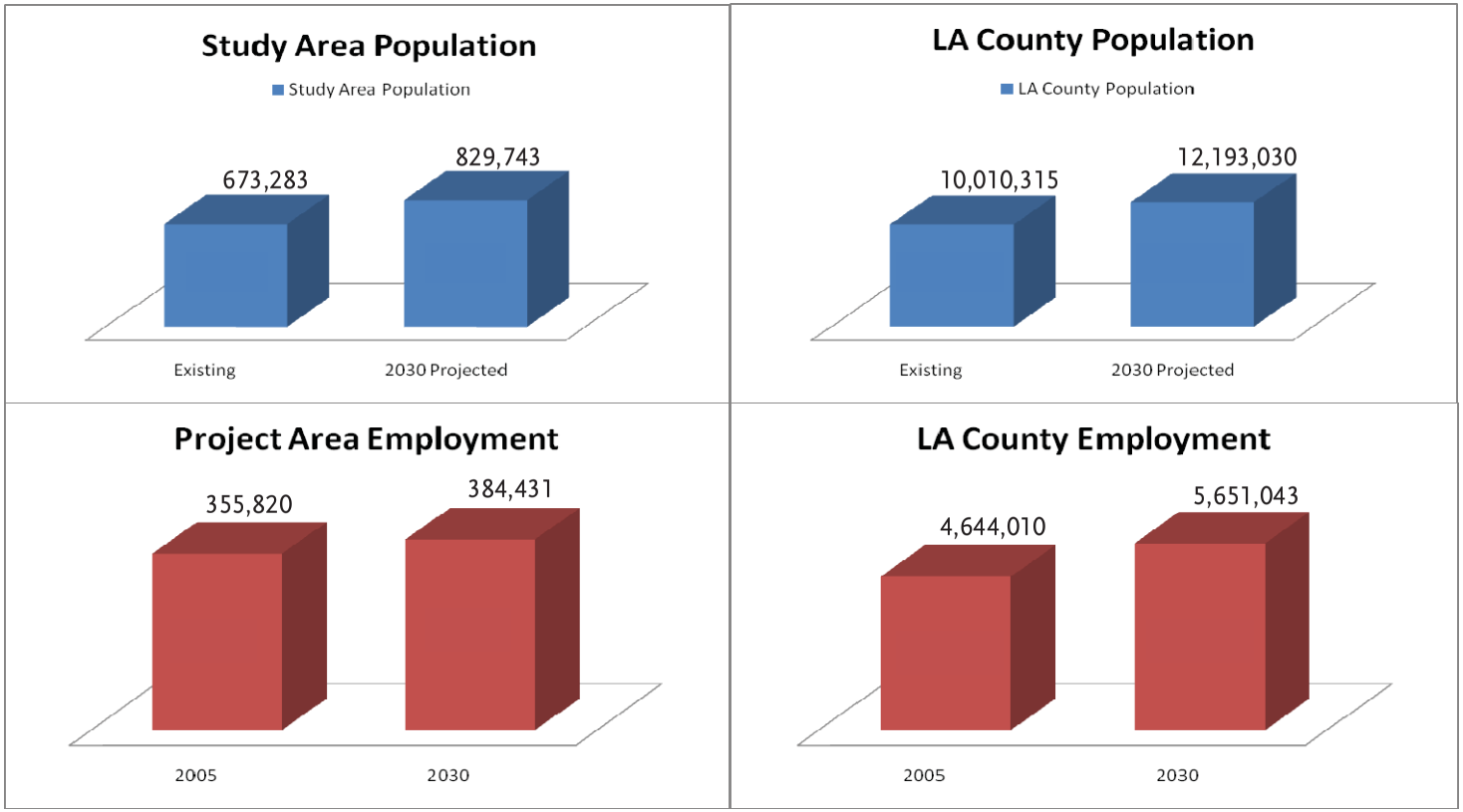
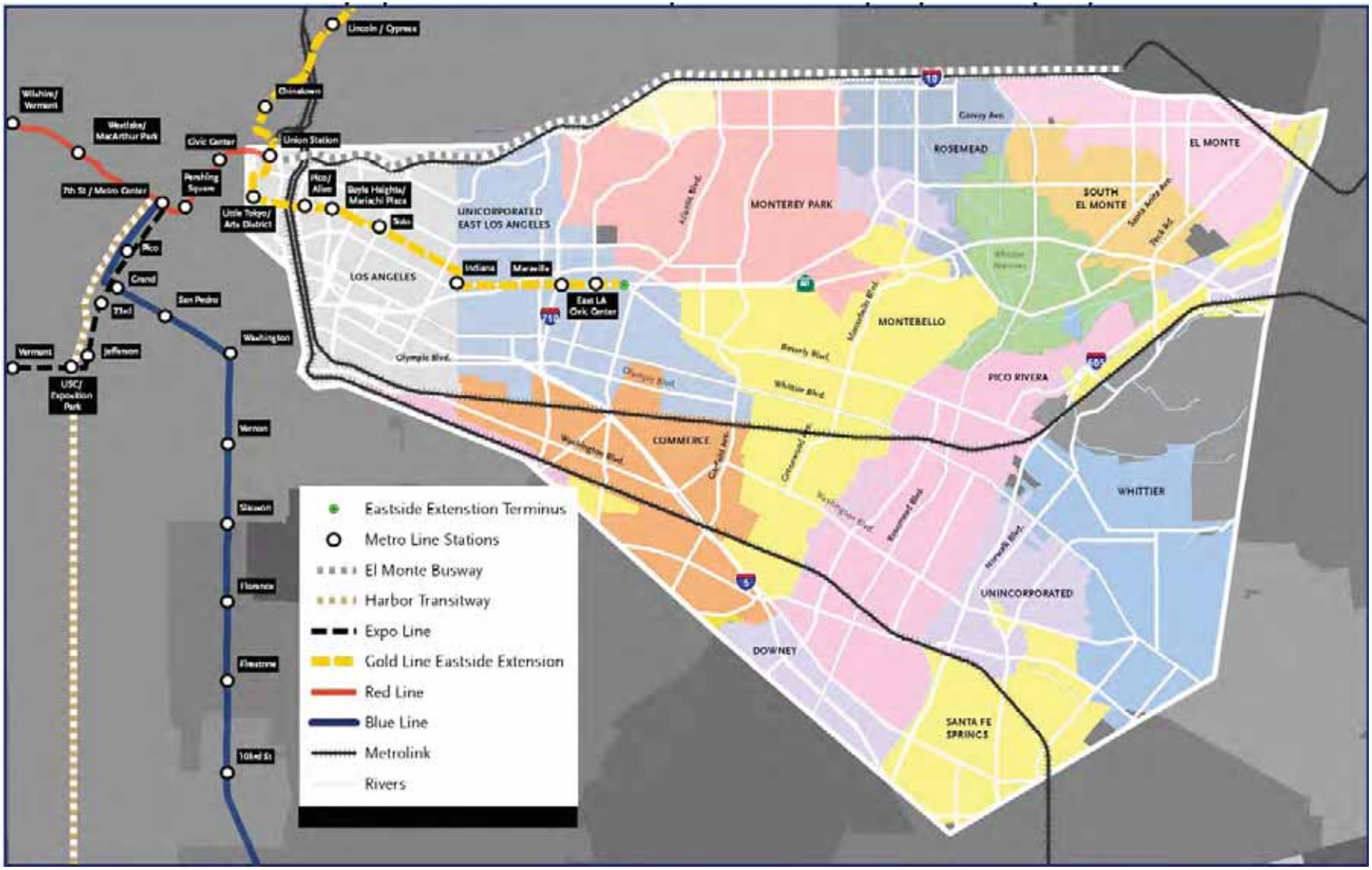


Figure S-2 Project Study Area



The Metro Eastside Transit Corridor Phase 2 study will evaluate transit connections to the 6-mile Metro Gold Line Eastside Extension Phase 1 project. This would also strengthen the PSA's connection to Metro's growing network of light rail, heavy rail, and bus rapid transit lines. At Union Station, passengers would be able to transfer to regional and nationwide rail services, airport FlyAway service, as well as local and long distance buses. This study evaluates the many different routes and technologies that could potentially be used to establish this connection. The report evaluated the alternatives based on the following objectives:

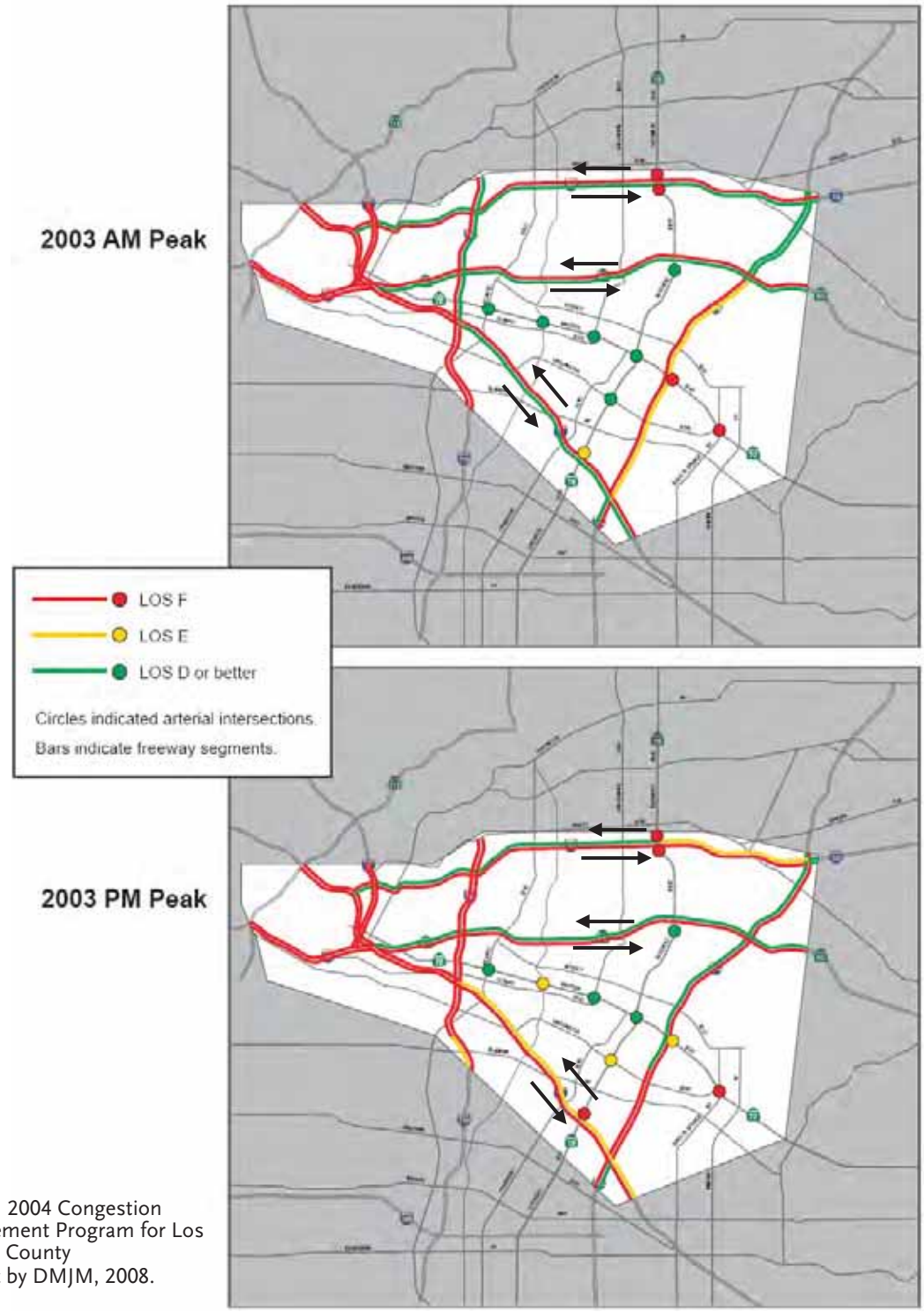
- Identifying methods of providing a transit connection to the Metro Gold Line Eastside Extension now under construction
- Improving transit linkages and coverage to cities beyond the East Los Angeles terminus of the Metro Gold Line Eastside Extension Phase 1
- Enhancing mobility to the PSA by providing a more robust transit network that offers effective alternatives to automobile travel
- Accommodating significant levels of projected growth in travel demand by developing sustainable solutions

Three separate screens were conducted in order to reduce the number of alternatives which are being recommended for further evaluation. A preliminary screening identified all feasible alternatives, eliminating alternatives that had "fatal flaws." Then an initial screening of feasible alternatives reduced the wide range of possible solutions from 17 down to five. These five build alternatives are evaluated in this report using the objectives identified above. These corridors include SR-60, Beverly Blvd., Whittier Blvd. and Washington Blvd., and are described in detail in Section 2. This report concludes with recommendations to the Metro Board on alternatives that should be further investigated in future study, including a Draft EIS/EIR.

Travel Demand

The high population densities and moderate employment densities present in the PSA have caused mounting congestion on the local arterial streets and freeways. Three of the major freeways in the PSA operate at level of service F (severe congestion) during peak hours (see Figure S-3). Intersections along several arterial streets, including the ones under consideration for the light rail build alternatives, are expected to deteriorate to level of service E or F by 2030. Table S-1 summarizes the current observed levels of service on major streets in the PSA. A detailed list of level of service forecasts is provided in Section 1. See Table S-2 for explanations of the six level of service designations.

Figure S-3: Freeway Level of Service



Source: 2004 Congestion Management Program for Los Angeles County
Graphic by DMJM, 2008.

Table S-1 Intersection and Freeway Levels of Service- Existing Conditions

Intersection		AM Peak Hour		PM Peak Hour	
North-South Street	East-West Street	V/C	LOS	V/C	LOS
Atlantic Blvd.	Garvey Ave.	0.684	B	0.898	D
Garfield Ave.		0.728	C	0.805	D
Rosemead Blvd.		0.948	E	0.94	E
Atlantic Blvd.	Beverly Blvd.	0.748	C	1.028	F
Garfield Ave.		1.016	F	0.949	E
Montebello Blvd.		0.598	A	0.623	B
Rosemead Blvd.		1.045	F	1.235	F
Atlantic Blvd.	Whittier Blvd.	0.581	A	0.812	D
Garfield Ave.		0.796	C	0.942	E
Montebello Blvd.		0.736	C	0.707	C
Paramount Blvd.		0.73	C	0.876	D
Rosemead Blvd.		0.811	D	1.018	F
Norwalk Blvd.		0.937	E	1.066	F
Painter Ave.		0.824	D	1.042	F
Rosemead Blvd.	Washington Blvd.	0.934	E	0.957	E
Pioneer Blvd.		0.675	B	0.799	C
Norwalk Blvd.		0.76	C	0.918	E
Freeway Segment	Direction	AM Peak Hour		PM Peak Hour	
		V/C	LOS	V/C	LOS
SR-60 east of Indiana St.	Eastbound	1.025	F(0)	1.308	F(1)
	Westbound	1.417	F(2)	0.592	C
SR-60 west of Peck Rd.	Eastbound	0.761	C	1.42	F(2)
	Westbound	1.31	F(1)	0.828	D

Sources: Metro, 2007 and LA County Department of Public Works, 2002-2008.

Table S-2 LOS Designations

V/C Ratio	Description	Grade
Intersections		
< 0.60	Virtually free flow	A
> 0.60 – 0.70	Stable flow with slight delays	B
> 0.70 – 0.80	Stable flow with more delays	C
> 0.80 – 0.90	Stable flow with significant delays	D
> 0.90 – 1.00	Unstable flow with significant delays	E
> 1.00	Enforced flow with poor traffic conditions	F
Freeway Segment		
< 0.35	Free-flow	A
> 0.35 – 0.54	Reasonably free-flow	B
> 0.54 – 0.77	Stable flow with more delays	C
> 0.77 – 0.93	Stable flow with significant delays	D
> 0.93 – 1.00	Unstable flow with significant delays	E
> 1.00 – 1.25	Breakdown in vehicular flow	F(0)
> 1.25 – 1.35		F(1)
> 1.35 – 1.45		F(2)
> 1.45		F(3)

Source: Highway Capacity Manual 2000

Countywide, commute times increased by 11 percent during the 1990s, and several communities in the PSA experienced nearly double that increase. The growing congestion and rising fuel costs have left many residents in Los Angeles County seeking alternatives to driving to work, including transit. At present, there are seven bus operators (including Metro) serving the PSA, but buses frequently become stuck in stalled traffic. One-quarter of the commute trips from the PSA to other areas are bound for Central Los Angeles, about 50,000 per day, and these trips could be effectively served by a further extension of the Metro Gold Line in the Eastside area. There are also 115,000 daily work trips made inside the boundaries of the PSA. Year 2000 Census Transportation Planning Package data shows that 70,000 daily work trips from the PSA are bound for areas served by the existing Metro Rail system. Overall, 70% of the work trips originating in the PSA end in areas served by the combined Metro bus and rail system. Additionally, there are a large number of daily work trips to the PSA, even larger than the number leaving, originating from points north, south, and west (Figures S-4 and S-5). As such, the Eastside Transit Corridor Phase 2 project could potentially improve mobility and job access both regionally and within the PSA, which would be invaluable given the growth that is expected to occur over the next two decades.

Figure S-4 2000 Work Trips (2000 CTPP Factored) To Eastside Study Area

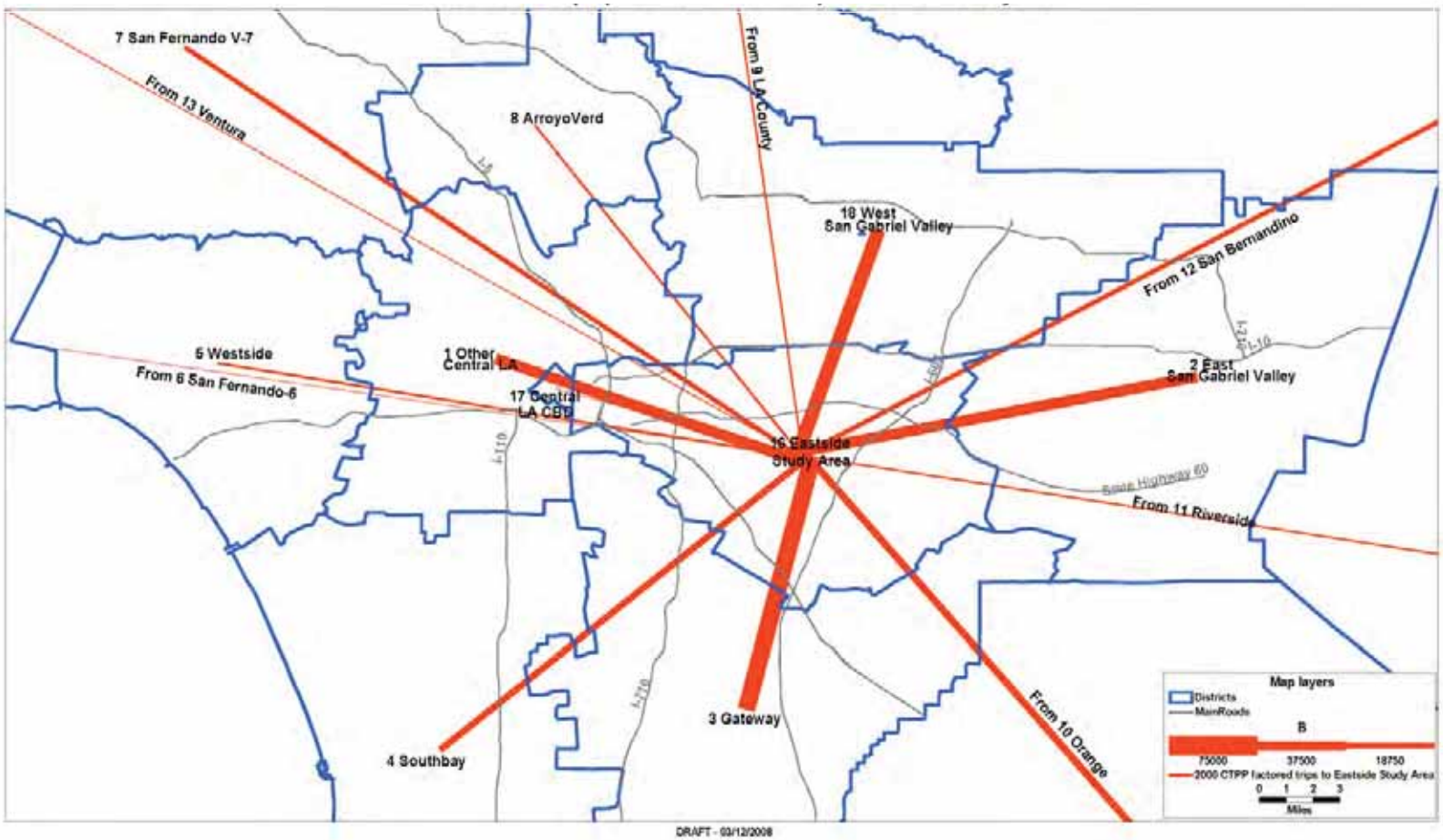
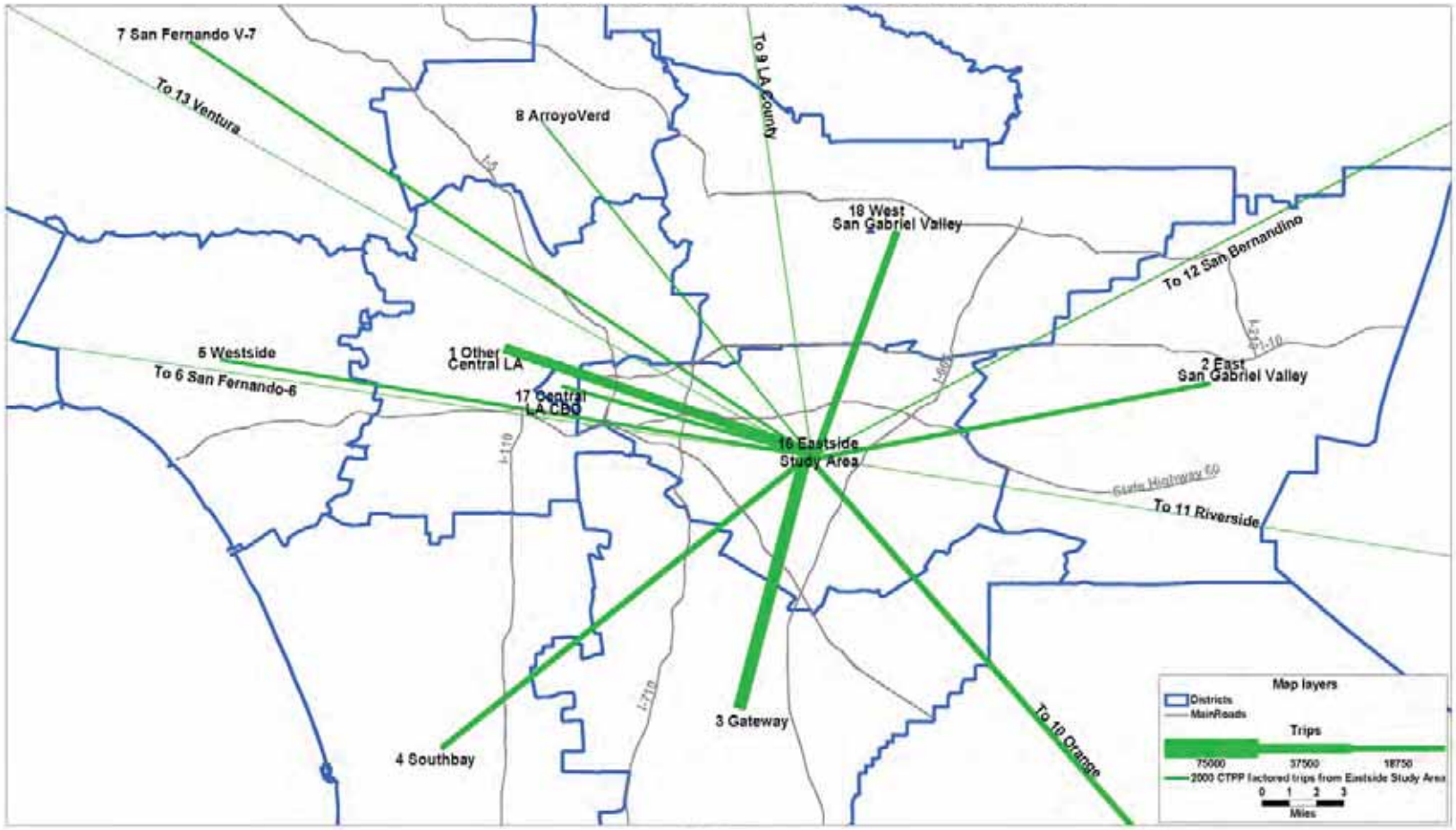


Figure S-5 2000 Work Trips (2000 CTPP Factored) From Eastside Study Area



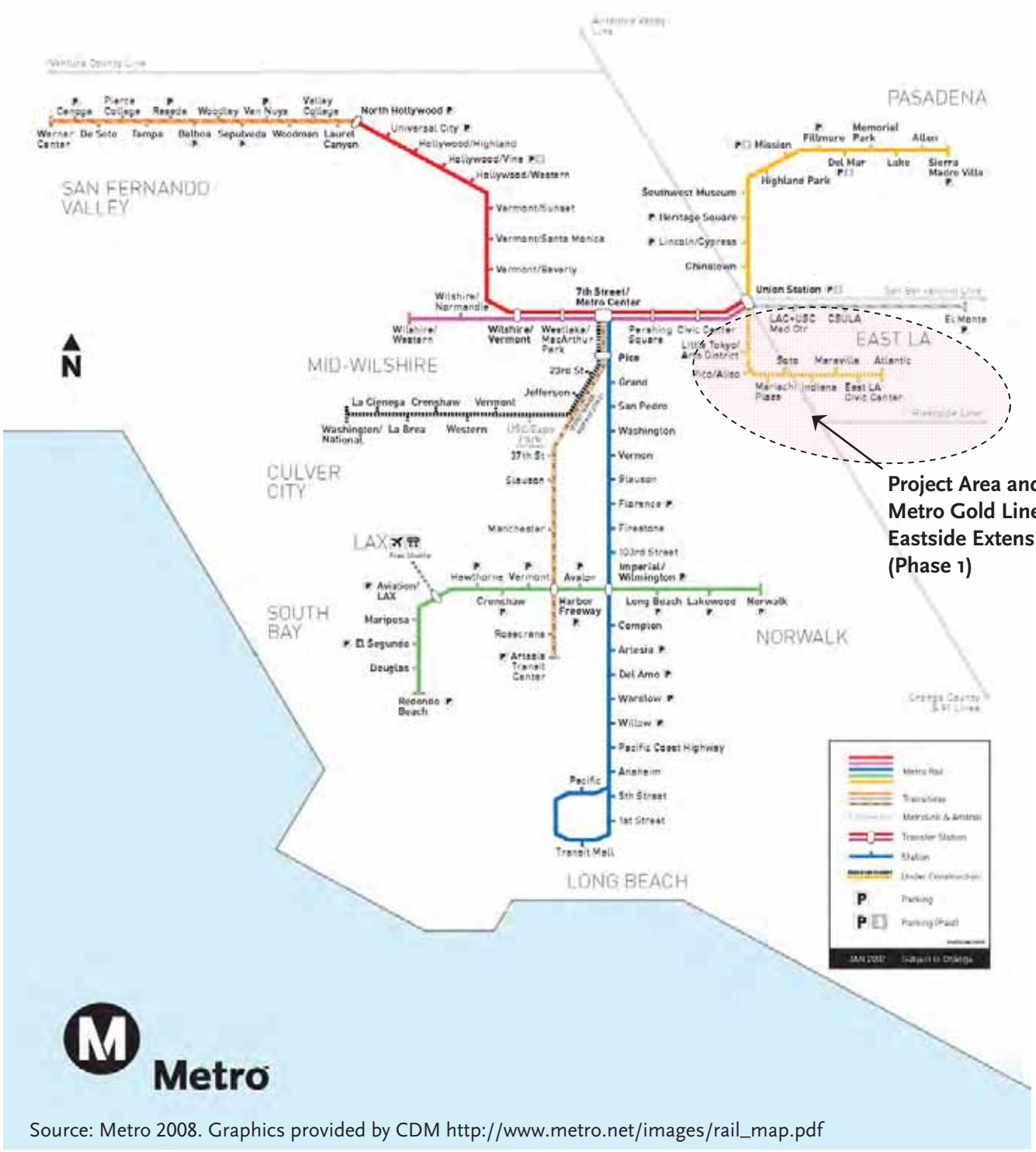
Planning Context and Background

Studies of major rail transit infrastructure investments on the Eastside date back to the 1980s, and loose plans for a major east-west backbone route through Los Angeles County date from decades prior. Metro initially selected an extension of the Metro Red Line heavy-rail subway as the locally preferred alternative for the Eastside Corridor, but this project was suspended in 1998 due to funding shortfalls and a voter-approved ban on Proposition A sales tax revenue being used for subway construction. Metro later adopted an extension of the Pasadena Blue Line light rail project (later named the Metro Gold Line) as the new locally preferred alternative for the Eastside following the 2000 Major Investment Study. Figure S-6 shows the system as it will look in 2010, once the first phases of the Eastside Extension to unincorporated East Los Angeles and the Exposition Line to Culver City are complete. This is the first study of the Eastside Corridor conducted by Metro since the Phase 1 Major Investment Study was completed.

The Southern California Association of Governments' (SCAG) 2030 Regional Transportation Plan outlines several projects in and around the PSA aimed at maximizing the effectiveness, safety, and reliability of Southern California's transportation system. These projects include widening I-5 and adding one high-occupancy vehicle (HOV) lane in each direction, and constructing a truck route along I-710 and SR-60 to facilitate goods movement to San Bernardino County from the Ports of Los Angeles and Long Beach. However, as there are no plans to widen I-5 to the west approaching downtown Los Angeles, this improvement will not improve access to principal destinations for travel generated within the Eastside PSA. Similarly, regional improvements to accommodate north-south goods movement will not materially improve conditions for commute and other home based trips generated to or from destinations within the PSA.

Similarly, Metro's Draft 2008 Long Range Transportation Plan calls for improvements to the bus system, additional Metro Rapid lines, Metrolink expansion, enhanced community transit service, and an extension of the East Los Angeles Corridor eastward from Pomona and Atlantic Blvds. These objectives are compatible with the Eastside Phase 2 project and would provide improved transit alternatives to driving on the congested road network. This study will help identify the alternatives that would best meet these goals.

Figure S-6 Metro Rail System Map with Future Extensions and PSA



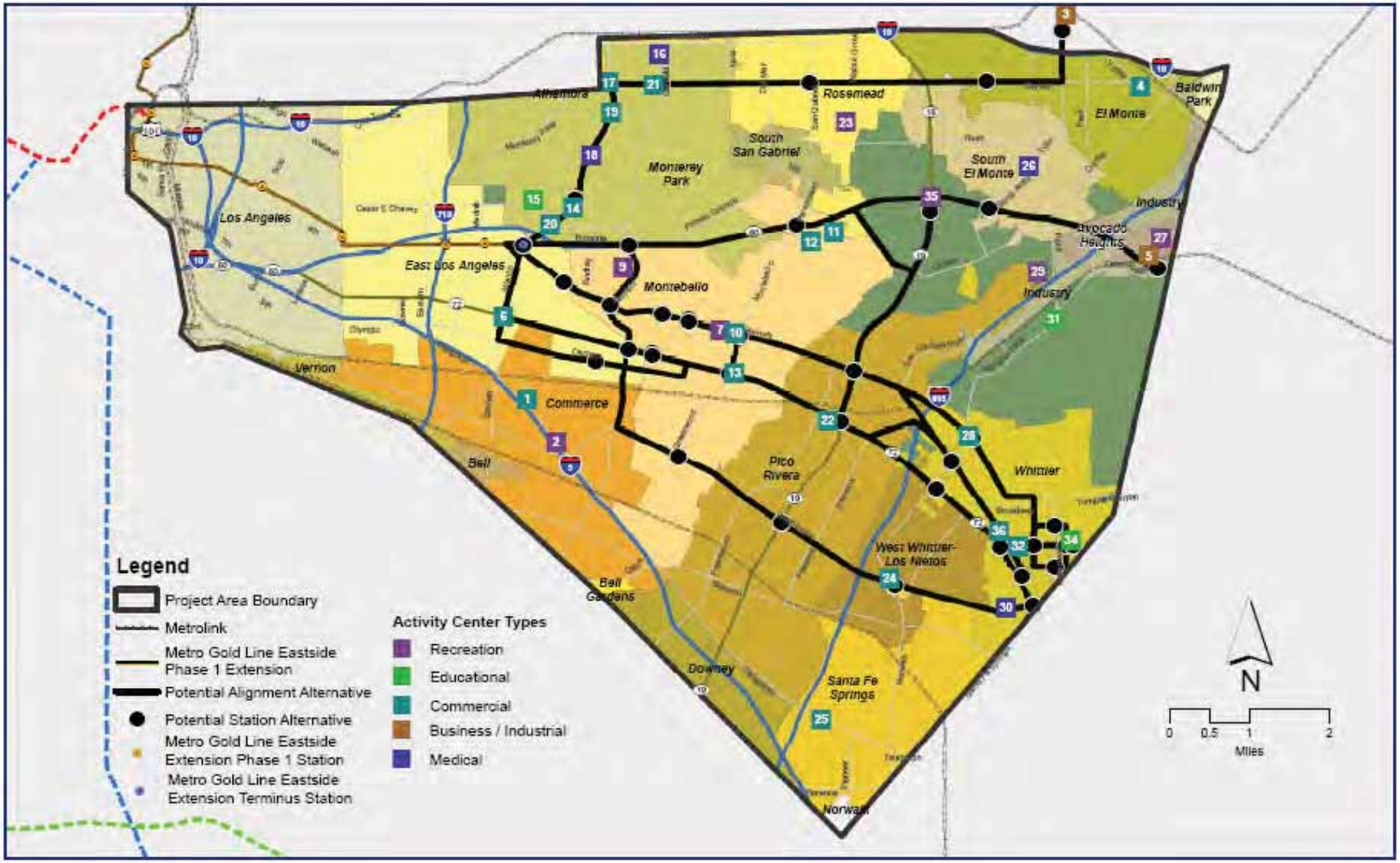
Source: Metro 2008. Graphics provided by CDM http://www.metro.net/images/rail_map.pdf

Potential Travel Markets

Activity Centers and Destinations

The Eastside Transit Corridor Phase 2 project would help alleviate the region's mobility constraints by providing a public transit alternative to major regional activity centers located within the PSA. These include large educational institutions, such as California State University's Los Angeles campus, Whittier College, and two community colleges. Major recreation areas include the Whittier Narrows Recreation Center and two public golf courses. Many people who are frequently unable to drive, such as the elderly and people with disabilities, would benefit from increased access to the area's medical centers, including Monterey Park Hospital, Beverly Hospital, Presbyterian Intercommunity Hospital, Greater El Monte Community Hospital, and Whittier Presbyterian Hospital. In addition, there are many business, industrial, and commercial areas organized around the main arterial streets in Whittier, Commerce, Montebello, Pico Rivera, and Industry. Figures S-7 illustrates the activity centers within the PSA. Many of these cities are planning large-scale redevelopment projects, such as retail and residential facilities, that would interface well with increased transit service. A detailed list of these projects is provided in Section 1.

Figure S-7: Activity Centers within PSA



Transit Dependent Population in the PSA

A significant portion of Los Angeles County's low-income and transit-dependent households are located in the PSA. As of 2005, there were 79,000 low-income households in the PSA, approximately 45 percent of all households in the area. Fully 16% of households in the area did not have a car. Additionally, 42% of the population is either age 18 or under, or 65 or over. Low-income residents, children, and the elderly are among the most likely to use public transportation (Table S-3), and particularly high concentrations of transit use already exist in Commerce, Montebello, Rosemead, El Monte, Pico Rivera, and Uptown Whittier. Though the highest concentrations of transit dependent communities and transit riders are at the western end of the PSA, there are several neighborhoods to the east that could also be characterized as transit dependent. At present, these transit dependent communities in the easternmost portion of the PSA are served only by local buses. An extension of the Eastside Transit Corridor would provide increased mobility and transportation options for these areas.

Table S-3 Transit Dependent Population Density Within ½ Mile of Station Locations

	Population Age 18 & Under		Population Age 65 & Over		Population with Zero Vehicles Available		Population using Public Transportation		# of Low-Income Households	
	#	% of PSA	#	% of PSA	#	% of PSA	#	% of PSA	#	% of PSA
PSA	204,498	-	63,862	-	60,276	-	17,439	-	79,218	-
SR-60 LRT/SR-60 Busway	13,736	6.7%	6,300	9.9%	2,711	4.5%	975	5.6%	6,270	6.3%
Beverly LRT	29,583	14.5%	11,212	17.6%	7,152	11.9%	2,016	11.6%	8,315	8.3%
Whittier LRT	31,483	15.4%	10,771	16.9%	7,695	12.8%	2,311	13.3%	12,261	12.2%
Washington LRT	27,702	13.5%	9,654	15.1%	5,873	9.7%	1,833	10.5%	10,245	10.2%

Source: Analysis based on 2000 US Census data and SCAG projections; provided by CDM 2008.

Regional Population and Employment Growth and Density

The Census Bureau identifies Los Angeles-Long Beach-Santa Ana among the densest Metropolitan Statistical Areas in the country. Los Angeles County alone is expected to grow by 35%, to 12.2 million people, by 2030 (Figure S-8). The PSA, along with Central Los Angeles, the Westside, Hollywood, and the Gateway Cities are expected to experience significant population increases. SCAG anticipates that the number of trips made each day in the region will grow by 30% during this time. The countywide housing densification and increase in employment activity will lengthen commute times and exacerbate congestion in the absence of enhancements to the transportation system. Adequate access to employment opportunities will continue to be important for the residents of Los Angeles County, as the dispersed arrangement of activity centers in the region has caused residents to dedicate increasingly larger portions of their time and money to commuting. Though there are some growing employment centers located in the PSA, many more are located in Downtown Los Angeles, Pasadena, the South Bay, and the Westside (Figure S-9), the freeway routes to which are already heavily congested.

Figure S-8 2030 Regional Population Density

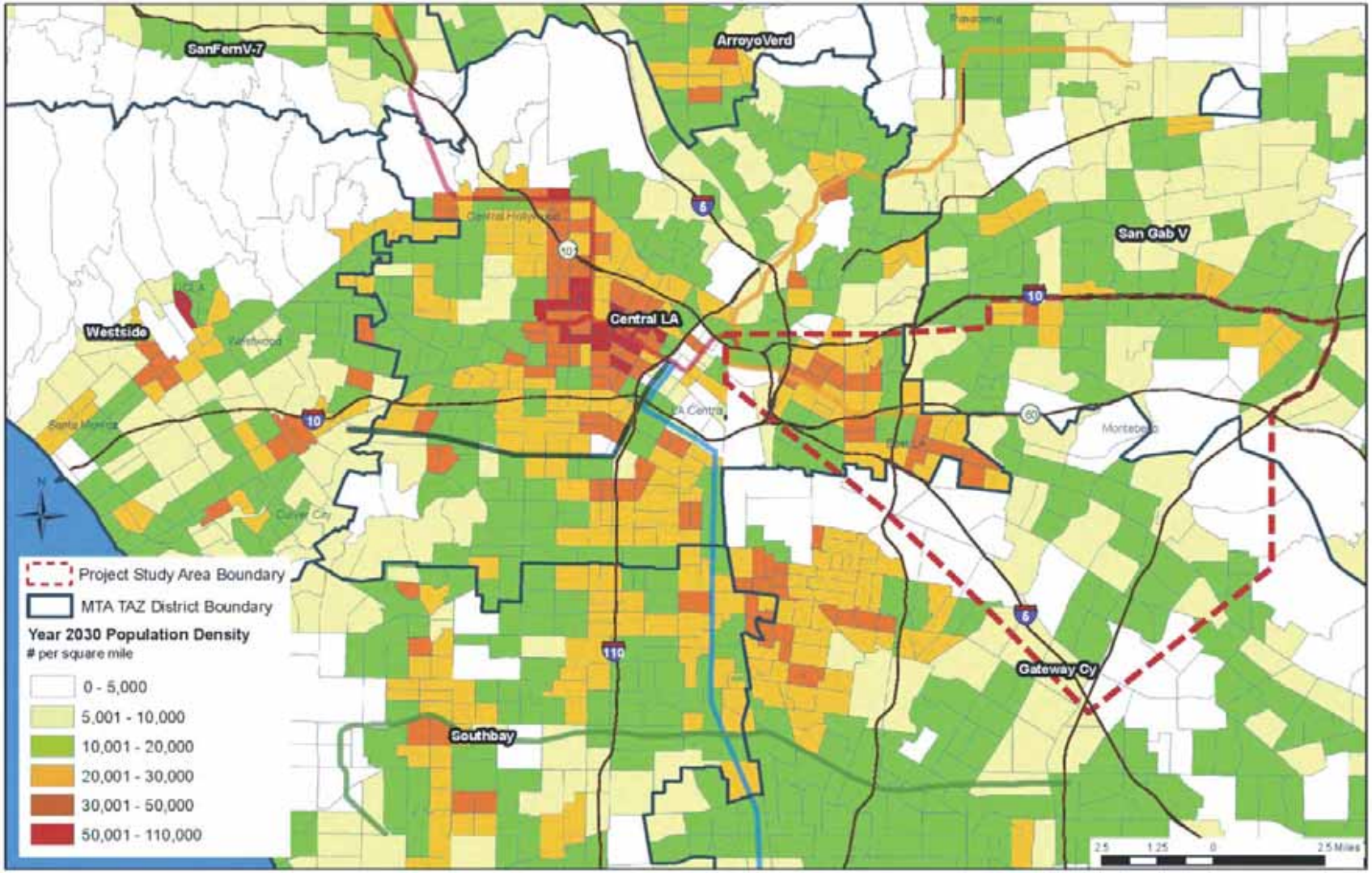
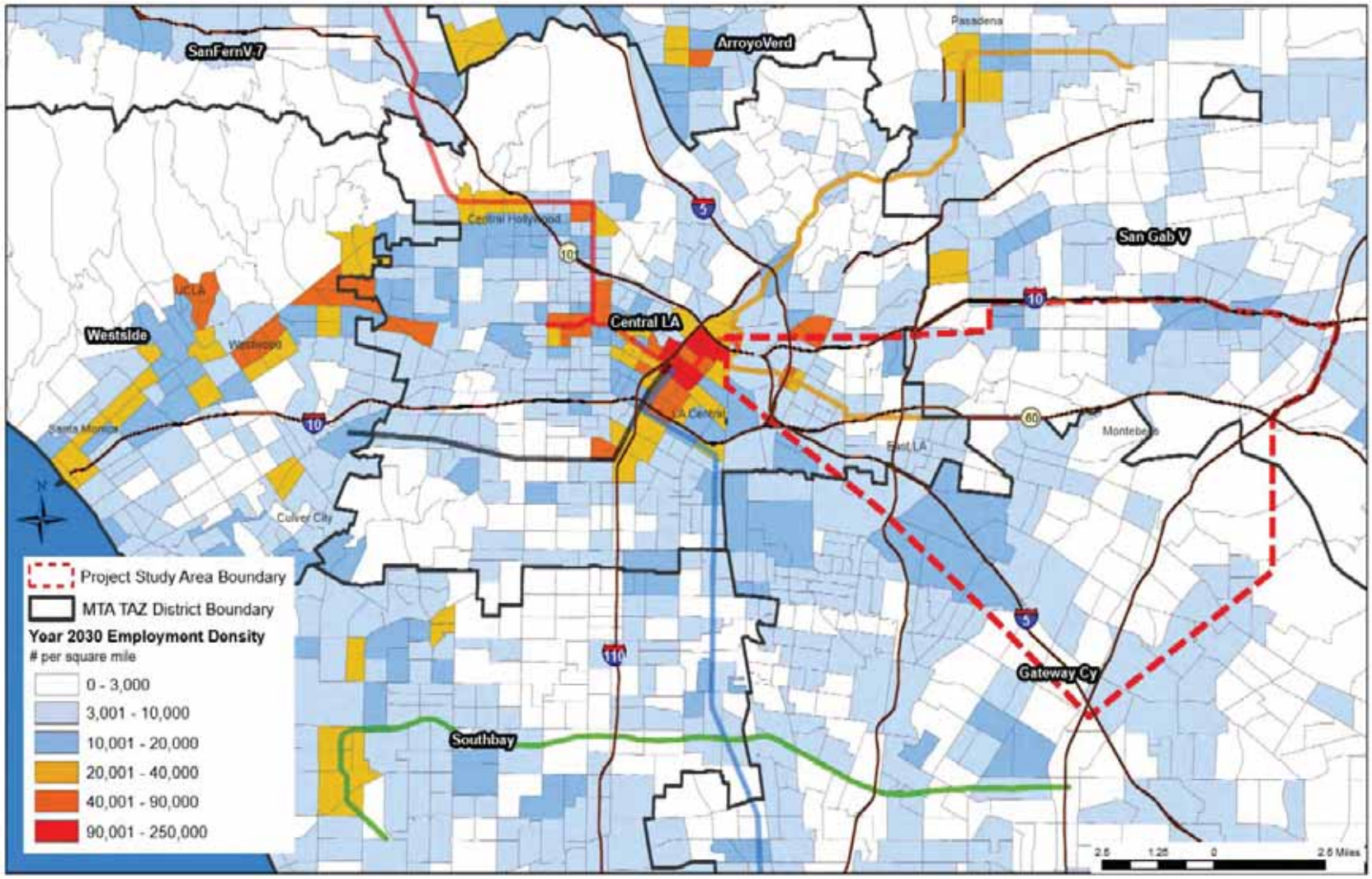


Figure S-9 2030 Regional Employment Density



Population and Employment Densities in the PSA

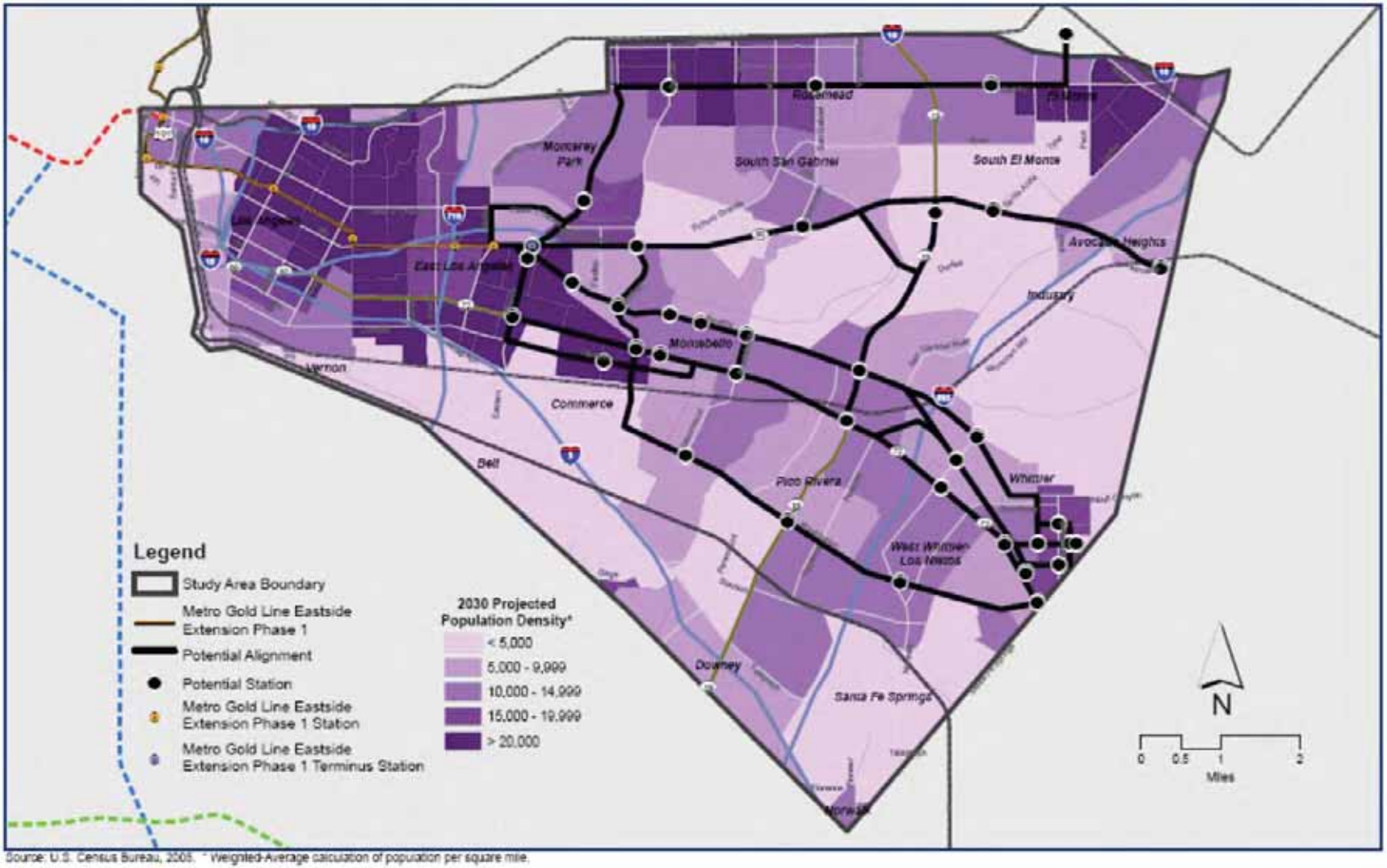
As of 2005, the population of the PSA was approximately 673,000, about 7% of the total population of Los Angeles County. The number of households was 176,000, 5.3% of the county total, yielding an average household size of about 3.8 persons. Overall, the number of people and households in the PSA is expected to grow by nearly 24% by 2030 (Table S-4 and Figure S-10). The 2030 population will be 830,000, larger than that of all but eleven U.S. cities in just 80 square miles. The densest census tracts have up to 20,000 residents and 10,000 employees per square mile. Employment in the PSA is also expected to experience a double-digit percent increase by 2030, for a total of 384,000 jobs (Figure S-11). High population and employment densities often yield high levels of transit use, and the large numbers of potential transit users in the PSA would contribute to ridership on the Eastside Transit Corridor Phase 2 project.

Table S-4 Population, Household, and Employment Growth

	2005	2030	Forecast Increase Between 2005-2030
Population			
PSA	673,283	829,743	23.2%
LA County	10,010,315	12,193,030	21.8%
PSA % of LA County	6.7%	6.8%	---
Households			
PSA	175,983	217,681	23.7%
LA County	3,298,210	4,116,567	24.8%
PSA % of LA County	5.3%	5.3%	---
Employment			
PSA	335,820	384,431	14.5%
LA County	4,644,010	5,651,043	21.7%
PSA % of LA County	7.2%	6.8%	---

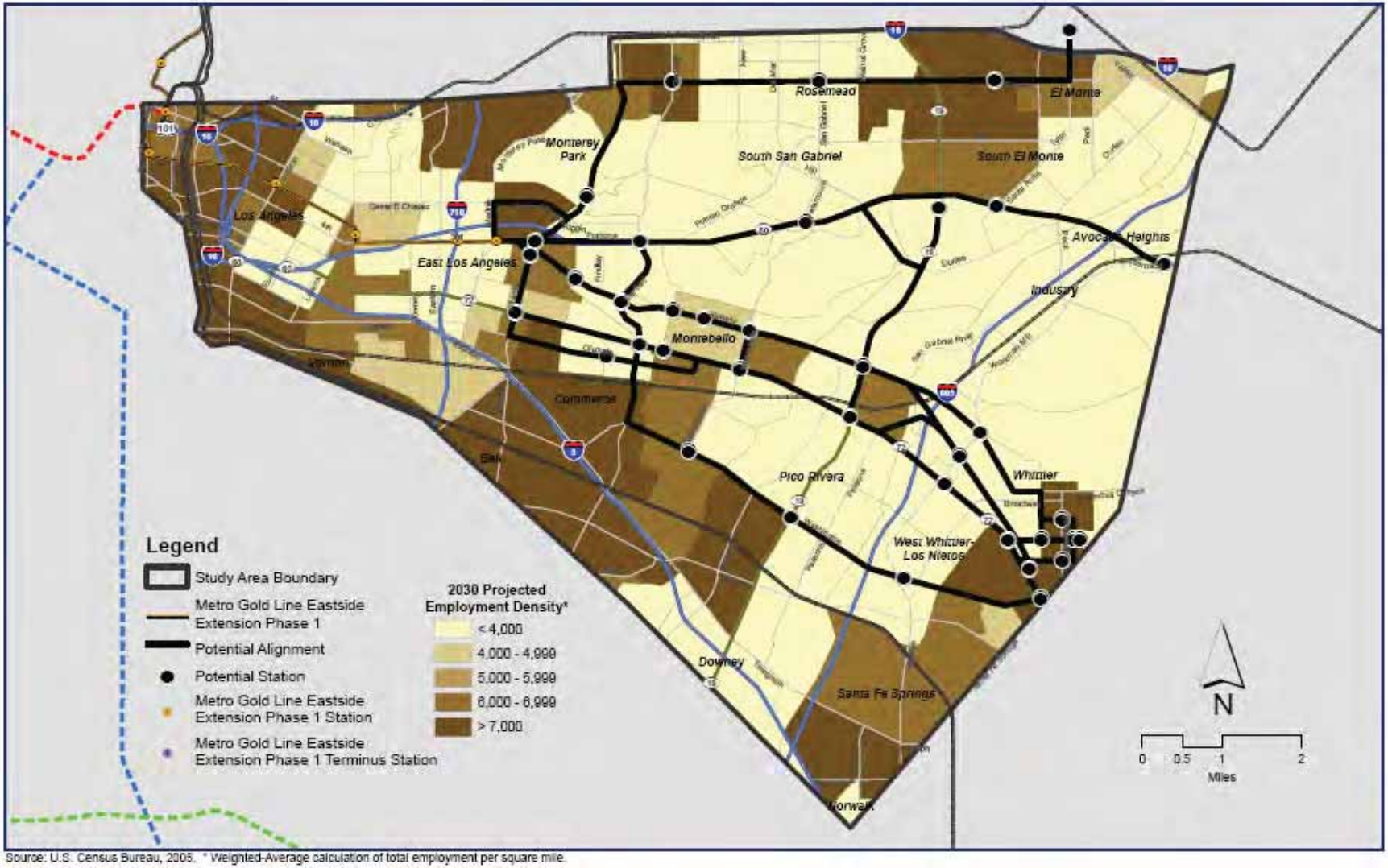
Source: SCAG, 2005 data and 2030 projections

Figure S-10 2030 Population Density in PSA



Source: U.S. Census Bureau, 2005. * Weighted-Average calculation of population per square mile.

Figure S-11 2030 Employment Density in PSA



Source: U.S. Census Bureau, 2005. * Weighted-Average calculation of total employment per square mile.

Transit Ridership

Overall, the PSA experiences a moderate level of transit ridership, and most of the population travels by private automobile. However, the highest densities of transit riders tend to coalesce around high-speed, high-capacity transit services, such as in the City of El Monte, which is served by the El Monte Busway. Additionally, the most heavily-ridden transit lines are those that travel in a westerly direction toward downtown Los Angeles. As such, the Eastside Transit Corridor Phase 2 would likely be popular among commuters. Part of the reason ridership is not higher may be because the PSA is currently served by seven different transit operators, each of which have different fare structures and transfer fares, posing an inconvenience to potential riders.

Goals and Intent of the Alternatives Analysis Study

The following goals were identified through interagency coordination, community stakeholder input, and FTA New Starts criteria. They will define the methodology used to evaluate the alternatives for a transit project investment in the PSA.

- Goal 1: Improve the Mobility, Accessibility, and Connectivity of the transit system and region.
- Goal 2: Support local land use objectives
- Goal 3: Choose a cost effective solution
- Goal 4: Plan for projected growth in an environmentally sustainable manner
- Goal 5: Meet the needs of the transit dependent
- Goal 6: Respond to community needs and support

During the AA study phase the project team has undergone extensive research and analysis in developing the study recommendation. The process included:

- Consideration of alternatives previously identified in the 2000 Major Investment Study
- Input received from the community involvement effort, including input from stakeholders, agencies, local jurisdictions and the public as part of the Early Scoping process
- Analysis of regional and sub-regional destinations and land use resulting in potentially promising candidate routes and station locations
- Consideration of modal and configuration options with regard to the “fit” or applicability to the PSA routes, taking into account land use, physical constraints and community characteristics

- Extensive field review and preliminary engineering of PSA opportunities and constraints relative to candidate alignments

The Final Alternatives Analysis Report documents the AA study process and analysis of alternatives as part of the Eastside Transit Corridor Phase 2. Section 7 summarizes the results of the comparative analysis of alternatives, and Section 2 provides further explanations of how the goals and evaluation criteria were applied during the analysis process. The results of the AA study provide decision makers the information needed to approve further study as part of a Draft EIR/EIS.

S.2. Alternatives Considered

Screening Process

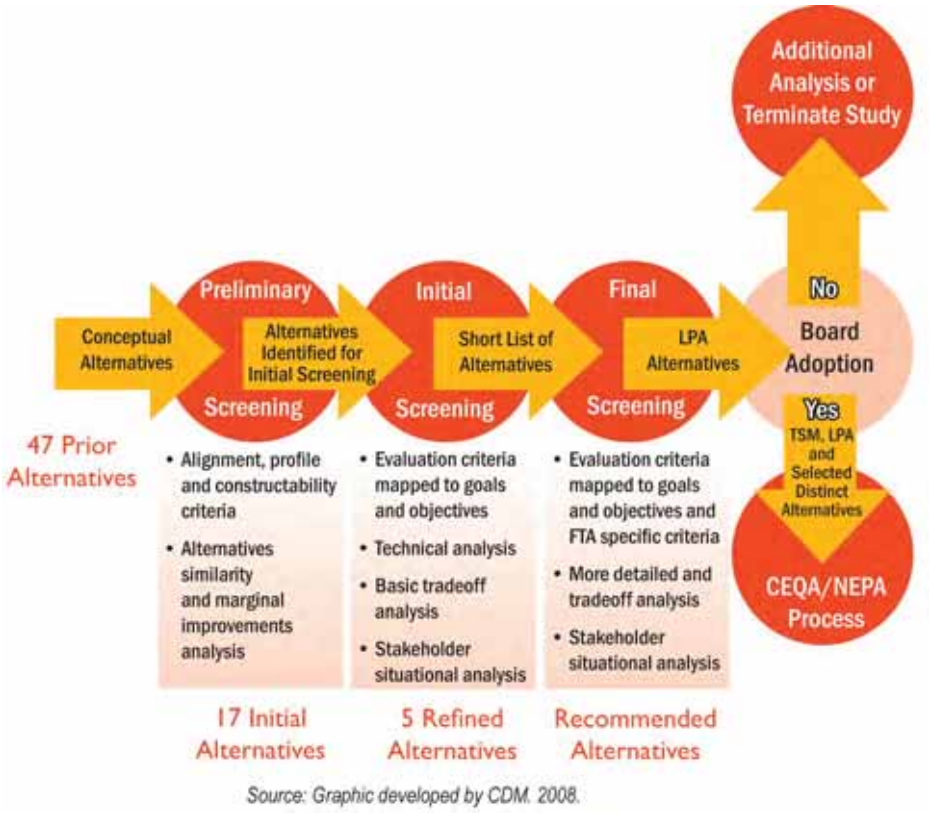
The alternatives screening process consists of four stages, which are described in detail in Section 2 (see Figure S-12). In short, they are:

- **Preliminary screening of conceptual alternatives**, which takes into account the alignment profile and construction feasibility. This process yielded the full spectrum of conceptual solutions down to 14 light rail and three bus rapid transit alternatives, for a total of 17.
- **Initial screening of alternatives**, where a screening methodology is developed based on the adopted goals for the project and stakeholder input, and technical considerations are taken into account. This stage narrowed the list of alternatives to five, with one bus rapid transit alternative and four light rail alternatives.
- **Final screening**, where FTA criteria are considered, and more detailed technical analysis is performed.
- **Adoption of a Locally Preferred Alternative**, where the Metro Board of Directors will select alternatives to be carried through to the California Environmental Quality Act (CEQA)/ National Environmental Policy Act (NEPA) process.

Alternative Definitions

Based on the six goals identified for the initial screening of alternatives, the list of 17 conceptual alternatives was shortened to the five most promising ones for examination in the Alternatives Analysis report alongside the No-Build and TSM Alternatives. The alternatives studied in this report are as follows (refer to Figure S-13 for a map showing routes and stations.)

Figure S-12 Approvals Process

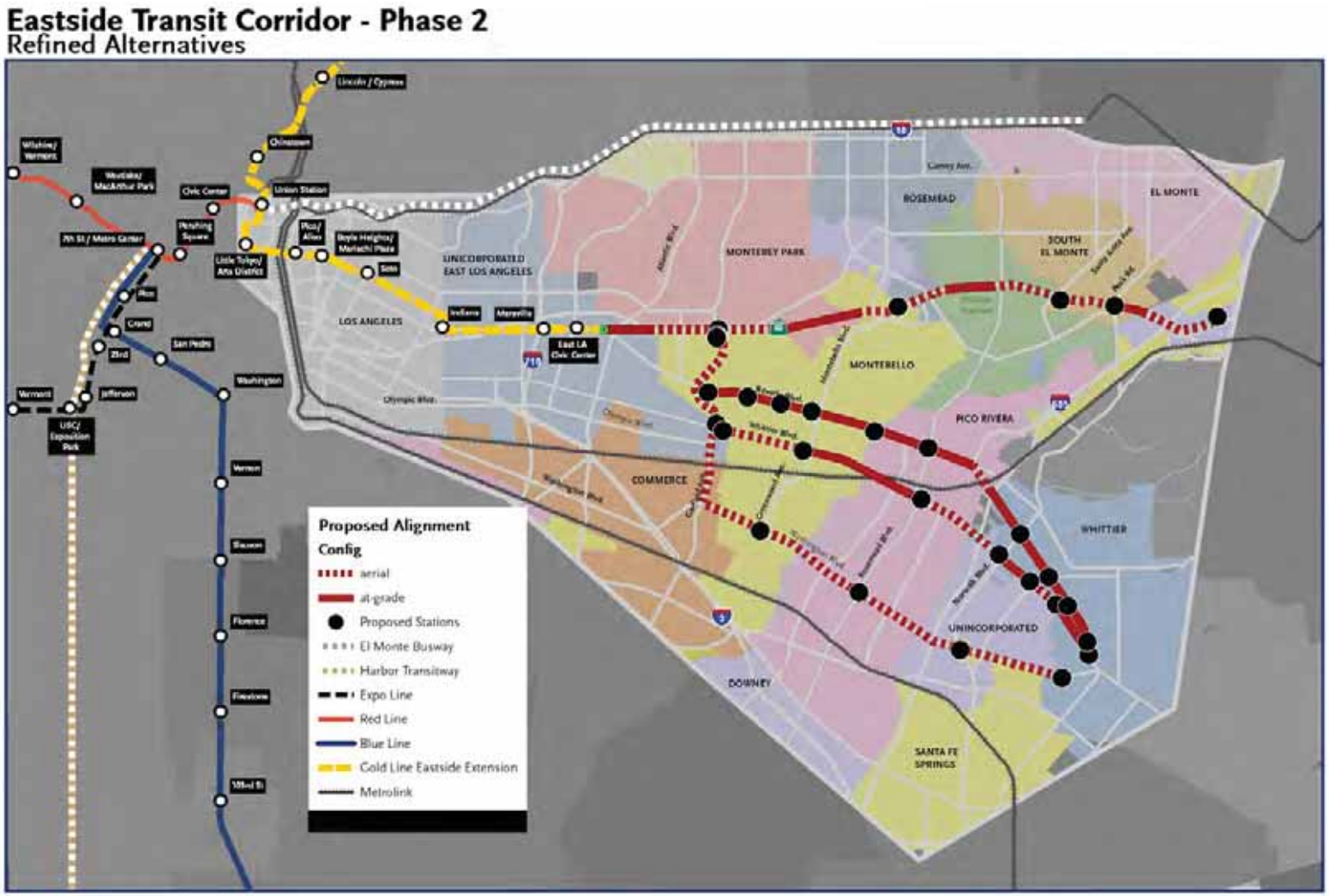


Source: Graphic developed by CDM. 2008.

- **No-Build Alternative**: This alternative includes no changes to the existing transportation system beyond those identified in the "constrained plan" of Metro's Draft 2008 Long Range Transportation Plan. Existing service would be maintained as is, and only minor service level adjustments would be made as warranted.
- **Transportation Systems Management (TSM) Alternative**: The TSM Alternative includes all of the provisions of the No-Build Alternative, plus some enhancements to existing bus service. These include new Metro Rapid lines on Beverly Blvd. and Garfield Ave., a new express line on the Pomona Freeway, increased frequency of service on existing bus lines, and new limited-stop buses on Montebello Blvd., Peck Rd., Workman Mill Rd., and Santa Fe Springs Rd.

- **Alternative 1 – SR-60 LRT**: This alignment extends from the Eastside Corridor Phase I terminal station at Pomona and Atlantic Blvds. eastward in the median of Pomona Blvd. to SR-60, then follows alongside the freeway on aerial structures or in a retained cut with several park and ride stations before reaching the end of the line at the SR-60/I-605 interchange. SR-60 is an 8-lane freeway that carries an average of 230,000 to 250,000 vehicles per day and routinely experiences travel speeds below 20mph during peak hours.
- **Alternative 2 – SR-60 Busway**: This alternative follows the same route as Alternative 1, but uses buses instead of LRT trains.
- **Alternative 3 – Beverly LRT**: The Beverly Blvd. alignment extends from the Eastside Corridor Phase I terminal station eastward via Pomona Blvd. and SR-60 to South Garfield Ave. then follows Garfield Ave. south to Beverly Blvd., turning east and following Beverly Blvd. to Central Whittier. It runs mostly at-grade in roadway medians, but includes some aerial structures and stations. The at-grade segments will necessitate restricting left-turn movements at some locations along the alignment. There is an optional "Uptown Whittier loop" at the end of the line. One limitation of Beverly Blvd. is that it has narrow segments along the proposed LRT route, ranging in width from 80 to 100 ft. The Phase 2 travel time along a Beverly Blvd. alignment is anticipated to be 26 minutes, and the average trip speed would be 25 mph.
- **Alternative 4 – Whittier LRT**: The Whittier Alternative proceeds eastward from the Phase 1 terminal station via the same alignment as the Beverly LRT but continues further south via South Garfield Ave. to Whittier Blvd. and then east along Whittier Blvd. to a terminal station at Mar Vista St. in Central Whittier. The alternative contains several design options, including use of aerial tracks along the Southern California Edison Utility Corridor in lieu of South Garfield Ave., an extended aerial segment above Whittier Blvd., and a streetcar-style loop to serve uptown Whittier at the end of the line. Like Beverly Blvd., Whittier Blvd. is as narrow as 80 feet in width in some locations and it is constrained by historic sites in Montebello and Pico Rivera as well as the San Gabriel River.
- **Alternative 5 – Washington LRT**: This alignment would continue eastward from the Phase 1 terminal station via the same alignment as the Beverly and Whittier alternatives but continues south along South Garfield Ave. on aerial structure to Washington Blvd. where it turns east and follows Washington Blvd. on an aerial structure to the terminal station at Lambert Rd. Washington Blvd. ranges in width from four to six lanes, and is a major truck route and commuter alternative to I-5. It passes through areas mostly zoned for commercial and industrial uses.

Figure S-13: Build Alternatives



S.3 Evaluation of Alternatives

S.3.1. Transportation Impacts

Transit

Operating Plans

When modeling the transportation impacts of each of the proposed alternatives, it was assumed that trains and buses would operate every five minutes during peak periods and every ten minutes during off-peak periods. Service would operate from 4am to 1:30am, consistent with hours of operation on the rest of the Metro Rail system. Additional assumptions regarding station dwell times, vehicle acceleration capabilities, and maximum speeds are discussed in Section 3.1.

Travel Times

Figure S-14 shows the station to station travel times for both the Phase 2 extension as well as the total station to station travel time to Union Station in downtown Los Angeles. The travel time along the Phase 2 extension ranges from 15 to 24 minutes. Travel times to Union Station range from 35 to 44 minutes. The estimated travel time along the Phase 1 extension is 19.5 minutes; however, with Alternative 2, SR-60 Busway, travel times to Union Station include the estimated six minute average transfer time at the Phase 1 terminus between bus and rail.

Travel Time Savings

Implementation of the Phase 2 extension would result in substantial savings in travel time to Atlantic Blvd. and to Union Station, as shown in Figure S-15. Travel time savings would range from about one half hour with Alternatives 3–5. The SR-60 alternatives would yield higher savings, but this is largely due to the relative inaccessibility to transit of the Crossroads terminal station. Travel time savings is measured relative to the No-Build condition. It evaluates the difference in transit travel time from any specific location in the project area. The Route 60 alternatives appear to outperform other alternatives because only limited transit opportunities are available from these locations under the No-Build condition.

Figure S-14: Alternative Travel Times

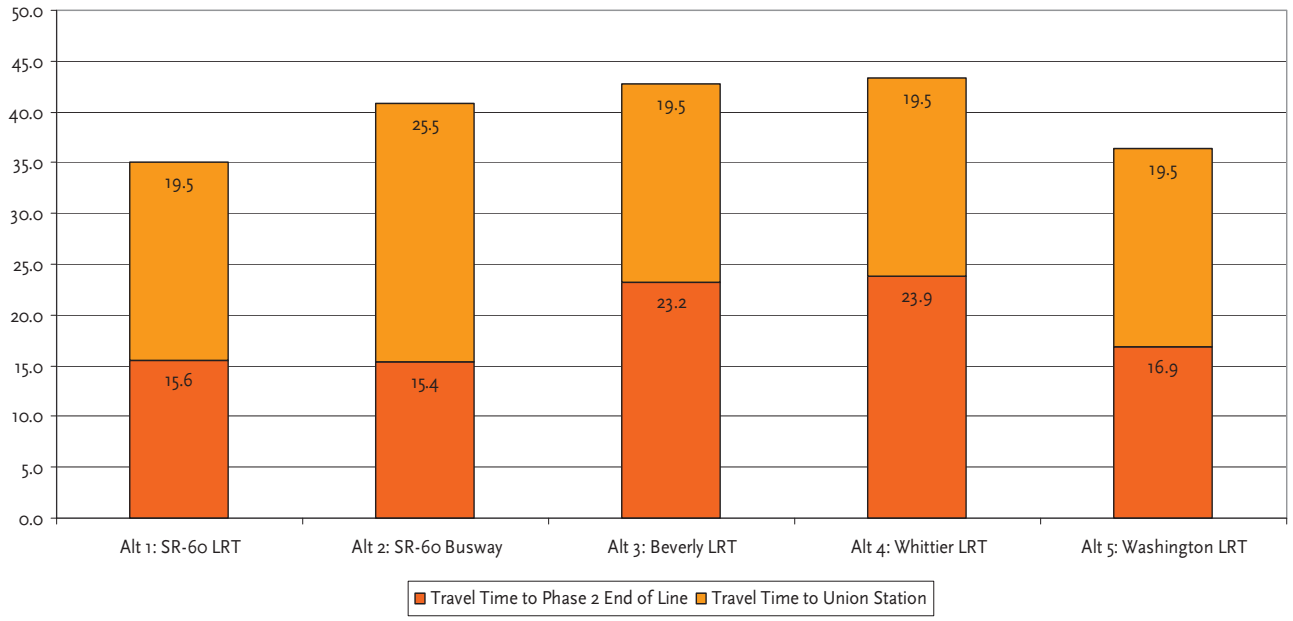
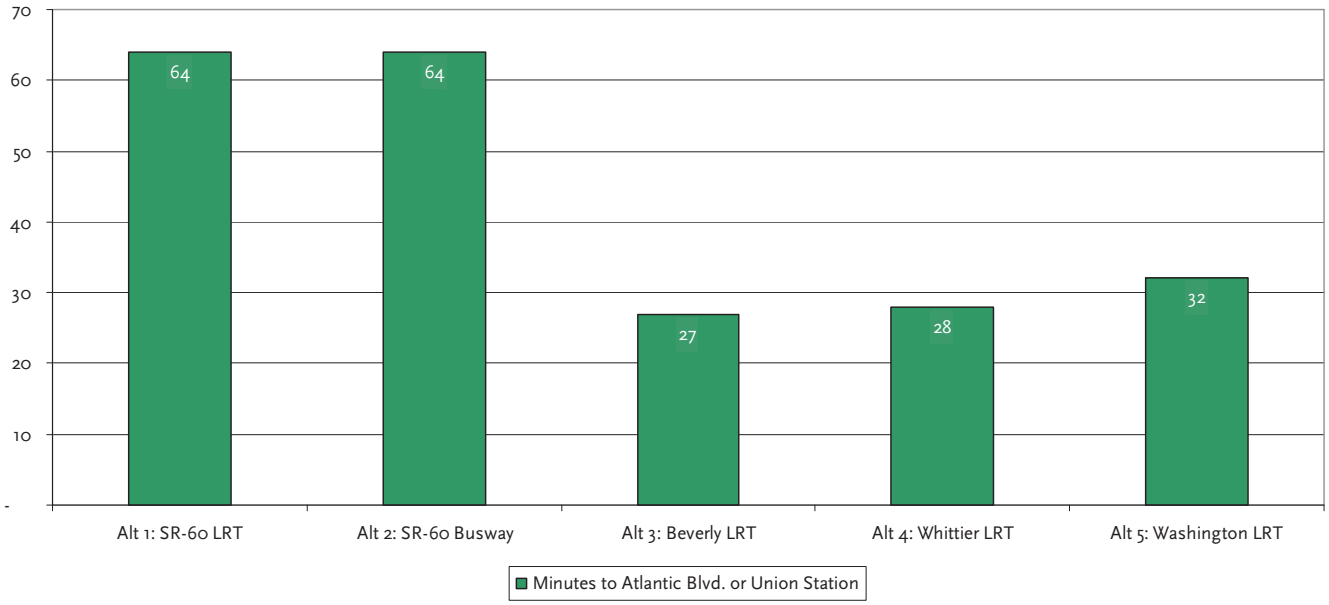


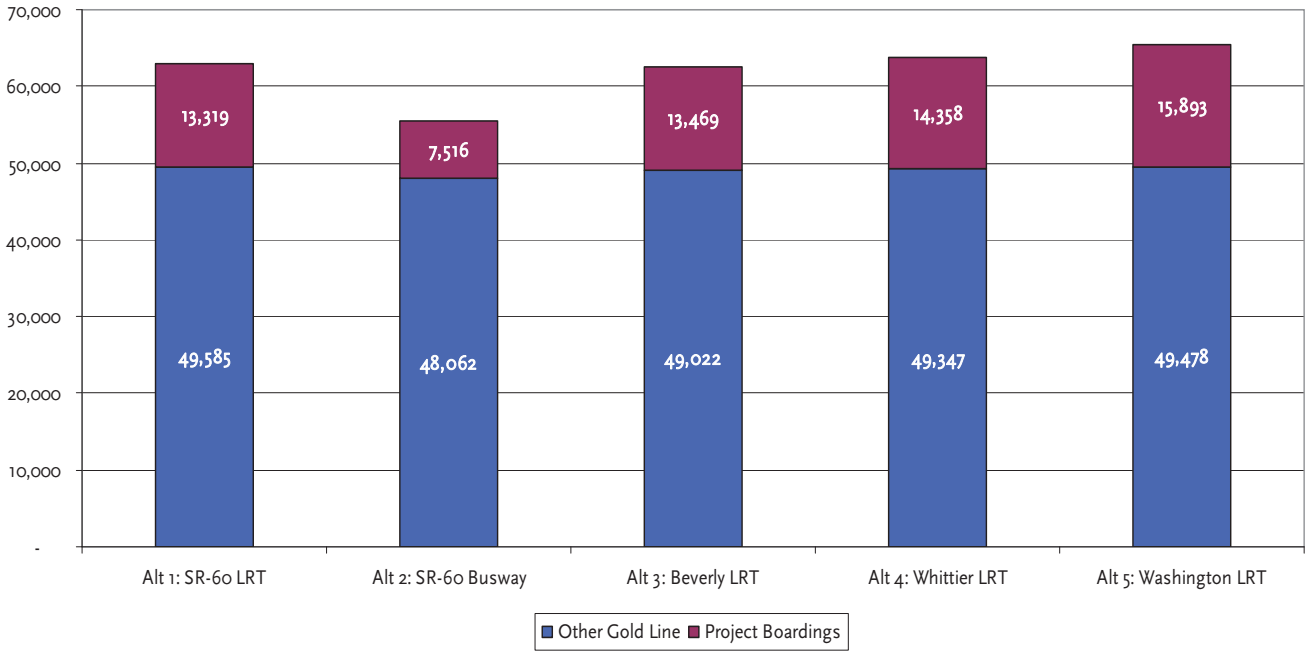
Figure S-15: Travel Time Savings



Ridership

Figure S-16 indicates the ridership increases associated with implementation of the Phase 2 extension. Project Boardings would range from a low of 7,500 (SR-60 Busway) to nearly 16,000 (Washington LRT), adding 16 to 32 percent to Gold Line ridership.

Figure S-16: Metro Gold Line Ridership

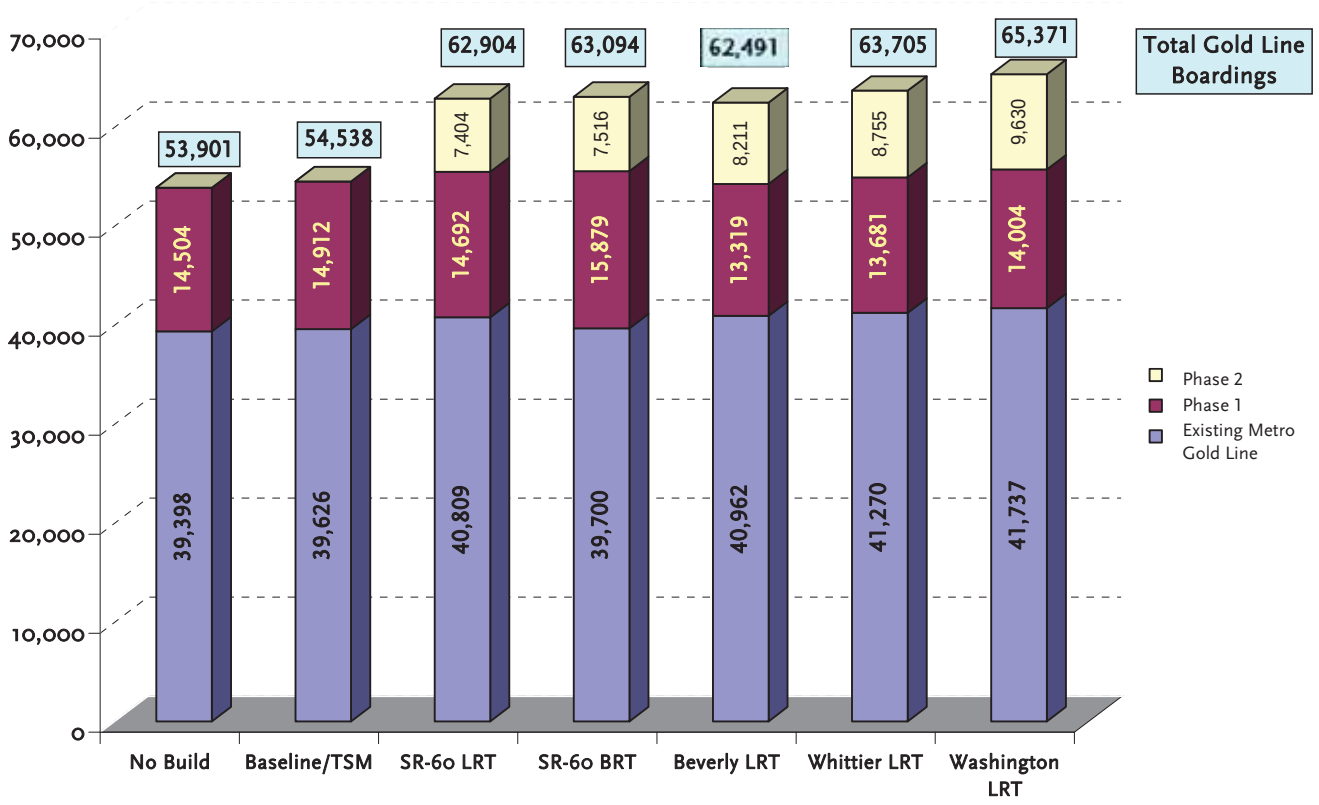


The model results showed the highest Phase 2 ridership as well as the highest overall Metro Gold Line transit ridership volumes for Alternative 5. For this alternative, the model estimated total boardings of about 15,900 riders using the Eastside Transit Corridor Phase 2 by 2030. Alternatives 1, 3, and 4 followed closely behind, ranging from about 13,300 to 14,400.

The ridership estimates were also calculated for the individual stations along each alternative alignment. For all of the alternatives, the highest volume of boardings occurred at the terminal station (ranging from 1,200 to 2,000) and at the station nearest Whittier Blvd. and South Garfield Ave. or SR-60 and South Garfield Ave. (1,000 to 2,100). Some stations were projected to have very low ridership volumes (below 500), and these were mostly on Alternative 3 with the Whittier Greenway option. Detailed station boarding estimates are provided in Section 3.1.

Figure S-17 presents the build-up of station boardings on the Gold Line in Year 2030 using the existing Pasadena Gold Line as the base case and then adding the Phase 1 extension (presently under construction) and finally the Phase 2 extension stations.

Figure S-17: Metro Gold Line Station Boardings



As illustrated in Figure S-17, Gold Line station boardings would be highest with the Washington Boulevard LRT alternative. The SR-60 BRT and Whittier Boulevard LRT alternatives would result in slightly lower station boardings and the SR-60 LRT and Beverly Boulevard LRT alternatives would result in the lowest total station boardings. Nevertheless, the Phase 2 extension increases in boardings are fairly similar, ranging from 7,404 for the SR-60 LRT Alternative to 9,630 for the Washington Boulevard LRT Alternative.

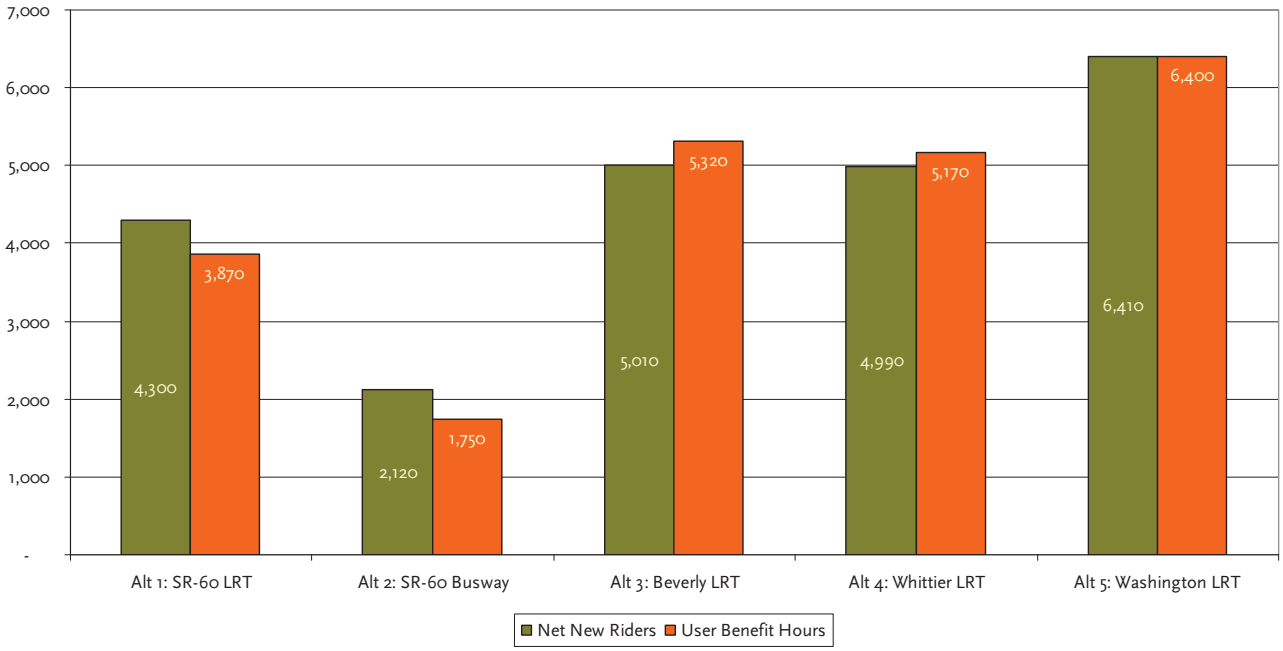
The Eastside Corridor Phase 2 project would bring increases in transit mode share within the PSA and small reductions in VMT. The best performing alternative from a ridership standpoint was Alternative 5 (Washington LRT), which would attract 6,000 new transit trips per day, a 17% increase over the current transit mode share. The worst-performing build alternative, SR-60 Busway, would achieve half of that increase. Nevertheless, the SR-60 Busway alternative promises to deliver the greatest reduction in VMT within the PSA, but this

would only be about 1,000 VMT per day (equivalent to one car driving 1,000 miles) less than the No-Build alternative.

FTA Criteria

Key performance metrics considered by the Federal Transit Administration include the projected daily net new transit riders and user benefit hours with the build alternatives compared to the TSM alternative. The net new transit riders include all transit riders, whether bus or rail. Similarly the user benefit hours are evaluated for all riders regardless of mode. As shown in Figure S-18 below, the net new transit riders range from 4,300 riders to 6,400 riders for the LRT alternatives and the user benefit hours closely track with the net new riders, ranging from about 3,900 to 6,400 hours for the LRT alternatives. Alternative 2, the SR-60 busway, is estimated to generate less than one-half of the net new riders and user benefit hours compared to the poorest of the LRT options. These performance measures are utilized to compute the cost-effectiveness, which is presented in S.3.3, Financial Feasibility.

Figure S-18: Net New Transit Riders and User Benefit



Highway

The impacts to arterial roadways will be minimal under the SR-60 alternatives, because they will have only one at-grade crossing along Pomona Blvd., and the rest of the alignment would be constructed adjacent to the Pomona Freeway. Alternatives 3, 4 and 5 would have the most substantial impacts, because they require new at-grade crossings and aerial structures along nearly the entire alignment. Though aerial structures have fewer impacts to surface traffic than at-grade tracks, they still require space equivalent to one lane of traffic (1/2 lane in each direction) for structural supports.

Station Facilities

At all proposed stations, access via walking, bicycling, transfers from bus lines, and automobile drop-off (kiss-and-ride) will be provided. Some stations are located near parcels that present opportunities for transit-oriented developments (TOD), which can reshape station-adjacent land uses in a way that is conducive to increasing transit ridership. In addition, each build alternative includes station sites that allow for the construction of park-and-ride lots, but the feasibility of doing so depends on the physical constraints of the station site. As such, not all stations will have parking. A complete analysis of the access issues at each proposed station site is provided in Section 3.2.2.

S.3.2. Environmental Issues

Overall, the environmental impacts of all of the alternatives are projected to be mostly low or moderate. The No-Build and TSM Alternatives have few negative effects overall, and the build alternatives would impose a mixture of mostly low and moderate impacts. The No-Build Alternative would generate air quality impacts by increasing emissions relative to existing conditions. Only the impacts of the property acquisitions needed to construct Alternatives 1 and 2 and the air quality impacts of Alternative 5 would be comparatively “high.” The anticipated environmental changes within the PSA are summarized below, and more detailed discussion of each impact is provided in Section 4.

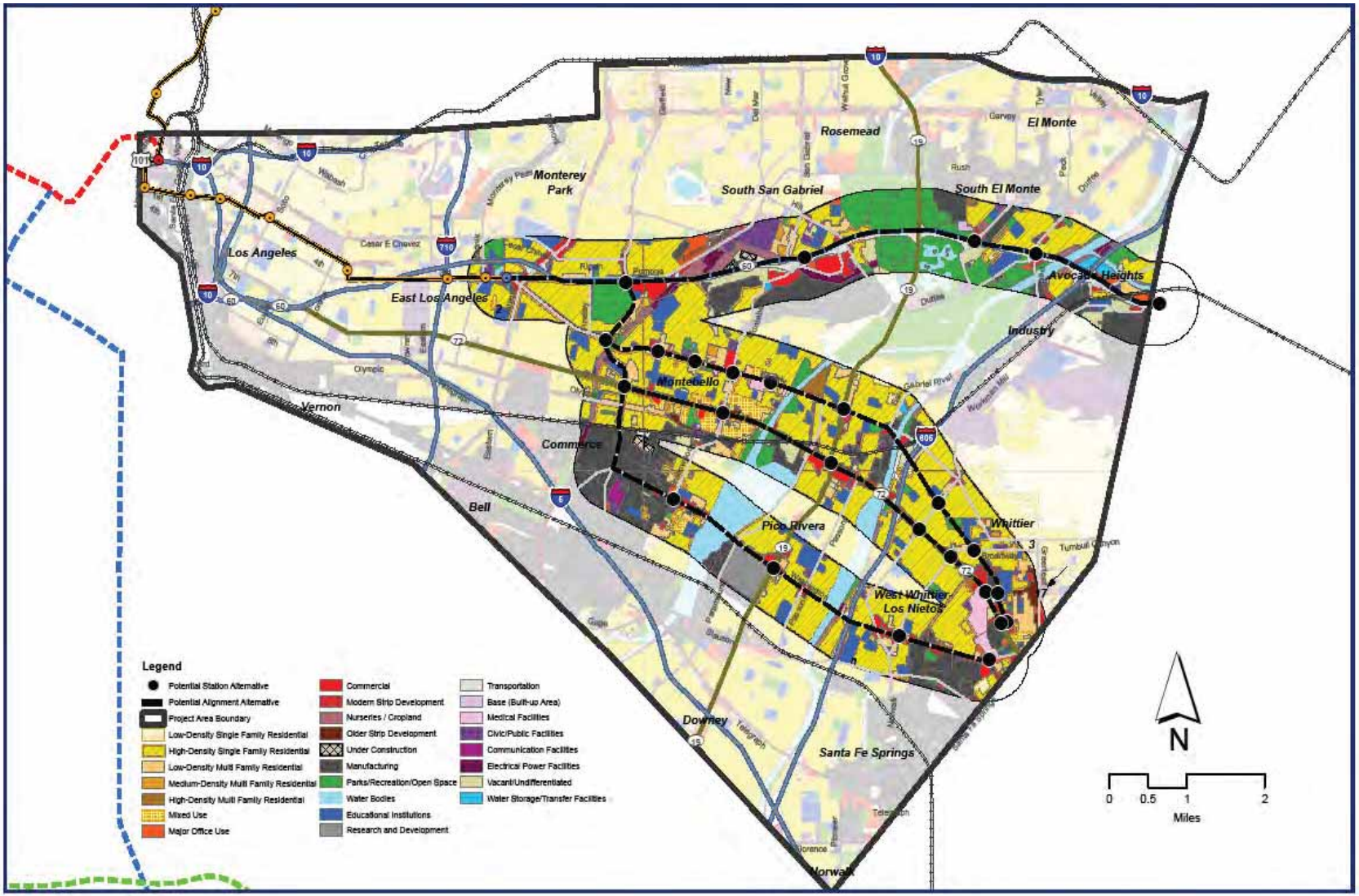
Surrounding Land Uses

Proximity to transit-supportive land uses is key to generating high ridership. In order to gauge the potential effectiveness of each alternative, the acreage of commercial, institutional, high-density residential, and recreation uses was tallied within ½ mile of each of the proposed alternatives. Of all of the alternatives, 3 and 4 are near the greatest amount of transit-supportive land uses, and a majority of the surrounding land is high-density residential. About 40% of the land uses near Alternatives 1 and 2 were deemed unsupportive of transit ridership, making these the lowest-performing alternatives in this segment of the analysis.

Overall, jurisdiction in the PSA have adopted General Plans that call for new transit options, increased density and mixed use near transit stations, and more pedestrian oriented streetscapes. For example, Los Angeles County has indicated a desire to reduce dependence on private automobiles and foster a multi-modal transportation network. Similarly, Pico Rivera and Commerce both call for better connections of their major streets and activity centers to the transit network. Montebello, Rosemead, and Whittier are all undertaking redevelopment and revitalization plans, and the cities want transit to play a key role in these new projects. Nine major mixed-use retail, housing, and office developments are currently underway in the PSA, the largest of which, the Pico Rivera Towne Center in Pico Rivera would add over 500,000 square feet of new commercial space (Cascades Marketplace in Monterey Park). In total, the combined effects of the developments will add well over 1.5 million square feet of new floor space. As such the Eastside Phase 2 project would be supportive of and compatible with the long-term land use plans established by the municipalities in the PSA.

Because it runs through a largely industrial area, Alternative 5 was found to run through areas with the highest employment density. Alternatives 3 and 4 are situated in areas with slightly lower employment density, and the SR-60 alternatives are located near the fewest jobs. Alternative 4 was found to run through areas with the highest population density. Alternatives 3 and 5 are situated in areas with slightly lower population density, and the SR-60 alternatives are situated in areas with the lowest population density. These trends continued through the year 2030 estimates as well, which take into account local land use policies, planned redevelopment projects, and the incremental growth that would be spurred by the new transit service. Figure S-19 illustrates the types of land uses surrounding the proposed build alternative alignments. Many of the potential station areas present opportunities for joint developments between Metro, local governments, and private investors. The TOD projects could revive the land uses around station areas and have an economically revitalizing effect on the surrounding neighborhoods. A list of possible redevelopment sites is included in Section 4.2.

Figure S-19 Land Uses along Refined Alternatives



Temporary Construction Impacts

If a build alternative is selected, all of the parcels near the final alignment will be impacted by the construction activities. Noise, dust, vibration, and road closures would occur, and this could be disruptive to existing land uses. Construction would also disrupt existing traffic patterns as detours would be necessary. Traffic congestion could increase on some of the detour roads. Construction in the vicinity of commercial land uses may disrupt some business activity by reducing access to the stores. However, these impacts would be temporary, and construction management would attempt to minimize their effects as much as possible.

Property and Right-of-Way Acquisition

Most of the proposed alignments utilize median lanes along existing freeways and arterial streets. As such, the need for property acquisition is low compared to many transit projects. Alternatives 1 and 2, for example, require no acquisitions to accommodate the new right-of-way. The remaining alternatives would need small acquisitions primarily at locations where the tracks curve to transition from one street to another. The only sites where larger acquisitions would be needed are confined to the areas around stations. Median stations would require expanding the roadway on either side to accommodate the platform, and some stations would require additional land for park and ride lots and other station-serving facilities. The alignments focused around arterial streets (Alternatives 3 through 5) would each require 240,000 to 326,000 square feet of acquisitions. For Alternatives 3 and 5, most of the square footage is already vacant, but all of the square footage is currently in commercial use for Alternative 4. Alternatives 1 and 2, the SR-60 alignments, would require more than double the acquisitions needed for any other alternative, 662,000 square feet. However, 500,000 square feet of that figure are already vacant. As such, Alternative 4 (Whittier LRT) would require the most significant removal of non-vacant land uses.

Community and Neighborhood Impacts

Public participation is key to evaluating community and neighborhood impacts. Of key concern to LRT or BRT projects are the potential for safety issues, noise, and the physical division of neighborhoods. Of particular concern to people living in the PSA were the preference of LRT over a busway, the maintenance of existing bus service, congestion reduction, impacts to schools and parks, connections to shopping areas, improvements to corridor aesthetics, and disturbances of superfund sites.

Streetscape alteration would be necessary along all of the alignments and would consist of the addition of trains to the medians of major streets, construction of 25-foot tall overhead catenary system (OCS) poles, installation of station platforms and canopies, and introduction of aerial structures. While the at-grade infrastructure would only pose minor visual impacts,

alternatives with extensive aerial tracks, such as Alternative 5, would alter the appearance of the right-of-way more significantly. Median-running tracks may also require the removal of street trees in some locations, but station and right-of-way areas would include landscaping in order to mitigate the effects of tree removal to the extent possible.

Cultural Resources

A complete listing of the historic structures located near each of the proposed build alternatives is provided in Section 4.6.3. Sites were identified using the National Register of Historic Places, the State of California Office of Historic Preservation, the 2000 Re-Evaluation MIS, and the SR-60 Truck Lane Feasibility Study. The Whittier LRT alternative passes by the most historic resources of any alternative. However, this may not necessarily mean the impact to surrounding cultural resources will be the heaviest for Alternative 4, only that the nearby buildings are older. Alignments with elevated tracks can be expected to impact nearby cultural resources more than at-grade alignments because of their imposing visual presence and the significant amount of additional noise generated.

Air Quality

Air quality in the PSA is expected to be worse under the No-Build Alternative than under the build alternatives, since all of the build alternatives are forecast to reduce automobile trips. The Busway alternative would replace these automobile trips with trips made by compressed natural gas (CNG) fueled buses. Since Alternative 2 would presumably use new vehicles, the emissions from the buses would be lower than the average for the Metro fleet as a whole. LRT vehicles are powered by electricity and would not generate any harmful emissions in the vicinity of the PSA, though pollution would continue to be generated at the power plant where the electricity is produced. Alternative 5 is the only build alternative that would generate any emissions increase, and this only occurred in two categories of emissions: CO2 (carbon dioxide) and PM10 (particulate matter less than ten µm in size). Alternative 1 (SR-60 LRT) provided the greatest air quality benefits overall, more than double those of the next best alternatives.

Noise and Vibration

In general, buses generate higher noise levels and less vibration than LRT trains, especially those operating on aerial tracks. For Alternative 2, these noise levels would be exacerbated by the anticipated use of CNG buses, which are louder than traditional diesel buses. However, Alternative 2's proximity to the SR-60 Freeway would offset most of the additional noise created, as the freeway traffic already generates high noise levels. Also, there are fewer sensitive receptors (land uses for which quietness is an essential part of their function) near SR-60 than the other alignments. Alternative 4 (Whittier LRT) passes by the most noise-

sensitive receptors, but the potential for vibration impacts is only moderate because the tracks run mostly at-grade.

Ecosystems

The SR-60 alignment is the only one to traverse an area with potentially sensitive biological resources (Whittier Narrows Recreation Area). Further study will be needed to determine whether construction or operation of Alternatives 1 and 2 would result in the loss of wildlife habitat or disturbances to sensitive species. The remainder of Alternatives 1 and 2 and the entire length of the other alternatives run through densely developed areas with little capability to house biological resources. The only remaining concern is that tree removal may disturb bird nesting sites, and further study is needed to determine the extent of this potential impact.

Hazardous Materials, Waste, and Water Resources

All of the build alternatives have the potential to affect water resources. All of the routes would cross the Rio Hondo and San Gabriel Rivers, which are sources of surface water. The operational effects to these two waterways would likely be slight because the alignments would cross over them on aerial structures, but the impacts could be amplified if in-water construction work is needed. Construction could also affect groundwater resources due to soil disturbances, the potential release of hazardous materials into the soil, and excavation near the OII Superfund site. This will be particularly important if Alternatives 1 or 2 are pursued, as SR-60 passes directly through the Superfund site. Additionally, Alternatives 3, 4, and 5 pass through a 100-year flood zone and appropriate permitting from the local governments would be needed to mitigate the risk of flooding. Further study is needed and more details on the possible impacts and mitigation measures will be presented in the Draft EIR/EIS.

Geology and Subsurface Conditions

There are 22 known faults within 40 miles of the PSA, and all of the alternatives would traverse areas susceptible to earthquake liquefaction. As such, extensive study during the next phase of the environmental review process will determine the risk of liquefaction more conclusively and recommend any necessary precautionary modification to the design of the build alternatives.

Energy

It is estimated that LRT vehicles use slightly more energy than busway buses, but this is a negligible amount that would have little effect on the overall energy efficiency of the project. As such, all of the build alternatives are expected to have similar energy requirements, as they

are all of similar length and there is little difference in energy consumption between the types of vehicles under consideration. Energy savings is expected to be generated by the diversion of automobile drivers to the new transit extension, and this would offset the amount of energy needed to operate the service. As such, the Phase 2 build alternatives are not expected to have any net energy consumption increases over the No-Build Alternative.

Parklands

All of the build alternatives pass through or nearby parkland and recreational areas. The appearance of these areas would be changed by the addition of at-grade, freeway-adjacent, or aerial transit facilities, but they would also benefit from the improved access provided by the new transit service.

Summary

The following table provides a summary of the environmental impacts described above. The impacts are discussed in greater detail in Section 4. Each alternative's impacts were ranked "high," "medium," or "low" based on their magnitude relative to the other alternatives and comparable transit projects.

Table S-5
Summary of Expected Impacts for Eastside Transit Corridor Phase 2 Project Alternatives

Resource Area	No-Build Alt.	TSM Alt.	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Land Use & Economic Development	L	L	L	L	L	L	L
Catalyst for Public/Private Economic Revitalization	L	L	L	L	L	L	L
Displacement	L	L	H	H	L	M	M
Community & Neighborhood	L	L	M	M	M	M	M
Visual and Aesthetic	L	L	M	M	M	M	M
Cultural Resources	L	L	M	M	M	M	M
Air Quality	H	M	L	M	M	M	H
Noise and Vibration	L	L	L	L	M	M	M
Ecosystems	L	L	M	M	L	L	L
Water Resources	L	L	L	L	L	L	L
Geology and Subsurface Conditions	L	L	M	M	M	M	M
Hazardous Substances	L	L	M	M	L	L	L
Energy	L	L	L	L	L	L	L
Parklands	L	L	M	M	M	L	L

Key: H - High, M - Medium, L – Low

S.3.3. Financial Feasibility

The financial feasibility analysis considers the capital and operations & maintenance cost for the alternatives as well as the measurement of project benefits in relationship to the estimated costs.

Capital Cost

Cost estimates for each of the build alternatives were obtained by analyzing the specific characteristics of each alignment and basing the cost of each feature on reports prepared for the Metro Orange Line Phase 2 Busway project and the Metro Expo Line Phase 2 LRT project. The final cost estimates are show in Table S-6 below:

Table S-6: Preliminary Estimated Capital Cost ($-Million, 2008)

Alternative	Const. Cost*	Project Costs**
Alternative 1 – SR-60 LRT	$1039	$1719
Alternative 2 – SR-60 Busway	$834	$1401
Alternative 3 – Beverly LRT	$665	$1086
Alternative 4 – Whittier LRT	$844.5	$1383.5***
Alternative 5 – Washington LRT	$1145.9	$1764.7

* Construction cost column includes hard costs and contingencies as establish by each cost category.
**Includes Right-of-Way, Vehicles, and Professional Services. It is total hand and soft cost.
*** Depending upon route options or combination of options the cost to construct could be higher or lower by as much as $50,000,000.

Construction and project costs would be lowest for Alternative 3, Beverly LRT, primarily due to its length (second shortest of all alternatives) and use of extensive at-grade configuration. Alternatives 1 and 5 are estimated to cost the highest due to their fully aerial configuration, whereas Alternatives 2 (SR-60) and 4 (Whittier LRT) are in the mid-range.

Operations & Maintenance Costs

Operating costs were estimated using data from existing Metro Rail and Metro Orange Line services, as well as the length of each alternative, proposed peak-hour headways, and number of cars on each train. Bus operation data from Metro, Foothill Transit, Norwalk Transit, and Montebello Bus Lines was also used to estimate costs. Detailed explanation of the cost model is provided in Section 5.2.1.

The Operations and Maintenance (O&M) cost results are summarized in Table S-7. According to the cost analysis, the SR-60 Busway alternative will require only one-seventh the cost needed to operate and maintain than the next cheapest build alternative ($15 million, versus $107 million for SR-60 LRT). All of the LRT alternatives were similarly expensive, ranging from $107 million to a high of $115 million for Alternative 3. In evaluating the O&M cost impact, comparison is made to the TSM alternative cost. Because the LRT alternatives result in reduced bus operations, the effective cost of the alternative reflects the net increase in cost over the TSM, which includes some savings in bus operating cost.

Table S-7: Estimated Annual Operations & Maintenance Cost ($-Million, 2008)

Alternatives	TSM	1	2	3	4	5
Annual O&M Cost	$77	$107	$92	$115	$112	$108
Net Increase in Annual O&M Cost (over TSM)	NA	$27	$11	$34	$31	$28

Cost Effectiveness Evaluation

Table S-8 provides a comprehensive summary of all of the alternatives and the cost-effectiveness criteria used to compare them. The cost effectiveness is defined in relationship to the increment over the TSM alternative. For the purpose of the evaluation, the TSM capital cost was estimated at $190 million. As indicated by Table S-8, Alternative 3, Beverly LRT, is the most cost-effective alternative when evaluated in terms of either net new transit riders or user benefit hours. Alternative 3, Beverly LRT has the second highest level of new transit riders and user benefit hours of all the Build Alternatives, while having the lowest capital cost. The two SR-60 alternatives performed the poorest in cost effectiveness. Alternative 4, Whittier LRT, and Alternative 5, Washington LRT, are slightly less cost-effective compared to the Beverly alternative.

For the purpose of federal funding, the threshold required to enter Preliminary Engineering is $24.99 per user benefit hour. None of the alternatives approaches this figure in cost-effectiveness. However, it would be expected that additional project development would reduce estimating contingencies and additional savings may be realized by refining the project description, including looking for potentially beneficial project phasing.

Two additional effectiveness criteria have been provided which indicate total riders per route mile and net new transit riders per $1-million capital cost. Alternative 1, SR-60 LRT and Alternative 5, Washington LRT, yield the highest total riders per route mile, closely followed by Alternative 3, Beverly LRT. However, in terms of net new transit riders per $1-million capital cost, the Beverly alternative is the best. In summary, Alternative 3, Beverly LRT, is either the most cost-effective or amongst the most cost-effective and would most likely have the highest potential to be advanced on the basis of cost-effectiveness.

Table S-8: Costs and User Benefits

Criteria	Alternatives 1	2	3	4	5
Capital Cost	$1,720	$1,400	$1,100	$1,385	$1,765
Net Increase in Annual O&M Cost	$27	$11	$34	$31	$28
Net New Transit Riders	4,300	2,120	5,010	4,990	6,410
User Benefit Hours (over TSM)	3,870	1,750	5,320	5,170	6,400
Annualized cost per new daily transit trips compared to TSM Alternative	$109	$160	$67	$79	$75
Annualized cost per hour of transit system user benefit compared to TSM Alternative	$121	$193	$63	$77	$75
Total Riders per Route Mile	1,530	860	1,480	1,580	1,710
Net New Transit Riders per $1-million Capital Cost	750	450	1,370	1,080	1,090

All monetary figures presented in 2008 dollars; ridership estimated in year 2030.

Potential Funding Sources

The Draft 2008 Long Range Transportation Plan identifies the participation by local (i.e., Metro), state, and federal government in its major capital programs. Local participation is primarily funded by proceeds of Proposition A of 1980 and Proposition C of 1990.

On July 17, 2008, Metro management briefed the Metro Board Audit Committee on a proposed one-half cent sales tax increase to fund transportation projects within Los Angeles County. This included a review of the draft ordinance and expenditure plan for the proposed sales tax and provided an outline of the requirements to put a measure on the November 4, 2008 ballot and an overall status of the sales tax measure effort.

The Metro Board's efforts to get the referendum on the Ballot were initially thwarted by the Los Angeles County Board of Supervisors, which failed to back the proposed tax increase on July 6, 2008.

On August 31, 2008, the California Assembly approved, AB 2321, a bill that allows the half-cent sales tax increase to be placed on the November 4 ballot in Los Angeles County. "Measure R" was passed by the voters with the required two-thirds vote and includes a $1.3-billion dollar line item for an Eastside extension in the later years of the program (post 2020.) The use of bonds could potentially allow for construction of the project at an earlier point in time.

State funding, which has been used in the past, may have an important role in the funding of the project, but the current California fiscal situation suggests that state funding may not be a reliable source in the near future.

Federal participation in the project is also expected; the total amount of funding and the timing of the receipt of these funds will depend on the availability of discretionary federal funds in an increasingly competitive landscape. To qualify for Section 5309 New Starts grants, the project will have to meet FTA cost-effectiveness criteria or have strong political support in conjunction with reasonable cost-effectiveness. The opportunity also exists to apply so-called flexible funds from the Surface Transportation Program (STP) and Congestion Mitigation –Air Quality Program (CMAQ), but the availability of these funds for this project are by no means certain. In the near-term, these funds are committed in the Long Range Transportation Plan to other projects; and in the long-term, these funds face intense competition from many local priorities, including highway projects. The determination of how these funds are applied is made by the Southern California Association of Governments, the metropolitan planning organization for the region.

S.3.4. Public and Agency Feedback

Four early scoping meetings and one resource agency scoping meeting were held in the PSA in November 2007 to provide information about the Alternatives Analysis process and gather comments on the proposed alignments and stations. The 220 participants at these meetings submitted 159 comments, and the largest number supported Whittier Blvd. (47 comments) over the other alignments, LRT (32 comments) over the other potential modes, and subway (18 comments) over the other possible configurations. Trees on Beverly Blvd. and traffic congestion ranked highest among all of the issues raised, receiving five comments each.

Four additional community workshops were held in April 2008 in order to provide the public with details on the refinement of the 17 original alternatives down to the five screened alternatives. The 163 attendees recorded 96 comments, with the largest number in favor of the SR-60 LRT option (38 comments), then Whittier LRT (29 comments), then Beverly LRT (3 comments). Washington LRT and SR-60 Busway each received two supportive comments. Oppositional comments were few in number, and Washington LRT received nearly half of the total of 16 (see Table S-9). The "high," "medium," and "low" ratings on the table are based on the number of favorable comments that each alternative received relative to the others.

Outside of the official public meetings, about 60 less-formal briefings were conducted for elected officials, representatives from the municipal governments within the PSA, local service and business organizations, and a technical advisory committee.

Table S-9: Public Feedback on Choice of Alternatives

Alternatives	1	2	3	4	5
Public Input (based on April public comments on five refined alternative)	H	L	M	H	L
In-favor	34	0	3	28	2
Opposed	5	0	3	1	4
Mode	LRT	BRT	LRT	LRT	LRT
Additional Considerations	Impacts to OII Superfund site. Consider combining truck route with LRT extension. SR-60 secondary choice for alignment.	Impacts to OII Superfund site. Preference for LRT over busway	Use aerial crossing at portions along Beverly where right-of-way is constrained. Potential impacts to nearby schools and parks	Whittier was preferred corridor alignment, with grade separations. Improves access at eastern end to Whittier College. Consider Whittier Uptown Specific Plan. Impacts to parking and traffic during construction. Concerns about aerial structure and graffiti.	Use of eminent domain. Washington Blvd was preferred as a secondary choice in alignment after Whittier and SR-60.

S.4. Summary, Evaluation, and Recommendations

Based on the project's six stated goals and the environmental analysis, transportation analysis, and public outreach performed as part of this alternatives analysis study, Table S-10 summarizes the benefits and disadvantages of each promising build alternative. The criteria used are:

- Ridership forecasts
- Expected travel time
- Impacts to arterial streets
- New transit trips and change in transit mode share
- User benefits
- Transit-supportive land use
- Employment density
- Population density
- Amount of property acquisition needed
- Proximity to historic resources, sensitive receptors, biological resource areas, and hazardous materials sites
- Proximity to noise and vibration-sensitive receptors
- Geologic constraints
- Construction and operation costs
- Public response

Table S-10 Comparison of Alternatives

	Alternatives				
	SR-60 LRT	SR-60 Busway	Beverly LRT	Whittier LRT	Washington LRT
Transportation	*Travel Time*: Fastest overall (16 minutes) *Daily Ridership*: Lowest of LRT alternatives (13,500) *Net New Transit Riders*: Lowest overall (4,300) *User Benefit Hours*: Fewest of LRT alternatives (3,870 daily) *Impacts to Arterial Streets*: Minimal, due to freeway alignment *Other*: Only LRT alternative which is located to conveniently serve communities north of SR-60	*Travel Time*: 16 minutes, but all riders continuing on Phase 1 will incur a 6-minute transfer at Atlantic Station. *Daily Ridership*: Lowest overall (7,500) *Net New Transit Riders*: Lowest overall (2,120) *User Benefit Hours*: Fewest overall (1,750) *Impacts to Arterial Streets*: Minimal, due to freeway alignment *Other*: Similar to SR-60 LRT, location is convenient to communities north of SR-60	*Travel Time*: Slower than most other alternatives (23 minutes) *Daily Ridership*: Nearly lowest ridership of LRT Alternatives (13,500) *Net New Transit Riders*: Second highest overall (5,010) *User Benefit Hours*: Second highest overall (5,320) *Impacts to Arterial Streets*: Potentially greatest, due to extensive at-grade segments	*Travel Time*: Slowest of the build alternatives (24 minutes) *Daily Ridership*: Second highest (14,400) *Net New Transit Riders*: (4,990) is nearly as high as Alternative 2 *User Benefit Hours*: Second highest (5,170) *Impacts to Arterial Streets*: Potentially high, but mitigated by aerial segments	*Travel Time*: Nearly fastest overall (17 minutes) *Daily Ridership*: Highest overall (15,900) *Net New Transit Riders*: Highest overall (6,410) *User Benefit Hours*: Greatest overall (6,400) *Impacts to Arterial Streets*: Low, due to aerial alignment

	Alternatives				
	SR-60 LRT	SR-60 Busway	Beverly LRT	Whittier LRT	Washington LRT
Environment	*Transit-Supportive Land Uses*: Fewest overall *Employment Density*: Lowest overall *Population Density*: Lowest overall *Property Acquisitions*: Most overall, mostly vacant *Historic Resources*: None nearby *Noise-Sensitive Receptors*: Fewest overall *Other*: Crosses potentially-sensitive biological resource and hazmat areas	*Transit-Supportive Land Uses*: Fewest overall *Employment Density*: Lowest overall *Population Density*: Lowest overall *Property Acquisitions*: Most overall, mostly vacant *Historic Resources*: None nearby *Noise-Sensitive Receptors*: Fewest overall *Other*: Crosses potentially-sensitive biological resource and hazmat areas	*Transit-Supportive Land Uses*: Greatest overall *Employment Density*: High *Population Density*: High *Property Acquisitions*: Fewest overall, mostly vacant *Historic Resources*: None nearby *Noise-Sensitive Receptors*: Second most overall *Other*: Crosses 100-year flood zone	*Transit Supportive Land Uses*: Moderate *Employment Density*: High *Population Density*: Highest overall *Property Acquisitions*: Moderate amount, none vacant (most non-vacant acquisitions overall) *Historic Resources*: Moderate amount nearby *Noise-Sensitive Receptors*: Most overall *Other*: Crosses 100-year flood zone	*Transit-Supportive Land Uses*: Moderate amount *Employment Density*: Highest overall *Population Density*: High *Property Acquisitions*: Moderate amount, mostly vacant *Historic Resources*: None nearby *Noise-Sensitive Receptors*: Moderate number *Other*: Crosses 100-year flood zone

	Alternatives				
	SR-60 LRT	SR-60 Busway	Beverly LRT	Whittier LRT	Washington LRT
Cost/Public Support	*Capital Costs*: Nearly highest ($1.72 billion) *Annual O&M Costs*: Moderately high ($26.5 million) *Cost Per User Benefit Hour*: Second worst ($121) *Cost Per Net New Rider*: Second worst ($109) *Public Comment Support*: Greatest (38 in favor, 5 opposed)	*Capital Costs*: Moderate *Annual O&M Costs*: Lowest ($11 million) *Cost Per User Benefit Hour*: Poorest ($193) *Cost Per Net New Rider*: Poorest ($160) *Public Comment Support*: 2 in favor, none opposed	*Capital Costs*: Lowest of the build alternatives ($1.1 billion) *Annual O&M Costs*: Highest ($34 million) *Cost Per User Benefit Hour*: Best ($63) *Cost Per Net New Rider*: Best ($67) *Public Comment Support*: 3 in favor, 3 opposed	*Capital Costs*: Mid-range ($1.38 billion)*Annual O&M Costs*: Mid-range ($31 million) *Cost Per User Benefit Hour*: Mid-range ($77) *Cost Per Net New Rider*: Mid-range($79) *Public Comment Support*: High, 29 in favor, 1 opposed	*Capital Costs*: Highest ($1.765 billion) *Annual O&M Costs*: Second lowest ($28 million) *Cost Per User Benefit Hour*: Mid-range ($75) *Cost Per Net New Rider*: Mid-range ($75) *Public Comment Support*: Lowest, 2 in favor, 7 opposed

In short, the compromises made by each alternative between speed, cost, and transit-preferential route are as follows.

Alternative 1 – SR-60 LRT

- Transit unfriendly route, but achieves a high enough speed to offset the drop in ridership
- High speed and nearly full grade separation comes at a high cost
- Serves communities north of SR-60.

Alternative 2 – SR-60 Busway

- Transit unfriendly route, and a time-consuming transfer is required to switch between modes at Atlantic station
- High speed and nearly full grade separation come at a high construction cost, but operating costs are very low compared to LRT
- Using a mode with low operating costs comes at the expense of an additional transfer and a large loss of riders
- Serves communities north of SR-60.

Alternative 3 – Beverly LRT

- Lowest cost to construct, but at-grade crossings slow down trip times
- Surrounding land uses are conducive to transit use, but the lower speeds still yield somewhat fewer riders per route mile than the faster SR-60 alternatives and the Washington Alternative.

Alternative 4 – Whittier LRT

- Moderate cost to construct, potential for traffic and/or land use impacts due to corridor constraints
- Surrounding land uses are conducive to transit use, but the lower speeds still result in less riders per route mile than the Washington Alternative.

Alternative 5 – Washington LRT

- High cost to construct, but also yields high speeds
- Surrounding land uses are moderately conducive to transit use, and, combined with the high speeds, this alternative draws the most riders
- Serves communities along the southern portion of the PSA.

Final Recommendations

After careful analysis of the screened alternatives, four transit project alternatives are recommended for Metro Board approval and detailed environmental study during the subsequent Draft EIR/EIS phase, along with development of a more robust bus (TSM) solution. These recommendations represent the most promising alternatives for the Eastside Transit Corridor Phase 2 and are based on the evaluation presented in this report. Furthermore, the recommendations factor in additional refinements that have emerged from this analysis in order to minimize negative impacts and capture the greatest benefit. The LRT alternatives are listed below and illustrated in Figure S-20.

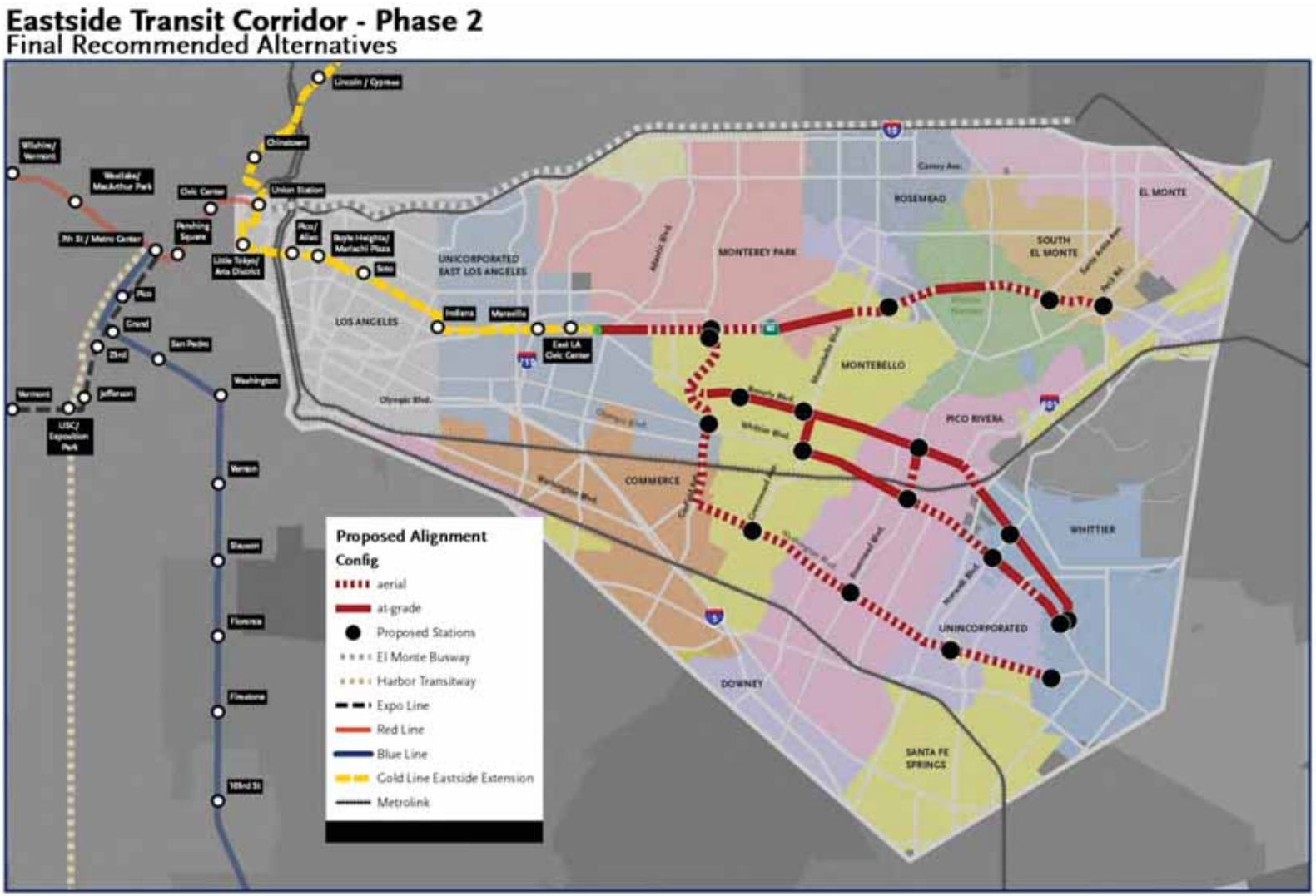
1. SR-60 LRT
    a. Reduce project length to Peck Rd.
    b. Evaluate potential for transit oriented development at each potential station site

2. Beverly LRT
    a. Re-evaluate candidate station locations
    b. Further evaluate Whittier Greenway option through West and Central Whittier
    c. Evaluate combining with Whittier LRT east of Montebello Blvd. (refer to Whittier alternative below)

3. Beverly/Whittier LRT
    a. Evaluate feasibility of alignment along Whittier Blvd. from Montebello Blvd. east to Mar Vista St. (combined with Beverly LRT as described above)
    b. Further evaluate at grade v.s. grade separated alignment sections

4. Washington LRT
    a. Evaluate feasibility of potential at-grade configuration east of Rosemead Blvd.

Figure S-20 Final Recommended Alternatives



S.5. Issues to Be Resolved

In order to better position the project for potential federal funding, measures should be taken to improve the cost-effectiveness as the project is further developed. The following strategies and/or measures should be considered during the EIR/EIS phase:

- SR-60 LRT – As the end-of-line station is primarily a freeway intercept location, and as the Peck Rd. station is generally situated to intercept the same traffic as the Crossroads Pkwy. terminal station studied in the AA, it is recommended that this alternative be cut back to Peck Rd. and re-evaluated both with respect to land use opportunities and stations as well as capital cost for a reduced length to improve its cost-effectiveness.

- Beverly LRT – The Beverly LRT option may be difficult to implement west of Montebello Blvd. due to right-of-way constraints. However, stations east along Whittier Blvd. from Montebello Blvd. are good attractors of trips. A combination of segments of Beverly LRT west of Montebello Blvd. and segments of Whittier LRT east of Montebello Blvd. may improve the cost-effectiveness of the Whittier option and could be studied in the EIR/EIS phase of the project.

- Washington LRT – The Washington LRT was defined as fully grade-separated. However, there are sections where the alignment could potentially be brought to grade, which may result in a more cost-effective solution. These potential revisions could be studied in the EIR/EIS phase of the project.

- Minimum Operable Segment – Due to the crossing of the Rio Hondo between Montebello and Pico Rivera as well as the combined crossing of the San Gabriel River and I-605 Freeway between Pico Rivera and Whittier, construction of the full project studied in the AA is costly. A shorter extension would have similar operational feasibility, reduced cost, and potentially high enough ridership to result in improved cost-effectiveness (similar to the suggestion for SR-60 LRT) and should be studied in the EIR/EIS phase.

1.0 PURPOSE AND NEED

1.1 Study Corridor Description

The Los Angeles County Metropolitan Transportation Authority (Metro) has initiated an Alternatives Analysis (AA) study to evaluate potential alternatives for the second phase of the Metro Gold Line Eastside Extension currently under construction. The Metro Gold Line Eastside Extension (Extension) is a six mile, eight station light rail transit line currently under construction and anticipated to be operational by 2009. The Extension will directly interface with the Metro Gold Line service to Pasadena thereby eliminating any need to transfer at the line's current terminus at Union Station. Roughly 30,000 daily riders are expected to utilize the first phase of the Eastside Extension by the year 2030. The AA will identify and evaluate potential alternatives to extend transit service east from the terminus of the Metro Gold Line Eastside Extension.

1.1.1 Project Study Area

The Eastside Transit Corridor Phase 2 Project Study Area (PSA) continues from the Phase 1 PSA. The PSA is located in eastern Los Angeles County and is approximately 80 square miles (See Figure 1-1).

The PSA begins in downtown Los Angeles and extends to just east of I-605, to the City of Whittier. The PSA for Phase 2 has been widened to include Cities and unincorporated portion of Los Angeles County just south of the I-10 highway. On the southern end, the PSA boundary is I-5.

PSA Demographics

In 2005 the population of the PSA was about 673,000, which accounts for roughly seven percent of the population of Los Angeles County (10,010,315). Continued population growth in the PSA is expected over the next 20 years. The PSA is composed of different racial and ethnic communities, neighborhoods with various income levels, and transit dependent communities consisting of young and old residents and families.

According to Census Data, approximately 77 percent of the population in the PSA is Hispanic or Latino, compared with 45 percent in Los Angeles County. Portions of the PSA also have a slightly higher concentration of Asian residents. Within the PSA, 13 percent of the population is Asian, compared to 12 percent County-wide. Table 1-1 provides data on the racial and ethnic composition of the PSA.

Figure 1-1 Project Study Area

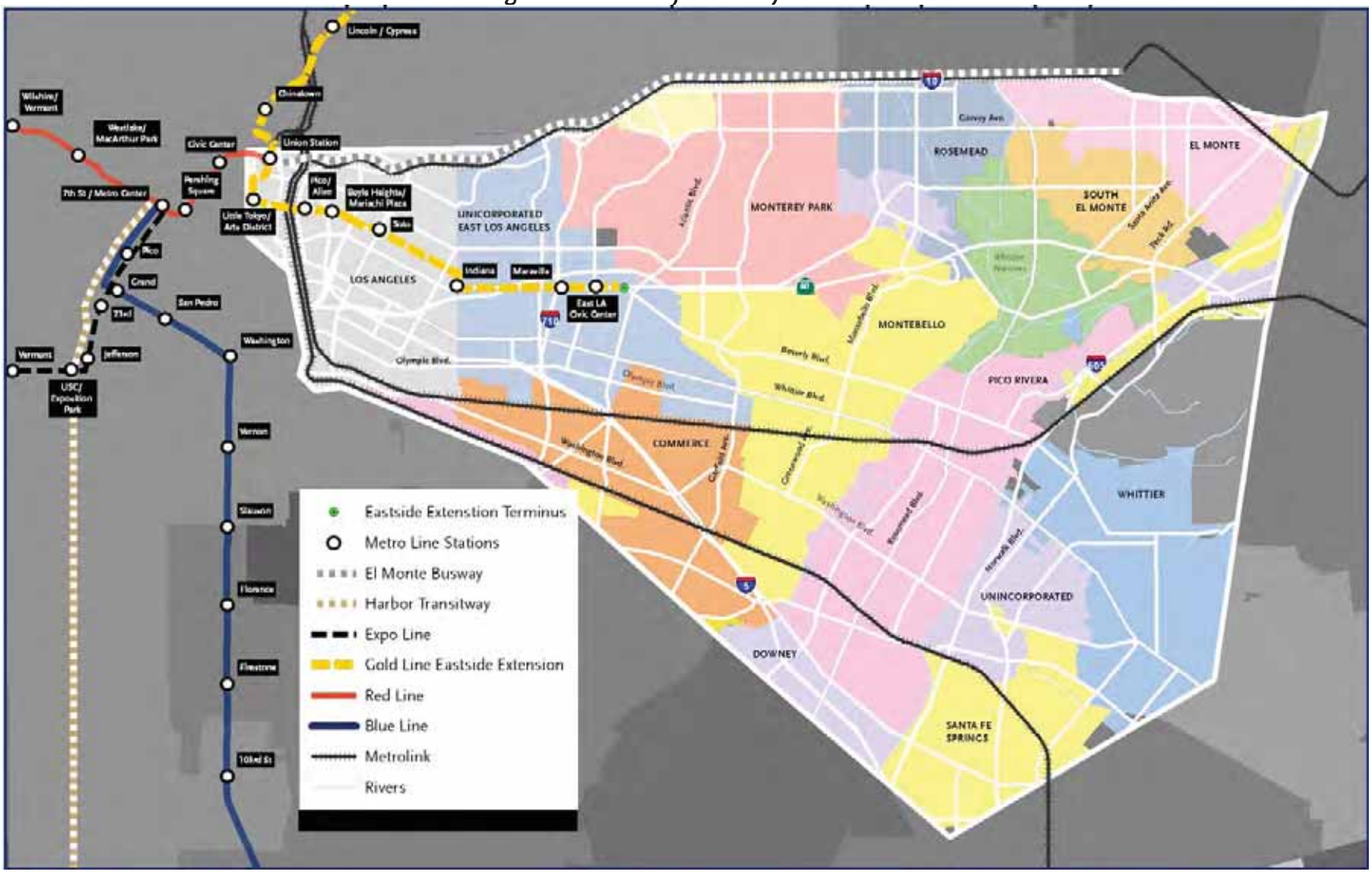


Table 1-1 Racial and Ethnic Composition

Demographics	PSA		Total LA County	
	Number	Percent	Number	Percent
Race				
White	252,308	39.9%	4,622,759	48.6%
Black	7,009	1.1%	916,907	9.6%
American Indian	5,915	0.9%	68,471	0.7%
Asian	82,788	13.1%	1,134,263	11.9%
Pacific Islander/Hawaiian	1,241	0.2%	27,221	0.3%
Some other race	253,258	40.1%	2,262,925	23.8%
Two or more races	29,535	4.7%	486,792	5.1%
Ethnicity				
Hispanic or Latino (regardless of race)	485,155	76.8%	4,242,213	44.6%
Other	146,900	23.2%	5,277,125	55.4%

Source: U.S. Census Bureau, 2000

The PSA is also composed of a mix of low-, medium-, and high-income households. In 2005, the median household income was approximately $86,000 annually. Table 1-2 provides a breakdown of household income.

Table 1-2 PSA Income Status

Demographics	PSA	Percent
Total Households	175,983	100%
Low-income Households	79,218	45%
Medium Income Households	71,671	41%
High-income Households	25,077	14%

Source: U.S. Census Bureau, 2005; SCAG, 2005

In 2005, about 32 percent of the population was age 18 and under and ten percent was age 65 and over. The young and the elderly populations tend to rely more heavily on public transportation. There is a large share of young people within the PSA, as shown in Table 1-3. The data suggests that in 2005, 32 percent of the population within the PSA was under the age of 18. This is a slightly higher percentage compared to Los Angeles County, where 29 percent of the population is under the age of 18. The senior population for the PSA and Los Angeles County is relatively the same. In both cases ten percent of the population is age 65 and older.

Table 1-3 Population Age

AGE	PSA	% of Population in PSA	L.A. County	% of Population in L.A. County
18 and under	204,498	32.4%	2,798,604	29.4%
65 and over	63,862	10.1%	926,670	9.7%

Source: U.S. Census Bureau, 2005; SCAG, 2005

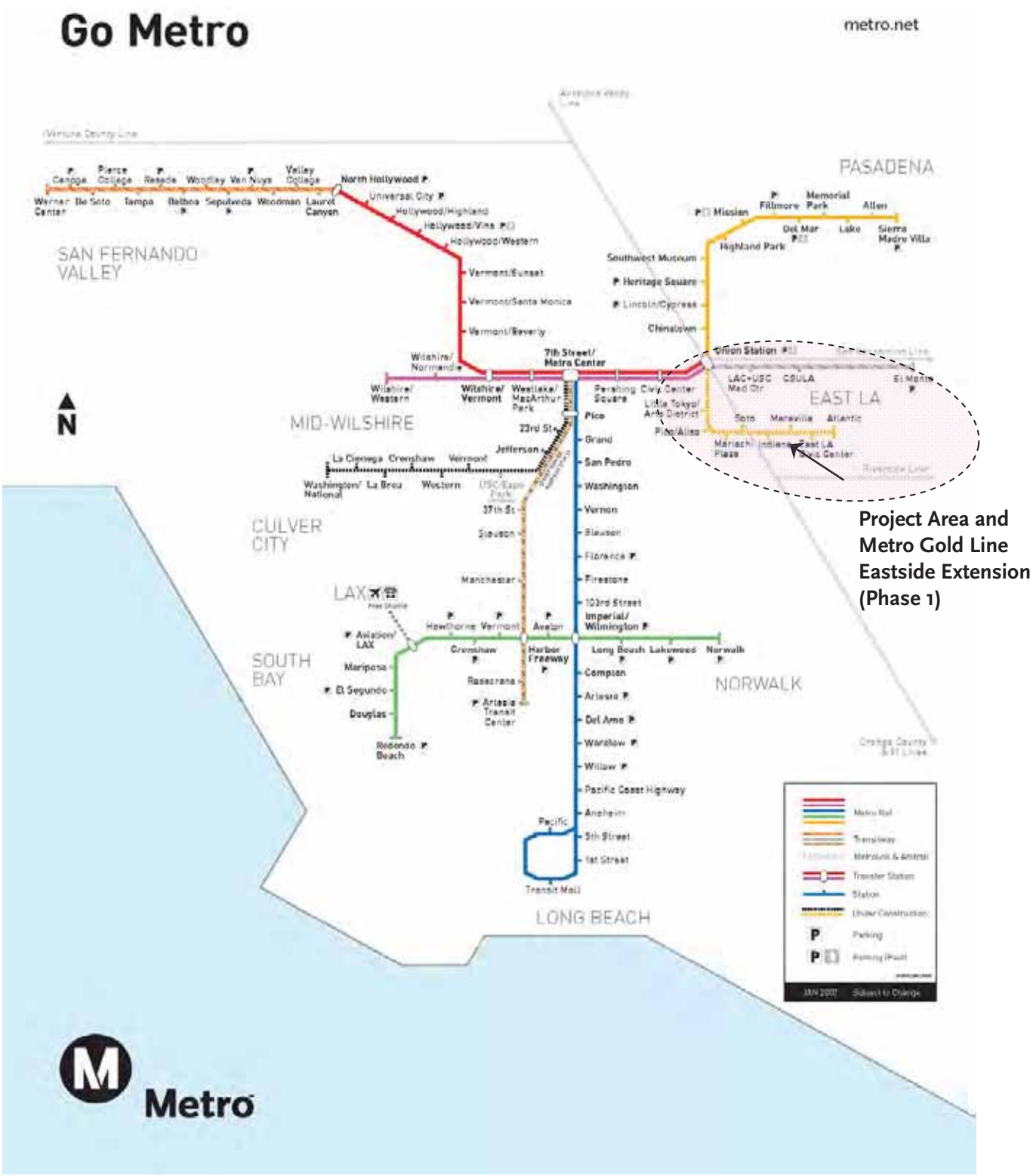
1.1.2 Regional Context

The Metro operates fixed guide-way rail service throughout the Los Angeles metropolitan area including the Metro Red and Purple Lines heavy rail subways and the Blue, Green, and Gold light rail lines. Several Metro rail stations provide connections to additional public transportation options including Metrolink and Amtrak commuter rails and bus service provided by Metro and various cities.

Metro has made significant investments in fixed-guideway transit service over the last ten years. Since 1990, communities to the west, north, northeast, and south of downtown Los Angeles, have benefited from increased mobility options. The Metro Red Line investment provides a 17.4 mile stretch of high capacity transit service for commuters traveling to and from downtown Los Angeles and to the areas farther west and northwest. Soon to be added to the list of operational transit services is the Metro Expo Line, which will provide an additional 8.5 miles of light rail to south/west portions of the County. The Metro Orange Line Bus Rapid Transit (Busway) provides exceptional transit service to commuters traveling to and from the San Fernando Valley. The Pasadena Gold Line provides 13.6 miles of light rail in the northeast from Pasadena to Downtown Los Angeles' Union Station. The Blue Line is a 22 mile light rail system which provides access to communities in the southern portion of Los Angeles County. The Green Line provides 20 miles of transit access to Gateway cities and beach communities. Figure 1-2 shows the Metro system.

The Metro Gold Line Eastside Extension is the most significant transit investment made east of downtown to date. Scheduled to open in 2009, it will provide six miles of light rail access to the western edge of the PSA. Still, due to high residential densities, population and employment growth, and increased travel demand and congestion, there is a need to provide greater access to communities farther east. This study will explore ways to provide expanded transit access to Los Angeles County residents and employees within the 80 square mile PSA.

Figure 1-2 Metro System Map



Source: Metro 2008. Graphics provided by CDM http://www.metro.net/images/rail_map.pdf

1.1.3 The Mobility Problem

The Southern California region is faced with multiple mobility challenges that hinder the region's ability to effectively meet additional travel demand, primarily associated with rapid population growth. Los Angeles County alone is expected to increase from roughly ten million people in 2005 to nearly 12.2 million people by the year 2030. Expected population growth in the region and within the Eastside PSA will inevitability impact mobility. Many residents in the Eastside PSA already encounter long travel delays as they travel west to regional employment centers in downtown Los Angeles.

If unaddressed, these mobility challenges pose a risk to future population and economic growth, commuter safety, existing infrastructure, goods movement, air quality, and environmental considerations. If no action is taken to improve transportation mobility, SCAG estimates that daily person hours of delay would increase from 2.2 million hours under the 2000 Base Year to 5.4 million hours under the 2030 Baseline.

The principal objectives for transit improvements being evaluated as part of the Eastside Transit Corridor Phase 2 Alternatives Analysis include:

- Identifying methods of providing a transit connection to the Metro Gold Line Eastside Extension now under construction;
- Improving transit linkages and coverage to cities beyond the East Los Angeles terminus of the Metro Gold Line Eastside Extension Phase 1;
- Enhancing mobility to the Eastside PSA by providing a more robust transit network that offers effective alternatives to automobile travel; and,
- Accommodating significant levels of projected growth in travel demand by developing sustainable solutions.

The following sections describe factors contributing to the mobility problem in greater detail. The figures included in this section show the initial conceptual alternatives considered. The study team screened initial alternatives down to five refined alternatives (see Section 2). The figures are included to show relevant current and future demographic trends in the PSA.

Population and Employment Growth

According to SCAG projections the total population of the PSA in 2005 was about 673,000, which accounts for roughly seven percent of the population of Los Angeles County (10,010,315). The trend is expected to continue over the next two decades. By the year 2030, the population of the PSA will reach 829,743-a 23 percent increase- making the Eastside home to more people than currently exist in the City of San Francisco which has a population of

744,000[1] .This is important given that few regional transportation improvements are shown in the Metro financially constrained regional transportation plan over this same period of time. Employment growth is also expected to grow 15 percent during the same period.

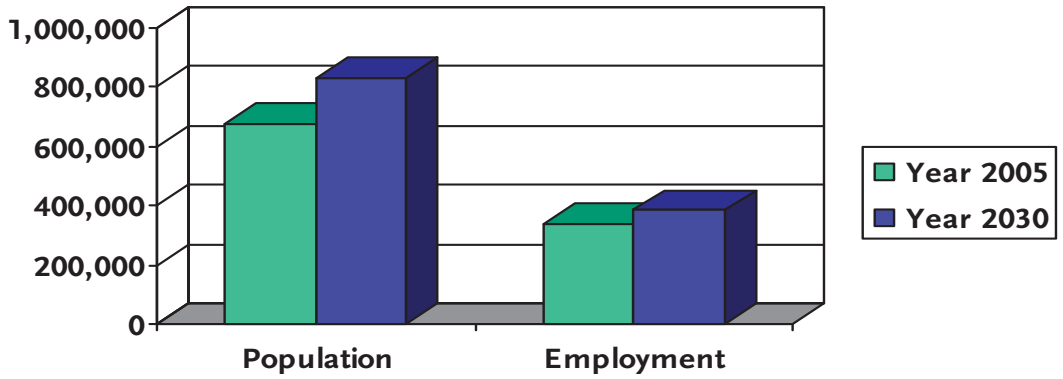
Table 1-4 summarizes the PSA's growth in total population, households and employment relative to LA County. Figure 1-3 depicts the population and employment growth in the PSA. Figures 1-4 through 1-7 show population and employment distributions in the PSA in 2005 and 2030.

Table 1-4 Population, Household, and Employment Growth

	2005	2030	Forecast Increase Between 2005-2030
Population			
PSA	673,283	829,743	23.2%
LA County	10,010,315	12,193,030	21.8%
PSA % of LA County	6.7%	6.8%	---
Households			
PSA	175,983	217,681	23.7%
LA County	3,298,210	4,116,567	24.8%
PSA % of LA County	5.3%	5.3%	---
Employment			
PSA	335,820	384,431	14.5%
LA County	4,644,010	5,651,043	21.7%
PSA % of LA County	7.2%	6.8%	---

Source: SCAG, 2005 data and 2030 projections

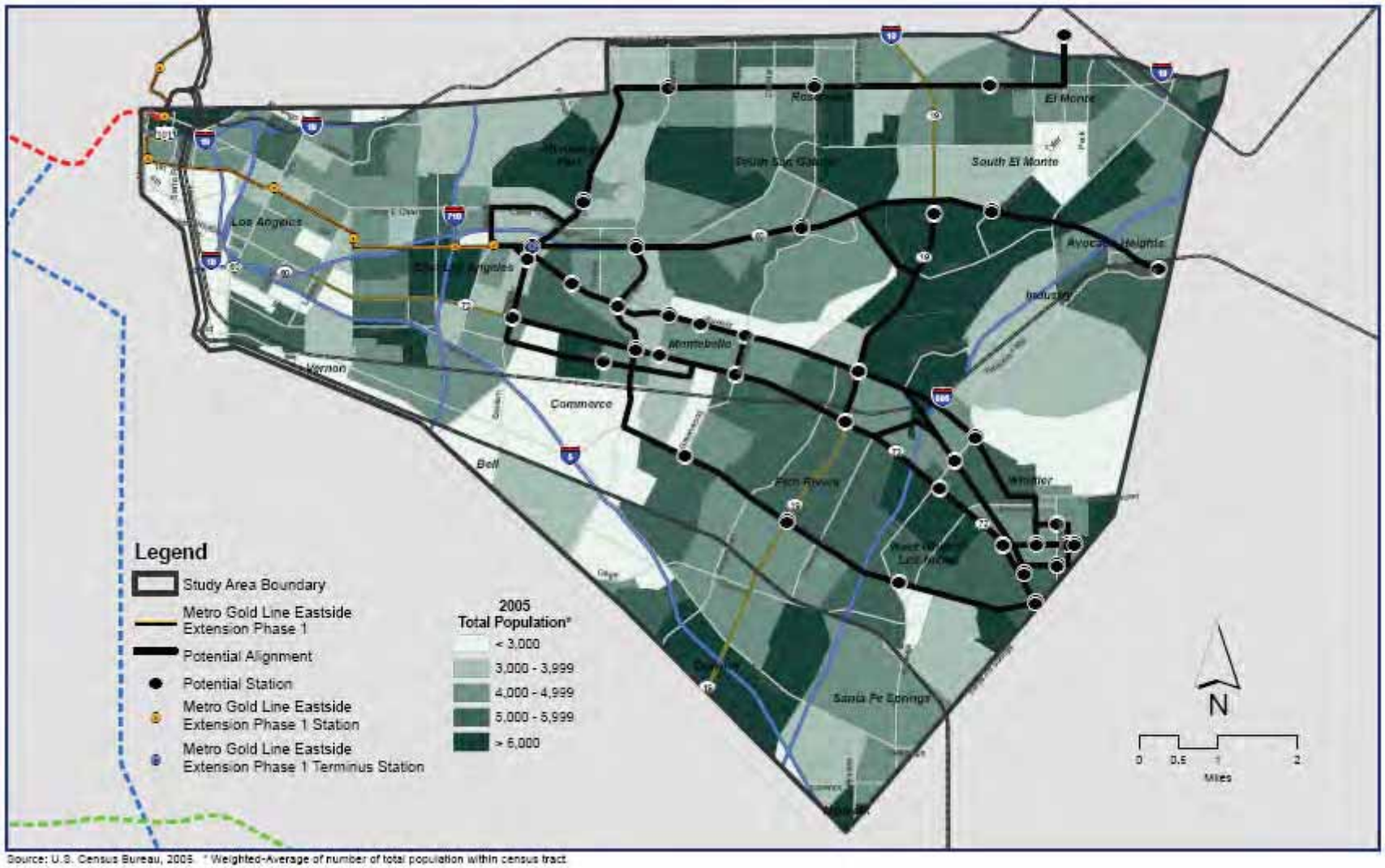
Figure 1-3 Eastside Study Area Growth



Source: SCAG, 2005 data and 2030 projections

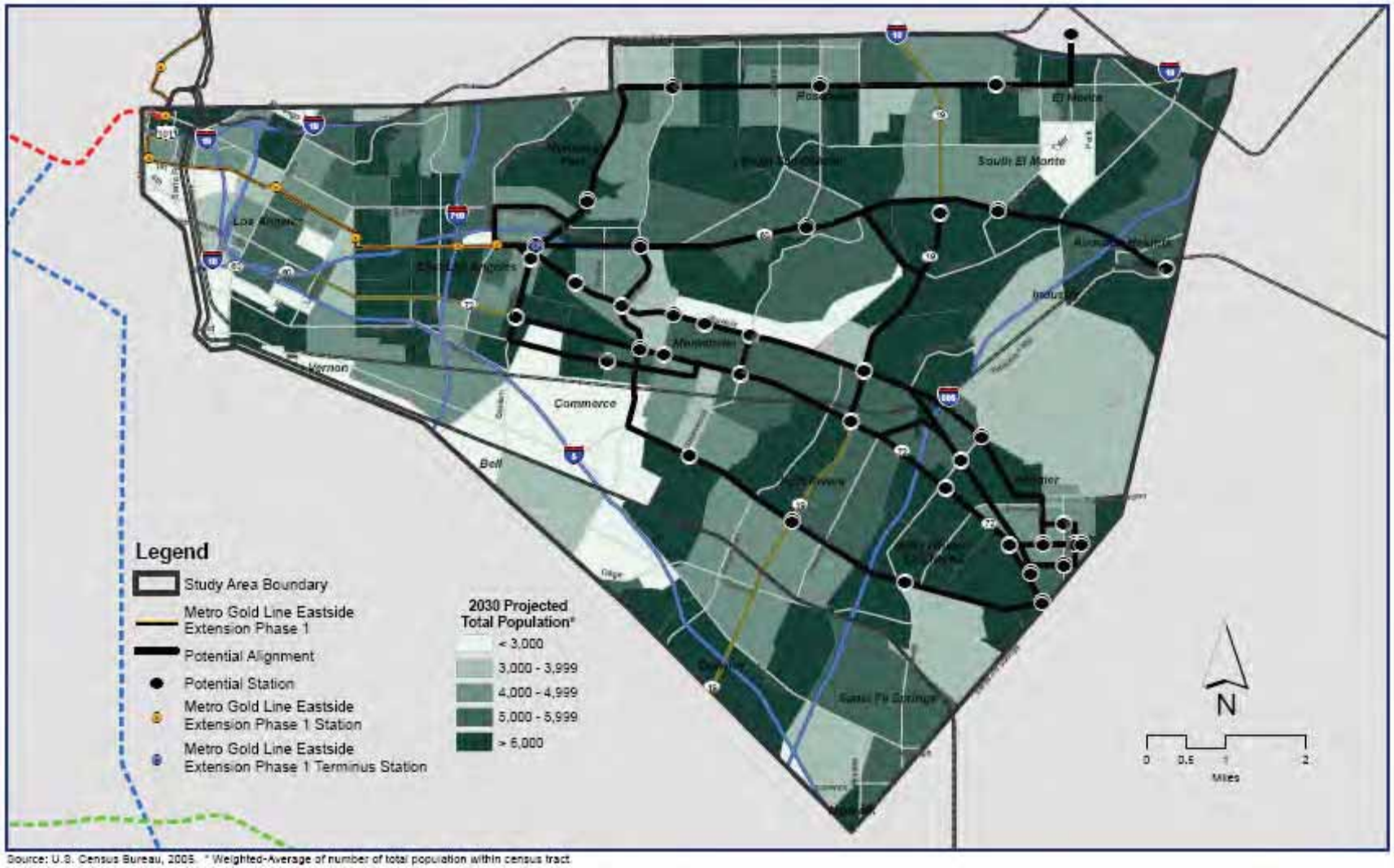
[1] U.S. Census Bureau American Fact Finder, 2008 available at http://factfinder.census.gov

Figure 1-4 2005 Total Population in PSA



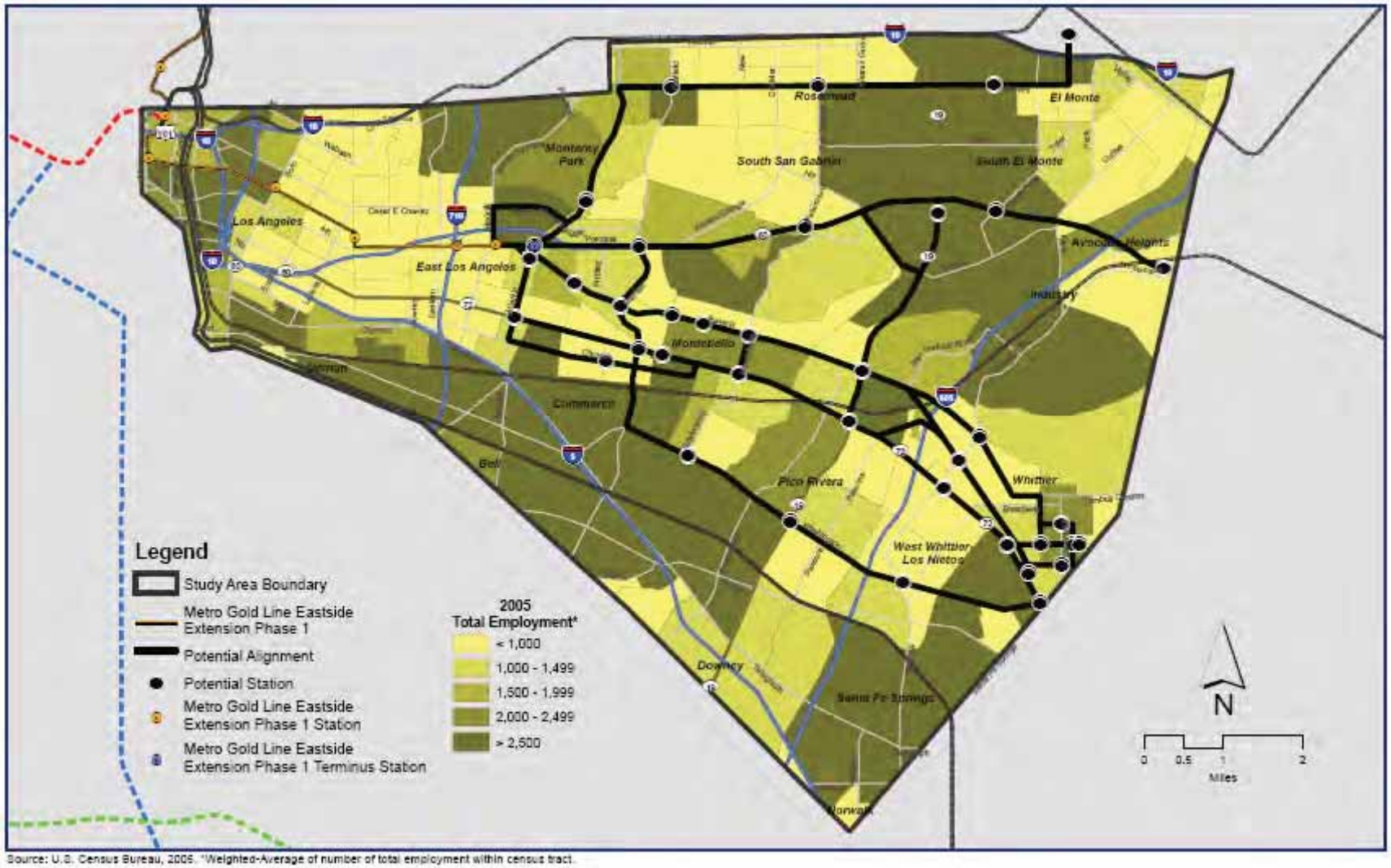
Source: U.S. Census Bureau, 2005. * Weighted-Average of number of total population within census tract

Figure 1-5 2030 Total Population in PSA



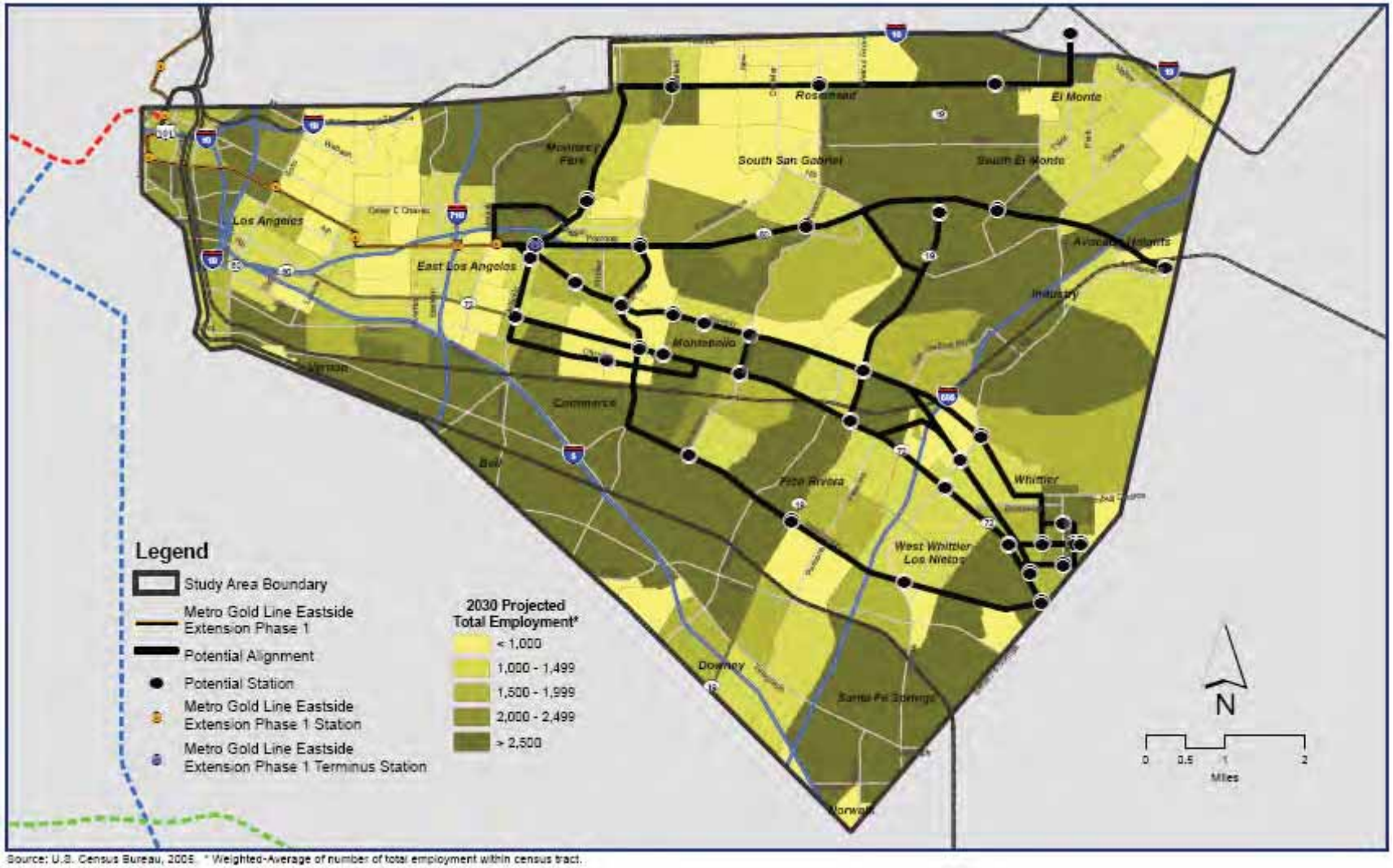
Source: U.S. Census Bureau, 2005. * Weighted-Average of number of total population within census tract.

Figure 1-6 2005 Total Employment in PSA



Source: U.S. Census Bureau, 2005. *Weighted-Average of number of total employment within census tract.

Figure 1-7 2030 Total Employment in PSA



Source: U.S. Census Bureau, 2005. * Weighted-Average of number of total employment within census tract.

Population and Employment Density

In 2005, areas of highest population density within the region were found in Central Los Angeles, Hollywood, Southgate, East Los Angeles, and the Westside. Figures 1-8 and 1-9 show the regional population densities in 2005 and 2030, respectively. Population growth in these areas is expected to increase. As population densities increase throughout the region, access to employment will be a critical issue. Projections for the year 2030 show population density increases within the Eastside PSA, particularly along the I-10 corridor and areas south of SR-60 as illustrated in Figure 1-9.

Areas of high population have workers that generally need to travel to employment centers throughout the region. Central Los Angeles is the largest employment center within Los Angeles County. Central Los Angeles (including the Central Business District) is the number one destination for workers commuting from the Eastside. Regional employment densities in 2005 and 2030 are illustrated in Figures 1-10 and 1-11, respectively. In 2005, the highest area of employment density was Central Los Angeles. Areas of moderate employment density included Westwood, Santa Monica, Culver City, Pasadena, the South Bay and East Los Angeles. Employment density is expected to increase in census tracts around these employment centers. Areas of high employment density are for the most part found outside the Eastside PSA, meaning that the population within the PSA must generally travel west for employment opportunities. Having a fixed guideway transit solution that connects residents farther east to the existing Gold Line Eastside Extension will allow for increased mobility and reduced commute times to employment center areas served by the Metro rail and bus system such as Central Los Angeles, Pasadena, South Bay, and the Westside.

The Eastside PSA has an urban infrastructure that is largely built out. Census tracts within the PSA have high levels of population density ranging from less than 5,000 persons per square mile to over 20,000 persons per square mile. The average population density in 2005 was approximately 12,000 people per square mile. The eastern portion of the PSA, in unincorporated areas of LA County, is the most densely populated with many census tracts over 20,000 persons per square mile. Employment densities in the PSA range from less than 300 employed per square mile to over 170,000 employed per square mile, with an average employment density of about 6,000 employees per square mile.

Figure 1-8 2005 Regional Population Density

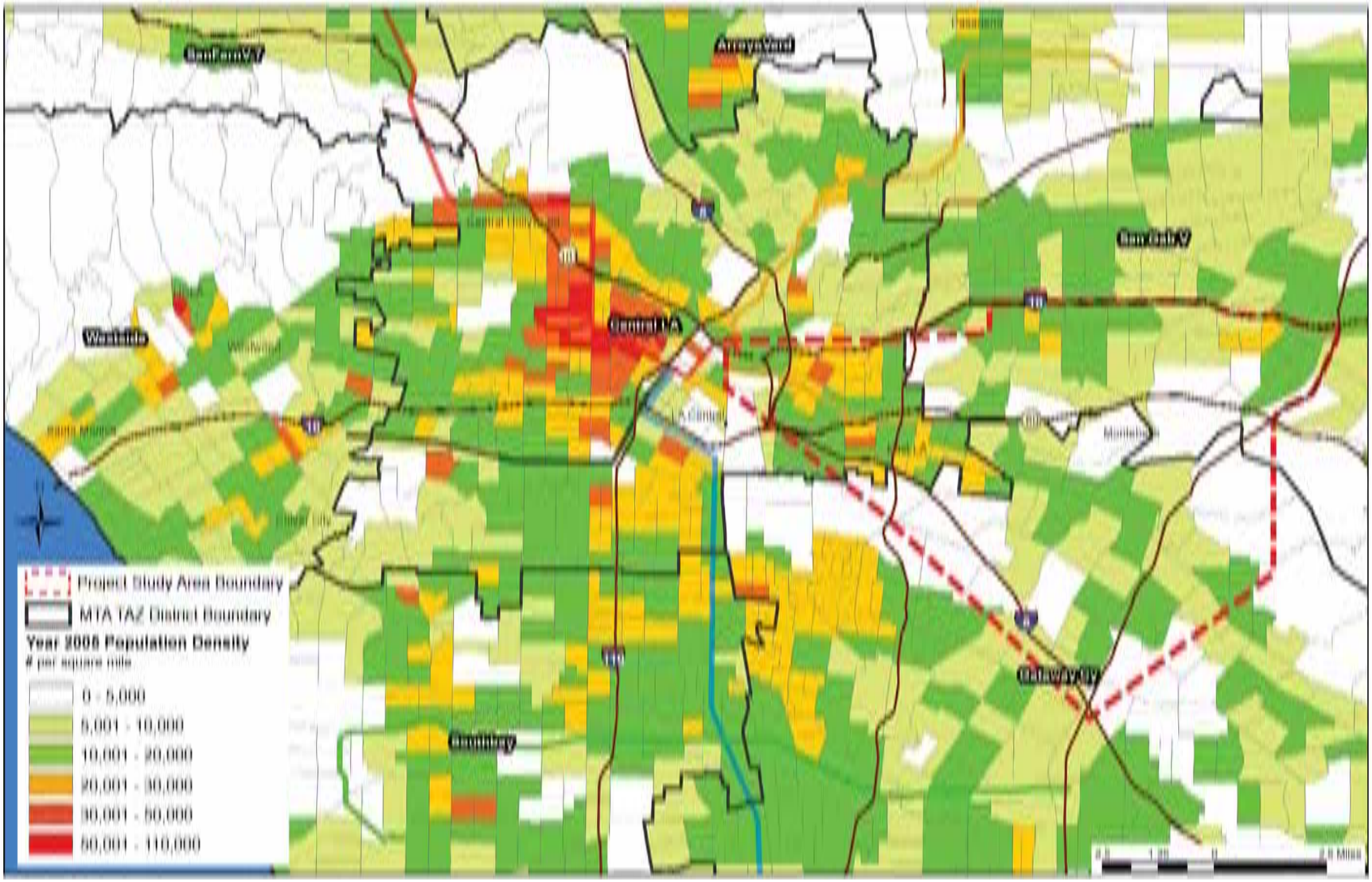


Figure 1-9 2030 Regional Population Density

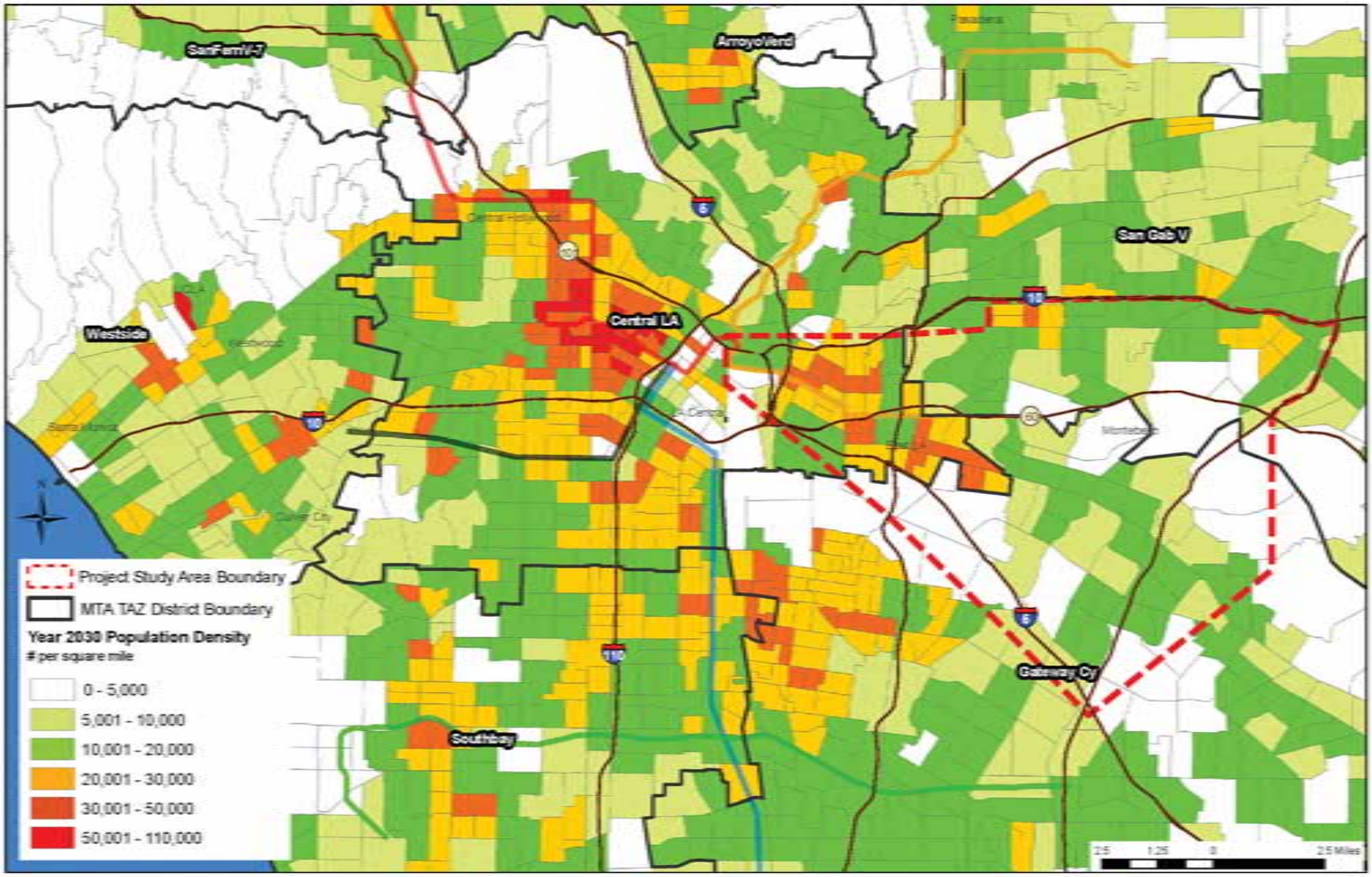


Figure 1-10 2005 Regional Employment Density

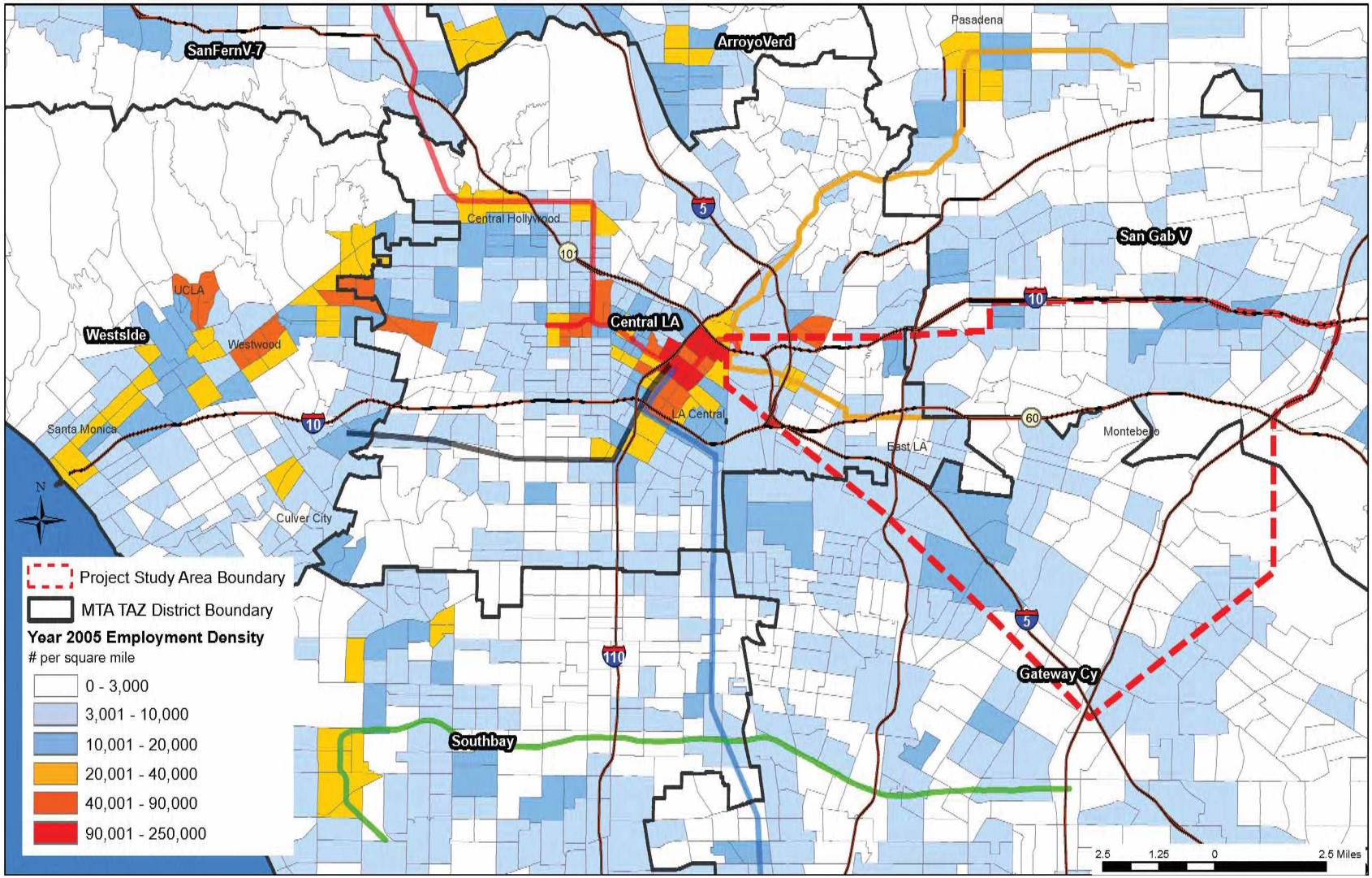
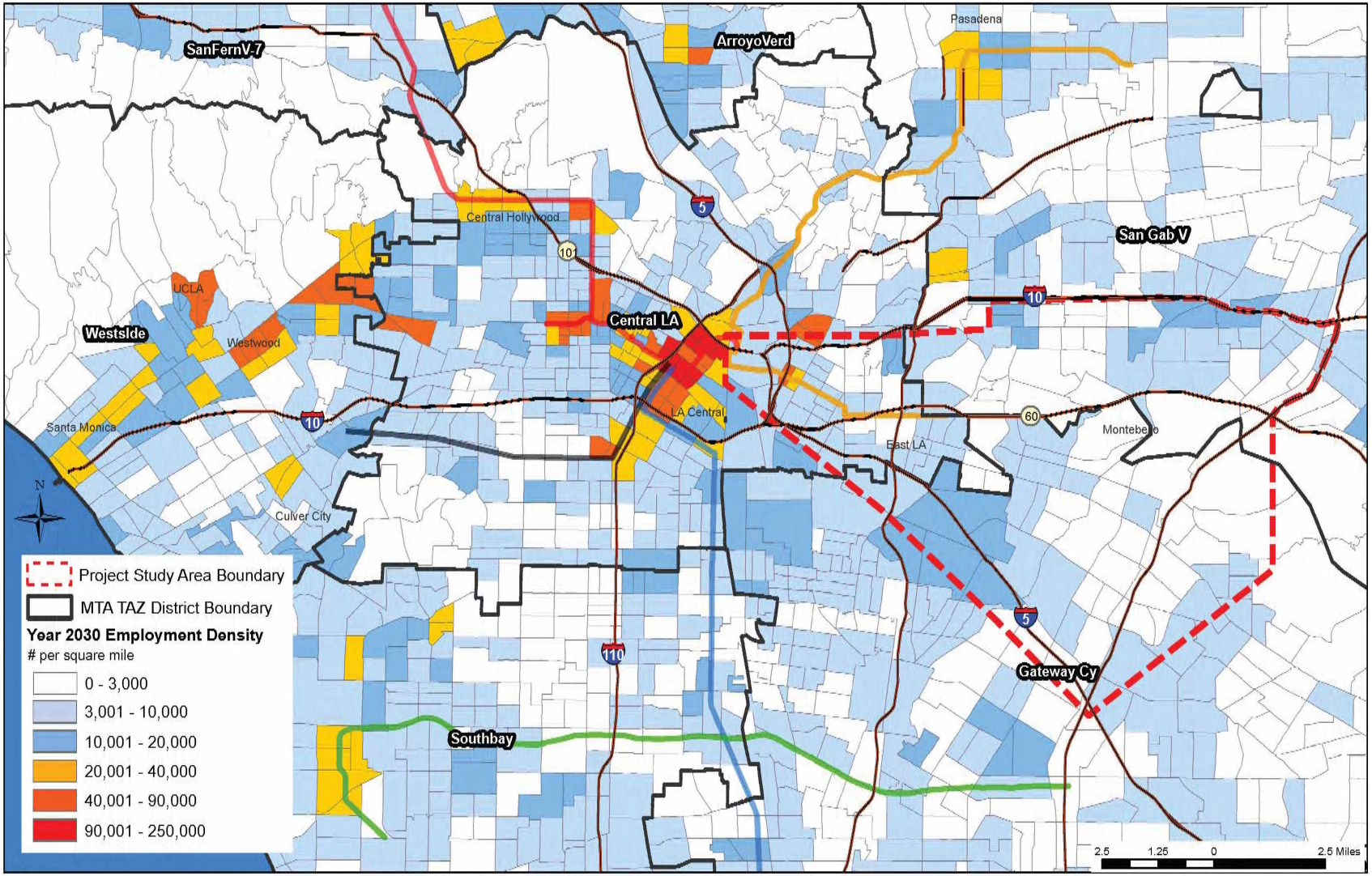


Figure 1-11 2030 Regional Employment Density



Population and employment densities are projected to increase in the PSA in 2030. Higher population density is anticipated in areas of Commerce, Montebello, and El Monte. In 2030, additional census tracts will also have high employment densities, greater than 10,000 employees per square mile, (predominately in an area of Vernon south of Interstate 5). Average employment density is projected to be approximately 7,000 employees per square mile. Figures 1-12 and 1-13 show projected 2030 population and employment densities. High population and employment densities mean more people will try to commute within the same area, which will lead to more congestion and longer commute times. The areas of high population and employment density have high public transit ridership opportunities.

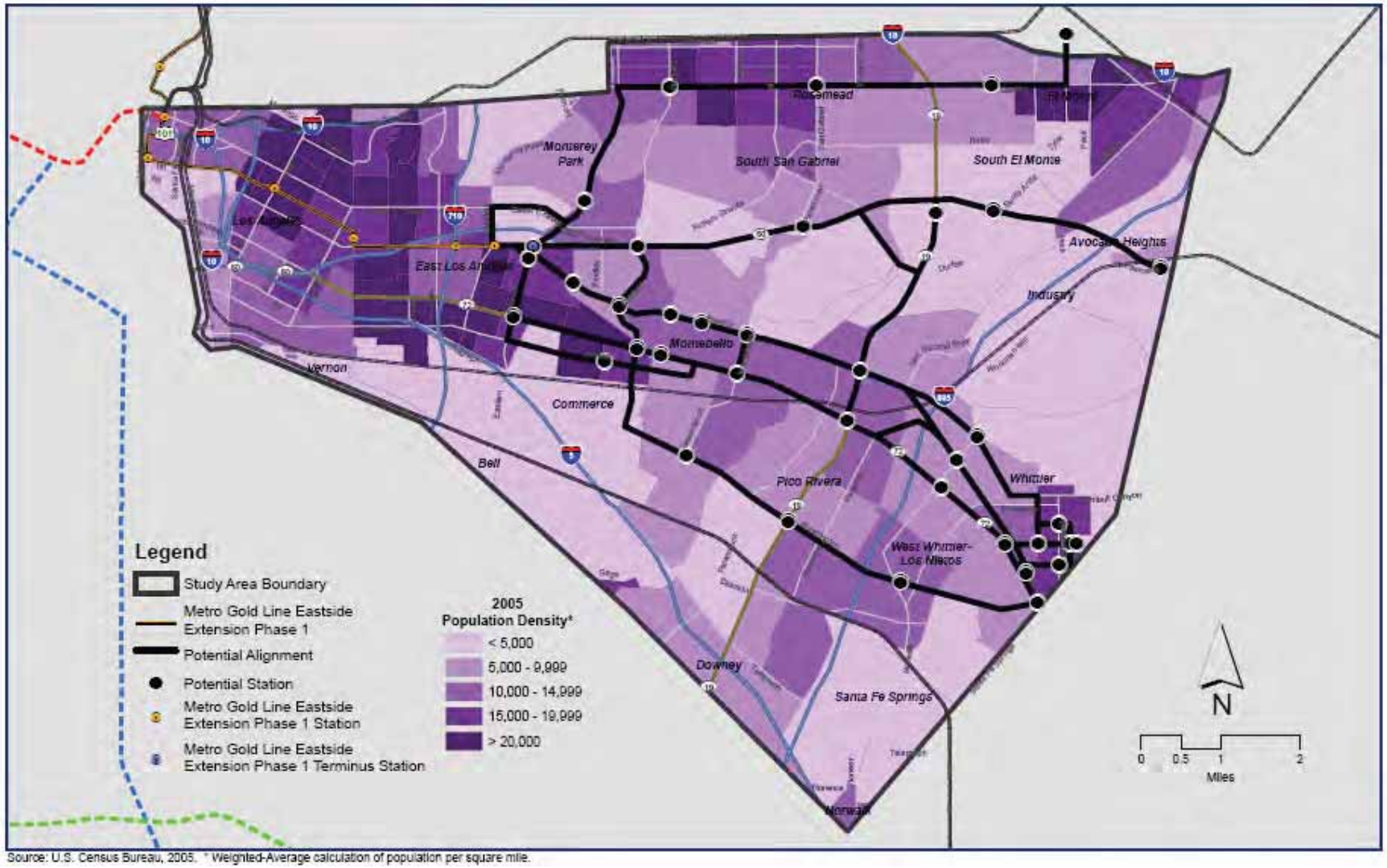
Travel Time

The SCAG 2007 State of the Region Report gave Southern California a "D-" for transportation mobility. Los Angeles has been the most congested city in the nation for the past two decades due to population growth, daily traffic, and movement of goods and information. Traffic congestion and commute times continue to increase in the County and PSA.

Over the ten-year period from 1990 to 2000, residents of Los Angeles County experienced an 11 percent increase in the journey to work time. Within the PSA, particular jurisdictions experienced an increase in commute times well beyond County figures, including the Cities of Commerce (21 percent), Santa Fe Springs (20 percent), and Whittier (17 percent). The mean commuting time for cities in the PSA ranged from approximately 25 to 30 minutes. In 2000, the mean commute time for Los Angeles County was 29 minutes. The City of Whittier had the highest commuting time of 30.10 minutes in 2000. The City lies in the far east portion of the PSA, with limited access to regional transit and highways. In contrast, cities closer to regional transit and commuter rail and or near a major highway in the PSA experienced a lower increase in commute times over the same ten year period. Detailed information on the number of commuters and mean commute times is provided in Table 1-5.

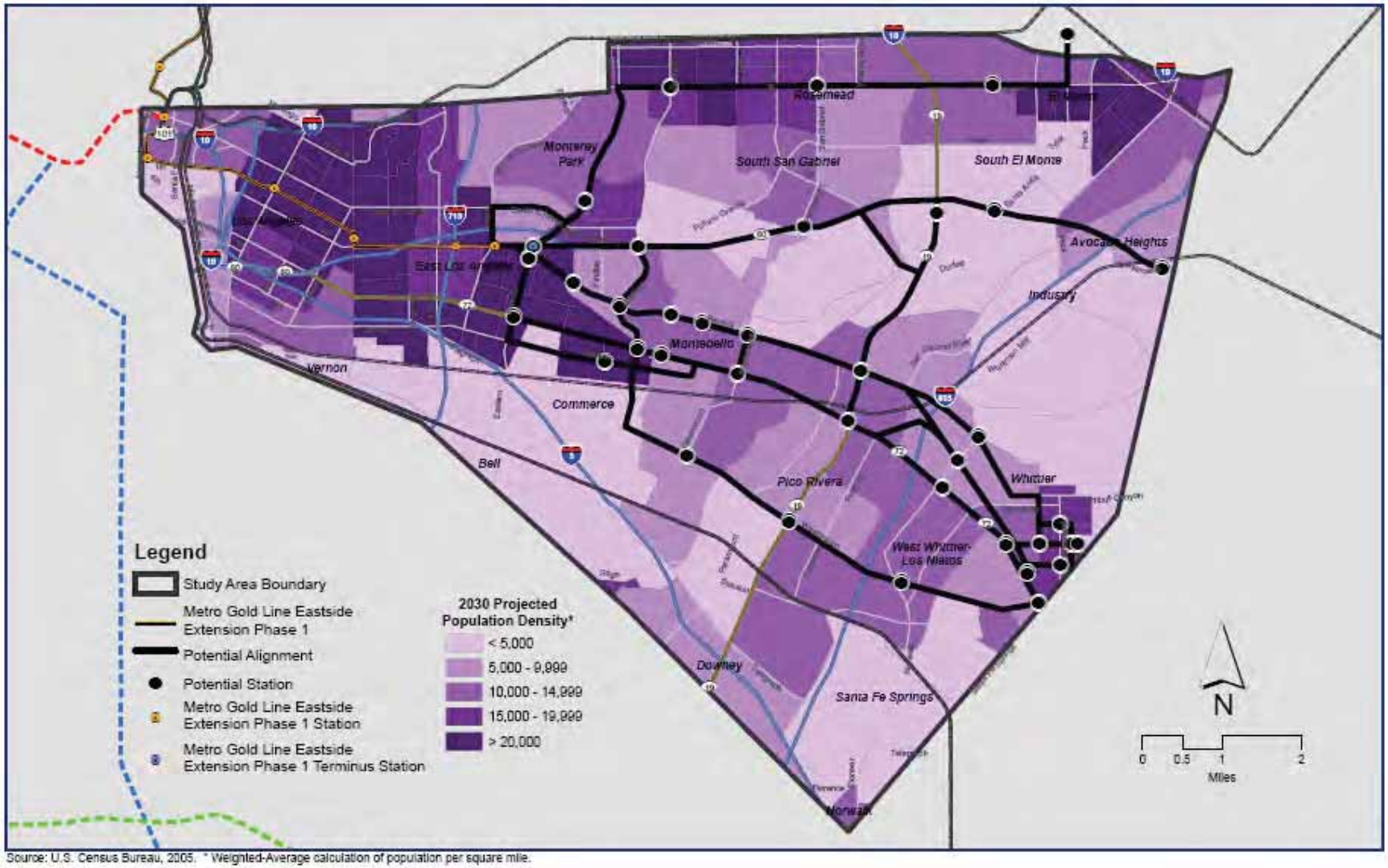
Travel time realities influence one's preferred mode of travel, location of employment, and even decisions on where to live. Due to these time pressures, a small percentage of workers in Los Angeles County are favoring alternative travel modes like public transit and carpools. The change in public transportation usage was fairly small from 1990 to 2000. If additional rail lines are operated with convenient schedules for commuters, public transportation ridership may increase as commuters choose to offset travel delays and the rising costs of driving to work.

Figure 1-12 2005 Population Density in PSA



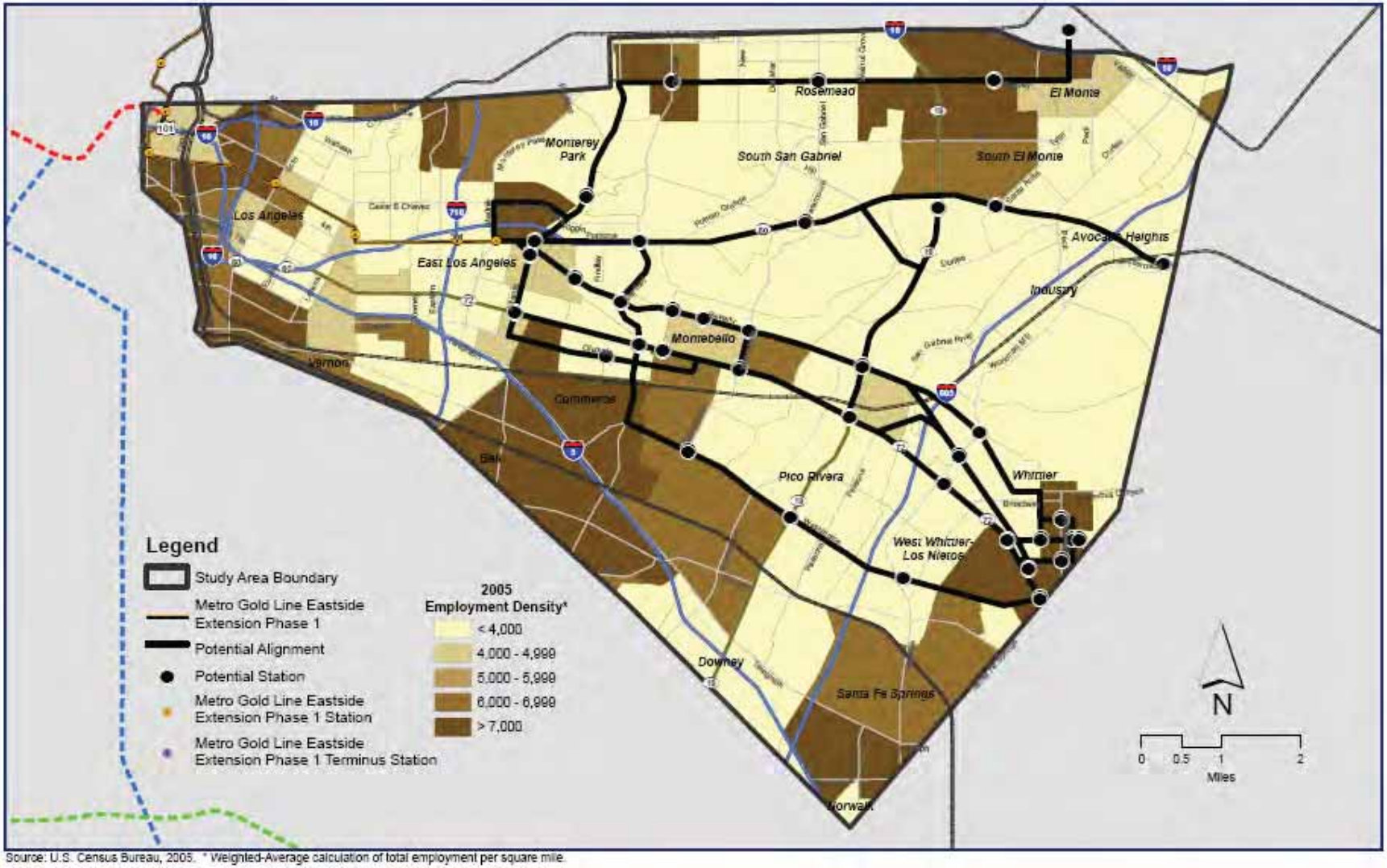
Source: U.S. Census Bureau, 2005. * Weighted-Average calculation of population per square mile.

Figure 1-13 2030 Population Density in PSA



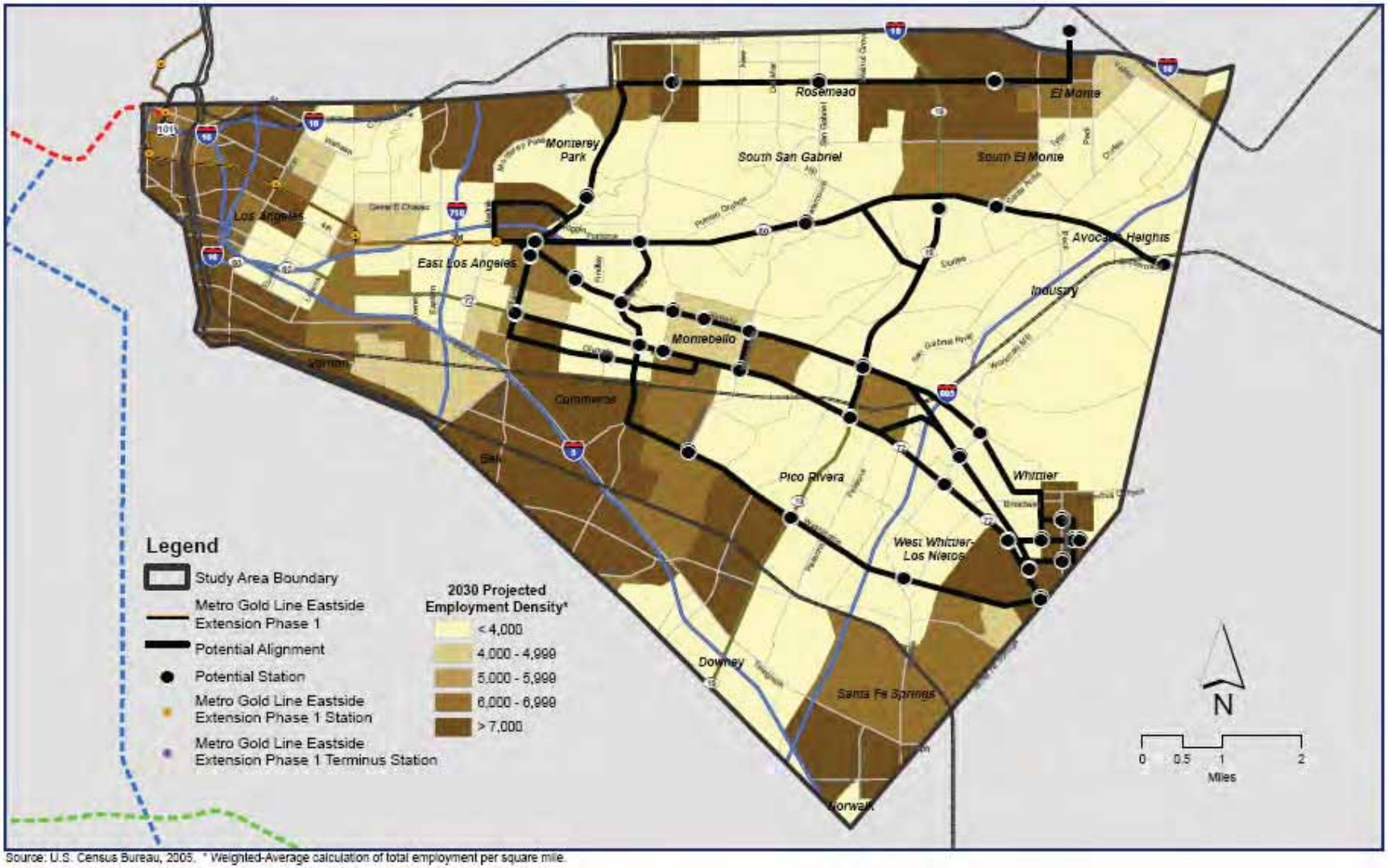
Source: U.S. Census Bureau, 2005. * Weighted-Average calculation of population per square mile.

Figure 1-14 2005 Employment Density in PSA



Source: U.S. Census Bureau, 2005. * Weighted-Average calculation of total employment per square mile.

Figure 1-15 2030 Employment Density in PSA



Source: U.S. Census Bureau, 2005. * Weighted-Average calculation of total employment per square mile.

Table 1-5 Commuters and Mean Commuting Time in 1990 and 2000

	Commuters (excludes work at home)			Mean Commuting Time (min)		
Name	1990	2000	Percent Change	1990	2000	Percent Change
LA County	4,115,248	3,858,750	-6%	26.48	29.40	11%
SCAG Region	6,844,948	3,858,750	-44%	26.35	29.03	10%
City of Commerce	4,416	3,882	-12%	21.29	25.70	21%
El Monte	41,762	39,211	-6%	25.77	27.20	6%
City of Industry	157	240	53%	27.11	29.70	10%
Los Angeles	1,629,096	1,494,895	-8%	26.47	29.60	12%
Montebello	25,702	22,197	-14%	25.93	27.50	6%
Monterey Park	26,298	23,826	-9%	25.27	27.30	8%
Pico Rivera	24,289	22,833	-6%	25.50	27.10	6%
Rosemead	20,670	19,637	-5%	26.63	27.00	1%
Santa Fe Springs	6,481	6,256	-3%	22.33	26.90	20%
South El Monte	8,137	7,141	-12%	23.25	24.60	6%
Whittier	36,389	35,596	-2%	25.67	30.10	17%

Source: Census 1990 & 2000 Summary File 3; Data tabulated by SCAG Community Development Division

The above table generally shows an increase in mean commuting time and a decrease in work commuters from 1900 to 2000. The share of work trips among total trips has been declining because of technological innovations allowing workers to rideshare (carpool and vanpool) and work at home (e-commuting and telecommuting), among others. However, the growth rate of VMT and workers driving alone did not decrease. Drive-alone commutes among other things tend to be longer than other personal trips. In addition, increased work travel time is also associated with location of jobs and housing, and reliance on a shared transportation network with commuters and the goods movement industry.[2]

1.1.4 Corridor Alternatives

Multiple corridor alignments in the PSA were identified and evaluated through the AA planning process. The study team screened over 17 conceptual alternative alignments to five refined alternatives, which include four different east/west alignments. The study team focused on east-west alternatives in the PSA, identifying four major corridors for detailed study including, SR-60, Beverly Blvd., Whittier Blvd., and Washington Blvd. Local arterials in the east-west orientation mirror the westbound AM / eastbound PM flows of the paralleling freeways; whereas, north-south arterials are congested approaching freeways in the AM and both approaching and departing freeways in the PM.

[2] 2004 RTP: Destination 2030

Within the PSA, three of the four study corridors (Beverly Blvd., Whittier Blvd., and Washington Blvd.) are classified as Major Arterials, and therefore serve as important east/west roadways linking cities and neighborhoods. The fourth study corridor, SR-60, is an east/west state highway that connects the PSA to downtown Los Angeles and Riverside County.

1.2 Planning Context and Background

This section describes past studies and planning efforts to improve the mobility problem in the PSA. Regional and local studies reinforce the need for transportation improvement in the PSA.

1.2.1 Regional Transportation Plan

In 2004, SCAG developed the Destination 2030 Regional Transportation Plan (RTP). The RTP provides a basic policy and program framework to improve the transportation system and integrate it with the best possible growth patterns for the region through 2030.

The RTP is a performance based plan with the following goals: maximize mobility and accessibility, ensure safety and reliability, preserve our transportation system, maximize productivity of our system, protect the environment, and encourage land-use and growth patterns that complement our transportation system. SCAG developed performance indicators (such as mobility, accessibility, safety, etc.) and measures to quantify the goals and evaluate progress towards achieving the goals.

The RTP outlines future highway projects, including the widening of I-5 and providing one HOV lane in each direction from the Orange County border to I-605. Prior to the 2004 RTP, the 2001 RTP had supported the SR-60 truck lane project from the I-710 to San Bernardino County. These improvements if implemented may provide long-range highway relief. However, given projected population and travel demand in the PSA, a transit alternative would increase mobility options and provide further relief to congested highways.

1.2.2 Systems Planning

The Metropolitan Transportation Authority (Metro) documents system planning in the Long Range Transportation Plan (LRTP).The most recent document adopted by the Metro board was completed in 2001. The 2001 LRTP identifies regional investments in public transportation to improve mobility. The LRTP identifies a limited number of constrained and strategic projects for the East Los Angeles Corridor. Most importantly, the Strategic Plan recommends the need for a public transportation investment in the East Los Angeles Corridor from Atlantic to Norwalk/Whittier (east of the Eastside Extension phase 1 which is currently under construction).

In the 2001 LRTP, regional and local recommendations to improve mobility that apply to the PSA are listed below:

- Constrained Public Transportation Projects
- Bus System Improvements
- Countywide Bus System Improvements
- Metro Rapid Corridors- 22 lines
- Implement Tiered Transit System
- Transit Capital Project Funding in Call for Projects
- Community Transit Service
- Commuter Rail Improvements
- Metrolink Expansion
- Strategic Public Transportation Projects
- Bus System Improvements
- Metro Rapid Corridors- additional 14 lines
- Additional Transit Capital Call for Projects funding
- Community Transit Service
- Transit Corridors
- East Los Angeles Corridor- extension from Atlantic Blvd. to Norwalk/Whittier
- Commuter Rail

Since the adoption of the 2001 LRTP, Metro has provided additional Metro Rapid Bus service within the PSA. This is discussed further in the section on transportation facilities below.

Metro Rail system coverage is sparse on the Eastside in comparison to other areas of the region. The existing Metro rail network provides rail lines in many directions of the compass (refer to Figure 1-2 above) – the Metro Gold Line to the northeast, the Metro Blue and Metro Green Lines to the south, the Metro Red and Metro Orange Lines to the west and northwest, and the Expo Line under construction to further build out rail to Mid Cities and the Westside. The only Metro Rail line to the East is the phase one minimum operable segment (MOS) of the Gold Line Eastside Extension. This line extends only six miles into the 80 square mile PSA, yielding less rail service in the PSA than most other areas in the County.

1.2.3 Corridor Planning

Studies on major transit improvements for the Eastside Transit Corridor date back to the late 1980s and early 1990s. Transit service to the PSA was originally identified as part of the Metro Red Line extension; a heavy rail transit service line proposed within Los Angeles County. The project was suspended due to funding constraints. In 1998, Metro completed the Regional Transit Alternatives Analysis study and reaffirmed its commitment to fund fixed guide-way

transit improvements beyond rapid bus in suspended rail corridors including the Eastside Transit Corridor. As a result, Metro funded and completed the Eastside Transit Corridor Re-evaluation/ Major Investment Study (MIS) in 2000.

The MIS Study analyzed a mix of alignments, configurations, technologies and station locations for potential projects extending from Union Station in downtown Los Angeles east to the City of Whittier. Over 47 various alternatives were analyzed and narrowed to approximately eight alternatives. Metro's Board of Directors then authorized continued study of a first phase of the Eastside Extension, to further narrow alternatives through the completion of a Draft EIR/EIS.

In 2001, Metro completed the Draft EIR/EIS and subsequently a Final EIR/EIS in 2002 for the first phase of what is now known as the Metro Gold Line Eastside Extension. As part of the Federal New Starts funding application, Metro received a Record of Decision from the Federal Transit Administration and ultimately a Full Funding Grant Agreement, which committed the federal government for approximately half the cost of the project. As a result of this effort, the Metro Gold Line Eastside Extension's first phase is currently under construction and anticipated to be operational in 2009 (see Figure 1-1). This Alternatives Analysis is the first study of the second phase of the Metro Gold Line Eastside Extension authorized by Metro since completion of the MIS in 2000.

The current Alternatives Analysis for the Eastside Transit Corridor will help to identify the most promising transportation investments linking the communities further east of the phase 1 segment. The development of the initial conceptual alternatives for this study was based upon extensive analysis of the PSA, transportation planning context and previous corridor studies.

1.3 Corridor Conditions and Needs

In the AA study is the opportunity to build on the existing corridor conditions and needs to determine whether the Eastside PSA can warrant and support a fixed-guideway transit alternative. For the present roadway conditions, as corridor use intensifies during AM and PM peak periods on major arterials, local streets begin to endure the pressure of cut-through traffic congestion. Additionally, the arterial corridors go in accordance with the pattern of the residential neighborhoods, city/town centers, and overall character of development through which it traverses. The arterial network also accommodates the extensive transit system in the PSA. Seven transportation providers utilize the study corridors for local and regional bus service, including express and para-transit. In the 2001 Metro LRTP, the need to evaluate the role of public capital transportation projects in the PSA is recognized to improve overall mobility. SCAG's "Destination 2030" has established policy frameworks to enhance the transportation system in ways that integrate dense growth patterns and attract activity centers and regional destinations. Potential redevelopment in the PSA provides an important opportunity to establish new regional and community centers where transit is viewed as a

desirable amenity. The study considers not only existing supply and demand of transit service, arterial infrastructure, and travel trends, but also projected demand based on future population growth. Identifying fixed-guideway transit alternatives is a crucial part of the larger vision of improving regional mobility and connectivity, retrofitting transportation corridors, and reinvesting in livable communities.

1.3.1 Highway Conditions

In the PSA, peak hour congestion on the roadway and highway network is a pressing concern. Major highways in the PSA are already close to capacity. Spill over from these congested highways causes substantial congestion on the local roadway networks, which during peak hours are operating at low level of service (LOS). Peak hour traffic estimates are used to approximate the amount of congestion experienced.

Highway travel to regional destinations is already impacted by high levels of congestion on area freeways and principal arterials in directions of peak travel. There are no significant highway improvements identified in the financially constrained 2001 Long Range Transportation Plan, which would provide relief to SR-60, I-5 or I-10 to accommodate travel to points west in the morning or east in the evening. While there are three Metrolink lines penetrating the PSA, there is only one Metrolink station serving the central zone. And Metrolink, while effective for commuter travel, does not provide the type of all day long service as provided by the Metro rail and bus network.

Preliminary projections for Year 2030 show these same travel patterns continuing, but with nearly 33 percent growth over existing conditions. These same preliminary travel projections show that construction of an extension of the light rail line to the vicinity of I-605 would increase Gold Line rail trips by about 40 percent over the amount with only the Phase 1 project (e.g., daily rail trips in the range of 30,000 to 45,000 with Phase 1 alone may increase to as high as 40,000 to 60,000 with the extension).

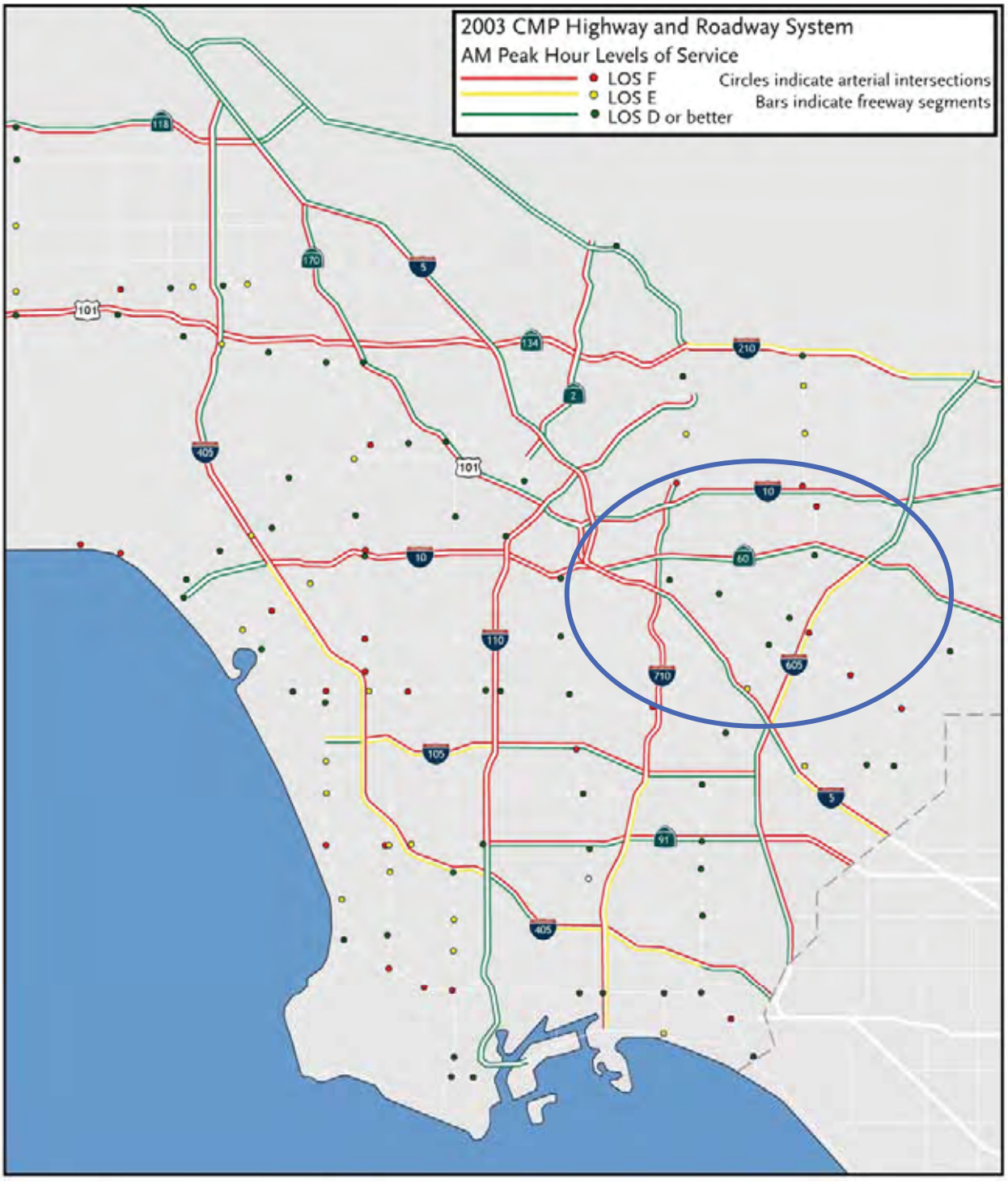
Existing conditions on area freeways and arterial roadways are highly congested during peak periods (see Figures 1-14 and 1-15). Heaviest congestion is present on the I-5, SR-60 and I-10 freeways in the westbound direction towards the Los Angeles CBD in the morning peak period and eastbound in the afternoon peak period. However, in the PM peak period, congestion is also present to a lesser degree in the reverse peak direction. The north/south I-710 and I-605 freeways are congested both in the AM as well as PM peak periods with bottleneck conditions near freeway-to-freeway connections such as the I-5 /SR-60 interchange.

With no major freeway or highway improvements provided in the financially constrained regional transportation plan, building the transit network coverage and services will be crucial to address the projected growth in population and employment.

1.3.2 Roadway Conditions

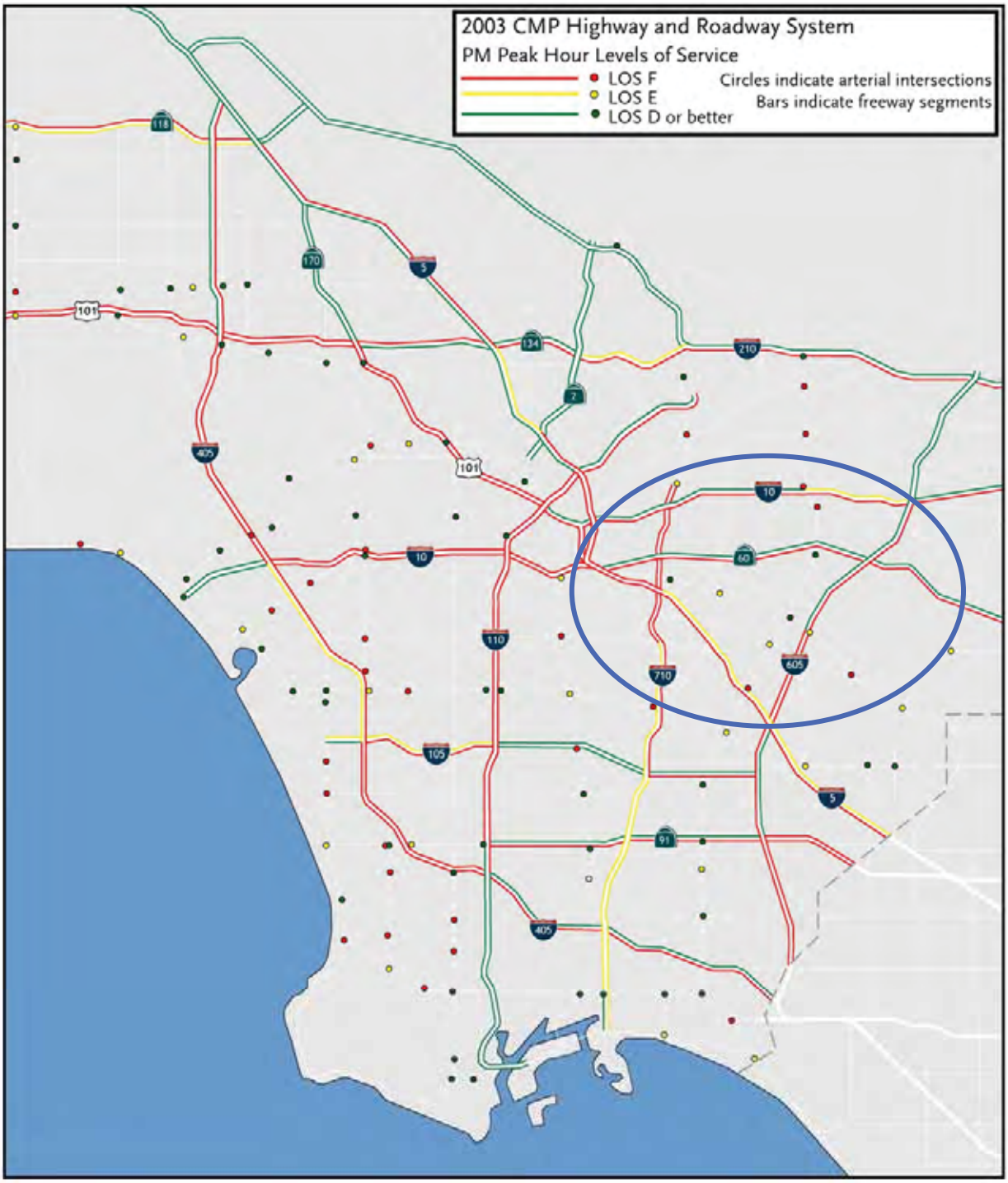
The alternatives under evaluation, as part of the AA, took into account roadway conditions, existing infrastructure configurations, and land uses in the PSA, to develop the most viable transit solution. Within the PSA, the existing roadway conditions on local arterials in the east-west direction are highly congested during peak periods. North-south oriented arterials are as congested when approaching and departing freeways in the AM and PM peak periods. Three of the four study corridors (Beverly Blvd., Whittier Blvd., and Washington Blvd.) are classified as Major Arterials, and therefore serve as important east/west roadways linking cities and neighborhoods with the regional transportation network. The fourth study corridor, SR-60, is an east/west state highway that connects the PSA to downtown Los Angeles and Riverside County.

Figure 1-16 Highway Congestion – Existing A.M. Conditions



Source: 2004 Congestion Management Program for Los Angeles County, maps prepared by CDM 2008.

Figure 1-17 Highway Congestion – Existing P.M. Conditions



Source: 2004 Congestion Management Program for Los Angeles County , maps prepared by CDM

Table 1-6 presents the LOS descriptions and classifications for intersections and freeway segments. Congestion is ranked from LOS A to LOS F based on volume capacity (V/C) ratio, a measure of the number of vehicles passing through an intersection divided by the number of vehicles the intersection can support. For example, an intersection LOS A has a V/C ratio less than 0.600, indicating a free-flow roadway. Conversely, an intersection V/C ratio of LOS F has a value greater than 1.00, indicating very poor traffic flow and congested conditions.

Beverly Blvd. is located between the SR-60 freeway and Whittier Blvd. West of Paramount Blvd., Beverly Blvd. has four travel lanes; east of Paramount Blvd., Beverly Blvd. has six travel lanes. Currently, most intersections on Beverly Blvd. operate acceptably during the weekday morning and evening commute periods. However, at intersections with major roadways (including Garfield Ave. and Beverly Blvd.), operating conditions are poor (LOS E or F) during both time periods.

Whittier Blvd. is designated as State Route 72 (SR-72) and part of the Congestion Management Program (CMP) highway network within the PSA. The CMP is a state mandated program to develop street networks and address concerns about urban congestion. In general, Whittier Blvd. has four travel lanes to the west of Paramount Blvd., five travel lanes (two westbound lanes and three eastbound lanes) between Paramount Blvd. and the I-605 freeway, and four travel lanes to the east of the I-605 freeway. During the weekday morning commute period, the majority of intersections along Whittier Blvd. operate with acceptable conditions (LOS A through D), except at intersections with major cross-streets (such as with Rosemead Blvd. and Norwalk Blvd.). However, during the weekday evening commute period, most intersections along Whittier Blvd. are congested and operate with poor conditions (the major intersections with Atlantic Blvd., Garfield Ave., Paramount Blvd., Rosemead Blvd., and Norwalk Blvd. are all at LOS D, E or F conditions).

Washington Blvd. is located between Whittier Blvd. and the I-5 freeway at the southern end of the PSA. In general, Washington Blvd. has four travel lanes to the west of the I-605 freeway and six travel lanes to the east of the I-605 freeway. Intersections along Washington Blvd. generally operate with acceptable conditions (LOS A through D) during the weekday morning commute period, except at intersections with major cross-streets (such as with Rosemead Blvd.). During the weekday evening commute period, conditions on Washington Blvd. are somewhat worse, with poor operating conditions at the major intersections (including with Rosemead Blvd. and Norwalk Blvd.).

Table 1-7 presents the existing intersection operating conditions at key locations along each roadway for the weekday AM and PM peak hours (the peak hour of the morning and evening commute periods).

In addition, the projected intersection and freeway mainline operating conditions were estimated for a future 2030 horizon year, based on output from the Los Angeles County 2004

Congestion Management Program analysis. In general, the anticipated growth along the freeway segments and at major arterials in the PSA would worsen operating conditions and result in increased congestion and delays. At the analysis intersections, intersection levels of service are projected to worsen by one or two service levels (i.e., from LOS B to LOS D, or from LOS D to LOS E). At the 17 locations evaluated, the frequency of LOS E or F conditions during the weekday AM or PM peak hours would increase from 15 to 23, including almost all locations during the PM peak hour. At the analysis freeway segments, mainline LOS would also worsen due to the anticipated growth rates. At several locations, the projected V/C would increase to over 1.5, indicating severe congestion and total breakdown in freeway operations. These conditions would also result in major delays and queued conditions at the freeway on-ramps.

The east-west peak hour congestion on the study corridors is a continuing concern due to roadway over-capacity and level of density in the PSA. During peak periods, the major arterial network operates at low LOS. The local arterial network also draws in significant congestion as well as cut-through traffic from congested highways. Physical roadway improvements, such as widening existing roadways, is unlikely since the financially constrained 2001 Long Range Transportation Plan did not identify major highway improvements within the PSA. However, Metro is in the process of revising the regional transportation plan, scheduled to be released in 2009. Building an alternative transit solution among a roadway network that desperately is in need of traffic relief will be crucial to address and accommodate projected growth and congestion.

Table 1-6 LOS Designations

V/C Ratio	Description	Grade
Intersections		
< 0.60	Virtually free flow	A
> 0.60 – 0.70	Stable flow with slight delays	B
> 0.70 – 0.80	Stable flow with more delays	C
> 0.80 – 0.90	Stable flow with significant delays	D
> 0.90 – 1.00	Unstable flow with significant delays	E
> 1.00	Enforced flow with poor traffic conditions	F
Freeway Segment		
< 0.35	Free-flow	A
> 0.35 – 0.54	Reasonably free-flow	B
> 0.54 – 0.77	Stable flow with more delays	C
> 0.77 – 0.93	Stable flow with significant delays	D
> 0.93 – 1.00	Unstable flow with significant delays	E
> 1.00 – 1.25	Breakdown in vehicular flow	F(0)
> 1.25 – 1.35		F(1)
> 1.35 – 1.45		F(2)
> 1.45		F(3)

Source: Highway Capacity Manual 2000

1.3.3 Transit Facilities and Services

Regional Transit Context

Metro operates fixed guide-way rail service throughout the Los Angeles metropolitan area. Other various public transportation providers connect with several Metro rail stations, including Metrolink and Amtrak. Figure 1-16 provides a map of currently available Metro rail service with 62 stations and 73 route miles of service.

Metro Red Line - Originates from Union Station with several stops in downtown Los Angeles, running along Vermont Ave. and Hollywood Blvd., with stops at Vermont/Santa Monica where the Los Angeles Community College is located, the tourist hub of Hollywood and Highland, and the Universal theme park location in Universal City. The line began operating with service between Union Station and Westlake/MacArthur Park in 1993. The current 17.4 mile line branches into two directions at the Wilshire/Vermont station. The Wilshire/Western branch opened in 1996 and is referred to as the Purple Line. The Hollywood branch has operated since 1999, with service to North Hollywood beginning in 2000. As of the 2007 fiscal year, this line carried approximately 136,355 weekday boardings.

Figure 1-18 Regional System Map

Source: Metro 2008. Graphic by CDM, 2008

Table 1-7 Intersection and Freeway Levels of Service-
Existing Conditions

Intersection		AM Peak Hour		PM Peak Hour	
North-South Street	East-West Street	V/C	LOS	V/C	LOS
Atlantic Blvd.	Garvey Ave.	0.68	B	0.90	D
Garfield Ave.		0.73	C	0.80	D
Rosemead Blvd.		0.95	E	0.94	E
Atlantic Blvd.	Beverly Blvd.	0.75	C	1.03	F
Garfield Ave.		1.02	F	0.95	E
Montebello Blvd.		0.60	A	0.62	B
Rosemead Blvd.		1.04	F	1.23	F
Atlantic Blvd.	Whittier Blvd.	0.58	A	0.81	D
Garfield Ave.		0.80	C	0.94	E
Montebello Blvd.		0.74	C	0.71	C
Paramount Blvd.		0.73	C	0.88	D
Rosemead Blvd.		0.81	D	1.02	F
Norwalk Blvd.		0.94	E	1.07	F
Painter Ave.		0.82	D	1.04	F
Rosemead Blvd.	Washington Blvd.	0.93	E	0.96	E
Pioneer Blvd.		0.67	B	0.80	C
Norwalk Blvd.		0.76	C	0.92	E
Freeway Segment	Direction	AM Peak Hour		PM Peak Hour	
		V/C	LOS	V/C	LOS
SR-60 east of Indiana St.	Eastbound	1.02	F(0)	1.31	F(1)
	Westbound	1.42	F(2)	0.59	C
SR-60 west of Peck Rd.	Eastbound	0.76	C	1.42	F(2)
	Westbound	1.31	F(1)	0.83	D

Sources: Metro, 2007 and LA County Department of Public Works, 2002-2008.

Table 1-8 Intersection and Freeway Levels of Service - 2030 Conditions

Intersection		AM Peak Hour		PM Peak Hour	
North-South Street	East-West Street	V/C	LOS	V/C	LOS
Atlantic Blvd.	Garvey Ave.	0.81	D	1.04	F
Garfield Ave.		0.85	D	0.95	E
Rosemead Blvd.		1.10	F	1.11	F
Atlantic Blvd.	Beverly Blvd.	0.87	D	1.17	F
Garfield Ave.		1.14	F	1.09	F
Montebello Blvd.		0.72	C	0.77	C
Rosemead Blvd.		1.17	F	1.38	F
Atlantic Blvd.	Whittier Blvd.	0.69	B	0.96	E
Garfield Ave.		0.92	E	1.09	F
Montebello Blvd.		0.87	D	0.82	D
Paramount Blvd.		0.85	D	1.02	F
Rosemead Blvd.		0.93	E	1.19	F
Norwalk Blvd.		1.11	F	1.23	F
Painter Ave.		0.96	E	1.15	F
Rosemead Blvd.	Washington Blvd.	1.08	F	1.11	E
Pioneer Blvd.		0.80	C	0.94	E
Norwalk Blvd.		0.88	D	1.06	F
Freeway Segment	Direction	AM Peak Hour		PM Peak Hour	
		V/C	LOS	V/C	LOS
SR-60 east of Indiana St.	Eastbound	1.20	F(0)	1.53	F(3)
	Westbound	1.66	F(3)	0.69	C
SR-60 west of Peck Rd.	Eastbound	0.89	D	1.66	F(3)
	Westbound	1.53	F(3)	0.97	E

Sources: Metro, 2007 and LA County Department of Public Works, 2002-2008.

Metro Blue Line - Opened in 1990 and was the first light rail transit line in Los Angeles since the previous system's closure in the 1960s. The 22 mile line runs between 7th St./Metro Center and Long Beach, passing through the communities of Vernon, Huntington Park, South Gate, Watts, Compton, and Carson. The Blue Line, which has more stations than any other Metro rail line, averaged 77,834 weekday boardings in the 2007 fiscal year.

Metro Green Line - Opened in 1995 and serves the communities of Norwalk, Downey, Lynwood, Watts, Inglewood, Lennox, El Segundo, Manhattan Beach and Redondo Beach. The light rail line is approximately 20 miles long and runs east-west, primarily along the median of the Interstate 105 (I-105) Freeway. In the 2007 fiscal year, the line carried an average of 40,576 weekday boardings.

Metro Gold Line - was originally part of the Blue Line Extension but the project was halted due to lack of funding and other complications. The 13.6 mile line began operating in 2003, serving the communities of Chinatown, Highland Park, South Pasadena, and Pasadena. As of the 2007 fiscal year, the line averaged 19,579 weekday boardings.

Metro Gold Line Eastside Extension - the first phase is expected to open in 2009, making destination stops in Little Tokyo, Boyle Heights, and East Los Angeles. The six mile line will connect with the existing Gold Line to Pasadena without requiring riders to transfer.

Metro Expo Line - is expected to open in 2010 as the first phase mid-city segment of the Exposition Light Rail line. The 8.5 mile line will run primarily at-grade from 7th St./Metro Center in Downtown Los Angeles to the intersection of Washington Blvd. and National Blvd. in Culver City.

Metro Orange Line - is a 14 mile dedicated busway and bike path that opened in 2005. It runs east and west from North Hollywood, interfacing with the Metro Red Line, to the Warner Center. It serves as a shortcut through the San Fernando Valley, boarding an average of 25,618 weekday riders for fiscal year 2007.

Bus

Bus service is the primary public transportation option available to the communities within the PSA. In addition to Metro, six local bus operators provide service to the PSA including local, express, dial-a-ride, and para-transit routes.

Major travel corridors in the PSA include east/west corridors such as Whittier Blvd., Beverly Blvd., and north/south corridors such as Atlantic Blvd. and Garfield Ave. Fixed route service in the PSA runs at high frequencies during the workday, with decreased service during the evenings and weekends. Rail feeder routes provide direct connections to Metrolink and Amtrak rail stations, while local routes provide transportation to most major shopping areas, recreation facilities, and public schools within the PSA. Figure 1-17 illustrates transportation facilities within the PSA.

Bus service is operated by seven transportation service providers including:

- Metro Bus;
- Montebello Bus Lines;
- Monterey Park Spirit Bus Lines;
- City of Commerce Lines;
- Norwalk Transit;
- Whittier Transit; and,
- Foothill Transit.

Figure 1-19 Transportation System Map

Source: Metro 2008. Graphic by CDM, 2008

Metro Bus

In 2001, the LRTP found that service on the Metro Rapid Bus "720" Wilshire-Whittier Blvd. Line was operating close to capacity. Line 720's average weekday ridership in 2001 was 40,343. Combined with local service along Wilshire and Whittier Blvd. (Lines 18, 20, and 21), the grand total for the corridor was 90,300, which represented a 42 percent increase in Wilshire/Whittier Blvd. corridor ridership over local service alone[3]. One recommendation identified in the LRTP was to explore more cost-effective long-term solutions, including high-capacity buses.

Since the adoption of the 2001 LRTP, Metro has provided additional Metro Rapid Bus service within the PSA. In 2004, the "751" Soto St. Line opened, followed by the "770" Garvey Ave./Cesar Chavez Ave. Line in December of 2007. The "762" Atlantic Blvd. Line opened for service in June of 2008, providing service from Fair Oaks Ave. and Colorado Blvd. in Pasadena to Atlantic Ave. and Imperial Highway in Lynwood.

Table 1-9 shows the bus lines provided by each bus operator. The frequency of available service for each bus route is shown in Table 1-10.

Commuter Rail

Commuter rail service within the PSA is provided primarily by Metrolink and Amtrak, with a connection to Metro rail service at Union Station (refer back to Figure 1-16).

Metrolink operates under the Southern California Regional Rail Authority (SCRRA), serving the Counties of Ventura, Los Angeles, Riverside, San Bernardino, Orange, and San Diego on 388 route miles. There are four Metrolink lines that traverse the PSA from Union Station to their final destinations including the 91, Orange County, Riverside, and San Bernardino Lines. The Commerce Station, at the intersection of Garfield Ave. and Telegraph Rd., is shared by the 91 and Orange County Lines and is the sole station on these lines within the PSA. The Riverside Line stops at the Montebello/Commerce Station, situated near the Garfield Ave. and Flotilla St. intersection, less than two miles northeast of the Commerce Station. Existing stops within the PSA on the San Bernardino Line include the Cal State LA Station, located on the south side of the university adjacent to I-10, and the El Monte Station near the El Monte municipal airport.

Amtrak is an inter-city passenger rail system serving Los Angeles' Union Station with statewide and nationwide service. Amtrak's Pacific Surfliner Line carries passengers from San Luis Obispo in the north to San Diego in the south. It shares rail tracks with the Metrolink Ventura and Orange County lines from Oxnard to San Clemente Pier.

[3] Wilshire/Whittier Blvd. and Ventura corridors Demonstration Projects, available at, http://www.metro.net

Table 1-9 Bus Transit Routes in PSA

Agency Provider	Route / Line	Route Description	
Metro	18	Local Service to/from Downtown LA	West 6th St-Whittier Blvd
	30		West Pico Blvd-East 1st St-Floral Dr
	62		Telegraph Rd-Norwalk-Pioneer Blvd-Hawaiian Gardens
	66		East Olympic Blvd-West 8th St
	68		West Washington Blvd-Cesar Eat Chavez Ave
	70		Garvey Avenue
	105	East/West Local Service in Other Areas	Vernon Ave-La Cienega Blvd
	108		Marina del Rey-Slauson Ave-Pico Rivera
	176		Highland Park-South Pasadena-Alhambra-San Gabriel-El Monte Station
	251	North/South Local Service in Other Areas	Lynwood-Soto St-Avenue 26
	258		Garfield Ave-Eastern Ave-Arizona Ave-Fremont Ave-Main St-Alhambra
	260		Atlantic Ave-Fair Oaks Ave
	265		Lakewood-Paramount Blvd-Pico Rivera
	484	Express Service to/from Downtown LA	Cal Poly Pomona-La Puente-Valley Blvd
	485		Lake Ave-Oak Knott-Fremont Ave
	487		Sierra Madrea Villa-San Gabriel Blvd-Del Mar Ave
	489		Temple City-Rosemead Blvd
	490		Cal Poly Pomona-Walnut-Covina-Baldwin Park-Ramona Blvd
	611	Special Service	CIRCULAR: Maywood-Bell-Cudahy-South Gate-Walnut Park & Huntington Park
	620		Boyle Heights Shuttle
	720	Metro Rapid	Wilshire Blvd-Whittier Blvd
	751		Soto St
	762		Atlantic Blvd
Montebello	10	Atlantic Blvd &Whittier Blvd	
	20	Greenwood Ave, Montebello Blvd, & San Gabriel Blvd	
	30	Garfield Ave	
	40	Beverly Blvd	
	50	Washington Blvd	
	60	Passon Ave	
	70	Via Campo / Wilcox Ave / Mines Ave	
	341	Taylor Ranch Express	
	342	Norwalk Blvd Express	
	343	Telegraph Rd Express	
Monterey Park	1	local circulator service	
	2	local circulator service	
	3	local circulator service	
	4	local circulator service	
	5	local circulator service	
Commerce	Blue	city circulator service	
	Red	city circulator service	
	Green	city circulator service	
	Orange	city circulator service	
	Yellow	city circulator service	
Norwalk	1	Rio Hondo / Bellflower	
	9	City of Santa Fe Springs	
Whittier	1	Northwest Whittier/Uptown Whittier/Whittwood Town Center	
	2	Northwest Whittier/Uptown Whittier/Whittwood Town Center	
Foothill	274	West Covina - Industry - Whittier	
	285	Puente Hills Mall - Whittier Hospital - La Habra	
	269	El Monte Station - Montebello Town Center	
	481	El Monte - Downtown LA - Express Service	
	707	Silver Streak	
	493	Downtown LA - Puente Hills Mall via 60	
	497	Downtown LA - City of Industry Park & Ride via I-10	
	498	Downtown LA - Citrus College via I-10 - Express Service	
	499	Downtown LA - Via Verde Park & Ride via I-10	

Source: Metro Bus Timetables 2007, Cities of Montebello, Monterey Park, Commerce, Norwalk, Whittier, & Foothill Transit Bus Timetables 2007

Table 1-10 Frequency (in Minutes) of Bus Transit Service in PSA

Agency Provider	Route / Line	Weekday		Saturday		Sunday/Holiday	
		Peak	Off Peak	Peak	Off Peak	Peak	Off Peak
Metro	18	3	8-10	5-10	15-40	10	15-40
	30	4-10	8-15	6-15	30-60	7-20	30-60
	62	15-20	30-40	60	60	60	60
	66	1-10	6-16	3-20	13-48	9-35	13-60
	68	7-10	8-12	10-20	20-60	12-30	20-60
	70	10-12	15	10-12	20-60	12	30-60
	105	15-18	18-20	15	20-60	20	40-60
	108	4-8	15	14-17	18-60	15-20	25-60
	176	60	60	-	-	-	-
	251	7-12	12	18	30-60	15	30-60
	258	22	35	-	-	-	-
	260	10-12	15	20	20	20	30
	265	26-40	43-50	50	50	50	50
	484	8-15	20-30	20-40	40-70	30	50-70
	485	12-15	30	30	40-60	30	40-60
	487	20-30	40-45	60	60	60	60
	489	20	-	-	-	-	-
	490	12-30	20-30	60	60	60	60
	611	30	30	30	30-60	30	30-60
	620	20	15-18	-	-	-	-
	720	3-10	10-15	6-12	10-15	6-12	10-15
	751	8-12	12-15	18-19	20	-	-
	762	10	20	20	20	-	-
Montebello	10	5-8	10-20	15	30-40	15	30-40
	20	15	15	15	15	15	15
	30	40-45	60	40	60	40	60
	40	8-10	15-20	15	30	15	30
	50	30	60	60	60	-	-
	60	35	70	70	70	-	-
	70	30	30	-	-	-	-
	341	30	-	-	-	-	-
	342	1 trip	-	-	-	-	-
	343	2 trips	-	-	-	-	-
Monterey Park	1	40	40	40	40	-	-
	2	40	40	40	40	-	-
	3	40	40	40	40	-	-
	4	40	40	40	40	-	-
	5	30	40	-	-	-	-
Commerce	Blue	60	60	60	60	-	-
	Red	53	60	53	60	-	-
	Green	60	60	60	60	-	-
	Orange	60	60	-	-	-	-
	Yellow	60	60	-	-	-	-
Norwalk	1	28	28				
	9	60	60	60	60	60	60
Whittier	1	60	60	60	60	-	-
	2	60	60	60	60	-	-
Foothill	274	60	60	60	60	60	60
	285	60	60	60	60	60	60
	269	30	30	60	60	60	60
	481	20	20	-	-	-	-
	707	15	15	15	15	15	15
	493	8-12	10-20	-	-	-	-
	497	15	30	-	-	-	-
	498	5-15	8-15	-	-	-	-
	499	12	15	-	-	-	-

- indicates not in service for that day/time Source: 2007 Metro, Montebello, Monterey Park, Commerce, Norwalk, Whittier, & Foothill Transit bus timetables

1.3.4 Transportation System Performance

To define and address mobility issues, SCAG developed regional performance indicators that help in understanding the problem, setting goals for improvement, and measuring progress towards the goals. SCAG is responsible for regional transportation planning for six counties within Southern California: Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura. In 2004, SCAG released Destination 2030, the Regional Transportation Plan (RTP) that provides basic policy and program framework to improve the transportation system and integrate it with the best possible growth patterns for the region through 2030.

Destination 2030 is a performance based plan with the following goals: maximize mobility and accessibility, ensure safety and reliability, preserve our transportation system, maximize productivity of our system, protect the environment, and encourage land-use and growth patterns that complement our transportation system. SCAG developed performance indicators and measures to quantify the goals and evaluate progress towards achieving the goals. Table 1-11 lists the performance indicators, associated measures, and final projected outcomes. The outcomes are estimated for the Plan as a whole for 2030, and not for individual projects.

If no action is taken, the performance indicators in the region would worsen. SCAG estimates that daily vehicle miles in the region will increase from 361.5 million under the 2000 Base Year to 488.8 million under the 2030 Baseline. The average travel speed would reduce from 35.2 mph to 31.9 mph during this time period. Daily person hours of delay would increase from 2.2 million hours under the 2000 Base Year to 5.4 million hours under the 2030 Baseline. The average daily delay per capita would increase from 8.0 minutes under the 2000 Base Year to 14.2 minutes under the 2030 Baseline. The percentage of peak period evening work trips completed within 45 minutes for autos and transit would decrease from 88 percent and 33 percent under 2000 conditions to 83 percent and 29 percent under 2030 Baseline, respectively. The home to work travel times would increase from 21.6 minutes to 25.9 minutes.

The Eastside Transit Corridor Phase 2 project would contribute to alleviating the mobility problem in the region, helping to achieve SCAG's Destination 2030 goals. The proposed project offers a public transit alternative that would improve mobility and accessibility in the region and provide commuters with a reliable transportation option. The PSA includes multiple major intersections that have significant traffic congestion and long delays. The public transit alternative could reduce daily vehicle trips and miles traveled, which could improve traffic flow at these intersections and throughout the region. Targeted areas with high population densities and households dependent on public transit increase potential ridership, thereby increasing the project benefits and making it more cost-effective. Improving transit alternatives within the PSA is one way to help reduce regional travel demand. Providing alternatives to the automobile will help to offset increased commuter

patterns associated with residential and employment population growth within Los Angeles County.

Table 1-11 Performance Indicators, Measures and Outcomes of Destination 2030 Goals

Performance Indicator	Performance Measure		Plan 2030	Base Year 2000	Baseline 2030
Mobility	Average Daily Speed (Miles per Hour)		35.2	35.9	31.9
	Average Daily Delay (Daily Person Hours in millions)		3.2	2.2	5.4
Accessibility	Percent PM peak period work trips within 45 minutes of home	Autos: Transit:	90% 37%	88% 33%	82% 29%
Reliability	Percent variation in travel time	6am-7am 7am-8am 8am-9am 3pm-4pm 4am-5pm 5am-6pm 6pm-7pm	10% 13% 13% 19% 18% 17% 20%	11% 15% 15% 21% 20% 19% 22%	N/A
Safety	Daily accident rates per million persons	Fatalities Injuries Property Damage	0.27 10.7 17.5	0.28 11.0 18.2	0.28 11.0 18.2
Productivity	Roadway capacity – vehicles per hour/lane (Lost Lane Miles)	am peak pm peak	377 302	332 266	N/A
Sustainability	Total cost per capita to sustain current system performance		Plan 2030 estimates an additional cost of $20 per capita per year over base year		
Preservation	Maintenance cost per capita to preserve system at base year conditions (base year 2002, constant 2002 dollars)		~$80	~$63 (2002)	N/A
Environmental	Emissions generated by travel (over Baseline 2030)	CO PM10 Exhaust PM10	Plan 2030 estimates: 6-8% reduction 6-8% reduction 8-11% reduction		
Environmental Justice	Benefit vs. Burden by quintiles* – Auto Percentage of Tax Paid and Time Savings (Quintile 1=lowest income, Quintile 5=highest income)		Plan 2030 estimates:		
			Expenditure	Time Savings	
		1	9%	6%	
		2	13%	14%	
		3	18%	21%	
		4	24%	29%	
		5	37%	30%	
	Benefit vs. Burden by quintiles* – Local Transit Percentage of Tax Paid and Time Savings (Quintile 1=lowest income, Quintile 5=highest income)		Expenditure	Time Savings	
		1	9%	23%	
		2	13%	30%	
		3	18%	23%	
		4	24%	16%	
		5	37%	8%	

*Quintile = statistical distribution of a population representing 20% of a given amount. Source: SCAG Destination 2030, 2004

1.3.5 Potential Travel Markets

The travel market for the proposed transit alternative is made up of activity centers, areas under future development, and travel patterns within the PSA and region. The travel market information has been an important element in determining ridership trends and potential alternatives that would maximize transit patrons.

Activity Centers and Destinations

Several activity centers with heavy traffic activity and high population or commercial density exist within the PSA. Activity centers generally serve the population of several communities. These areas generate large numbers of trips, such as a central business district, large shopping center, or large university. Figure 1-18 illustrates the activity centers categorized by education, recreational, business/industrial, and commercial activity within the PSA. Table 1-12 provides a detailed list of these facilities.

Educational - several institutions fall within or immediately adjacent to the PSA boundary, including the East Los Angeles (27,481 students) and Rio Hondo (20,121 students) Community Colleges, as well as two four-year universities, Whittier College (2,054 students) and Cal State University, Los Angeles (20,565 students)[4].

Recreational Areas - the PSA is home to State recreational centers and local sports/activity centers. The most notable are the Whittier Narrows Recreation Center, Montebello Golf Course, and Industry Country Club.

Health & Medical Services - within the PSA, there are a number of facilities that provide vital health and medical services to residents and throughout the region, including medical centers such as Monterey Park Hospital, Beverly Hospital, Presbyterian Intercommunity Hospital, Greater El Monte Community Hospital and Whittier Presbyterian Hospital.

Business/Industrial Parks - are concentrated in the Cities of Commerce, El Monte, and Industry. These areas provide a range of employment opportunities including industrial, major retail and office jobs.

Commercial - several commercial centers exist within the PSA ranging from neighborhood/main street retail to large regional malls and shopping centers. Main street retail districts, such as Whittier Blvd. and Uptown Whittier, are magnets for high volume pedestrian activity. The Cities of Commerce, Montebello and Pico Rivera each have large regional centers, which attract residents from within and outside of the PSA.

[4] Fall 2006 student population count from collegetoolkit.com

Figure 1-20 Activity Centers within PSA

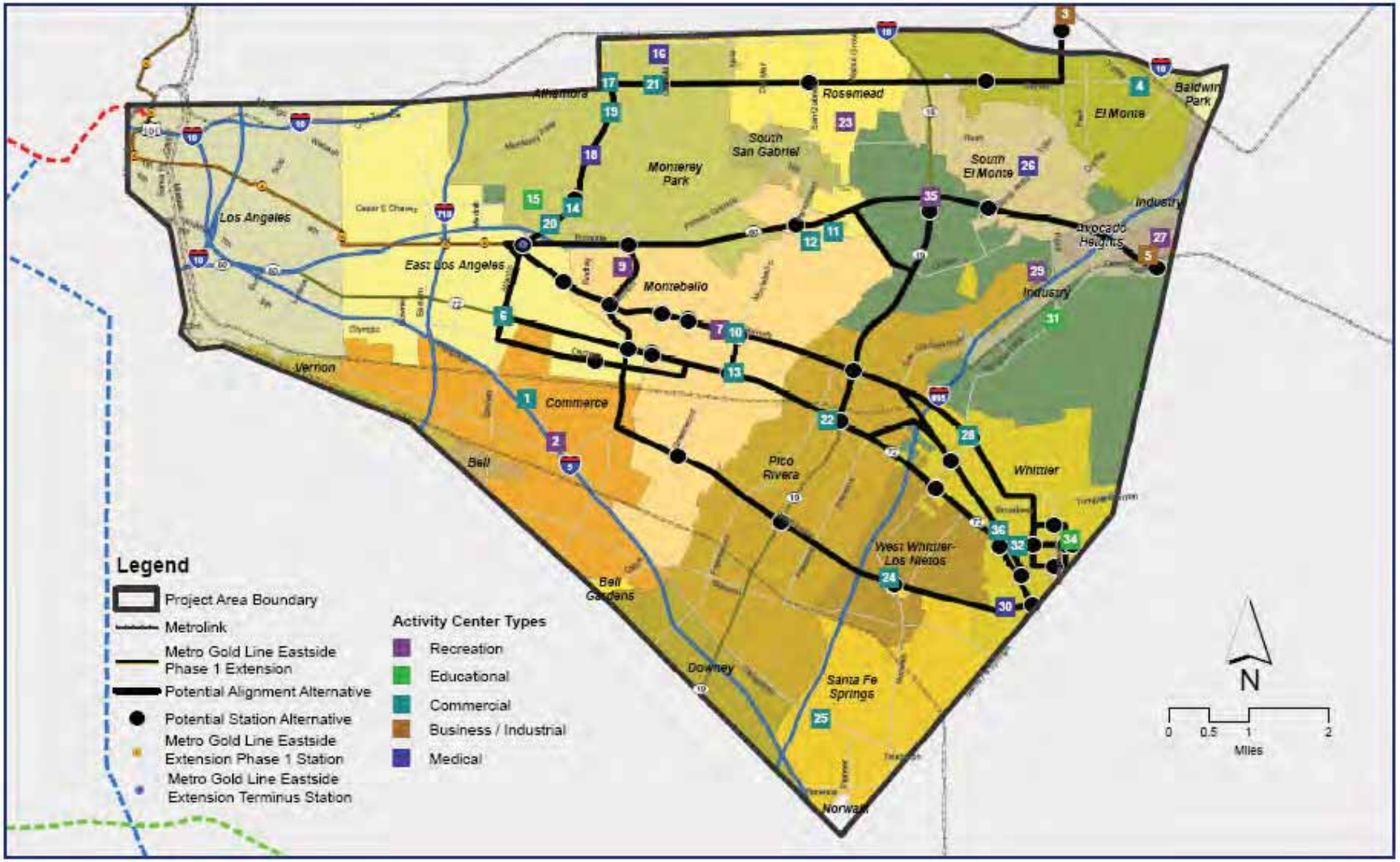


Table 1-12 Activity Centers in PSA

City	Activity Center	# on Map
Commerce	Citadel Regional Shopping Center	1
	Commerce Casino	2
El Monte	El Monte Busway Station	3
	Five Points Plaza	4
Industry	Industry Office Park	5
Los Angeles	Historic Whittier Blvd. Shopping District	6
Montebello	Beverly Bowl	7
	Beverly Hospital	8
	Montebello Golf Course	9
	Montebello Mart Shopping Center	10
	Montebello Town Center	11
	Montebello Town Square Shopping Center	12
	Newmark Street Mall	13
Monterey Park	Atlantic Square Shopping Center	14
	East Los Angeles Community College	15
	Garfield Medical Center	16
	Landmark Shopping Center	17
	Monterey Park Hospital	18
	Monterey Park Mall	19
	Monterey Park Village	20
	Taipei Center	21
Pico Rivera	Pico Rivera Towne Center	22
Rosemead	Jess Gonzales Sports Park	23
Santa Fe Springs	Santa Fe Springs Market Place	24
	Santa Fe Springs Promenade	25
South El Monte	Greater El Monte Community Hospital	26
Whittier	California Country Club	27
	Model Plaza Shopping Center	28
	Pico Rivera Sports Arena	29
	Presbyterian Intercommunity Hospital	30
	Rio Hondo College	31
	Uptown Whittier District	32
	Village Square Shopping Center	33
	Whittier College	34
	Whittier Narrows Recreation Center	35
	Whittier Station Shopping Center	36

Source: LA County Department of Planning, Google, City Planning documents.

Potential Development

Many of the cities in the PSA are focusing on redevelopment projects to meet increasing residential and commercial demands. Several large commercial centers or mixed use developments have been identified within the PSA in Figure 1-19. These centers are typically ideal locations for public transit services due to the potential to capture a large share of patrons and alleviate traffic congestion to and from the areas.

The following describes the potential redevelopment projects in the PSA.

- Atlantic Times Square[5] – The project will include a 205,000 square-foot shopping center and adjacent 210-unit condo complex. The center will be anchored by an AMC Theatre. This is a mixed-use redevelopment project in Monterey Park along Atlantic Blvd. at the northeast corner of Atlantic and Hellman.

- Cascades Market Place[6] – This project is a 507,000 square-foot shopping center and will be the largest in Monterey Park. It is north of the Pomona Freeway and west of Paramount Blvd.

- El Monte Transit Village Specific Plan[7] – The Transit Village is a mixed use development project with office, retail, residential, transit and open space uses on Santa Anita Ave. The Mixed-Use Sub-District is just north of I-10 and proposes various land use types to encourage pedestrian utilization throughout the sub-district and approximately 16 acres of publicly-accessible parkland.

- Monterey Park Towne Center[8] – The town center is a 94,000 square-foot site consisting of 109 condominiums and approximately 71,366 square feet of commercial space. It is at the southeast corner of Garfield and Garvey Ave. in Monterey Park.

- Pico Rivera Towne Center[9] – The project is a 60-acre open air shopping center on Rosemead Blvd. and Washington Blvd.

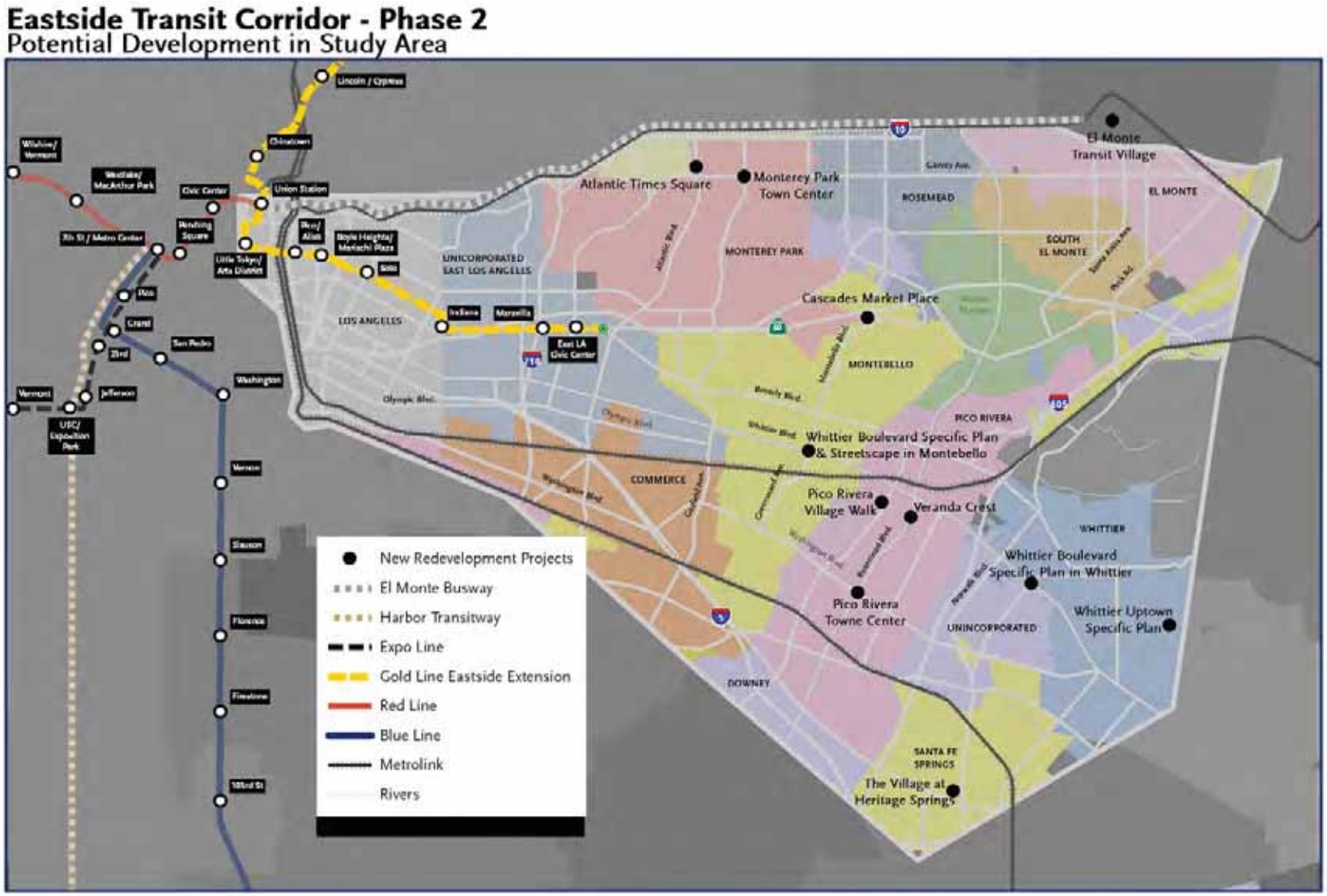
- Pico Rivera Village Walk[10] – The project is a 12-acre shopping center anchored by Krikorian Theatres. It is at the southwest corner of Whittier Blvd. and Paramount Blvd.

- The Village at Heritage Springs[11] – This project is a residential community with 554 attached and detached housing units on 54.5 acres. It is bounded by Telegraph Rd. to the north, Bloomfield Rd. to the east, Clark Ave. to the south, and Norwalk Blvd. to the west in Santa Fe Springs.

- Veranda Crest[12] - This is a 42-unit condominium at Rosemead Blvd. and Whittier Blvd. in Pico Rivera.

[5] City of Monterey Park website, Economic Development Department
[6] City of Monterey Park website, Economic Development Department
[7] City of El Monte website, Community Development Department
[8] City of Monterey Park website, Economic Development Department
[9] Vestar Development Co., vestar.com/newsite/PropMngmt.html
[10] City of Pico Rivera website, Redevelopment Agency
[11] Comstock Homes, thevillagesatheritagesprings.com
[12] Comstock Homes, comstock-homes.com/3_12.asp

Figure 1-21 Potential Developments in PSA



- Whittier Blvd. Specific Plan and Streetscape in Montebello[13] – This project proposes development and redevelopment along the Whittier Blvd. corridor through Montebello. The project supports mixed use development and improved design controls.

- Whittier Blvd. Specific Plan in Whittier[14] – This project includes development and redevelopment on Whittier Blvd. from Broadway Ave. to Valley Home Rd. in Whittier. It has plans for five new districts along the boulevard: Gateway Segment, Workplace District, Shopping Center Clusters, Commercial Expansion/Auto Sales Segment, and Neighborhood Spine.

- Whittier Uptown Specific Plan[15] – The goal of the Uptown Whittier project is to develop a pedestrian-oriented, mixed residential and retail area with distinct character and smart transportation and planning. The area covers 185 acres and 35 city blocks from Hadley St. to the north, Painter Ave. to the east, Penn St. to the south, and Pickering Ave. to the west.

Travel Demand and Patterns

The regional transportation network includes 9,000 lane-miles of freeway, more than 42,000 lane-miles of arterials, and several large public transit service providers.[16] Yet growth of the transportation system has not kept pace with population growth and increases in transportation demand. As the population in the region doubled from 1960 to 2000, highway miles increased by less than 30 percent.[17] The congestion caused by insufficient transportation lanes affects both personal travel and goods movement. The majority of the congestion is from travel on the highways and local arterial network regardless of transportation mode. If the current trend persists, travel delays are expected to rise to 5.4 million person hours by 2030, more than double currently experienced delays, which will deeply affect productivity.[18] Expanding the public transportation system will provide more choices for commuters and potentially reduce travel demand and patterns on major highway and arterial systems.

A full one-third of the work trips originating in the PSA are destined for areas within the PSA. Additionally, Central Los Angeles, including the Central Business District, is the number one ranked destination zone for external trips that originate in the PSA with over 50,000 daily trips (25 percent of external trips). The Eastside Transit Corridor Phase 2 project would provide an east/west transit spine to serve both the internal and external travel market. Figures 1-20 and 1-21 illustrate travel patterns to and from the Eastside PSA using spider diagrams.

[13] Freedman Tung & Bottomley, ftburbandesign.com/WhittierBlvd.SpecificPlanandStreetscape
[14] Freedman Tung & Bottomley, ftburbandesign.com/Whittier_Blvd._Specific_Plan
[15] City of Whittier, insidewhittier.com/cgi-bin/store.cgi?&Category=uptown
[16] SCAG 2004 RTP Chapter 2
[17] SCAG 2004 RTP Executive Summary
[18] SCAG 2004 Draft RTP EIR

Travel patterns identified in Year 2000 factored census data taken from the Census Transportation Planning Package (CTPP) indicate the following:

- Central Los Angeles, including the CBD, is the number one rank destination zone for work trips produced in the greater Eastside area with over 50,000 daily trips (nearly 25 percent of external trip destinations).
- The Metro rail network provides access through the Union Station hub to Pasadena and Long Beach – The greater travel zones, which include Pasadena (e.g., western San Gabriel) and Long Beach (e.g., Gateway Cities), together comprise a destination market shed of another 70,000 daily work trips produced from the greater Eastside area (nearly 30 percent of external trip destinations).
- Work trips internal to the greater Eastside area comprise nearly 115,000 daily trips, or about 40 percent of all trips – expansion of transit coverage within the PSA could tap into this market.
- Three areas currently served by the Metro rail and bus network, Central Los Angeles, Western San Gabriel Valley, and the South Bay, comprise nearly 70 percent of the destinations for Eastside trips – therefore expansion of transit within the PSA could potentially serve a high proportion of residents.
- There are even greater numbers of trips attracted to Eastside destinations than trips produced in the Eastside PSA. Many of these trips originate in zones to the north, south and west, which are served by the Metro Rail system. The Eastside Transit Corridor Phase 2 will provide a rail spine traversing the greater Eastside area that in conjunction with a robust bus grid provides transit service for inbound trips.

Summary

Identifying key activity centers, potential development sites, as well as major trip origin and destinations within the PSA, are important aspects of evaluating the travel market in relation to the proposed fixed transit alternative. The potential development projects dispersed throughout the PSA create areas effective for transit use. By analyzing and integrating land use and origin and destination, these development projects can attract new trips to and from the PSA and account for potential transit-using communities. The highest level of trip activity can be served by the proposed transit investment for trips to work, school, shopping, recreation, entertainment, regional destinations, etc.

Trip origin and destination identifies the likely trip generators in the Eastside and region, including major residential, retail, and employment centers. Preliminary projections for Year 2030 show travel patterns continuing from the Eastside PSA to Central Los Angeles, but with nearly 33 percent growth over existing conditions. These same preliminary travel projections show that construction of an extension of the light rail line to the vicinity of I-605 would

increase Gold Line rail trips by about 40 percent over the amount with only the Phase 1 project (e.g., daily rail trips in the range of 30,000 to 45,000 with Phase 1 alone may increase to as high as 40,000 to 60,000 with the extension). Potential travel markets would benefit from an extension of the Metro Gold Line Eastside Extension Phase 1. As population growth outpaces the rest of the region, the need to respond to travel demand and alternative transportation, such as a fixed transit route, becomes more evident.

1.3.6 Community Factors

Community factors indicative of transit dependency and other socioeconomic factors are considered as part of the AA study process. A meaningful portion of Los Angeles County's transit dependent population lies within the PSA, a trend that is projected to continue through 2030. Transit dependent factors take into account the population's elderly (65+ years) and young (age 18 and under), low-income households, number of households with zero vehicles, and public transportation users. A higher concentration of transit dependent communities is found in the western portion of the PSA. These communities are in closer proximity to downtown Los Angeles and benefit from a higher concentration of Metro Bus routes. Moving further east through the PSA, transit dependent communities are served primarily by local circulator bus services. Providing an extended fixed-guideway transit system beyond the current terminus of the Metro Gold Line Eastside Extension would allow transit dependent communities further east increased mobility and connectivity to regional as well as local services.

Household Income

Socioeconomic trends in the PSA are correlated to transit-dependent communities; household income is an important factor. In 2005, the PSA had about 79,000 low-income households, about 72,000 medium income households, and only about 25,000 high-income households. Low-income households include those households considered to be living in poverty. The US Census Bureau's defined 2005 poverty threshold is an annual average salary of $12,755 for a two-person household. Low-income households represented about 45 percent of the PSA's total households. The high proportion of low-income households increases the need for public transit. Figure 1-22 shows the distribution of low-income households in 2005. A substantial number of census tracts within the PSA have greater than 1,000 low-income households. These are found in areas such as Monterey Park, South San Gabriel (area of unincorporated Los Angeles County), Rosemead, Montebello and Whittier. Figure 1-23 shows the distribution of low-income households in 2030. In the PSA, low-income households are projected to increase from about 80,000 in 2005 to about 99,000 in 2030.

Figure 1-22 Work Trips to PSA
Eastside Transit Corridor Phase 2 Project

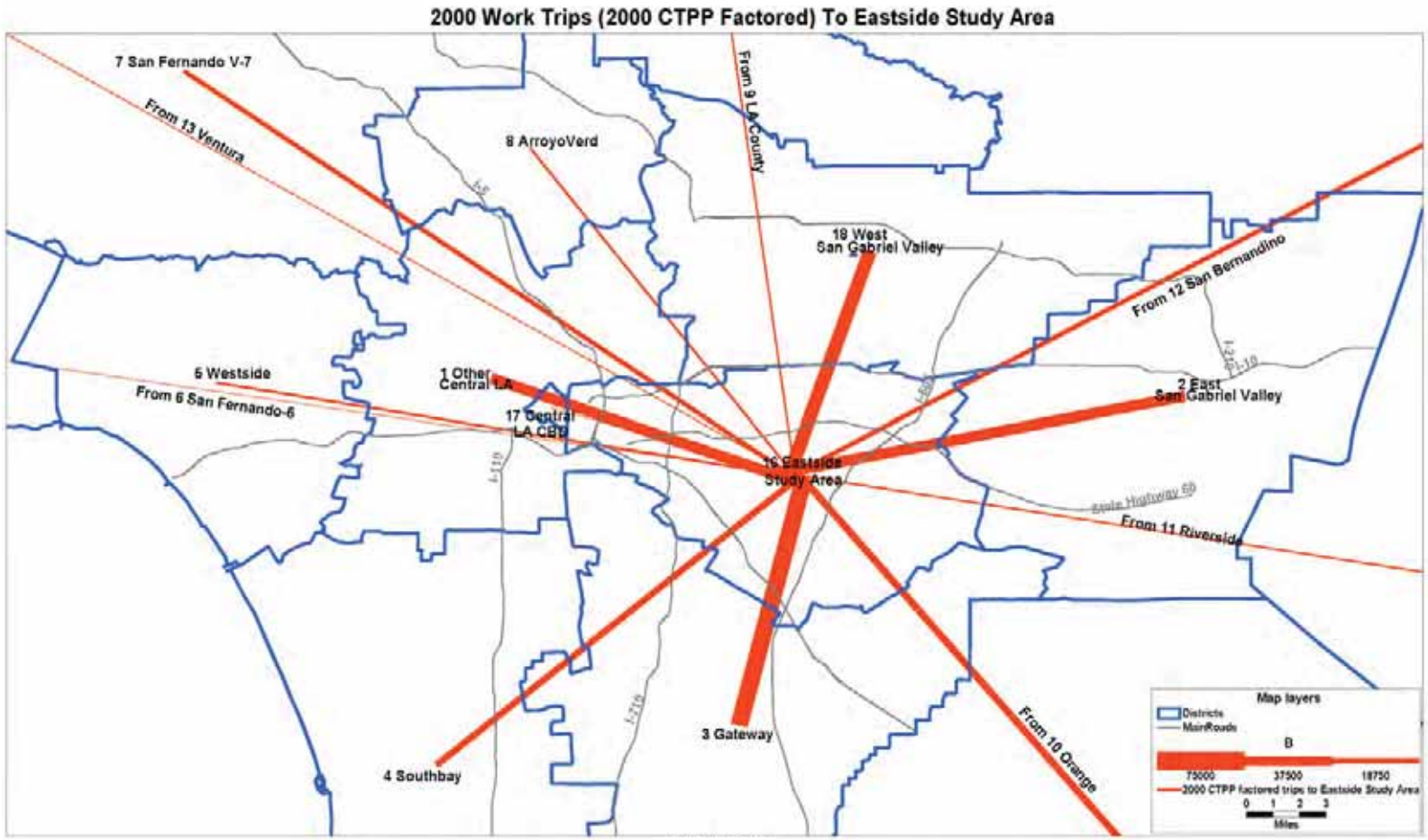
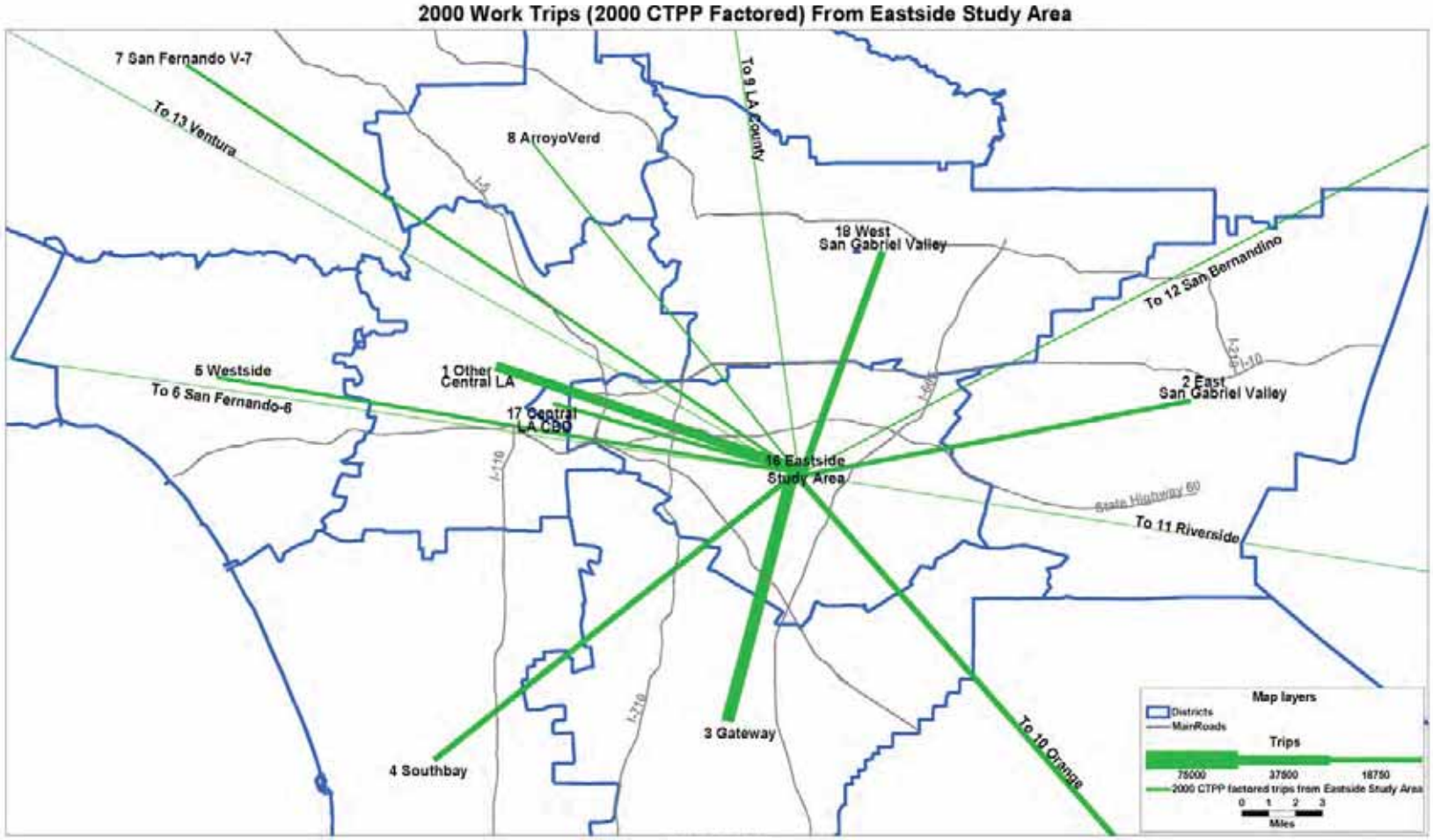


Figure 1-23 Work Trips from PSA
Eastside Transit Corridor Phase 2 Project



Age Distribution

Many of the PSA residents are young: 32 percent are age 18 years and under and only ten percent are elderly (age 65 years and over). Figure 1-24 shows the distribution of residents age 18 or younger in the PSA. The population age 18 and younger is spread throughout the PSA. Conversely, the percentage of elderly residents is concentrated around the City of Monterey Park, where over 40 percent of the population is over 65 or older. Figure 1-25 shows the distribution of residents age 65 and over in the PSA. Young and elderly residents are more likely to depend on public transit because of inability to drive or lack of vehicle accessibility.

Public Transportation Ridership and Vehicle Accessibility

Many of the households in the PSA have no car and rely on public transit for commuting needs. Approximately 16 percent of households in the PSA had no vehicle. Figure 1-26 shows the distribution of households with no available vehicles. In the western portion of the PSA, many tracts had over 25 percent of the households without a car. A high concentration of public transit usage is also present in the western portion of the PSA, with additional high concentrations in Commerce, Montebello, Rosemead, El Monte, Pico Rivera, and Uptown Whittier. Figure 1-27 shows the number of people age 16 and older that relied on public transportation in 2005. When comparing vehicle accessibility and public ridership patterns in the PSA, the trends suggest that even households with one or more cars have a higher propensity to use public transportation. Table 1-13 summarizes the transit dependent characteristics in the PSA relative to LA County.

Summary

As the community factors in the Eastside PSA increase (such as transit inaccessibility and numbers of low and medium households), heavy reliance will continue to be placed on public transportation and alternative modes of travel. Given that 16 percent of households in the PSA did not own an automobile, mobility problems are marked by lack of transit access. Many transit dependent households affected by accessibility need improved transit service and connections to jobs, educational, and cultural opportunities within the Eastside PSA and throughout the larger Los Angeles region.

1.4 Goals and Objectives

The goals and objectives of the Eastside Transit Corridor Phase 2 define the Methodology for evaluating a fixed guideway investment. Broadly the goals of the project are to provide a transit connection to the Metro Gold Line Eastside Extension currently under consideration, link communities further east of Los Angeles to the regional transit network, to improve mobility within the PSA by enhancing transit options, and to plan for projected growth in a sustainable manner.

Table 1-13 Transit Dependent Demographic Information

	PSA		LA County		PSA % of LA County
	Number	%	Number	%	
Population	673,283	100%	10,010,315	100%	6.7%
Under 18 years	204,498	30.4%	2,798,604	28%	7.3%
Over 65 years	63,862	9.5%	926,670	9.3%	6.9%
Households	175,983	100%	3,298,210	100%	5.3%
No vehicle households	60,276	34.3%	671,214	20.4%	9.0%
Low-income households	79,218	45%	1,481,896	44.9%	5.3%
Total employment	335,820	100%	4,644,010	100%	7.2%
Use public transportation	17,439	5.2%	254,091	5.5%	6.9%

Source: SCAG, 2005 data and 2030 projections

The specific goals identified as part of the AA study methodology have been shaped by input from agency coordination, and stakeholder and community engagement. These specific goals have been organized in accordance with FTA New Starts criteria, and include:

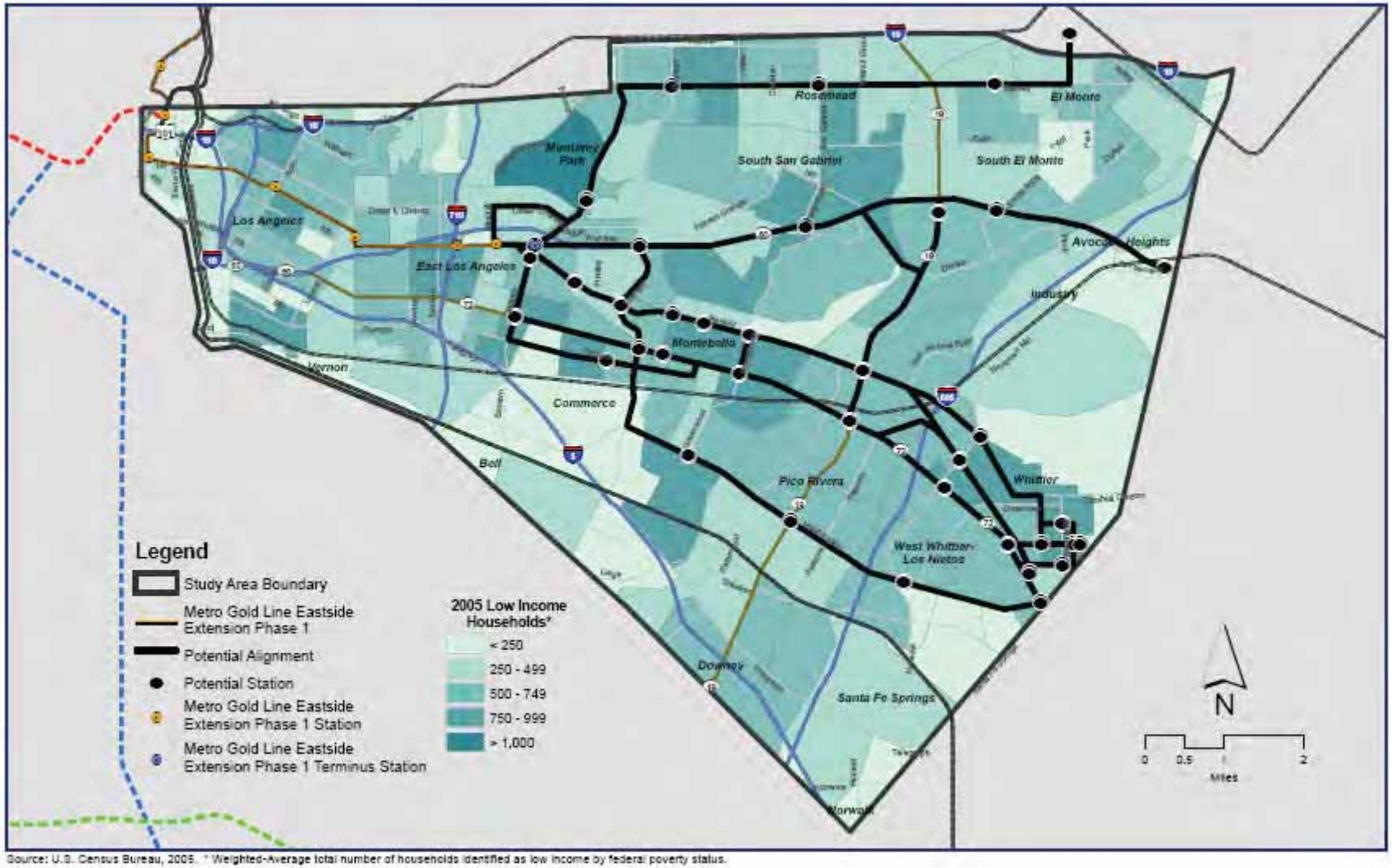
- **Goal 1**: Improve Mobility, Accessibility and Connectivity of the Transit System and Region
- **Goal 2**: Support Local land Use Objectives
- **Goal 3**: Cost Effectiveness
- **Goal 4**: Plan for projected growth in an environmentally sustainable manner
- **Goal 5**: Meet the Needs of the Transit Dependent
- **Goal 6**: Respond to Community Needs and Support

Section 2 of this report provides detailed information on Goals, Objectives and Evaluation Criteria used in the screening and selection of the proposed alternatives.

1.5 Mobility Problem Summary

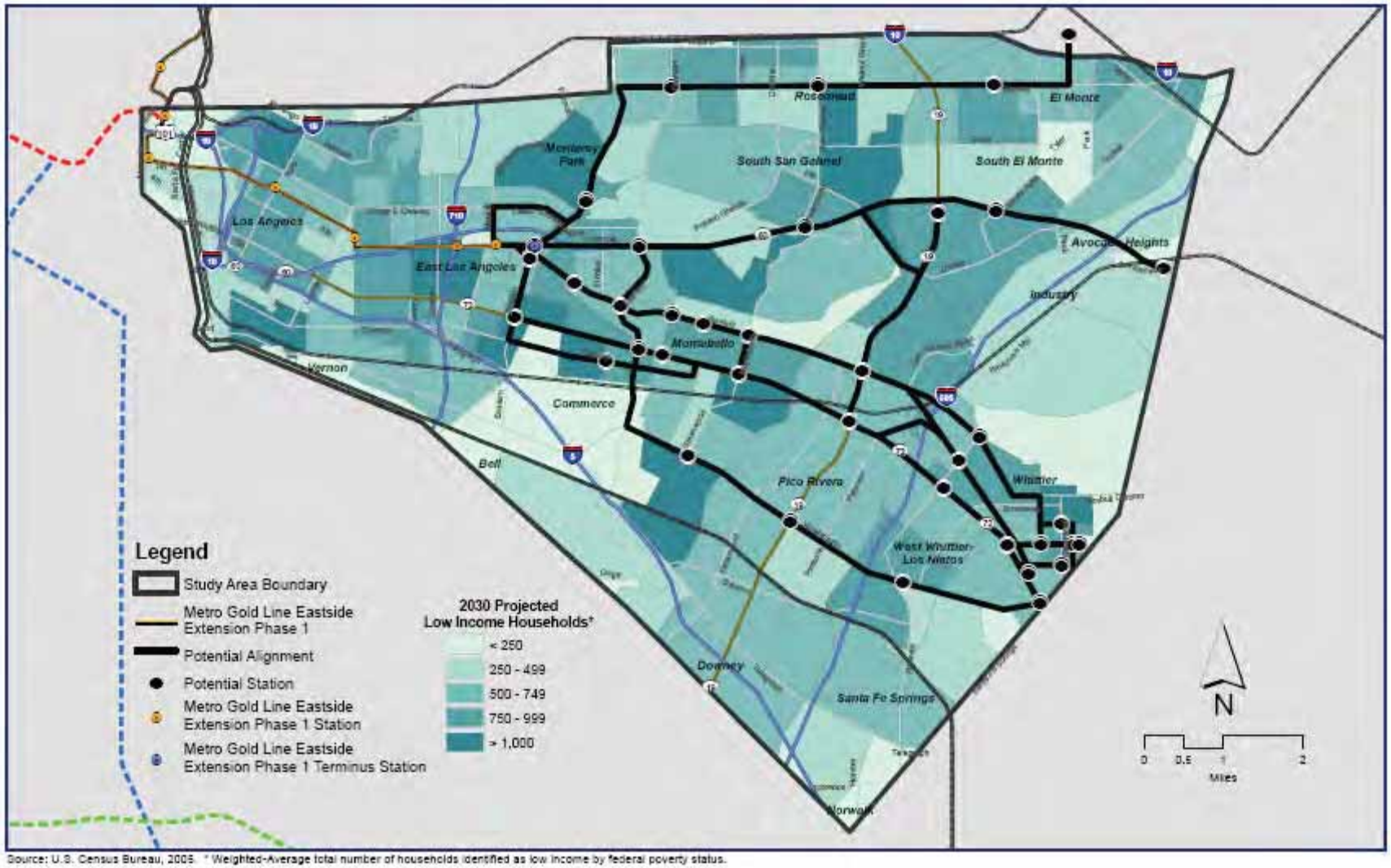
The Eastside PSA is a mature, urban area with high levels of population density and projected population growth. Residents within the PSA will continue to face local and regional traffic congestion in their daily commutes as they travel to employment centers further west. Current and future transit investments in the Long Range Transportation Plan are limited in the PSA. With significant population and employment growth projected over the next 20 years, residents of the Eastside would benefit from a fixed guideway investment that would provide access within the PSA and connect communities to jobs, universities, retail and entertainment centers in the Los Angeles region. A summary of key points regarding the Purpose and Need for the Eastside Transit Corridor Phase 2 is provided below.

Figure 1-24 2005 Low-income Households



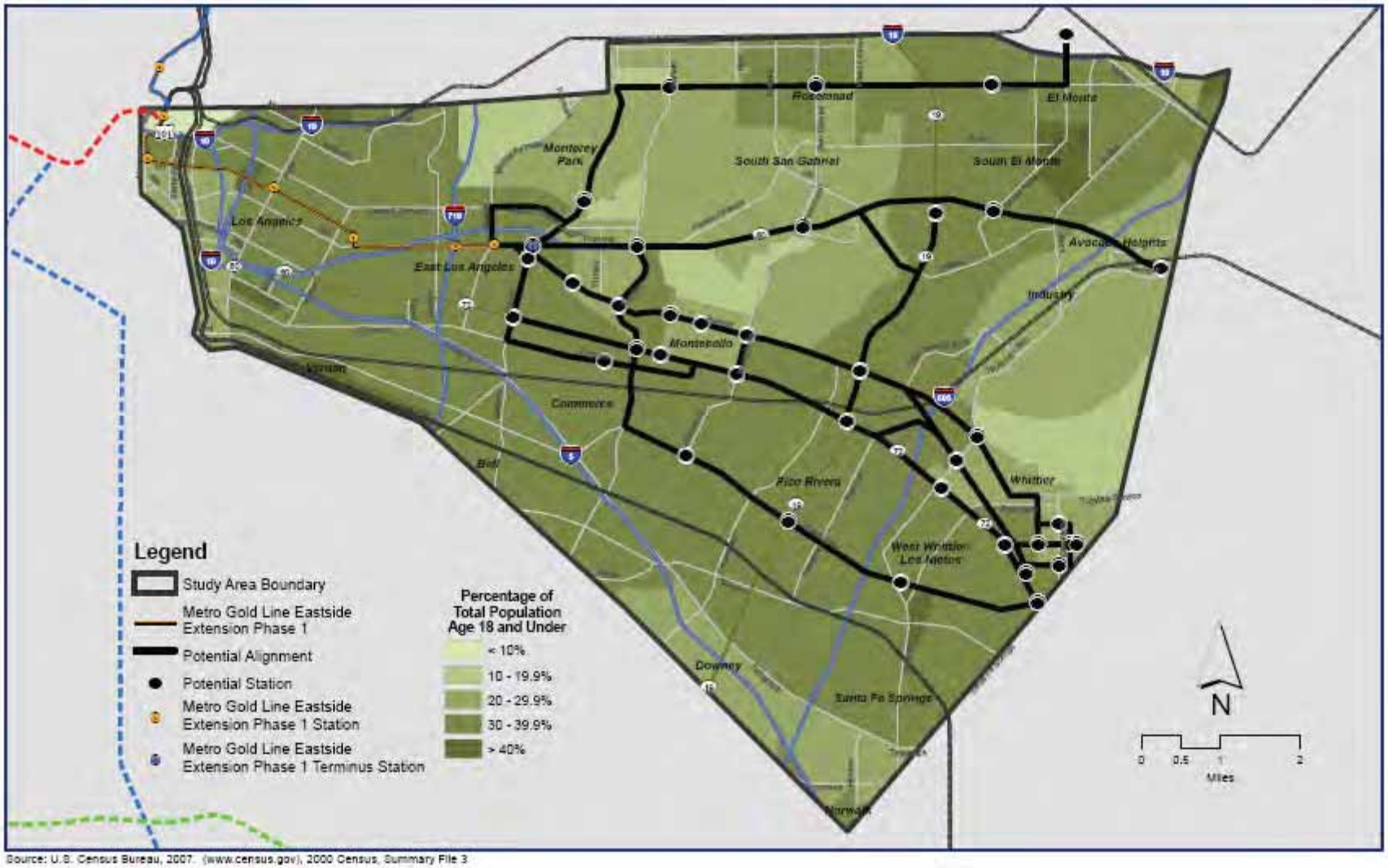
Source: U.S. Census Bureau, 2005. * Weighted-Average total number of households identified as low income by federal poverty status.

Figure 1-25 2030 Low-income Households



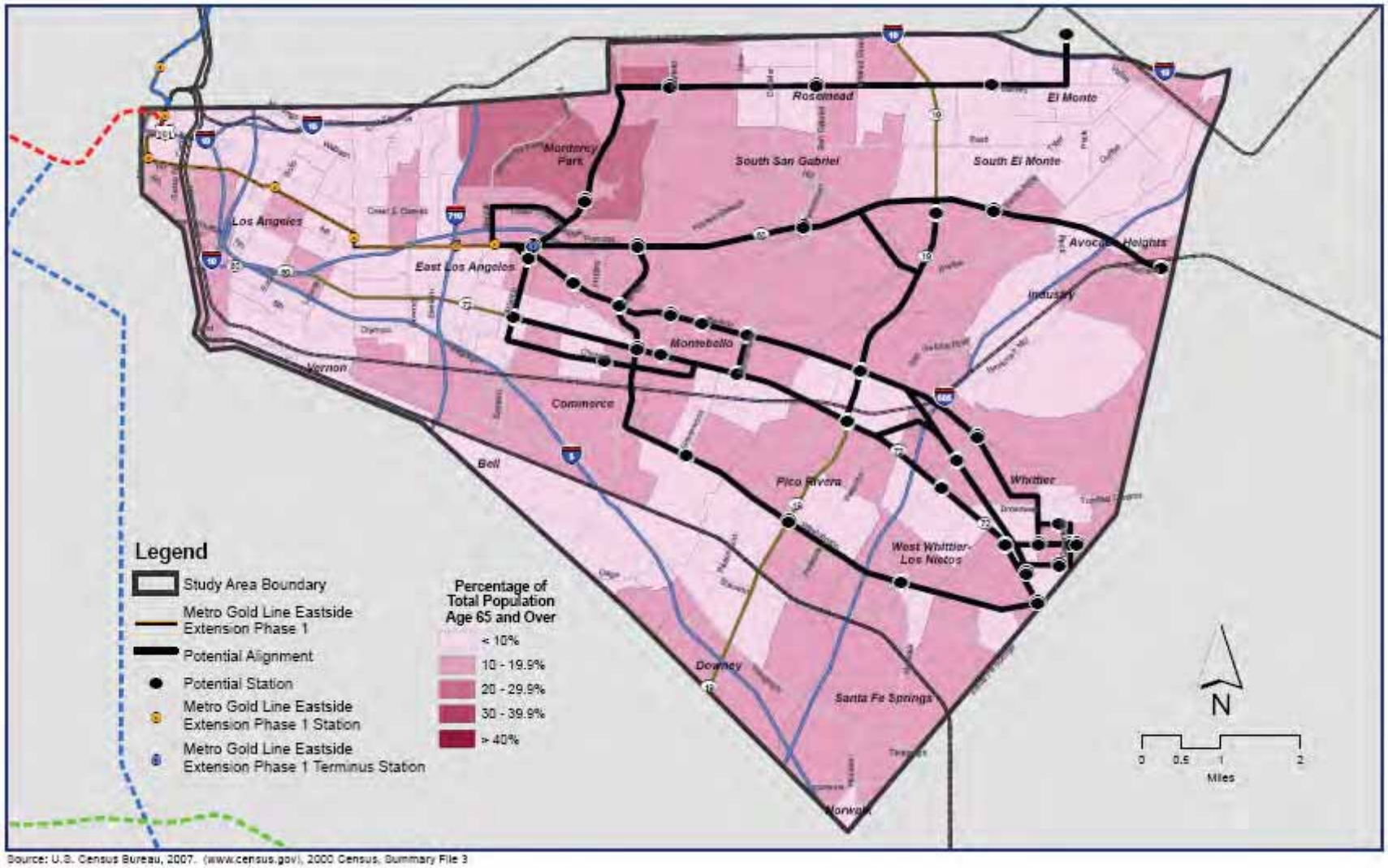
Source: U.S. Census Bureau, 2005. * Weighted-Average total number of households identified as low income by federal poverty status.

Figure 1-26 Population Age 18 and Under



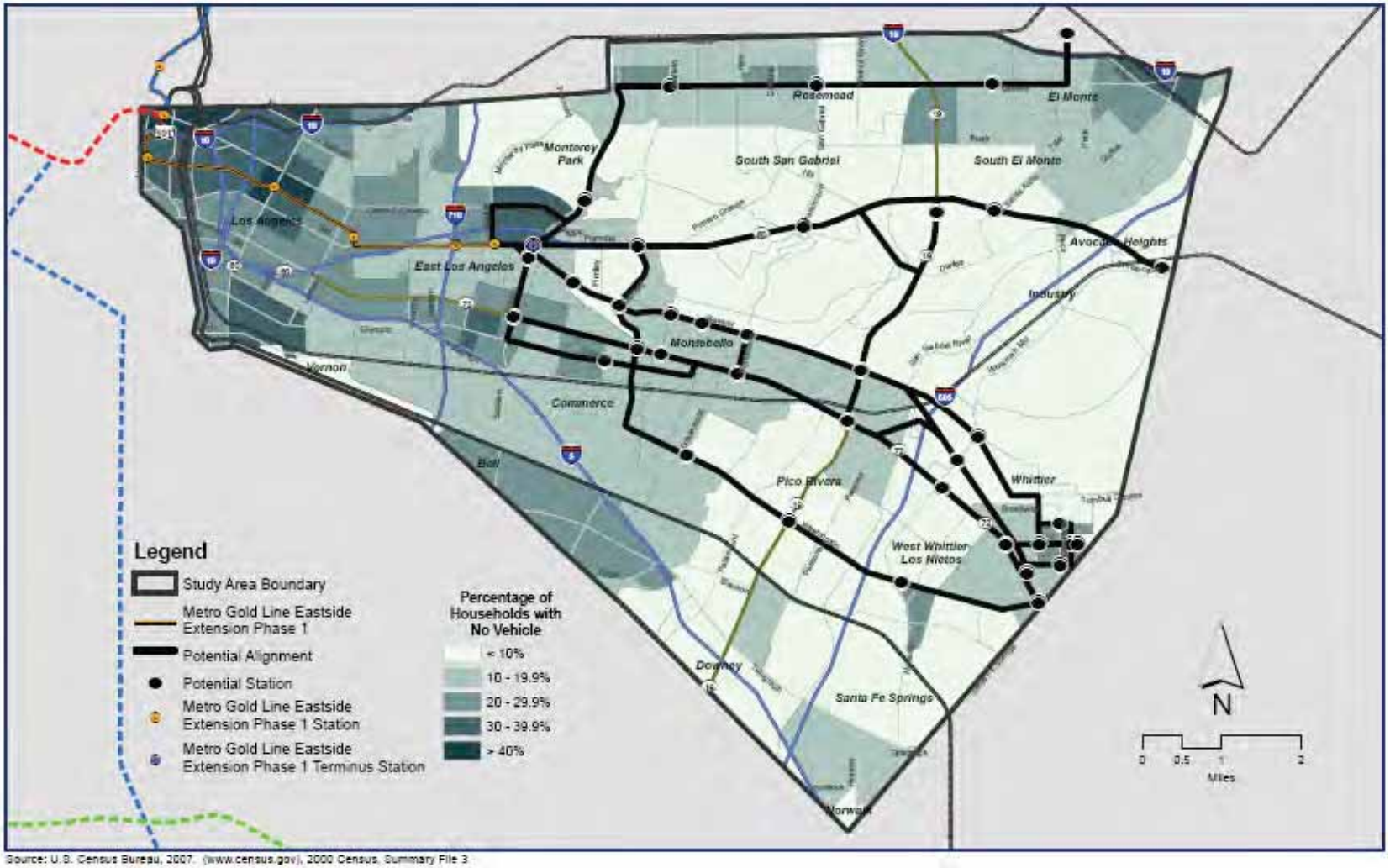
Source: U.S. Census Bureau, 2007. (www.census.gov), 2000 Census, Summary File 3

Figure 1-27 Population Age 65 and Over



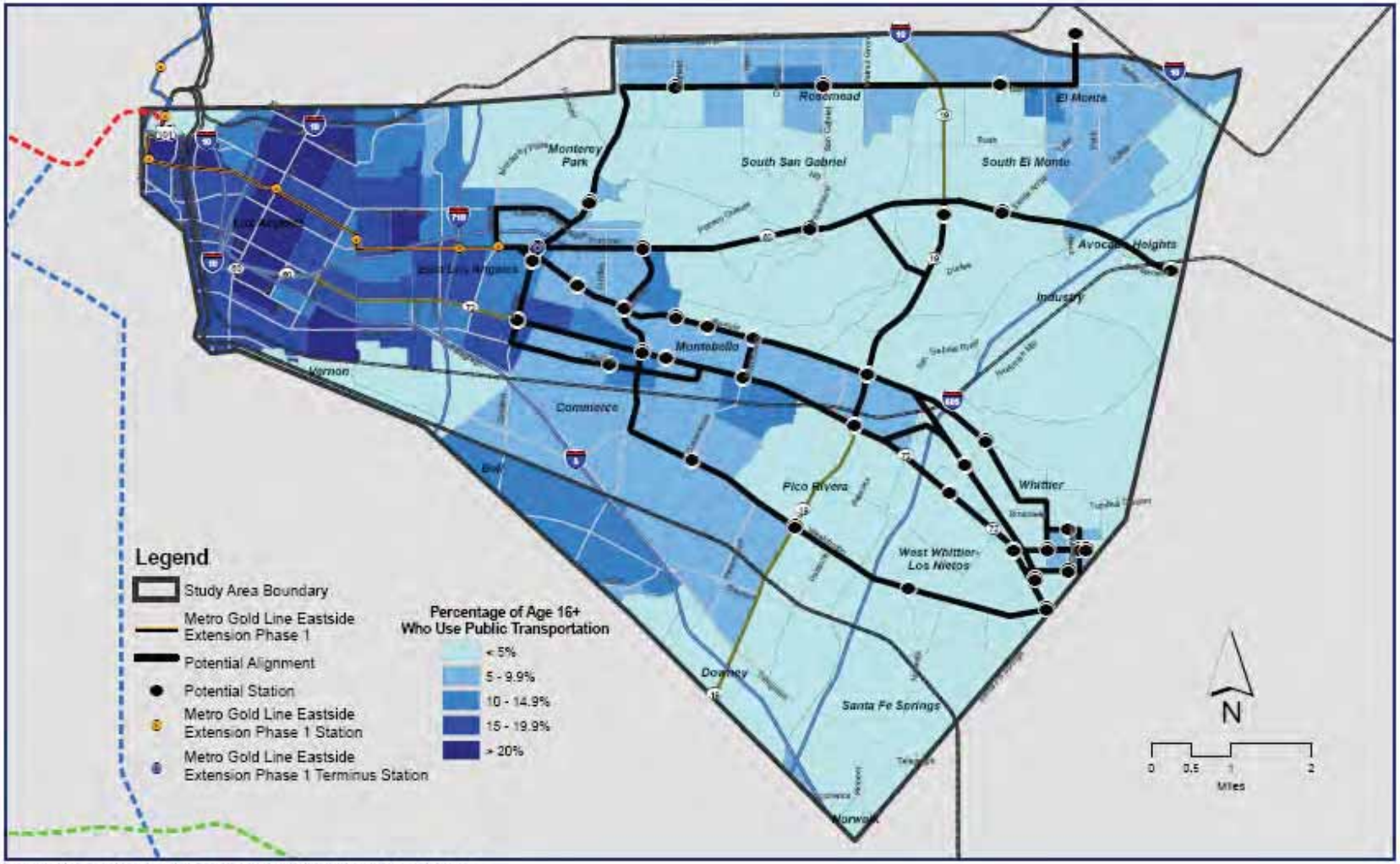
Source: U.S. Census Bureau, 2007. (www.census.gov), 2000 Census, Summary File 3

Figure 1-28 Percentages of Zero Vehicle Households



Source: U.S. Census Bureau, 2007. (www.census.gov), 2000 Census, Summary File 3

Figure 1-29 Population Age 16 and Over Who Use Public Transportation



Source: U.S. Census Bureau, 2007. (www.census.gov), 2000 Census, Summary File 3

A fixed guideway investment in the Eastside Transit Corridor would serve to:

- Accommodate future population growth by providing increased mobility options for the 830,000 residents expected by 2030, a population greater than the current population of the City of San Francisco;
- Increase access to commercial, recreational, and entertainment activity centers within in the PSA;
- Provide a transit alternative to the high level of automobile congestion on arterial and highway networks in PSA, three major freeways serving the area have a LOS of F during peak hours;
- Leverage the investment in the phase 1 project by increasing Eastside Gold Line rail ridership by about 40 percent with a phase 2 extension to the vicinity of I-605;
- Extend fixed guideway transit access to Central Los Angeles and Los Angeles CBD, which is the number one ranked destination area for trips produced from the greater Eastside area (25 percent of external trips);
- Provide the opportunity to serve the PSA through the greater Metro rail and bus network market area to the west, which comprises more than 50 percent of external trip destinations;
- Provide a fixed guideway within the greater Eastside area which provides an east-west spine for internal travel which accounts for nearly 40 percent of trips made; and
- Increase rail transit investment in a large area east of the Los Angeles CBD that is currently not served by existing and committed rail transit system.

1.6 Role of the AA Study

The Los Angeles County Metropolitan Transportation Authority (Metro) has initiated an Alternatives Analysis (AA) study to evaluate potential alternatives for the second phase of the Metro Gold Line Eastside Extension currently under construction. The Metro Gold Line Eastside Extension (Extension) is a six mile, eight station light rail transit line currently under construction and anticipated to be operational by 2009. The AA will identify and evaluate potential alternatives to extend transit service east from the terminus of the Metro Gold Line Eastside Extension. The alternatives developed as part of this process have been evaluated and screened in order to narrow the alternatives down to a more promising set of recommendations.

During the AA study phase the project team has undergone extensive research and analysis in developing the study recommendation. The process included:

- Consideration of alternatives previously identified in the 2000 Major Investment Study
- Input received from the community involvement effort including input from stakeholders, agencies, local jurisdictions and the public as part of the Early Scoping process
- Analysis of regional and sub-regional destinations and land use resulting in potentially promising candidate routes and station locations
- Consideration of modal and configuration options with regard to the "fit" or applicability to the PSA routes, taking into account land use, physical constraints and community characteristics
- Extensive field review and preliminary engineering of PSA opportunities and constraints relative to candidate alignments

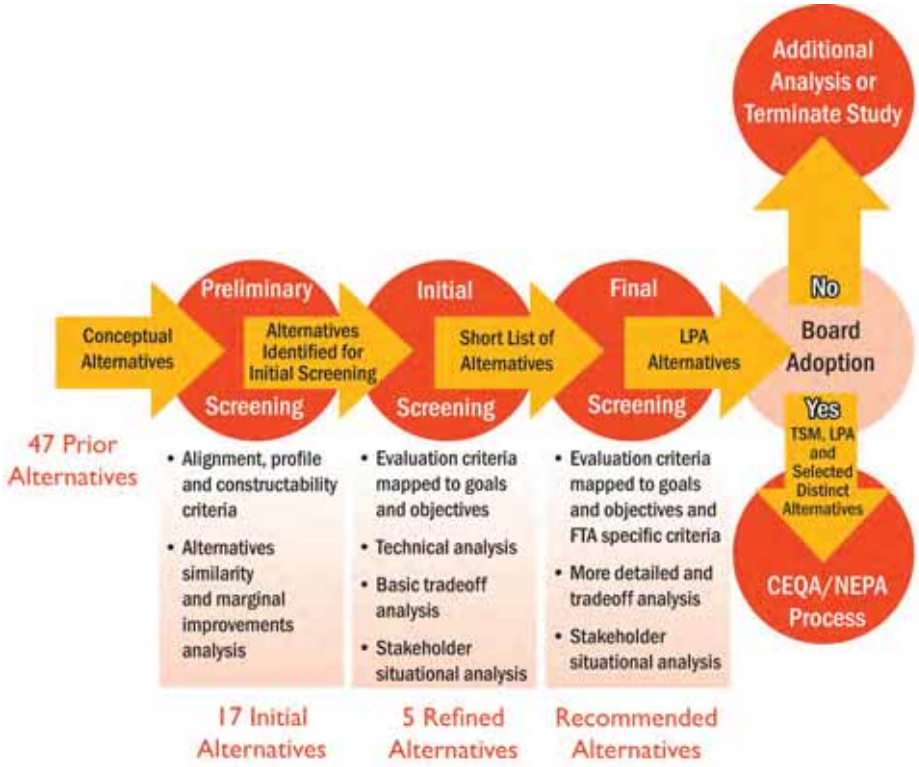
This Final Comparative Analysis of Alternatives Report documents the AA study process and analysis of alternatives as part of the Eastside Transit Corridor Phase 2. The results of the AA study provide decision makers the information needed to approve further study as part of an EIR/EIS.

2.0 ALTERNATIVES CONSIDERED

2.1 Screening and Selection Process

The *Eastside Transit Corridor Phase 2 AA* study included three phases of screening: preliminary, initial, and final. Each process built on the previous, including more specific evaluation criteria. The methodology for the screening process included goals, objectives and evaluation criteria that were applied to the proposed alternatives to determine their relative performance and areas for further refinement. The *Eastside Transit Corridor Phase 2 Methodology Report* provides detailed information on the evaluation criteria and screening process. Figure 2-1 below illustrates the AA study screening process.

Figure 2-1 AA Screening Process



Source: Graphic developed by CDM. 2008.

The preliminary screening evaluated 47 alternatives, which were identified through the previous corridor studies and the early scoping process. Preliminary alternatives were eliminated and refined based on stakeholder input, fatal flaws, and technical faults. The result of the preliminary evaluation resulted in 17 "feasible alternatives". These 17 alternatives were

subjected to the initial screening process. The highest performing and most promising alternatives based on the comparative analysis were then refined to a smaller set of five alternatives. The five "refined alternatives" are the subject of the final screening process, which is detailed throughout this report. A comparative analysis of these alternatives, based on the project goals, objectives and evaluation criteria, reveals the recommended set of alternatives that best meets the corridor needs. Subsequent sections of this report provide results on the comparative evaluation and recommendations to move into the Draft EIR/EIS process.

These goals, objectives and criteria, used to evaluate the alternatives were developed in accordance with FTA New Starts guidelines, Metro objectives for the corridor and comments received from the community and stakeholders. Figure 2-2 below illustrates the qualitative and quantitative criteria used in both the initial and final screening process. The criteria range from the effects on surrounding land uses to financial feasibility and operational constraints. The criteria are used to assess each alternative's potential performance relative to other alternatives.

Initial Screening

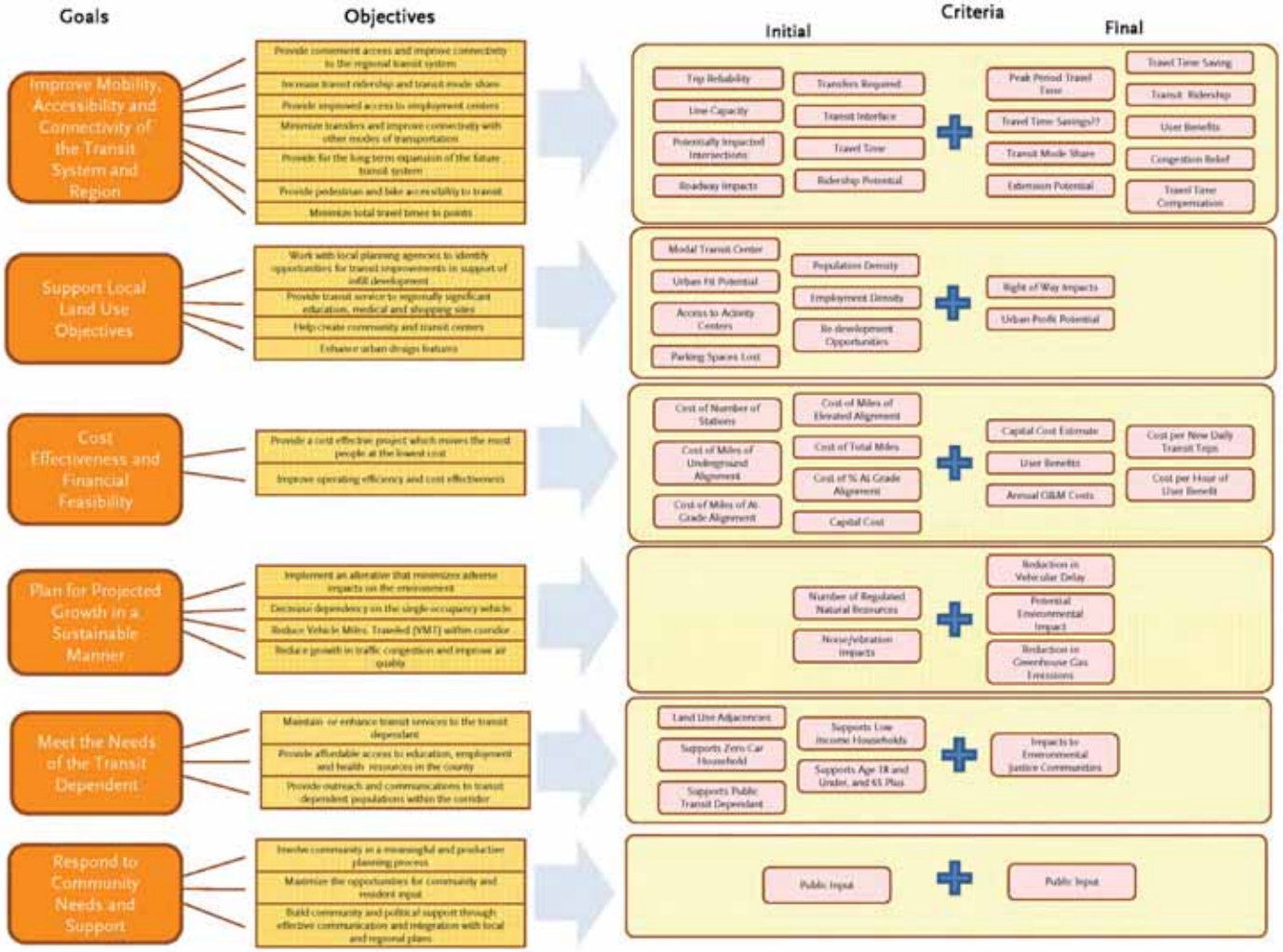
The initial set of conceptual alternatives represented appropriate alignments along the various corridors within the PSA. A total of 17 Initial Conceptual Alternatives were identified for the initial screening process, including 14 light rail alternatives and three bus rapid transit options.

Subsequently, a detailed screening of the initial 17 alternatives was conducted to identify which of the alternatives performed best based on the project goals, objectives and evaluation criteria.

The methodology used in the initial screening process involved two levels of analysis. First, the initial screening evaluation criteria was applied to each alternative, results were ranked high, medium, or low per objective. Each alternative was then given an overall ranking for how well it meets the objectives of each individual goal. Second, the goal rankings for each alternative were compared. The alternatives that showed the highest ranking and greatest promise in meeting all of the six goals were selected to move forward into the next phase of study. Dependant

Table 2-1 illustrates the ranking of the comparative evaluation of initial screening applied to the 17 initial alternatives. The alternatives are grouped by corridor and mode: SR-60 and North, Beverly Blvd., Whittier Blvd., Washington Blvd., and Bus Rapid Transit. The *Eastside Transit Corridor Phase 2* AA Initial Screening Report provides detailed information on the analysis and evaluation of the initial screening process.

Figure 2-2 Evaluation Criteria in Initial & Final Screening



Final Screening

The initial screening process resulted in the selection of five (5) alternatives. The five alternatives were further refined to incorporate their most promising characteristics and features. For example, the Washington alignment was refined to include additional aerial segments to improve travel time, and avoid traffic issues identified in the initial screening process. These five refined alternatives selected for final screening are discussed in greater detail in subsequent sections. The final alternatives are described in detail in section 2.2 of this report.

In addition, the final screening process involved the application of more detailed evaluation criteria, developed during alternative refinement, including detailed cost estimates and travel forecast modeling. The result of the final screening process is the set of recommended alternatives.

The project team has identified a recommended set as a result of quantitative and qualitative analysis outlined in the final screening process, which in addition to quantitative measures and modeling, takes into consideration, agency stakeholder, and community feedback. The recommended alternatives will be presented to the Metro Board in the Winter of 2009. If approved, then these recommendations will undergo further detailed analysis during the subsequent Draft EIR/EIS. Findings from the final screening and comparative evaluation process are presented and discussed in subsequent sections of this report. The report concludes with the comparative analysis and recommendations. In addition, proceeding sections describe all the elements that served as the basis for the initial screening process and criteria development, including past studies, current conditions, and scoping and public involvement.

Table 2-1 Ranking of the Comparative Evaluation of Initial Screening

		Alternative	Goal 1 Improve Mobility, Accessibility and Connectivity	Goal 2 Support Local Land Use Objectives	Goal 3 Cost Effectiveness and Financial Feasibility	Goal 4 Plan for Projected Growth in a Sustainable Manner	Goal 5 Meet the Needs of the Transit Dependent	Goal 6 Respond to Community Needs and Support
SR-60 and North	1	Atlantic - Garvey - Santa Anita to El Monte Busway	Medium	High	Medium	Low	Medium	Medium
	2	Pomona Blvd - SR-60 to I-605	High	Medium	High	High	Low	Medium
	3	Pomona Blvd - SR-60 - Rosemead - Whittier to Whittier/Washington	Medium	Medium	Low	Medium	Medium	High
	4	SR-60 - South San Gabriel - Rosemead - Beverly to Whittier Greenway	Low	High	Medium	Medium	Low	Medium
Beverly Boulevard	5	Beverly Mixed Flow LRT to Uptown Whittier Loop	Low	Medium	High	Medium	High	Medium
	6	SR-60 - Garfield - Beverly LRT - Whittier Greenway to Mar Vista	Medium	Medium	High	Medium	Medium	Medium
	7	Pomona Blvd - SR-60 - Garfield - Beverly Aerial - Whittier Greenway to Mart Vista	High	Medium	Medium	Medium	Medium	Medium
	8	Beverly - Montebello - Whittier Subway to Whittier/Philadelphia	High	High	Low	Medium	Medium	Medium
Whittier Boulevard	9	Pomona Blvd - SR-60 - Garfield - Whittier Mixed Flow LRT to Uptown Whittier	Low	High	Medium	Medium	High	High
	10	Atlantic - Whittier Underground & Aerial/ At-grade along Whittier Greenway to Mar Vista	Medium	Medium	Medium	Medium	Medium	High
	11	Pomona Blvd - SR-60 - Garfield - Whittier Aerial to Whittier/Philadelphia	High	High	Medium	Medium	Medium	High
	12	Atlantic - Olympic - Whittier - Philadelphia to Philadelphia/ Painter	Medium	High	Medium	Medium	High	High
Washington	13	Pomona Blvd - SR-60 - Garfield Aerial - Washington LRT to Whittier/Washington	Medium	High	High	Medium	Medium	High
	14	Pomona Blvd - SR-60 - Washington Aerial to Whittier/Washington	Medium	High	Medium	Medium	Medium	High
BRT	15	Pomona Blvd - SR-60 Busway to I-605	Medium	Medium	Medium	High	Low	Low
	16	Beverly Bus Rapid Transit to Philadelphia/ Painter	Low	Medium	High	High	High	Low
	17	Whittier Bus Rapid Transit to Whittier/ Washington	Low	High	High	High	High	Medium

High

Medium

Low

2.1.1 Metro/FTA Scoping

Early scoping was conducted in order to inform the public, organizations, and local, regional, state, and federal agencies on all issues concerning the project, including benefits, costs, and impacts. The early scoping period was also intended to address needs for improvements in the corridor and identify how a project will fit into a long range transportation plan. As part of the AA process, the Early Scoping Period for the Eastside Transit Corridor Phase 2 project occurred over a 30-day period in November 2007 and was initiated with the publication of the Early Scoping Notice in the Federal Register on October 31, 2007. Placement of the legal notice provided information with regards to the study, its associated meetings, as well as other opportunities to provide public comment concerning the scope of the AA. In total, there were four early scoping public meetings and a resource meeting held between November 8th and 15th with over 214 community members and interested parties involved. A summary of scoping activities including meeting schedules, comments received, and materials can be found in the *Eastside Transit Corridor Phase 2 Early Scoping Outreach Report,* March 2008.

In addition, the project team conducted ongoing outreach and stakeholder involvement. A second round of public meetings was held in April of 2008. Ongoing meetings with stakeholder groups, elected officials, and community members have also continued throughout the process. Input from this process is discussed in more detail later in this report, in the section on Public Involvement Process and Agency Coordination.

2.1.2 Screening Criteria

The goals and objectives of the Eastside Transit Corridor Phase 2 have been developed out of the extensive corridor and systems planning studies carried out over the last ten years, including Metro Draft 2008 Long Range Transportation Plan and the Eastside Transit Corridor Re-Evaluation/Major Investment Study process. The process of development of these goals in the AA also complies specifically with the Federal Transit Administration (FTA) requirements related to alternatives analysis for New Starts funding. The goals, objectives and evaluation criteria are also consistent with the Regional Transportation Plan for the Southern California Association of Governments (SCAG) Region. Strong emphasis is placed on improving mobility by supporting efforts to increase use of public transportation and reduce the reliance on single occupancy vehicles.

Based on regional efforts to improve land use and transportation coordination, past Metro corridor planning efforts, community involvement activities, and the Early Scoping process as part of the Eastside Transit Corridor Phase 2 AA study, the following goals and objectives were established. They are based on transportation and land use goals and objectives of the major government jurisdictions along the corridor, local cities and the County of Los Angeles.

There are six major goals and multiple objectives for the advancement of the Eastside Transit Corridor Phase 2 project. They are listed below:

Goal 1: Improve Mobility, Accessibility and Connectivity of the Transit System and Region

- Provide convenient access and improve connectivity to the regional transit system
- Reduce congestion by increasing transit ridership and transit mode split
- Provide improved access to employment centers
- Minimize transfers and improve connectivity with other modes of transportation
- Provide for the long term expansion of the future transit system
- Provide pedestrian and bike accessibility to transit
- Minimize travel times to points accessible from the Metro rail and bus network

Goal 2: Support Local Land Use Objectives

- Work with local planning agencies to identify and implement transit improvements in support of infill development
- Provide transit service to regionally significant education, medical and shopping sites
- Help create community and transit centers
- Identify joint development opportunities
- Enhance urban design features

Goal 3: Cost Effectiveness

- Provide a cost effective project that moves the most people at the lowest cost
- Improve operating efficiency and cost effectiveness

Goal 4: Plan for Projected Growth in an Environmentally Sustainable Manner

- Implement an alternative that minimizes adverse impacts on the environment
- Decrease dependency on single occupancy vehicle
- Reduce Vehicles Miles Traveled (VMT) within corridor
- Reduce growth in traffic congestion and improve air quality

Goal 5: Meet the Needs of the Transit Dependent

- Maintain or enhance transit services to the transit dependent
- Provide affordable access to education, employment and health resources in the County
- Provide outreach and communication to transit dependent populations within the project corridor

Goal 6: Respond to Community Needs and Support

- Involve community in a meaningful and productive planning process
- Maximize the opportunities for community and resident input
- Build community and political support through effective communication and integration with local and regional plans

2.1.3 Evaluation Criteria Development

In addition to the goals/objectives hierarchy, evaluation criteria that evaluate different performance measures were applied to each of the alternatives in the screening process. Evaluation criteria are very specific and detailed measures that were established for each of the goals for the purpose of measuring the performance of the alternatives. The evaluation criteria were developed in accordance with FTA guidance criteria, Metro corridor goals and feedback from stakeholders, the Technical Advisory Committee, and the public comments during the early scoping meetings. The evaluation process reduced the initial alternatives identified for screening to the current five refined alternatives.

As mentioned in sections 2.1 and 2.1.3, the evaluation criteria used in the initial screening were each linked to a specific methodology in the goals/objectives/criteria hierarchy. Table 2-2 below provides a detailed list of the evaluation criteria established for each goal and set of objectives.

Table 2-2 Goals, Objectives and Evaluation Criteria

Goal	Objectives	Initial Screening Criteria	Final Screening Criteria *(additional considerations)*
1 **Improve Mobility, Accessibility and Connectivity of the Transit System and Region** *Develop an efficient connection with the Metro Gold Line Eastside Extension that provides a greater number of transit options connecting residents and commuters to Union Station and all Metro transit services*	➢ Provide convenient access and improve connectivity to the regional transit system ➢ Increase transit ridership and transit mode share ➢ Provide improved access to employment centers ➢ Minimize transfers and improve connectivity with other modes of transportation ➢ Provide for the long term expansion of the future transit system ➢ Provide pedestrian and bike accessibility to transit ➢ Minimize travel times to points accessible from the Metro rail and bus network	➢ *Number of transfers required* ➢ *Interface with existing transit (number of stations that connect with existing bus routes, ranked High, Medium, Low)* ➢ *Travel time (Eastside Gold Line Extension terminus to Phase 2 end point)* ➢ *Ridership potential (number of riders ranked High, Medium, Low)* ➢ *Trip Reliability (ranked High, Medium, Low)* ➢ *Trip Capacity(ranked High, Medium, Low)* ➢ *Number of potentially impacted intersections (number where operational impacts may occur to reduce level of service)* ➢ *Parallel roadway congestion (ranked High, Medium, Low)*	➢ *Travel time savings (to Union Station compared to No-Build and TSM alternatives)* ➢ *Transit ridership potential (number of transit riders)* ➢ *Hours of transportation user benefits* ➢ *Congestion relief (reduction in highway travel demand in the PSA)* ➢ *Comparison of highway, bus and fixed guideway peak period travel times between major travel pairs (run times, headways, average speed, station spacing)* ➢ *Peak period travel time* ➢ *Estimated change in transit mode share* ➢ *Assessment of expandability*
2 **Support Local Land Use Objectives** *Integrate transit with local land uses to provide economic benefits and enhanced urban design*	➢ Work with local planning agencies to identify and implement transit improvements in support of infill development ➢ Provide transit service to regionally significant education, medical and shopping sites	➢ *Population density within ¼ mile of stations* ➢ *Employment density within ¼ mile of stations* ➢ *Re-development opportunities within ¼ mile of stations*	➢ *Number of Right-of-Way impacts* ➢ *Urban fit potential, including pedestrian accessibility and urban design enhancement opportunities*

Table 2-2 Goals, Objectives and Evaluation Criteria

Goal	Objectives	Initial Screening Criteria	Final Screening Criteria *(additional considerations)*
features to the local communities	➢ Help create community and transit centers ➢ Identify joint development opportunities ➢ Enhance urban design features	➢ *Potential for park-n-ride/multi modal transit center (based on existing and/or potential land use)* ➢ *Urban fit potential (qualitative list of benefits and problem locations)* ➢ *Provides access to activity centers (number of activity centers provided direct access)* ➢ *Number of parking spaces lost (ranked High, Medium, Low)*	

3 **Cost Effectiveness and Financial Feasibility**
Develop solutions that ensure capital costs are commensurate with benefits and ensure financial feasibility
	➢ Provide a cost effective project which moves the most people at the lowest cost
	➢ Improve operating efficiency and cost effectiveness
		➢ *Rough order of magnitude of Capital cost (ranked High, Medium, Low)*
		  ➢ *Number of stations*
		  ➢ *Miles of underground alignment*
		  ➢ *Miles of at-grade alignment*
		  ➢ *Miles of elevated alignment*
		  ➢ *Total miles*
		  ➢ *Percent of alternative that is at-grade*
		➢ *Capital cost vs. benefit (ranked High, Medium, Low)*
			➢ *Capital cost estimate*
			➢ *User benefits per passenger mile*
			➢ *Annual O&M costs*
			➢ *Annualized cost per new daily transit trips compared to No-Build and TSM alternatives*
			➢ *Annualized cost per hour of transit system user benefit compared to No-Build and TSM alternatives*

4 **Plan for Projected Growth in a Sustainable Manner** *Incorporate project within*	➢ Implement an alternative that minimizes adverse impacts on the environment ➢ Decrease dependency on the single	➢ *Number of regulated natural resources (number of potential wetlands, river crossings, parks intersected or adjacent)* ➢ *Potential Noise/Vibration Impacts*	➢ *Reduction in vehicular delay compared to No-Build* ➢ *Expected level of impact after mitigation to biological, social*

Table 2-2 Goals, Objectives and Evaluation Criteria

Goal	Objectives	Initial Screening Criteria	Final Screening Criteria *(additional considerations)*
the fabric of the local communities, to be developed in accordance with local plans and to minimize effects on the environment	occupancy vehicle ➢ Reduce Vehicle Miles Traveled (VMT) within corridor ➢ Reduce growth in traffic congestion and improve air quality	➢ *Land use adjacencies*	*and physical resources* ➢ *Potential for reductions in PM_{10}, NO_x and SO_x emissions*
5 **Meet the Needs of the Transit Dependent** *Evaluate solutions that provide enhanced mobility for transit dependent populations*	➢ Maintain or enhance transit services to the transit dependent ➢ Provide affordable access to education, employment and health resources in the county ➢ Provide outreach and communications to transit dependent populations within the corridor	➢ *Supports transit dependent populations (1/4 mile of stations)* ➢ *Zero car households* ➢ *Public transit dependent* ➢ *Low-income households* ➢ *Age 18 and under, and 65 plus*	➢ *Evaluation of potential disproportionate effects and risk to environmental justice populations related to construction activities*
6 **Respond to Community needs and support** *Develop solutions that involve community input and address community needs*	➢ Involve community in a meaningful and productive planning process ➢ Maximize the opportunities for community and resident input ➢ Build community and political support through effective communication and integration with local and regional plans	➢ *Public Input (based on PSA zones and early scoping meeting comments)*	➢ *Public Input (based on public workshop and comments)*

2.2 Screened Alternatives (Alternatives 1-5)

The screening process included the preliminary screening of all the conceptual alternatives. An initial evaluation of these alternatives resulted in a refined 17 alternatives, the alternatives identified for initial screening. The 17 alternatives identified for initial screening were analyzed in a detailed process against all the project goals and objectives. The criteria, which are linked to each overall goal, help identify which alternatives perform well in certain aspects as opposed to others. This trade off analysis is helpful in comparing not only quantitative totals, but qualitative socio-economic characteristics as well.

More detail of the results of the initial screening can be found in the *Eastside Transit Corridor Phase 2 Initial Screening of Alternatives Report,* April 2008. A total of five alternatives were identified that most fulfill the goals and objectives of the Eastside Transit Corridor Phase 2 Project.

Table 2-3 provides a detailed look at the screening process and the scores that were given to each alternative, based on specific criteria. A further screening of the alternatives through this analysis has resulted in the refinement of the five promising alternatives, and Table 2-3 is a summary of the scores and comments received for these recommended alternatives. The following five refined alternatives, which have undergone final screening, are described in greater detail in section 2.3:

- Final Alternative 1 – SR-60 LRT
- Final Alternative 2 – SR-60 Busway
- Final Alternative 3 – Beverly LRT
- Final Alternative 4 – Whittier LRT
- Final Alternative 5 – Washington LRT

2.3 Refinement of Alternatives

This section discusses the refinement of alternatives based upon considerations that were identified in the initial screening of alternatives. This section presents information on the engineering and urban design considerations factored into the refinement of alternatives.

Table 2-3 Ranking of Screened Alternatives

	Alternative	Goal 1 Improve Mobility, Accessibility and Connectivity	Goal 2 Support Local Land Use Objectives	Goal 3 Cost Effectiveness and Financial Feasibility	Goal 4 Plan for Projected Growth in a Sustainable Manner	Goal 5 Meet the Needs of the Transit Dependent	Goal 6 Respond to Community Needs and Support	Comments
SR60 LRT	Pomona Blvd - SR-60 to I-605	High	Medium	High	High	Low	Medium	• Potential to serve northern tier cities • Intercept of SR-60 traffic; Extensive aerial structure; No walkable service • Carry forward for detialed analysis - Refine stations & feeders
SR60 BRT	Pomona Blvd - SR-60 Busway to I-605	Medium	Medium	Medium	High	Low	Low	• Benefits of Alt. 2 with flexibility of rubber tired feeder service • Potential for combined HOV/bus lanes on SR-60; Forced transfer at Phase 1 terminus • Carry forward for detailed analysis
Beverly LRT	SR-60 - Garfield - Beverly LRT - Whittier Greenway to Mar Vista	Medium	Medium	High	Medium	Medium	Medium	• Direct route to central cities & potential end of line TOD • Impact to traffic capacity; potential for parking loss • Potentail impact to widen & at-grade alignment may not be feasible • Carry forward for detailed analysis - Consider aerial or mixed flow segments
Whittier LRT	Pomona Blvd - SR-60 - Garfield - Whittier Aerial to Whittier/ Philadelphia	High	High	Medium	Medium	Medium	High	• Grade separation lowers travel time; Reduced impact on traffic & parking • Higher cost than other Whittier alternatives; Aerial structure results in visual impact • Carry forward for detailed analysis - Consider aerial or mixed flow segments
Washington LRT	Pomona Blvd - SR-60 - Garfield Aerial - Washington LRT to Whittier/Washington	Medium	High	High	Medium	Medium	High	• Long run time offset by higher ridership; Lower cost due to at-grade configuration • Potential traffic capacity impacts; Pontential impact to adjacent land use • Carry forward for detailed analysis - Consider aerial segments

High ● Medium ● Low ●

2.3.1 Alternative 1 – SR-60 LRT

The SR-60 LRT alignment begins as an eastward extension of the Phase 1 project across S. Atlantic Blvd. then transitions to an aerial configuration using a combination of retained cut, retained fill and aerial trackway on columns to follow the south side of SR-60, largely within the existing right-of-way, east to the Crossroads Pwky. interchange east of I-605.

The screening analysis of this route alternative indicated the following key issues need to be considered in refinement of the alternative:

- Maximize potential for transit oriented development (TOD) at selected station sites;
- Provide park and ride and feeder bus connectivity; and
- Develop initial description of alignment to conform to freeway geometric constraints.

The following narrative addresses each principal segment, the design considerations, and the rationale for the recommended configuration.

Pomona Blvd. and Via Campo

The Eastside Extension Phase 1 project terminates at-grade in the median of Pomona Blvd. immediately west of Atlantic Blvd. As such, the simplest design solution is to extend the line at-grade across Atlantic Blvd. and follow Pomona Blvd. to the SR-60 Freeway. Accordingly, the LRT trackway continues east across S. Atlantic Blvd. in the median of Pomona Blvd. Slightly west of S. Hillview Ave., the alignment transitions to aerial structure and crosses over S. Sadler Ave., swinging to the south to follow the south side of the Pomona Freeway (SR-60) in a combination of retained cut and aerial with columns as required to fit between the freeway and Via Campo to the south. Figure 2-3 provides a prototypical cross section for a retained cut section along the edge of the freeway; Figure 2-4 shows the aerial trackway supported on columns as it would clear cross streets and ramps.

The alignment continues to Garfield Ave. where it passes through an aerial station located between Garfield Ave. and Wilcox Ave. The station would be located between SR-60 and Via Campo. There is an opportunity to provide a parking deck above existing surface parking at the commercial sites along the south side of Via Campo. Located east of and away from the congestion present at Atlantic Blvd. where the Eastside Extension Phase 1 terminal station is located, the site has excellent access from the SR-60 Freeway ramps to the east, making this station a good intercept point for freeway traffic. The site also has excellent roadway access from Garfield Ave. to the west as well as Wilcox Ave. to the east.

Figure 2-3 Typical Cross Section – Retained Cut along SR-60 Freeway

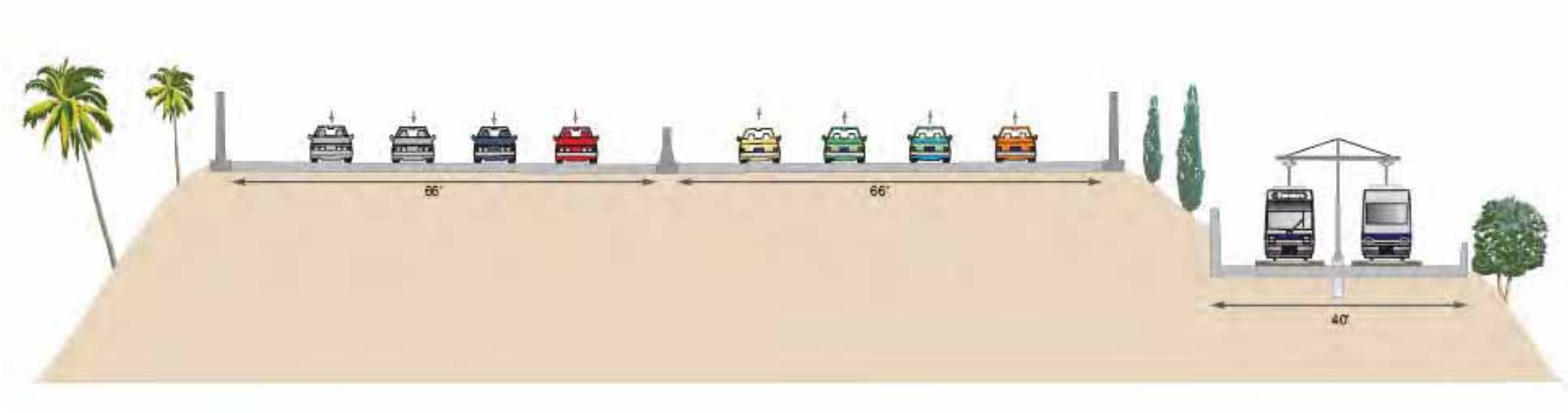
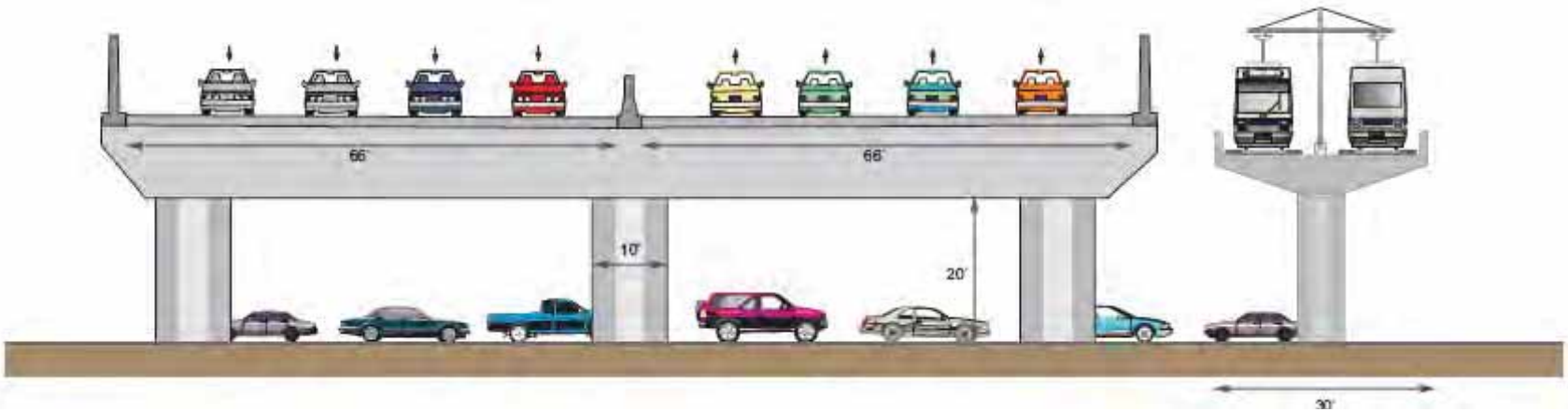


Figure 2-4 Typical Cross Section - Aerial Configuration Parallel to SR-60 Freeway



Pedestrian access would be provided by a bridge across Via Campo to make a convenient connection between the station, parking and commercial uses. Vertical circulation could potentially be integrated into a parking structure and/or additional commercial development. Fixed route buses serving the station include the M30 (on Garfield) and M70 (on Via Campo and Wilcox Ave.).

N. Vail Ave. to Montebello Town Center Dr.

East of N. Vail Ave., the trackway continues east on a high aerial structure, clearing over the merge of the eastbound on-ramp from Vail Ave. Further to the east, the gradient is reduced so that the trackway converges with the freeway grade, ending up on retained fill climbing towards the crest – use of retained fill minimizes the need to excavate over the waste disposal site located between Vail Ave. and Paramount Blvd. (this site is designated as a "Superfund" location and has been capped and is being treated to address toxics issues). As the alignment would be close to freeway grade, it would pass beneath the Greenwood Ave. bridge, climbing up the hill at a gradient of about 2.5%.

Approaching the Paramount Blvd. interchange the trackway remains high, clearing over the eastbound off-ramp, the cross street bridge and eastbound on-ramp (overhead utility lines will need to be relocated to provide vertical clearance). The trackway profile dips east of the interchange; the horizontal alignment runs parallel to the freeway immediately north of Town Center Dr. A station is provided at the approximate location of the existing bus stop along Town Center Dr. There is potential to develop parking and new mixed-use development interfacing to the station over surface parking lots in the northwest corner of the mall and at the Kaiser Medical site. There is also an opportunity to provide a bridge connection to a vertical circulation element across Town Center Dr. which could be integrated into a parking structure or TOD. Figures 2-5 and 2-6 show a before-after urban design concept from the vantage point of Town Center Dr., including a pedestrian bridge to higher-intensity uses constructed over existing parking areas. This station would provide a good interface to the numerous Metro and Montebello Bus Lines that presently connect at the existing stop along Town Center Dr. (M20, M70, M341, M343, FT269, 68 & 287). Although the station is not located on an arterial, it sits between two interchanges that connect with Montebello Blvd., Paramount Blvd. and San Gabriel Blvd. Therefore, traffic could be attracted from a broad market area surrounding the site.

Montebello Town Center to San Gabriel River

The alignment continues east, dipping at a steep grade approaching 4% but remaining above the Montebello Blvd. freeway ramps (potentially requiring relocation of overhead power lines). The alignment clears over the San Gabriel Blvd. interchange bridge and then dips down to approximate freeway grade, crossing the Rio Hondo floodplain immediately parallel to and south of the freeway mainline. East of the Rio Hondo, the alignment follows the freeway closely; rising slightly and swinging south slightly to clear over the Rosemead Blvd. interchange ramps and bridge.

Figure 2-5 Urban Design Concept – BEFORE, Town Center Dr., Montebello

Figure 2-6 Urban Design Concept – AFTER, Aerial Station at Town Center Dr., Montebello

The alignment follows the freeway closely east of Rosemead Blvd., again rising slightly and swinging to the south at Santa Anita Ave., entering an elevated platform station immediately east of the interchange bridge. This station would serve the vacant development parcel south of SR-60 and east of Santa Anita Ave. identified by the City of South El Monte. The station would also be within walking distance of the Whittier Narrows Recreation Area, which is a major regional park. Santa Anita Ave. connects via Durfee Ave. to Pico Rivera to the south, and provides direct access to the heart of South El Monte located to the north. An existing pedestrian bridge located at Lexham Ave. east of the site provides an alternative pedestrian access to portions of South El Monte located north of the freeway. The site is served by the FT269 bus route, which provides access to the bus hub at the El Monte Busway terminus. Figures 2-7 and 2-8 show the before/after urban design concept from the viewpoint of the Santa Anita Ave. eastbound ramps intersection.

East of the platform the alignment rises to clear the pedestrian bridge. The trackway sits between the edge of the freeway and the existing sound wall, with the westbound track overhanging the freeway shoulder. Figures 2-9 and 2-10 show the before/after urban design concept from the viewpoint of the pedestrian bridge east of Santa Anita Ave.

The alignment continues east along the south edge of the freeway, clearing over the Peck Rd. ramps and cross street to enter an aerial station immediately east of Peck Rd. The station would be developed in the triangle between Peck Rd., the freeway and the San Gabriel River. This station is situated to interface with bus routes that operate north into South El Monte along Durfee Ave. as well as south into Whittier via Workman Mill Rd. About ½ mile to the south, Peck Rd. connects to an interchange on I-605 so a station at this location could also intercept traffic from communities south via that freeway. The site is served by the 270 bus which provides access north to Monrovia and south to Whittier, Santa Fe Springs and Norwalk. Peck Rd. also provides a direct route for a shuttle bus connection to Rio Hondo College, which is located just beyond the I-605 Freeway.

East of the Peck Rd. station, the alignment dips slightly approaching the river, crossing the river on long-span aerial structure immediately south of the existing freeway bridge.

San Gabriel River to Crossroads Pkwy.

East of the San Gabriel River, the alignment swings wide to the south, crossing over the eastbound connector ramp to I-605 then reversing direction and rising to clear the main line of SR-60 at a skewed angle. Farther east, the alignment swings back over the westbound I-605 connector ramp, reversing direction to follow the freeway along the north edge. The trackway sits between the edge of the freeway and Crossroads Pwky. with the eastbound track overhanging the freeway shoulder. The alignment dips nearly to grade, passing beneath the Crossroads Pkwy. bridge and continuing in to a station on embankment just north of the freeway between the Crossroads bridge and ramps.

Figure 2-7 Urban Design Concept – BEFORE, Santa Anita, South El Monte

Figure 2-8 Urban Design Concept – AFTER, Aerial Station at Santa Anita, South El Monte

Figure 2-9 Urban Design Concept – BEFORE, SR-60 Freeway east of Santa Anita

Figure 2-10 Urban Design Concept – AFTER, Aerial Trackway along SR-60 Freeway east of Santa Anita

The terminal station would be immediately accessible to the freeway ramps at the Crossroads Pwky. interchange, so that it could intercept traffic entering the PSA from points east along SR-60, including Hacienda Heights, Rowland Heights, and Diamond Bar. This intercept would be ahead of the SR-60 / I-605 interchange so traffic exiting to the station site would avoid congestion associated with the freeway-to-freeway interchange. Workman Mill Rd., located within ½ mile of the station site, provides direct access to West Puente Valley, Baldwin Park and West Covina, all located within about five miles of the station. The site is served by the FT 274 bus, which provides access to Whittier to the south and to Baldwin Park and West Covina to the north.

2.3.2 Alternative 2 – SR-60 Busway

The SR-60 Busway alternative has a similar alignment and the same station locations as the SR-60 LRT alternative with some key differences:

- Because this alternative uses the bus mode, there would be a "forced transfer" to the existing Eastside Extension light rail line terminal just west of Atlantic Blvd.;
- As a busway, intermediate points of connection could be provided to allow routes from north or south to enter the facility and utilize it to connect with the Eastside Extension light rail line;
- Buses serving locations farther east along SR-60 could utilize the HOV lanes, which have recently been added, exiting the diamond lanes at Crossroads Pkwy. to enter the busway; and,
- Whereas the bus mode would be slightly slower than the LRT alternative due to the acceleration characteristics and loss of speed on grades, the alignment criteria for a busway would be less demanding, which could potentially allow for some cost savings for the trackway and stations.

The following narrative addresses each principal segment, the design considerations, and the rationale for the recommended configuration.

Pomona Blvd. and Via Campo

Providing a convenient transfer that minimizes travel time is critical. The existing "triangle" formed by Atlantic, Beverly and Pomona Blvds. could be used as a one-way clockwise circulation loop to position buses to an eastbound curbside stop located immediately adjacent to the platform at the terminal station. It would be desirable to provide a lay-over zone, either by obtaining a site within the triangle area or by utilizing the construction lay-down site in the northwest corner of the Pomona/Atlantic intersection.

Buses would travel east across Atlantic Blvd. to busway ramps located in the median of Pomona Blvd., similar to the LRT transition from at-grade to aerial.

The busway would follow the same general alignment as the LRT alternative, with the first station located east of Garfield Ave. between Via Campo and the freeway. The busway stations would utilize double side platforms similar to the Harbor Transitway facility, so that buses with right-hand doors could load. Similar to Alternative 1, a connecting bridge could be provided to interface with commercial uses south of Via Campo. It should be noted that this location would not provide park and ride; with a forced transfer to LRT at the next stop, it is unlikely patrons would drive to this site. Fixed route buses serving the station include the M30 (on Garfield) and M70 (on Via Campo and Wilcox Ave.).

N. Vail Ave. to Montebello Town Center

East of N. Vail Ave., the busway would utilize a similar alignment to the LRT trackway proceeding east to a station located at Town Center Dr. between Paramount Blvd. and San Gabriel Blvd.

The station would be located between the mall and Kaiser Foundation medical facility at the approximate location of the existing bus stop along Town Center Dr. There is potential to develop parking and new mixed-use development interfacing to the station over surface parking lots in the northwest corner of the mall and at the Kaiser Medical site. There is also an opportunity to provide a bridge connection to a vertical circulation element across Town Center Dr., which could be integrated into a parking structure or TOD. This station would provide a good interface to the numerous Metro and Montebello Bus Line routes that presently connect at the existing stop along Town Center Dr. (M20, M70, M341, M343, FT269, 68 & 287). Although the station is not located on an arterial, it sits between two interchanges that connect with Montebello Blvd., Paramount Blvd. and San Gabriel Blvd. Thus, traffic could be attracted from a broad market area surrounding the site.

Montebello Town Center to San Gabriel River

The busway continues east, dipping but remaining above the Montebello Blvd. freeway ramps (potentially requiring relocation of overhead power lines). The alignment clears over the San Gabriel Blvd. interchange bridge and then dips down to approximate freeway grade, crossing the Rio Hondo floodplain immediately parallel to and south of the freeway mainline. East of the Rio Hondo, the alignment follows the freeway closely; rising slightly and swinging south slightly to clear over the Rosemead Blvd. interchange ramps and bridge. The alignment follows the freeway closely east of Rosemead Blvd., again rising slightly and swinging to the south at Santa Anita Ave., entering an elevated platform station immediately east of the interchange bridge.

This station would serve the vacant development parcel south of SR-60 and east of Santa Anita Ave. identified by the City of South El Monte. The station would also be within walking distance of the Whittier Narrows Recreation Area, which is a major regional park. Santa Anita Ave. connects via Durfee Ave. to Pico Rivera to the south, and provides direct access to the heart of South El Monte located to the north. An existing pedestrian bridge located at Lexham

Ave. east of the site provides an alternative pedestrian access to portions of South El Monte located north of the freeway. The site is served by the FT269 bus route, which provides access to the bus hub at the El Monte Busway terminus.

East of the platform the alignment rises to clear the pedestrian bridge. The busway sits between the edge of the freeway and the existing sound wall, with the westbound track overhanging the freeway shoulder. The alignment continues east along the south edge of the freeway, clearing over the Peck Rd. ramps and cross street to enter an aerial station immediately east of Peck Rd.

The station would be developed in the triangle between Peck Rd., the freeway and the San Gabriel River. This station is situated to interface with bus routes that operate north into South El Monte along Durfee Ave. as well as south into Whittier via Workman Mill Rd. About ½ mile to the south, Peck Rd. connects to an interchange on I-605, so a station at this location could also intercept traffic from communities south via that freeway. The site is served by the 270 bus, which provides access north to Monrovia and south to Whittier, Santa Fe Springs and Norwalk. Peck Rd. also provides a direct route for a shuttle bus connection to Rio Hondo College, which is located just beyond the I-605 Freeway.

In addition to the station, this site would include a connector ramp between Peck Rd. and the busway that would allow buses from Workman Mill Rd. to use the busway to provide service via the busway to the light rail transfer station. Bus routes coming north from Whittier as well as buses coming southeast from West Puente Valley could join the busway facility at this location.

East of the Peck Rd. station, the busway dips slightly approaching the river, crossing the river on long-span aerial structure immediately south of the existing freeway bridge.

San Gabriel River to Crossroads Pkwy.

East of the San Gabriel River, the busway swings wide to the south, crossing over the eastbound connector ramp to I-605 then reversing direction and rising to clear the main line of SR-60 at a skew angle. Farther east, the alignment swings back over the westbound I-605 connector ramp, reversing direction to follow the freeway along the north edge. The busway sits between the edge of the freeway and Crossroads Pkwy. N. with the eastbound lane overhanging the freeway shoulder. The alignment dips nearly to grade, passing beneath the Crossroads bridge and crossing the station site at an angle to align with the access point at the intersection where Crossroads Pkwy. meets the Fry's Electronics store.

The terminal station would be immediately accessible to the freeway ramps at the Crossroads Pwky. interchange, so that buses serving communities farther east along SR-60 could operate over the recently-constructed HOV lanes to that point, utilizing the busway to connect with the LRT station at Atlantic Blvd. In addition, the site is currently served by the FT274 bus,

which provides access to Whittier to the south and to Baldwin Park and West Covina to the north.

This station could also intercept freeway traffic entering the PSA from points east along SR-60, including Hacienda Heights, Rowland Heights, and Diamond Bar. This intercept would be ahead of the SR-60 / I-605 interchange, so traffic exiting to the station site would avoid congestion associated with the freeway-to-freeway interchange. Workman Mill Rd., located within ½ mile of the station site, provides direct access to West Puente Valley, Baldwin Park and West Covina, all located within about five miles of the station.

2.3.3 Alternative 3 – Beverly LRT

The Beverly Blvd. LRT alignment begins as an eastward extension of the Phase 1 project across S. Atlantic Blvd. then turns south at Garfield Ave., then turns east at Beverly Blvd. and follows Beverly Blvd. to the San Gabriel River where the route swings south and enters the Whittier Greenway, following that facility to a terminus at Mar Vista St. in Central Whittier. There is an optional "Streetcar Loop" around Uptown Whittier that also serves Whittier College. Refinement of the Beverly LRT considered the following key issues:

- Placement of Garfield station and aerial trackway along Garfield Ave.
- Minimizing right-of-way impact along Beverly Blvd.
- Addressing narrow right-of-way along Beverly Blvd. between Montebello Blvd. and Rio Hondo
- Minimizing impact and/or mitigating impact along Whittier Greenway
- Refining and testing a streetcar loop option to serve Uptown Whittier and Whittier College

The following narrative addresses each principal segment, the design considerations, and the rationale for the recommended configuration.

Pomona Blvd. and Via Campo

The Eastside Extension Phase 1 project terminates at-grade in the median of Pomona Blvd. immediately west of Atlantic Blvd. As such, the simplest design solution is to extend the line at-grade across Atlantic Blvd. and follow Pomona to the SR-60 Freeway. Accordingly, the LRT trackway continues east across S. Atlantic Blvd. in the median of Pomona Blvd. Slightly west of S. Hillview Ave., the alignment transitions to aerial structure and crosses over S. Sadler Ave., swinging to the south to follow the south side of the Pomona Freeway (SR-60) in a

combination of retained cut and aerial with columns as required to fit between the freeway and Via Campo to the south. The alignment continues to Garfield Ave. where it turns south.

Garfield Ave.

The conceptual plans were refined to indicate a side running aerial station behind the west curb of Garfield Ave. immediately south of Via Campo. This location has excellent access via Garfield Ave. to points north of SR-60 in Monterey Park and to points south in East Los Angeles and Montebello as well as accessibility to the freeway ramps located to the east along Via Campo. The walk radius includes the commercial sites east of Garfield Ave., high density residential located south along Garfield Ave. and residential neighborhoods immediately north of the freeway.

Placement of the station at this location reduces the visual impact compared to a median location and simplifies the structural requirements. The station site is served by the M30 bus on Garfield Ave. providing access to areas north and south. The site could also be developed as an end-of-line stop for buses operating to and from communities to the east via freeway flyer services along SR-60. Finally, a pedestrian bridge could be provided to the commercial uses along the east side of Garfield Ave., which provides an opportunity for TOD and possible shared parking. Figures 2-11 and 2-12 illustrate the before and potential urban design treatments at this location.

Transitioning to the median of Garfield Ave. south of the station, the intention would be to install a raised median island to support the trackway and reduce the number of left turn locations in order to minimize the loss of parking in front of residential uses. All four traffic lanes would be retained.

Beverly Blvd. – Garfield Ave. to Rio Hondo

The aerial alignment turns east at Beverly Blvd. and continues into an aerial station located along the utility corridor about 300 feet east of Beverly Blvd. The station would be elevated over the roadway median, with vertical circulation behind the sidewalk connecting via pedestrian bridges. The station site is within close walking distance of bus stops at the Garfield/Beverly intersection, (where the Garfield Ave. M70 as well as Beverly Blvd. M40 buses stop) and also allows pedestrian access from either east or west of the utility corridor. There is a potential for a small parking area to be developed along the utility corridor.

East of the station, the trackway transitions to an at-grade configuration approaching Hay St., taking advantage of the roadway upgrade east of the station site to facilitate the transition to street running.

Figure 2-11 Urban Design Concept – BEFORE, Garfield Ave. Aerial Station

Figure 2-12 Urban Design Concept – AFTER, Garfield Ave. Aerial Station

There are two different cross sections along Beverly Blvd. in Montebello – west of Montebello Blvd., the right-of-way is 90 feet wide and the roadway is a seven lane facility with raised median; east of Montebello Blvd. the right-of-way is only 80 feet wide and it is striped as a five lane facility with a two-way left turn lane median. Parallel capacity is available on Whittier Blvd. which is 0.5 miles to the south as well as by a number of through collector roadways. In addition, traffic is effectively "metered" into the section due to the constraint of the two lane section along the Phase 1 LRT alignment west of Atlantic Blvd. and by the bridge to the east at the Rio Hondo, which is striped as a four lane facility. Given these constraints, the strategies described further below can be used to develop an at-grade solution.

West of Montebello Blvd. the cross section consists of a 90-foot right-of-way with a 78-foot roadway; narrow 6-foot sidewalks and two additional travel lanes with parking allowed during off-peak periods are present. In addition, left-turns are banned at many of the minor intersections during the peak period. An at-grade 26 foot wide dedicated LRT trackway can be developed in this segment by continuing to ban left turns at minor roadways and/or providing an "all red" traffic phase during LRT passage and by reducing through traffic lanes from three to two. Parking could be allowed in the curb lane during off-peak periods. Figure 2-13 provides a typical cross section, which shows that 8-foot sidewalks could be provided with a reduction to four travel lanes.

Stations would be located at Wilcox Ave. (or N. Vail Ave. at City Hall), Montebello Blvd. and Poplar Ave. Placement of stations at major intersections would utilize the additional width required to provide both left-turn bays approaching the intersection as well as side platforms downstream from the intersection, built in the "shadow" of the left-turn pockets (see Figure 2-14 for prototypical plan). This configuration requires about 100 feet curb-to-curb, or about 120 feet of right-of way (as shown in Figure 2-15). Spot widening at the intersection would be required. In addition to widening at the platform and/or intersection for about 300 feet, transition tapers of about 350 feet on either side would be required, making the total extent of the impact about 1,000 feet per location. Figures 2-16 and 2-17 show a before/after urban design concept illustration looking east at the Beverly/Montebello intersection.

If a stop were to be provided at City Hall, a center platform design may be more appropriate since this location is not at a principal intersection. Figure 2-18 and 2-19 depict a before/after urban design concept.

All of these station locations would be walkable from moderate density residential neighborhoods located immediately off Beverly Blvd. in addition to commercial uses along the roadway. All four roadways (Wilcox Ave., Vail Ave., Montebello Blvd. and Poplar Ave.) are through arterials providing vehicular and bicycle access to uses farther away within the station market areas.

Figure 2-13 Typical Section – Beverly Blvd. west of Montebello Blvd.

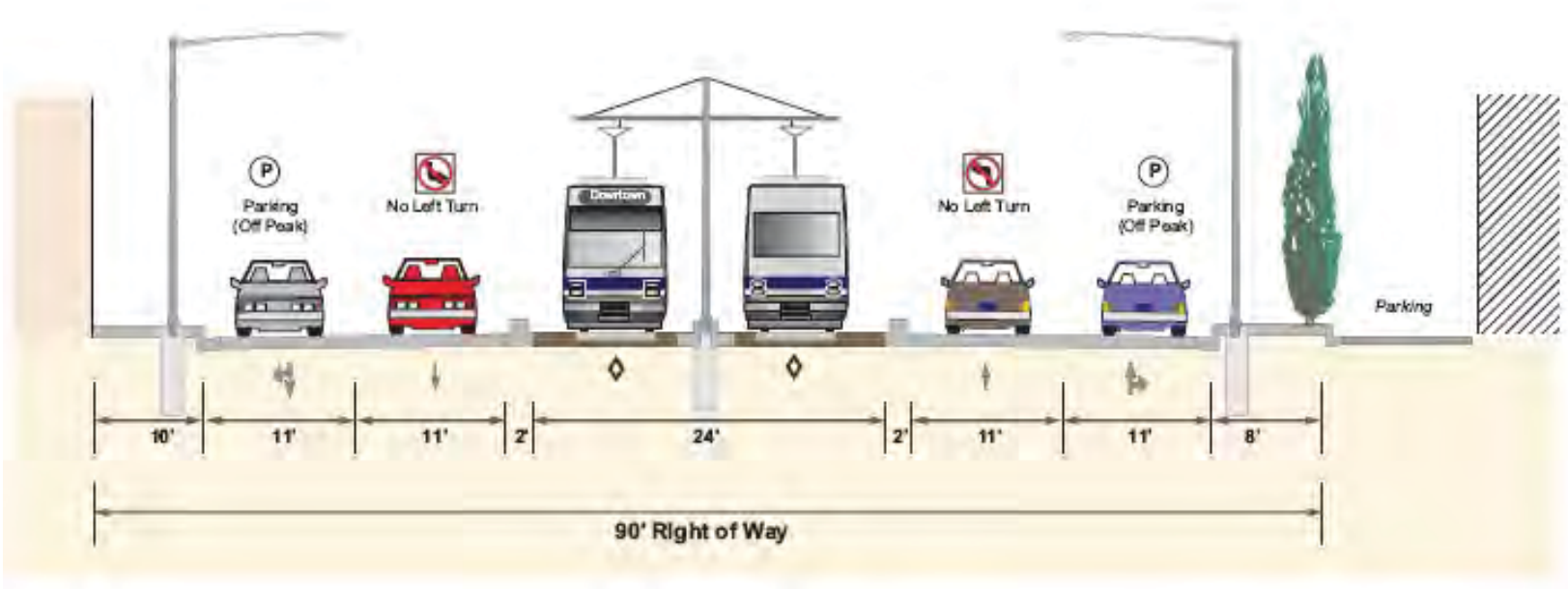


Figure 2-14 Prototype Plan – At-Grade Station with Split Far Side Platforms

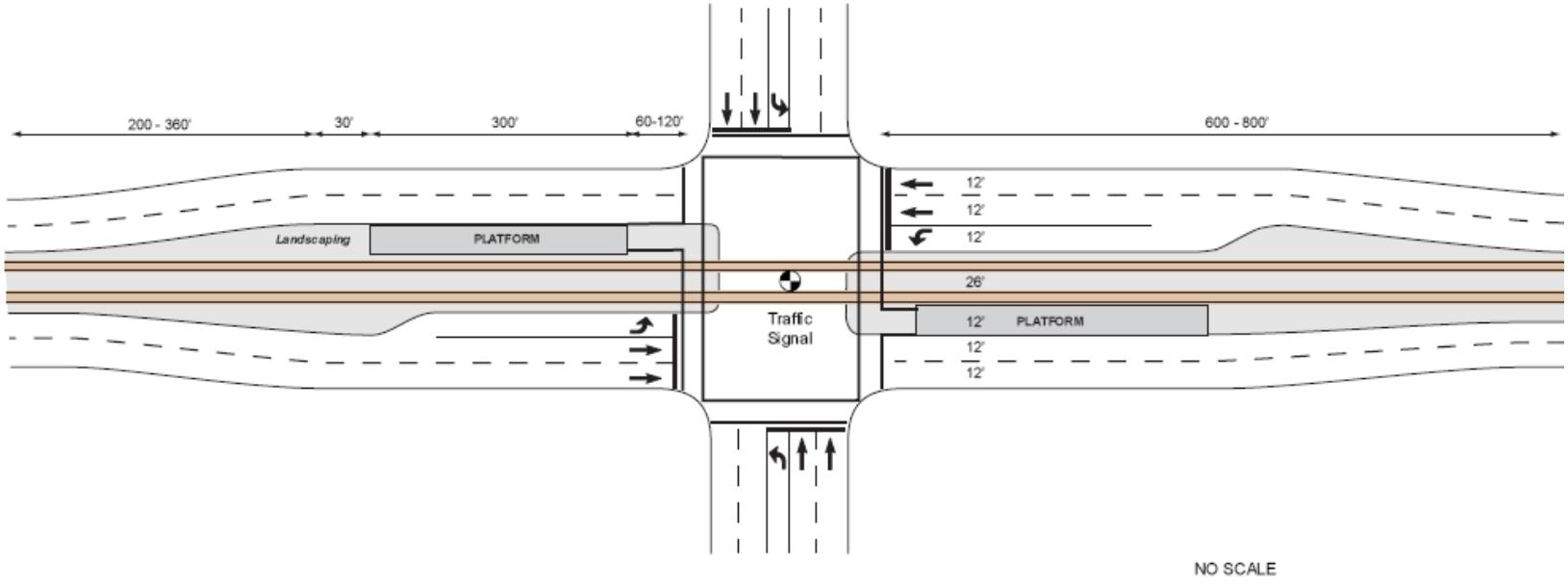


Figure 2-15 Prototype Section – At-Grade LRT at Station with Four through Lanes

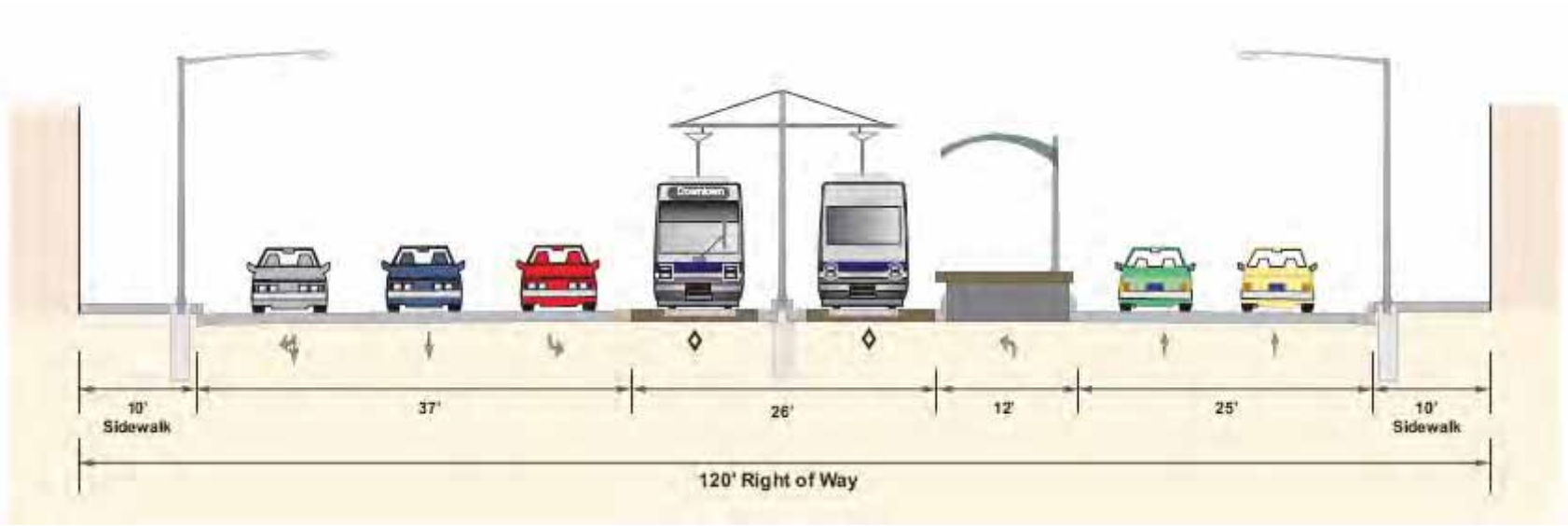


Figure 2-16 Urban Design Concept – BEFORE, Beverly Blvd. at Montebello Blvd.

Figure 2-17 Urban Design Concept – AFTER, Side Platform Station on Beverly Blvd. at Montebello Blvd.

Figure 2-18 Urban Design Concept – BEFORE, Montebello City Hall

Figure 2-19 Urban Design Concept – AFTER, Center Platform Station at Montebello City Hall

All of these stations are served by the M40 Beverly Blvd. bus. The Wilcox Ave. station is served by the M70 bus, and the Montebello Blvd. station is served by the M20 and M70 buses. Major destinations served include City Hall (from Wilcox Ave. or Vail Ave. stop), the shopping center located at Montebello/Beverly, and Beverly Hospital at Poplar Ave.

East of Montebello Blvd., the right-of-way is reduced to 80 feet; in addition, the sidewalks are 12 feet wide on either side so the roadway is reduced to 56 feet. Four through lanes and a continuous left-turn lane are provided, with no raised median. This segment is too narrow to allow fitting a dedicated LRT trackway along with two travel lanes. However, the City of Montebello has indicated an effort is underway to widen the roadway in this section and some right-of-way has already been obtained. Therefore, for planning purposes it has been assumed that an additional ten feet of right-of-way would be obtained, which would allow the same cross section as previously described for the 90-foot wide right-of-way west of Montebello Blvd. to be utilized in this segment.

The trade-offs and specific traffic, parking and right-of-way impacts would be evaluated in the EIR/EIS phase of the project.

Beverly Blvd. – Rio Hondo to San Gabriel River

This segment crosses the central portion of Pico Rivera where the right-of-way is 100 feet wide and seven lanes are currently provided. However, as there are only four through lanes to the west in Montebello and four lanes to the east in Whittier, the six through lanes are relatively uncongested compared to upstream and downstream segments. The proposed configuration would be similar to that with four through lanes utilized in Montebello; however, the additional ten feet of right-of-way that is present could be used to provide slightly wider lane widths, a full-time parking lane, or raised barriers alongside the trackway.

This segment is slightly longer than one mile, so a station centrally located at Rosemead Blvd. would provide walkable access to communities located north and south of Beverly Blvd., including higher intensity uses located up and down Rosemead Blvd. The Rosemead station would be developed with split far side platforms similar to the configuration of the Montebello stations. Rosemead Blvd. is a major arterial and would provide auto access to Pico Rivera destinations in addition to interfacing with the 266 Rosemead Blvd. bus that provides access to a large market area north and south along Rosemead Blvd.

East of Durfee Ave., the trackway would transition to aerial configuration and cross the San Gabriel River and I-605 Freeway at a skew angle to align with and enter the Whittier Greenway in Whittier.

Beverly Alignment East of San Gabriel River

East of Norwalk Blvd., Beverly Blvd. has been screened out due to the narrow width and mature trees planted immediately behind the curb line that were identified by residents and

local policy makers as a fatal flaw for this alignment. Accordingly, the alignment is shown along the Whittier Greenway within Whittier. The Greenway is an abandoned railroad corridor that has been developed with a bicycle trail and pedestrian pathway that provides a continuous corridor between Pioneer Blvd. and the Washington/Whittier intersection in central Whittier. Adjoining land uses are residential between Pioneer Blvd. and the Camilla/Magnolia intersection, then industrial and commercial south and east of that location. The right-of-way width is 40 to 50 feet wide and there are encroachments at some locations as well as wider spots at other locations. A typical section for a 50-foot wide railroad corridor is illustrated in Figure 2-20. At the tightest locations a minimal two-track LRT trackway could be fitted along with minimal pathway widths by utilizing minimum dimensions for all elements.

Lighting and landscaping was installed along with the pathway improvements; however, existing property fences, some of which encroach upon the right-of-way, were left intact at the time the trail was established. In order to mitigate some of the impact of the LRT, the following strategies could be utilized:

- Provide new continuous fencing at the property line, designed to screen the trail and LRT from adjoining homes and reduce noise impacts
- Undulate the profiles of the trails to restore visual interest at tight spots due to straightening the trail alignment to conform to the LRT and right-of-way lines (refer to Figures 2-21 and 2-22 for a before/after illustrative treatment)
- Provide a “land bridge” type of grade separation at Palm Park to allow cross-trail and LRT pedestrian connection between the east and west sides of the alignment (refer to Figures 2-23 and 2-24 for a before/after illustrative treatment).

Station opportunities along the Greenway include Norwalk Blvd., Broadway Ave., Philadelphia St. and Mar Vista St. All of the stations would be center platform to minimize the overall width required to 40 feet so that the bicycle and pedestrian pathways could be maintained. Specific opportunities at each station are as follows:

- Norwalk Station – This station would be integrated with the existing embankment and grade separation to provide access to both sides of the street where bus stops could be provided to connect with the NW1 bus. In addition to walkable residential neighborhoods and bicycle access, the Norwalk station could support drop off activity from West Whittier points. Civic facilities at Palm Park are within walking distance using the adjacent bicycle and pedestrian trail.
- Broadway Station – This station would serve residential areas within walking distance as well as a portion of the commercial strip along Whittier Blvd. to the west, which is within ½ mile walking distance. Broadway is an arterial roadway that would provide auto access for drop off from many points in West Whittier. In addition, the NW6 and NW7 buses that provide access to Uptown Whittier and Whitwood Mall operate on Broadway.

Figure 2-20 Typical Section – Whittier Greenway

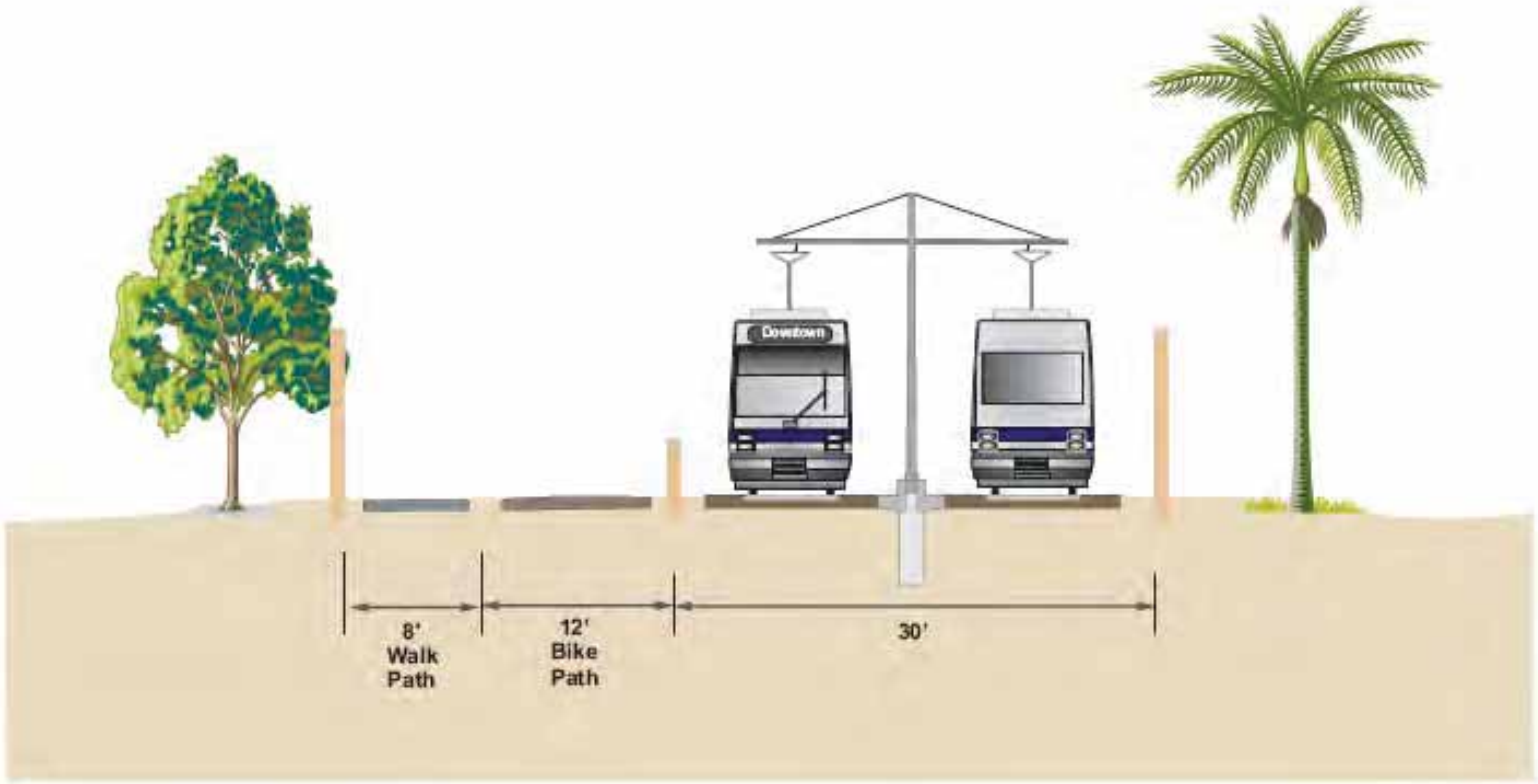


Figure 2-21 Urban Design Concept – BEFORE, Whittier Greenway Treatment

Figure 2-22 Urban Design Concept – AFTER, Whittier Greenway Treatment

Figure 2-23 Urban Design Concept – BEFORE, Land Bridge at Palm Park

Figure 2-24 Urban Design Concept – AFTER, Land Bridge at Palm Park

- Philadelphia Station – The Philadelphia Station has numerous destinations within walking distance including Whittier High School, the Whittier Blvd. commercial corridor, and potential new uses at the Fred C. Nelles School site located across Whittier Blvd. to the west. The Philadelphia station would be located ½ mile from the Philadelphia/ Greenleaf intersection in the heart of Uptown Whittier; in addition, the Whittier College campus is located within a one-mile radius. The existing M10 Whittier bus connects between Whittier College, Uptown Whittier, and points west along Whittier Blvd. There would be an opportunity to provide a shuttle or circulator bus, potentially modifying the route of the SW "Sunshine Shuttle" bus. There is also an opportunity to provide some parking at this station utilizing the vacant land within the railroad right-of-way.
- Mar Vista Station – Mar Vista would be the terminal station for this phase of the project. This station location is alongside the Whittier Blvd. commercial corridor. Walkable destinations include the residential district located to the north and east as well as the Whittier Blvd. commercial corridor located to the west. The Whittier Civic Center is located with ½ mile of this site. Mar Vista is a four-lane through arterial to the east, providing auto access to large areas of Central Whittier. There are opportunities to develop a substantial amount of park and ride capacity utilizing the immediately adjoining railroad right-of-way lands. This park and ride could be accessed through Whittier Blvd. and tributary streets, including Washington Blvd. and Santa Fe Springs Rd., which fan out from the Whittier/Washington intersection about ½ mile to the southeast of the station site. In the event the City of Whittier extends Mar Vista to the southwest, the Presbyterian Hospital campus would be within walking and short shuttle bus range.

Uptown Whittier Streetcar Loop

A design option has been identified to provide a "Streetcar Loop", which would circulate around Uptown Whittier in a counterclockwise direction. The loop would provide stops located close to walking destinations in the historic central district as well as to Whittier College located east of Painter Ave. (refer to Figure 2-25)

The Streetcar Loop would utilize "mixed flow" travel in which the LRT would share the roadway lane with general purpose traffic; stations would be provided along the curb between the sidewalk and the trackway in the location where parking is presently provided as illustrated in Figure 2-26. The route of the streetcar has been proposed along streets with low traffic volumes and where parking utilization is low to minimize the interference between the LRT trains and other roadway activities while bringing the stations closer to ultimate travel destinations in the Uptown Whittier area. Use of a span wire ("trolley wire") hung between street light poles could be used to reduce visual impact compared to conventional double-wire catenary, brackets and catenary poles. The potential route and stops for the streetcar loop are as follows:

Figure 2-25 – Uptown Whittier Streetcar Loop

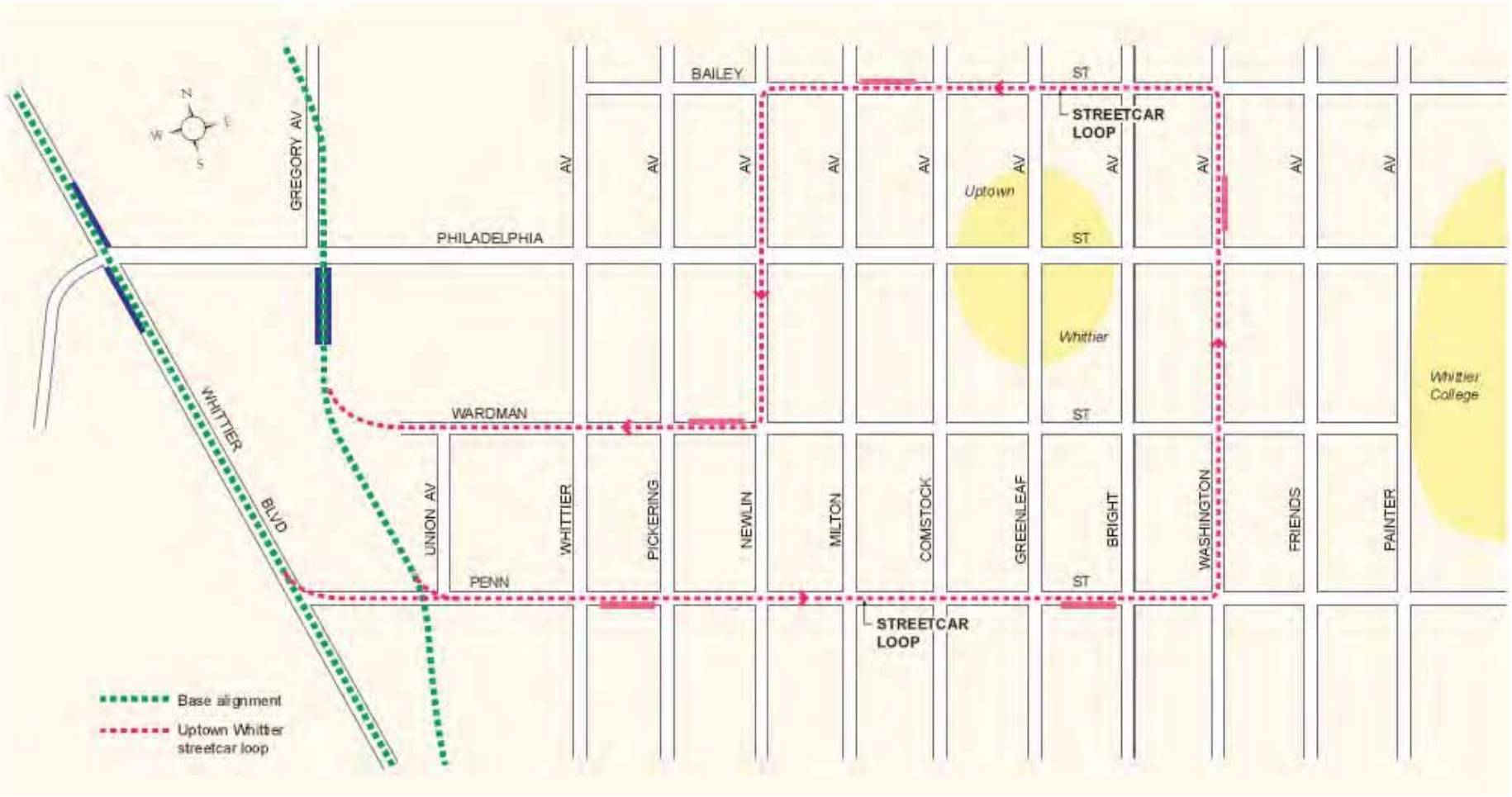
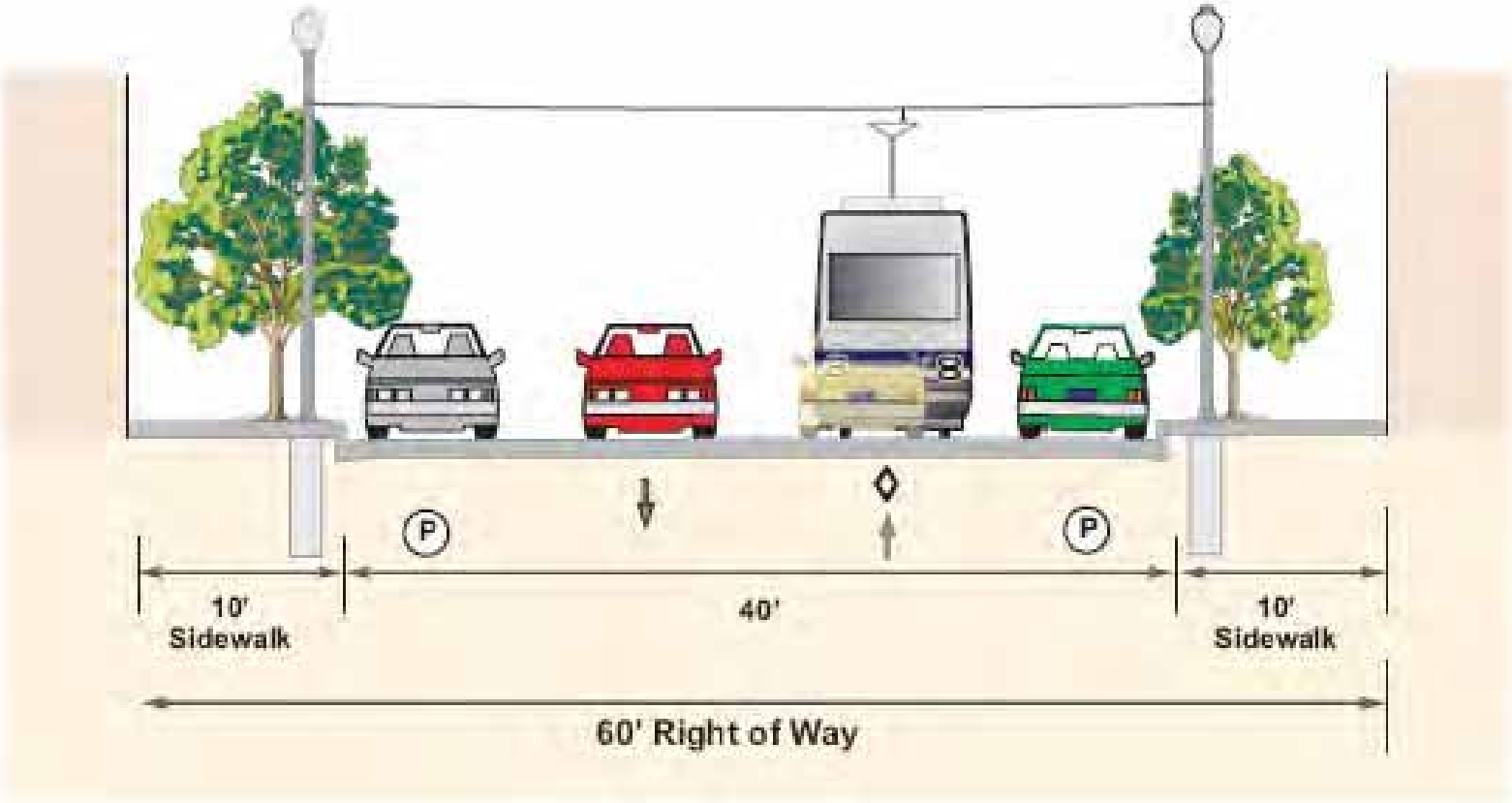


Figure 2-26 Typical Section – Uptown Whittier Streetcar Loop



- Eastbound track along Penn St. to Washington Ave.; stops on south side of Penn between Whittier Ave. and Pickering Ave. and between Greenleaf Ave. and Bright Ave.;
- Northbound track along Washington Ave. to Bailey St.; stop on east side of Washington Ave. between Philadelphia St. and city parking lot driveway;
- Westbound track along Bailey St.; stop on north side of Bailey St. between Comstock Ave., and Milton Ave.;
- Southbound track along Newlin Ave. (converted to one-way southbound) to Wardman St.; and,
- Westbound track along Wardman St. to Greenway; stop on north side of Wardman St. between Newlin Ave. and Pickering Ave.

This loop would serve to turn trains around for the journey back to Union Station and would collect and distribute trips over a broad market area in Uptown Whittier, including the Civic Center, the heart of the commercial district, and Whittier College.

With a streetcar loop, there would still be a station at Philadelphia St. but there would not be a Mar Vista station. Parking would need to be provided at this location and the station design would need to accommodate higher levels of access traffic and drop-off activity than would occur at that location with a terminal station located at Mar Vista St. The streetcar loop would interface with numerous fixed route bus lines serving the Uptown Whittier vicinity, including Route 270, M10, M40, and M50, N8 as well as NW6 and NW7 buses.

2.3.4 Alternative 4 – Whittier LRT

The Whittier Blvd. LRT alignment begins as an extension of the Phase 1 project across S. Atlantic Blvd. then parallels SR-60 to Garfield, turns south via Garfield to Whittier Blvd. then turns east and follows Whittier Blvd. to a terminus at Mar Vista in Central Whittier. The refinement of the Whittier Blvd. LRT alternative considered the following key issues:

- Determine locations where an aerial configuration could be provided within the existing right-of-way
- Determine whether an at-grade alignment could be provided through Montebello Old Town in order to avoid the impact of fitting an aerial structure along the narrow roadway
- Provide configuration options for the LRT trackway entering Whittier where tight spots exist at a number of locations

The Whittier LRT alternative has the same alignment and configuration heading east beyond the Phase 1 project terminal station, following the south side of SR-60 to Garfield Ave., where the route would turn south and enter a station on the west side of Garfield Ave. (refer to section 2.5.1 describing the treatments at Garfield Ave.). However, instead of turning into Beverly Blvd., the alignment continues south to Garfield Ave., turning across the parcel at the NE quadrant of the Whittier/Garfield intersection and entering an aerial station east of Via Vista. There are three locations with design options:

- Use of either Garfield Ave. or a combination of Garfield Ave. and the Southern California Edison utility corridor between Beverly Blvd. and Whittier Blvd.;
- Use of either at-grade or aerial between Norwalk Blvd. and Hadley Ave. in Whittier; and,
- Use of either double-track to terminus at Mar Vista Ave. in Central Whittier or single track streetcar loop serving Uptown Whittier and Whittier College.

The following narrative addresses each principal segment, the design considerations, and the rationale for the recommended configuration.

Pomona Blvd. and Via Campo

The Eastside Extension Phase 1 project terminates at-grade in the median of Pomona Blvd. immediately west of Atlantic Blvd. As such, the simplest design solution is to extend the line at-grade across Atlantic Blvd. and follow Pomona to the SR-60 Freeway. Accordingly, the LRT trackway continues east across S. Atlantic Blvd. in the median of Pomona Blvd. Slightly west of S. Hillview Ave., the alignment transitions to aerial structure and crosses over S. Sadler Ave., swinging to the south to follow the south side of the Pomona Freeway (SR-60) in a combination of retained cut and aerial with columns, as required, to fit between the freeway and Via Campo to the south. The alignment continues to Garfield Ave., where it turns south.

Garfield Ave.

North of Beverly Blvd., this segment is the same as Beverly LRT alternative, including the proposed station west of Garfield Ave. immediately south of Via Campo. South of the Garfield station, the alignment enters the median of Garfield Ave. and continues south; however, for this alternative, the alignment continues on aerial structure over the median of Garfield Ave. beyond Beverly Blvd. down to Whittier Blvd., where it turns into the median of Whittier. (Refer to Section 2.4.2 for a description of the Garfield station.) There is a design option that uses the Southern California Edison utility corridor south of Beverly Blvd. – this design option avoids the large "S" curve along Garfield between Beverly Blvd. and Whittier.

Whittier Blvd. West of Montebello Old Town

The alignment would be on an aerial structure over the median of Whittier Blvd. between Garfield Ave. and N. Maple Ave. An aerial station would be provided over the median east of Garfield Ave. This station would provide walking access to the Whittier Blvd. commercial

corridor as well as residential neighborhoods located north and south of Whittier Blvd. The arterial roadways of Whittier Blvd. and Garfield Ave. would provide auto access to the station for drop-off purposes. The M10 Whittier bus could stop at the site, and the M30 as well as Route 18 and Route 66 buses stop just west of the site along Garfield Ave.

In order to fit the trackway over the median without widening the roadway, turn bays beneath would be modified to accommodate columns placed about 120 to 140 feet apart. As shown in the conceptual plan in Figure 2-27, some turn bays would be closed or shortened and traffic signals would be installed to allow left turns from the median at selected locations. East of S. Maple Ave., the alignment would transition from aerial back to an at-grade configuration running in the median of Whittier Blvd. east of S. Taylor Ave.

Whittier Blvd. at Montebello Old Town

As it approaches Montebello Blvd., the Whittier Blvd. cross section is highly variable, including right-of-way widths of 100 feet, then 90 feet then 80 feet east of Montebello Blvd. Roadway configurations range from an 80-foot width (providing five lanes plus two parking lanes) down to as narrow as 50 feet (with 15-foot sidewalks but only four travel lanes and no parking). There are extensive streetscape improvements that have recently been completed, including bulb-outs around parking bays, decorative lighting and formal landscaping consisting of rows of palm trees lining the street behind the curb.

West of Montebello Blvd., where the right-of-way is greater, a center platform station could be provided by displacing the painted median in the block between 10th St. and Spruce St. The before/after urban design concept is shown in Figures 2-28 and 2-29. This station would serve the Old Town business district. In addition to a direct interface to the M10 Whittier bus, routes M20 and M70 stop at the Rosemead/Montebello intersection within 500 feet of the platform. The station would be accessible from Rosemead Blvd. or Whittier Blvd. A limited amount of parking could be provided in a parking structure developed along the alley way located about ½ block north of Whittier Blvd.

The narrow right-of-way, with buildings immediately behind the back of sidewalk at many locations, and lack of median make it problematic to locate columns to support an aerial trackway. Accordingly, the conceptual engineering plans delineate a median trackway. By operating through intersections on an “all red” phase, the LRT can be made to operate without left turn bays. The narrow right-of-way width would require reducing the roadway to a single lane, consideration of mixed flow, or widening at hard spots. Refer to Figure 2-30 for a cross section east of Montebello Blvd. These trade-offs should be further evaluated during the EIR/EIS phase to determine whether at-grade operation is feasible in this segment.

Between Bluff Rd. and Paramount Blvd., there are only two short cul-de-sacs that have access to Whittier Blvd.; access could be restricted to right-in / right-out (by running the LRT median across these roadways without a median break) to maximize the roadway capacity even with a

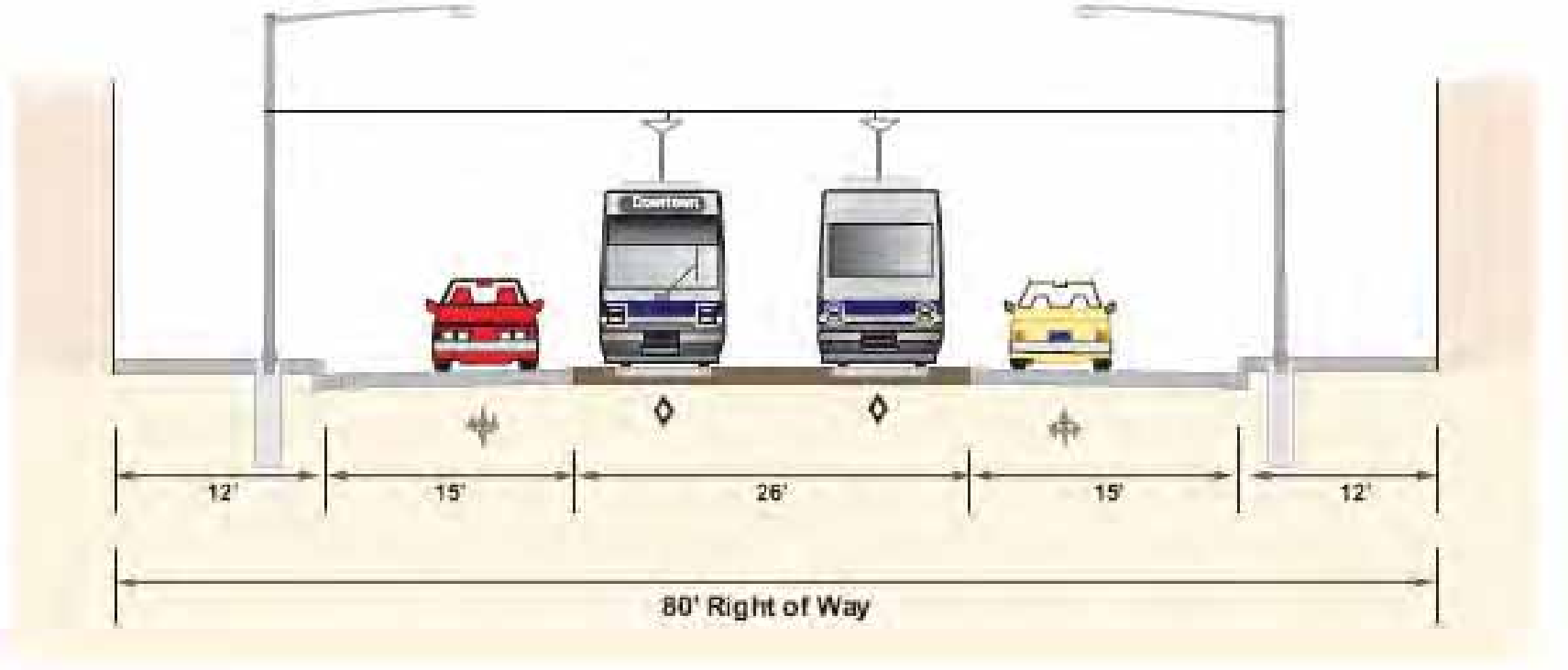
single traffic lane. This would allow use of the existing median lanes to provide the LRT trackway across the bridge at the Rio Hondo and through the underpass beneath the Union Pacific Railroad.

Figure 2-27 Concept Plan – Aerial Trackway Column Placement in Whittier Blvd.

Figure 2-28 Urban Design Concept – BEFORE, Whittier Blvd. at Montebello Blvd.

Figure 2-29 Urban Design Concept – AFTER, Center Platform Station on Whittier Blvd. west of Montebello Blvd.

Figure 2-30 Typical Section – Whittier Blvd. east of Montebello Blvd.



Whittier Blvd. in Pico Rivera

The roadway width in Pico Rivera is too narrow to fit an at-grade trackway into the existing right-of-way even with the reduction of the general purpose travel lanes. In addition, there are a number of major commercial driveway access points serving large shopping areas. However, the right-of-way increases to 100 feet, which is adequate to provide both a median to support an aerial trackway while maintaining space for continuous turn lanes (see Figure 2-31). Since an elevated section would be required to cross the San Gabriel River and I-605 to the east, the most reasonable solution is to provide the transition to aerial to the west of Paramount Blvd., which would allow grade separation at both Paramount Blvd. and Rosemead Blvd.

An aerial station is shown at or east of Rosemead Blvd. There are two design options for the station configuration: (1) over the median of Whittier Blvd., or (2), behind the south curb, similar to the recommended location at Garfield Ave. The engineering and urban design implications of these two alternatives are described in the following text:

- Aerial Station over Roadway Median – Due to the need to provide a double row of columns at the station, there would need to be a spot widening to about 120 feet to fit an aerial station into the roadway. Refer to the prototypical plan on Figure 2-32 and prototypical cross section in Figure 2-33.
- Aerial Station behind Sidewalk – In the event the station was placed behind the sidewalk, it would extend about 50 feet into the adjacent property as shown in Figure2-34. However the sidewalk could be integrated into the station plaza to reduce this width. This option would provide better integration with the large commercial uses south of the boulevard and would reduce the footprint and structure over the roadway.

Figures 2-35 thru 2-38 illustrate the before/after urban design concepts for the median and side aerial stations, respectively. There is an opportunity to provide park and ride by developing structured parking over the shopping center surface parking lots. Depending upon whether the station is located over the roadway median or over the shopping center parking, pedestrian access would be provided via a bridge over the roadway or directly down to a plaza below the station. The integration of the station with the commercial uses could facilitate joint development, which may intensify land uses within close walking distance of the station.

The station at this location would be within walking distance to large commercial uses along Whittier Blvd. as well as residential and commercial areas off of Rosemead Blvd. to the north and south. Auto access is provided by Whittier and Rosemead Blvd., which are major arterials. In addition, the station would be located within one mile of the Whittier Blvd. interchange at I-605. In addition to the M10 bus operating along Whittier Blvd., the station is located near the Rosemead Blvd. stops for the Route 266 bus, which provides access to a large market area extending north and south of Whittier Blvd.

Figure 2-31 Typical Section – Whittier Blvd. in Pico Rivera

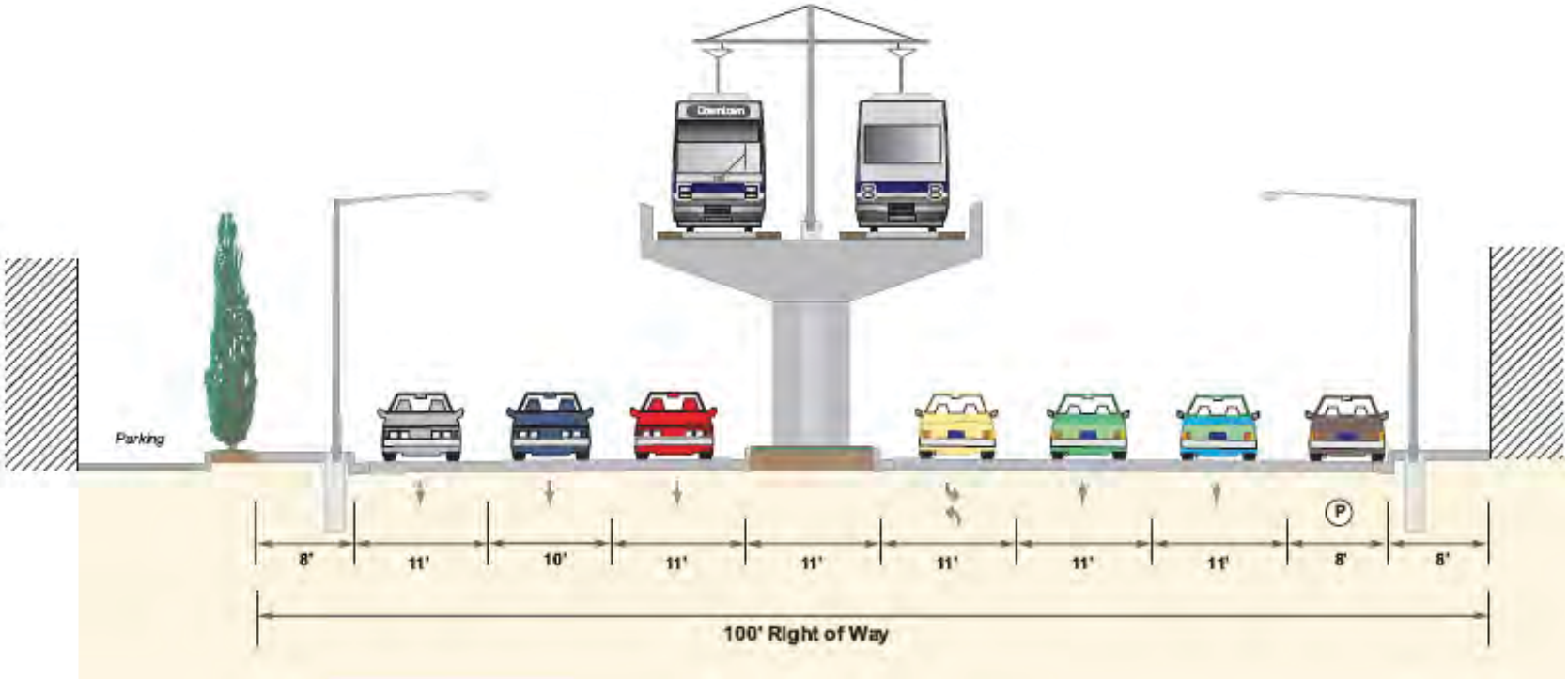


Figure 2-32 Prototype Plan – Median Aerial Station at Major Intersection

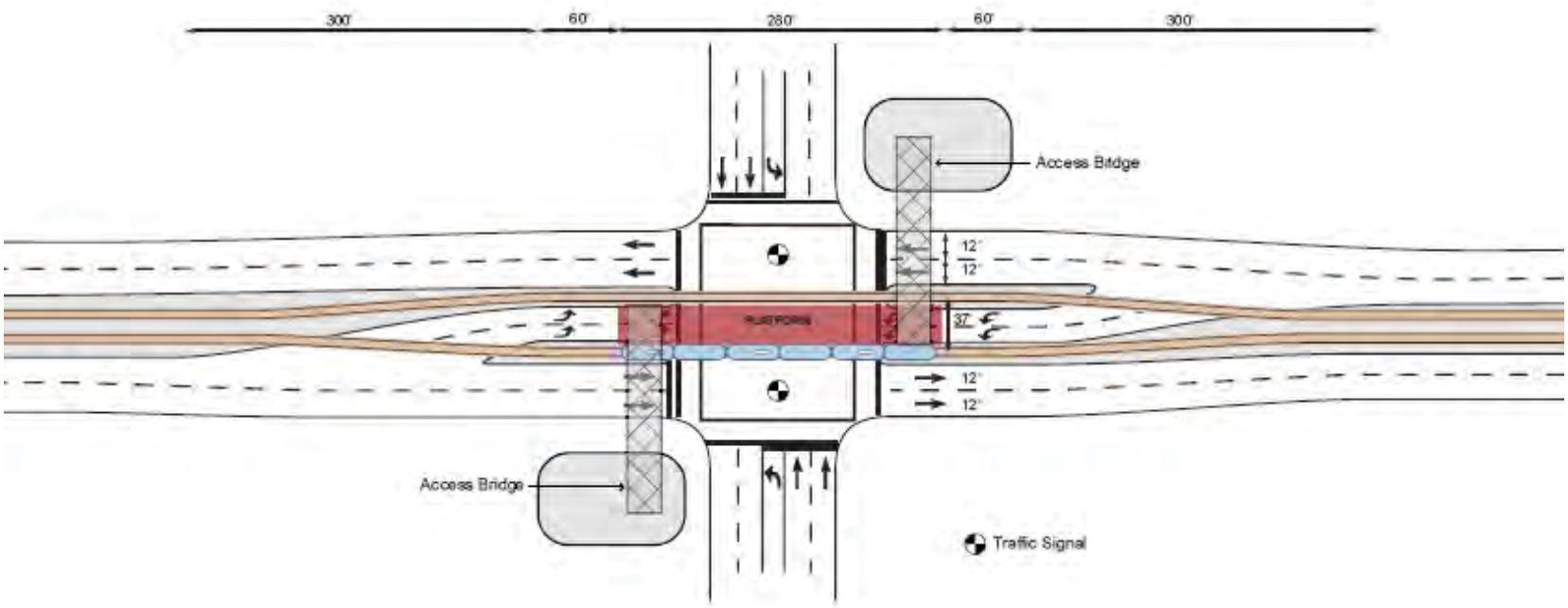


Figure 2-33 Prototype Section – Aerial Station over Roadway Median

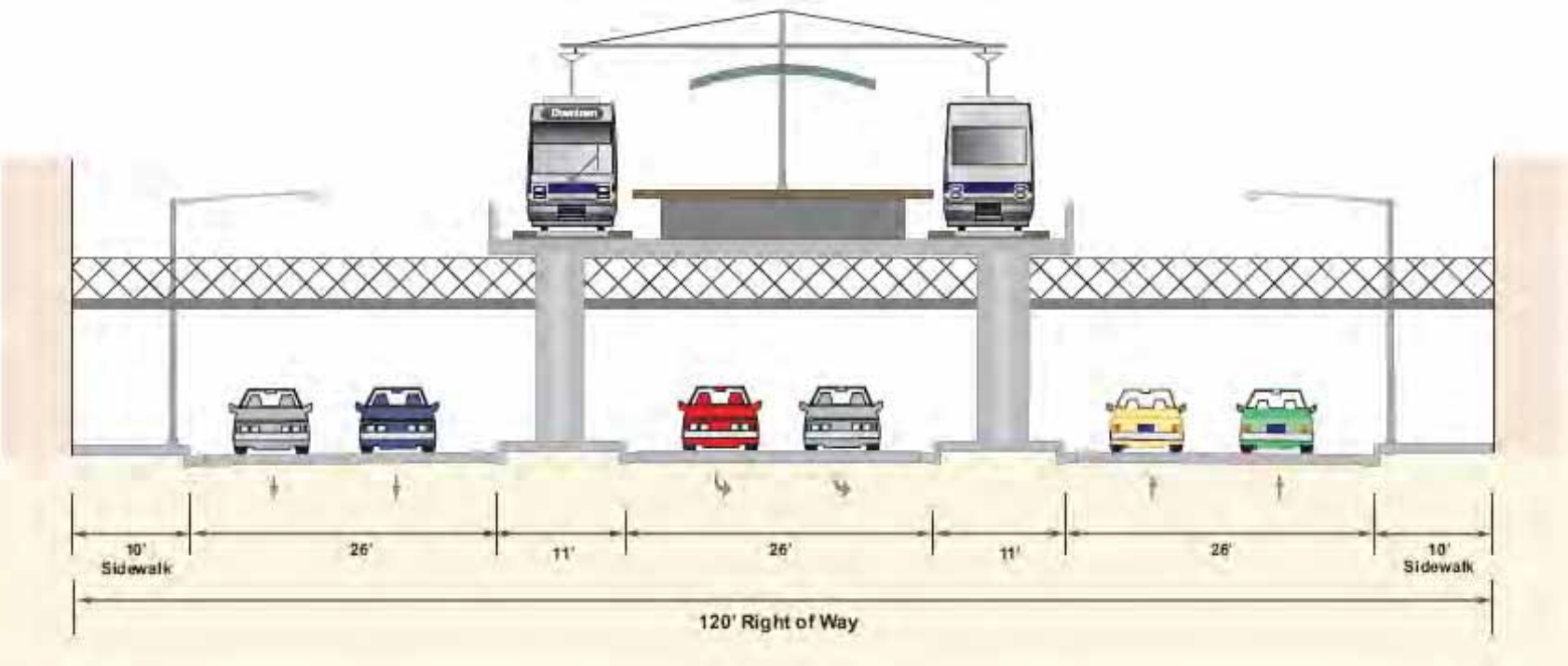


Figure 2-34 Prototype Section – Aerial Station behind Sidewalk

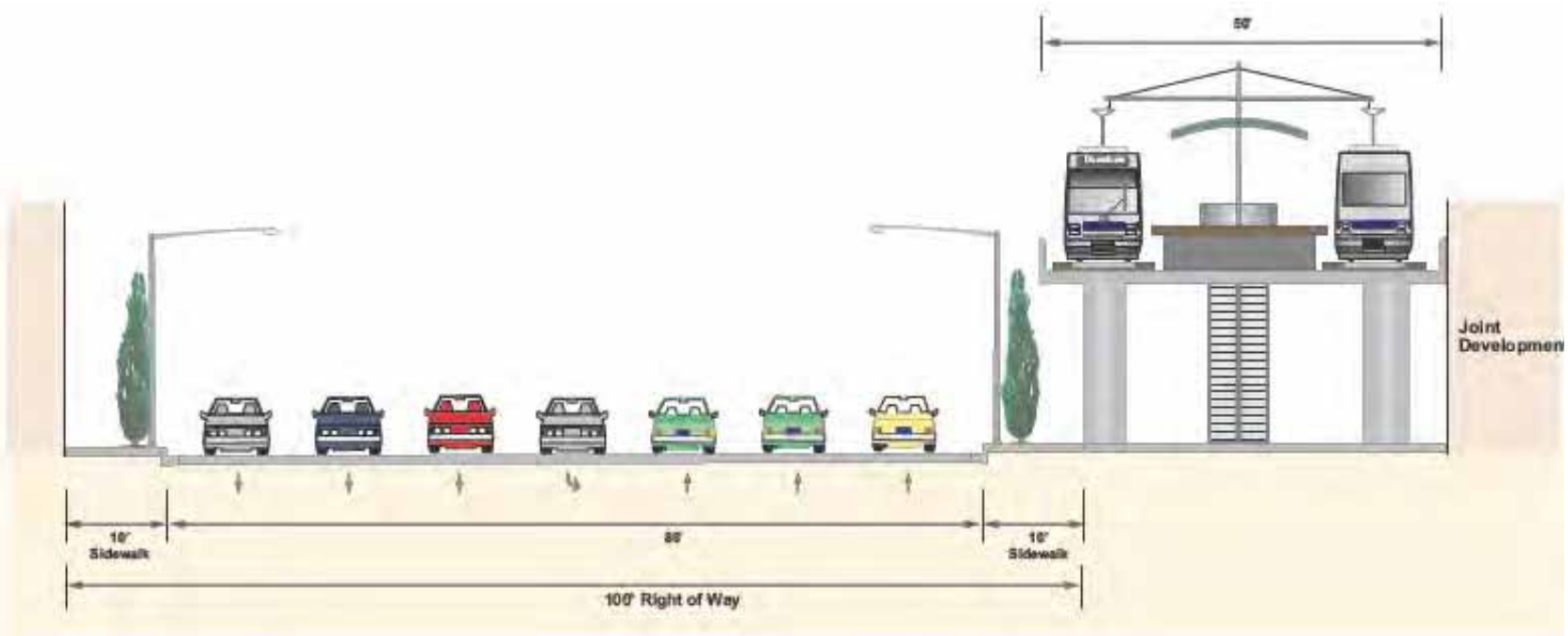


Figure 2-35 Urban Design Concept – BEFORE, Whittier Blvd. east of Rosemead

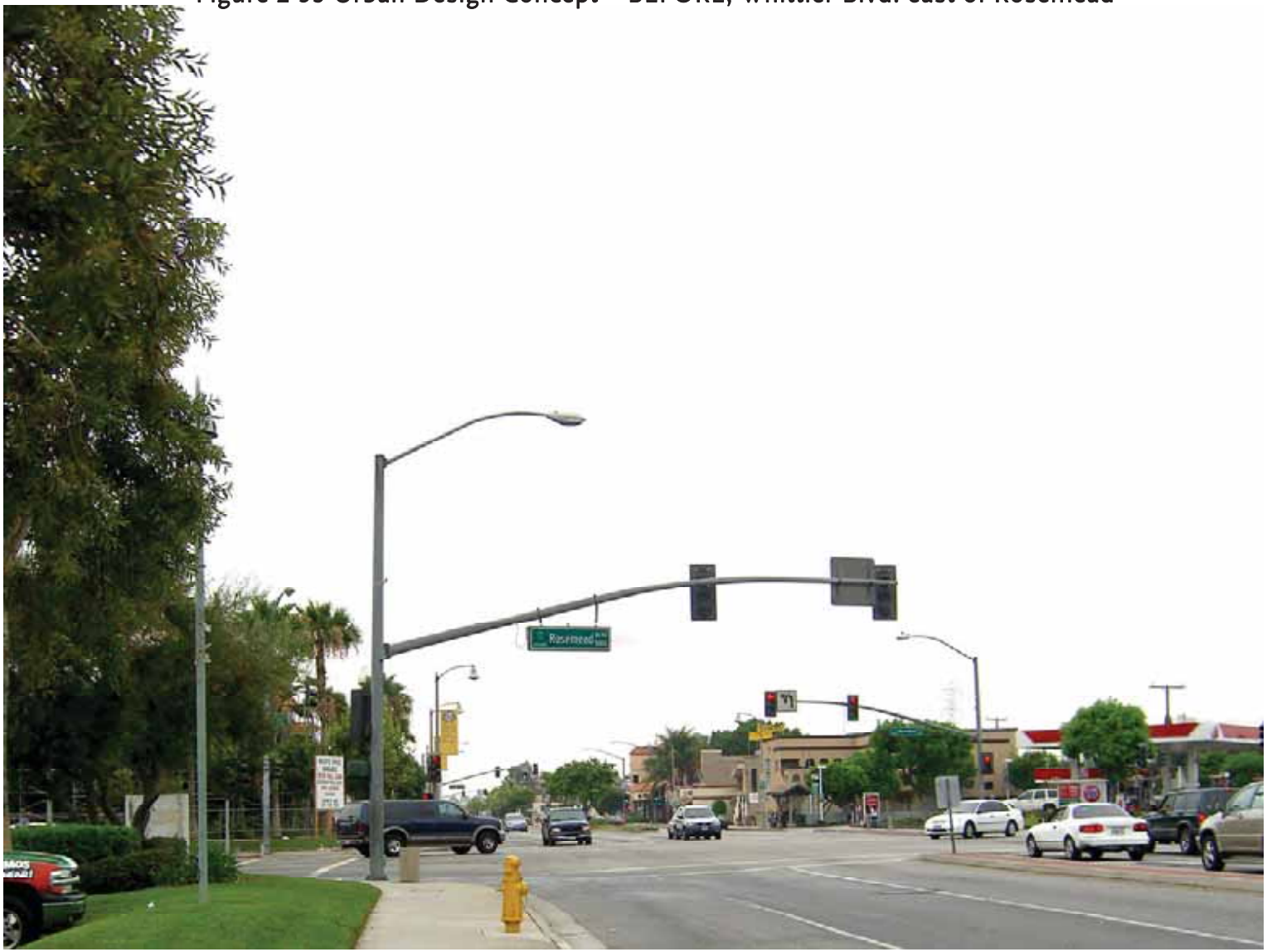


Figure 2-36 Urban Design Concept – AFTER, Median Aerial Station on Whittier Blvd. east of Rosemead

Figure 2-37 Urban Design Concept – BEFORE, Whittier Blvd. east of Rosemead

Figure 2-38 Urban Design Concept – AFTER, Side Aerial Station on Whittier Blvd. east of Rosemead

Whittier Blvd. in Whittier

Approaching Whittier, the alignment crosses over the San Gabriel River as well as I-605 Freeway on long-span aerial sections. The narrow roadway and sidewalks immediately east of the freeway, coupled with high traffic volumes at the interchange, make it impractical to provide an at-grade solution at this location. Therefore, an aerial station is proposed at Norwalk Blvd., located over the parcels south and east of the intersection, similar to the potential side aerial station previously identified in Pico Rivera at Rosemead Blvd.

The Norwalk station is located within walkable range of the residential neighborhoods located north and south of Whittier Blvd. which are accessible from Norwalk Blvd., multi-family units located along Norwalk Blvd., and commercial sites along Whittier Blvd. Norwalk Blvd. buses from routes serving West Whittier, Santa Fe Springs and beyond would stop at the station. In addition to traffic access via Whittier and Norwalk Blvds., the station would be located within ½ mile of the Whittier Blvd. interchange on I-605. A limited amount of parking could be developed using structures located on land acquired for the station footprint. In addition to the Whittier M10 bus, the station is served by the NW1 Norwalk Blvd. bus, which connects to Rio Hondo College and the Crossroads area to the north, and to Norwalk and other cities beyond to the south.

East of the station, the corridor widens with wide sidewalks and/or big setbacks to adjoining land uses. Accordingly, two design options have been identified: (1) transition to at-grade immediately east of the Norwalk station, or (2), continue east on aerial structure to east of Hadley St. As shown in Figure 2-39, an aerial structure can be provided within the existing right-of-way by reducing the sidewalk width from 22 feet to ten feet or by reducing the setback from the curb on both sides from 22 feet to 16 feet. In order to provide an at-grade solution, a desirable right-of-way width of 120 feet would be required in order to maintain four through lanes along with left turn lanes at the intersections.

East of Hadley St. the right-of-way widens considerably, eventually becoming a 200 foot wide corridor with a large green median and southern frontage road approaching the Whittier/ Washington intersection. Within this reach, a “grand boulevard” could be developed to include an at-grade LRT median with wide landscaped separator islands, and landscaped setbacks from the roadway lanes on either side with meandering sidewalks (see Figure 2-40 for the cross section).

Stations would be provided at Philadelphia St. and Mar Vista St. (see Figure 2-41 and 2-42 for a before/after urban design concept). Land uses, connectivity and the functional features of the Philadelphia and Mar Vista stations would be similar to the treatment of these same two stations in the Beverly LRT alternative: The Philadelphia station would be oriented towards serving local land uses including the immediately surrounding neighborhood, Uptown Whittier and future potentials at the Fred C. Nelles School site.

Figure 2-39 Typical Section – Whittier Blvd. west of Hadley

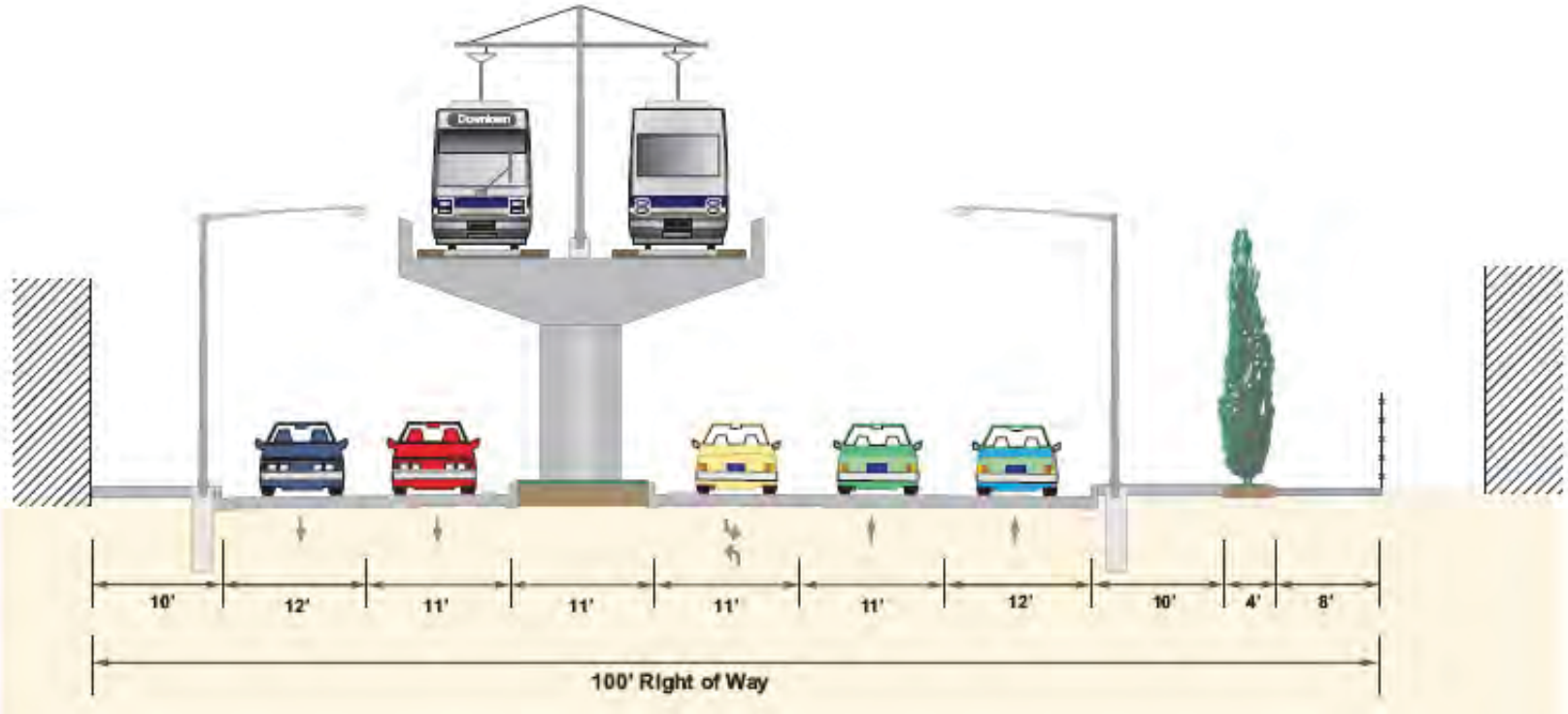


Figure 2-40 Typical Section – Whittier Blvd. east of Philadelphia

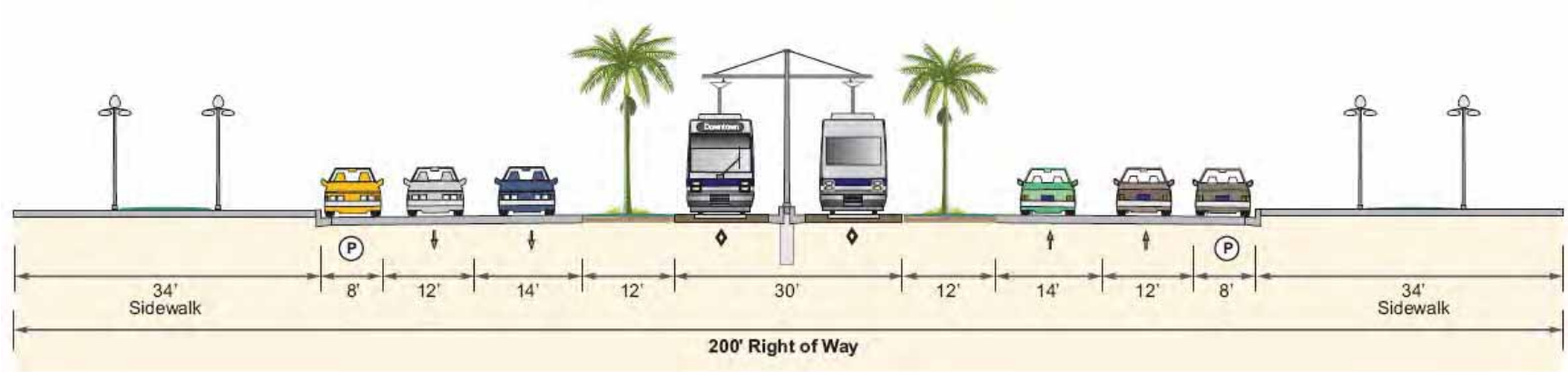


Figure 2-41 Urban Design Concept – BEFORE, Whittier Blvd. at Mar Vista St.

Figure 2-42 Urban Design Concept – AFTER, Whittier Blvd. at Mar Vista St.

The Mar Vista station would be the focus of intercepting highway trips from points farther east, accessed through Whittier Blvd., Santa Fe Springs Rd., and Washington Blvd. and would include park and ride capacity in addition to drop off. The Mar Vista station would also provide access to the Presbyterian Hospital campus and potential higher intensity land uses along the south side of Whittier Blvd. if the city extends Mar Vista St. southwest across Whittier Blvd. to connect with the Presbyterian campus. The Philadelphia station would provide an interface to the M10 Whittier bus. The M50 Washington Blvd. bus could potentially be re-routed from Pickering Ave. to Whittier Blvd. to connect with the station.

As an alternative to the boulevard treatment, the streetcar loop could be provided with a single track turning north towards Uptown Whittier at Penn St. and looping back at Wardman St. – refer to section 2.4.6 of the Beverly LRT narrative for a description of the loop and stop locations.

2.3.5 Alternative 5 – Washington LRT

The Washington Blvd. LRT alignment begins as an eastward extension of the Phase 1 project across S. Atlantic Blvd. then turns south at Garfield Ave. and follows Garfield Ave. south to Washington Blvd.; the alignment continues east along Washington Blvd. to a terminus east of Lambert Rd. in the vicinity of the Washington/Whittier intersection.

Key issues identified as a result of the screening include the following:

- Placement of Garfield station and aerial trackway along Garfield Ave.
- Evaluating at-grade vs. aerial configuration in Montebello segment
- Evaluating at-grade vs. aerial configuration in Pico Rivera segment
- Evaluating at-grade vs. aerial configuration east of San Gabriel River, including Santa Fe Springs/Whittier

In evaluating the potential for at-grade operation, consideration was given to the fact that Washington Blvd. is a major six lane arterial and truck route that connects warehouse and industrial uses along a corridor extending from south of the Los Angeles Central Business District. In addition, it is used as a principal access route to Commerce, southern Montebello, central Pico Rivera, Santa Fe Springs and Central Whittier, including large regional shopping facilities in Pico Rivera. In order to continue to serve this function, it is necessary to maintain traffic capacity so that a reduction in the number of through lanes would not result in major conflicts with highway traffic.

The following narrative addresses each principal segment, the design considerations, and the rationale for the recommended configuration.

Pomona Blvd. and Via Campo

The Eastside Extension Phase 1 project terminates at-grade in the median of Pomona Blvd. immediately west of Atlantic Blvd. As such, the simplest design solution is to extend the line at-grade across Atlantic Blvd. and follow Pomona Blvd. to the SR-60 Freeway. Accordingly, the LRT trackway continues east across S. Atlantic Blvd. in the median of Pomona Blvd. Slightly west of S. Hillview Ave., the alignment transitions to aerial structure and crosses over S. Sadler Ave., swinging to the south to follow the south side of the Pomona Freeway (SR-60) in a combination of retained cut and aerial with columns, as required, to fit between the freeway and Via Campo to the south. The alignment continues to Garfield Ave., where it turns south.

Garfield Ave.

North of Beverly Blvd., this segment is the same as Beverly LRT alternative, including the proposed station west of Garfield Ave. immediately south of Via Campo. South of the Garfield station, the alignment enters the median of Garfield Ave. and continues south; however, for this alternative, the alignment continues on aerial structure over the median of Garfield Ave. beyond Beverly Blvd. down to Washington Blvd., where it turns into the median of Washington Blvd. Refer to section 2.4.2 for a description of the Garfield station. The alignment would need to cross over the 160-foot wide Union Pacific Railroad corridor south of Olympic using a long span structure to avoid encumbering rail uses.

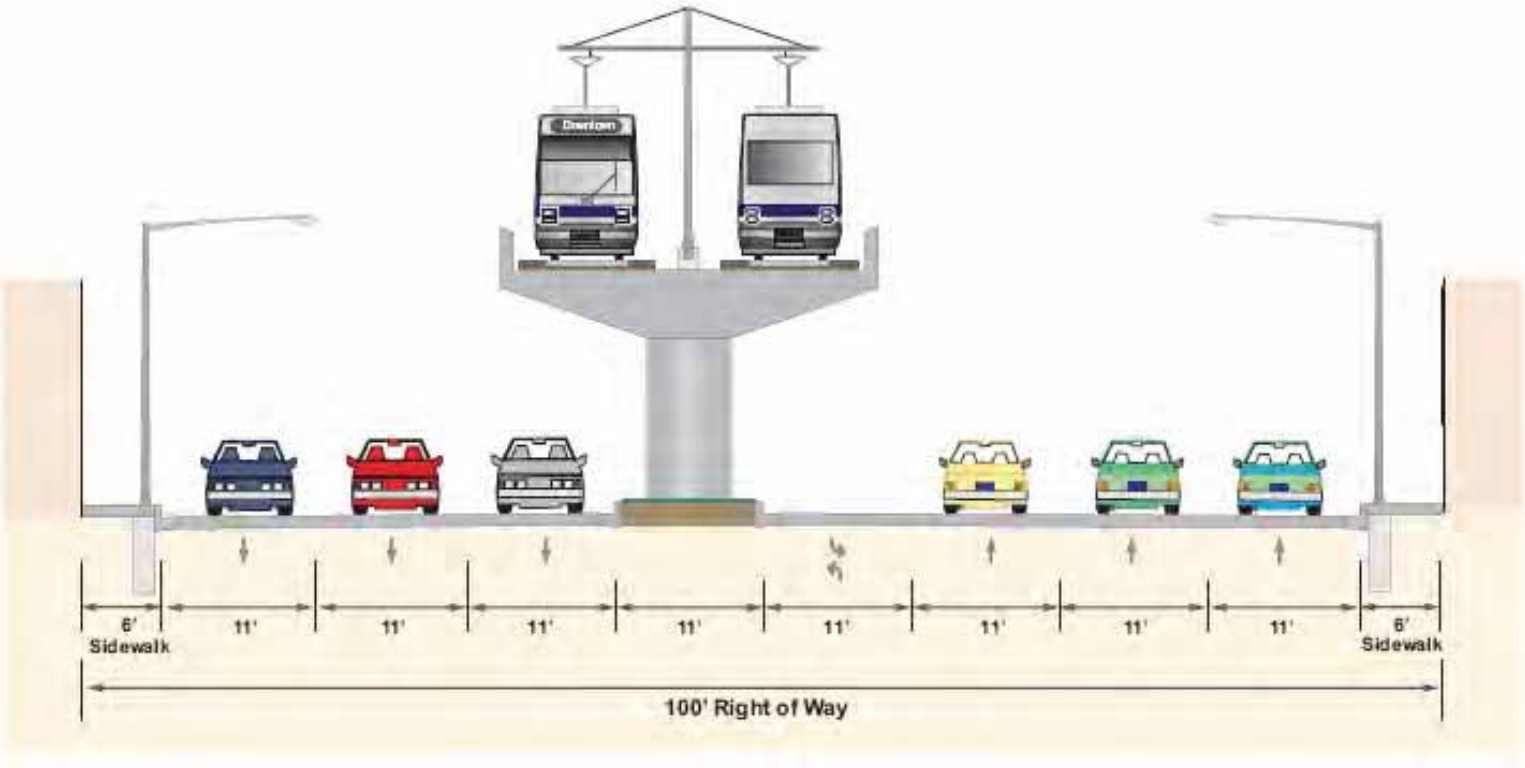
Washington Blvd. west of Rio Hondo

In Montebello, the Washington Blvd. right-of-way is 100 feet wide but land uses are built out to the back of the sidewalks at many locations. The roadway is 80 feet wide, providing a central median and six travel lanes (parking is allowed in the shoulder lanes in off peak periods). In order to fit an at-grade LRT trackway into the corridor while maintaining six through lanes at intersections, a roadway width of nearly 120 feet would be required, which in turn would require a right-of-way of about 140 to 150 feet. Alternatively, by reducing existing lane widths slightly and reconfiguring the median, an aerial structure can be provided along with an area for left turn lanes at all of the major intersections. Figure 2-43 shows the aerial cross section, which is included in the final alternative.

The Montebello segment is just over one mile in length, which could be served by a centrally located station at S. Greenwood Ave. Most of the walkable residential destinations are located east of S. Greenwood Ave. both north and south of Washington Blvd. West of S. Greenwood Ave., there are some commercial uses that would be within walking distance of the station, and the remaining land uses are industrial and warehouse. Roadway access is provided by Washington Blvd. and Greenwood Ave. – the latter route swings east approaching the Union Pacific Railroad and connects via Montebello Way to Montebello Blvd., which in turn provides

access to the central area of Montebello. This stop would connect to a number of bus lines. In addition to the M50 Washington Blvd. bus, the M20 and M70 buses operating north-south along S. Greenwood Ave. and Montebello Blvd. would serve the station.

Figure 2-43 Typical Section – Washington Blvd. near S. Greenwood



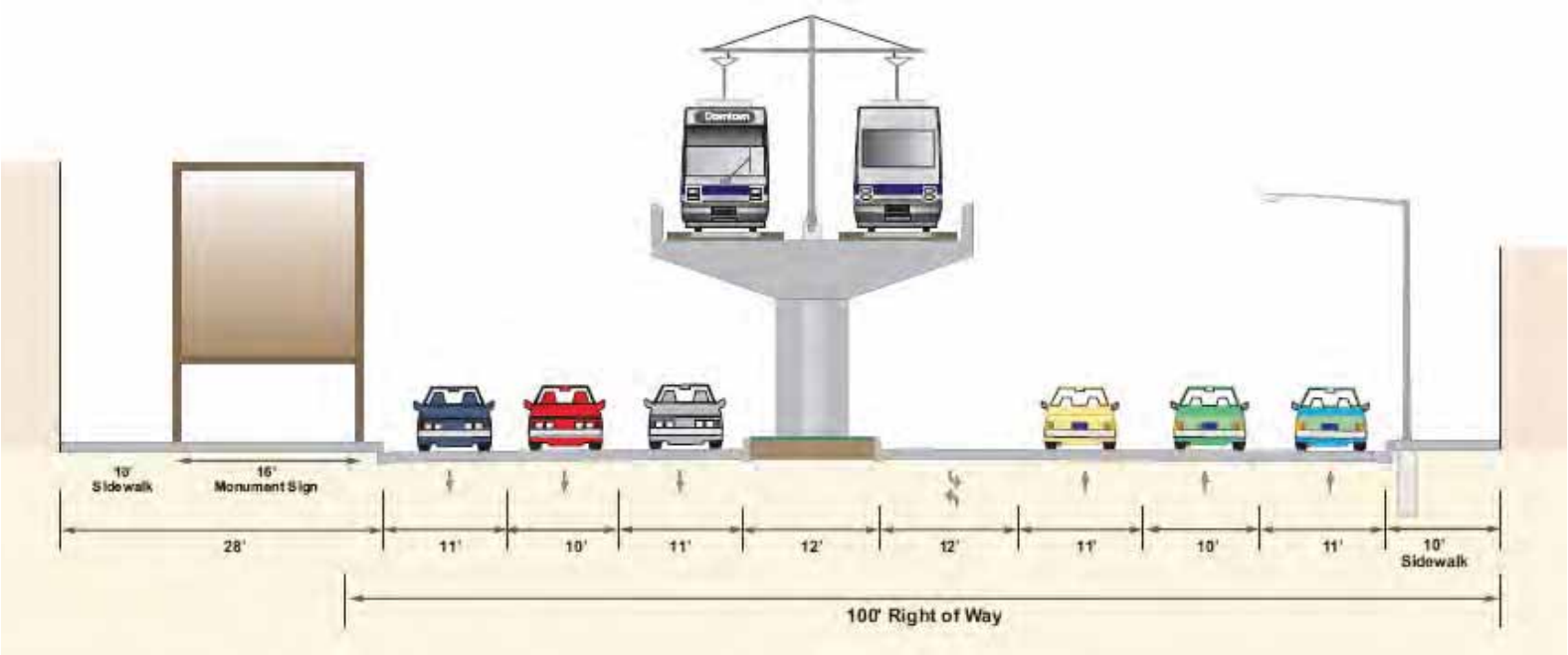
Washington Blvd., Rio Hondo to San Gabriel River

There are two distinctly different roadway segments in Pico Rivera. West of Rosemead Blvd., industrial and commercial uses front along Washington Blvd.; east of Rosemead, there are residential uses. Proposed treatments for these two distinctly different segments are described below:

- West of Rosemead Blvd. – The right-of-way is 100 feet wide, similar to the Montebello segment; however, there is a landscaped setback of about 25 feet that includes a meandering sidewalk and large monument signs for the shopping center uses along much of the segment. As noted above for the Montebello segment, 40 to 50 feet of additional right-of-way would be required to develop an at-grade trackway; however, reducing the width of the landscape setback by about ten feet would provide enough width for a roadway widening to accommodate a median to support an aerial trackway, along with maintaining six through lanes and left turn lanes at major intersections (refer to Figure 2-44). In order to accomplish the widening, the sidewalk, landscaping and monument signs would need to be revised along the southern curb. Additionally, a station is provided west of Rosemead Blvd. At the station location, the trackway would be shifted to the southern half of the street, allowing the station to "fit" with the commercial land uses to the south. There is a potential opportunity for TOD and shared parking by decking over existing surface parking lots.
- East of Rosemead Blvd. – In this segment the right-of-way is 160 feet wide where both north and south side frontage roads are provided. Although in principle the frontage road side medians and outboard parking lanes could be eliminated in order to fit an at-grade trackway into the existing right-of-way, this treatment would result in the six lane roadway being shifted immediately in front of the residences. In addition, with an aerial segment immediately to the west, and with an aerial section required to cross the San Gabriel River and I-605 Freeway immediately to the east, the two large transition sections would substantially reduce the actual amount of at-grade running that could be provided. Accordingly, the recommended treatment is to revise the existing center median pockets similar to the treatment shown for Whittier Blvd. west of Montebello Blvd. so that the aerial trackway could be constructed over the existing median, thereby eliminating the requirement for additional right-of-way along most of the segment.

The Pico Rivera stretch of Washington Blvd. is about 1.5 miles long and could be served by a centrally-located station at Rosemead Blvd. This station would be located west of Rosemead which maximizes the opportunity to integrate the station with the large shopping complex located to the south and west of the Rosemead/Washington intersection. A median design would be used similar to the treatment discussed for the Rosemead station in Pico Rivera.

Figure 2-44 Typical Section – Washington Blvd. west of Rosemead



This station would be within walking distance of residential neighborhoods located northwest, east and south of the station. Washington and Rosemead Blvds. would provide high capacity vehicular access to the site and the station would be just over one mile east of the I-605 Freeway interchange along Washington Blvd. The station would be directly accessible to bus stops located at the Washington/Rosemead intersection, including the M50 Washington Blvd. bus as well as the Route 266 Rosemead bus serving a large market area north and south of the station.

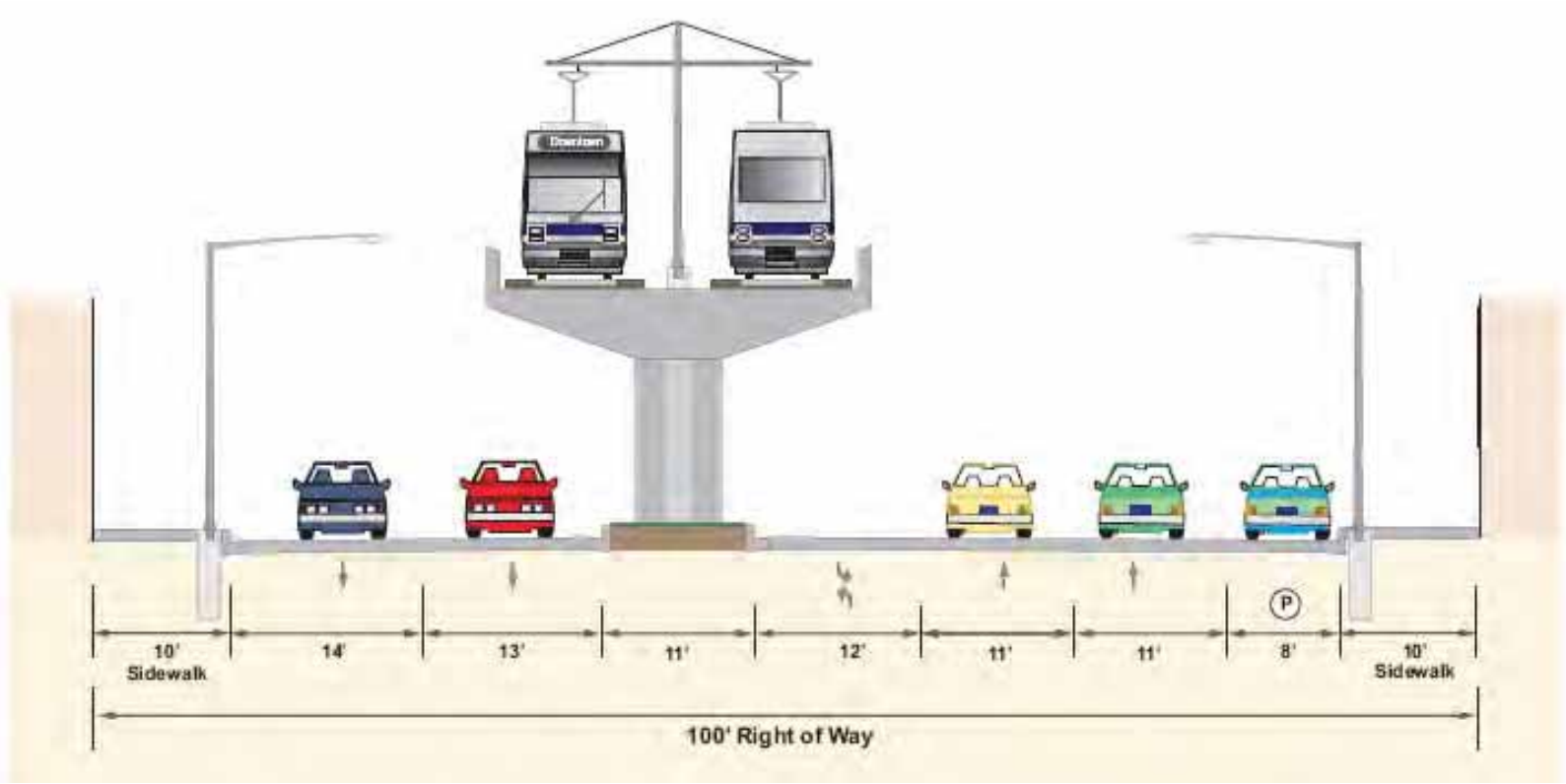
Continuing to the east, the alignment would cross over the San Gabriel River and I-605 Freeway on a combination of long-span and high column aerial construction. The alignment would shift to the south side of the roadway to develop a separate alignment parallel to the existing roadway crossing the San Gabriel River. East of the river, the alignment would take advantage of the curve along the Washington Blvd. roadway to align with and transition to the median of Washington Blvd. heading into Santa Fe Springs and Whittier.

Washington Blvd. east of San Gabriel River

East of the San Gabriel River, the Washington Blvd. right-of-way is 100 feet wide, with six through lanes provided west of Norwalk Blvd. and four through lanes to the east. Neither of these segments could accommodate an at-grade alignment without widening the roadway. However, an aerial trackway could be developed by reconfiguring the roadway facilities within the existing right-of-way as described further below for the three distinctively different segments:

- Washington Blvd. I-605 to Norwalk Blvd. – The alignment would cross the river and freeway on aerial structure. The six-lane section immediately east of the river has frontage roadways and residential to either side, similar to the segment just west of the river. Accordingly, for reasons described above for the east of Rosemead segment, the aerial structure could be developed over the existing median by providing a raised island and channelizing the left-hand turns to avoid columns.
- Washington Blvd. east of Norwalk Blvd. –There is inadequate width to develop an at-grade alignment or to transition the structure down at Norwalk Blvd. East of Norwalk Blvd., the 100-foot right-of-way is too narrow to accommodate an at-grade trackway along with four lanes of traffic and left turn lanes without widening to a right-of-way width of 120 feet or more. (see Figure 2-45) However, commercial uses are built out to the back of the sidewalk including numerous buildings as well as parking areas that are too narrow to be reconfigured efficiently with a loss of depth. On the other hand, given the large amount of off-street parking, the existing parking strip along both sides of the roadway could be eliminated and the roadway reconfigured to provide a raised median with space for left-turns alongside. This configuration could be carried all the way to the terminal station, which is proposed at Lambert Rd.

Figure 2-45: Typical Section – Washington Blvd. east of Norwalk



The stations in this segment would both be aerial stations with center platforms. A circulation bridge would connect to a vertical circulation element adjacent to the station; this element could be either free-standing or integrated into adjoining private development. Parking could also be developed either as free-standing structure or could be provided as shared parking developed in conjunction with adjacent commercial properties. The specific access and functional considerations for these two stations are as follows:

- Norwalk Station – This station would serve walkable residential neighborhoods located both north and south of the station off Norwalk Blvd. in addition to the commercial properties located along Washington Blvd. itself. A convenient connection could be made to Norwalk Blvd. bus stops. Norwalk and Washington Blvds. would serve as access routes. In addition, the station is within ½ mile of the Washington/ I-605 interchange and could potentially attract traffic from the freeway. This station would connect to the Washington Blvd. M50 bus and the NW 1 and NW9 Norwalk Blvd. buses serving locations north along Workman Mill Rd. and locations south in Santa Fe Springs and Norwalk.
- Lambert Station – A station would be located directly opposite the Presbyterian Intercommunity Hospital campus and would also provide walk access to the commercial corridor along Washington Blvd. Lambert Rd. provides a connection to the Fred C. Nelles School site, a potential development area about ½ mile to the north. This station is within walking distance of some residential areas in Santa Fe Springs to the southeast and Central Whittier to the northeast and northwest. Washington Blvd. connects to Whittier Blvd immediately east of the station, providing access to Central Whittier, and Lambert Rd. provides access to east Whittier as well as Santa Fe Springs via Santa Fe Springs Rd. In addition to the M50 Washington Blvd. bus, this station would connect to the Route 270 bus, which provides access to points along Norwalk Blvd. and a large market area to the south, and the "Sunshine Shuttle" bus serving local destinations. Access to Uptown Whittier and Whittier College could be provided by shuttle bus or using the Route 270 bus.

2.4 Final Alternatives

This section presents a narrative description of the No-Build, TSM and five (5) final fixed-guideway alternatives, which are the basis for the comparative analysis.

2.4.1 No-Build Alternative

The No-Build Alternative includes all projects that are identified for construction in the financially constrained Long Range Transportation Plan by the year 2030 but does not include the Eastside Transit Corridor Phase 2 project. The No-Build Alternative is used for comparison purposes in order to assess the relative benefits and impacts of constructing a new transit project versus constructing only projects that are already funded and planned for in the Long Range Transportation Plan.

Figure 2-46 illustrates the features of the No-Build Alternative, which reflects approved Metro actions and the transit network representing the "constrained plan" from the last-approved Metro Long Range Transportation Plan adopted February 2001. The assumed countywide urban rail network includes the following lines:

- Red Line, North Hollywood to Union Station
- Purple Line, Wilshire/Western to Union Station
- Gold Line, Pasadena to East Los Angeles
- Blue Line, Long Beach to 7th/Flower
- Exposition Line Phase 1, Culver City to 7th/Flower
- Crenshaw Line, Expo/Crenshaw to Aviation
- Green Line, Norwalk to El Segundo
- Green Line, Norwalk to LAX
- LAX people mover

The No-Build Alternative is also a required alternative for comparison as part of later NEPA/CEQA environmental analysis. Therefore, the No-Build Alternative will be carried beyond the AA analysis to the environmental phase of project development regardless of its performance versus the build alternatives still under consideration.

Figure 2-46 No-Build Alternative

2.4.2 Future Baseline/TSM Transit Network

A variety of bus services are currently provided in the PSA, including Metro Local, Limited, Express and Rapid buses as well as municipal bus lines. Montebello Bus Lines are the principal local bus service, operating a range of lines that include local services as well as express bus service. East-west Express and Rapid services extend to downtown Los Angeles, and some of the north-south lines extend north to connect with the Metro Pasadena Gold Line and south to connect with the Metro Green Line and beyond to the vicinity of Long Beach.

In addition to bus services, the baseline network includes three Metrolink commuter rail routes, each of which has one station located within the PSA:

- San Bernardino Line – Providing service between San Bernardino and Union Station – The station is located near Tyler Ave. in El Monte at the far northeast corner of the PSA
- Riverside Line – Providing service between Riverside and Union Station – The station is located in an industrial area near the Commerce/Montebello border east of Garfield Ave.
- Orange County / 91 Lines – Providing service between Orange County/Riverside and Union Station – The station is located west of Garfield Ave. along the southwest edge of the PSA

None of the Metrolink stations are located directly along alignment routes that were identified in the on-going planning process for the Eastside Transit Corridor Phase 2. The Commerce/Montebello Metrolink station is east of Garfield Ave. near the Washington LRT alignment but is not located near an identified stop. The LRT alignment would need to be re-routed away from principal roadways onto narrow collector roadways to serve the Metrolink station, which is located in an industrial area that would preclude development of transit-supportive land uses. However, most of the Metrolink stations are served by bus, so the baseline network would integrate the Metrolink stations with the Metro fixed guideway alternatives under study.

In addition to the Metrolink services, Metro operates rail transit lines that connect to some of the baseline fixed route bus transit lines serving the PSA, notably:

- Metro Pasadena Gold Line – Currently providing service paralleling I-210 north of the PSA between Santa Anita Ave. and Union Station with planning for an extension to Montclair
- Metro Green Line – Currently providing service along I-105 south of the PSA between I-605, Los Angeles International Airport and points beyond

In order to leverage the investment in an east-west transit spine to provide a high capacity fixed guideway, it is appropriate to consider enhancements to north-south bus services that

would feed and integrate with the improved east-west spine. These improvements have been identified and have been incorporated in a "Baseline" transit network, which would be provided in conjunction with any of the build alternatives.

In addition to the consideration for service enhancements to support the proposed build alternatives, the Alternatives Analysis process requires the evaluation of the performance benefits of the build alternatives compared to a lower cost Transportation Systems Management (TSM) alternative. The TSM would address the same needs as the build alternatives but without requiring construction of a fixed guideway facility and would have a lower level of capital investment. At this step in the project development process, additional enhancements to the baseline network were identified in conjunction with the current east-west network in order to develop the TSM options for testing against each of the build alternatives. The basic approach will be to replace the east-west bus option in the same corridor to develop the TSM network.

The characteristics of this enhanced baseline network are depicted in Figure 2-47; Tables 2-4 and 2-5 provide more specifics on a line-by-line basis. In summary, key elements of the future baseline include:

North-South "Feeder" Services

- Upgrade M30 Garfield Ave. bus to Rapid service
- Upgrade M20 Montebello Blvd. bus to Limited Stop service with higher service levels
- Add service to Metro 265 and Metro 266 local buses along Rosemead Blvd. and Paramount Blvd.
- Add service to Foothill Transit 274 along Workman Mill Rd.
- Provide new 577 Express service operating along Metro Route 270

East-West "TSM" Services

- Provide new Pomona Freeway Express connecting to Phase 1 terminal
- Provide new Beverly Blvd. Rapid bus service
- Add service to M10 Whittier Blvd. bus
- Add service to M50 Washington Blvd. bus

Figure 2-47 Baseline/TSM Bus Improvements

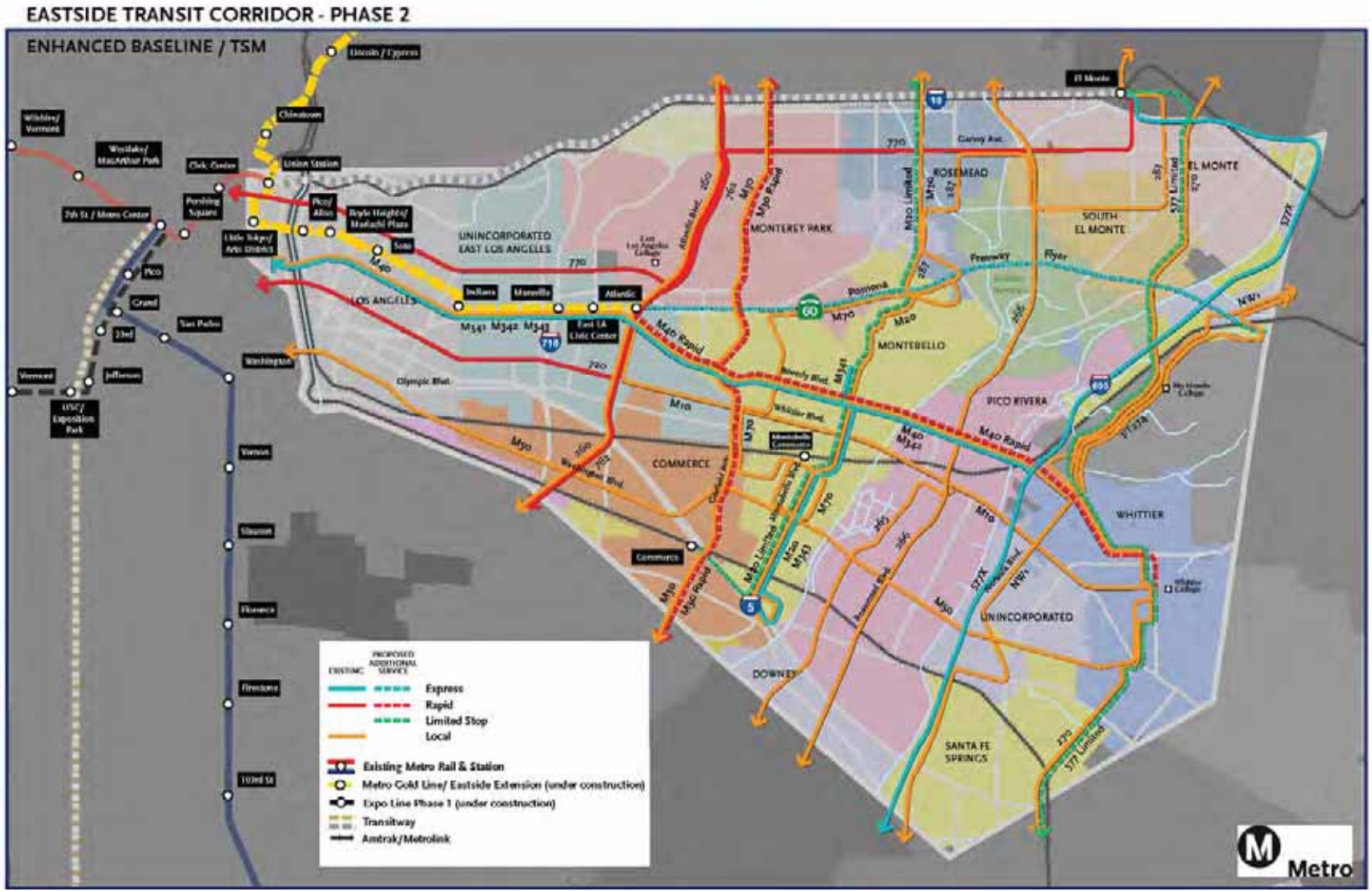


Table 2-4 Baseline/TSM Bus Improvements – North-South Services

Existing Lines (North-South)	Current Service Routing & Frequencies (Minutes)	TSM Alternative Service Improvements
260 – Atlantic Blvd.-Fair Oaks Ave.	- Northern terminus at Fair Oaks / Loma Alta - Southern terminus at Artesia Blue Line Station - Peak (10-12) / Day (15) / Eve (20) / Wkd (20 -30)	- No extension - At current frequencies
762 – Pasadena – Artesia Station	- Northern terminus at Fair Oaks / Washington - Southern terminus at Artesia Blue Line Station - Weekday 5 am – 9 pm / Saturday 7 am – 7 pm	- Rapid service replaces 361 Limited starting 6/30/08
M30 – Garfield Ave.	- Northern terminus at Garfield/Huntington - Southern terminus at Garfield/Firestone - Peak (45) / Day (45) / Eve (60) / Wkd (40-60)	- Upgrade to Rapid service operated by Montebello Bus - Peak, day, evening and weekend service added
M70 – Montebello Town Center Dr. - Montebello Commerce Metrolink Station	- Northern terminus at Montebello Town Center Dr. - Southern terminus at Greenwood/Mines - Peak (30) / Day (30) / Eve (30) / No Wkd	- Continued operation by Montebello Bus - At current frequencies
M20 – Garvey Ave.-San Gabriel Blvd.-Foothill Blvd.	- Northern terminus at Sierra Madre Villa Gold Line Station - Southern terminus at Greenwood/Telegraph - Peak 15 / Day 15 / Eve 20-30 / Wkd 15-30	- Upgrade to Limited Stop service operated by Montebello Bus - Extension to Commerce Metrolink Station - Peak, day, evening and weekend service added
287 – Sierra Madre Villa-Sierra Madre Villa Blvd.-Santa Anita Ave.-El Monte-South El Monte-Montebello Town Center Dr.	- Northern terminus at Sierra Madre Villa Gold Line Station - Southern terminus at Montebello Town Center - Peak (20-35) / Day (30-45) / Eve (30-60) / Wkd (60)	- No extension - At current frequencies

Table 2-5 Baseline/TSM Bus Improvements – East-West Services

Existing Lines (East-West)	Current Service Routing & Frequencies (Minutes)	TSM Alternative Service Improvements
265 – Lakewood-Paramount Blvd.-Pico Rivera	- Northern terminus at Whittier/Rosemead - Southern terminus at Lakewood Center - Peak (26-40) / Day (43-50) / Eve (50) / Wkd (50)	- No extension - Peak, day, evening and weekend service added
266 - Rosemead Blvd.-Lakewood Blvd.-Sierra Madre Villa	- Northern terminus at Sierra Madre Villa Gold Line Station - Southern terminus at Lakewood/Del Amo - Peak (20-40) / Day (40) / Eve (60) / Wkd (40-60)	- No extension - Peak, day, evening and weekend service added south to Lakewood Green Line Station
577X - El Monte-Norwalk-VA Medical Center-Downtown Long Beach via I-605 Freeway Express	- Operates nonstop through PSA from El Monte Transitway Station to Long Beach Transit Mall - Peak (20) / Day (30) / Eve (30-60) / No Wkd	- No extension - At current frequencies
NW1 - Rio Hondo-Norwalk-Bellflower	- Northern terminus at Workman Mill / Don Julian - Southern terminus at Flower/Bellflower - Peak (30) / Day (30) / Eve (50) / Wkd (60)	- Continued operation by Norwalk Transit - At current frequencies
270 - Monrovia-El Monte-Whittier-Santa Fe Springs-Norwalk Metro Rail Station	- Northern terminus at Primrose/Foothill - Southern terminus at Norwalk Green Line Station - Peak (20-60) / Day (60-70) / Eve (40-60) / Wkd (60)	- Supplement with new 577 Limited service on same route between El Monte Transitway Station and Norwalk Green Line Station
FT274 - West Covina-La Puente-Whittier	- Northern terminus at West Covina/California - Southern terminus at Beverly/Norwalk - Peak 60 / Day 60 / No Eve / Wkd 60	- No extension - Peak, day, evening and weekend service added

2.4.3 Final Alternative 1 – SR-60 LRT

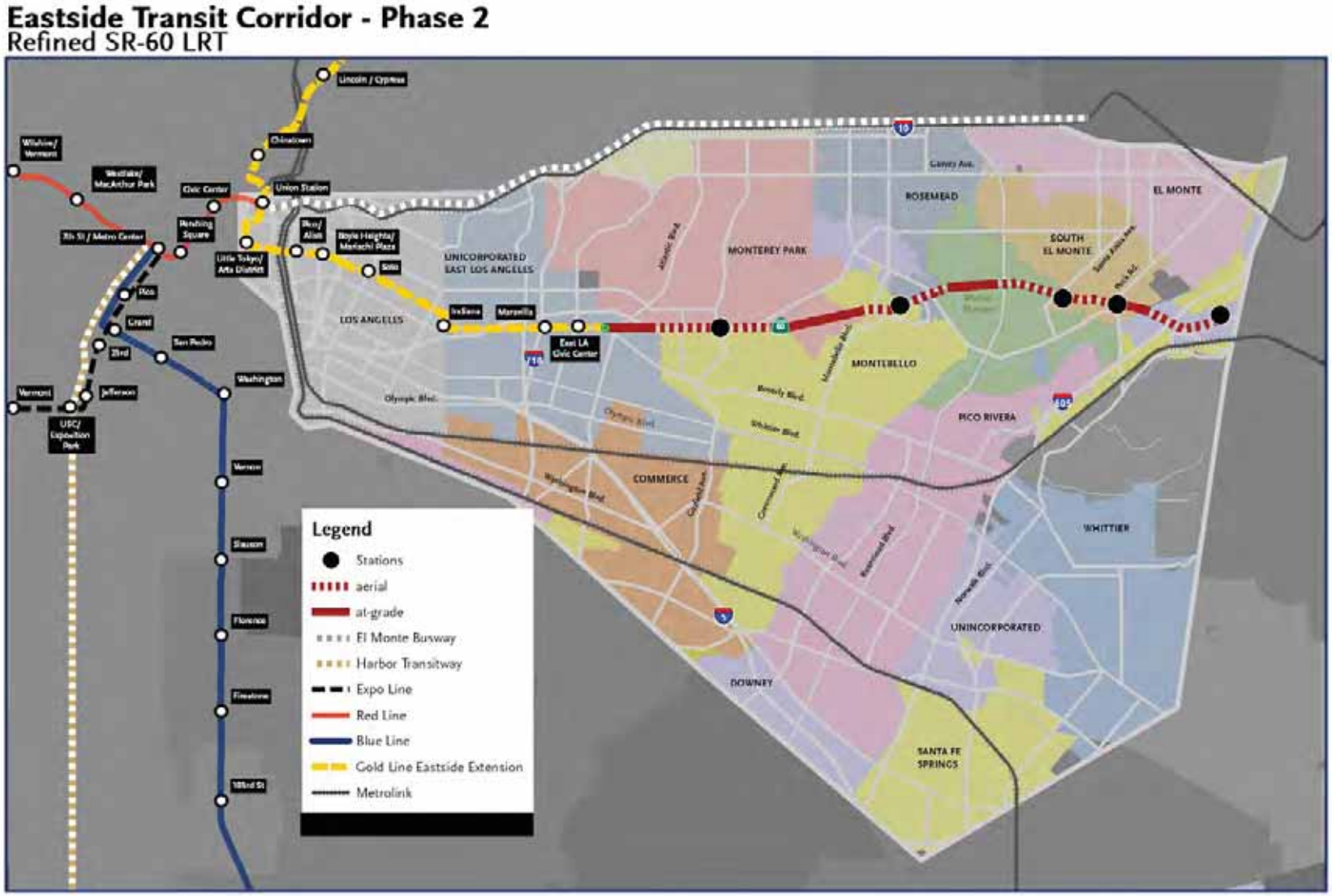
General Description:

This alternative follows the edge of the SR-60 Freeway generally within the freeway right-of-way. The alternative serves a series of park and ride stations to an end-of-line freeway intercept station east of the SR-60/I-605 interchange. The alignment serves Monterey Park, South San Gabriel, Rosemead, South El Monte and West Puente Valley north of SR-60 as well as the northern portions of Montebello, Pico Rivera and Whittier(via Workman Mill Rd.). A terminus in the vicinity of the Crossroads Pkwy./SR-60 interchange is accessible from SR-60 east of the SR-60/I-605 interchange as well as I-605 south of the freeway-freeway interchange. The alignment extends along Pomona Blvd. to SR-60 at-grade and follows the freeway in a side-running configuration using a combination of aerial and retained cut depending upon topography. The stations are designed with large park and ride facilities to intercept north/south roadway traffic and bus lines approaching the freeway. Shuttle bus access is provided to significant trip generators near stations such as for Rio Hondo College at the terminal station. There is some potential for TOD to occur on or adjacent to parking areas at freeway interchanges. Figure 2-48 illustrates the alignment of the SR-60 LRT Alternative.

Alignment Segments:

- Extend existing at-grade alignment east across Atlantic Blvd. and follow the median of Pomona Blvd. to SR-60
- The alignment transitions to aerial configuration slightly west of S. Hillview Ave., crossing over S. Sadler Ave. to follow the south edge of the SR-60 Freeway
- Alignment continues east along the south side of SR-60 in a combination of retained cut and/or on columns; an aerial station is located immediately east of S. Garfield Ave.
- Alignment climbs up above the freeway to cross over the N. Vail Ave. eastbound on-ramp and follows the freeway on an approximate 2.5 – 3.0 % grade approaching the crest
- Alignment transitions to approximate freeway grade east of the on-ramp, supported on retained fill so as not to disturb the cap over the encapsulated waste disposal site located along the freeway between N. Vail Ave. and Paramount Blvd.
- Alignment passes under the Greenwood Ave. bridge, with modifications near the south abutment to accommodate the LRT trackway
- Alignment continues to climb beyond the freeway crest about 0.5 mile west of the Paramount Blvd. interchange so as to clear the eastbound off-ramp to Paramount Blvd.
- Alignment passes over the Paramount Blvd. interchange cross street and on-ramp and then dips and levels off at the Town Center station platform
- East of platform the alignment dips down at 4% – 5% grade approaching the Rio Hondo

Figure 2-48 SR-60 LRT Alternative



- Alignment crosses the Rio Hondo at approximate elevation as main line then climbs to clear Rosemead Blvd. interchange ramps at Whittier Narrows Recreation Area
- Alignment swings south to clear Santa Anita Ave. interchange bridge then levels off at station east of Santa Anita Ave.
- Alignment continues east along south edge of freeway and rises up to clear Peck Rd. interchange ramps
- Alignment levels off for station east of Peck Rd. then dips to follow freeway across San Gabriel River
- Alignment swings south at I-605 ramps then aligns at skew angle to cross SR-60 main line east of I-605 main line
- Alignment curves to follow north edge of SR-60 Freeway then dips beneath Crossroads Pkwy. S. bridge
- Alignment terminates at platform along north edge of freeway approaching Crossroads Pkwy. N.

Station Locations:

- E. 3rd St./Atlantic Blvd./ Pomona Blvd. (East Los Angeles) – At-grade center platform (Existing); transfer to Atlantic Blvd. buses
- SR-60 east of S. Garfield Ave.(Monterey Park & Montebello) – Aerial center platform along south edge of SR-60 with bridge access to parcel in SW quadrant of S. Garfield Ave./Pomona Blvd. intersection; opportunity for park and ride using parking deck and/or shared parking and TOD; transfer to S. Garfield Ave. buses
- SR-60 at Town Center Dr. between Paramount Blvd. and San Gabriel Blvd.(Montebello, Rosemead, and South San Gabriel) – Aerial center platform between Town Center Dr. and SR-60 with bridge access to parking lots at mall and Kaiser facility; opportunity for park and ride with shared parking and TOD; transfer to Montebello Blvd. and San Gabriel Blvd. buses
- SR-60 at Santa Anita Ave. (Montebello, South San Gabriel, and Whittier Narrows Recreational Area) – Aerial center platform with bus loading area at plaza level on undeveloped parcel in SE quadrant of Santa Anita Ave. and SR-60; opportunity for park and ride using parking deck and/or shared parking and TOD
- SR-60 at Peck Rd. (South El Monte, Pico Rivera and Whittier) – Aerial center platform with bus loading area at plaza level on triangle parcel between freeway, Peck Rd. and San Gabriel River; opportunity for site redevelopment with park and ride and TOD
- SR-60 at Crossroads Pkwy. (Whittier, City of Industry, and West La Puente Valley) – Aerial center platform with bus loading level on undeveloped parcel between Crossroads Pkwy.

and freeway; opportunity for park and ride using parking deck and/or shared parking and TOD

2.4.4 Final Alternative 2 – SR-60 Busway

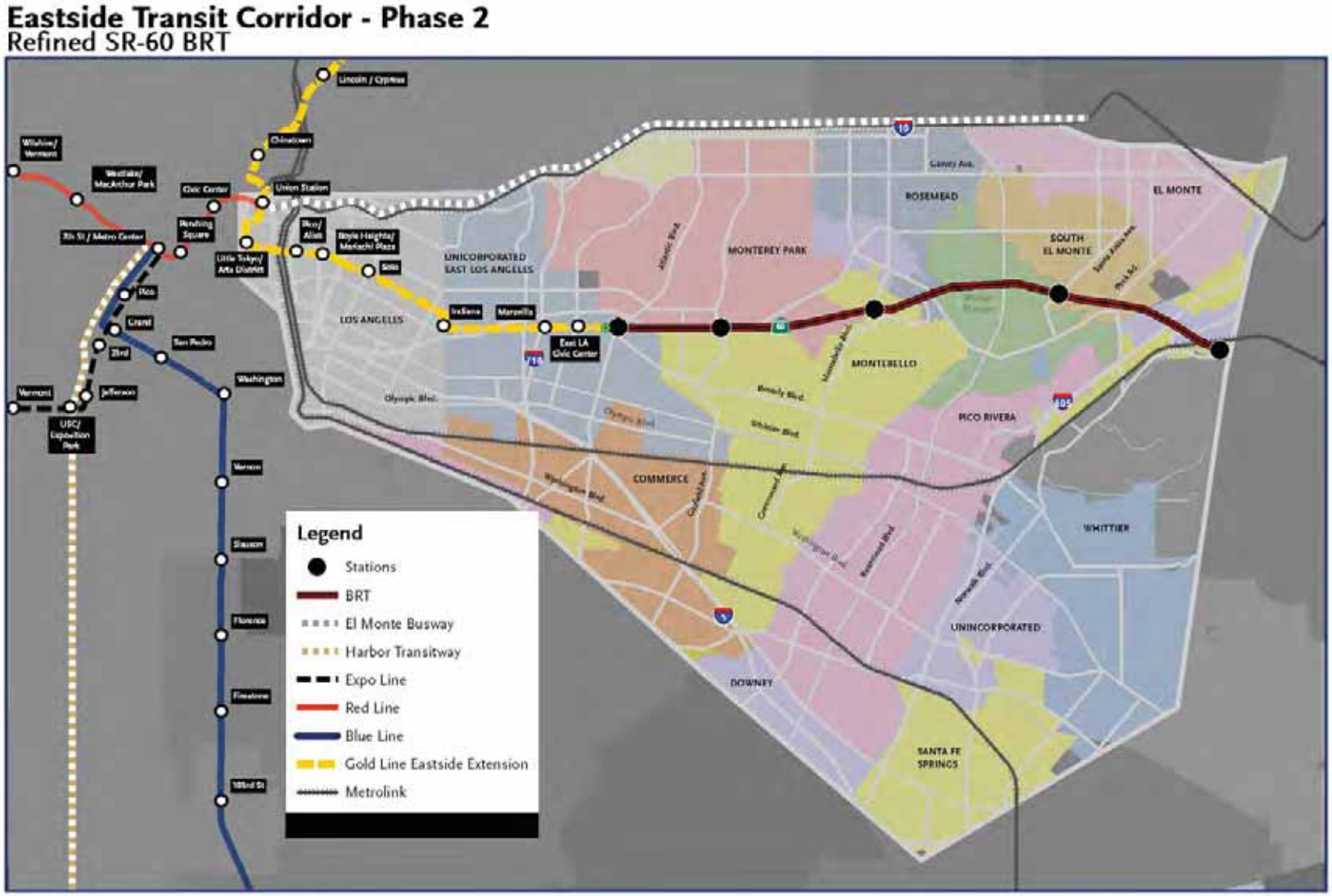
General Description:

This alternative follows the edge of the SR-60 Freeway generally within the freeway right-of-way. The alternative serves a series of park and ride stations to an end-of-line freeway intercept station east of the SR-60/I-605 interchange. The alignment serves Monterey Park, South San Gabriel, Rosemead, South El Monte and West Puente Valley north of SR-60 as well as the northern portions of Montebello and Pico Rivera. A terminus in the vicinity of the Crossroads Pkwy./SR-60 interchange is accessible from SR-60 east of the freeway-freeway interchange as well as I-605 south of the freeway-freeway interchange. Ramps at the Peck Rd. interchange allow buses from South El Monte, El Monte and Whittier to access the facility at an intermediate point. The alignment extends along Pomona Blvd. to SR-60 at-grade and follows the freeway in a side-running configuration using a combination of aerial and retained cut depending upon topography. The stations are designed with large park and ride facilities to intercept north/south roadway traffic and bus lines approaching the freeway. Shuttle bus access is provided to significant trip generators near stations such as for Rio Hondo College at the terminal station. There is some potential for TOD to occur on or adjacent to parking areas at freeway interchanges. Figure 2-49 illustrates the alignment of the SR-60 BRT Alternative.

Alignment Segments:

- Bus lanes extend east across Atlantic Blvd. and follow the median of Pomona Blvd. to SR-60
- Alignment transitions to aerial configuration slightly west of S. Hillview Ave., crossing over S. Sadler Ave. to follow the south edge of the SR-60 Freeway
- Alignment continues east along the south side of SR-60 in a combination of retained cut and/or on columns; an aerial station is located immediately east of S. Garfield Ave.
- Alignment climbs up above the freeway to cross over the N. Vail Ave. eastbound on-ramp and follows the freeway on an approximate 2.5 – 3.0 % grade approaching the crest
- Alignment transitions to approximate freeway grade east of the on-ramp, supported on retained fill so as not to disturb the cap over the encapsulated waste disposal site located along the freeway between N. Vail Ave. and Paramount Blvd.
- Alignment passes under the Greenwood Ave. bridge, with modifications near the south abutment to accommodate the busway
- Alignment continues to climb beyond the freeway crest about 0.5 mile west of the Paramount Blvd. interchange so as to clear the eastbound off-ramp to Paramount Blvd.

Figure 2-49 SR-60 BRT Alternative



- Alignment passes over the Paramount Blvd. interchange cross street and on-ramp and then dips and levels off at the Town Center Dr. station platform
- East of platform, the alignment dips down at 4% – 5% grade approaching the Rio Hondo
- Alignment crosses the Rio Hondo at approximate elevation as main line then climbs to clear Rosemead Blvd. interchange ramps at Whittier Narrows Recreation Area
- Alignment swings south to clear Santa Anita Ave. interchange bridge then levels off at station east of Santa Anita Ave.
- Alignment continues east along south edge of freeway and rises up to clear Peck Rd. interchange ramps
- Alignment levels off for station east of Peck Rd.; a connector ramp provides intermediate access to the busway from Peck Rd.
- Alignment dips to follow the freeway across San Gabriel River then swings south at I-605 ramps then aligns at skew angle to cross SR-60 main line east of I-605 main line
- Alignment curves to follow north edge of SR-60 Freeway then dips beneath Crossroads Pkwy. S. bridge
- Alignment swings to northeast and terminates at-grade at a platform approaching the intersection of Crossroads Pkwy. and the Fry's Electronics store
- Busway alignment terminates at Crossroads Pkwy. N. where freeway flyer buses serving areas east along SR-60 can enter the facility by exiting SR-60 at the Crossroads Pkwy. interchange

Station Locations:

- E. 3rd St./Atlantic Blvd./ Pomona Blvd. (East Los Angeles) – At-grade LRT center platform (Existing); busway loading zone is located along south curb of Pomona Blvd. east of Beverly Blvd.; buses circulate around triangle parcel; a part of the western portion of the parcel is developed for bus storage
- SR-60 east of S. Garfield Ave.(Monterey Park & Montebello) – Aerial side platform along south edge of SR-60 with bridge access to parcel in SW quadrant of S. Garfield Ave./Pomona Blvd. intersection; opportunity for park and ride using parking deck and/or shared parking and TOD; transfer to S. Garfield Ave. buses
- SR-60 at Town Center Dr. between Paramount Blvd. and San Gabriel Blvd. (Montebello, Rosemead, and South San Gabriel) – Aerial side platform between Town Center Dr. and SR-60 with bridge access to parking lots at mall and Kaiser facility; opportunity for park and ride using parking deck and/or shared parking and TOD; transfer to Montebello Blvd. and San Gabriel Blvd. buses
- SR-60 at Santa Anita Ave. (South El Monte and Whittier Narrows Recreational Area) – Aerial side platform with bus loading area at plaza level on undeveloped parcel in SE

quadrant of Santa Anita Ave. and SR-60; opportunity for park and ride using parking deck and/or shared parking and TOD

- SR-60 at Peck Rd. (South El Monte, Pico Rivera and Whittier) – Aerial side platform with bus loading area at plaza level on triangle parcel between freeway, Peck Rd. and San Gabriel River; opportunity for site redevelopment with park and ride and TOD; opportunity for Peck Rd. buses serving South El Monte, El Monte and Whittier to access busway facility via connector ramp
- SR-60 at Crossroads Pkwy. (Whittier, City of Industry, and West La Puente Valley) – Aerial side platform with bus loading level on undeveloped parcel between Crossroads Pkwy. and freeway; opportunity for park and ride using parking deck and/or shared parking and TOD; opportunity for bus access from freeway flyer buses serving portions of SR-60 farther east

2.4.5 Final Alternative 3 – Beverly LRT

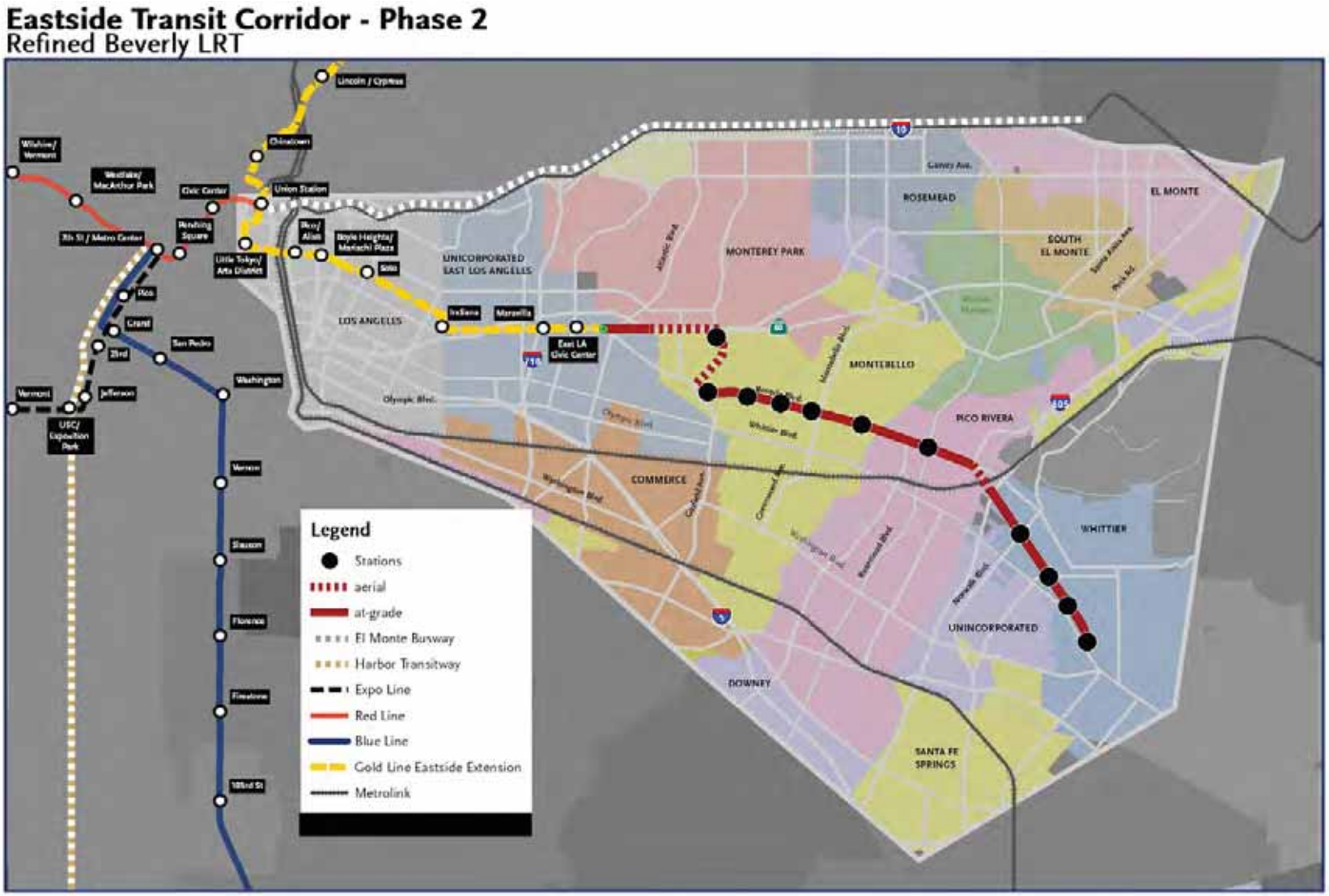
General Description:

This alternative parallels SR-60 to S. Garfield Ave., drops down to follow Beverly Blvd. to Whittier, then extends to Central Whittier via the Whittier Greenway. The route serves Monterey Park, Montebello, Pico Rivera and Whittier. The alignment uses retained cut and aerial along SR-60, and aerial structure south along S. Garfield Ave. to Beverly Blvd. The alignment is at-grade along Beverly Blvd. and the Whittier Greenway, using the existing Beverly Blvd. bridge across the Rio Hondo and with a separate aerial structure across the San Gabriel River. Elimination of left turns at minor intersections allows keeping two lanes open to traffic during peak periods while retaining off-peak parking within the existing roadway right-of-way; spot widening is accomplished at stations and principal intersections to provide needed roadway capacity. The on-street section connects to an exclusive at-grade alignment along the Whittier Greenway to Whittier Blvd., with an optional streetcar loop serving Uptown Whittier. The alternative could potentially intercept SR-60 trips at a park and ride with joint development potential near S. Garfield Ave. and serves built-up areas along Beverly Blvd. in Montebello and Pico Rivera and through Central Whittier. There is potential for TOD to occur on state lands at the Fred Nelles School in Whittier which is now closed. Figure 2-50 illustrates the alignment of the Beverly LRT Alternative.

Alignment Segments:

- Extend existing at-grade alignment east across Atlantic Blvd. and follow the median of Pomona Blvd. to SR-60
- Alignment transitions to aerial configuration slightly west of S. Hillview Ave., crossing over S. Sadler Ave. to follow the south edge of the SR-60 Freeway
- Alignment continues east along the south side of SR-60 in a combination of retained cut and/or on columns

Figure 2-50 Beverly LRT Alternative



- Alignment swings south on aerial structure approaching S. Garfield Ave., entering an aerial station along the west side of the street just south of Garfield Ave.
- Beyond the S. Garfield Ave. station, the alignment transitions to the median of S. Garfield Ave. and follows the roadway on aerial structure to Beverly Blvd.
- Approaching Beverly Blvd. the alignment swings to the east, crossing over the parcels in the northeast corner and continuing to turn into the median of Beverly Blvd.
- An aerial station is located over the median of Beverly Blvd. along the Southern California Edison easement
- East of the station, the alignment descends to an at-grade median running configuration, touching down immediately west of Concourse Ave.
- Alignment continues at-grade in the median of Beverly Blvd. with two through lanes open to traffic in the peak direction and off-peak parking in the curb lane (left turns are prohibited at minor intersections – at major intersections and stations, spot widening is used to preserve traffic capacity)
- At-grade stations are located at Wilcox Ave., Montebello Civic Center (option to Wilcox Ave.) and Montebello Blvd.
- Beverly Blvd. is widened by about five feet to either side between Montebello Blvd. and the Rio Hondo to allow the same at-grade configuration to be utilized heading east
- At-grade station is located at N. Poplar Ave.
- Alignment crosses the Rio Hondo on the existing six lane bridge, using the inside two lanes to accommodate the trackway
- The configuration in Pico Rivera between the Rio Hondo and the San Gabriel River is similar to that utilized in Montebello, with two through lanes open to traffic in the peak direction and off-peak parking in the curb lane (left turns are prohibited at minor intersections – at major intersections and stations, spot widening is used to preserve traffic capacity)
- At-grade station is located at Rosemead Blvd.
- East of Durfee Ave., the alignment transitions to aerial structure over the median
- East of Sandoval Ave., the aerial alignment transitions to the south side of Beverly Blvd.; the line parallels the existing San Gabriel River bridge across the river and then swings south
- Alignment continues on aerial structure over the Union Pacific Railroad Los Angeles subdivision main line and Los Nietos subdivision spur track to align with the abandoned railroad right-of-way approaching West Whittier

- Alignment shares the abandoned railroad corridor with the existing Whittier Greenway bicycle and pedestrian trail approaching Central Whittier; the existing pathways are modified and additional screening and landscape revisions are provided; in conjunction with sharing the right-of-way, a new connection is located beneath the Los Nietos subdivision spur track to connect between the existing Greenway trail and the San Gabriel River trail via Floral Dr., Obregon St. and Eduardo Ave.
- Alignment continues along the Greenway; grade crossings is located at Pioneer Blvd., Palm Park (pedestrian only), Palm Ave., Broadway, Camilla St., Hadley St., Bailey St. and Philadelphia St. (the alignment bridges Norwalk Blvd.); stations are located at Norwalk Blvd. and Broadway Ave.
- Alignment includes two design options (refer to text in next section for station locations):

<u>Design Option 1 – Double Track to Mar Vista</u>

- Two-track line with grade crossings at Philadelphia St., Penn St. and Mar Vista St. with a Mar Vista St. station and a tail track extending east of Mar Vista St. for mid-day and overnight storage

<u>Design Option 2 – Streetcar Loop to Uptown Whittier and Whittier College</u>

- A single-track streetcar loop serving Uptown Whittier and Whittier College as described further: Single track southbound extends across grade crossing at Philadelphia St. and turns east into Penn St., operating on-street in the eastbound travel lane; the single track continues east to Washington Ave., then turns north to follow the northbound travel lane along Washington Ave. to Bailey St., then turns west to follow the westbound travel lane along Bailey St. to Newlin Ave., then turns south to follow the southbound travel lane along Newlin Ave. to Wardman St., then turns west to follow the westbound travel lane along Wardman St.; finally turning north to rejoin the two-track dedicated trackway along the Greenway west of Wardman St. (includes mid-day/overnight storage tracks between Philadelphia St. and Wardman St. along Whittier Greenway)

Station Locations:

- E. 3rd St./Atlantic Blvd./ Pomona Blvd. (East Los Angeles) – At-grade center platform (Existing); transfer to Atlantic Blvd. buses
- S. Garfield Ave. south of SR-60 (Monterey Park & Montebello) – Aerial center platform over parcels along west side of S. Garfield Ave. with bridge access to parcel in NE quadrant of Garfield/Pomona intersection; opportunity for park and ride using parking deck and/or shared parking and TOD; transfer to S. Garfield Ave. buses
- Beverly Blvd. east of S. Garfield Ave. (Montebello) – Aerial center platform over median at Ashiya Park Rd. just east of Beverly Blvd.; potential for small park and ride

on parcel at NE quadrant of Beverly/Garfield intersection; transfer to local buses at Beverly/Garfield intersection

- Beverly Blvd. at Wilcox Ave. (Montebello) – At-grade split far side platform station
- Beverly Blvd. at Montebello Civic Center (Montebello) – At-grade center platform immediately west of Civic Center driveway (optional location in lieu of Wilcox Ave.)
- Beverly Blvd. at Montebello Blvd. (Montebello) – At-grade split far side platform station; opportunity for park and ride using parking deck and/or shared parking and TOD at shopping center in NW quadrant of Beverly/Montebello intersection; transfer to Montebello Blvd. and Beverly Blvd. buses
- Beverly Blvd. at N. Poplar Ave. (Montebello) – At-grade split far side platform station; no parking
- Beverly Blvd. at Rosemead Blvd. (Pico Rivera) – At-grade split far side platform station; opportunity for park and ride using parking deck and/or shared parking and TOD at shopping center in SE quadrant of Beverly/Rosemead intersection; transfer to Rosemead Blvd. and Beverly Blvd. buses
- Whittier Greenway at Norwalk Blvd. (West Whittier) – Center platform station along Greenway bridging Norwalk Blvd.; no parking; transfer to Norwalk Blvd. buses
- Whittier Greenway at Broadway (West Whittier) – At-grade center platform station along Greenway west of Broadway; no parking

<u>Design Option 1 – Double Track to Mar Vista</u>

- Whittier Greenway at Philadelphia St. (Central Whittier) – At-grade center platform station along Greenway east of Philadelphia St.; potential to acquire adjoining industrial parcels for park and ride; potential for adjacent TOD at Fred C. Nelles School site 500 feet to the south
- Whittier Greenway at Mar Vista St. (Central Whittier) – At-grade center platform station along Greenway east of Mar Vista St.; potential to provide new roadway connection at Mar Vista St. to give access to Presbyterian Intercommunity Hospital and encourage TOD on south side of Whittier Blvd.; transfer to Whittier Blvd. buses

<u>Design Option 2 – Streetcar Loop to Uptown Whittier and Whittier College</u>

- Whittier Greenway at Philadelphia St. (Central Whittier) – At-grade center platform station along Greenway north of Philadelphia St.; potential to acquire adjoining industrial parcels for park and ride; potential for adjacent TOD at Fred C. Nelles School site 500 feet to the west
- Penn St. at Pickering Ave. (Central Whittier) – At-grade side platform station along south curb of Penn St. west of Pickering Ave.; platform will occupy parking lane on block between Whittier Ave. and Pickering Ave.

- Penn St. at Greenleaf Ave. (Uptown Whittier) – At-grade side platform station along south curb of Penn St. east of Greenleaf Ave.; platform will occupy parking lane on block between Greenleaf Ave. and Bright Ave.
- Washington Ave. at Philadelphia St. (Uptown Whittier/Whittier College) – At-grade side platform station along east curb of Washington Ave. north of Philadelphia St.; platform will occupy parking lane on block between Philadelphia St. and city parking lot driveway between Philadelphia St. and Bailey St.
- Bailey St. at Comstock (Uptown Whittier) – At-grade side platform station along north curb of Bailey St. west of Comstock Ave.; platform will occupy parking lane on block between Comstock Ave. and Milton Ave.
- Wardman St. at Pickering Ave. – At-grade side platform station along north curb of Wardman St. east of Pickering Ave.; platform will occupy parking lane on block between Newlin Ave. and Pickering Ave.

2.4.6 Final Alternative 4 – Whittier LRT

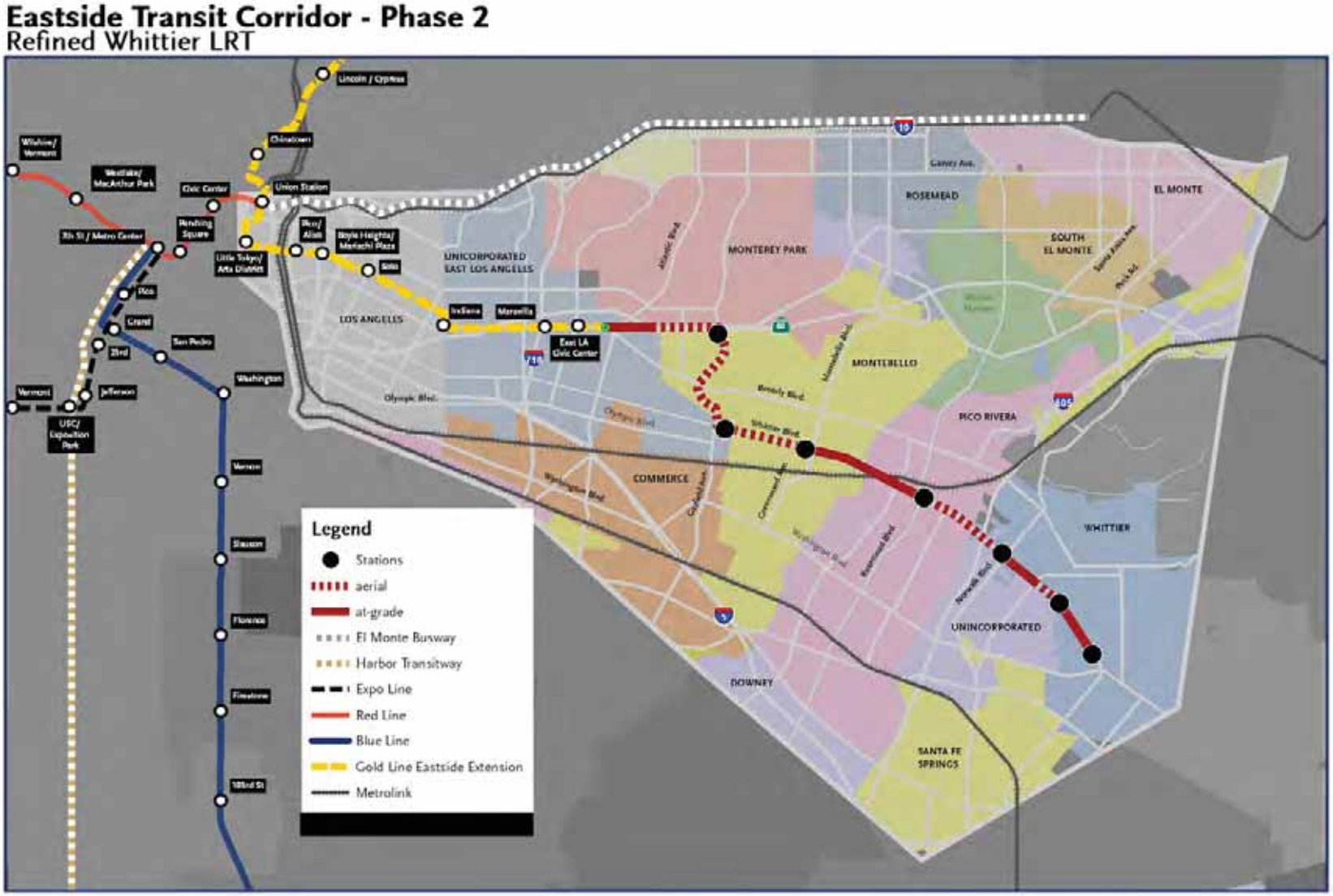
General Description:

This alternative parallels SR-60 to S. Garfield Ave. then follows S. Garfield Ave. south to Whittier Blvd. east to Central Whittier. The line serves Montebello, central Pico Rivera, and Whittier. The line is on an aerial structure in the median of S. Garfield Ave. and/or Southern California Edison utility corridor and turns east into the median of Whittier Blvd. The line descends to grade and operate in a semi-exclusive trackway between 10th Ave. in Montebello and the Union Pacific Railroad route in Pico Rivera. East of that location the alignment is on aerial approaching Central Whittier, descending to an at-grade section approaching the terminus east of Mar Vista St. Similar to the Beverly Blvd. alternative, there is an optional terminus in a streetcar loop serving Uptown Whittier and Whittier College. There is some potential to intercept trips off SR-60 at S. Garfield Ave. TOD opportunities are available on large parking areas in the commercial districts as well as the potential for redevelopment on state lands at the Fred Nelles School in Whittier which is now closed. Figure 2-51 illustrates the alignment of the Whittier LRT Alternative.

Alignment Segments:

- Extend existing at-grade alignment east across Atlantic Blvd. and follow the median of Pomona Blvd. to SR-60 Freeway
- Alignment transitions to aerial configuration slightly west of S. Hillview Ave., crossing over S. Sadler Ave. to follow the south edge of the SR-60 Freeway
- Alignment continues east along the south side of SR-60 in a combination of retained cut and/or on columns
- Alignment swings south on aerial structure approaching S. Garfield Ave., entering an aerial station along the west side of the street just south of S. Garfield Ave.

Figure 2-51 Whittier LRT Alternative



Design Option 1 – Southern California Edison Utility Corridor

- Beyond the S. Garfield Ave. station, the alignment transitions to the median of S. Garfield Ave. and follows the roadway on aerial structure to the Southern California Edison utility corridor south of Beverly Blvd.
- Alignment swings south into utility corridor and continues south towards Whittier Blvd.; approaching Whittier Blvd., the alignment swings east into median of Whittier Blvd. on aerial trackway

Design Option 2 – Garfield Ave.

- Beyond the S. Garfield Ave. station, the alignment transitions to the median of S. Garfield Ave. and follows the roadway on aerial structure south
- Approaching Whittier Blvd., the alignment swings east into median of Whittier Blvd. on aerial trackway

Included in Both Design Options

- Alignment continues east on aerial trackway over median of Whittier Blvd.
- Alignment descends to grade east of N. Maple Ave., continuing at-grade in the median of Whittier Blvd. east across the N. Taylor Ave. intersection
- At-grade station is located between N. 10th St. and N. Spruce St.
- East of Montebello Blvd., Whittier Blvd. parking and/or travel lanes are reduced to fit the at-grade trackway within the existing narrow right-of-way
- Alignment continues east along the median of Whittier Blvd. using the existing bridge over the Rio Hondo and continuing beneath the existing Union Pacific Railroad bridge along the Los Angeles subdivision east of the Rio Hondo
- East of the railroad undercrossing, the alignment ascends to a median aerial configuration, crossing over Paramount Blvd.
- Alignment continues east along Whittier Blvd., with a design option to shift the trackway behind the south curb along the commercial parking lots of the shopping malls; aerial station is located east of Rosemead Blvd.
- Alignment continues east along Whittier Blvd., transitioning to the north side approaching the San Gabriel River, and continuing east on the north side of Whittier Blvd. on aerial structure over the San Gabriel River and I-605 Freeway
- Beyond the I-605 Freeway, the alignment transitions back to the median of Whittier Blvd., aligned over the median east of the northbound off-ramp
- Alignment continues east, transitioning to the south side approaching Norwalk Blvd. where an aerial station is located over the parcels in the SE quadrant of the Whittier/Norwalk intersection; there are two design options east of Norwalk Blvd.:

Design Option 3 – At-grade

- Alignment continues east along south side of Whittier Blvd., transitioning back to grade ahead of Glengarry Ave.; at Glengarry Ave., alignment swings into median of Whittier Blvd. and continues east

Design Option 4 – Aerial

- Alignment transitions to median of Whittier Blvd. immediately east of Norwalk Blvd. station and continues east on aerial structure to Hadley Ave.; east of Hadley Ave., alignment transitions to grade and continues east
- Alignment continues east across Sorensen Ave. in the median of Whittier Blvd. – there are two additional design options for the terminus (refer to text in following section for station locations):

Design Option 5 – Double Track to Mar Vista

- Two-track line in median of Whittier Blvd. extending to a terminal station at Mar Vista St. and a tail track extending east for mid-day and overnight storage,

Design Option 6 – Streetcar Loop to Uptown Whittier and Whittier College

- Single track streetcar loop serving Uptown Whittier and Whittier College as described further: Single track eastbound track extends south of Philadelphia St. and turns into Penn St., operating on-street in the eastbound travel lane; the single track continues east to Washington Ave. then turns north to follow the northbound travel lane along Washington Ave. to Bailey St., then turns west to follow the westbound travel lane along Bailey St.; then turns east to follow the eastbound travel lane along Newlin Ave., then turns west to follow the westbound travel lane along Wardman St.; finally turning north to rejoin the two-track dedicated trackway along the median of Whittier Blvd. (includes mid-day/overnight storage tracks between Philadelphia St. and Penn St. along Whittier Blvd.)

Stations:

- E. 3rd St./Atlantic Blvd./ Pomona Blvd. (East Los Angeles) – At-grade center platform (Existing); transfer to Atlantic Blvd. buses
- S. Garfield Ave. south of SR-60 (Monterey Park & Montebello) – Aerial center platform over parcels along west side of S. Garfield Ave. with bridge access to parcel in NE quadrant of Garfield/Pomona intersection; opportunity for park and ride using parking deck and/or shared parking and TOD; transfer to S. Garfield Ave. buses

Design Option 1 – Southern California Edison Utility Corridor

- Whittier Blvd. at S. Garfield Ave. (East Los Angeles, Montebello and Commerce) – Aerial center platform immediately east of S. Garfield Ave.; vertical circulation to parcel at NE or SE corner; no parking; bus transfer to S. Garfield Ave. and Whittier Blvd. buses

Design Option 2 – Garfield

- Whittier Blvd. at Concourse Ave. (East Los Angeles, Montebello and Commerce) – Aerial center platform between Via Vista and Concourse Ave.; vertical circulation bridge from west end of platform to parcel along N. or S. curb of Whittier Blvd.; bus transfer to S. Garfield Ave. and Whittier Blvd. buses

Either Design Option

- Montebello Old Town (Montebello) – At-grade center platform located on Whittier Blvd. between 10th and Spruce St. immediately west of Montebello Blvd.; limited opportunity for parking deck on alley behind land uses to north; bus transfer to Montebello Blvd. and Whittier Blvd. buses
- Pico Rivera (Pico Rivera) – Aerial center platform station along Whittier Blvd. at Rosemead Blvd.; two design options: (1) over median of Whittier Blvd., or (2) behind south curb over parking areas of adjacent commercial properties. Opportunity for development of park and ride using additional shared parking constructed over existing parking lots; opportunity for TOD; transfer to Rosemead Blvd. and Whittier Blvd. buses
- Norwalk Blvd. (West Whittier and Los Angeles County) – Aerial center platform station across and generally east of Norwalk Blvd. alongside and behind south curb of Whittier Blvd. Opportunity for limited park and ride or TOD on parcels south of Whittier Blvd. along the alignment

Design Option 1 – Double Track to Mar Vista

- Philadelphia St. (Central Whittier) – At-grade split far side platform station located at Philadelphia St. Opportunity for large park and ride and/or TOD on Fred C. Nelles School site abutting Whittier Blvd. ; transfer to Whittier buses; shuttle bus connection to Uptown Whittier and Whittier College
- Mar Vista St. (Central Whittier) – At-grade split far side platform station along Whittier Blvd. east of Mar Vista St.; potential to provide new roadway connection at Mar Vista St. to give access to Presbyterian Intercommunity Hospital and encourage TOD on south side of Whittier Blvd.; transfer to Whittier Blvd. buses

Design Option 2 – Streetcar Loop to Uptown Whittier and Whittier College

- Philadelphia St. (Central Whittier) – At-grade center platform station located between Sorensen Ave. and Philadelphia St. Opportunity for large park and ride and/or TOD on Fred C. Nelles School site abutting Whittier Blvd. ; transfer to Whittier buses; shuttle bus connection to Uptown Whittier and Whittier College
- Penn St. at Pickering Ave. (Central Whittier) – At-grade side platform station along south curb of Penn St. west of Pickering; platform will occupy parking lane on block between Whittier Ave. and Pickering Ave.

- Penn St. at Greenleaf Ave. (Uptown Whittier) – At-grade side platform station along south curb of Penn St. east of Greenleaf Ave.; platform will occupy parking lane on block between Greenleaf Ave. and Bright Ave.
- Washington Ave. at Philadelphia St. (Uptown Whittier/Whittier College) – At-grade side platform station along east curb of Washington Ave. north of Philadelphia St.; platform will occupy parking lane between Philadelphia St. and city parking lot driveway between Philadelphia St. and Bailey St.
- Bailey St. at Comstock Ave. (Uptown Whittier) – At-grade side platform station along north curb of Bailey St. west of Comstock Ave.; platform will occupy parking lane on block between Comstock Ave. and Milton Ave.
- Wardman St. at Pickering Ave. – At-grade side platform station along north curb of Wardman St. east of Pickering Ave.; platform will occupy parking lane on block between Pickering Ave. and Newlin Ave.

2.4.7 Final Alternative 5 – Washington LRT

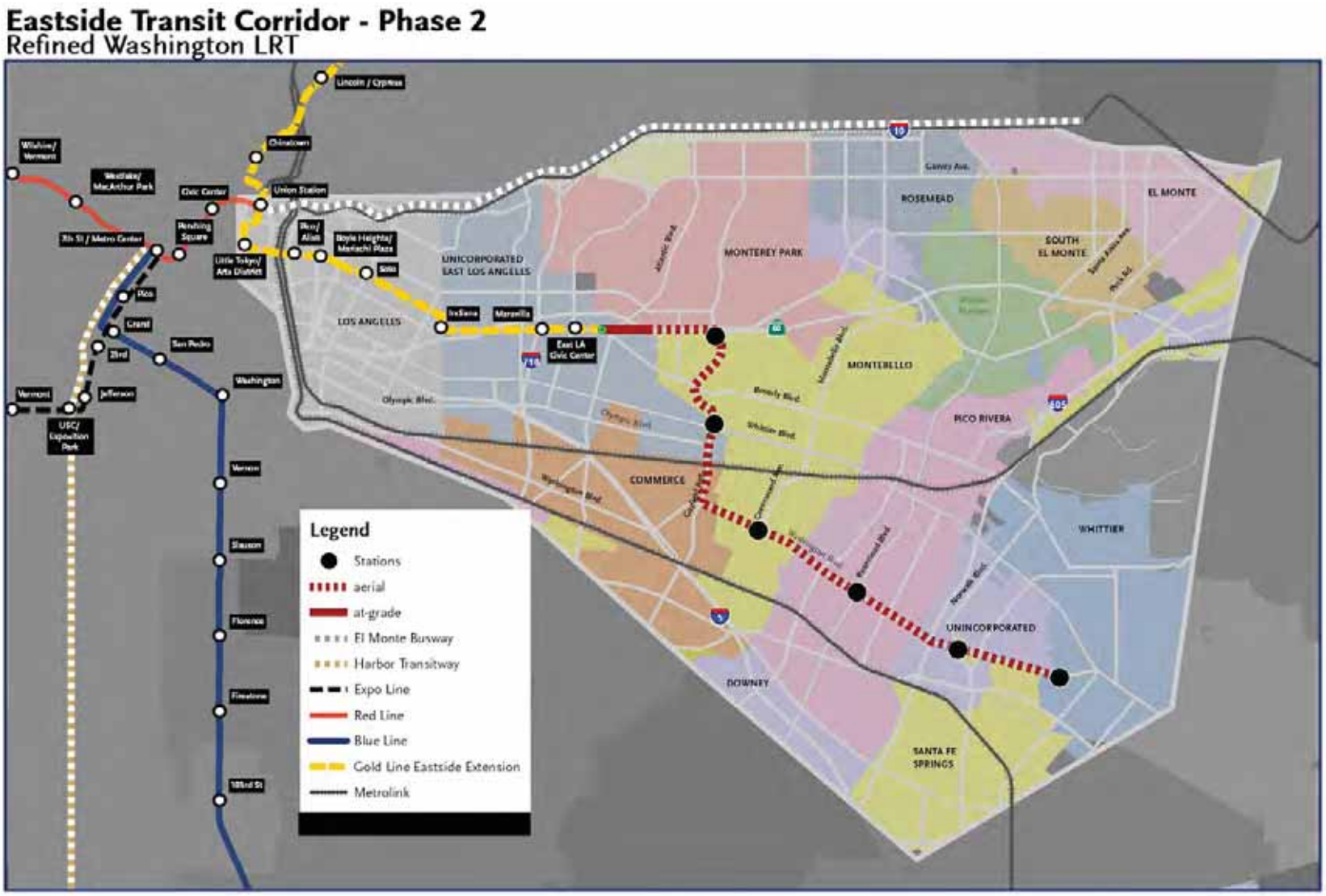
General Description:

This alternative extends parallel to SR-60 to S. Garfield Ave. then follows S. Garfield Ave. to Washington Blvd. and Washington Blvd. east to Whittier. The route serves southern portions of Monterey Park as well as Montebello, Pico Rivera, Santa Fe Springs and West and South Whittier. The alignment extends east in retained cut and aerial along SR-60 then follows S. Garfield Ave. south on aerial structure to Washington Blvd. The configuration would reduce the shoulder width to provide a median to support the aerial structure while retaining turn lanes at intersections in principal commercial driveways without widening. This alternative could potentially intercept SR-60 trips at a park and ride with joint development potential near S. Garfield Ave. There is potential for TOD at large surface parking areas near stations. The terminal station is near Presbyterian Intercommunity Hospital and the state lands of the Fred Nelles School, which is presently closed but could be redeveloped. Whittier College and Uptown Whittier are accessible by shuttle bus. Figure 2-52 illustrates alignment of the Washington LRT Alternative.

Alignment Segments:

- Extend existing at-grade alignment east across Atlantic Blvd. and follow the median of Pomona Blvd. to SR-60
- Alignment transitions to aerial configuration slightly west of S. Hillview Ave., crossing over S. Sadler Ave. to follow the south edge of the SR-60 Freeway
- Alignment continues east along the south side of SR-60 in a combination of retained cut and/or on columns
- Alignment swings south on aerial structure approaching S. Garfield Ave., entering an aerial station along the west side of the street just south of S. Garfield Ave.

Figure 2-52 Washington LRT Alternative



- Beyond the S. Garfield Ave. station, the alignment transitions to the median of S. Garfield Ave. and follows the roadway on aerial structure to Washington Blvd. (long span construction would be used across the Union Pacific Railroad right-of-way to avoid conflict with rail uses beneath).
- Alignment swings east through northeast corner of Garfield/Washington intersection into an alignment over median of Washington Blvd. (shoulders, lane widths and sidewalks are revised to accommodate aerial structure within existing right-of-way to greatest extent practical)
- Alignment continues over median east towards the Rio Hondo; aerial station is located at S. Greenwood Ave.
- Alignment shifts to north side of Washington Blvd. approaching the Rio Hondo and shifts back to median of Washington Blvd. approaching Paramount Blvd.
- Alignment continues east over median of Washington Blvd. towards Rosemead Blvd.
- Approaching Rosemead Blvd. the alignment shifts to south side of Washington Blvd. to accommodate Pico Rivera station along south half of roadway
- Alignment shifts back to median at Rosemead Blvd. and continues along the median approaching the San Gabriel River
- Alignment shifts to follow the south side of Washington Blvd. approaching the San Gabriel River and parallels the existing bridge along the south side across the river
- East of the river, the alignment continues along the south edge of the roadway, swinging back to the median as it crosses I-605; aerial station is located at Norwalk Blvd.
- Alignment continues east over median of Washington Blvd. to a terminal station at Lambert Rd. (tail track extends 600 feet beyond terminal station)

Stations:

- E. 3rd St./Atlantic Blvd./ Pomona Blvd. (East Los Angeles) – At-grade center platform (Existing); transfer to Atlantic Blvd. buses
- S. Garfield Ave. south of SR-60 (Monterey Park & Montebello) – Aerial center platform over parcels along west side of S. Garfield Ave. with bridge access to parcel in NE quadrant of Garfield/Pomona intersection; opportunity for park and ride using parking deck and/or shared parking and TOD; transfer to S. Garfield Ave. buses
- Whittier Blvd. at S. Garfield Ave. (East Los Angeles, Montebello and Commerce) – Aerial center platform along median of S. Garfield Ave. north of Whittier Blvd.; small park and ride and minor TOD potential on parcels in NE quadrant of intersection; bus transfer to S. Garfield Ave. and Whittier buses

- S. Greenwood Ave. (Montebello) – Aerial center platform along median of Washington Blvd. at S. Greenwood Ave.; opportunity for park and ride using parking deck and/or shared parking with some TOD potential in one of the four quadrants of the intersection; transfer to Washington Blvd. and Greenwood Ave. buses
- Rosemead Blvd. (Pico Rivera) – Aerial center platform station located over eastbound lanes of Washington Blvd. approaching Rosemead Blvd.; opportunity to develop park and ride with shared parking and/or parking decks over commercial parking lots; opportunity to develop TOD on commercial lots in conjunction with shared parking; transfer to Washington Blvd. and Rosemead Blvd. buses
- Norwalk Blvd. (West Whittier, Santa Fe Springs, and Los Angeles County) – Aerial center platform station over median east of Norwalk Blvd.; transfer to Norwalk Blvd. and Washington Blvd. buses
- Lambert Rd. (Central Whittier and Santa Fe Springs) – Aerial center platform over median generally west of Lambert Rd. Opportunity for park and ride using parking deck and/or shared parking in SE quadrant of Washington/Lambert intersection. Potential for TOD with redevelopment of existing commercial uses. Walk access to Presbyterian Intercommunity Hospital; shuttle bus connections to Fred C. Nelles School site, Uptown Whittier and Whittier College.

3.0 TRANSPORTATION ISSUES AND ANALYSIS

3.1 Transit Analysis

The following sections address the anticipated transit service levels under each of the alternatives considered in the detailed screening as well as anticipated levels of ridership and other key transit performance indicators.

3.1.1 Service Levels

Transit service levels for each alternative are presented below in bold.

No-Build Alternative

The No-Build Alternative includes all projects in the PSA that are identified for construction in the financially constrained Long Range Transportation Plan by the year 2030 but does not include the Eastside Transit Corridor Phase 2 project. The No-Build Alternative reflects approved Metro actions and the transit network representing the "constrained plan" from the Metro Long Range Transportation Plan adopted February 2001. The assumed countywide urban rail network includes the following lines:

- Red Line, North Hollywood to Union Station
- Purple Line, Wilshire/Western to Union Station
- Gold Line, Pasadena to East Los Angeles
- Blue Line, Long Beach to 7th/Flower
- Exposition Line Phase 1, Culver City to 7th/Flower
- Crenshaw Line, Expo/Crenshaw to Aviation
- Green Line, Norwalk to El Segundo
- Green Line Extension to LAX

Future Baseline/TSM Alternative

The Future Baseline/TSM Alternative for the Eastside Transit Corridor Phase 2 project was the basis for comparison for the system plan alternatives. The Future Baseline/TSM Alternative proposes to improve transit service in the PSA without major capital costs. Service would be improved by increasing service frequencies on existing bus lines, upgrading existing lines with limited/rapid service, and introducing a new bus line. Service improvements would focus on

lines that form the "grid of service" operating throughout the day on the north-south and west-east arterials of the PSA. These service improvements are summarized below.

Additional detail on the service improvements that are part of the Baseline/TSM Alternative are provided in Section 2.4.2.

Service Frequency Increases

As part of the Future Baseline/TSM improvements, service frequencies would generally be increased on all of the lines in the PSA, unless:

- the line is an express with peak-hour service only;
- the line already operates at high frequencies;
- frequency increases are proposed for another line operating in the same corridor; or
- the line has a subordinate role in the overall "grid of service" operating on major arterials.

Limited/Rapid Service Upgrades and New Line

The Future Baseline/TSM Alternative improvements include adding limited or rapid service, in addition to existing service, on the PSA's major arterials:

East-West "Feeder" Services

- Rapid service on Beverly Blvd.
- Limited service on Montebello Blvd. and Peck, Workman Mill, and Santa Fe Springs roads.
- New express line on SR-60 Freeway
- Additional service to M10 Whittier Blvd. bus
- Additional service to M50 Washington Blvd. bus

North-South "Feeder" Services

- Upgrade limited service on Atlantic Blvd. and Garfield Ave. to Rapid service.
- Upgrade M30 Garfield Ave. bus to Rapid service.
- Upgrade M20 Montebello Blvd. bus to Limited Stop service with higher service levels.
- Add service to Metro 265 and Metro 266 local buses along Paramount Blvd. and Rosemead Blvd.
- Add service to Foothill Transit 274 along Workman Mill Rd.
- Provide new 577 Limited services operating along Metro Route 270.

Build Alternatives

Five "build" alternatives were tested. The Build Alternatives were compared against the Future Baseline/TSM Baseline. Each of the Build Alternatives include all of the Future Baseline/TSM Alternative improvements with certain exceptions, which are described for each Build Alternative. For example, Alternative 1 would provide service which would be duplicative of the SR-60 Freeway Flyer planned under the TSM/Baseline Alternative. Therefore, the SR-60 Freeway Flyer would not be implemented in conjunction with Alternative1, but other non-duplicative services identified in the TSM/Baseline Alternative would be implemented. In addition, a set of the following common service concepts was assumed for each Build Alternative:

- 5 minute peak/10 minute off peak headways
- Shuttle/Feeder buses at select stations
- Park and Ride at select stations

Alternative 1 – SR-60 LRT

Alternative 1, SR-60 LRT, would extend Metro Gold Line LRT service east along the SR-60 Freeway Corridor to Crossroads Pkwy. This alternative would include all of the Future Baseline/TSM Alternative improvements except the Pomona Freeway Flyer, as it would duplicate service in this corridor.

Alternative 2 – SR-60 Busway

The Alternative 2, SR-60 Busway, would introduce busway service east from the Metro Gold Line terminus at the Atlantic Station along the SR-60 Freeway Corridor to Crossroads Pkwy. This alternative would include all of the Future Baseline/TSM Alternative improvements except the Pomona Freeway Flyer, as it would duplicate service in this corridor.

Alternative 3 – Beverly LRT

Alternative 3, Beverly LRT, would extend Metro Gold Line LRT service east along the Beverly Blvd. Corridor to Mar Vista St. in the City of Whittier. This alternative would include all of the Future Baseline/TSM Alternative improvements except:

- the Pomona Freeway Flyer would terminate at Garfield/Pomona Station, instead of Atlantic Station;
- the M40 Rapid service would not be provided and the M341/M342/M343 lines would be discontinued, as they would duplicate the LRT service;
- Line 720 would be extended to Wilcox/Beverly Station to provide connectivity;
- Line 265 would be extended to Rosemead/Beverly Station to provide connectivity; and

- Lines M50 and 270 would be slightly rerouted to serve the LRT terminus station at Mar Vista St. to provide connectivity.

Alternative 4 – Whittier LRT

Alternative 4, Whittier LRT, would extend Metro Gold Line LRT service east along the Whittier Blvd. Corridor to Hadley St. in the City of Whittier. This alternative would include all of the Future Baseline/TSM Alternative improvements except:

- the Pomona Freeway Flyer would terminate at Garfield/Pomona Station, instead of Atlantic Station;
- the M40 Rapid service would not be provided, as it would duplicate the LRT service;
- Line 720 would be extended to Garfield/Whittier Station to provide connectivity; and
- Line 270 would be slightly rerouted to serve the LRT terminus station at Hadley St. to provide connectivity.

Alternative 5 – Washington LRT

Alternative 5, Washington LRT, would extend Metro Gold Line LRT service east along the Washington Blvd. corridor to Whittier Blvd. in the City of Whittier. This alternative would include all of the Future Baseline/TSM Alternative improvements except:

- the Pomona Freeway Flyer would terminate at Garfield/Pomona Station, instead of Atlantic Station;
- Line 720 would be extended to Beverly/Garfield Station, to provide connectivity; and
- the M30 Rapid service would not be included, as it would duplicate LRT service.

3.1.2 Operating Assumptions and Plans

This section documents general operating assumptions and plans for each of the Eastside Transit Corridor Phase 2 Build Alternatives. These assumptions include: operating agency, span of service, vehicle capacity/loading standards, vehicle performance, and station dwell times. The operating plans include station-to-station run time estimates and operating requirements for each Build Alternative.

Operating Assumptions

Existing transit services in the Eastside Transit Corridor Phase 2 PSA are operated by Metro, Montebello Bus Lines, Norwalk Transit System, Monterey Park Spirit Bus and Foothill Transit Zone. Metro provides local and express bus service throughout the PSA. The other transit

providers offer local bus service in municipalities where the Eastside Transit Corridor Phase 2 would operate.

Metro is assumed to be the operating agency for the proposed extension that would connect to Phase 1 of the Metro Gold Line Eastside Extension currently under construction.

Hours of Operation

When modeling the transportation impacts of each of the proposed alternatives, it was assumed that trains and buses would operate every five minutes during peak periods and every ten minutes during off-peak periods. Service would operate from 4 am to 1:30 am, consistent with hours of operation on the rest of the Metro Rail system.

The hours of operation for the proposed LRT and busway alternatives will be comparable to the weekday, Saturday and Sunday and holiday schedules for current Gold and Orange Line schedules, respectively. Table 3-1, below, summarizes the assumed span of service.

Table 3-1 Metro Busway & LRT Operating Hours

Time Period	Hours
AM Peak Period	6:30 - 8:30 a.m.
Midday	8:30 a.m. - 4:00 p.m.
PM Peak Period	4:00 – 7:00 p.m.
Early Evening	7:00 - 8:00 p.m.
Late Evening	8:00 p.m. - 1:30 a.m.

Service Frequency

Service frequency for Busway and LRT alternatives are assumed to be the same, based on FTA planning guidelines for screening transit modes. Table 3-2 below, summarizes the assumed service frequency.

Table 3-2 Metro Busway & LRT Service Frequency		
Day of Week	Frequency	Hours
Weekdays	5 minutes	6:30 - 8:30 a.m., 4:00 – 7:00 p.m.
	10 minutes	8:30 a.m. - 4:00 p.m., 7:00 - 8:00 p.m.
	15 minutes	4:00 - 6:30 a.m., 8:00 p.m. - 1:30 a.m.
Saturday & Sunday	12 minutes	9:00 a.m.– 6:30 p.m.
	15 minutes	7:00 - 9:00 a.m., 6:30 - 7:30 p.m.
	20 minutes	4:00 – 7:00 a.m., 7:30 p.m. – 1:00 a.m.

The assumed service frequencies for busway and LRT operations are based on Metro's 2008 Long Range Transportation Plan criteria.

Vehicle Capacity and Passenger Load Standards

Vehicle capacity and passenger loading standards have been established in order to determine the service frequency and fleet requirements for each of the busway and LRT alternatives. Table 3-3, summarizes the assumed vehicle capacity (seats) and passenger loading standards for all modes. The lower load standard for busway mode reflects the high-speed, freeway operations (SR-60) associated with the busway alternative.

Table 3-3 Vehicle Capacity and Peak Hour Passenger Loading Standards		
Transit Mode	Seats	Load Standard
Busway	55	100% of seats (a)
LRT	76	190% of seats (a)

(a) Metro load factor

The above load standards were used to determine the appropriate peak hour service frequency for the project alternatives. The projected AM or PM peak hour maximum line loads can be divided by the load standard (e.g., 76 * 1.90 = 144 for LRT) to determine the peak hour throughput required for that route. During off-peak hours, the load standard for all modes will be a maximum of 100 percent (i.e., no standees).

The vehicle type for the busway is assumed to be similar to the Metro Busway Orange Line vehicles, with 60 foot long articulated buses.

Metro's current load factor standard for LRT = 190% of seated load (144 passengers per light rail vehicle [LRV]) applied to the peak hour, peak direction maximum load point. However, Metro is expected to reduce its load factor standard due to overcrowding and increased incidence of wheelchairs, bicycles and strollers. A standard of 190% of seated load will be applied for the Eastside Transit Corridor Phase 2 project.

The train expected in the design year is based on projected ridership. Two-car trains will be operated in early AM, AM peak, midday, PM peak and early evening periods and one-car trains will be operated in late evening periods for weekdays and weekends.

Vehicle Performance

Busway vehicles are assumed to have a normal service maximum acceleration rate of about 1.5 miles per hour per second (mphps) from 0 and 30 miles per hour (mph), decreasing to 0.5 mphps from 0-55 mph. Normal service braking is assumed to be a constant 2.0 mphps from 65 mph to 0 mph. Busway vehicles are assumed to have a maximum speed of 65 mph. However, sections of the alignment will have speed restrictions due to horizontal and vertical curves, and station spacing. Station-to-station busway time estimates have been developed based on these criteria and are included below.

LRT vehicles are assumed to have a normal service maximum acceleration rate of about 2.5 miles per hour per second (mphps) from 0 and 30 miles per hour (mph), decreasing to an average acceleration rate of 1.0 mphps from 0 to 65 mph. Normal service braking is assumed to be a constant 2.5 mphps from 65 mph to 0 mph. LRT vehicles are assumed to have a maximum speed of 65 mph. However, sections of the alignment will have speed restrictions due to horizontal and vertical curves, and station spacing. Station-to-station LRT time estimates have been developed based on these criteria and are included below.

Station Dwell Times and End-of-Line Layovers

The average station dwell times (i.e., time to allow passengers to board and alight the transit vehicle) for the busway and LRT alternatives are assumed to be 20 seconds at all of the proposed stations.

Transit operations plans will include time for end-of-line layovers. Layovers will provide sufficient time for drivers to take breaks as required by union agreement as well as provide for schedule recovery (i.e., a late bus or train can "catch up" to its schedule). Operations plans will include layovers at least five minutes at each end-of-line station. Metro currently uses drop-back operators at most terminal stations. The busway operations plan will reflect layover time that includes six minutes required for passengers to transfer from the Metro Gold Line Eastside Extension Phase 1 at the Atlantic/Pomona Station.

Average Intersection Delay

The average intersection delay assumes a comparable level of signal priority for busway and LRT operations for at-grade alignments. Non-signalized intersections, driveways and other crossings will be signal or gate-controlled and no delay will be incurred. Average intersection delay for major collectors and minor arterial intersections are assumed to be approximately ten seconds, while a 30 second delay is assumed at major arterial intersections.

3.1.3 Run Time Estimates

Station-to-station run times for each Build Alternative are provided in Tables 3-4 through 3-8. Figure 3-1 shows the station to station travel times for both the Eastside Transit Corridor Phase 2 as well as the total station to station travel time to Union Station in downtown Los Angeles. The travel time along the Eastside Transit Corridor Phase 2 ranges from 16 to 34 minutes. Travel times to Union Station range from 35 to 44 minutes. The estimated travel time along the Eastside Extension Phase 1 is 19.5 minutes; however with Alternative 2, SR-60 Busway, travel times to Union Station include the estimated six minute average transfer time at the Phase 1 terminus between bus and rail.

Figure 3-1 Station to Station Travel Times

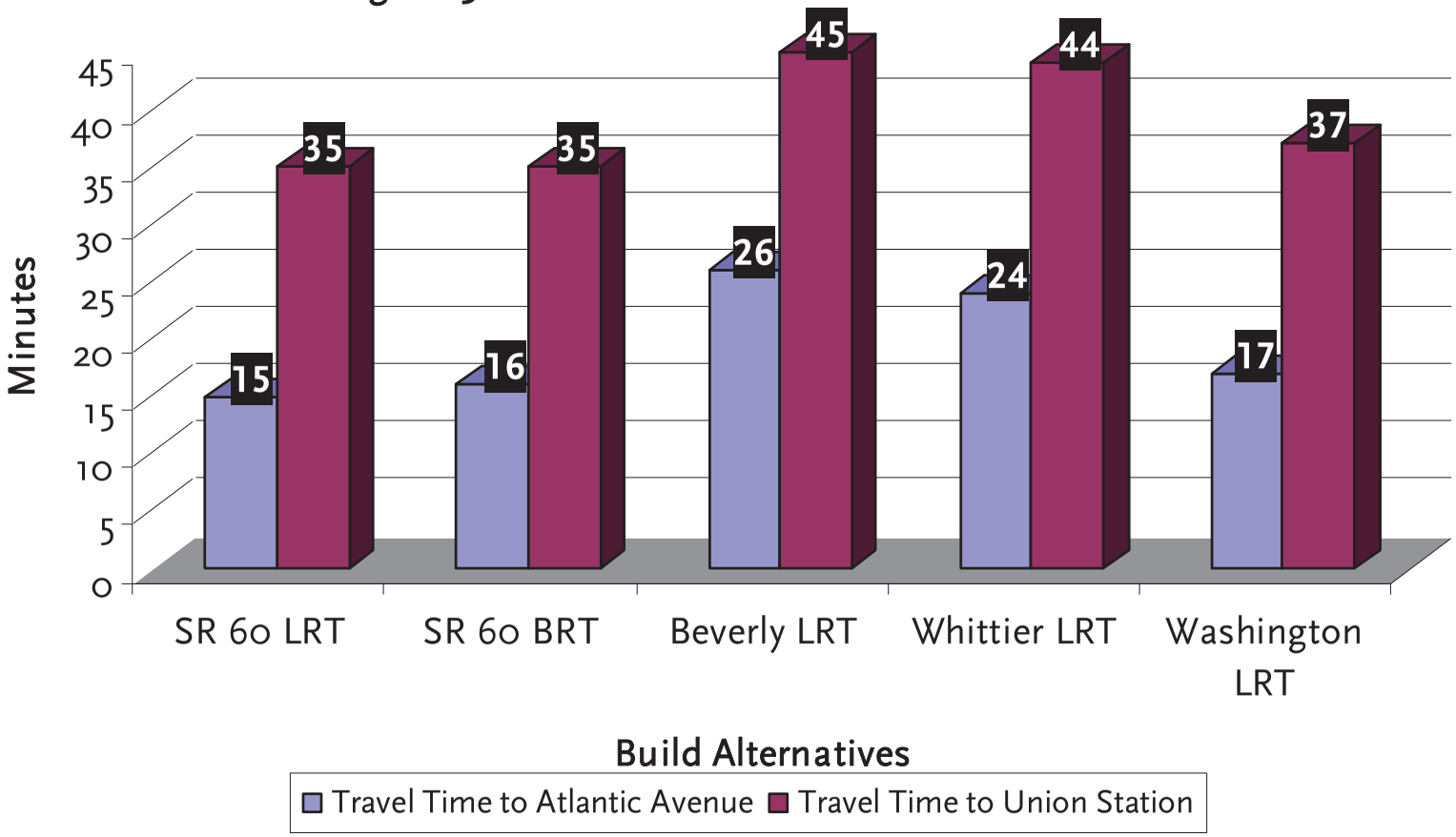


Table 3-4 SR-60 Busway Alternative Station-to-Station Run Times

Station		Speed (mph)	Distance (miles) Increment	Distance (miles) Total	Run Time (hr:min:sec)	Delay Time (hr:min:sec)	Dwell Time (hr:min:sec)	Total Time (hr:min:sec)
East 3rd / Atlantic / Pomona				0.00			00:00:20	00:00:20
		35	0.55		00:01:07	00:00:20		
	At-Grade to Aerial			0.55			00:00:00	00:01:47
		50	0.93		00:01:31	00:00:00		
Route 60 east of Garfield				1.48			00:00:20	00:03:38
		65	2.31		00:03:08	00:00:00		
Route 60 at Paramount				3.79			00:00:20	00:07:06
		65	2.39		00:03:12	00:00:00		
Route 60 at Santa Anita				6.18			00:00:20	00:10:38
		50	0.73		00:01:30	00:00:00		
Route 60 at Peck				6.91			00:00:20	00:12:28
		65	1.74		00:02:36	00:00:00		
Route 60 at Crossroads Parkway				8.65			00:00:00	00:15:04
				8.65	**00:13:04**	**00:00:20**	**00:01:40**	**00:15:04**
						Avg. Speed =	34.4 mph	
						Avg. Station Spacing=	1.4 miles	

Table 3-5 SR-60 LRT Alternative Station-to-Station Run Times

Station		Speed (mph)	Distance (miles) Increment	Distance (miles) Total	Run Time (hr:min:sec)	Delay Time (hr:min:sec)	Dwell Time (hr:min:sec)	Total Time (hr:min:sec)
East 3rd / Atlantic / Pomona				0.00			00:00:20	00:00:20
		35	0.55		00:01:04	00:00:20		
	At-Grade to Aerial			0.55			00:00:00	00:01:44
		55	0.93		00:01:23	00:00:00		
Route 60 east of Garfield				1.48			00:00:20	00:03:27
		45	2.31		00:03:27	00:00:00		
Route 60 at Paramount				3.79			00:00:20	00:07:14
		45	2.39		00:03:33	00:00:00		
Route 60 at Santa Anita				6.18			00:00:20	00:11:07
		55	0.74		00:01:21	00:00:00		
Route 60 at Peck				6.92			00:00:20	00:12:48
		55	1.74		00:02:27	00:00:00		
Route 60 at Crossroads Parkway				8.66			00:00:00	00:15:15
				8.66	**00:13:15**	**00:00:20**	**00:01:40**	**00:15:15**
						Avg. Speed =	34.1 mph	
						Avg. Station Spacing=	1.4 miles	

Table 3-6 Beverly Alternative Station-to-Station Run Times

Station		Speed (mph)	Distance (miles) Increment	Distance (miles) Total	Run Time (hr:min:sec)	Delay Time (hr:min:sec)	Dwell Time (hr:min:sec)	Total Time (hr:min:sec)
East 3rd / Atlantic / Pomona				0.00			00:00:20	00:00:20
		35	0.55		00:01:04	00:00:20		
	At-Grade to Aerial			0.55			00:00:00	00:01:44
		40	0.93		00:01:33	00:00:00		
Garfield south of Route 60				1.48			00:00:20	00:03:37
		40	0.88		00:01:37	00:00:00		
Beverly east of Garfield				2.36			00:00:20	00:05:34
		40	0.15		00:00:24	00:00:00		
	Aerial to At-Grade			2.51			00:00:00	00:05:58
		35	0.43		00:00:51	00:00:20		
Beverly at Wilcox				2.94			00:00:20	00:07:29
		35	0.36		00:00:52	00:00:20		
Beverly at Montebello Civic Center				3.30			00:00:20	00:09:01
		35	0.62		00:01:19	00:00:40		
Beverly at Montebello				3.92			00:00:20	00:11:20
		35	0.54		00:01:10	00:01:00		
Beverly at Poplar				4.46			00:00:20	00:13:50
		35	1.01		00:01:59	00:00:30		
Beverly at Rosemead				5.47			00:00:20	00:16:39
		35	0.31		00:00:40	00:00:40		
	Street to Railroad			5.78			00:00:00	00:17:59
		45	1.53		00:02:15	00:00:00		
Whittier Greenway at Norwalk				7.31			00:00:20	00:20:34
		45	0.73		00:01:20	00:00:00		
Whittier Greenway at Broadway				8.04			00:00:20	00:22:14
		45	1.31		00:02:07	00:00:00		
Whittier Greenway at Philadelphia				9.35			00:00:20	00:24:41
		45	0.43		00:00:56	00:00:00		
Whittier Greenway at Mar Vista				9.78			00:00:00	00:25:37
				9.78	**00:18:07**	**00:03:50**	**00:03:40**	**00:25:37**
						Avg. Speed =	22.9 mph	
						Avg. Station Spacing=	0.7 miles	

Table 3-7 Whittier Alternative Station-to-Station Run Times

Station		Speed (mph)	Distance (miles) Increment	Distance (miles) Total	Run Time (hr:min:sec)	Delay Time (hr:min:sec)	Dwell Time (hr:min:sec)	Total Time (hr:min:sec)
East 3rd / Atlantic / Pomona				0.00			00:00:20	00:00:20
		35	0.55		00:01:04	00:00:20		
	At-Grade to Aerial			0.55			00:00:00	00:01:44
		40	0.93		00:01:33	00:00:00		
Garfield south of Route 60				1.48			00:00:20	00:03:37
		40	1.54		00:02:37	00:00:00		
Garfield east of Whittier				3.02			00:00:20	00:06:34
		40	0.87		00:01:28	00:00:00		
	Aerial to At-Grade			3.89			00:00:00	00:08:02
		35	0.22		00:00:30	00:00:20		
Whittier at west of Montebello				4.11			00:00:20	00:09:12
		35	1.71		00:03:11	00:01:50		
Whittier at Rosemead				5.82			00:00:20	00:14:33
		35	1.10		00:02:01	00:01:30		
	At-Grade to Aerial			6.92			00:00:00	00:18:04
		35	0.18		00:00:26	00:00:00		
Whittier east of Norwalk				7.10			00:00:20	00:18:50
		35	0.97		00:01:48	00:00:00		
	Aerial to At-Grade			8.07			00:00:00	00:20:38
		35	0.21		00:00:29	00:00:10		
Whittier at Philadelphia				8.28			00:00:20	00:21:37
		35	0.77		00:01:34	00:00:20		
Whittier east of Mar Vista				9.05			00:00:00	00:23:31
				9.05	**00:16:41**	**00:04:30**	**00:02:20**	**00:23:31**
						Avg. Speed =	23.1 mph	
						Avg. Station Spacing=	0.8 miles	

Table 3-8 Washington Alternative Station-to-Station Run Times

Station		Speed (mph)	Distance (miles) Increment	Distance (miles) Total	Run Time (hr:min:sec)	Delay Time (hr:min:sec)	Dwell Time (hr:min:sec)	Total Time (hr:min:sec)
East 3rd / Atlantic / Pomona				0.00			00:00:20	00:00:20
		35	0.55		00:01:04	00:00:20		
	At-Grade to Aerial			0.55			00:00:00	00:01:44
		40	0.93		00:01:33	00:00:00		
Garfield south of Route 60				1.48			00:00:20	00:03:37
		40	1.42		00:02:26	00:00:00		
Garfield at Whittier				2.90			00:00:20	00:06:23
		55	1.86		00:02:35	00:00:00		
Washington at So. Greenwood				4.76			00:00:20	00:09:18
		55	1.54		00:02:14	00:00:00		
Washington at Rosemead				6.30			00:00:20	00:11:52
		55	1.56		00:02:15	00:00:00		
Washington east of Norwalk				7.86			00:00:20	00:14:27
		55	1.46		00:02:09	00:00:00		
Washington at Lambert				9.32			00:00:00	00:16:36
				9.32	**00:14:16**	**00:00:20**	**00:02:00**	**00:16:36**
						Avg. Speed =	33.7 mph	
						Avg. Station Spacing=	1.3 miles	

3.1.4 Ridership Results

An important measure in characterizing the efficiency and utility of a transit alternative is transit ridership. A transit alternative that attracts more new riders will serve to help reduce highway and local street congestion, which will improve the mobility of both the new transit riders as well as the remaining highway trips.

Ridership

Figure 3-2 indicates the ridership increases associated with implementation of the Eastside Transit Corridor Phase 2. Project Boardings would range from a low of 7,500 (SR-60 Busway) to nearly 16,000 (Washington LRT), adding 16 to 32 percent to ridership along the entire Metro Gold Line.

The model results showed the highest Eastside Transit Corridor Phase 2 ridership as well as the highest overall Metro Gold Line transit ridership volumes for Alternative 5. For this alternative, the model estimated total boardings of about 15,900 riders using the Eastside Corridor Phase 2 by 2030. Alternatives 1, 3, and 4 followed closely behind, ranging from about 13,300 to 14,400.

The ridership estimates were also calculated for the individual stations along each alternative alignment. For all of the alternatives, the highest volume of boardings occurred at the terminal station (ranging from 1,200 to 2,000) and at the station nearest Whittier Blvd. and South Garfield Ave. or SR-60 and South Garfield Ave. (1,000 to 2,100). Some stations were projected to have very low ridership volumes (below 500), and these were mostly on Alternative 3 with the Whittier Greenway option.

Figure 3-2 Gold Line Project Boardings (Year 2030)

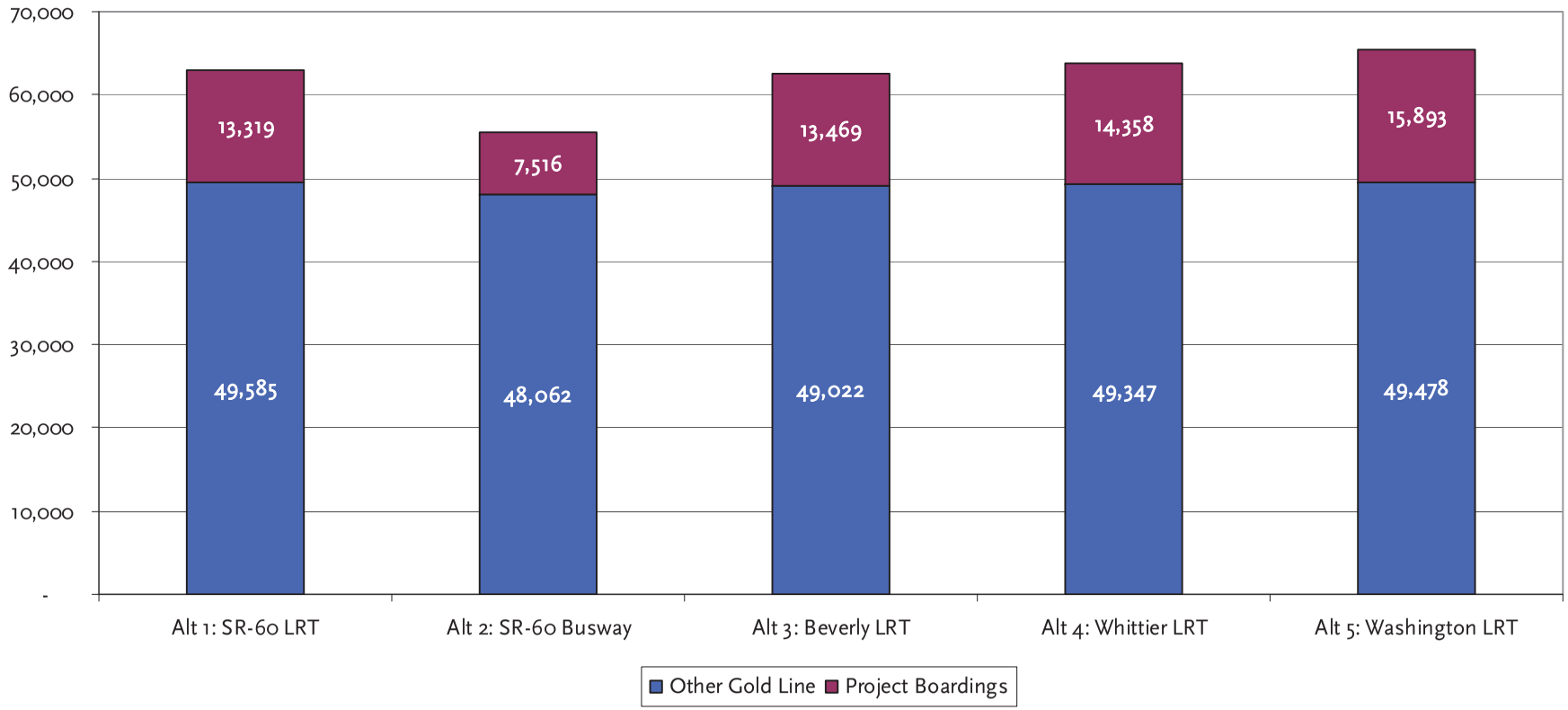
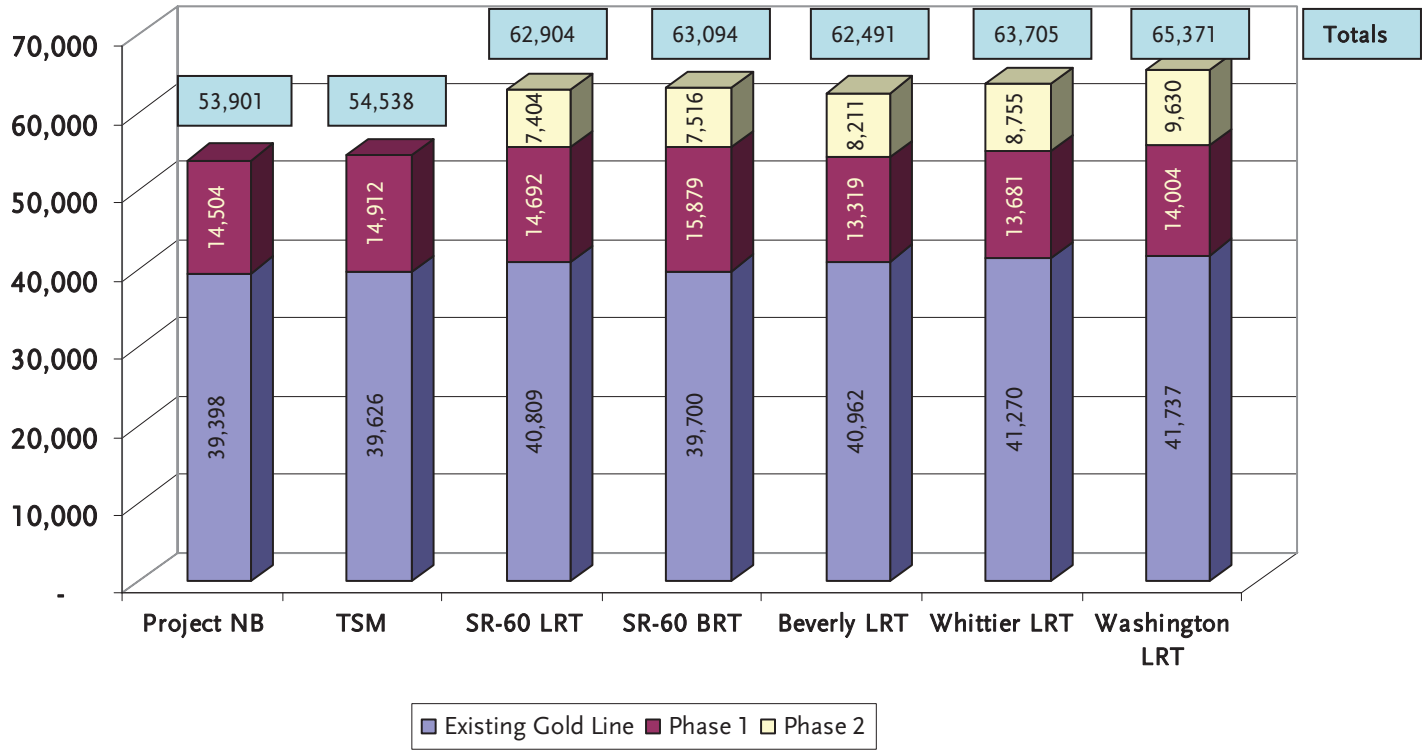


Figure 3-3 presents the build-up of station boardings on the Metro Gold Line in Year 2030 using the Existing Pasadena Gold Line as the base case and then adding the Eastside Extension Phase 1 (presently under construction) and finally the Eastside Transit Corridor Phase 2 stations.

Figure 3-3 2030 Gold Line Station Boardings



Tables 3-9 through 3-15 show the station boardings and times for the existing and proposed transit stations on each of the Eastside Transit Corridor Phase 2 alternatives. Station boardings are the number of riders that board transit at each station.

Table 3-9 2030 Station Boardings and Times – No-Build Alternative

	Station Name	Eastbound (Read Up) Dist (mi)	Eastbound (Read Up) Time (min)	Eastbound Boardings Peak	Eastbound Boardings Off-Peak	Eastbound Boardings Daily	Westbound (Read Down) Dist (mi)	Westbound (Read Down) Time (min)	Westbound Boardings Peak	Westbound Boardings Off-Peak	Westbound Boardings Daily	Total Boardings Peak	Total Boardings Off-Peak	Total Boardings Daily
Phase 1	Pomona/Atlantic (Atlantic)	0.4	1.5	1,088	270	1,358	-	-	1,706	633	2,338	2,794	903	**3,696**
	Third St./Mednick (East LA Civic Center)	0.4	2.0	212	9	221	0.4	1.5	747	274	1,021	959	283	**1,242**
	Third St./Ford (Maravilla)	1.4	4.0	331	151	481	0.4	2.0	456	231	686	786	381	**1,167**
	Third St./Indiana (Indiana)	1.3	3.3	422	144	566	1.4	4.0	1,119	323	1,442	1,541	467	**2,007**
	First St./Soto (Soto)	0.6	1.6	664	225	888	1.3	3.3	1,317	404	1,720	1,980	628	**2,608**
	First St./Boyle (Mariachi/Plaza)	0.4	1.4	286	116	402	0.6	1.6	392	157	549	678	273	**951**
	First St./Utah (Pico/Aliso)	0.8	2.8	76	34	109	0.4	1.4	126	60	186	202	93	**295**
	First St./Alameda (Little Tokyo)	0.5	3.0	1,193	298	1,491	0.8	2.8	703	346	1,048	1,896	643	**2,539**
	Union Station	0.6	3.0	7,893	1,804	9,696	0.5	3.0	5,345	1,437	6,782	13,238	3,241	**16,478**
	Chinatown	1.6	3.0	737	138	875	0.6	3.0	513	164	677	1,250	302	**1,552**
	Lincoln Heights/Cypress Park	0.6	1.0	911	387	1,298	1.6	3.0	454	172	626	1,365	559	**1,924**
Existing	Heritage Square/Arroyo	0.9	2.0	733	315	1,048	0.6	1.0	385	91	475	1,117	406	**1,523**
	Southwest Museum	1.5	4.0	515	147	661	0.9	2.0	138	50	188	652	197	**849**
	Highland Park	2.1	3.0	1,848	452	2,300	1.5	4.0	519	264	783	2,367	716	**3,083**
	Mission	1.5	3.0	476	77	553	2.1	3.0	258	87	345	734	164	**897**
	Filmore	0.6	1.0	587	116	703	1.5	3.0	507	163	670	1,094	279	**1,373**
	Del Mar	0.5	2.0	1,164	491	1,655	0.6	1.0	996	347	1,342	2,160	837	**2,997**
	Memorial Park	1.1	2.0	1,088	296	1,384	0.5	2.0	990	282	1,272	2,078	578	**2,656**
	Lake Ave.	1.0	2.0	954	219	1,173	1.1	2.0	558	168	726	1,512	387	**1,898**
	Allen Ave.	1.7	3.0	490	131	621	1.0	2.0	178	69	247	668	200	**867**
	Sierra Madre Villa	-	-	1,849	645	2,494	1.7	3.0	615	195	810	2,464	840	**3,304**
	Total	**19.5**	**48.6**	**23,514**	**6,459**	**29,973**	**19.5**	**48.6**	**18,016**	**5,912**	**23,928**	**41,530**	**12,371**	**53,901**

Table 3-10 2030 Station Boardings and Times – Future TSM/Baseline Alternative

	Station Name	Eastbound (Read Up) Dist (mi)	Eastbound (Read Up) Time (min)	Eastbound Boardings Peak	Eastbound Boardings Off-Peak	Eastbound Boardings Daily	Westbound (Read Down) Dist (mi)	Westbound (Read Down) Time (min)	Westbound Boardings Peak	Westbound Boardings Off-Peak	Westbound Boardings Daily	Total Boardings Peak	Total Boardings Off-Peak	Total Boardings Daily
Phase 1	Pomona/Atlantic (Atlantic)	0.4	1.5	1,356	335	1,690	-	-	1,828	705	2,532	3,183	1,039	**4,222**
	Third St./Mednick (East LA Civic Center)	0.4	2.0	211	13	224	0.4	1.5	707	221	928	918	234	**1,152**
	Third St./Ford (Maravilla)	1.4	4.0	213	146	359	0.4	2.0	490	248	738	703	394	**1,097**
	Third St./Indiana (Indiana)	1.3	3.3	431	151	582	1.4	4.0	1,121	342	1,463	1,552	493	**2,045**
	First St./Soto (Soto)	0.6	1.6	651	218	869	1.3	3.3	1,323	397	1,720	1,974	615	**2,588**
	First St./Boyle (Mariachi/Plaza)	0.4	1.4	286	121	406	0.6	1.6	394	156	550	680	277	**956**
	First St./Utah (Pico/Aliso)	0.8	2.8	75	35	110	0.4	1.4	126	61	186	201	96	**296**
	First St./Alameda (Little Tokyo)	0.5	3.0	1,195	300	1,495	0.8	2.8	714	349	1,063	1,909	649	**2,558**
	Union Station	0.6	3.0	7,969	1,822	9,791	0.5	3.0	5,399	1,439	6,838	13,368	3,261	**16,628**
	Chinatown	1.6	3.0	739	139	878	0.6	3.0	517	163	680	1,256	302	**1,558**
	Lincoln Heights/Cypress Park	0.6	1.0	913	389	1,302	1.6	3.0	460	173	633	1,373	562	**1,934**
Existing	Heritage Square/Arroyo	0.9	2.0	736	316	1,052	0.6	1.0	385	90	474	1,120	406	**1,526**
	Southwest Museum	1.5	4.0	515	147	662	0.9	2.0	135	52	187	650	199	**848**
	Highland Park	2.1	3.0	1,853	454	2,306	1.5	4.0	525	264	789	2,377	718	**3,095**
	Mission	1.5	3.0	536	77	613	2.1	3.0	273	94	367	809	170	**979**
	Filmore	0.6	1.0	540	122	662	1.5	3.0	492	164	656	1,032	286	**1,318**
	Del Mar	0.5	2.0	1,166	492	1,658	0.6	1.0	1,000	346	1,346	2,165	838	**3,003**
	Memorial Park	1.1	2.0	1,086	293	1,378	0.5	2.0	988	282	1,270	2,074	575	**2,648**
	Lake Ave.	1.0	2.0	947	219	1,165	1.1	2.0	561	170	730	1,507	388	**1,895**
	Allen Ave.	1.7	3.0	490	131	621	1.0	2.0	177	73	249	666	204	**870**
	Sierra Madre Villa	-	-	1,850	649	2,499	1.7	3.0	634	194	828	2,484	842	**3,326**
	Total	**19.5**	**48.6**	**23,752**	**6,564**	**30,316**	**19.5**	**48.6**	**18,244**	**5,978**	**24,222**	**41,996**	**12,542**	**54,538**

Table 3-11 2030 Station Boardings and Times – SR-60 LRT Alternative

	Station Name	Eastbound (Read Up) Dist (mi)	Eastbound (Read Up) Time (min)	Eastbound Boardings Peak	Eastbound Boardings Off-Peak	Eastbound Boardings Daily	Westbound (Read Down) Dist (mi)	Westbound (Read Down) Time (min)	Westbound Boardings Peak	Westbound Boardings Off-Peak	Westbound Boardings Daily	Total Boardings Peak	Total Boardings Off-Peak	Total Boardings Daily
Phase 2	Crossroads Pkwy/SR-60	1.7	2.8	151	110	261	-	-	1,374	578	1,952	1,525	688	**2,213**
	Peck/SR-60	0.7	1.7	143	89	232	1.7	2.8	722	417	1,138	865	505	**1,370**
	Santa Anita/SR-60	2.4	3.9	51	40	91	0.7	1.7	471	288	758	522	328	**849**
	Paramount/SR-60	2.3	3.8	135	104	239	2.4	3.9	725	304	1,028	860	407	**1,267**
	Garfield/SR-60	1.5	3.5	223	129	352	2.3	3.8	998	358	1,355	1,221	486	**1,707**
Phase 1	Pomona/Atlantic (Atlantic)	0.4	1.5	1,254	301	1,555	1.5	3.5	1,675	547	2,222	2,929	848	**3,777**
	Third St./Mednick (East LA Civic Center)	0.4	2.0	174	35	209	0.4	1.5	526	147	673	700	182	**882**
	Third St./Ford (Maravilla)	1.4	4.0	190	111	300	0.4	2.0	417	157	574	607	268	**874**
	Third St./Indiana (Indiana)	1.3	3.3	435	155	589	1.4	4.0	1,154	352	1,506	1,589	506	**2,095**
	First St./Soto (Soto)	0.6	1.6	640	218	858	1.3	3.3	1,420	453	1,873	2,060	671	**2,731**
	First St./Boyle (Mariachi/Plaza)	0.4	1.4	281	118	399	0.6	1.6	411	166	577	692	284	**976**
	First St./Utah (Pico/Aliso)	0.8	2.8	74	34	107	0.4	1.4	131	62	193	204	96	**300**
	First St./Alameda (Little Tokyo)	0.5	3.0	1,116	280	1,396	0.8	2.8	1,160	504	1,664	2,276	783	**3,059**
Existing Gold Line Stations	Union Station	0.6	3.0	7,651	1,701	9,352	0.5	3.0	7,051	1,973	9,024	14,702	3,674	**18,376**
	Chinatown	1.6	3.0	736	140	876	0.6	3.0	521	172	693	1,257	311	**1,568**
	Lincoln Heights/Cypress Park	0.6	1.0	906	384	1,290	1.6	3.0	518	194	711	1,423	578	**2,001**
	Heritage Square/Arroyo	0.9	2.0	737	317	1,053	0.6	1.0	395	89	484	1,132	405	**1,537**
	Southwest Museum	1.5	4.0	517	148	665	0.9	2.0	137	53	190	654	201	**854**
	Highland Park	2.1	3.0	1,844	452	2,295	1.5	4.0	525	267	792	2,369	719	**3,087**
	Mission	1.5	3.0	516	76	592	2.1	3.0	272	92	364	788	168	**956**
	Filmore	0.6	1.0	514	118	632	1.5	3.0	482	169	651	996	286	**1,282**
	Del Mar	0.5	2.0	1,142	473	1,615	0.6	1.0	1,006	352	1,358	2,148	825	**2,973**
	Memorial Park	1.1	2.0	1,077	282	1,359	0.5	2.0	1,000	292	1,291	2,077	573	**2,650**
	Lake Ave.	1.0	2.0	939	217	1,156	1.1	2.0	565	172	736	1,504	388	**1,892**
	Allen Ave.	1.7	3.0	488	130	618	1.0	2.0	179	74	253	667	204	**870**
	Sierra Madre Villa	-	-	1,473	469	1,941	1.7	3.0	631	195	825	2,103	663	**2,766**
	Total	**28.1**	**64.3**	**23,402**	**6,623**	**30,025**	**28.1**	**64.3**	**24,460**	**8,419**	**32,879**	**47,862**	**15,042**	**62,904**

Table 3-12 2030 Station Boardings and Times – SR-60 Busway Alternative

	Station Name	Eastbound (Read Up) Dist (mi)	Eastbound (Read Up) Time (min)	Eastbound Boardings Peak	Eastbound Boardings Off-Peak	Eastbound Boardings Daily	Westbound (Read Down) Dist (mi)	Westbound (Read Down) Time (min)	Westbound Boardings Peak	Westbound Boardings Off-Peak	Westbound Boardings Daily	Total Boardings Peak	Total Boardings Off-Peak	Total Boardings Daily
Phase 2	Crossroads Pkwy/SR-60	1.7	2.8	137	97	233	-	-	837	313	1,149	973	409	**1,382**
	Peck/SR-60	0.7	1.7	126	80	205	1.7	2.8	453	223	675	578	302	**880**
	Santa Anita/SR-60	2.4	3.9	47	40	87	0.7	1.7	281	157	438	328	197	**525**
	Paramount/SR-60	2.3	3.8	113	69	182	2.4	3.9	448	168	615	561	237	**797**
	Garfield/SR-60	1.5	3.5	170	78	248	2.3	3.8	508	181	689	678	259	**937**
	Pomona/Atlantic (Atlantic)	-	-	264	106	370	1.5	3.5	1,969	658	2,627	2,233	763	**2,996**
	Total Phase 2	**8.6**	**15.7**	**856**	**468**	**1,324**	**8.6**	**15.7**	**4,494**	**1,698**	**6,192**	**5,350**	**2,166**	**7,516**
Phase 1	Pomona/Atlantic (Atlantic)	0.4	1.5	1,260	289	1,549	-	-	3,040	943	3,983	4,300	1,231	**5,531**
	Third St./Mednick (East LA Civic Center)	0.4	2.0	156	10	165	0.4	1.5	540	115	655	695	125	**820**
	Third St./Ford (Maravilla)	1.4	4.0	188	121	309	0.4	2.0	427	178	605	615	299	**914**
	Third St./Indiana (Indiana)	1.3	3.3	425	143	568	1.4	4.0	1,135	323	1,457	1,560	466	**2,025**
	First St./Soto (Soto)	0.6	1.6	637	217	853	1.3	3.3	1,328	407	1,734	1,964	623	**2,587**
	First St./Boyle (Mariachi/Plaza)	0.4	1.4	282	120	402	0.6	1.6	401	156	557	683	276	**959**
	First St./Utah (Pico/Aliso)	0.8	2.8	75	34	108	0.4	1.4	127	63	189	201	96	**297**
	First St./Alameda (Little Tokyo)	0.5	3.0	1,148	291	1,438	0.8	2.8	927	382	1,309	2,075	673	**2,747**
	Union Station	0.6	3.0	7,715	1,750	9,465	0.5	3.0	6,197	1,546	7,743	13,912	3,296	**17,207**
	Chinatown	1.6	3.0	737	139	875	0.6	3.0	519	160	678	1,255	298	**1,553**
	Lincoln Heights/Cypress Park	0.6	1.0	905	385	1,290	1.6	3.0	487	179	666	1,391	564	**1,955**
Existing Gold Line	Heritage Square/Arroyo	0.9	2.0	736	315	1,051	0.6	1.0	392	92	484	1,128	407	**1,535**
	Southwest Museum	1.5	4.0	515	147	662	0.9	2.0	137	54	190	652	201	**852**
	Highland Park	2.1	3.0	1,836	447	2,283	1.5	4.0	522	260	781	2,358	706	**3,064**
	Mission	1.5	3.0	518	66	584	2.1	3.0	270	86	355	788	151	**939**
	Filmore	0.6	1.0	479	119	598	1.5	3.0	467	161	628	946	280	**1,225**
	Del Mar	0.5	2.0	1,155	485	1,640	0.6	1.0	995	342	1,336	2,150	827	**2,976**
	Memorial Park	1.1	2.0	1,080	287	1,367	0.5	2.0	980	283	1,263	2,060	570	**2,630**
	Lake Ave.	1.0	2.0	942	217	1,158	1.1	2.0	558	169	727	1,499	386	**1,885**
	Allen Ave.	1.7	3.0	489	131	619	1.0	2.0	181	69	250	670	200	**869**
	Sierra Madre Villa	-	-	1,631	575	2,206	1.7	3.0	615	192	807	2,246	766	**3,012**
	Total Phase 1 and Existing Gold Line	**19.5**	**48.6**	**22,904**	**6,281**	**29,185**	**19.5**	**48.6**	**20,239**	**6,154**	**26,393**	**43,143**	**12,435**	**55,578**

Table 3-13 2030 Station Boardings and Times – Beverly LRT Alternative

	Station Name	Eastbound (Read Up) Dist (mi)	Eastbound (Read Up) Time (min)	Eastbound Boardings Peak	Eastbound Boardings Off-Peak	Eastbound Boardings Daily	Westbound (Read Down) Dist (mi)	Westbound (Read Down) Time (min)	Westbound Boardings Peak	Westbound Boardings Off-Peak	Westbound Boardings Daily	Total Boardings Peak	Total Boardings Off-Peak	Total Boardings Daily
Phase 2	Whittier Greenway/Mar Vista	0.4	0.9	210	106	316	-	-	666	281	947	875	387	**1,262**
	Whittier Greenway/Philadelphia	1.3	2.5	253	97	350	0.4	0.9	493	169	662	746	266	**1,011**
	Whittier Greenway/Broadway	0.7	1.7	68	41	109	1.3	2.5	102	34	136	170	75	**244**
	Whittier Greenway/Norwalk	1.8	3.9	108	58	166	0.7	1.7	204	76	280	312	134	**445**
	Beverly/Rosemead	1.0	2.8	234	110	344	1.8	3.9	510	298	808	744	407	**1,151**
	Beverly/Poplar	0.5	2.5	113	41	154	1.0	2.8	117	48	165	230	89	**319**
	Beverly/Montebello	0.6	2.3	155	109	264	0.5	2.5	294	251	545	449	360	**809**
	Beverly/Montebello Civic Center	0.4	1.5	205	79	284	0.6	2.3	197	78	275	402	157	**558**
	Beverly/Wilcox	0.6	1.9	248	103	351	0.4	1.5	393	175	568	641	278	**919**
	Beverly/East of Garfield	0.9	2.0	85	42	127	0.6	1.9	226	76	301	311	117	**428**
	Garfield/SR-60	1.5	3.6	182	63	245	0.9	2.0	538	285	822	719	348	**1,067**
Phase 1	Pomona/Atlantic (Atlantic)	0.4	1.5	850	261	1,111	1.5	3.6	1,287	444	1,731	2,137	705	**2,842**
	Third St./Mednick (East LA Civic Center)	0.4	2.0	184	44	227	0.4	1.5	518	157	674	701	200	**901**
	Third St./Ford (Maravilla)	1.4	4.0	159	100	259	0.4	2.0	339	159	497	498	259	**756**
	Third St./Indiana (Indiana)	1.3	3.3	455	160	615	1.4	4.0	1,130	335	1,465	1,585	495	**2,079**
	First St./Soto (Soto)	0.6	1.6	666	223	888	1.3	3.3	1,376	426	1,802	2,042	649	**2,690**
	First St./Boyle (Mariachi/Plaza)	0.4	1.4	290	123	412	0.6	1.6	406	165	571	696	287	**983**
	First St./Utah (Pico/Aliso)	0.8	2.8	80	33	113	0.4	1.4	129	63	192	209	96	**305**
	First St./Alameda (Little Tokyo)	0.5	3.0	1,157	299	1,456	0.8	2.8	878	431	1,309	2,035	730	**2,765**
Existing Gold Line Stations	Union Station	0.6	3.0	8,135	1,859	9,994	0.5	3.0	6,262	1,697	7,959	14,397	3,556	**17,953**
	Chinatown	1.6	3.0	743	140	883	0.6	3.0	525	169	694	1,268	309	**1,577**
	Lincoln Heights/Cypress Park	0.6	1.0	913	392	1,305	1.6	3.0	509	186	694	1,422	578	**1,999**
	Heritage Square/Arroyo	0.9	2.0	740	320	1,059	0.6	1.0	397	94	491	1,137	413	**1,550**
	Southwest Museum	1.5	4.0	519	151	669	0.9	2.0	136	55	190	654	205	**859**
	Highland Park	2.1	3.0	1,851	456	2,307	1.5	4.0	525	265	790	2,376	721	**3,097**
	Mission	1.5	3.0	535	77	612	2.1	3.0	271	90	361	806	167	**972**
	Filmore	0.6	1.0	537	120	657	1.5	3.0	504	170	674	1,041	289	**1,330**

Table 3-13 2030 Station Boardings and Times – Beverly LRT Alternative

Station Name	Eastbound (Read Up) Dist (mi)	Eastbound (Read Up) Time (min)	Eastbound Boardings Peak	Eastbound Boardings Off-Peak	Eastbound Boardings Daily	Westbound (Read Down) Dist (mi)	Westbound (Read Down) Time (min)	Westbound Boardings Peak	Westbound Boardings Off-Peak	Westbound Boardings Daily	Total Boardings Peak	Total Boardings Off-Peak	Total Boardings Daily
Del Mar	0.5	2.0	1,159	486	1,645	0.6	1.0	1,011	350	1,361	2,170	836	**3,006**
Memorial Park	1.1	2.0	1,083	284	1,367	0.5	2.0	1,008	293	1,301	2,091	577	**2,668**
Lake Ave.	1.0	2.0	945	217	1,162	1.1	2.0	563	174	737	1,508	391	**1,899**
Allen Ave.	1.7	3.0	490	130	620	1.0	2.0	185	71	256	675	201	**876**
Sierra Madre Villa	-	-	1,757	592	2,349	1.7	3.0	636	195	831	2,392	787	**3,179**
Total	**29.2**	**74.2**	**25,102**	**7,311**	**32,413**	**29.2**	**74.2**	**22,328**	**7,750**	**30,078**	**47,430**	**15,061**	**62,491**

Table 3-14 2030 Station Boardings and Times – Whittier LRT Alternative

	Station Name	Eastbound (Read Up) Dist (mi)	Eastbound (Read Up) Time (min)	Eastbound Boardings Peak	Eastbound Boardings Off-Peak	Eastbound Boardings Daily	Westbound (Read Down) Dist (mi)	Westbound (Read Down) Time (min)	Westbound Boardings Peak	Westbound Boardings Off-Peak	Westbound Boardings Daily	Total Boardings Peak	Total Boardings Off-Peak	Total Boardings Daily
Phase 2	Whittier/E. of Mar Vista	0.8	2.2	168	96	264	-	-	688	285	973	856	381	**1,236**
	Whittier/Philadelphia	1.2	2.8	302	119	420	0.8	2.2	608	260	868	910	378	**1,288**
	Whittier/E. of Norwalk	1.3	4.3	220	102	322	1.2	2.8	358	118	476	578	220	**798**
	Whittier/Rosemead	1.7	5.4	290	115	404	1.3	4.3	560	305	864	849	419	**1,268**
	Whittier/W. of Montebello	1.1	2.6	397	178	575	1.7	5.4	422	198	620	819	376	**1,195**
	Garfield/E. of Whittier	1.5	3.0	530	239	769	1.1	2.6	679	292	970	1,208	531	**1,739**
	Garfield/SR-60	1.5	3.6	215	89	304	1.5	3.0	603	327	930	818	415	**1,233**
Phase 1	Pomona/Atlantic (Atlantic)	0.4	1.5	896	271	1,167	1.5	3.6	1,322	488	1,810	2,218	759	**2,976**
	Third St./Mednick (East LA Civic Center)	0.4	2.0	199	52	251	0.4	1.5	538	163	701	737	215	**951**
	Third St./Ford (Maravilla)	1.4	4.0	195	108	303	0.4	2.0	402	157	559	597	265	**862**
	Third St./Indiana (Indiana)	1.3	3.3	463	168	631	1.4	4.0	1,121	338	1,459	1,583	506	**2,089**
	First St./Soto (Soto)	0.6	1.6	665	232	897	1.3	3.3	1,365	425	1,790	2,029	657	**2,686**
	First St./Boyle (Mariachi/Plaza)	0.4	1.4	294	122	416	0.6	1.6	411	165	576	704	287	**991**
	First St./Utah (Pico/Aliso)	0.8	2.8	78	35	113	0.4	1.4	130	63	193	208	98	**305**
	First St./Alameda (Little Tokyo)	0.5	3.0	1,187	299	1,486	0.8	2.8	901	435	1,336	2,088	733	**2,821**
Existing Gold Line Stations	Union Station	0.6	3.0	8,244	1,896	10,140	0.5	3.0	6,306	1,695	8,001	14,550	3,591	**18,141**
	Chinatown	1.6	3.0	746	142	887	0.6	3.0	526	168	693	1,271	309	**1,580**
	Lincoln Heights/Cypress Park	0.6	1.0	919	395	1,313	1.6	3.0	512	186	698	1,430	581	**2,011**
	Heritage Square/Arroyo	0.9	2.0	744	321	1,065	0.6	1.0	399	93	492	1,143	414	**1,557**
	Southwest Museum	1.5	4.0	522	151	672	0.9	2.0	138	55	192	659	205	**864**
	Highland Park	2.1	3.0	1,866	459	2,325	1.5	4.0	524	268	791	2,390	726	**3,116**
	Mission	1.5	3.0	537	77	614	2.1	3.0	274	87	361	811	163	**974**
	Filmore	0.6	1.0	539	120	659	1.5	3.0	497	171	668	1,035	291	**1,326**
	Del Mar	0.5	2.0	1,163	489	1,652	0.6	1.0	1,017	352	1,369	2,179	841	**3,020**
	Memorial Park	1.1	2.0	1,090	288	1,378	0.5	2.0	1,011	292	1,303	2,101	580	**2,681**
	Lake Ave.	1.0	2.0	950	219	1,169	1.1	2.0	570	171	741	1,520	390	**1,910**
	Allen Ave.	1.7	3.0	492	131	623	1.0	2.0	181	74	255	673	204	**877**
	Sierra Madre Villa	-	-	1,784	600	2,384	1.7	3.0	638	195	832	2,421	795	**3,216**
	Total	**28.6**	**72.5**	**25,687**	**7,506**	**33,193**	**28.6**	**72.5**	**22,693**	**7,819**	**30,512**	**48,380**	**15,325**	**63,705**

Table 3-15 2030 Station Boardings and Times – Washington LRT Alternative

	Station Name	Eastbound (Read Up) Dist (mi)	Eastbound (Read Up) Time (min)	Eastbound Boardings Peak	Eastbound Boardings Off-Peak	Eastbound Boardings Daily	Westbound (Read Down) Dist (mi)	Westbound (Read Down) Time (min)	Westbound Boardings Peak	Westbound Boardings Off-Peak	Westbound Boardings Daily	Total Boardings Peak	Total Boardings Off-Peak	Total Boardings Daily
Phase 2	Washington/Lambert	1.5	2.5	414	183	597	-	-	1,017	420	1,437	1,431	603	**2,034**
	Washington/E. of Norwalk	1.6	2.6	321	163	483	1.5	2.5	739	390	1,129	1,060	553	**1,612**
	Washington/Rosemead	1.5	2.6	284	98	381	1.6	2.6	466	213	678	749	310	**1,059**
	Washington/So. Greenwood	1.9	2.9	424	214	638	1.5	2.6	408	227	635	832	441	**1,273**
	Garfield/Whittier	1.4	2.8	703	293	996	1.9	2.9	830	330	1,160	1,533	623	**2,156**
	Garfield/SR-60	1.5	3.6	265	133	398	1.4	2.8	729	371	1,100	994	504	**1,497**
Phase 1	Pomona/Atlantic (Atlantic)	0.4	1.5	943	284	1,227	1.5	3.6	1,377	530	1,907	2,320	814	**3,134**
	Third St./Mednick (East LA Civic Center)	0.4	2.0	205	61	266	0.4	1.5	540	177	716	745	238	**982**
	Third St./Ford (Maravilla)	1.4	4.0	200	111	311	0.4	2.0	399	151	550	599	262	**861**
	Third St./Indiana (Indiana)	1.3	3.3	474	175	648	1.4	4.0	1,126	341	1,466	1,599	515	**2,114**
	First St./Soto (Soto)	0.6	1.6	678	238	916	1.3	3.3	1,374	436	1,810	2,052	674	**2,726**
	First St./Boyle (Mariachi/Plaza)	0.4	1.4	295	126	421	0.6	1.6	414	166	579	709	291	**1,000**
	First St./Utah (Pico/Aliso)	0.8	2.8	78	36	114	0.4	1.4	129	63	192	207	99	**305**
	First St./Alameda (Little Tokyo)	0.5	3.0	1,190	299	1,488	0.8	2.8	936	460	1,396	2,126	759	**2,884**
Existing Gold Line Stations	Union Station	0.6	3.0	8,345	1,924	10,268	0.5	3.0	6,435	1,792	8,227	14,780	3,716	**18,495**
	Chinatown	1.6	3.0	749	139	888	0.6	3.0	529	171	700	1,278	310	**1,587**
	Lincoln Heights/Cypress Park	0.6	1.0	920	398	1,318	1.6	3.0	526	195	720	1,446	592	**2,038**
	Heritage Square/Arroyo	0.9	2.0	748	324	1,071	0.6	1.0	404	90	494	1,151	414	**1,565**
	Southwest Museum	1.5	4.0	524	151	675	0.9	2.0	136	56	192	660	207	**867**
	Highland Park	2.1	3.0	1,876	463	2,339	1.5	4.0	525	270	795	2,401	733	**3,134**
	Mission	1.5	3.0	540	79	619	2.1	3.0	276	90	366	816	169	**985**
	Filmore	0.6	1.0	524	122	645	1.5	3.0	490	170	660	1,013	292	**1,305**
	Del Mar	0.5	2.0	1,169	492	1,661	0.6	1.0	1,011	354	1,365	2,180	846	**3,026**
	Memorial Park	1.1	2.0	1,095	291	1,386	0.5	2.0	1,015	295	1,310	2,110	586	**2,696**
	Lake Ave.	1.0	2.0	955	220	1,174	1.1	2.0	565	176	741	1,520	395	**1,915**
	Allen Ave.	1.7	3.0	494	131	625	1.0	2.0	184	74	258	678	205	**883**
	Sierra Madre Villa	-	-	1,798	605	2,403	1.7	3.0	643	200	843	2,441	805	**3,246**
	Total	**28.9**	**65.6**	**26,205**	**7,745**	**33,950**	**28.9**	**65.6**	**23,218**	**8,203**	**31,421**	**49,423**	**15,948**	**65,371**

Project Riders and User Benefits

Project riders are the number of riders that board on the each of the build alternatives. Project riders indicate those riders that get on or off the proposed Eastside Transit Corridor Phase 2. It includes riders that board at one of the proposed new stations or travel to one of them from other parts of the Metro Gold Line. Of the build alternatives, the Washington Blvd. LRT Alternative is projected to have the most project riders at approximately 15,900 project boardings. The SR-60 Busway would have the least project riders, at about 7,500 project boardings.

User benefits are defined as the weighted travel time savings for all users of each of the project alternatives. As shown in Table 3-16, the Washington LRT Alternative is forecast to have the greatest user benefits at 6,403 hours, or 24.2 minutes per project boardings. The Beverly LRT Alternative is expected to have the next highest user benefits at 5,316 hours, or 23.7 minutes per project boarding. The SR-60 Busway is forecast to have the least user benefits at 1,745 hours, or 13.9 minutes per project boarding. Table 3-16 shows the project riders and project user benefits for each alternative.

Travel Times

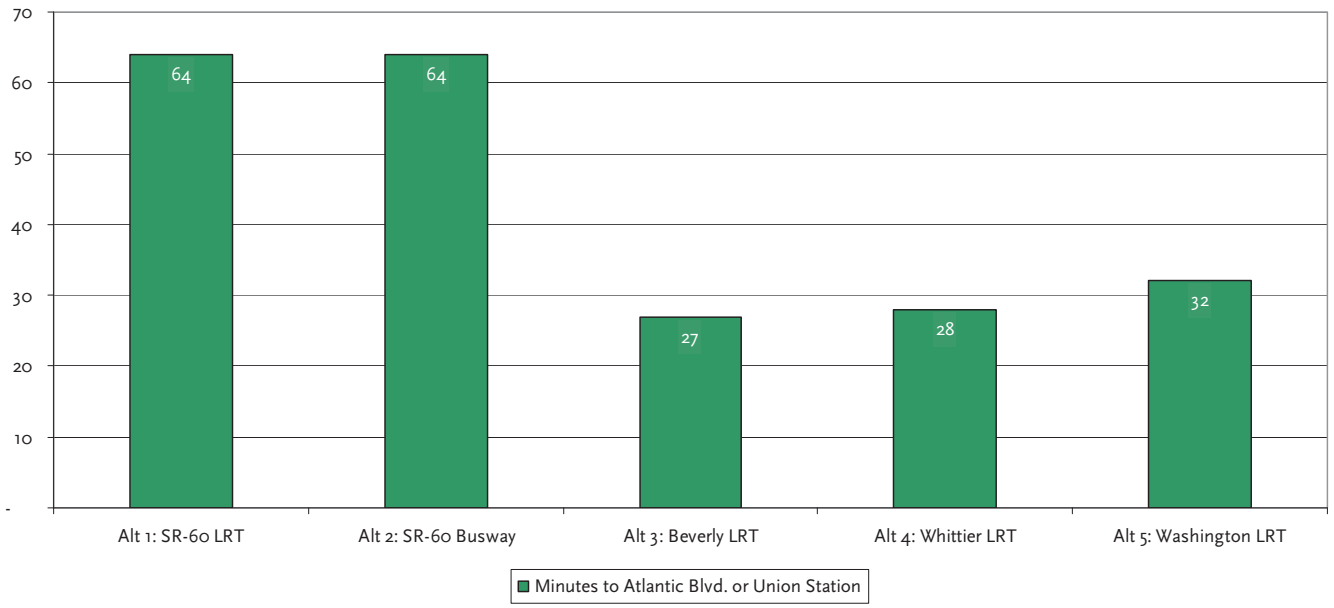
Table 3-17 shows the travel times for each alternative. Travel time savings is measured relative to the No-Build condition. It evaluates the difference in transit travel time from any specific location in the project area. The SR-60 LRT and SR-60 Busway Alternatives have the lowest running times to Atlantic Ave. and Union Station. The Beverly LRT has the highest running times to the same locations.

Implementation of the Eastside Transit Corridor Phase 2 would result in substantial savings in travel time to Atlantic Blvd. and to Union Station. As shown in Figure 3-4, travel time savings would range from about one half hour with most of the alternatives. (The SR-60 alternatives would yield higher savings, but this is largely due to the relative inaccessibility of the Crossroads terminal station to modes other than auto.)

When comparing the change in travel time to Atlantic Ave. and Union Station for the Build alternatives compared to the No-Build and TSM alternatives, the SR-60 LRT and SR-60 Busway Alternatives would see the greatest change at 64 minutes. The Beverly LRT would see a 27 minute change in travel times to Atlantic Ave. and Union Station, the lowest change of the Build Alternatives.

The Peak Period Travel Times compare the change in travel time between Atlantic Ave. and Union Station during peak travel periods for each alternative. Overall, the Build Alternatives would perform better during the peak periods. The Washington LRT Alternative would have the lowest total transit time during the peak period to both Atlantic Ave. and Union Station. The Beverly LRT Alternative would have the highest total transit time to the same destinations during the peak period.

Figure 3-4 Travel Time Savings



Congestion Relief

Congestion relief is the reduction in highway travel demand in the PSA expressed in vehicle miles traveled (VMT). It includes both auto and truck travel. As more people switch to transit, fewer vehicles are observed on the highway, thus reducing the overall regional VMT. Of the Build alternatives, the Beverly LRT Alternative would result in the most average weekday daily VMT while the SR-60 Busway Alternative would result in the least. Table 3-18 shows the average weekday daily VMT for each alternative.

Transit Mode Share

The estimated change in transit mode share shows the percentage of total trips taken by transit for each alternative. In all cases, the proposed Eastside Extension results in an increased transit mode share. Though each alternative shows an overall improvement, there is variation by segment. The Washington LRT Alternative shows the highest transit mode share at 7.5 percent while the SR-60 Busway Alternative shows the lowest at 7.0 percent. Table 3-19 presents the transit mode share for each alternative.

Table 3-16 2030 Project Riders and User Benefits

Run →	Alternative 1 - SR-60 LRT					Alternative 2 - SR-60 Busway				
Daily Gold Line Boardings	62,904					55,578				
Project Riders	13,319					7,516				
	HBW[1]	HBO[2]	NHB[3]	HBU[4]	Total	HBW[1]	HBO[2]	NHB[3]	HBU[4]	Total
New Riders	-	-	-	-	4,301	-	-	-	-	2,116
User Benefits (hours)	2,491	993	146	236	3,867	1,065	496	57	127	1,745
User Benefits per Project Boarding (min)	-	-	-	-	17.4	-	-	-	-	13.9
% of benefits that are coverage related	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
% of benefits capped prices	-1.0%	-2.3%	-0.5%	-0.6%	-1.3%	-2.2%	-2.1%	-0.6%	-1.2%	-2.1%

Run →	Alternative 3 – Beverly LRT					Alternative 4 – Whittier LRT					Alternative 5 – Washington LRT				
Daily Gold Line Boardings	62,491					63,705					65,371				
Project Riders	13,469					14,358					15,893				
	HBW[1]	HBO[2]	NHB[3]	HBU[4]	Total	HBW[1]	HBO[2]	NHB[3]	HBU[4]	Total	HBW[1]	HBO[2]	NHB[3]	HBU[4]	Total
New Riders	-	-	-	-	5,010	-	-	-	-	4,992	-	-	-	-	6,407
User Benefits (hours)	2,550	2,201	391	175	5,316	2,593	2,019	360	198	5,169	3,459	2,250	414	280	6,403
User Benefits per Project Boarding (min)	-	-	-	-	23.7	-	-	-	-	21.6	-	-	-	-	24.2
% of benefits that are coverage related	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
% of benefits capped prices	-1.0%	-4.7%	-0.6%	-1.7%	-2.5%	-1.2%	-3.6%	-0.5%	-1.4%	-2.1%	-2.2%	-5.0%	-1.2%	-1.1%	-3.1%

1. Home based work trip – A trip made between home and work.
2. Home based other trip – A trip made between home and a non-work, non-university location, e.g., shopping.
3. Non home based trip – A trip not originating at home such as business to business trip.
4. Home based university trip – A trip made between home and a university.

Table 3-17 2030 Travel Times

Measure	No-Build	Future Baseline/TSM	Alternative				
			SR-60 LRT	SR-60 Busway	Beverly LRT	Whittier LRT	Washington LRT
Travel time (running time) from Eastside Gold Line Extension Terminus (Minutes)							
To Atlantic Blvd.	SR-60 80 Beverly and Whittier 52 Washington 49	SR-60 52 Beverly 39 Whittier and Washington 37	16	15	34	24	17
To Union Station	SR-60 99 Beverly and Whittier 72 Washington 69	SR-60 72 Beverly 56 Whittier and Washington 57	35	35	45	44	37
Change in travel time from end of line compared to No-Build (Minutes)							
To Atlantic Blvd.	-	SR-60 28 Beverly 13 Whittier 15 Washington 12	64	64	27	28	32
To Union Station	-	SR-60 28 Beverly 13 Whittier 15 Washington 12	64	64	27	28	32
Headways (minutes)	-	-	5 peak / 10 off-peak	5 peak / 10 off-peak	5 peak / 10 off-peak	5 peak / 10 off-peak	5 peak / 10 off-peak
Average Speed (mph)	-	-	33.3	33.7	22.6	22.8	33
Average Station Spacing (miles)	-	-	1.4	1.4	0.7	0.8	1.3
Peak period total highway time (from TAZ to TAZ) from end of line (Minutes)							

Table 3-17 2030 Travel Times

Measure	No-Build	Future Baseline/TSM	Alternative				
			SR-60 LRT	SR-60 Busway	Beverly LRT	Whittier LRT	Washington LRT
To Atlantic Blvd.	SR-60 35 Beverly, Whittier, and Washington 27	SR-60 35 Beverly, Whittier, and Washington 27	35	35	27	27	27
To Union Station	SR-60 52 Beverly and Whittier 46 Washington 44	SR-60 52 Beverly and Whittier 46 Washington 44	52	52	46	46	44
Peak period total transit time (from TAZ to TAZ) from end of line (Minutes)							
To Atlantic Blvd.	SR-60 121 Beverly and Whittier 71 Washington 67	SR-60 76 Beverly 55 Whittier 53 Washington 52	40	40	41	40	32
To Union Station	SR-60 147 Beverly and Whittier 97 Washington 93	SR-60 103 Beverly 81 Whittier and Washington 79	59	59	61	59	52

Table 3-18 2030 Average Weekday Daily Vehicle Miles Traveled	
Alternative	VMT
No-Build	4,540,774
Future Baseline/TSM	4,540,112
SR-60 LRT	4,539,616
SR-60 Busway	4,539,513
Beverly LRT	4,540,351
Beverly LRT	4,540,500
Whittier LRT	4,539,636
Washington LRT	4,540,266

Source: LA Metro Travel Demand Model 2008

Table 3-19 2030 Average Weekday Daily Transit Mode Share for Work Trips from/to/within Eastside PSA			
Alternative	Person Trips	Transit Trips	Transit Share
No-Build	483,895	30,787	6.362%
Future Baseline/TSM	483,895	33,033	6.826%
SR-60 LRT	483,895	34,401	7.109%
SR-60 Busway	483,895	33,895	7.005%
Beverly LRT	483,895	35,505	7.337%
Whittier LRT	483,895	35,473	7.331%
Washington LRT	483,895	36,112	7.463%

Source: LA Metro Travel Demand Model 2008

3.2 Roadway and Highway Analysis

Although all five alternatives would lead to increased transit use and a reduction in automobile activity along the affected corridor, they could result in secondary impacts to local and regional traffic conditions. As such, each of the five alternatives were assessed in terms of potential effects to area wide traffic congestion and localized vehicular circulation.

3.2.1 Traffic Congestion and Circulation

Alternative 1

Since this LRT alternative would operate along the SR-60 right-of-way for the majority of the corridor, it would have minimal impacts to traffic congestion and vehicular circulation, except for the segment between the terminal station for the Eastside Extension at Pomona Blvd. and Atlantic Blvd. and where it transitions into the aerial structure along SR-60 near Sadler Ave. For this short distance (less than half a mile), the LRT would run within the Pomona Blvd.

right-of-way, crossing Atlantic Blvd. at-grade, and resulting in the elimination of a travel lane and some minor restrictions in local access. Overall, this alternative would have a relatively minimal effect on traffic congestion and circulation for the entire length of the alignment.

Alternative 2

Similar to Alternative 1, Alternative 2 would also operate along the SR-60 right-of-way for the majority of the corridor but as a busway. As such, it would also have minimal impacts to traffic congestion and vehicular circulation, except for the segment between the terminal station for the Eastside Extension at Pomona Blvd./Atlantic Blvd. and where it transitions into the aerial structure along SR-60 near Sadler Ave. For this short distance (less than half a mile), the busway would be running within the Pomona Blvd. right-of-way, crossing Atlantic Blvd. at-grade, and resulting in the elimination of a travel lane and some minor restrictions in local access. Overall, this alternative would have a relatively minimal affect on traffic congestion and circulation for the entire length of the alignment.

Alternative 3

This LRT alternative would operate in a series of at-grade, aerial, and exclusive right-of-way (via the Whittier Greenway) segments between the terminal station for the Eastside Extension at Pomona Blvd./Atlantic Blvd. and downtown Whittier. Along Pomona Blvd. to SR-60, Alternative 3 would operate at-grade (same configuration as Alternative 1), resulting in the loss of a travel lane and minor impacts to local circulation. After Sadler Ave., the alternative would travel in an aerial structure along SR-60 and Garfield Ave., returning to an at-grade configuration on Beverly Blvd. This aerial configuration would allow for minimal impacts to capacity along Garfield Ave. and Beverly Blvd., as the majority of left-turns could be maintained and there would only be the loss of travel lanes when there are conflicts with left-turns or on-street parking provision. Between Garfield Ave. and I-605, the alignment would operate within the median of Beverly Blvd., which would generally require the elimination of a travel lane in each direction, the prohibition of left-turns at minor streets, and the loss of some on-street parking. After the aerial structure over the I-605 freeway, the alignment would transition into the Whittier Greenway, which would be an exclusive right-of-way with minimal impacts to local circulation and traffic conditions.

Alternative 4

Between Pomona Blvd./Atlantic Blvd. and Beverly Blvd., this alternative would have the same alignment as Alternative 3. However, it would continue to operate in an aerial structure farther south to Whittier Blvd., where it would transition into an at-grade alignment. For this aerial section of Garfield Ave. between Beverly Blvd. and Whittier Blvd., the alternative would also have minimal impacts to roadway capacity and local circulation. Once the alignment turns on Whittier Blvd., the LRT would transition into an at-grade alignment until Rosemead Blvd. For this segment, the alternative would result in the elimination of travel lanes and/or restrictions in on-street parking provision, plus the prohibition of left-turns at minor streets. The alternative would operate in an aerial structure until after Norwalk Blvd., where it would

transition back to an at-grade alignment to the end of the line near Washington Blvd. With the aerial alignment, there would be low impacts to local circulation and traffic conditions, as there would be a minimal reduction in capacity (although some left-turn movements may be eliminated). For the at-grade section between Norwalk Blvd. and Washington Blvd., a travel lane would need to be eliminated, which would moderately affect local conditions.

Alternative 5

Between Pomona Blvd./Atlantic Blvd. and Whittier Blvd., this alternative would have the same alignment as Alternative 4. However, it would travel south to Washington Blvd., and then continue as an aerial structure to the terminal location near Lambert Ave. Throughout the aerial section, the alternative would have minimal impacts to roadway capacity and local circulation; however, there would be some loss in on-street parking and restriction of left-turns into minor streets. In addition, there would need to be the loss of roadway capacity in the segment between the I-605 freeway and Lambert Rd., as some portions of travel lanes may need to be reduced to accommodate the aerial structure.

As discussed, the implementation of these five alternatives could impact traffic conditions, in terms of reducing the capacity of the streets along the proposed alignments and affecting operations at major cross-streets. To determine these potential impacts, two evaluations were conducted.

For each segment along the proposed alignments, the amount of existing roadway capacity that would be transferred from regular traffic lanes to transit right-of-way was estimated by the proposed transit type (aerial or at-grade dedicated lane). Table 3-20 presents the estimated reduction in roadway capacity for each transit type. The reduction of Capacity can be represented as follows:

- Assume roadway capacity is 750 cars per lane per hours.
- A 25 percent reduction would result in capacity for 187 fewer cars per hours in the lane.
- A 25 to 75 percent reduction would result in capacity for between 187 and 562 fewer cars per hours in the lane.
- Over 75 percent reduction would result in capacity for 563 or more fewer cars in the lane.

These segment-by-segment changes were aggregated for each alignment alternative, and then categorized into ranges, as defined below:

Roadway Capacity Ranges

- "Low" – Averages less than 25 percent of one lane per direction
- "Medium" – Averages between 25 and 75 percent of one lane per direction
- "High" – Averages over 75 percent of one lane per direction

Table 3-20 Estimated Reduction in Roadway Capacity	
LRT At-Grade (Dedicated Lane)	1 lane in each direction
LRT At-Grade (Railroad Right-of-Way)	0 lane in each direction
LRT Aerial (Along SR-60)	0 lane in each direction
LRT Aerial (Over Roadway)	½ lane in each direction
Busway (Grade Separated)	0 lane in each direction
Busway (At-Grade)	1 lane in each direction

To determine the potential impact to major cross-street operations, the number of intersections with roadways classified as "major arterials" or "roadways of regional significance" was determined. The total number of potentially affected intersections was aggregated for each alignment alternative, and separated into ranges:

Major Intersection Ranges

- "Low" – Less than five major intersections
- "Medium" – Between five and ten major intersections
- "High" – Over ten major intersections

The results of these evaluations of potential traffic impacts are presented in Table 3-21.

Table 3-21 Preliminary Roadway Capacity and Major Intersection Impact Categories

Alternatives	Reduction in Roadway Capacity	Roadway Capacity Category	Number of Major Intersection Crossings	Major Intersection Category
Alternative 1	< 0.25 lanes	Low	1	Low
Alternative 2	< 0.25 lanes	Low	1	Low
Alternative 3	0.25 - 0.75 lanes	Medium	8	Medium
Alternative 4	< 0.25 lanes	Low	11	High
Alternative 5	< 0.25 lanes	Low	14	High

3.2.2 Access to Stations

All station locations would provide access for pedestrian and bicycle traffic as part of the design of each station area. Access to stations would be provided for automobiles to drop-off passengers; however, parking opportunities at each station will differ depending on adjacent land use, available land parcels, and urban design features surrounding each station. Stations and access issues for each of the build alternatives are discussed below.

Alternative 1 – SR-60 LRT Stations and Access Issues

- East 3rd St./Atlantic Blvd./Pomona Blvd. (East Los Angeles) – will be an at-grade center platform with transfer to Atlantic Blvd. buses. Station access will be provided for roadway drop-offs, pedestrians and bicyclists. A park and ride will be provided at the station.
- SR-60 east of South Garfield Ave. (Monterey Park & Montebello) – would be an aerial center platform along south edge of SR-60 with bridge access to a parcel of land in the southwest quadrant of the South Garfield Ave./Pomona Blvd. intersection. Station access will be provided for roadway drop-offs, pedestrians and bicyclists. A park and ride will be provided at the station. There is an opportunity for using parking deck and/or shared parking and TOD. There would be a transfer to South Garfield Ave. buses.
- SR-60 at Town Center Dr. between Paramount Blvd. and San Gabriel Blvd. (Montebello, Rosemead, and South San Gabriel) – would be an aerial center platform between Town Center Dr. and SR-60 with bridge access to parking lots at the mall and Kaiser facility. There is an opportunity for park and ride with shared parking and TOD. There would be a transfer to Montebello Blvd. and San Gabriel Blvd. buses.
- SR-60 at Santa Anita Ave. (Montebello, South San Gabriel, and Whittier Narrows Recreational Area) – would be an aerial center platform with a bus loading area at plaza level on the undeveloped parcel in the southeast quadrant of Santa Anita Ave. and SR-60. There is the opportunity for park and ride using parking deck and/or shared parking and TOD.
- SR-60 at Peck Rd. (South El Monte, Pico Rivera and Whittier) – would be an aerial center platform with a bus loading area at plaza level on a triangular parcel of land between the freeway, Peck Rd. and the San Gabriel River. There is the opportunity for site redevelopment with park and ride and TOD.
- SR-60 at Crossroads Pkwy. (Whittier, City of Industry, and West La Puente Valley) – would be an aerial center platform with a bus loading level on an undeveloped parcel between Crossroads Pkwy. and the freeway. There is the opportunity for park and ride using parking deck and/or shared parking and TOD.

Alternative 2 – SR-60 Busway Stations and Access Issues

- East 3rd St./Atlantic Blvd./ Pomona Blvd. (East Los Angeles) – will be an at-grade LRT center platform (Existing). The busway loading zone will be located along the south curb of

Pomona Blvd. east of Beverly Blvd. Buses could circulate around the area planned for a park and ride, and a part of the western portion of the parcel would be developed for bus storage.

- SR-60 east of South Garfield Ave. (Monterey Park & Montebello) – would be an aerial side platform along south edge of SR-60 with bridge access to a parcel in southwest quadrant of South Garfield Ave./Pomona Blvd. intersection. There is the opportunity for park and ride using parking deck and/or shared parking and TOD. There would be a transfer to South Garfield Ave. buses.
- SR-60 at Town Center Dr. between Paramount Blvd. and San Gabriel Blvd. (Montebello, Rosemead, and South San Gabriel) – would be an aerial side platform between Town Center Dr. and SR-60 with bridge access to parking lots at the mall and Kaiser facility. There is the opportunity for park and ride using parking deck and/or shared parking and TOD. There would be a transfer to Montebello Blvd. and San Gabriel Blvd. buses.
- SR-60 at Santa Anita Ave. (South El Monte and Whittier Narrows Recreational Area) – would be an aerial side platform with a bus loading area at the plaza level on the undeveloped parcel in the southeast quadrant of Santa Anita Ave. and SR-60. There is the opportunity for park and ride using parking deck and/or shared parking and TOD.
- SR-60 at Peck Rd. (South El Monte, Pico Rivera and Whittier) – would be an aerial side platform with a bus loading area at the plaza level on a triangle parcel of land between the freeway, Peck Rd. and the San Gabriel River. There is the opportunity for site redevelopment with park and ride and TOD and the opportunity for Peck Rd. buses serving South El Monte, El Monte and Whittier to access the busway facility via a connector ramp.
- SR-60 at Crossroads Pkwy. (Whittier, City of Industry, and West La Puente Valley) – would be an aerial side platform with a bus loading level on the undeveloped parcel between Crossroads Pkwy. and the freeway. There is the opportunity for park and ride using parking deck and/or shared parking and TOD and the opportunity for bus access from freeway flyer buses serving portions of SR-60 farther east.

Alternative 3 – Beverly LRT Stations and Access Issues

- East 3rd St./Atlantic Blvd./ Pomona Blvd. (East Los Angeles) – At-grade center platform (Existing); transfer to Atlantic Blvd. buses. Station access will be provided for roadway drop-offs, pedestrians and bicyclists and a park and ride is as part of on-going construction.
- South Garfield Ave. south of SR-60 (Monterey Park & Montebello) – would be an aerial center platform over parcels along the west side of South Garfield Ave. with bridge access to a parcel in northeast quadrant of the Garfield Blvd./Pomona Blvd. intersection. There is the opportunity for park and ride using parking deck and/or shared parking and TOD and transfer to South Garfield Ave. buses.
- Beverly Blvd. east of South Garfield Ave. (Montebello) – would be an aerial center platform over the median at Ashiya Park Rd. just east of Beverly Blvd. There is the potential for a small

park and ride on the parcel at northeast quadrant of the Beverly Blvd./Garfield Ave. intersection and transfer to local buses.

- Beverly Blvd. at Wilcox Ave. (Montebello) – would be an at-grade split far side platform station with roadway drop-off; pedestrian and bicycle access from Beverly Blvd. and Wilcox Ave.
- Beverly Blvd. at Montebello Civic Center (Montebello) – would be an at-grade center platform immediately west of the Civic Center driveway (optional location in lieu of Wilcox Ave.). Access would be available for roadway drop-offs, pedestrians and bicyclists.
- Beverly Blvd. at Montebello Blvd. (Montebello) – would be an at-grade split far side platform station with the opportunity for park and ride using parking deck and/or shared parking and TOD at shopping center in northwest quadrant of the Beverly Blvd./Montebello Blvd. intersection. There would be a transfer to Montebello Blvd. and Beverly Blvd. buses.
- Beverly Blvd. at North Poplar Ave. (Montebello) – would be an at-grade split far side platform station. No parking would be provided. Access for roadway drop-offs, pedestrians and bicyclists would be provided by Beverly Blvd. and North Poplar Ave.
- Beverly Blvd. at Rosemead Blvd. (Pico Rivera) – would be an at-grade split far side platform station with the opportunity for park and ride using parking deck and/or shared parking and TOD at the shopping center in southeast quadrant of the Beverly Blvd./Rosemead Blvd. intersection and transfer to Rosemead Blvd. and Beverly Blvd. buses.
- Whittier Greenway at Norwalk Blvd. (West Whittier) – would be a center platform station along the Greenway bridging Norwalk Blvd. No parking would be provided. There would be a transfer to Norwalk Blvd. buses. Access would be available for roadway drop-offs via Norwalk Blvd.; pedestrians and bicyclists via Norwalk Blvd. and the Whittier Greenway.
- Whittier Greenway at Broadway (West Whittier) – would be an at-grade center platform station along the Greenway west of Broadway with no parking. Access would be available for roadway drop-offs via Broadway; pedestrians and bicyclists via Broadway and Whittier Greenway.
- Whittier Greenway at Philadelphia St. (Central Whittier) – would be an at-grade center platform station along the Greenway east of Philadelphia St. with the potential to acquire adjoining industrial parcels for park and ride and the potential for adjacent TOD at Fred C. Nelles School site 500 feet to the south.
- Whittier Greenway at Mar Vista St. (Central Whittier) – would be an at-grade center platform station along the Greenway east of Mar Vista St. with the potential to provide new roadway connection at Mar Vista St. to give access to Presbyterian Medical Center and encourage TOD on south side of Whittier Blvd. There would be a transfer to Whittier Blvd. buses.

Alternative 4 – Whittier LRT Stations and Access

- East 3rd St./East Beverly Blvd./Pomona Blvd. (East Los Angeles) – would be an at-grade center platform (Existing) with a transfer to Atlantic Blvd. buses. Station access will be provided for roadway drop-offs, pedestrians and bicyclists and a park and ride is planned as part of on-going construction.
- South Garfield Ave. south of SR-60 (Monterey Park & Montebello) – would be an aerial center platform over parcels along the west side of South Garfield Ave. with bridge access to a parcel in the northeast quadrant of the Garfield Blvd./Pomona Blvd. intersection. There is the opportunity for park and ride using parking deck and/or shared parking and TOD and transfer to South Garfield Ave. buses.

Design Option 1 – Southern California Edison Utility Corridor

- Whittier Blvd. at South Garfield Ave. (East Los Angeles, Montebello and Commerce) – would be an aerial center platform immediately east of South Garfield Ave. with vertical circulation to a parcel at the northeast or southeast corner. No parking would be provided. There would be a transfer to South Garfield Ave. and Whittier Blvd. buses.

Design Option 2 – Garfield

- Whittier Blvd. at Concourse Ave. (East Los Angeles, Montebello and Commerce) – would be an aerial center platform between Via Vista and Concourse Ave. with a vertical circulation bridge from the west end of the platform to a parcel along the north or south curb of Whittier Blvd. There would be a transfer to South Garfield Ave. and Whittier Blvd. buses.

Either Design Option

- Montebello Old Town (Montebello) – would be an at-grade center platform located on Whittier Blvd. between 10th and Spruce St. immediately west of Montebello Blvd. There is limited opportunity for a parking deck on the alley behind land uses to the north. There would be a transfer to Montebello Blvd. and Whittier Blvd. buses.
- Pico Rivera (Pico Rivera) – would be an aerial center platform station along Whittier Blvd. at Rosemead Blvd. with two design options: (1) over the median of Whittier Blvd., or (2) behind the south curb over parking areas of adjacent commercial properties. There is the opportunity for development of park and ride using additional shared parking constructed over existing parking lots. There is also the opportunity for TOD. There would be a transfer to Rosemead Blvd. and Whittier Blvd. buses.
- Norwalk Blvd. (West Whittier and Los Angeles County) – would be an aerial center platform station across and generally east of Norwalk Blvd. alongside and behind the south curb of Whittier Blvd. There is the opportunity for limited park and ride or TOD on parcels south of Whittier Blvd. along the alignment.
- Philadelphia St. (Central Whittier) – would be an at-grade split far side platform station located at Philadelphia St. There is the opportunity for a large park and ride and/or TOD on

Fred C. Nelles School site lands abutting Whittier Blvd. There would be a transfer to Whittier buses and a shuttle bus connection to Uptown Whittier and Whittier College.

- Mar Vista St. (Central Whittier and Santa Fe Springs) – would be an at-grade split far side platform station along Whittier Blvd. east of Mar Vista St. with the potential to provide a new roadway connection at Mar Vista St. to give access to Presbyterian Medical Center and encourage TOD on south side of Whittier Blvd. There would be a transfer to Whittier Blvd. buses.

Alternative 5 – Washington LRT Stations and Access

- East 3rd St./East Beverly Blvd./Pomona Blvd. (East Los Angeles) – will be an at-grade center platform (Existing) with a transfer to Atlantic Blvd. buses. Station access will be provided for roadway drop-offs, pedestrians and bicyclists and a park and ride is planned as part of on-going construction.
- South Garfield Ave. south of SR-60 (Monterey Park & Montebello) – would be an aerial center platform over parcels along the west side of South Garfield Ave. with bridge access to a parcel in northeast quadrant of the Garfield Ave./Pomona Blvd. intersection. There is the opportunity for park and ride using parking deck and/or shared parking and TOD. There would be a transfer to South Garfield Ave. buses.
- Whittier Blvd. at South Garfield Ave. (East Los Angeles, Montebello and Commerce) – would be an aerial center platform along the median of South Garfield Ave. north of Whittier Blvd. There could be a small park and ride and minor TOD potential on parcels in the northeast quadrant of the intersection. There would be a transfer to South Garfield Ave. and Whittier Blvd. buses.
- South Greenwood Ave. (Montebello) – would be an aerial center platform along the median of Washington Blvd. at South Greenwood Ave. There is the opportunity for park and ride using parking deck and/or shared parking with some TOD potential in one of the four quadrants of the intersection. There would be a transfer to Washington Blvd. and Greenwood Ave. buses.
- Rosemead Blvd. (Pico Rivera) – would be an aerial center platform station located over the eastbound lanes of Washington Blvd. approaching Rosemead Blvd. There is the opportunity to develop park and ride with shared parking and/or parking decks over commercial parking lots and the opportunity to develop TOD on commercial lots in conjunction with shared parking. There would be a transfer to Washington Blvd. and Rosemead Blvd. buses.
- Norwalk Blvd. (West Whittier, Santa Fe Springs and Los Angeles County) – would be an aerial center platform station over the median east of Norwalk Blvd. There would be a transfer to Norwalk Blvd. and Washington Blvd. buses. Access would be provided for roadway drop-offs, pedestrians and bicyclists via Norwalk Blvd. and Washington Blvd.
- Lambert Rd. (Central Whittier and Santa Fe Springs) – would be an aerial center platform over the median generally west of Lambert Rd. There is the opportunity for park and ride

using parking deck and/or shared parking in the southeast quadrant of the Washington Blvd./Lambert Rd. intersection. There is also the potential for TOD with redevelopment of existing commercial uses. Walk access would be available to the Presbyterian Medical Center and shuttle bus connections to Fred C. Nelles School site, Uptown Whittier and Whittier College.

3.3 Summary Transportation Analysis

The following sections summarize the results of the transportation analysis, including the comparison of each alternative from the perspective of transit service and potential ridership and potential effects on the local roadway and highway system.

3.3.1 Comparison by Alternative

Ridership

As indicated in Table 3-16 and in Figure 3-5, the level of ridership varies by alternative. Total project riders range from a low of 7,516 for Alternative 2 (SR-60 Busway) to a high of 15,893 for Alternative 5 (Washington LRT). The other three LRT alternatives (SR-60, Beverly Blvd., Whittier Blvd.) have similar levels of total riders in the range of 13,300.

In terms of new transit ridership, Alternative 2 again ranks the lowest with only 2,116 new riders, while Alternative 5 ranks the highest with 6,407 new riders. The other three alternatives have similar levels of new ridership although Alternatives 3 and 4 encourage more new riders (about 5,000) than Alternative 1 (about 4,300)

User Benefits

As indicated in Table 3-16 and Figures 3-6 and 3-7, the level of user benefits (measured in hours) anticipated with each alternative range from a low of 1,745 hours with Alternative 2 (SR-60 Busway) to a high of 6,403 hours for Alternative 5 (Washington Blvd.). User benefits anticipated for Alternative 1 are 3,867 hours while those anticipated for Alternatives 3 and 4 are 5,316 and 5,169 respectively.

The level of user benefits per project boarding (measured in minutes) anticipated with each alternative range from a low of 13.9 minutes for Alternative 2 (SR-60 Busway) to a high of 24.2 minutes for Alternative 5 (Washington Blvd.). Similar to the total user benefits, Alternative 1 improves on the level anticipated for Alternative 2 (17.4 minutes), but is not as high as that anticipated for Alternatives 3 and 4 (23.7 and 21.6 minutes, respectively).

Travel Time

As indicated in Table 3-17, travel times for all build alternatives provide a substantial improvement over travel times with the No-Build or Baseline/TSM alternatives. Travel times from the end of line to Atlantic Ave. range from 15-17 minutes for Alternatives 1, 2 and 5 (SR-60 LRT, SR-60 Busway, Washington Blvd.) to 24-26 minutes for Alternatives 4 and 3 (Whittier Blvd., Beverly Blvd.). Forecasted travel times are illustrated in Figure 3-8.

When considering travel time to Union Station from the end of line, similar results are expected. Alternatives 1, 2 and 5 range from 35-37 minutes while Alternatives 3 and 4 range from 44-45 minutes.

Travel time savings over the No-Build Alternative are illustrated in Figure 3-9. Travel time savings to Atlantic Ave. from the end of line over the No-Build Alternative are greatest with Alternatives 1 and 2. Alternatives 3, 4 and 5 all provide travel time savings over the No-Build, but the savings are about half as great as for Alternatives 1 and 2 (27-32 minutes for Alternatives 3, 4 and 5 compared with 64 minutes for Alternatives 1 and 2). Similar travel time savings are predicted for the trip to Union Station.

Congestion Relief

As indicated in Table 3-18 and Figure 3-10, each of the Build Alternatives would result in a reduction of vehicle miles travelled (VMT) in the PSA. The greatest reductions would occur for alternatives along SR-60 (Alternative 1 and 2); however, the Whittier Blvd. Alternative (Alternative 4) would provide similar savings in VMT over the No-Build. Alternatives 3 and 5 provide limited savings in VMT over the No-Build reducing VMT by 423 and 508 miles respectively.

Figure 3-5 Build Alternative Forecast Ridership

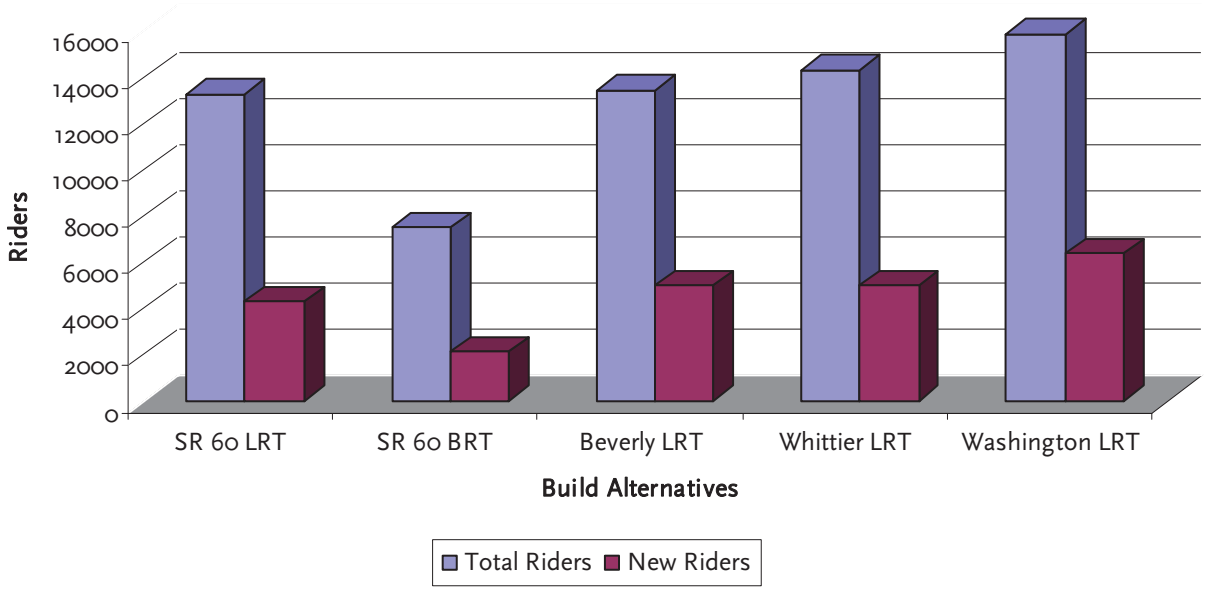


Figure 3-6 Transportation User Benefits (Hours)

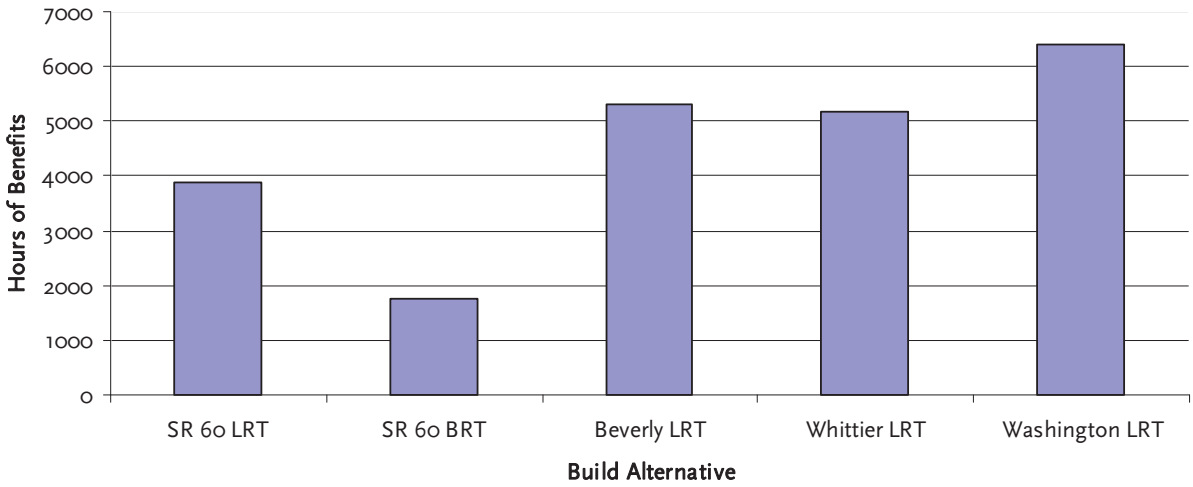


Figure 3-8 Forecast Travel Times

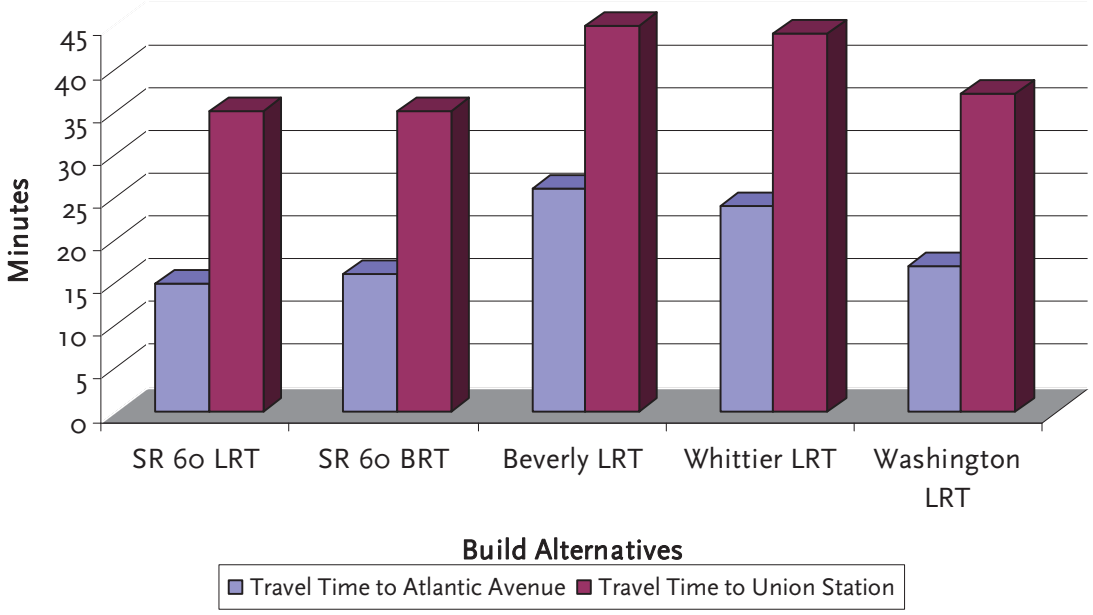


Figure 3-7 User Benefits Per Project Boarding

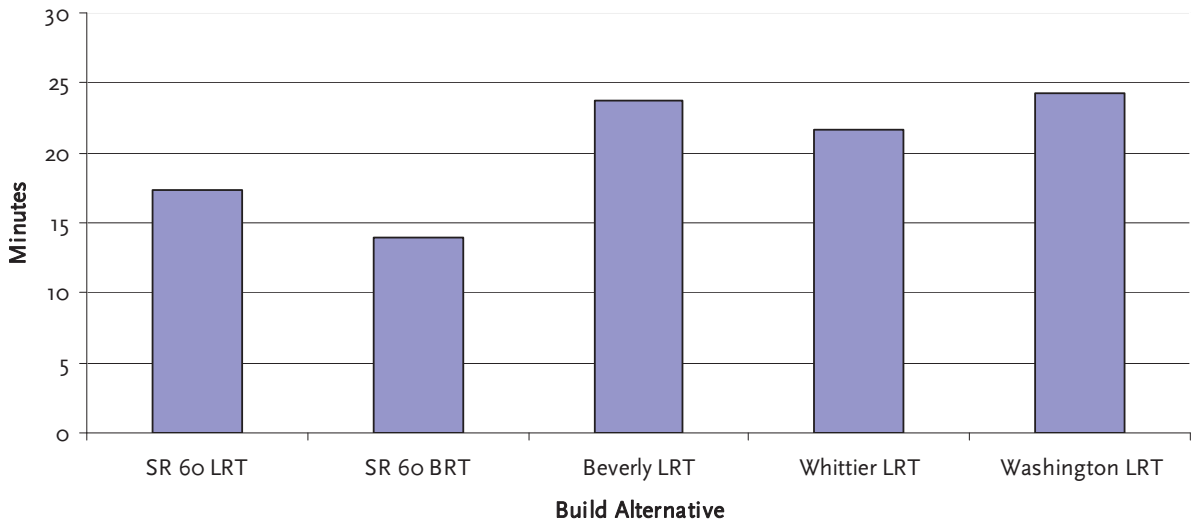


Figure 3-9 Travel Time Savings Over No Build

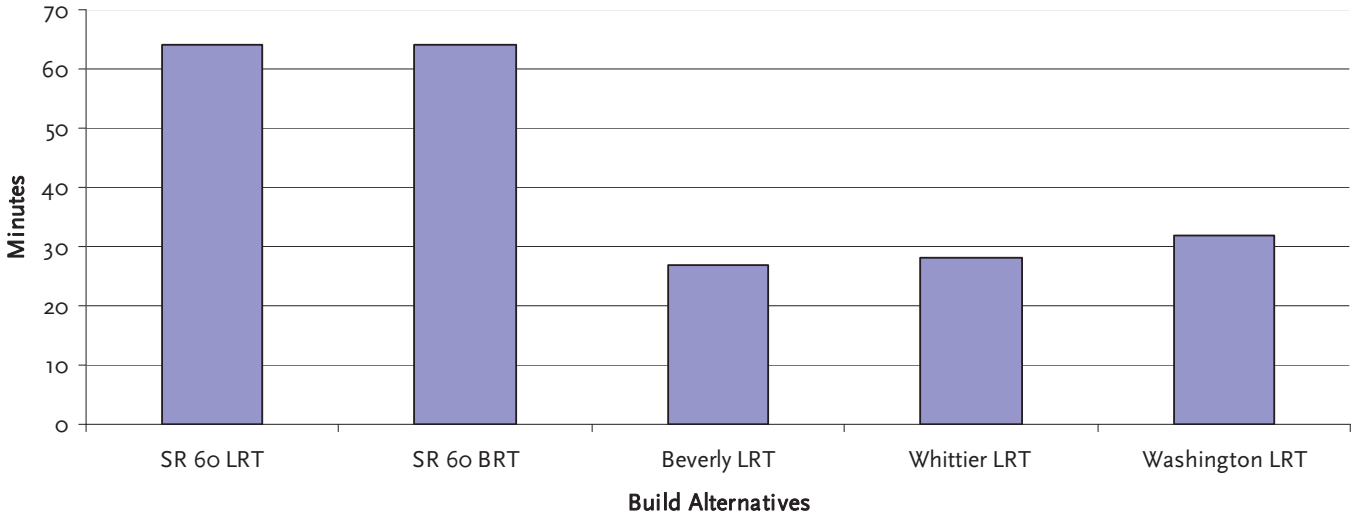
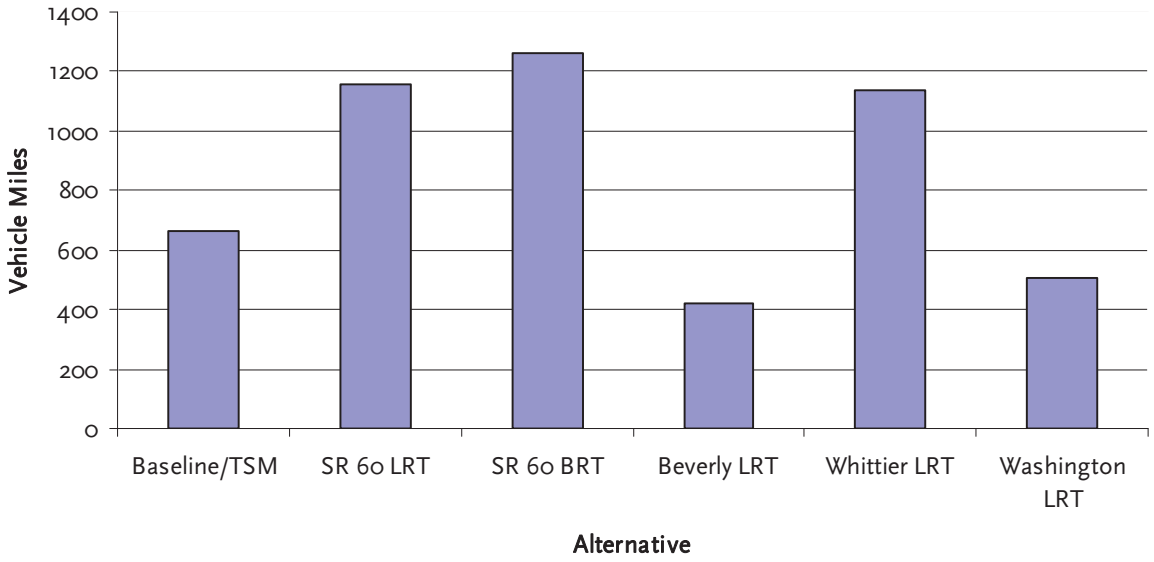


Figure 3-10 Vehicle Miles Traveled Reduction From No Build



Transit Mode Share

None of the alternatives under consideration can be expected to provide huge shifts from private automobiles to public transit. Each of the Build Alternatives does however result in an increase in transit mode share over the No-Build and TSM/Baseline Alternatives as documented in Table 3-19.

The increase in transit mode share over the No-Build Alternative would be highest with Alternative 5 (Washington LRT), but Alternatives 3 and 4 also provide a similar improvement in mode share (7.33 percent versus 7.46 percent). Alternatives 1 and 2 (SR-60 LRT and Busway) result in the lowest shift in mode over No-Build with total transit mode shares of 7.10 percent and 7.00 percent respectively.

Roadway Congestion

Alternative 1: Overall, this alternative would have a relatively minimal affect on traffic congestion and circulation for the entire length of the alignment. Although there would be a short section of at-grade operation, the majority of the alignment would be in an aerial structure along SR-60, and therefore not impact surface roadways.

Alternative 2: Similar to Alternative 1, this alternative would have a relatively minimal affect on traffic congestion and circulation for the entire length of the alignment.

Alternative 3: Overall, Alternative 3 would have moderate impacts to roadway capacity and intersection operations. Impacts to traffic conditions would primarily be focused on the at-grade segment along Beverly Blvd.; however, the aerial segments to the east and west of this section would have relatively low impacts. This alignment would also have a moderate potential impact to major intersections, as it would cross eight major arterials or key roadways.

Alternative 4: Overall, this alternative would include aerial structures to reduce the impacts to key streets and roadway segments, and therefore have a low impact to overall traffic conditions. However, this alternative would have a high potential for impacts to major arterials or other key roadways, as it would intersect with 11 along the entire alignment.

Alternative 5: This alignment have the highest number of intersections with major arterials and other roadways of regional significance (14), which could results in secondary capacity constraints at these locations. Overall, this alternative would have low impacts to roadway capacity along the alignment, as it is primarily an aerial configuration, but would have a high potential for affects to major cross-streets.

3.3.2 Conclusions

Alternatives 1 and 2 would have the least number of potential impacts on roadway congestion and traffic circulation, with Alternative 1 having the lowest levels of ridership and user benefits of any of the Build Alternatives by far. Alternatives 1 and 2 would have the greatest travel time savings over the No-Build condition of all the Build Alternatives.

Alternative 3 would result in moderate levels of roadway congestion and traffic circulation effects as well as moderate levels of ridership and user benefits. Travel time savings would be the lowest of all of the Build Alternatives as would the reduction of VMT over the No-Build condition.

Alternative 4 would be expected to have a low impact on overall traffic conditions, but would have a high potential for impacts to major arterials and other key roadways. Alternative 4 has the second highest ridership forecast, but does not perform as well as other alternatives in the areas of user benefits and travel time savings.

Alternative 5 would have low impacts to roadway capacity, but would be expected to have a high level of impact on major arterials due to the number of intersections with which it intersects. Alternative 5 would have the highest level of ridership of any of the Build Alternatives, the highest level of user benefits, and the highest level of travel time savings for any of the alternatives not located on SR-60.

4.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL ISSUES

4.1 Land Use and Economic Development

The Eastside Transit Corridor Phase 2 alternatives that support adjacent land uses can benefit the PSA by reducing local traffic congestion, increasing mobility within the PSA and to other LA County destinations, supporting local economic activity, and improving environmental quality. High density areas support transit alternatives more than low density areas because they offer more riders and can generate more trips. High density areas typically include highly populated residential areas, intensive commercial and industrial areas, major job and activity centers, institutional facilities, such as colleges or hospitals, and regional recreation areas.

Alignments near transit supportive land uses increase mobility within and outside the PSA and make activity centers in the PSA more accessible to riders, including the transit dependent population. Access to the proposed transit alternatives would also allow for riders within the PSA to access other LA County activity centers and tourist destinations, including downtown LA, local colleges and major universities (such as the University of Southern California; the University of California, Los Angeles; and the California State University, Los Angeles) Hollywood, Universal Studios, as well as cultural attractions and museums, etc.

Increased trips to the PSA's commercial activity centers, especially from riders originating outside of the PSA, would likely increase spending and support local economic development. Increased trips to LA County destinations would also support the County's economy. Analysis of these effects is presented in detail in Section 4.2 Catalyst for Public/Private Economic Revitalization and Section 1.3.5 Potential Travel Markets.

Alternatives serving high density land uses protect the environment by reducing reliance on private vehicles and the number of trips taken. This would potentially improve air quality by providing increased opportunities to use public transit and reducing vehicle emissions (analyzed in detail in Section 4.7), and improve water quality by reducing vehicle-related contaminants in runoff (analyzed in detail in Section 4.10), both of which would protect plants, trees, and other biological resources.

City and County General Plans and other regional plans often include policies that support public transit services to improve circulation. Alternatives that serve transit supportive land uses and increase ridership would contribute to meeting local and regional transit goals. However, construction of the transit alignments could result in adverse impacts to land use.

Construction activities may temporarily impede access to existing land uses by reducing access to or dividing an area. Construction may also result in displacement of existing land uses, such as residences or businesses, which would be a permanent impact to land use.

This section describes preliminary land use benefits and consequences of the proposed alternatives. Benefits are measured in terms of the land uses supported by the proposed alternatives, the existing and future population and employment densities served and if the alternatives support local land use policies.

Because detailed construction plans and exact station locations have not been developed for the alternatives, it is difficult to address construction impacts at this level of analysis, including potential displacement of residences and businesses. These impacts are briefly discussed in this section and will be analyzed in detail in subsequent planning phases.

4.1.1 Proximity to Existing Transit Supportive Land Use

Transit supportive land uses include commercial, institutional, high density residential, and recreation areas because they are major sources for generating transit riders. Redevelopment areas, activity centers, and job centers also provide potential transit usage because they attract people to the areas. Alignments that serve these land uses benefit the PSA by providing transit to a larger population and generating more ridership. Table 4-1 shows both transit supportive and other non-supporting land uses in the vicinity of the proposed alternatives. The non-supportive land uses are typically areas that do not support high populations or offer activities with high consumer demands, such as education facilities, recreation, or shopping centers. These areas include, but are not limited to, low-density residential, industrial and manufacturing areas, maintenance yards, and storage facilities. Figure 4-1 shows land uses within ½ mile of the proposed alternatives.

The land uses along the Route 60 (SR-60) corridor for Alternatives 1 and 2 include a mix of commercial, industrial, residential, and open space. This is a freeway corridor with limited residential land use adjacencies, only serving about 1,895 acres of high density residential land uses (apartments, condominiums, multistory buildings) within ½ mile of the alignment. It is largely defined by large scale commercial development projects and recreation centers adjacent to the freeway. This alignment supports the most recreation use of all the refined alignments, about 900 acres. Approximately 40 percent of the alignment's adjacent land use is non-transit supportive that would not support a high population for the transit corridor. The alignment serves two recreational activity centers, Montebello Golf Course and the Whittier Narrows Recreation Area, and commercial centers at the Montebello Town Center and Montebello Town Square Shopping Center.

Given that the corridor is defined by commercial development, the proposed alternative would provide access to new and future shopping centers. Conversely, the SR-60 alternatives would not provide a high level of access to residential communities. The alignment would support future redevelopment projects in the PSA, including the Cascades Market Place at Paramount Blvd and SR-60. Future development could increase transit supportive land uses along this corridor by adding mixed commercial and residential development with integrated park and ride facilities near stations.

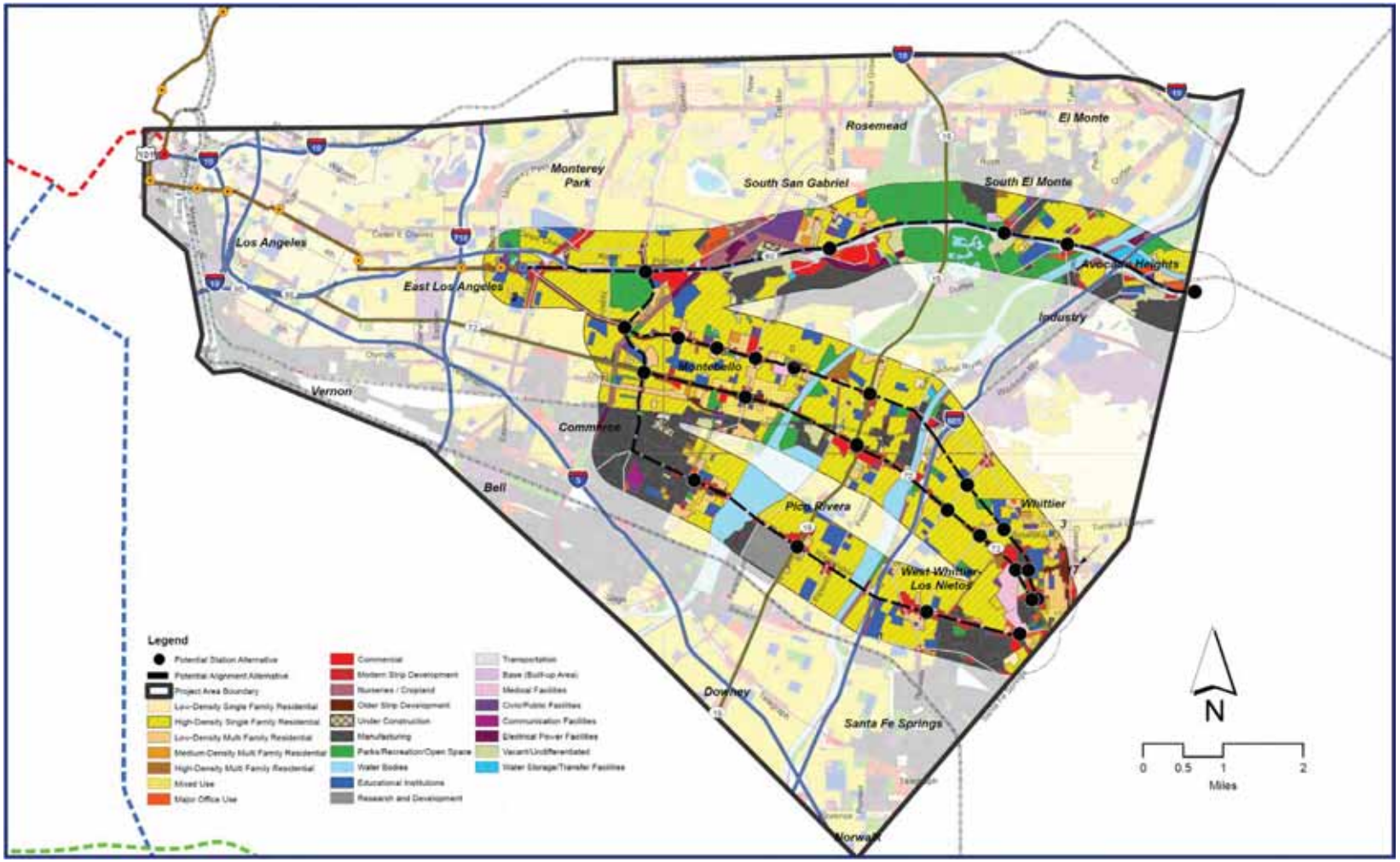
Table 4-1
Land Uses within ½ Mile of Proposed Alternatives (in acres)

Alternative		Commercial	Institutional	High Density Residential	Recreation	Other Non-Supporting Uses	Total Land Use
1 & 2 SR-60 LRT & Busway	acres	489	303	1,895	900	2,428	6,015
	% of Total	8%	5%	32%	15%	40%	--
3 Beverly LRT	acres	669	613	3,779	309	756	6,126
	% of Total	11%	10%	62%	5%	12%	--
4 Whittier LRT	acres	709	590	3,461	309	991	6,059
	% of Total	12%	10%	57%	5%	16%	--
5 Washington LRT	acres	629	704	3,100	231	1,803	6,467
	% of Total	10%	11%	48%	4%	28%	--

Source: SCAG 2005, provided by CDM

Alternative 3 along Beverly Blvd. extends largely through the existing urban fabric of the PSA, providing access to residential communities with commercial centers. This alignment serves the largest acreage of high-density residential land uses relative to the other proposed alignments, about 3,779 acres or 62 percent of the total adjacent land uses. The alignment would also provide access to recreational land uses including the San Gabriel River, smaller community parks, and the Whittier Greenway. The eastern end of the alignment would support commercial land uses concentrated in the City of Whittier. The alternative would serve about 669 acres of commercial land uses. Approximately 88 percent of the adjacent land uses along this corridor are transit supportive, which is the most relative to the other refined alternatives. The alignment would also serve activity centers in the PSA, such as the Montebello Golf Course, Beverly Hospital, Beverly Bowl, several strip shopping centers anchored by Rite Aid, Ross Dress for Less, and Big Lots, as well as future redevelopment projects identified in the Whittier Blvd. Specific Plan.

Figure 4-1 Land Uses along Refined Alternative Alignments



The initial stretch of Alternative 4 alignment serves the same areas as Alternative 3 through the vicinity of Garfield Ave. and Beverly Blvd. The alignment then continues south turning east onto Whittier Blvd. Along the stretch of Whittier Blvd. there is a mix of commercial, residential, and open space land uses. The alignment serves mainly residential land uses through Montebello and it serves more commercial areas after it crosses the Union Pacific Railway into Pico Rivera. Alternative 4 would terminate in Uptown Whittier, where there is a concentration of commercial, educational and residential activity oriented around pedestrian and transit supportive land uses. This alternative serves the largest acreage of commercial land uses compared to the other alternatives, about 709 acres. It also serves a total of 3,461 acres of high-density residential land uses, which is the second highest of the proposed alternatives. Within the PSA the alignment serves local activity centers at Montebello Golf Course, Norwalk St. Mall, Target shopping center in Pico Rivera, Pico Rivera Towne Center, and the Uptown Whittier District. Redevelopment projects served include the Whittier Blvd. Specific Plan and Streetscape that revitalizes the two-mile stretch of Whittier Blvd. in Montebello; Pico Rivera Village River Walk, which includes a new movie theater; the new Veranda Crest residential community; and projects included in the Whittier Blvd. Specific Plan.

Alternative 5 extends south down Garfield Ave. until heading east along Washington Blvd. Adjacent to the western end of the corridor there is a concentration of manufacturing, warehousing, and industrial land uses. This area is home to a significant amount of truck traffic that utilizes Washington Blvd. as a transportation and goods movement corridor. As the alignment heads east, the land use becomes increasingly residential and commercial in the Cities of Montebello, Pico Rivera, and Whittier. The proposed terminus would provide access to a regional hospital, which serves as a local employment base. Comparatively, Alternative 5 would provide less access to transit supportive land uses serving local and regional centers. The alternative would serve about 629 acres of commercial land use and 3,100 acres of high-density residential land use. About 1,803 acres, or 28 percent of total adjacent land, would serve non-transit supportive land uses. The alignment serves activity centers at Montebello Golf Course, Presbyterian Intercommunity Hospital, a Wal-Mart shopping center in Pico Rivera, and Santa Fe Springs Marketplace. It serves the redevelopment project at the Pico Rivera Towne Center.

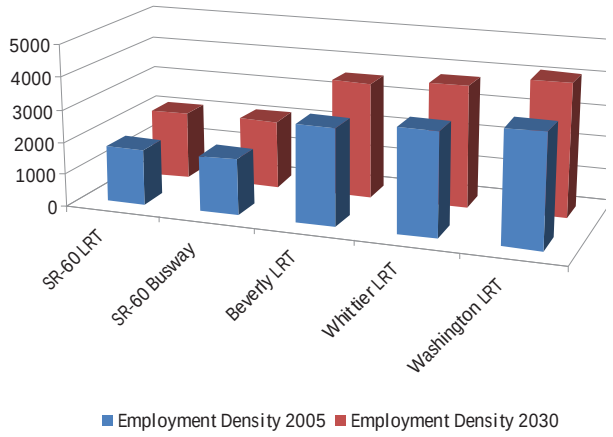
4.1.2 Accessibility to Existing and Future Population and Employment

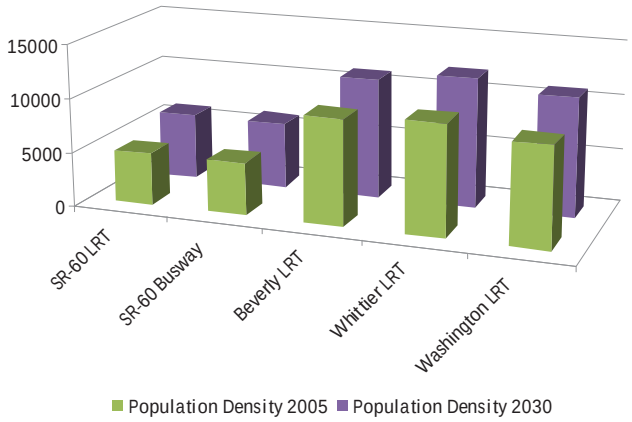
An alternative's land use benefits can be measured in terms of its access to areas with high population and employment densities. Providing transit access to areas with a high concentration of residential and employment generating land use can help to increase the benefit to the user and increase ridership along a given route. Given the varied land uses that exist along each alternative, understanding the current and future concentration of employment and population densities can help to identify alignments and station locations with the greatest potential benefit. Table 4-2 summarizes estimated population and employment densities around station locations for each of the refined alternatives.

Table 4-2
2005 and 2030 Population and Employment Density within ½ Mile of Station Alternatives

Alternative	Population Density 2005	Population Density 2030*	Change	Employment Density 2005	Employment Density 2030*	Change
	Persons per square mile		%	Jobs per square mile		%
1 SR-60 LRT	4,844	6,131	27%	1,729	2,099	21%
2 SR-60 Busway	4,844	6,131	27%	1,729	2,099	21%
3 Beverly LRT	9,757	11,145	14%	2,989	3,581	20%
4 Whittier LRT	10,204	11,959	17%	3,175	3,778	19%
5 Washington LRT	9,194	11,003	20%	3,443	4,125	20%

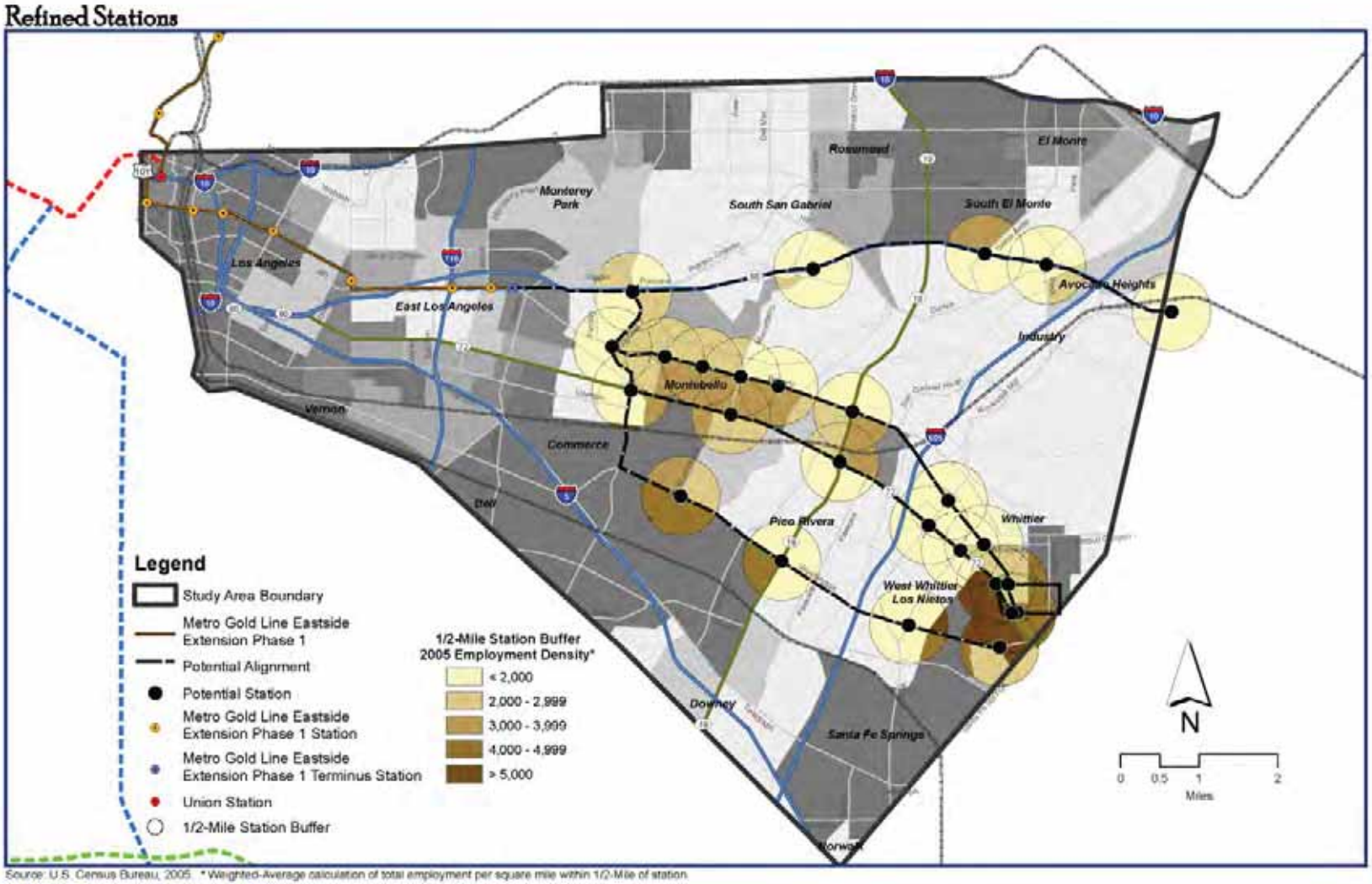
Source: U.S. Census Bureau 2005, provided by CDM
*Weighted average calculation of projected total population and employment per square mile within ½ mile of station





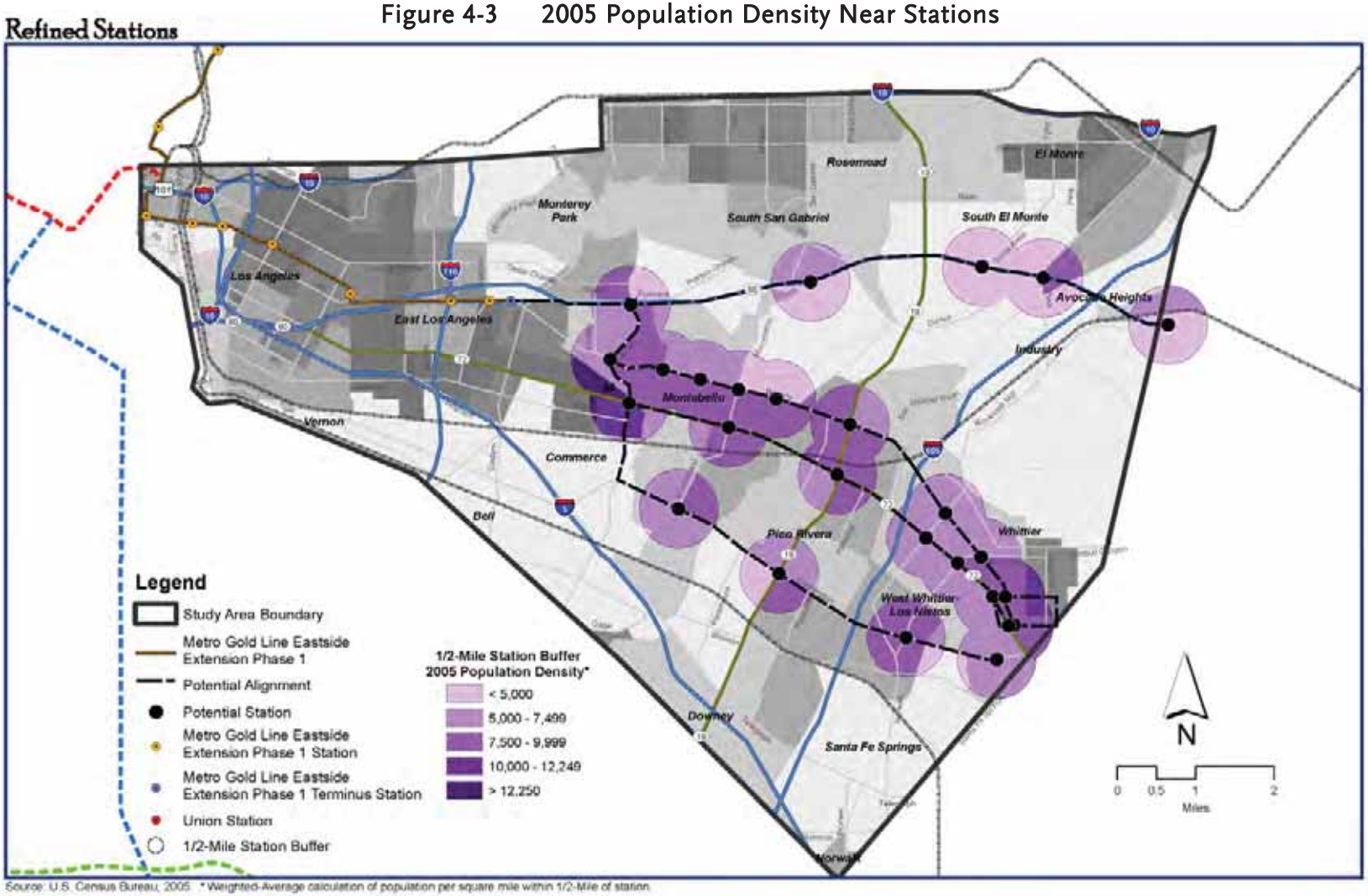
The information presents both existing and future trends. Figures 4-2 through 4-5 illustrate 2005 and 2030 population and employment densities within ½ mile of the proposed stations.

Figure 4-2 2005 Employment Density Near Stations



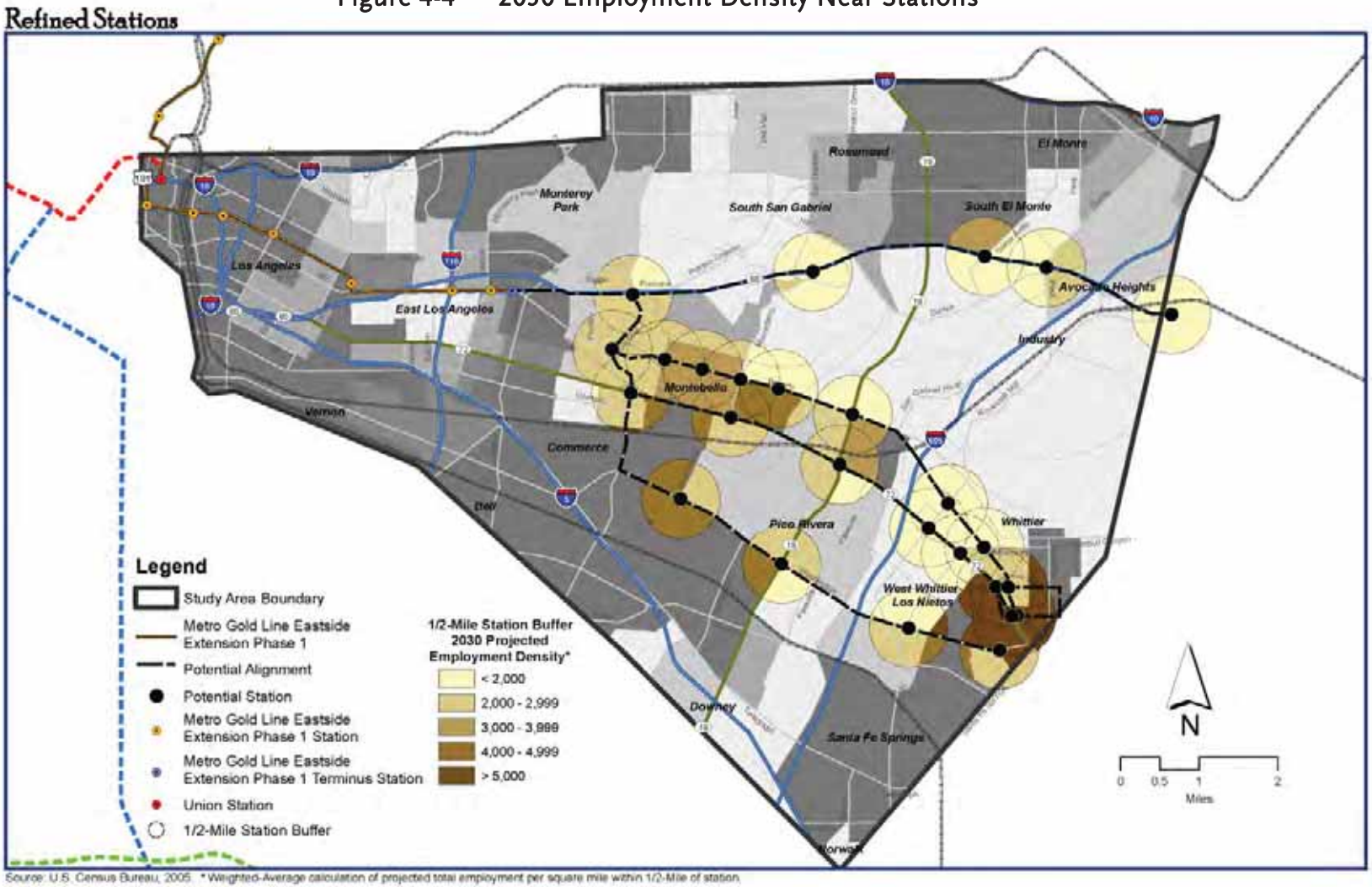
Source: U.S. Census Bureau, 2005. * Weighted-Average calculation of total employment per square mile within 1/2-Mile of station.

Figure 4-3 2005 Population Density Near Stations



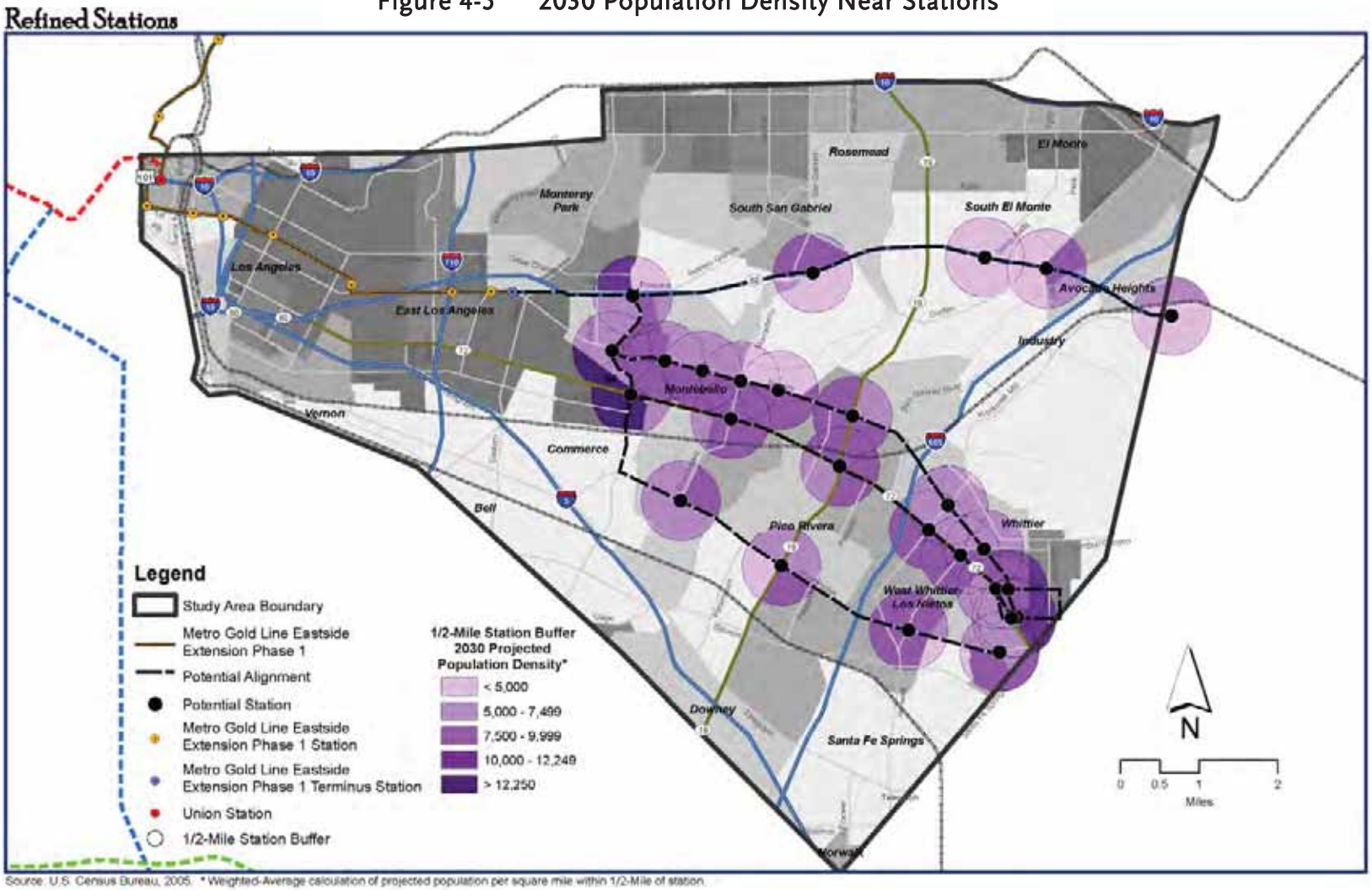
Source: U.S. Census Bureau, 2005 * Weighted-Average calculation of population per square mile within 1/2-Mile of station.

Figure 4-4 2030 Employment Density Near Stations



Source: U.S. Census Bureau, 2005. *Weighted-Average calculation of projected total employment per square mile within 1/2-Mile of station.

Figure 4-5 2030 Population Density Near Stations



Source: U.S. Census Bureau, 2005. * Weighted-Average calculation of projected population per square mile within 1/2-Mile of station.

Alternatives 1 and 2 serve the same area along SR-60. These alignments would serve the lowest population and employment density of the five refined alternatives. The alignment extends along a freeway corridor that does not have high density population or employment areas immediately adjacent to the corridor. The alternative could include park and ride lots that would support more populated areas in the PSA to access the transit system. The proposed SR-60 and Garfield Ave. station would serve the highest 2030 population density within ½ mile of all the alignment's stations. It should be noted that all of the proposed alternatives would include a stop at SR-60 and Garfield Ave. The SR-60 and Santa Anita Ave. station would serve the highest 2030 employment density of the alignment's stations. It serves several schools, including Rio Hondo Community College that provides a large employment base. Total population and employment densities along the alignment are expected to increase significantly by the year 2030. Total population density is projected to increase 27 percent from 2005 and employment density will increase by 21 percent from 2005. This alternative will see the largest increase in densities of the refined alternatives under evaluation.

Alternative 3 serves the Beverly Blvd. corridor into Whittier. The alternative would serve 11,145 people per square mile in 2030, which ranks second among the refined alternatives. The highest concentration of population density in 2030 is at the proposed Beverly Blvd. and Garfield Ave. station, which serves a densely populated area in Montebello and East LA. This alignment would serve the third highest employment density in 2030, about 3,581 jobs per square mile. The Whittier Blvd. and Mar Vista St. station would serve the highest employment density of the alternative's stations.

This station is in the center of the uptown Whittier area that includes many commercial and business developments. Total population density along this alternative is expected to increase the least relative to the other alternatives, about 14 percent from 2005 to 2030.

This alternative extends through the center of the PSA, which is already largely built out and would not support much new residential development. The employment density along the alignment is expected to increase 20 percent, which is generally in the same range as the other alternatives.

Alternative 4 serves the Whittier Blvd. corridor and provides access to the most densely populated station under evaluation, the proposed station at Whittier Blvd. and Garfield Ave. This might be explained by the proximity of high density residential land uses in Montebello and East LA. The highest employment density of the alignment's stations is concentrated around the Whittier Blvd. and Mar Vista Ave. station.

This alternative serves the highest levels of population and employment densities of the five alternatives under evaluation. In addition to the densely populated areas of Montebello and East LA, the alternative serves high density residential land uses in Pico Rivera and Whittier. The alternative serves jobs in large commercial centers in Pico Rivera (Target shopping center

and Pico Rivera Towne Center) and Whittier (Uptown Whittier commercial center). Population densities around stations are expected to grow 17 percent, serving 11,959 persons per square mile, while employment density is expected to increase 19 percent, providing access to 3,778 jobs per square mile.

Alternative 5 follows the Washington Blvd. corridor. It would provide access to the highest level of employment density of the refined alternatives under evaluation. This is due in large part to the significance of industrial and commercial land uses along Washington Blvd. Conversely it ranks third in providing access to residents, with a population density along stations totaling 11,003 people per square mile in 2030. This alignment would, however, provide access to the station located at Whittier Blvd. and Garfield Ave., which has the highest level of population density of all the proposed stations. Projected 2030 employment density served by this alignment is highest at the Washington Blvd. and Whittier Blvd. station, which is also in the Uptown Whittier commercial and business center. Total population is projected to increase 20 percent from 2005 to 2030, which is the second highest increase of the proposed alternatives, behind the SR-60 alignment alternatives. This area is less built out than the Beverly Blvd. and Whittier Blvd. corridors and can support some new residential development, such as the new Veranda Crest town homes in Pico Rivera. Employment density is expected to increase about 20 percent to 4,125 jobs per square mile from 2005 to 2030. In 2030, this alternative would provide access to more jobs per square mile than the other alternatives.

Construction Impacts

Construction of the proposed alternatives would result in temporary impacts to existing land uses. Construction would disrupt existing traffic patterns as detours would be necessary to divert vehicles from construction sites. Traffic congestion could increase on some of the detour roads. Construction could impact residential land uses by increasing noise levels, moving construction equipment and materials into and out of the area and blocking some streets. Construction in the vicinity of commercial land uses may disrupt some business activity by reducing access to the stores. These impacts to land use would only occur during the construction period. The construction crews would implement best management practices to reduce the level of potential impacts. Construction impacts will be further evaluated as construction plans are identified.

The proposed alternatives could result in some permanent impacts to land uses. As described above, most city and county land use policies support public transit; therefore, the alternatives would not interfere with land use policies. The alternatives may require displacement of residents and businesses. Potential displacement has not been determined at this level of analysis and will be further analyzed in the future planning phases.

4.1.3 Conformance with Public Policy

Transit planning within the larger Los Angeles metropolitan area must by its nature involve coordination and support from a number of agencies and municipal entities.

Within the PSA there are 13 incorporated cities as well as un-incorporated areas of Los Angeles County. Those communities that are directly traversed by the refined alignments include the Cities of Commerce, Industry, Los Angeles, Montebello, Monterey Park, Pico Rivera, Santa Fe Springs, South El Monte, and Whittier. Unincorporated areas of Los Angeles County include the communities of East Lost Angeles (Belvedere Gardens, City Terrace and Eastmont), West Whittier/ Los Nietos, and South San Gabriel. In addition, other regional transit planning efforts are led by the Metro, SCAG, and Caltrans. Clearly, successful implementation of any transit project must consider and incorporate the issues and interests of each community.

Within the PSA, the 2005 population was estimated to be about 673,000 and expected to grow to about 830,000 by 2030.

At the regional planning level, Metro has responsibility for development of the county Congestion Management Plan mandated by the passage of Proposition 111 in 1990[1]. The purpose of this document is to link land use, transportation and air quality planning efforts to develop transportation policies that use all modes of travel. In addition, SCAG also supports transportation planning via the development of the Regional Transportation Plan and Improvement Program that covers six counties and provides information related to transportation capital projects planned from 2009 through 2014. The current implementation plan was issued in draft form in June 2008. Policy documents such as these are key for coordinating with multiple agencies with jurisdiction over transportation related projects and development.

In addition to regional planning efforts, action taken by state agencies can also influence the development of transit related projects at the local level. For example, policies set by Caltrans include support of local projects by making it possible to access Caltrans air space and right-of-way at less than market prices (i.e. use of land adjacent to SR-60) and by supporting mobility action plans that support access to transit by the elderly, handicapped persons and low-income populations.

Also at the state level, recent voter approval of Proposition 1C supports the development of transit oriented housing with low interest loans and grants totaling $285 million over the next three years. Local agencies can submit projects for consideration of funding via a statewide application process[2].

[1] Metropolitan Transportation Authority, Congestion Management Plan, 2004
[2] CA State Department of Housing and Community Development, Div of Financial Assistance, www.hcd.ca.gov/fa/tod

At the local level, each city or unincorporated planning area provides policy direction in documents such as a general plan (land use and circulation elements) and specific plan.

As the cities are contiguous within the planning area, policy statements reflect the need for regional cooperation in the development of transit options as well as dealing with the local requirements for streets, parking, pedestrian and bike trails, and traffic management.

Many include development conditions related to transportation demand management ordinances that prescribe various levels of transit related improvements that must be included within project planning. These requirements can range from provision of transit information boards in employee areas to additional parking for carpools and shuttle services to regional transit stations. Some examples of these policies include:

- Inclusion of transit centers as elements of new development; and
- Improved bus and transit connections as an element of redevelopment that densifies residential and mixed use within traditional commercial areas.

Redevelopment within the PSA

A review of the community and planning issues of the communities within the PSA indicates that these are older communities that have a range of residential, commercial, and industrial development that has been built over the last 50-100 years. While there is some vacant land available, many projects involve redevelopment of "downtown" areas and frequently include higher density residential and mixed use commercial development. Assumptions that access to mass transit will add to the appeal of this type of development is key to many redevelopment proposals.

Some of the proposed development/redevelopment activities in the PSA include:

City of Montebello[3]	Whittier Blvd. Mixed Use Zone Residential development along Whittier Blvd. Montebello Hills Specific Plan
City of Monterey Park[4]	Cascades Market Place (SR-60/Paramount Blvd.) Pedestrian Linkage Plan for Downtown Redevelopment zone along SR-60
City of Whittier[5]	Uptown Specific Plan
City of South El Monte[6]	Peck Rd. and Michael Hunt Mixed Use Development Other Potential Development along SR-60
City of Pico Rivera[7]	Pico Plaza Shopping Center (Whittier Blvd. /Passons Blvd.) Pico Rivera Village Walk (Whittier Blvd./ Paramount Blvd.) Veranda Crest Condos (Rosemead) Pico Rivera Market Place (Rosemead Blvd./ Washington Blvd.)

This list is not intended to be all inclusive and the projects may be added or deleted depending on other economic issues. Future redevelopment projects may present themselves over the course of the study process and should be re-evaluated during the Draft EIR/EIS phase.

[3] City of Montebello, Redevelopment Department website http://www.cityofmontebello.com/depts/economic_development_department/default.asp
[4] City of Monterey Park, Redevelopment Department website http://www.ci.monterey-park.ca.us/Index.aspx?page=277
[5] City of Whittier, Planning Department, Uptown Whittier Specific Plan, draft December 2006
[6] City of South El Monte, Redevelopment Department website http://208.109.59.167/index.php?option=com_content&task=view&id=41&Itemid=74
[7] City of Pico Rivera, Redevelopment Department website http://www.ci.pico-rivera.ca.us/ourcommunity/redevelprojects.html

Bicycle Transportation Plans

Several bicycle transportation plans support bicycle commuting within Los Angeles County and the PSA. The City of Los Angeles Bicycle Plan, part of the General Plan, provides a guide to the development of a citywide bicycle transportation system. The plan recognizes the increase of bicycle usage throughout the city and the need to develop riding facilities while improving those facilities already existing. The overall goal of the Bicycle Plan is to provide a system that is reliable and safe for bicycle travel, while increasing both the daily trips and home-to-work trips overall by five percent by the year 2015.

The 2005 Metro Bicycle Transportation Strategic Plan provides a vision for Los Angeles County that promotes bicycling as a viable transportation mode which remains consistent with the regional goals of improving quality of life, mobility, air quality, and access to resources. The plan provides a "toolbox" of policies, which can be used by local agencies to incorporate bike plans into larger arterial projects and to identify gaps in bike networks, among others. The plan places emphasis on improved access to existing facilities as well as the opportunity for linking bikes with transit.

The Metro Bike Transit Implementation Plan establishes a network of Bike-Transit Centers that provide a full service facility offering parking, repairs, sales, rentals, and other services to make bicycle commuting easier and encourage usage. Bike-Transit Hubs are areas with high bicycle activity and contain elements to support biker needs, such as racks and lockers.

Metro will integrate bike facilities and bike and pedestrian paths into station design to encourage the use of bicycles in the PSA. Metro will work with city jurisdictions to incorporate Bike-Transit Centers at major stations and provide racks and lockers in areas of high bicycle activities and high density land uses. A bike map is provided to illustrate bikeways in the PSA (see adjacent Figure 4-6).

Washington Blvd

Whittier Blvd and Pioneer Blvd

Figure 4-6 Bike Parks and Trails Map

Source: Metro, 2006. Produced by CDM, 2008

4.1.4 Evaluation Methodology

The project alternatives are evaluated based on the land uses that they serve; proximity to population and employment growth areas; and conformity with public policy. Alternatives that serve more transit supportive land uses would provide more benefits to the region by reducing local traffic congestion, increasing mobility within the PSA and to other LA County destinations, supporting local economic activity, and improving environmental quality. Alternatives that reach areas with high population and employment densities would increase potential ridership. Lastly, alignments should be consistent with existing General Plans and local transportation policies. Construction impacts will be further evaluated in later phases of the planning process for potential impacts to existing land uses and displacement of residences or businesses.

4.1.5 Environmental Issues

Environmental issues concerning land use could occur during the construction phase if construction activities interfere with existing land uses by restricting access or causing delays. Alternative corridors and stations could also result in real estate issues and displacement of existing buildings. Preliminary analysis does not indicate any conflicts with existing plans, including city and county general plans, the Regional Transportation Plan, and bicycle transit plans, or redevelopment activities; however, these land use policies will continue to be considered in future planning and design phases.

4.1.6 Summary

Alternative 1 SR-60 LRT and Alternative 2 SR-60 Busway serve the lowest acreage (3,587 acres) of transit supportive land uses relative to the other alternatives, largely because the alignment runs parallel to a freeway corridor that does not have significant residential neighborhoods adjacent to it. This alignment would serve also the lowest population and employment density of the project alternatives; however, it is expected to have the highest growth rate from 2005 to 2030.

Alternative 3 Beverly Blvd. serves the highest acreage (5,370 acres) of transit supportive land uses, primarily high density residential areas. Beverly Blvd. extends through the urban center of the PSA, with many residential neighborhoods and commercial centers. The expected growth of population density served by this alternative is less than others because the area is largely built out and does not have much room for additional development.

Alternative 4 Whittier Blvd. serves the second highest acreage (5,068 acres) of transit supportive land uses of the project alternatives. Similar to Alternative 3, Whittier Blvd. is largely built out with residential and commercial areas. Alternative 4 would serve the highest population density in 2030 among the project alternatives, 11,959 people per square mile. The expected growth of population density served by this alternative is also less than others because the area is largely built out. It does serve multiple redevelopment projects along the corridor.

Alternative 5 Washington Blvd. serves 4,664 acres of transit supportive land uses. The western end of the corridor has a concentration of manufacturing, warehousing, and industrial land uses, but, as the alignment heads east, the land use becomes increasingly residential and commercial. Population and employment density along this corridor are both expected to increase 20 percent from 2005 to 2030. Some new residential developments are being planned along the eastern end of the corridor. This alternative has the second highest expected growth among the alternatives, behind the SR-60 corridor alternatives.

All alternatives support existing local and regional transportation plans and policies. Construction impacts to land uses will be further evaluated as construction plans are identified.

4.2 Catalyst for Public/Private Economic Revitalization

There are opportunities along the Eastside Transit Corridor Phase 2 where a fixed guideway transit investment can serve as a "catalyst" for economic revitalization and growth. There are many definitions for the types of investments that can contribute to the economic growth. Most are referred to as joint development, transit-oriented development, or public/private partnerships. These concepts suggest that investments in development and re-development projects can provide economic benefits and enhanced quality of life to communities, while increasing opportunities for transit ridership. Many of these projects require a mutually beneficial agreement with the transit agency and the developer. Metro has a Joint Development Program, which outlines the following goals/policies[8].

- Encourage comprehensive planning and development around station sites and along transit corridors.
- Reduce auto use and congestion through encouragement of transit-linked development.

The types of development that Metro seeks for the Joint Development program are projects that promote and enhance transit ridership, enhance and protect the transportation corridor and its environs, enhance the land use and economic development goals of surrounding communities and conform to local and regional development plans, and generate value to Metro based on a fair market return on public investment. Metro has completed many successful joint development projects and is currently constructing new projects at station locations throughout Los Angeles County as illustrated in Figure 4-7.

[8] Metro Joint Development Program, information available on www.metro.net

Figure 4-7 Map of Metro Joint Development Projects

Metro Joint Development Programs

Completed	Under Construction	In Negotiations	Under Consideration
1 Hollywood/Highland	1 Hollywood/Vine	1 Balboa	1 Sepulveda Park/Ride
2 Hollywood/Western	2 Wilshire/Western	2 North Hollywood	2 Vermont/Sunset
3 Wilshire/Vermont Apts	3 Wilshire/Vermont School	3 Universal City	3 Vermont/Beverly
4 Willow	4 Fillmore	4 Vermont/Santa Monica	4 Aviation/LAX
5 Del Mar		5 Westlake/MacArthur Park	5 West Hollywood (Division 7)
6 Memorial Park		6 Mariachi Plaza	6 Canoga Park/Ride
7 Sierra Madre Villa Phase I		7 Soto	7 Wilshire/Shatto Bus Layover
8 Union Station(Metro HQ)		8 1st & Lorena	8 Chatsworth Metrolink
		9 Chavez & Soto	9 Balboa Park/Ride
		10 El Monte	10 Sierra Madre Villa Phase II
		11 Santa Fe	11 Washington/National
		12 Taylor Yard	
		13 Temple & Beaudry	

Within the Eastside PSA there exist many opportunities for joint development at station locations and other public/private transit-oriented opportunities along the proposed alignments. The benefits of these projects depend on a number of factors including station area planning, coordination with the transit agency and local jurisdictions, conformity with local and regional land use policies, effectiveness of fees and financial programs associated with the development, and market forces.

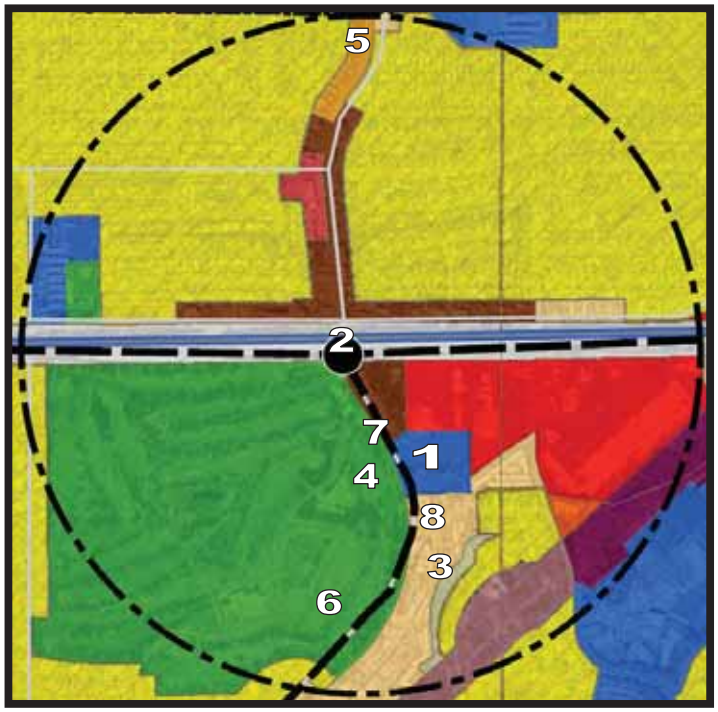
The following section provides a preliminary analysis of land use and economic development potential along corridors within the Eastside Transit Corridor Phase 2 PSA. A snap shot of potential locations for economic development along the five refined alternatives provide information on existing land uses, community character, available land, and redevelopment opportunities (see section below). The information presented here is not an exhaustive list of opportunities but rather identifies key locations evaluated as part of the Alternatives Analysis study process. Opportunity sites include ½ mile analysis around station locations and alignments and consist of the following:

- SR-60 & Garfield Ave., station location
- Montebello Towne Center, station location
- SR-60 & Santa Anita Ave., station location
- SR-60 & Peck Rd., station location
- Beverly Blvd. & Garfield Ave., station location
- Beverly Blvd. & Wilcox Ave., station location
- Beverly Blvd. & Montebello Blvd., station location
- Beverly Blvd. Alignment, vicinity of Rosemead Blvd.
- Whittier Blvd. Alignment, vicinity of Downtown Montebello
- Whittier Blvd. & Philadelphia St., station location
- Washington Blvd. Alignment, vicinity of Garfield Ave.
- Washington Blvd. & Greenwood Ave., station location

The areas of analysis are illustrated and described in further detail below.

Section 4.1 of this report provides more detailed information on land use, population and employment densities and local and regional policies supporting transit oriented development within the PSA. It should be noted that a full economic analysis of benefits and consequences of joint development opportunities along the alignment must be conducted as part of the next phase of study.

1/2 MILE AROUND STATION LOCATION: **SR-60 & GARFIELD AVE.**
SR-60 ALTERNATIVE

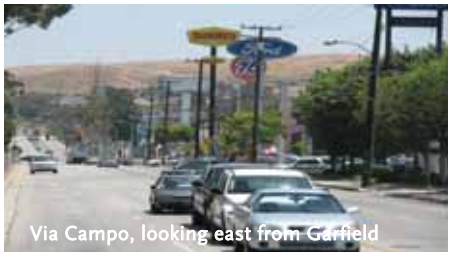


DESCRIPTION: This potential station location applies to all refined alternatives under consideration. It is the ideal location for intercepting freeway and bus trips, as well as commuters traveling along Garfield Ave., a major north-south arterial that connects cities within the PSA. This stop would provide access to a large concentration of high density single family communities and major commercial retail.

KEY CHARACTERISTICS:
(Numbers correspond to figure on right)

1. Large commercial retail center and other commercial strip developments. Location has potential public/private joint development opportunities to accommodate park and ride, shared parking and/or transit-oriented development.
2. Other strip commercial north of SR-60 Freeway with potential for transit-oriented, mixed use development along corridor.
3. High density single family and low density multifamily complexes within ½ mile vicinity.
4. Established effort by City of Montebello to improve retail store frontage and streetscape.
5. City of Monterey Park's Garvey/Garfield Shopping District. There is potential to improve transit connectivity from station to this shopping destination.
6. Potential development opportunities to complement the Montebello Country Club's Hilton Garden Inn, a three-story 121-room hotel.
7. Intersection improvements needed to improve multi-modal activity and pedestrian safety. Garfield Ave. is a high volume auto-oriented corridor.
8. Consider recreational activities related to church/educational facility along Garfield Ave.

South on Garfield Ave


Via Campo, looking east from Garfield

East on Via Campo

Residential neighborhood near Garfield/SR-60

1/2 MILE AROUND STATION LOCATION: MONTEBELLO TOWN CENTER SR-60 ALTERNATIVE

DESCRIPTION: Identified as a key station location along the SR-60 alternative. There is potential for future development around this existing retail center and adding more mixed-used, employment generating land uses near transit investment with potential opportunities for public/private partnerships.

KEY CHARACTERISTICS:
(Numbers correspond to figure on right)

1. Enclosed regional shopping center Montebello Town Center (664,000 sq. ft.), with 160 shops and restaurants surrounded by surface parking lots.
2. Potential to expand commercial/business development at western end of shopping center on surface parking lot.
3. Potential for location of shared parking expansion to accommodate transit riders and shopping center patrons.
4. Residential area on northern side of SR-60, identify opportunities to provide convenient transit access to potential station (freeway pedestrian bridge)
5. Streetscape, landscaping and lighting improvements for improved pedestrian access to station and Town Center, currently auto oriented design.
6. Medical Office building currently exists and could serve as an employment destination. Future expansion of office/light industrial land uses that could create a small employment hub around future transit investments.
7. According to the Montebello Hills Specific Plan, potential development projects would convert hillside land uses south of the shopping center into residential communities with pedestrian trails, parks and open space.

Looking south on Town Center Dr.

Looking east on SR-60 on-ramp

View from SR-60 looking west

Montebello Town Center parking lot

1/2 MILE AROUND STATION LOCATION: SR-60 & SANTA ANITA AVE. SR-60 ALTERNATIVE

DESCRIPTION: Identified as a key station location along the SR-60 alternative. This stop provides access to Whittier Narrows, one of the largest regional recreational areas in the PSA. There is potential for future station area development on available vacant lot south of SR-60.

KEY CHARACTERISTICS:
(Numbers correspond to figure on right)

1. City of South El Monte has identified a 22-acre parcel of vacant land for a potential development, including a transit village supporting the station location.
2. Friends of Whittier Narrows is planning first phase of the River Discovery Center on the Whittier Narrows Natural Area to replace current nature center building; the 50-space parking lot would also expand onto undeveloped natural area.
3. Provides access to north/south Metro and Foothill Transit lines to increase interface with fixed-guideway transit investments.
4. High Density Single Family residential within ½ mile radius, north and south of SR-60. The city is continually developing housing; recent additions include 13 new single family homes along Lerma Ave.
5. Earthworks Community Farm by the LA Conservation Corps is located north of the SR-60, providing organic sustainable agriculture and at-risk youth programs.
6. Industrial uses north of SR-60, potential to provide access to local employment generating land uses.
7. Mixed-use development being proposed for retail/commercial on existing 9-acre parcel of land on Santa Anita Ave. (currently a nursery).

Legg Lake in Whittier Narrows

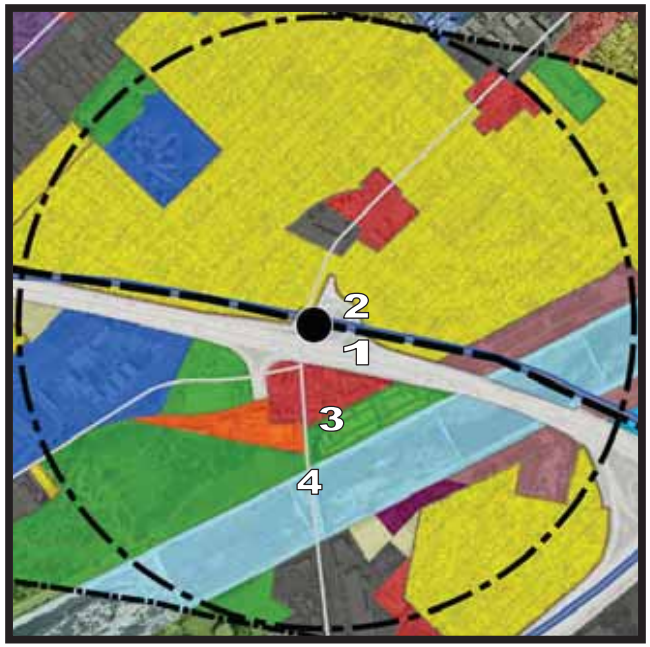
Undeveloped land next to Rosemead overpass

Looking south on Rosemead Blvd

SR-60 off-ramp meets Rosemead

1/2 MILE PROPOSED STATION LOCATION: SR-60 & PECK RD. SR-60 ALTERNATIVE

DESCRIPTION: Identified as a key station location along the SR-60 alternative. This stop provides access to residential communities, educational, recreational and commercial land uses within close proximity. Both Peck Rd. and Durfee Ave. are major north-south corridors in the PSA. This station location can draw patrons to an east-west line providing service to regional employment and activity centers.



KEY CHARACTERISTICS:
(Numbers correspond to figure on right)

1. Unlike other stations along the SR-60 alignment, housing is within close proximity to this location. This provides access to high density single family residential communities to the north and open space and office/commercial use to the south. Underutilized commercial strip malls are located both north and south of potential station location.
2. South El Monte's proposed two-phase mixed use development site is located on Peck Rd. and Michael Hunt Dr. Phase 1 was recently completed and includes market-rate single family detached homes. Development of 21,000 SF of retail space (restaurants, cafes, and drug and apparel stores) and a minimum three-story 60-unit senior housing project is being planned for Phase 2.
3. Residential developments north of SR-60 are currently being pursued by City, which has also indicated that maintaining a mix of industrial and retail business base south of SR-60 is a priority.
4. Potential access to recreational areas and bikeway adjacent to the San Gabriel River Trail.

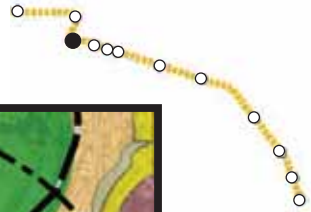
North on Peck Rd.

North of Durfee Ave

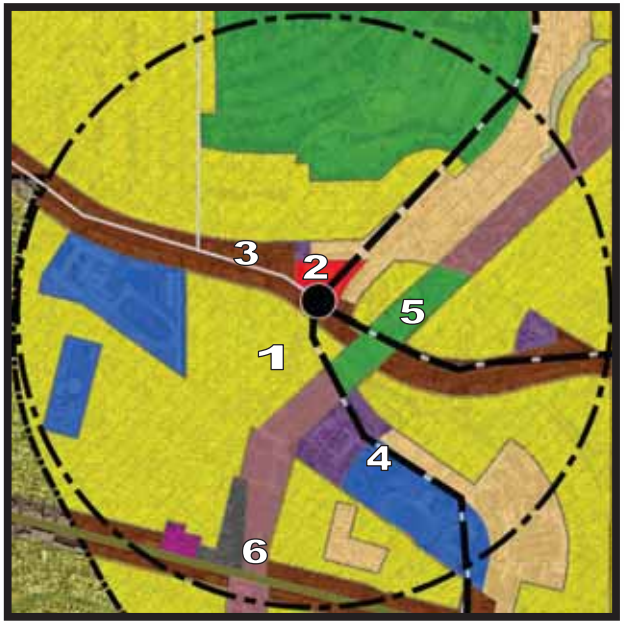
Rodeway Inn, south of SR-60

Trailer Storage Outlet, south of SR-60

1/2 MILE AROUND STATION LOCATION: BEVERLY BLVD. & GARFIELD AVE. BEVERLY BLVD ALTERNATIVE



DESCRIPTION: This potential station location connects north-south and east-west activity along the Beverly alignment. It is well situated near commercial activity along the corridor and high density single family residents to the north, south, east, and west. This location provides access to the existing urban neighborhoods and amenities within the PSA.



KEY CHARACTERISTICS:
(Numbers correspond to figure on right)

1. Situated within a cluster of higher density residential communities with neighborhood retail along corridor, and larger commercial retail center at intersection.
2. In-fill development opportunities to connect retail and residential communities and explore shared parking strategies for transit and retail access.
3. Close proximity to the highly utilized Montebello 40 bus line, opportunity to attract pedestrian activity at this transfer point.
4. Transit access for nearby educational institutions and pedestrian activity. Safety and pedestrian oriented design improvements to station area needed.
5. Recreational access to Ashiya Park, green space situated atop utility right-of-way, serves as a community gathering place for residents along this busy thoroughfare. Station area planning could contribute to greening of the urban environment.
6. Within ½ mile vicinity of commercial corridor along Whittier Blvd.

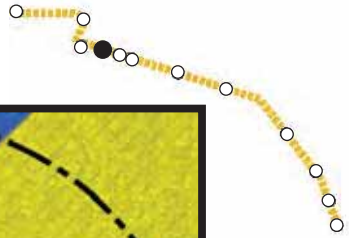
Southwestern corner of Beverly/Garfield

Ashiya Park

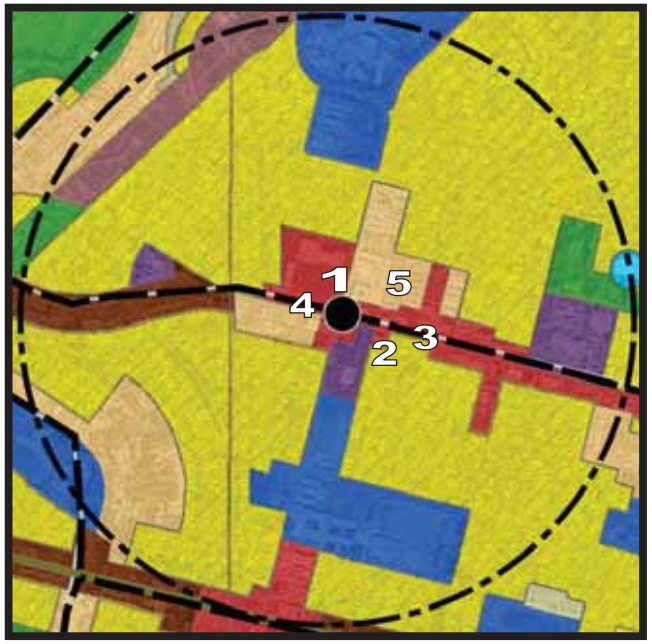
South View of Beverly Blvd

Apartments along Beverly Blvd

1/2 MILE AROUND STATION LOCATION: BEVERLY BLVD. & WILCOX AVE. BEVERLY BLVD ALTERNATIVE



DESCRIPTION: This potential station location connects north-south activity on Wilcox Ave. and east-west activity on Beverly Blvd. Well situated near commercial activity along the corridor and higher density housing. This location provides access to the existing urban neighborhoods and amenities within the PSA.



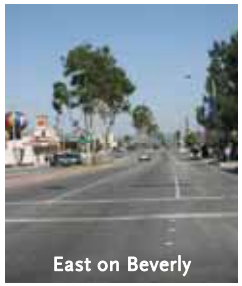
KEY CHARACTERISTICS:
(Numbers correspond to figure on right)

1. Potential to spur investment in Beverly Wilcox plaza while maximizing parking availability and pedestrian activity at this large commercial retail center.
2. Highly visible corner retail and adjacent commercial development signify entrance to higher intensity commercial retail along corridor, west of proposed station.
3. City of Montebello is exploring street widening along Beverly Blvd. to accommodate automobile and commercial uses.
4. Potential enhancements to streetscape such as sidewalk widening, lighting and signage to increase pedestrian activity and safety for transit riders and retail patrons.
5. Surrounded by high density single family communities with low density multifamily housing supporting corridor uses.

View of Banco Popular, at Wilcox Ave.

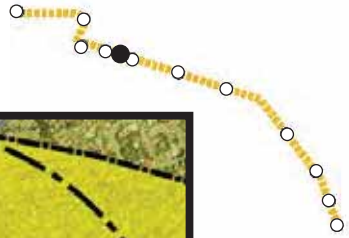
Variety of Restaurants

East on Beverly Blvd


East on Beverly

Apartments along Beverly Blvd

1/2 MILE AROUND STATION LOCATION: BEVERLY BLVD. & MONTEBELLO BLVD. BEVERLY BLVD ALTERNATIVE



DESCRIPTION: This potential station location is conveniently located around high intensity commercial and residential uses along the Beverly corridor. It is within a ½ mile of Downtown Montebello, a historic main street area with recent investments in streetscape, mixed use development, and public parking facilities.

KEY CHARACTERISTICS:
(Number correspond to figure on right)

1. This stretch of Beverly Blvd. has both a neighborhood and strip commercial feel. Streetscape along this portion of the corridor includes large trees and areas with median. Future development should build upon streetscape and integrate more of a pedestrian and transit oriented design.
2. Close proximity to regional medical facility, Beverly Hospital, as well as other regional shopping and recreational activities.
3. Current development pattern of higher density single family, low to medium density multi-family dwellings with some mixed use developments.
4. Montebello Mart, shopping center(213,000 SF) anchored by major retailers like Vons, Ross Dress for Less, Marshall's, and Rite Aid. Opportunities for park and rides, shared parking, and design improvements to create a more pedestrian friendly transit oriented environment.
5. Distance from local recreational facility, Beverly Bowl and underutilized strip developments. Some street furniture at bus stops. Potential to create a more vibrant pedestrian oriented mixed-use environment.
6. Close proximity to Downtown Montebello.

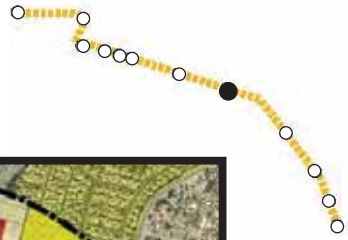
Local businesses in shopping center

Anchor stores in shopping center

vacant parcel along Beverly Blvd.

Beverly Blvd. approaching Montebello

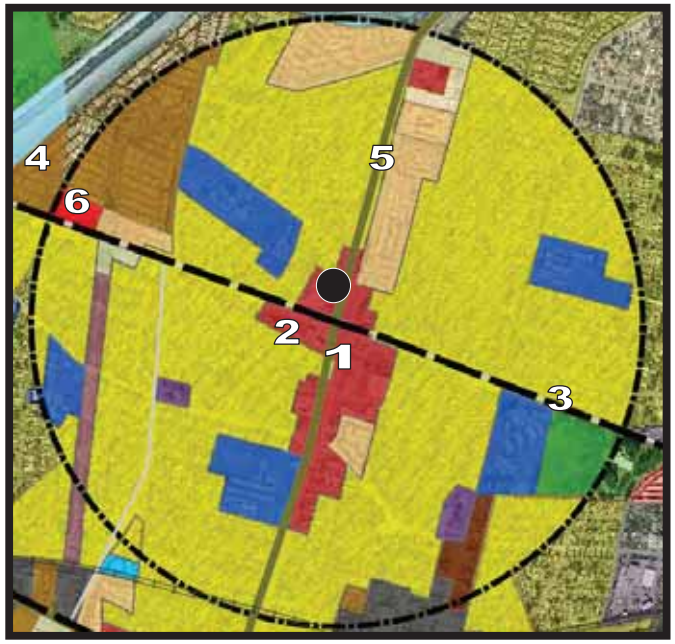
1/2 MILE AROUND POTENTIAL ALIGNMENT: VICINITY OF BEVERLY BLVD. & ROSEMEAD BLVD. BEVERLY BLVD ALTERNATIVE

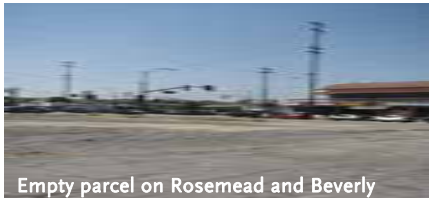


DESCRIPTION: This potential alternative would help generate economic revitalization along the Beverly Corridor; this location is centered along a major north/ south corridor, Rosemead Blvd. Potential station is situated on a former commercial lot that is now vacant. The fixed guideway transit investment and potential station can add vibrancy along the corridor.

KEY CHARACTERISTICS:
(Numbers correspond to figure on right)

1. Potential for joint development project on site located at the southeast corner of Beverly and Rosemead Blvds. Formerly a large retail commercial center, the vacant lot and adjacent underutilized property could transition into a multi-modal transit oriented project with park and ride lot.
2. Small retail center west of Rosemead, local businesses with surface parking lots support auto-oriented uses and serve surrounding residential communities.
3. Access to recreational and educational uses along the corridor.
4. Provide a connection to bikeways and trails along Rio Hondo and San Gabriel Rivers. Transit could provide access to local and regional recreational facilities for increased access to the trails and open space.
5. Reinforce north/south connections with improved bus interface to maximize station area transfers and capture riders from surrounding residential neighborhoods.
6. Alignment would provide transit service to higher density housing complexes and multi-family units surrounding the corridor. System and station design should help create a smooth transition between residential units facing Beverly Blvd. through landscaping and urban design.



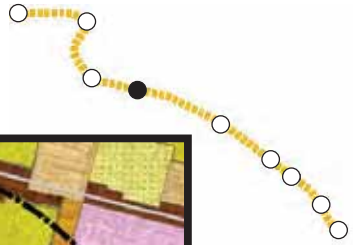

Empty parcel on Rosemead and Beverly

West on Beverly Blvd after Rio Hondo

Car Wash business along Beverly Blvd

Gated-community along Beverly Blvd

1/2 MILE AROUND POTENTIAL ALIGNMENT: VICINITY OF WHITTIER BLVD. & MONTEBELLO BLVD. WHITTIER BLVD ALTERNATIVE (DOWNTOWN MONTEBELLO)



DESCRIPTION: This potential alignment would provide transit through the heart of Downtown Montebello, a high activity area with mixed use, retail and residential uses. Transit investments would complement local bus and pedestrian activity. Potential opportunities along the corridor for transit oriented development that fits the scale and size of the Downtown area.

KEY CHARACTERISTICS:
(Numbers correspond to figure on right)

1. Downtown Montebello stretches for approximately two miles along Whittier Blvd.
2. City of Montebello has recently completed streetscapes improvements, including the addition of trees, signage and streetlights to visually change the dynamics of the street. Small public parking facilities about the rear of street facing retail. Future development should build upon the corridor's downtown character.
3. Identify specific sites around potential station for shared parking and transit oriented development opportunities that fit the character of the Downtown area.
4. City of Montebello is exploring extending Downtown area farther west and east to further upgrade the street and existing businesses. There is a poor transition outside the downtown boundary. One consideration is to extend east to Montebello Park to connect to open space and recreational uses.
5. Underutilized land uses along the corridor could transition to support the Downtown's pedestrian and potentially transit oriented design.
6. Integrate north/south bus feeder lines to maximize transfer potential and capture riders from higher density residential neighborhoods.

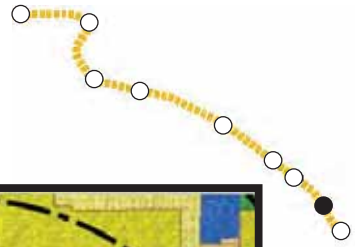
Downtown Montebello

commercial offices

Whittier streetscapes view

local businesses along Whittier Blvd.

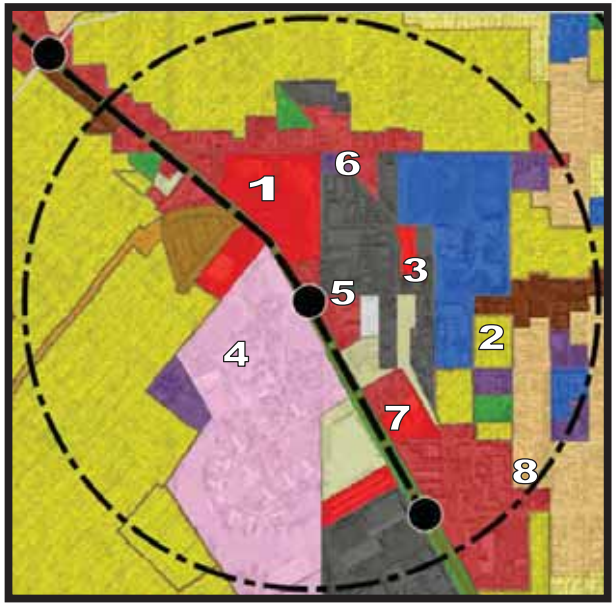
1/2 MILE AROUND STATION LOCATION: WHITTIER BLVD. & PHILADELPHIA ST. (UPTOWN WHITTIER) WHITTIER BLVD ALTERNATIVE



DESCRIPTION: This potential station location would provide access to large scale commercial development along Whittier Blvd. and convenient access to the Uptown Whittier area with its main street feel and access to surrounding multifamily residential, the Whittier Greenway bike trail, uptown shops and restaurants, and Whittier College.

KEY CHARACTERISTICS:
(Numbers correspond to figure on right)

1. Strong presence of large retail anchors and local commercial shops at Whittier Marketplace.
2. Uptown Specific Plan documents vision to further transform the heart of the community into a richer and lively business district with mixed use and transit oriented development.
3. Light manufacturing uses provide access to local jobs.
4. The City of Whittier is exploring opportunities to utilize the State-run Fred C. Nelles Youth Correctional Facility site. Potential opportunities for joint development to accommodate parking and transit oriented development.
5. Philadelphia is being targeted as the gateway to Uptown Whittier with retail and office redevelopment opportunities.
6. Whittier Greenway trail provides multi-modal access to potential stops along Whittier Blvd. and is currently under development as a walking and biking trail that traverses the city.
7. This stretch of Whittier Blvd. is part of the Whittier Retail Corridor connecting the Whittier Marketplace to other retail centers such as the Quad and Whittwood Mall.
8. Multi-family and high density single family units, close proximity to students living on or near Whittier College campus.

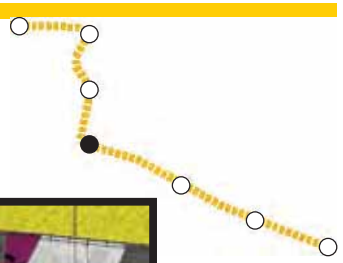


Greenway Trail at Philadelphia St.

Whittier Retail Corridor

vacant correctional facility site

North on Whittier Blvd



1/2 MILE AROUND POTENTIAL ALIGNMENT: VICINITY OF WASHINGTON BLVD. & GARFIELD AVE. WASHINGTON BLVD ALTERNATIVE

DESCRIPTION: This area would require significant economic and land use investments to maximize ridership and create a transit friendly environment. The western portion of the Washington Blvd. alternative crosses heavy industrial and manufacturing areas in the Cities of Commerce and Montebello. The vicinity of Washington and Garfield is very much designated for industrial and manufacturing land uses, with wide roads accommodating truck and high volume automobile traffic, improvements to system and urban design and safety are needed to make this a more pedestrian and transit oriented option.

KEY CHARACTERISTICS:
(Numbers correspond to figure on right)

1. Large and medium size industrial facilities surrounding potential station location. This area provides local and regional employment. Identify specific opportunity sites for joint development, parking facilities, and transit oriented design. Integrate automobile, bike and pedestrian access. Consider measures to preserve job generating uses while creating a transit friendly environment.
2. Small commercial area along Washington Blvd. opportunities to expand commercial development that serves potential riders.
3. Higher density housing to the north, not in close walking proximity to the potential station location. Streetscape and sidewalk enhancements need to make the area safer and welcoming for potential riders.
4. Washington Blvd. offers wide-streets favoring auto dominated uses. Transit system could help to improve overall aesthetic and landscaping along the alignment and at station locations.

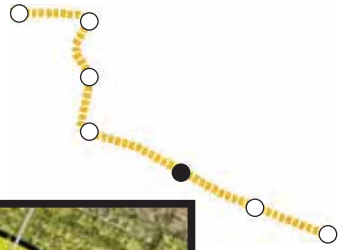
Garfield Ave. & Washington Blvd.

SE corner of Washington & Garfield

Garfield Ave.

Washington Blvd.

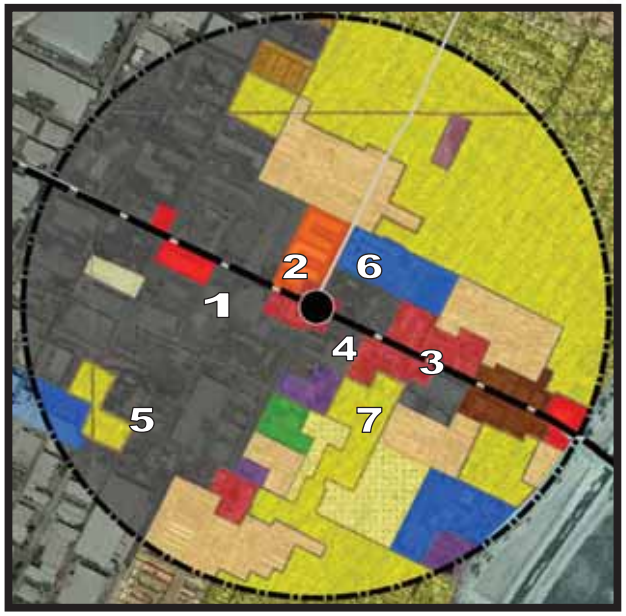
1/2 MILE AROUND STATION LOCATION: WASHINGTON BLVD. & GREENWOOD AVE. WASHINGTON BLVD ALTERNATIVE



DESCRIPTION: This potential station location is centered near heavy industrial and manufacturing uses to the west, transitioning to more commercial and residential uses heading east. The stops may provide access to local jobs and residential communities located within a ½ mile of the station. Significant improvements to the built environment are needed to create a transit oriented, pedestrian friendly environment.

KEY CHARACTERISTICS:
(Numbers correspond to figure on right)

1. Washington Blvd. experiences high automobile and truck traffic. It is utilized as an alternative to the freeways providing goods to the ports of Los Angeles and Long Beach (Weekday peak period traffic volumes approximately 43,400 ADT).
2. Areas of industrial and manufacturing and major office along the corridor may transition to support commercial and transit oriented uses.
3. Transit improvement may help with street beautification and landscaping to make areas to the east and west of the station more pedestrian and transit friendly.
4. Identify specific opportunities for joint development that would support parking and planning around station area.
5. City of Commerce is supporting opportunities for new development located in area of Washington for businesses located along the arterial (per Community Development Policy 1.7)
6. Improvements to bus lines will help to draw potential riders from residential areas north and south of the station.
7. City of Montebello discussing comprehensive revitalization program in the Greenwood neighborhood to improve housing conditions to both single family and rental units in addition to overall neighborhood improvements.



Greenwood and Washington

East on Washington Blvd

Greenwood and Washington

Greenwood bus stop station

4.3 Right-of-Way Acquisition

The following sections provide a discussion of the potential right-of-way acquisition and land use types for each of the build alternatives considered in the final screening analysis. Land use types for each acquisition area provide a representation of what can be expected in terms of potential displacements and relocations. It is likely that some businesses and even some residences will be displaced depending on the alternative selected for implementation. Although specific numbers of displacements and relocations have not been determined at this conceptual level of detail, this information will be refined and presented in detail as part of the Draft EIR/EIS.

Information presented in the Draft EIR/EIS regarding potential relocations and displacements will include discussion of the requirements of the Federal and State laws related to relocation displacement of properties for public projects:

- The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 requires that the federal government provide relocation advice and payments when it acquires real property under its power of eminent domain. Real property is defined as anything that is permanently affixed to the ground, which can include parking lots and spaces, sidewalks, and landscaping.

- California Relocation Assistance Act (Government Code, Sections 7260, et seq.) requires public entities to provide procedural protections and benefits when they displace businesses, homeowners, and tenants in the process of implementing public projects for public benefit. State law allows a displaced person certain compensation for a forced relocation, including relocation assistance and reimbursement of moving costs.

- Eminent Domain Law (California Code of Civil Procedure, Title 7, Sections 12301.010 through 1273.050) Title 7 of the California Code of Civil Procedure outlines the steps required for public entities to follow when the power of eminent domain is necessary to acquire property for a public use. The power of eminent domain may be exercised to acquire property for a proposed project only if all of the following are established: (a) the public interest and necessity require the project; (b) the project is planned or located in the manner that will be most compatible with the greatest public good and the least private injury; and (c) the property sought to be acquired is necessary for the project.

4.3.1 Affected Environment

The PSA contains a diverse mix of land uses adjacent to each of the build alternatives. Generally, land uses potentially affected by the alternatives include commercial areas, industrial facilities, vacant land, parks and residential development.

Along SR-60, there are large concentrations of mixed use development as well as recreational and commercial properties and some vacant land. All other build alternatives (Beverly Blvd., Whittier Blvd., Washington Blvd.) utilize a portion of Garfield Ave. which includes residential, recreational, commercial and mixed use properties. Beverly Blvd. includes many commercial properties, particularly west of the San Gabriel River. East of the San Gabriel River, the Beverly Blvd. alignment utilizes the Whittier Greenway which has many residential areas adjacent as well as some recreational and commercial properties.

Whittier Blvd. also is surrounded by numerous commercial properties as well as mixed use areas, residential areas and some recreational resources. Washington Blvd. is surrounded by mainly industrial, commercial and residential properties throughout its length.

4.3.2 Evaluation Methodology

Assessment of the right-of-way requirements for each alternative was based upon the physical characteristics and conceptual design configuration of each build alternative. It was assumed that both the No-Build and TSM alternatives would not require any substantial right-of-way in order to be implemented.

Based upon the cross sections developed for each build alternative, most of the proposed improvements would be within public right-of-way along line segments. Many station locations would also fit within existing public right-of-way; however, there are several station locations where right-of-way would be needed.

The assumptions made in terms of right-of-way requirements for each alternative are summarized below:

Alternatives 1 and 2 (LRT on SR-60 and Busway on SR-60)

- No right-of-way required for the base alignment
- Station footprints and associated amenities would require acquisition of parcels at the northeast corner of SR-60 and Santa Anita Ave., the northeast corner of SR-60 and Peck Rd., and the southeast corner of SR-60 and the Crossroads Pwky. north ramps

Alternative 3 (Beverly LRT)

- The southwest corner at Garfield Ave. and Via Campo
- The northeast corner of Garfield Ave. and Beverly Blvd.
- Five feet on either side of Beverly Blvd. from Montebello Blvd. to the Rio Hondo crossing
- Station locations where 12 feet of right-of-way would be required on either side of the road including: Beverly Blvd. east of Garfield Ave., at Wilcox Ave., at Montebello Blvd., at Poplar Ave. and at Rosemead Blvd.

Alternative 4 (Whittier LRT)

- The southwest corner at Garfield Ave. and Via Campo
- The northeast corner at Garfield Ave. and Whittier Blvd.
- Parcels on the south side of Whittier Blvd. from I-605 to just east of Norwalk Blvd. (about 50 feet deep)
- 24 feet on the south side of Whittier Blvd. from Glengarry Ave. to Philadelphia St.
- Station locations where 12 feet of right-of-way would be required on either side of the road including: Whittier Blvd. east of Garfield Ave. and east of Rosemead Blvd.

Alternative 5 (Washington LRT)

- The southwest corner at Garfield Ave. and Via Campo
- The northeast corner of Garfield Ave. and Washington Blvd.
- Station locations where 12 feet of right-of-way would be required on either side of the road including: Washington Blvd. north of Whittier Blvd., at Greenwood Ave., west of Rosemead Blvd., east of Norwalk Blvd. and west of Lambert Rd.

Square feet of right-of-way required for acquisition to implement each alternative were calculated based on the information above and segregated by land use type. Each of the total acquisition figures was then compared to evaluate the potential effect of each alternative with regards to land acquisition needs. Alternatives were then assigned a ranking of high, medium or low depending on the amount of right-of-way necessary for implementation. Since the range of right-of-way requirements was from a low of zero square feet for the No-Build and TSM alternatives to a high of 662,000 square feet for two of the build alternatives, rankings were assigned as follows:

- 0 - 250,000 square feet = Low
- 250,001 - 500,000 square feet = Medium
- 500,001 - 750,000 square feet = High

4.3.3 Environmental Issues

Right-of-way requirements for each of the build alternatives are discussed in this section. The section concludes with a discussion of the relative ranking of each alternative based on this criterion.

Alternative 1: SR-60 LRT - A total of 662,000 square feet (15.20 acres) of land acquisition is anticipated for this alternative. Of that total, 500,000 square feet (11.48 acres) is currently vacant land and 162,000 square feet (3.72 acres) is currently in commercial use.

Alternative 2: SR-60 Busway - A total of 662,000 square feet (15.20 acres) of land acquisition is anticipated for this alternative. Of that total, 500,000 square feet (11.48 acres) is currently vacant land and 162,000 square feet (3.72 acres) is currently in commercial use.

Alternative 3: Beverly LRT - A total of 240,000 square feet (5.51 acres) of land acquisition is anticipated for this alternative. Of that total, 214,000 square feet (4.91 acres) is currently in commercial use, 6,000 square feet (0.14 acres) is in residential use and 20,000 square feet (0.46 acres) is in park/recreational use.

Alternative 4: Whittier LRT - A total of 326,000 square feet (7.48 acres) of land acquisition is anticipated for this alternative. All of the land is currently in commercial use.

Alternative 5: Washington LRT - A total of 314,000 square feet (7.21 acres) of land acquisition is anticipated for this alternative. Of that total, 236,000 square feet (5.42 acres) is currently in commercial use, 54,000 square feet (1.24 acres) is in industrial use and 24,000 square feet (0.55 acres) is in residential use.

Given the anticipated levels of land acquisition discussed above, the relative ranking of each alternative is as follows:

- No-Build Alternative = Low
- TSM Alternative = Low
- Alternative 1 = High
- Alternative 2 = High
- Alternative 3 = Low
- Alternative 4 = Medium
- Alternative 5 = Medium

4.3.4 Potential Impacts of Property Acquisition

Nearly all of the property acquisition impacts are in areas with high volumes of low-income families and in areas where the population is mostly Hispanic. Many of the areas also have a sizeable White population, though not a majority. These demographic trends are predominant throughout the PSA and are not unique to the property acquisition sites. Thus the property acquisitions occur in areas that are typical of the entire PSA and do not appear to be targeted at any one minority or income group. Again, detailed evaluation of impacts to environmental justice communities and mitigation measures will be conducted in the subsequent EIR/EIS phase.

4.4 Community & Neighborhood (Quality of Life/Environmental Justice)

4.4.1 Community Cohesion

Community participation and consensus are important factors in identifying a fixed guideway transit investment. Community outreach efforts conducted as part of the AA process provided an opportunity to capture public perception. The Eastside Transit Corridor Phase 2 PSA includes 13 cities and various neighborhoods and districts, each with their own community character. Preserving and enhancing quality of life for communities within the PSA has continued to be a factor in evaluating each alternative.

Two rounds of public meetings were held during the AA process. Public comments at the Early Scoping Meetings in November of 2007 captured general perceptions about benefits and concerns around the initial set of alternatives. Overall, the community expressed support for a Light Rail Transit alternative as the preferred mode choice relative to Busway. The public also voiced concerns about potential social and environmental impacts. Table 4-3 summarizes the public feedback and information gathered at the November meetings about route, mode, and configuration options. Feedback was used to refine the initial conceptual alternatives and address specific quality of life concerns along corridors.

Table 4-3 November Early Scoping Meetings Summary

Community Suggestions	Community Concerns
LRT preferred transit mode	Residential and business impacts
Opportunity to reduce congestion and travel time commute to Downtown LA	Avoid segments of Beverly Blvd. due to narrow right-of-way and the pine trees in the entryway to the City of Whittier
Expand LRT further east of existing terminus	Impacts on existing bus service
Usage of Union Pacific right-of-way and Whittier Greenway to reduce community impacts	Potential affects on parking, safety, noise, graffiti/crime, cost, property values

In April of 2008 a second round of public meetings took place in which a refined set of alternatives was presented. The public provided more specific comments on the proposed alignments and configurations. They also provided suggestions on how a transit investment would improve community character and identified specific community impacts along each corridor. Table 4-4 summarizes the comments received from the April public meetings.

Table 4-4 April Project Update Meetings Summary

	Community Suggestions	Community Concerns
SR-60	• Consider north and south routes that connect station areas • Consider combining elevated truck route with the new rail extension • South El Monte interested in station areas	• Social considerations • Quality of life impacts of people living along proposed routes • Impacts to OII Superfund Site in Monterey Park and Montebello • Preference for LRT over Busway
Beverly	• Use aerial at Whittier Blvd. & Beverly Blvd. to reduce traffic impacts • Incorporate rapid buses to alternative	• Impacts to school and parks • Preference for LRT over Busway
Whittier	• Significant benefits to Uptown Whittier visitors & Whittier College community • Support if route connects w/ the Blue Line • Extend Busway to Whitwood Mall (potential for multi-story parking structure) • Possible transit center at the Fred C. Nelles site • Complement Whittier Uptown Specific Plan • Ensure good transit connections & parking	• Negative impact to businesses during construction and reduced bus service • Negative perception of home values • Quality of life impacts to people living along proposed routes • Impacts on traffic and parking during construction • Graffiti if aerial route selected • Preference for LRT over Busway
Washington	• Incorporate rapid buses to alternative • Line should serve southern areas like Washington and Whittier Blvd.; El Monte currently being served by El Monte Busway	• Potential property acquisition • Impacts to school and parks • Quality of life impacts of people living along proposed routes
General	• Eastside Extension should complement Whittier Bus services • New line should favor people who are transit dependant	• Potential impacts to current Whittier bus service • Potential reduction in existing travel lanes.

In terms of community cohesion within the PSA, Whittier and Beverly Blvd. are significant commercial and business centers with high levels of population density. Cities along these corridors have invested in large and small scale commercial development and sidewalk and streetscape enhancements to liven up these historic strips. Investment in a fixed guideway transit system would help to increase walkability, accessibility and development. The public generally supports the introduction of transit along Whittier and Beverly Blvds. Concerns about the existing urban landscape (mainly the pine trees along Beverly Blvd. at the entrance to the City of Whittier), and narrow right-of-way along Beverly Blvd. have been addressed in the refinement of the initial alternatives for the Eastside Transit Corridor Phase 2 and will be factors incorporated in the project's urban design and station area planning. In addition, public comments reinforced the fact that any transit investment must interface with the existing bus network. The communities within the PSA currently rely on bus operations by

municipal and regional providers. The public is very interested in preserving and enhancing connectivity across communities. The TSM and bus intercept plans will address this concern and aid in capturing a higher level of transit ridership.

At the April 2008 public meetings, community members had an opportunity to share comments on the refined alternatives. Public comments were summarized in the Scoping Report and April Public Meeting Summary memo, developed by Arellano and Associates, the public outreach consultant for Metro on this project. Benefits and concerns regarding quality of life and community cohesion for each alternative are discussed below.

Alternative 3 along Beverly Blvd. was strongly considered for its aptitude to liven up the commercial centers of Montebello. The public expressed major concerns about the potential traffic impacts, thus suggested incorporating an extensive rapid bus system with an elevated fixed guideway along portions of Beverly Blvd. The possibility of eliminating traffic lanes on an already narrow right-of-way and the closeness to schools were major safety concerns to address. Comments regarding the disturbance to the preexisting Pine trees on Beverly Blvd., east of Norwalk Blvd., the entryway to the City of Whittier, was also an issue raised by the public.

Alternative 4 along Whittier Blvd. shows promise for potential riders due to its path through downtown Montebello and directly into Uptown Whittier. Both communities suggested segments of the alignment needed to be elevated to alleviate potential traffic congestion and the possibility of taking away curbside parking for local business areas. A fixed guideway system along this route would also provide convenient access to Uptown Whittier's neighborhood community of retail, restaurants, and open space. In the November Early Scoping meetings residents expressed an interest in continuing Alternative 11 down to Whitwood Mall because there is space to build a multilevel parking facility; this may be a factor for future extensions of the Eastside Transit Corridor Phase 2 project. Temporary construction disruptions to homes and businesses were identified as quality of life concerns.

Alternative 5 travels down Washington Blvd., a multi-lane arterial traversing the major industrial/manufacturing portion of the PSA. The public mentioned that transit would help to further improve aesthetics and land uses along the corridor, noting recent improvements such as commercial centers developed along Washington Blvd. in the City of Pico Rivera. Environmental concerns were also raised at the April 2008 public meetings regarding whether or not public transit along Washington Blvd. would cause land erosion and would deteriorate the quality of the road. A few residents thought research should be done to see if this alternative could use the Union Pacific rail track with Metrolink.

Strong public support was demonstrated for Alternatives 1 and 2 along SR-60, especially by community members and stakeholders living north of the corridor. The alignment follows SR-60 and does not traverse the existing urban fabric and residential communities within the PSA. Transit investments along SR-60 would provide freeway intercept access for all the cities

in the northern portion of the PSA. Members of the public identified areas along this corridor where new development could support future growth. In addition environmental concerns were raised regarding impacts to local schools, parks and the OII Superfund Site in Monterey Park (environmental impacts along refinements are addressed in subsequent sections of this report). Temporary construction disruptions to homes and businesses were identified as quality of life concerns. Support groups, such as Friends of Whittier Narrows, support alternatives along SR-60 given that it would increase access to the new River Discovery Center and regional recreational area. In a regional context, the fixed guideway transit system would provide Los Angeles County the open space accessibility that it lacks for residential areas overall.

Public opinion and preservation of community cohesion have helped to shape the development and refinement of alternatives currently under study as part of the AA. The role of neighborhood participation is necessary to determine how the remaining alternatives will affect local and regional quality of life. Public feedback and reservation of community cohesion will be factors carried forth into the next study phase.

4.4.2 Service to Transit Dependent Populations

FTA New Starts guidelines require the consideration of improved mobility and access for transit dependent populations. Providing access to transit dependent communities helps to ensure that the investment meets environmental justice guidelines. Transit dependency factors are used to determine provision to sectors of the population that depend on the use of public transit and are not currently served by the rail system. Segments of the population evaluated include youth age 18 years and under, seniors age 65 year and older, zero vehicle households, and low-income households.

The transportation investments currently under evaluation as part of the Eastside Transit Corridor Phase 2 would provide access to transit dependent communities within the PSA. The April 2008 *Eastside Transit Corridor Phase 2 Initial Screening Report* provides detailed analysis of these factors for each of the alternatives considered. Table 4-5 summarizes access provided to future transit dependent populations within a ½ mile of the station locations along the refined alternatives. The table illustrates what percent of transit dependent populations are within the ½ mile radius and the overall populations of transit dependents within the PSA. Figures 4-8 through 4-12 illustrate transit dependency for each station along the refined alternatives.

The Beverly and Whittier Alignments would provide the greatest degree of service to the transit dependent population within the PSA. Both alignments are located within the more urban core of the PSA with already established residential communities. Both Beverly and Whittier alignments provide access to a large share of the PSA's youth, seniors, zero car

households, and residents who currently use transit. Whittier Blvd. differs in that it provides the highest level of access to low-income households of all the alternatives under evaluation.

Table 4-5 Transit Dependent Population Density ½ mile of Station Locations along Alternative Alignments

	Population Age 18 & Under		Population Age 65 & Over		Population with Zero Vehicles Available		Population using Public Transportation		# of Low-Income Households	
	#	% of PSA	#	% of PSA	#	% of PSA	#	% of PSA	#	% of PSA
PSA	204,498	100%	63,862	100%	60,276	100%	17,439	100%	79,218	100%
SR-60	13,736	6.7%	6,300	9.9%	2,711	4.5%	975	5.6%	6,270	6.3%
Beverly Blvd.	29,583	14.5%	11,212	17.6%	7,152	11.9%	2,016	11.6%	8,315	8.3%
Whittier Blvd.	31,483	15.4%	10,771	16.9%	7,695	12.8%	2,311	13.3%	12,261	12.2%
Washington Blvd.	27,702	13.5%	9,654	15.1%	5,873	9.7%	1,833	10.5%	10,245	10.2%

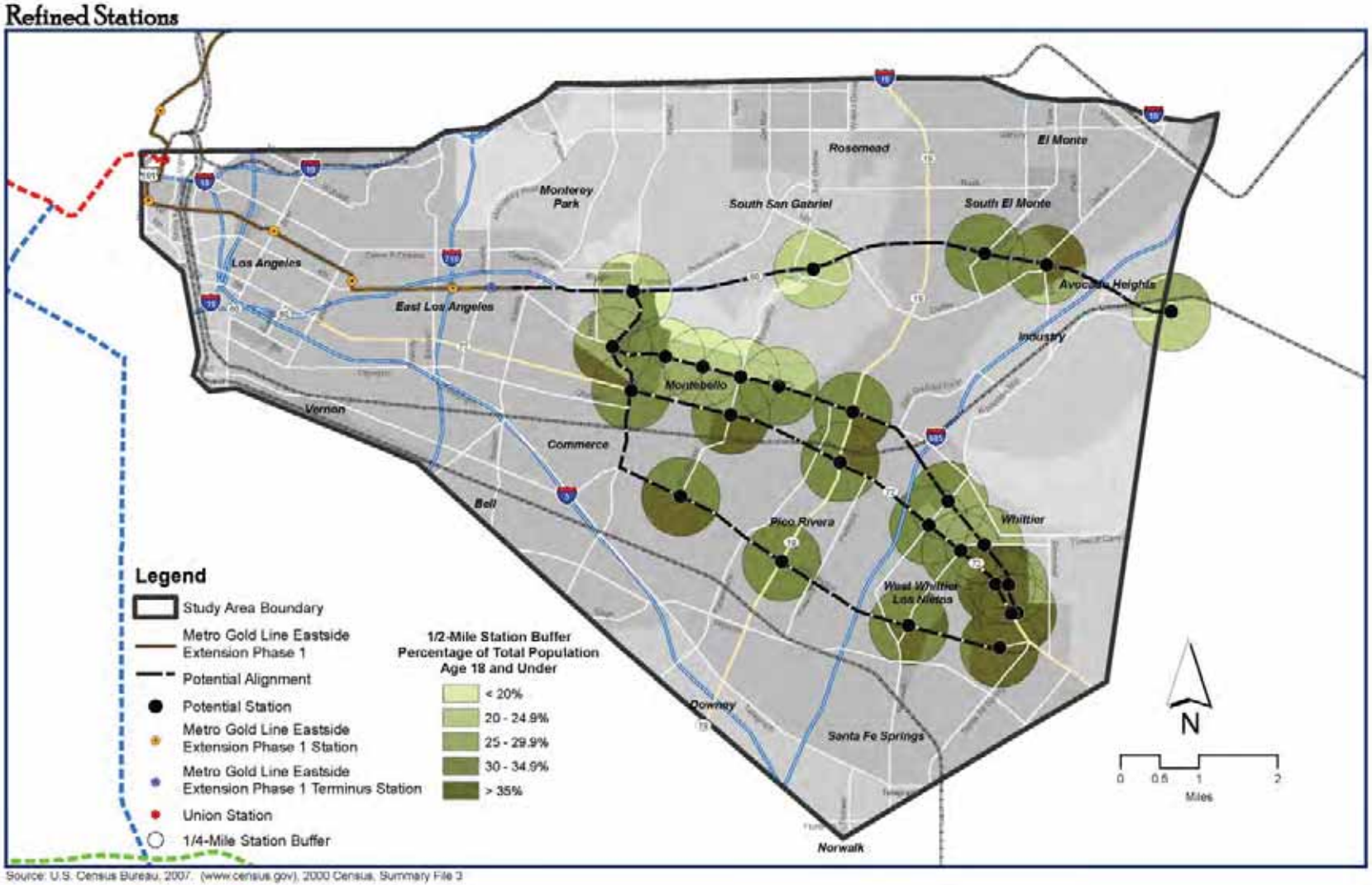
Source: Analysis based on 2000 US Census data and SCAG projections; provided by CDM 2008.

The SR-60 alternative provides the least access to transit dependent populations given that it follows a highway corridor with limited access to residential communities. Only a small handful of schools and senior housing developments are located near the freeway. Most adjacent land uses are commercial, industrial and recreational in nature.

The Washington alignment follows a more commercial and industrial corridor. There is a strong industrial employment base at the western end, near the vicinity of Garfield Ave. and Washington Blvd. Further east the alignment would provide access to multi-family units and lower-income households. The alternative falls third in line in terms of providing access to transit dependent communities.

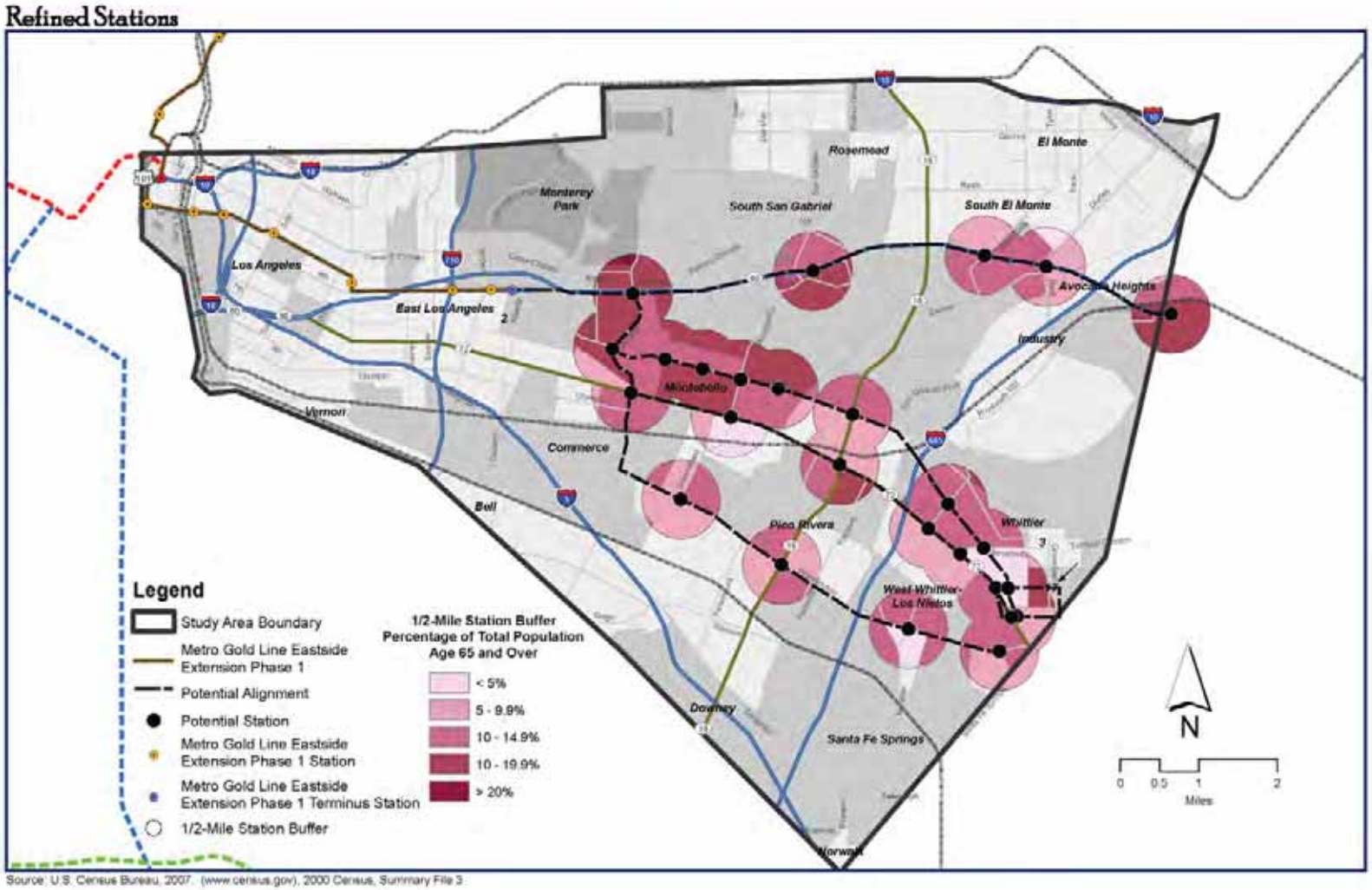
A review of factors evaluated as part of the AA study indicates the Whittier Blvd. and Beverly Blvd. (Alternatives 3 and 4) would provide greater access to transit dependent communities within the PSA. Further analysis of environmental justice factors will be conducted as part of the Draft EIR/EIS process.

Figure 4-8 ½ Mile Station Buffer of Percentage of Total Population Age 18 & Under



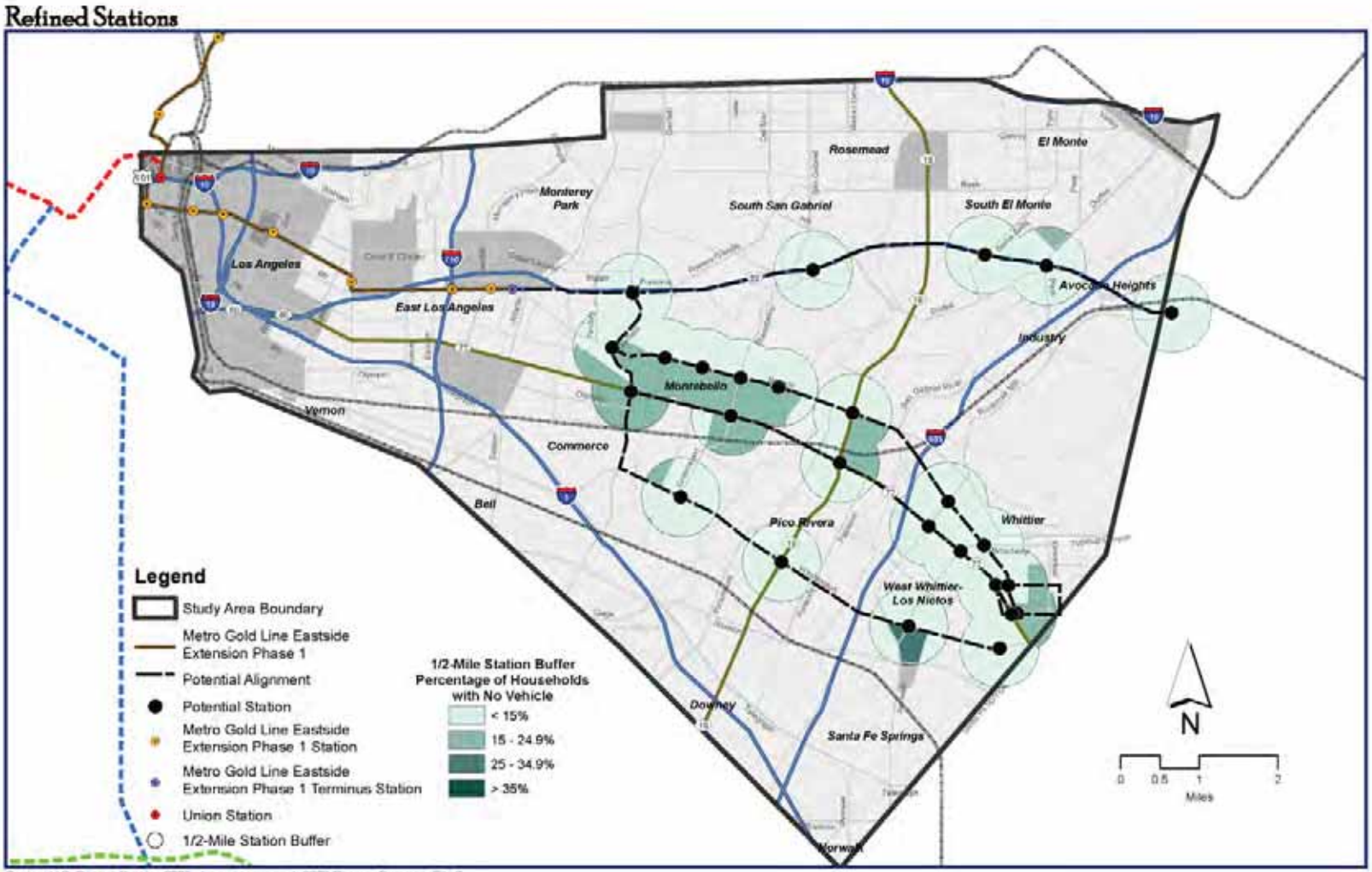
Source: U.S. Census Bureau, 2007. (www.census.gov), 2000 Census, Summary File 3

Figure 4-9 ½ Mile Station Buffer of Percentage of Total Population Age 65 & Over



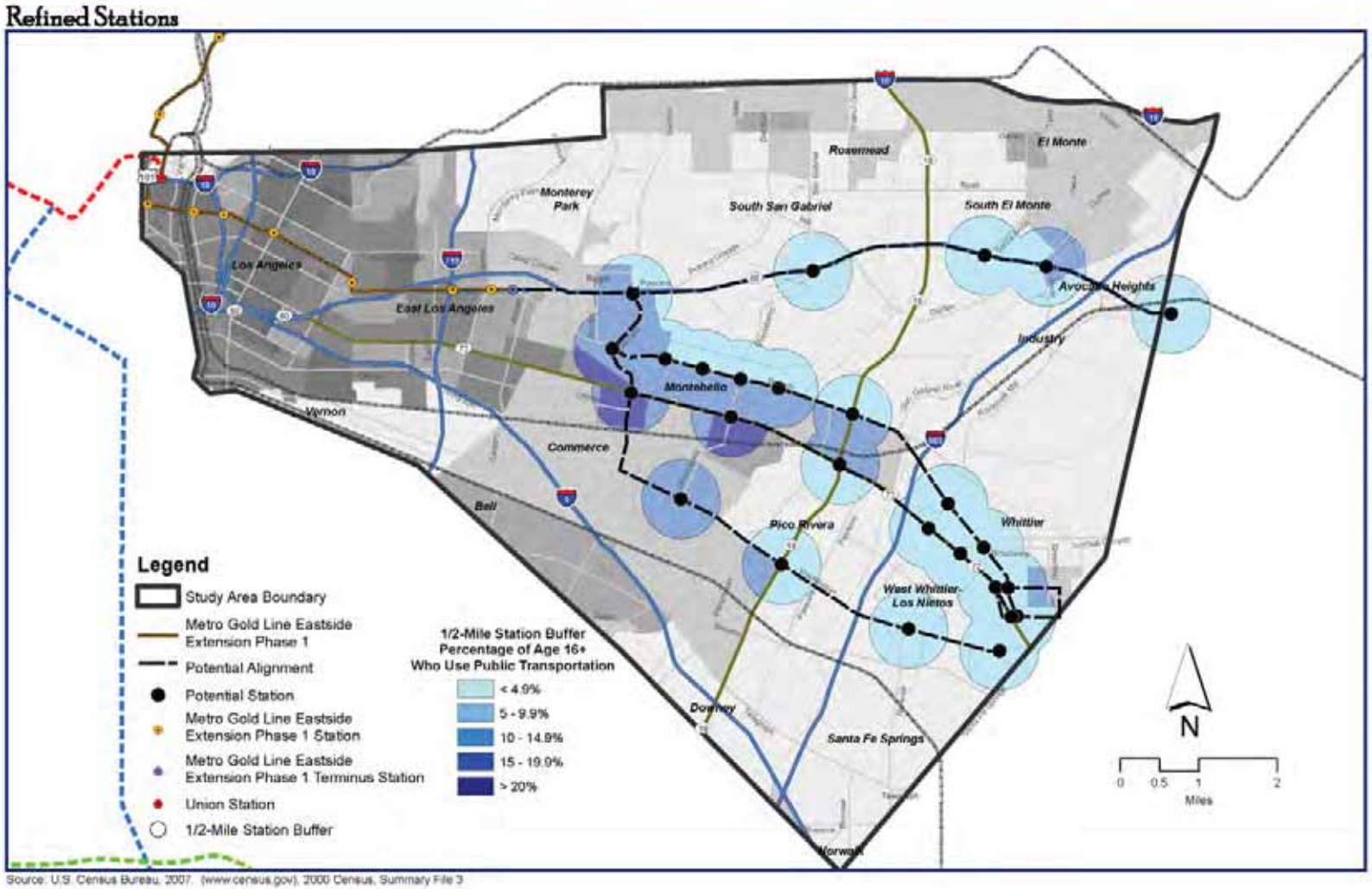
Source: U.S. Census Bureau, 2007. (www.census.gov), 2000 Census, Summary File 3

Figure 4-10 ½ Mile Station Buffer of Percentage of Households with No Vehicle



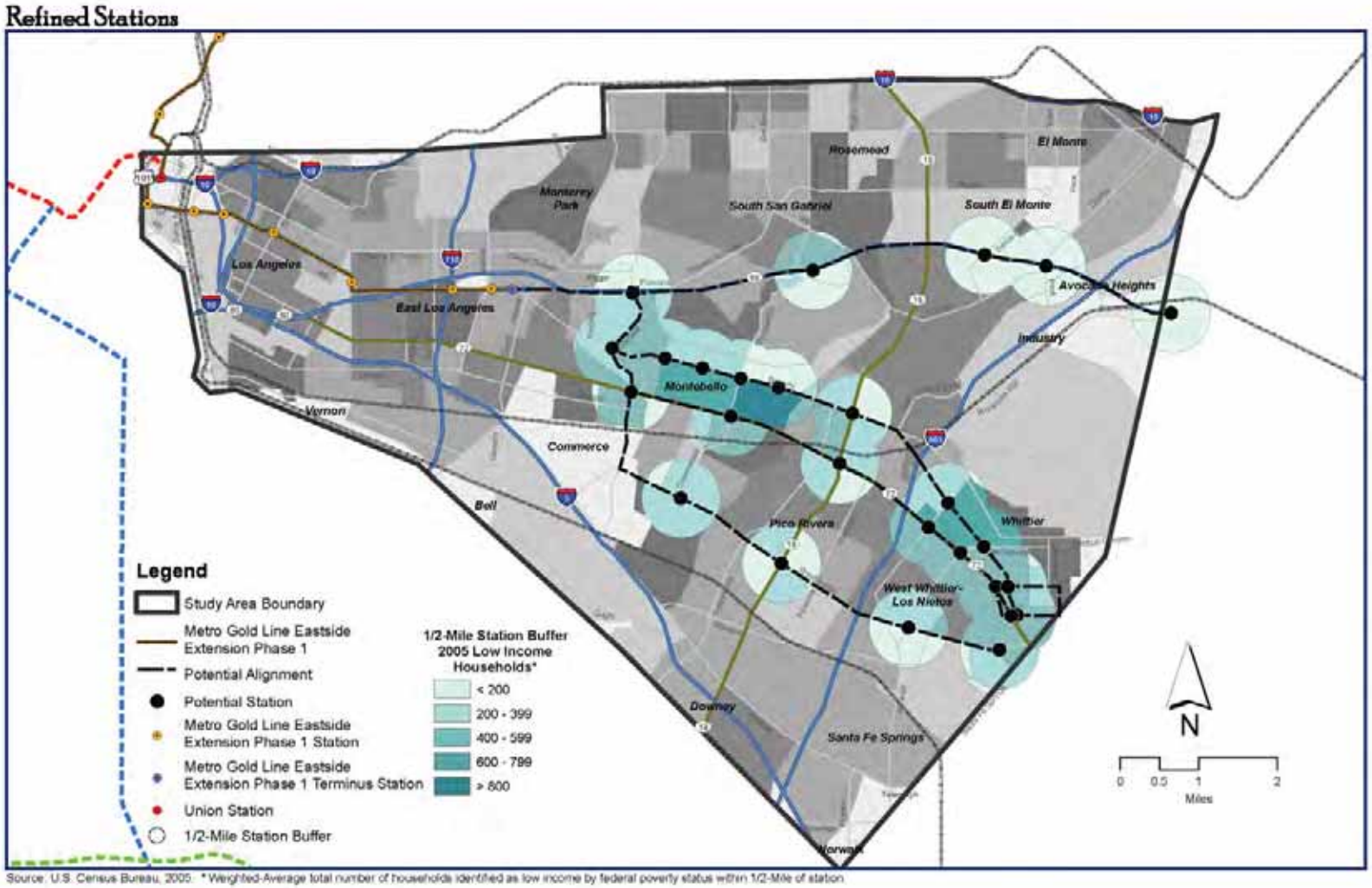
Source: U.S. Census Bureau, 2007, (www.census.gov), 2000 Census, Summary File 3

Figure 4-11 ½ Mile Station Buffer of Percentage of Age 16+ Who Use Public Transportation



Source: U.S. Census Bureau, 2007. (www.census.gov), 2000 Census, Summary File 3

Figure 4-12 ½ Mile Station Buffer 2005 Low-income Households



Source: U.S. Census Bureau, 2005. * Weighted-Average total number of households identified as low income by federal poverty status within 1/2-Mile of station.

4.5 Visual and Aesthetic

This section describes existing visual and aesthetic qualities in the PSA and along the potential alternatives, describes potential changes to these visual and aesthetic qualities generated by the different alternatives, and identifies potential steps that could lower the severity of these potential changes.

4.5.1 Affected Environment

Predominant land uses in the PSA and along the proposed alternative alignments include, as described in Section 4.1 - Land Use and Economic Development, commercial, industrial, residential and open space land uses. Changes to specific visual and aesthetic resources, regional and local viewsheds, or a community's sense of place could generate a negative change in quality of life for local residents and visitors to the PSA.

Regulatory Setting

This section outlines the federal, state and local policies pertinent to the existing visual and aesthetic qualities and the potential changes to these qualities generated by the implementation of the alternatives under consideration.

Federal

NEPA (42 U.S. Code (USC) Section 4231 Federal Highway Administration (FHWA) and Urban Mass Transportation Administration (UMTA) - Established the Environmental Impact and Related Procedures (23 Code of Federal Regulations (CFR) 771) for the evaluation of urban mass transit projects and the compliance of these projects with 23 USC 109(h) and 303, as well as other USCs. The Federal Railroad Administration (FRA) Procedures for Considering Environmental Impacts (FRA Docket NO EP-1, Notice 5, May 26, 1999) provides guidance as a part of NEPA compliance, the consideration of changes to aesthetic environmental and scenic resources in the natural landscape and developed environment.

FTA Circular 9400.1A, Design and Art in Transit Projects - The FTA Circular 9400.1.A, Design and Art in Transit Projects, encourages the use of design and artistic considerations in transit projects. The FTA recognizes that specific types of transit projects require an assessment of visual effects. The circular provides guidance on opportunities for incorporating art and design into transit projects.

Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), Sections 6002-6009 - SAFETEA-LU, Sections 6002-6009, places additional emphasis on environmental considerations such as mitigation, enhancement activities, context sensitive solutions, and Section 4(f) which has been a part of federal transportation law since 1966, applies to agencies within the United States Department of Transportation (USDOT) and is generally referred to as 49 USC 303.

USDOT, Section 4(f) - USDOT, Section 4(f) stipulates that the FHWA and other DOT agencies cannot approve the use of land from publicly owned parks, recreational areas, wildlife and waterfowl refuges, or public and private historical sites unless the following conditions apply, (1) there is no feasible and prudent alternative to the use of land, and (2) the action includes all possible planning to minimize harm to the property resulting from use.

State

CEQA (State CEQA Guidelines Appendix G Environmental Checklist Form 2001) - The CEQA environmental checklist requires that project proponents identify whether a project would have a substantial adverse effect on a scenic vista; substantially damage scenic resources, including trees, rock outcroppings, and historical buildings within a state scenic highway; substantially degrade the existing visual character or quality of the site and its surroundings; or create a new source of substantial light or glare that would adversely affect day or nighttime views in the area (State CEQA Guidelines Appendix G Environmental Checklist Form 2001).

Local

General Plan Land Use Element - As discussed in Section 1.1 the proposed alternatives traverse multiple incorporated cities and unincorporated sections of the County of Los Angeles. Each incorporated city's General Plan Land Use Element and the County General Plan Land Use Element contain objectives and policies that guide development to support the generation of and maintenance of existing visual and aesthetic resources.

4.5.2 Evaluation Methodology

The visual and aesthetic resources analysis was completed at a preliminary level utilizing existing data as site-specific details will be developed in future project phases. The proposed alignments were evaluated based on their potential to negatively alter the perception of the area's visual and aesthetic quality. The project's potential to alter the visual and aesthetic quality of the existing streetscape and to generate the loss of street trees along the alignments are presented in this section by alternative. In the next stages of the planning process, engineering drawings and designs will be required to determine specific locations of proposed structures and the visual and aesthetic resources that could be affected.

4.5.3 Environmental Issues

Alteration of Streetscape

The existing streetscapes along the proposed alignments vary widely based on the predominant land use within the communities they cross. The descriptions of potential changes to the existing streetscapes are presented in this section by each alternative. Each alternative description is divided into sections to indicate changes in streetscape type as each alignment extends from the terminus of the Eastside Transit Corridor Phase 1 along its proposed route.

Alternative 1- SR-60 LRT

The Alternative 1 alignment alongside SR-60 traverses multiple sections of varied streetscape types with sections running alongside commercial, residential, open space land uses. The first section of the alignment extends from the terminus of Phase 1 of the Eastside Transit Corridor at East 3rd St. and Atlantic Blvd. east alongside SR-60 to Garfield Ave. Land uses in this first section of the alignment includes the following: commercial, residential and active recreation (Montebello Golf Course). The alignment will initially run down the median of Pomona Blvd. before climbing to an elevated structure alongside SR-60 to Garfield Ave. The aerial structure with its Overhead Catenary System (OCS) would be expected to blend in with the existing freeway infrastructure and not generate a major adverse visual and aesthetic effect on the neighboring land uses.

From Garfield Ave. the alignment runs parallel to SR-60 to the 605 Freeway as it passes existing residential, commercial, industrial and open space areas. As with the initial section from Atlantic Blvd. to Garfield Ave. described above, development of this second section of the alignment, with exception of the portion that crosses the Whittier Narrows Recreation Area, would not be expected to generate any major changes to the neighboring area's existing visual and aesthetic quality. This second section of the alignment varies between at-grade and aerial sections alongside SR-60 and is expected to blend in with the existing freeway infrastructure.

The Whittier Narrows Recreation Area is an open space area between the Rio Hondo and San Gabriel Rivers adjacent to SR-60. The alignment would parallel SR-60 through the recreation area with sections of both at-grade and aerial structure. The exposed OCS and construction of aerial structures as the alignment traverses the recreation area could generate an effect on site user's perception of the area's visual and aesthetic quality. Planned landscaping enhancements incorporated into project design are expected to mitigate this affect.

Alternative 2: SR-60 Busway

The Alternative 2 Busway alignment is similar in layout to the alignment of Alternative 1, along SR-60. The street running bus technology would be expected to have a minimal effect on visual and aesthetic qualities given the alternative's development adjacent to SR-60. The potential effects on viewshed sightlines described for Alternative 1 could be expected at a similar degree for this Busway alignment. These effects will be investigated in greater detail in future project phases, while considering potential mitigation benefits generated by planned urban design and landscape enhancements incorporated into the project design.

Alternative 3- Beverly LRT

Alternative 3 begins like Alternative 1 at East 3rd St. and Atlantic Blvd. where it extends east alongside SR-60 to Garfield Ave. The effects described above for Alternative 1 along this section of the alignment are also expected to be minimal for Alternative 3 given the aerial structure's placement adjacent to the existing freeway infrastructure.

The Alternative 3 alignment splits from Alternative 1 when it turns south at Garfield Ave. Alternative 3 follows Garfield Ave. south to Beverly Blvd. where it turns east. The section along Garfield Ave. from Pomona Blvd. to Beverly Blvd. passes residential, commercial, and active recreation (Montebello Golf Course) uses. As proposed, the alternative would utilize an aerial alignment for the full length of this section down the middle of Garfield Ave. This aerial structure could affect the visual and aesthetic quality of the neighborhoods it passes through by introducing the aerial structure and an exposed OCS to the viewshed. The aerial structure could potentially obstruct existing sightlines in this viewshed and generate shade on homes and businesses located adjacent to the alignment, effects that could both be perceived as a negative change in the area's visual aesthetic quality. Analysis in future phases of the project will evaluate this potential effect in greater detail.

The aerial structure transitions to at-grade heading along Beverly Blvd. The proposed alignment runs along Beverly Blvd. at-grade with a new aerial structure used to cross the San Gabriel River. This section of Beverly Blvd. has intermittent sections of landscape median that would be removed or modified by the project. Land uses along this section of the Beverly Blvd. corridor include commercial, residential and open space.

Urban design enhancements are under development as a part of ongoing project design to mitigate potential visual and aesthetic effects. These enhancements will be described in greater detail as a part of analysis in future phases of the project. This analysis will investigate in greater detail the potential for changes to sections of landscaped median along Beverly Blvd. and the related effect on perceived visual and aesthetic quality for residents, recreation users, employees, visitors and commuters. This future analysis will evaluate the potential effects while considering potential benefits generated by the planned urban design enhancements.

The alignment as proposed will cross the Rio Hondo and San Gabriel Rivers utilizing the existing Beverly Blvd. Bridge across the Rio Hondo and a new stand alone aerial structure for the San Gabriel River. Both rivers support passive recreation uses with multi use trails that support pedestrian and cycling uses along the riverbanks. The development of the alignment across both rivers could generate a change in user perception, by introducing a new source of viewshed obstruction at the river crossings, due to the introduction of an exposed OCS to the viewshed as the alignment crosses both rivers and a new aerial structure at the San Gabriel River crossing. The relative effect of this development along both viewsheds would be expected to be minimized both by steps to incorporate design enhancements into the project and the already urbanized nature of the PSA. The proposed alignment would cross the San Gabriel River and turn southeast to meet an abandoned Union Pacific Railroad right-of-way that has been converted into the Whittier Greenway. The Whittier Greenway is a multi-use bike path that extends from Pioneer Blvd. to the alignment's terminus at Mar Vista St. (see Figure 4-13). The Whittier Greenway, used by cyclists and pedestrians, passes through residential, commercial, industrial, open space areas and alongside a school. The light rail alignment would be developed along the greenway with modifications to the existing trail to

support multimodal use. Landscaping and layout modifications are expected to minimize any visual and aesthetic quality effects experienced by pedestrians, cyclists, or passengers. Analysis in future phases of the project will evaluate the potential effect as well as the potential benefit generated by the landscaping and layout modifications in greater detail.

Figure 4-13 Whittier Greenway

Alternative 4: Whittier LRT

Alternative 4 begins like Alternatives 1 and 3 at East 3rd St. and Atlantic Blvd. where it extends east alongside SR-60 to Garfield Ave. The effects described above for Alternatives 1 and 3 are also expected for Alternative 4.

Alternative 4, like Alternative 3, turns south along Garfield Ave. and would be expected to generate the same potential effects as Alternative 3 until the alignments split at Beverly Blvd. These effects are related to the construction of the aerial structure and exposed OCS and the resulting effect on the existing viewshed sightlines and the potential generation of unwanted shade on homes and businesses alongside the alignment. As proposed, Alternative 4 would continue south along Garfield Ave. to Whittier Blvd. on an aerial structure and would then turn east at Whittier Blvd. where it would continue with a mix of elevated aerial sections and at-grade sections to the terminus at Mar Vista St. The alignment continues from its split with the Alternative 3 alignment at Garfield Ave. and Beverly Blvd., through commercial, residential, and open space land uses and also passes a school and a State Park (Pio Pico State Park).

Sections of Whittier Blvd. along the alignment have landscaped medians and have recently been upgraded with streetscape improvement projects that could be affected by development of the light rail alignment. Urban design enhancements, which would include new landscaping features to replace any displaced landscaping as a result of project construction, are under development as a part of ongoing project design to mitigate potential visual and aesthetic effects. These enhancements will be described in greater detail as a part of analysis in future phases of the project. This analysis will investigate in greater detail the potential for changes to sections of landscaped median along Whittier Blvd. and the related effect on perceived visual and aesthetic quality for residents, recreation users, employees, visitors and

commuters. The future analysis will evaluate the potential effects while considering the potential benefits generated by planned urban design enhancements.

The proposed alignment from the Alternative's split from Alternative 3 at Garfield Ave. and Beverly Blvd., to the terminus at Whittier Blvd. and Mar Vista St. could affect the visual and aesthetic quality of the neighborhoods it passes through by introducing aerial structures and at-grade sections both with exposed OCS. The introduction of the aerial structures and exposed OCS features could obstruct sightlines in existing viewshed corridors along the alignment and generate shade on homes and businesses located adjacent to the alignment, effects that could both be perceived as a negative change in the areas visual aesthetic quality. The alignment as proposed will cross the Rio Hondo and San Gabriel Rivers utilizing the existing Whittier Blvd. Bridge across the Rio Hondo and a new stand alone aerial structure for the San Gabriel River. Both rivers support passive recreation uses with multi use trails that support pedestrian and cycling uses along the riverbanks. The development of the alignment across both rivers could generate a change in user perception, by introducing a new source of viewshed obstruction at the river crossings, due to the introduction of an exposed OCS to the viewshed as the alignment crosses both rivers and a new aerial structure at the San Gabriel River crossing. The relative effect of this development along both viewsheds would be expected to be minimized both by steps to incorporate design enhancements into the project and the already urbanized nature of the PSA. As described above these effects will be investigated in greater detail in future project phases.

Alternative 5: Washington LRT

Alternative 5 begins like Alternatives 1, 3 and 4 at East 3rd St. and Atlantic Blvd. where it extends east alongside SR-60 to Garfield Ave. The effects described above for Alternatives 1, 3 and 4, are also expected for Alternative 5, to be minimal given the aerial structures placement adjacent to the existing freeway infrastructure.

Alternative 5, like Alternatives 3 and 4, turns south along Garfield Ave. and would be expected to generate the same potential effects as Alternatives 3 and 4 until Alternative 3 turns east at Beverly Blvd. and Alternative 4 turns east at Whittier Blvd. These effects are related to the construction of the aerial structure and exposed OCS and the resulting effect on the existing viewshed sightlines and the potential generation of unwanted shade on homes and businesses alongside the alignment.

As proposed, Alternative 5 would continue south from Whittier Blvd. along Garfield Ave. to Washington Blvd. on an aerial structure where it would turn east and continue on an elevated aerial structure to the terminus at the intersection of Washington Blvd. and Whittier Blvd.

The proposed alignment passes residential, commercial, and industrial land uses. Sections of Washington Blvd. along the alignment have landscaped medians that could be affected by development of the aerial structure. Urban design enhancements, which would include new landscaping features to replace any displaced landscaping as a result of project construction,

are under development as a part of ongoing project design to mitigate potential visual and aesthetic effects. These enhancements will be described in greater detail as a part of analysis in future phases of the project. This analysis will investigate in greater detail the potential for changes to sections of landscaped median along Washington Blvd. and the related effect on perceived visual and aesthetic quality for residents, recreation users, employees, visitors and commuters. The future analysis will evaluate the potential effects.

The proposed alignment from the Alternative's split from Alternative 4 at Garfield Ave. and Whittier Blvd., to the terminus at Washington Blvd. and Lambert Rd. could affect the visual and aesthetic quality of the neighborhoods it passes through by introducing aerial structures and at-grade sections both with exposed OCS. The introduction of the aerial structures and exposed OCS features could obstruct sightlines in existing viewshed corridors along the alignment and generate shade on homes and businesses located adjacent to the alignment, effects that could both be perceived as a negative change in the area's visual aesthetic quality. The elevated aerial structure will cross the Rio Hondo and San Gabriel Rivers. Both rivers support passive recreation uses with multi use trails that support pedestrian and cycling uses along the riverbanks. The development of the alignment across both rivers could generate a change in user perception, by introducing a new source of viewshed obstruction at the river crossings, due to the introduction of an exposed OCS to the viewshed as the alignment crosses the rivers. The relative effect of this development along both viewsheds would be expected to be minimized both by steps to incorporate design enhancements into the project and the already urbanized nature of the PSA. As described above these effects will be investigated in greater detail in future project phases.

Loss of Street Trees

Street trees along the alternative alignments help to create a neighborhood's sense of place and can represent a major financial investment for the community that establishes and maintains the trees. Street trees can, depending on their size, maturity and longevity in a neighborhood, become associated with the visual and aesthetic character of a neighborhood. Removal of these trees can generate negative responses from local residents, employees at local businesses and visitors to the impacted neighborhood. The connection between street trees and

Figure 4-14 Pomona Blvd. towards Garfield Ave.

neighborhood character coupled with the financial investment that these trees can represent for local governments is outlined below for each alternative.

Alternative 1 -SR-60 LRT

The Alternative 1 alignment alongside SR-60 of all the alternatives has the least interaction with street trees that contribute to neighborhood character. The proposed alignment is separated from existing neighborhoods along much of its length as it extends from the terminus of the Eastside Transit Corridor Phase I to the 605 Freeway. The section extending eastward from the terminus of the Eastside Transit Corridor Phase I at East 3rd St. and Atlantic Blvd. alongside SR-60 to Garfield Ave. would traverse a landscaped slope with mature eucalyptus trees that would likely need to be removed (see Figure 4-14). These eucalyptus trees currently provide some level of buffering between the existing land uses along Pomona Blvd. and SR-60. The proposed alignment also crosses the Rio Hondo and San Gabriel Rivers and the Whittier Narrows Recreation Area, which have high concentrations of existing trees. Planned design enhancements currently under development will include landscaping to mitigate the effects of project implementation. The potential benefit generated by these design enhancements and the degree to which they will replace any lost tree canopy along the alignment will be outlined in greater detail as a part of future environmental review.

Alternative 2 -SR-60 Busway

As described above, Alternative 2 Busway alignment is similar in layout to the alignment of Alternative 1, along SR-60. The street running bus technology would be expected to have a minimal effect on street trees given the alternative's development adjacent to SR-60. The potential effects on street trees described for Alternative 1 could be similar for this Busway alignment. Areas along the alignment with high concentrations of potentially effected street trees, as was noted for Alternative 1, are the mature eucalyptus trees along the embankment between SR-60 and Pomona Blvd., the Rio Hondo and San Gabriel Rivers and the Whittier Narrows Recreation Area found between the two rivers. Planned design enhancements that will include landscaping improvements are under development and will be described in greater detail in future phases of the project. The degree to which these landscaping enhancements will mitigate project effects on existing trees will be analyzed as part of the environmental review in future project phases.

Alternative 3 –Beverly LRT

Alternative 3 begins like Alternative 1 at East 3rd St. and Atlantic Blvd. where it extends east alongside SR-60 to Garfield Ave. The effects described above for Alternative 1 on existing eucalyptus trees along this section of the alignment are also expected for Alternative 3. The aerial structure extending south to Beverly Blvd. along Garfield Ave. would not interact with any sections of landscaped medians but may interact with large existing trees with canopies that extend out over the roadway along the sidewalks. The alternative turns east at the intersection of Garfield Ave. and Beverly Blvd., where the aerial structure then transitions into an at-grade alignment and continues to the San Gabriel River. Beverly Blvd. has intermittent

sections of landscaped median along this section of the alignment that would be displaced by the project. The largest concentration of landscaped median features is found between Garfield Ave. and Montebello Blvd., with more dispersed features found in the stretch of Beverly Blvd. between the Rio Hondo and San Gabriel Rivers. At the San Gabriel River the final section of alignment extends east along the Whittier Greenway, which is landscaped with trees. Planned design enhancements that will include landscaping improvements are under development and will be described in greater detail in future phases of the project. The degree to which these landscaping enhancements will mitigate project effects on existing trees will be analyzed as part of the environmental review in future project phases.

Alternative 4 - Whittier LRT

Alternative 4 begins like Alternatives 1 and 3 at East 3rd St. and Atlantic Blvd. where it extends east alongside SR-60 to Garfield Ave. The effects described above for Alternatives 1 and 3 on existing eucalyptus trees along this section of the alignment are also expected for Alternative 4. The alternative extends south on Garfield Ave. with the same aerial structure proposed for Alternative 3. This aerial structure would be expected to generate the same potential effects on large tree canopies on either side of the street. The Alternative 4 aerial alignment splits from Alternative 3 at Beverly Blvd. and continues south along Garfield Ave. to Whittier Blvd. This section from Beverly Blvd. to Whittier Blvd. could be expected to generate the same potential effects on large tree canopies on either side of the street as the section from SR-60 to Beverly Blvd. The mix of at-grade and aerial alignment extending east on Whittier Blvd. would directly interact with sections of landscaped median with trees, upgraded sidewalk features with newly planted street trees, and large existing trees with canopies that extend out over the roadway. The landscaped medians extend from Garfield Ave. to Montebello Blvd. where the upgraded sidewalk features begin and extend east to the Rio Hondo. Landscaped medians begin again at Paramount Blvd. and extend east to the San Gabriel River. Large existing trees with canopies, which could be potentially affected by project implementation, are found east of the 605 Freeway to the alignment terminus at Mar Vista St. Planned design enhancements that will include landscaping improvements are under development and will be described in greater detail in future phases of the project. The degree to which these landscaping enhancements will mitigate project effects on existing trees will be analyzed as part of the environmental review in future project phases.

Alternative 5 – Washington LRT

Alternative 5 begins like the other alternatives at East 3rd St. and Atlantic Blvd. where it extends east alongside SR-60 to Garfield Ave. The effects described above for Alternatives 1, 3 and 4 on existing eucalyptus trees along this section of the alignment are also expected for Alternative 5. The alternative extends south on Garfield Ave. with the same aerial structure proposed for Alternatives 3 and 4. This aerial structure would be expected to generate the same potential effects on large tree canopies on either side of the street. The Alternative 5 aerial alignment splits from Alternative 3 at Beverly Blvd. and from Alternative 4 at Whittier Blvd. and continues south along Garfield Ave. to Washington Blvd. This section from Whittier

Blvd. to Washington Blvd. could be expected to generate the same potential effects on large tree canopies on either side of the street as the section from SR-60 to Whittier Blvd. In addition, the aerial structure extending south to Washington Blvd. along Garfield Ave. would interact with intermittent sections of landscaped medians, in the stretch between Ferguson Rd. and Washington Blvd. The section of aerial structure extending east on Washington Blvd. to the alignment's terminus at Whittier Blvd. would directly interact with sections of landscaped median with trees. The majority of these landscaped medians along Washington Blvd. are located between the Rio Hondo and Rosemead Blvd. Planned design enhancements that will include landscaping improvements are under development and will be described in greater detail in future phases of the project. The degree to which these landscaping enhancements will mitigate project effects on existing trees will be analyzed as part of the environmental review in future project phases.

4.5.4 Summary

All of the alternatives have the potential to affect visual and aesthetic resources in the PSA. Planned urban design and landscape enhancements that are being incorporated into the project design are expected to reduce the severity of these effects. The alternatives carried forward for review in future phases will be compared against the No-Build alternative to determine how changes to the existing streetscape generated by the different alignments would alter visual and aesthetic resources in the PSA.

The following studies to investigate the potential effects generated by alternative implementation in greater detail will be completed in future project phases:

- Viewshed investigation to analyze the potential for alternative interference with existing viewsheds through the introduction of infrastructure supporting the light rail alignments.
- Street tree canopy density survey to investigate the relative effect of alternative implementation on street trees in the PSA.
- Shading investigation to review the potential for adverse shading effects generated by infrastructure supporting the light rail alignments on existing land uses.

4.6 Cultural Resources

4.6.1 Governmental Policies Applicable to Cultural Resources

NEPA (42 USC Section 4331) stipulates it is the Federal Government's responsibility to "...use all practicable means..." to "preserve important historic, cultural, and natural aspects of our national heritage..."

The FHWA and the UMTA, now FTA, established Environmental Impact and Related Procedures (23 CFR 771) for evaluation of public transit projects and compliance of these projects with 23 USC 109(h) and 303, as well as other USCs.

Federal legislation contained in SAFETEA-LU, Sections 6002-6009, places additional emphasis on environmental considerations such as mitigation, enhancement activities, context-sensitive solutions, and Section 4(f).

Modifications to the procedures for granting Section 4(f) approvals in the Code of Federal Regulations at 23CFR 774, Parks, Recreation Areas, Wildlife and Waterfowl Refuges, and Historic Sites were issued on March 12, 2008. The modifications altered the implementation procedures originally enacted as Section 4(f) of the Department of Transportation Act of 1966. The modifications provide direction to the Department of Transportation (DOT) not to approve the use of a Section 4(f) property unless: 1) there is no feasible and prudent avoidance alternative to use of land from a property and; 2) all possible planning has been done to minimize harm from the use. However, this recent rule allows DOT to authorize the use of a property protected under Section 4(f) if it will have a de minimis impact, as further defined in the rule.

Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended and 36 CFR Part 800 (NHPA implementing regulations) require that federal agencies take into account the effect of carrying out federally funded, assisted, or licensed projects on resources identified as included in, or determined eligible for, the National Register of Historic Places (NRHP). If a project adversely affects those characteristics qualifying a resource for inclusion on the NRHP, feasible alternatives should be considered.

Section 21084.1 of CEQA states that a project that may cause a substantial adverse change in the significance of a historical resource is a project that may have a significant effect on the environment. CEQA defines a historic resource as any resource listed, or determined to be eligible for listing, in the California Register of Historical Resources. In addition, historic resources included in a local register of historic resources or otherwise deemed significant per Public Resources Code 5024.1 are presumed to be historically or culturally significant unless the preponderance of the evidence demonstrates that the resource is not historically or culturally significant.

4.6.2 Evaluation Methodology

Identification of cultural resources in the vicinity of the proposed routes and modes, as well as potential issues that should be addressed, is important during the alternatives analysis phase of the project. This will help determine the relative potential for concerns that each refined alternative may present so that appropriate actions may be taken early in project development to avoid adverse impacts on these precious resources.

To identify resources in the vicinity of the refined alternatives being considered, a review of readily available information was conducted. For this task, the following sources were reviewed:

- Eastside Transit Corridor Study, Re-Evaluation/Major Investment Study (MIS), February 24, 2000.
- Los Angeles Eastside Corridor Draft Supplemental Environmental Impact Statement/Draft Subsequent Environmental Impact Report, March 2001.
- SR-60 Truck Lane Feasibility Study Environmental Report, May 30, 2000.
- National Register Information System (NRIS) - website database contains information on historic properties listed in the NRHP, June 2008.
- California State Office of Historic Preservation (OHP) - Historic Resource Information - public website database contains information regarding State Historic Landmarks and points of historical interest, June 2008.
- Searches of the Los Angeles County website and websites of the following municipalities: Montebello, Whittier, Pico Rivera, South El Monte, South San Gabriel, June 2008.

With the exception of generalized archaeological information that was available in the Re-Evaluation/MIS and the SR-60 Truck Lane Feasibility Study Environmental Report, the information contained in all of the other sources was limited to historical properties. This is likely due to the normally confidential nature for disclosure of archaeological resource locations to avoid their vandalism and theft. Note that additional work will need to be undertaken for the Draft EIR/EIS to determine locations of all cultural resources in the vicinity of the alternatives that will be studied in that environmental document.

The following sections identify cultural resources in close proximity of each refined alternative being considered and then concludes with a discussion of the issues that should be evaluated in the Draft EIR/EIS.

4.6.3 Existing Conditions

Cultural Setting

The *Eastside Transit Corridor Study, Re-Evaluation/MIS* includes information about resources in the Phase 2 PSA as well as the PSA for the Phase 1 project that is now under construction. A summary of the cultural setting from that report is presented in this section.

At the time of Euroamerican exploration, the PSA was inhabited by the Tongva (Gabrieleño) Indians, whose territory encompassed the greater Los Angeles basin area. The Tongva were hunter-gatherers who followed a seasonal round of annual movement to various locations where they collected and processed food and material for tools, shelter, and so on. These Native Americans had a stable lifestyle based on vegetal foods, such as acorns, grass seeds, bulbs and greens, and meat sources, such as deer, fish, and shellfish. Urban development has obscured the Tongva presence in the Los Angeles basin; a few archaeological sites and isolated finds attest to their presence.

The Tongva were subsumed early into the Spanish/Mexican mission system, and many of their sites were abandoned. Based on information from elsewhere in Tongva territory, from

comparison with adjacent tribes, and by referring to geographical principles of settlement location, the locations of archaeological sites can be predicted. Water sources, such as springs and small streams, were attractive locations, as were oak groves and stands of seed-bearing grass and shrubs. Although large water courses, such as the Los Angeles and San Gabriel Rivers, were not attractive for settlement, they collected plant resources, such as basket-making reeds and grasses from these areas. Settlement associated with large water courses was usually on elevated ground nearby, as at archaeological site CA-LAN-182a near Pio Pico State Historical Park, set back from the bank of the San Gabriel River.

Spanish and Mexican settlement after the 1770s introduced economic reliance on domesticated plants and animals. The population was small and tended to be concentrated in centers, such as the early pueblo of Los Angeles, with a few people living on scattered ranchos. Some of the same resources that influenced Native American settlement were also important to the Hispanic population, although the Spanish and Mexican custom was to build with adobe and establish a permanent residence. As with the Tongva, the dwellings were not in large river beds or immediately adjacent. The Pio Pico residence is an example, set near the San Gabriel River, but not in the bed or on the immediate bank.

The area of Boyle Heights (west of the Phase 2 PSA) and, later, East Los Angeles, remained largely unaltered residential neighborhoods centered on main streets with retail establishments. The residents of this area were often immigrants, such as European Jews or Russian Molokans. They built community facilities, such as churches and synagogues, to serve their populations. Later, native Californian Hispanics and Hispanic immigrants moved into the area and today are the dominant cultural group.

Population east of East Los Angeles grew relatively slowly, and there were still large areas of vacant or agricultural land in the PSA as late as the 1920s. This was partly a function of distance and public transportation. Living farther out may have cost less, but the commute to work took longer and cost more than living closer to downtown. Trolleys served the Boyle Heights area from a fairly early date, but as soon as automobiles became available, they were eagerly adopted there and at greater distances from downtown. In the post-World War II era, previously vacant areas were built up in housing tracts for new residents. Houses built in this period were mainly wood frame and stucco in the ranch style.

The 2000 Re-Evaluation MIS notes that the portion of the MIS study area east of Atlantic Blvd. contains fewer potentially significant structures than west of Atlantic Blvd. where the Phase 1 project is being constructed.

Cultural Resources Adjacent to the Refined Alternatives

Table 4-6 presents the known cultural resources adjacent to each of the refined alternatives based on a review of the sources cited above. Locations of sites listed on the NRHP and sites known to be included in the State of California's OHP database are shown in Figure 4-15.

Table 4-6 Cultural Resources Adjacent to the Refined Alternatives

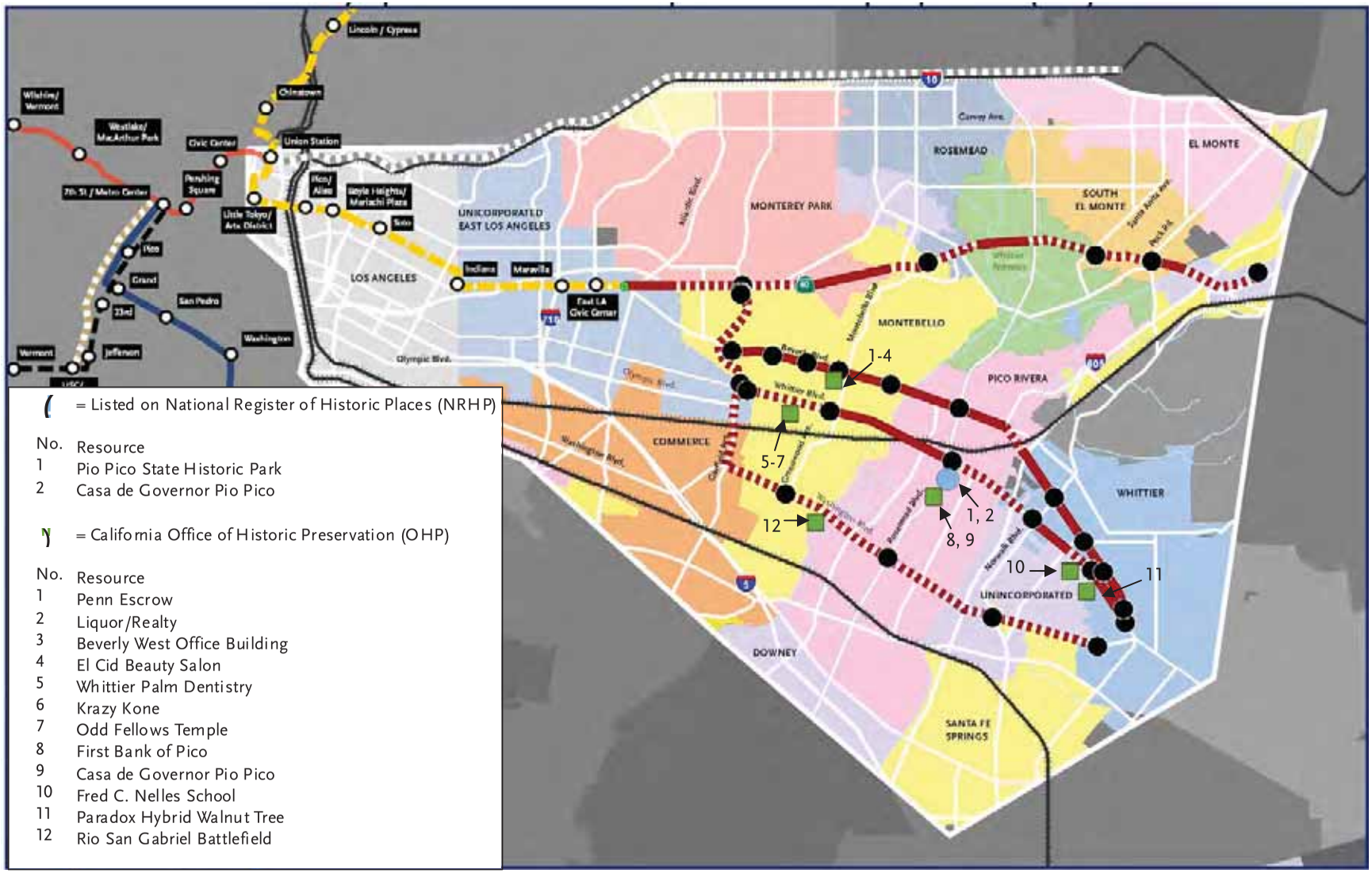
Cultural Resource	Address	Status[1]	Data Source[2]
Alternative 1 and 2 – SR-60 (LRT) and (Busway)			
Triangle Car Wash	5181 E. Pomona Blvd. (Atlantic/Pomona Blvd.)	Warrants further investigation	SR-60 Truck Study
Various structures	From western terminus to Findlay Ave.	Warrant further investigation	SR-60 Truck Study
Archaeological site	Los Angeles County—specific location unknown except within ¼ mile of SR-60 Truck Feasibility Study Area	Unknown	SR-60 Truck Study
Alternative 3 – Beverly (LRT)			
Triangle Car Wash	5181 E. Pomona Blvd. (Atlantic/Pomona Blvd.)	Warrants further investigation	SR-60 Truck Study
Penn Escrow	921 W. Beverly Blvd.	OHP 19-178631	MIS 2000
Liquor/Realty	901 W. Beverly Blvd.	OHP 19-178631	MIS 2000
Beverly West Office Building	817 W. Beverly Blvd.	OHP 19-17632	MIS 2000
El Cid Beauty Salon	801 W. Beverly Blvd.	OHP 18-17633	MIS 2000
1 commercial structure	Between Poplar Ave. and Paramount Blvd.	Warrants further investigation	MIS 2000
Alternative 4 – Whittier (LRT)			
Triangle Car Wash	5181 E. Pomona Blvd. (Atlantic/Pomona Blvd.)	Warrants further investigation	SR-60 Truck Study
Whittier Palm Dentistry	1920 Whittier Blvd.	OHP 19-180768	MIS 2000
Krazy Kone	1519-1521 Whittier Blvd.	OHP 19-180772	MIS 2000
Odd Fellows Temple	917-923 Whittier Blvd.	OHP 19-180767	MIS 2000
First Bank of Pico	9235 Whittier Blvd.	OHP 19-178667	MIS 2000
Pio Pico State Historical Park[2]	6003 Pioneer Blvd., Whittier	NRHP	MIS 2000
Casa de Governor Pio Pico	6003 Pioneer Blvd., Whittier	OHP Historic Landmark NRHP	OHP, NRIS
Reform School for Juvenile Offenders (Fred C. Nelles	11850 Whittier Blvd., Whittier	OHP Historic Landmark	OHP

Table 4-6 Cultural Resources Adjacent to the Refined Alternatives

Cultural Resource	Address	Status[1]	Data Source[2]
School)			
Paradox Hybrid Walnut Tree	12300 Whittier Blvd. (at Mar Vista St.), Whittier	OHP Historic Landmark	OHP
5 commercial structures	Between Garfield Ave. and Norwalk Blvd.	Warrant further investigation	MIS 2000
Alternative 5 – Washington (LRT)			
Triangle Car Wash	5181 E. Pomona Blvd. (Atlantic/Pomona Blvd.)	Warrants further investigation	SR-60 Truck Study
Rio San Gabriel Battlefield	Washington Blvd. and Bluff Rd., Montebello	OHP Historic Landmark	OHP

[1]OHP=Listed by CA Office of Historic Preservation. NRHP=Listed on National Register of Historic Places. NRIS=National Register Information System.
[2]A prehistoric site, CA-LAN-182a, also lies in the immediate area.

Figure 4-15 NRHP and OHP Resources Adjacent to Refined Alternatives



(= Listed on National Register of Historic Places (NRHP)

No.	Resource
1	Pio Pico State Historic Park
2	Casa de Governor Pio Pico

= California Office of Historic Preservation (OHP)

No.	Resource
1	Penn Escrow
2	Liquor/Realty
3	Beverly West Office Building
4	El Cid Beauty Salon
5	Whittier Palm Dentistry
6	Krazy Kone
7	Odd Fellows Temple
8	First Bank of Pico
9	Casa de Governor Pio Pico
10	Fred C. Nelles School
11	Paradox Hybrid Walnut Tree
12	Rio San Gabriel Battlefield

Alternative 1 and 2 - SR-60 (LRT and Busway) No historic resources in the vicinity of these alternatives are listed on the NRHP or on the State of California's OHP public website. The SR-60 Truck Lane Feasibility Study notes several structures, including the Triangle Car Wash (at Atlantic/Pomona Blvds.), that warrant further investigation for historic significance as well as an archaeological site located within ¼ mile of the study area for that project. No specific location information was included in that report to determine whether this archaeological site is adjacent to either of these alternatives. The 2000 Re-Evaluation MIS did not study alternatives along SR-60; therefore, no additional information was available from that source.

Alternative 3 - Beverly LRT No historic resources are listed on the NRHP or on the State of California's OHP public website. Note that their public website does not contain all resources listed on the State Register. A database search of the OHP's entire data base was conducted as part of the 2000 Re-Evaluation MIS. That search found four OHP sites located along Beverly Blvd. just west of Montebello Blvd. A general reconnaissance was conducted for the area along the Beverly Blvd. alternatives that were studied in the Re-Evaluation MIS. The reconnaissance found a commercial structure, located between Poplar Ave. and Paramount Blvd., which is potentially historic. The SR-60 Truck Lane Feasibility Study also indicates that the Triangle Car Wash, located at Atlantic/Whittier Blvds., warrants further investigation with regard to potential for historic significance.

Alternative 4 - Whittier LRT The Pio Pico State Historical Park and the Casa de Governor Pio Pico, both located along Whittier Blvd. between the San Gabriel River and I-605, are listed on the NRHP. The Casa de Governor Pio Pico is also a State Historic Landmark. Two additional State Historic Landmarks are located along Whittier Blvd. near the eastern terminus of this alternative. A search of the OHP's entire database of the Whittier alternatives investigated in the Re-evaluation MIS found three OHP sites located on Whittier Blvd. between Wilcox Ave. and Montebello Blvd. and one OHP site just west of Rosemead Blvd. A general reconnaissance of the area that was conducted for the Re-Evaluation MIS also found five commercial structures, located between Garfield Ave. and Norwalk Blvd., which are potentially historic. The SR-60 Truck Lane Feasibility Study also indicates that the Triangle Car Wash, located at Atlantic/Whittier Blvds., warrants further investigation with regard to potential for historic significance.

Alternative 5 - Washington LRT No historic resources in the vicinity of Washington Blvd. are listed on the National Register. A search of the OHP public website found one State Historic Landmark located on Washington Blvd. at Bluff Rd. in the City of Montebello. The SR-60 Truck Lane Feasibility Study also indicates that the Triangle Car Wash, located at Atlantic/Whittier Blvds., warrants further investigation with regard to potential for historic significance. The 2000 Re-Evaluation MIS did not study alternatives along Washington Blvd.; therefore, no additional information was available from that source.

4.6.4 Cultural Resources Considerations for Evaluation in the Draft EIR/EIS

It is likely that the cultural resources identified for this task do not include all resources in the vicinity of the alternatives. Therefore, additional records searches and field reconnaissance should be conducted to determine locations of all listed or eligible cultural resources in the vicinity of the alternatives to be studied in the Draft EIR/EIS.

Both Section 106 of the NHPA and Section 4(f) of the Department of Transportation Act require avoidance of alternatives that have a major adverse effect on historic resources if other practicable alternatives that avoid adverse impacts exist. For this reason, it is recommended that coordination with the State Historic Preservation Office (SHPO), as well as with the appropriate local historic preservation offices, begin as soon as possible to obtain their input and to determine the issues early in project development to avoid potential problems later.

Based on the information that is currently known, a few observations can be made about the refined alternatives being considered. As noted in the 2000 Re-Evaluation MIS, fewer cultural resources are located in the Eastside Transit Corridor Phase 2 PSA than in the Phase 1 PSA. Nevertheless, all of the alternatives have the potential to affect cultural resources.

The previous SR-60 Truck Study notes that various structures from that project's western terminus at I-710 to Findlay Ave. (west of Garfield Ave.) are potentially historically significant and warrant further investigation. Both the SR-60 LRT and Busway alternatives operate along SR-60 through the Whittier Narrows Recreation Area, a 1,400 acre park. This area warrants further investigation given the influence of both Native American people who inhabited the area as well as the original Mission San Gabriel (Mission Vieja) that was located near the Rio Hondo in the Whittier Narrows area until it was destroyed by a flash flood in 1776.

The Whittier LRT alignment appears to have the most cultural resources along its route. Three buildings on the western end (between Wilcox Ave. and Rosemead Blvd.) are OHP listed as is a bank located west of Rosemead Blvd. The Fred C. Nelles School, a reform school, and a paradox hybrid walnut tree are two state historic landmarks located near the eastern end of the alignment. Several other structures along the alignment will require more research to determine their significance. The Pio Pico State Historic Park, between Pioneer and Redman Aves., is a particularly sensitive area as can be seen in the recognition of this resource by both state and federal authorities. The area is near the bank of the San Gabriel River and thus an environment favorable for prehistoric settlement; site CA-LAN-182a is recorded in the vicinity of the historic buildings. Excavation for project construction in this area has a high likelihood of encountering prehistoric remains. Euro American settlement was also present in an area called "Jimtown" (no site record or number), adjacent to the Pico property north of Whittier Blvd. Any subsurface disturbance/construction along either side of

Whittier Blvd. in this area is likely to yield archaeological remains of one or more periods from prehistory to the 20th century.

The Beverly LRT alignment appears to have fewer resources than Whittier Blvd. because development is relatively more recent. Nevertheless, four state-listed commercial properties are located near the west end of the alignment west of Montebello Blvd. Additional assessment of other properties with potential for historical significance will be necessary if this alignment is selected for further evaluation in the Draft EIR/EIS.

Little information is available for the Washington (LRT) alignment. However, the Rio San Gabriel Battlefield, a state landmark, is located along Washington Blvd. at Bluff Rd. Excavation for project construction in this area could encounter significantly important remains. However, because this alignment is aerial, there is less likelihood of disturbance of this resource since less excavation would be required for the aerial structures. If this alignment is selected for inclusion in the Draft EIR/EIS, additional research should be undertaken to determine if other cultural resources exist in the vicinity of the Washington (LRT) alignment.

With regard to aerial or at-grade configurations that comprise the various segments of the refined alternatives, potential effects on adjacent historic resources would be different. Although an aerial alignment would require less right-of-way, thus reducing the likelihood of directly affecting an historic property, the aerial structure itself is more likely to result in potential visual impacts and could alter a property's historic setting. The Area of Potential Effects (APE) for an aerial alignment may need to encompass a larger area than an at-grade alignment to take into account potential effects on properties at a farther distance that may still be affected by this obtrusive project element. As previously mentioned, those segments of the alternatives operating on aerial structures would require considerably less excavation than at-grade segments; thus, impacts on archaeological resources would be less likely.

An at-grade configuration would still introduce a new visual element to the surrounding historic resources, unless historic trolley routes previously operated along a route. In that case, it is likely that the presence of the overhead catenary and supporting elements would be seen as restoring an historic feature of the setting. Even if historic trolley did not operate along any of the routes, an at-grade configuration would be less intrusive than aerial with regard to visual impacts. However, as mentioned, the wider right-of-way needed to accommodate LRT or Busway at-grade in an exclusive or semi-exclusive guideway has a higher potential of requiring right-of-way from a site of historic significance, which would be an adverse effect unless the take is so minor that it does not affect the attributes qualifying the property for eligibility.

There are a few differences in anticipated effects on cultural resources depending on whether the selected mode is LRT or Busway. LRT generally requires deeper excavation for fixed guideway than Busway. The deeper excavation presents a higher potential for encountering and disturbing archaeological remains in areas where such resources are likely to occur. Also,

Busway has the flexibility to share existing traffic lanes or to operate in exclusive or semi-exclusive guideway. This flexibility offers the opportunity to minimize right-of-way needs in areas with significant cultural resources. Busway also does not have overhead catenary; therefore, potential visual impacts on historic resources may be less.

If noise or vibration would result in impacts on cultural resources that would diminish the integrity of a property's significant historic features, then this would be considered an adverse effect. The noise and vibration levels of the two technologies are somewhat different. Fuel-powered buses generally produce higher noise levels than electrically-powered light rail vehicles. However, determination of whether an impact from either source may be adverse depends on other factors such as distance between the vehicle and resource, vehicle speed, and frequency of operations at various times of the day. Buses are not generally considered major sources of vibration due to the rubber-tire operation. However, light rail vehicles have potential to produce vibration impacts. Whether an impact would be adverse depends on a number of factors such as distance between the vehicle and the resource, vehicle speed and operating frequencies, soil conditions, and type of building construction. An assessment of potential noise and vibration levels, including investigation of types of mitigation measures available to minimize impacts on historic resources, should be conducted for the Draft EIR/EIS.

4.7 Air Quality

This section addresses the potential impacts of the proposed project on air quality. The following analysis describes the baseline ambient air quality conditions of the impacted area, the regulatory setting and background as it relates to activities affecting air quality, and potential impacts to air quality from the proposed alternatives.

An analysis of air quality impacts and potential reduction in green house gases was conducted.

The potential air quality benefits or impacts of each alternative, relative to the No-Build scenario are identified in this section. No significant differences between alternatives were detected during this preliminary environmental review; however, small differences are noted. Detailed environmental review and impacts for mitigation will be conducted during the subsequent Draft EIR/EIS phase.

A description of the existing air quality conditions, discussion of the air quality impact analysis methodology, and summary of the results are presented in the following subsections.

The criteria used for the comparison of alternatives for this analysis were the potential to reduce emissions of inhalable PM10, oxides of nitrogen (NOx), and sulfur oxides (SOx), which are usually analyzed as sulfur dioxide (SO2). Therefore, the analysis focuses on these

pollutants. In addition, the benefits or impacts from emissions of the greenhouse gas CO2 are analyzed.

4.7.1 Meteorological Setting

The PSA is in the South Coast Air Basin (SCAB), which exhibits a distinctive climate due to its unique terrain and geographic location. The SCAB is a coastal plain with broad valleys and low rolling hills bounded by the Pacific Ocean to its southwest and high mountain defining its other perimeters (South Coast Air Quality Management District (SCAQMD) 1993. CEQA Air Quality Handbook. April. p. A8-1). The regional climate is dominated by a persistent high pressure area that commonly resides over the eastern Pacific Ocean (the Pacific High), resulting in a mild climate tempered by cool sea-breezes. Besides the influence of the Pacific High, other important meteorological characteristics influencing air quality in the PSA include persistent temperature inversions, prevalent sunlight, and predominant light onshore winds, with mountain and valley topography.

These combine to limit the mixing of air in the atmosphere and concentrate air contaminants under the persistent atmospheric inversions. In the summer, the inversion layers can be stronger than in the winter, preventing air pollution (ozone) from dispersing into the atmosphere. In the winter, ground level inversions form at night which can trap carbon monoxide pollution created from combustion sources such as motor vehicles.

4.7.2 Regulatory Setting

Federal, State, and local authorities have adopted various rules and regulations requiring evaluation of air quality impacts of projects and appropriate mitigation for air pollutant emissions.

Federal

The Federal Clean Air Act (amended in 1990) (FCAA) establishes emission reduction goals and the basis for the National Ambient Air Quality Standards (NAAQS). The United States Environmental Protection Agency (EPA) is charged with enforcing the FCAA and is responsible for establishing the NAAQS. The EPA has set NAAQS for the following criteria pollutants: carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM_{10} and $PM_{2.5}$), and SO_2.

State

The State of California ratified the California Clean Air Act (CCAA) in 1988, amended in 1992, which set forth the requirements for the California Ambient Air Quality Standards (CAAQS). The California Air Resources Board (CARB), part of the California Environmental Protection Agency (CalEPA), is responsible for meeting the State's requirements of the FCAA and

administering the CCAA. The CCAA requires regional air districts in the State to try and meet CAAQS.

Local and Regional Authority

The state has been split up into 35 local or regional air districts. This project falls within the local jurisdiction of the South Coast Air Quality Management District (SCAQMD), which has jurisdiction over an area of 10,743 square miles consisting of Orange County, the non-desert portions of Los Angeles, Riverside, San Bernardino Counties, the Riverside County portions of the Salton Sea Air Basin, and the Mojave Desert Air Basin. The SCAB falls under the jurisdiction of the SCAQMD and covers an area of 6,745 square miles, which includes all of Orange County, the non-desert portions of Los Angeles, Riverside, and San Bernardino Counties. While air quality in this area has improved, the Basin requires continued diligence to meet air quality standards.

The SCAQMD is responsible for monitoring air quality, planning, implementing, and enforcing programs designed to attain and maintain CAAQS and NAAQS for the district.

4.7.3 Air Quality Standards

In California, the CAAQS is more restrictive than the NAAQS for some criteria pollutants. The NAAQS and CAAQS are listed in Table 4-7. Also included within this table is the averaging time for determination of attainment status.

Table 4-7
National and California Ambient Air Quality Standards
(NAAQS and CAAQS)

Pollutant	Averaging Time	NAAQS Primary	NAAQS Secondary	CAAQS
Carbon monoxide (CO)	1 hour	35 ppm (40 mg/m^3)	N/A	20 ppm (23 mg/m^3)
	8 hour	9 ppm (10 mg/m^3)	N/A	9.0 ppm (10 mg/m^3)
Ozone (O_3)	1 hour	N/A[a]	N/A	0.09 ppm (180 µg/m^3)
	8 hour	0.08 ppm (157 µg/m^3)	Same as primary	0.070 ppm (137 µg/m^3)
Nitrogen dioxide (NO_2)	1 hour	N/A	N/A	0.25 ppm (470 µg/m^3)
	Annual	0.053 ppm (100 µg/m^3)	Same as primary	N/A
Sulfur dioxide (SO_2)	1 hour	N/A	N/A	0.25 ppm (655 µg/m^3)
	3 hour	N/A	0.5 ppm (1300 µg/m3)	N/A
	24 hour	0.14 ppm (365 µg/m^3)	N/A	0.04 ppm (105 µg/m^3)
	Annual	0.030 ppm (80 µg/m^3)	N/A	N/A
Respirable particulate matter (PM_{10})	24 hour	150 µg/m^3	Same as primary	50 µg/m^3
	Annual	N/A[b]	Same as primary	20 µg/m^3
Fine particulate matter ($PM_{2.5}$)	24 hour	35 µg/m3	Same as primary	N/A
	Annual	15 µg/m^3	Same as primary	12 µg/m^3

a. The ozone 1-hour NAAQS was revoked by USEPA on June 15, 2005.
b. The PM10 annual NAAQS was revoked by USEPA on October 17, 2006.
mg/m3 milligrams per cubic meter
N/A not applicable
ppm parts per million
µg/m3 micrograms per cubic meter
Sources: 40 CFR 50; and 17 CCR 70200.

Most pollutants regulated by the NAAQS have a primary and secondary standard. The primary standard protects everyone, specifically aimed at children, people with asthma, and the elderly with health risk. The secondary standard is established to protect against the unacceptable effects on the public welfare, such as damage to crops, plants, animals, property, and ecosystems.

4.7.4 Environmental Conditions

The SCAQMD operates a regional air quality monitoring network that provides average concentration levels of criteria pollutants as determined by the NAAQS and CAAQS. Results from area monitoring networks are used by regulatory agencies to help define attainment status of local and regional areas.

Regional Air Quality Conditions

The SCAB has been in violation of NAAQS and CAAQS for ozone and particulate matter and has been designated as nonattatinment for these pollutants as shown in Table 4-8.

Table 4-8 Federal and State Attainment Status in the SCAB

Pollutants	Federal Classification	State Classification
Ozone 1-hour	—	Nonattainment
Ozone 8-hour	Nonattainment, Severe-17	—
PM10	Serious Nonattainment	Nonattainment
PM2.5	Nonattainment	Nonattainment
CO	Attainment	Attainment
NO_2	Unclassified/Attainment	Attainment

Local Air Quality Conditions

The air quality conditions, including baseline levels, are established through the two air monitoring stations closest to the project site. These air monitoring stations are the Pico Rivera #2 Station and the Los Angeles North Main St. Station.

Pico Rivera #2

The air quality monitoring station that is closest to the PSA is the Pico Rivera #2 Air Monitoring Station. The station is located at 4144 San Gabriel River Pwky., in Pico Rivera. The station lies immediately north of Alternative 3, near the intersection of Beverly Blvd. and San Gabriel River Pwky. The following Table 4-9 shows exceedances of NAAQS and CAAQS for the most recently available annual values.

Table 4-9 Pico Rivera #2 Air Monitoring Station

Standard	2005[c]	2006	2007
OZONE STANDARD			
Maximum Concentration 1-hour Standard (ppm)	0.077	0.128	0.135
Maximum Concentration 8-hour Standard (ppm)	0.065	0.095	0.101
Days > CAAQS 1-hour Standard (0.09 ppm)	0	9	6
Days > NAAQS 8-hour Standard (0.08 ppm)	0	3	2
NO_2 (1-Hour) STANDARD[a]			
Maximum Concentration (ppm)	0.087	0.102	0.108
Days > CAAQS (0.18 ppm)	0	0	0
PM10 (24-Hour) STANDARD			
Maximum Concentration (ug/m^3)[d]	-	-	-
Days > CAAQS (50 ug/m^3)[d]	-	-	-
Days > NAAQS (150 ug/m^3)[d]	-	-	-
PM2.5 (24-Hour) STANDARD			
Maximum Concentration (ug/m^3)	58.2	72.2	63.6
Days > NAAQS (65 ug/m^3)[b]	0	1	0
CO (8-Hour) STANDARD			
Maximum Concentration (ppm)	2.41	2.71	2.89
Days > CAAQS (9.0 ppm)	0	0	0
Days > NAAQS (9.0 ppm)	0	0	0

Notes: ppm=parts per million; μg/m^3=micrograms per cubic meter; -- means data not available

[a] No Federal (1-hour) NO_2 standard.

[b] Number of exceedances based on NAAQS applicable during period shown (65 µg/m^3). Standard was changed to 35 µg/m^3 in November 2006, to be applied to 2007.

[c] Pico Rivera Site No.1 data was used. Not all of Site 2 data was on-line in 2005.

[d] There was insufficient data to validate date for this contaminant.

Los Angeles – N. Main St.

The Los Angeles – North Main St. Monitoring Station is located approximately five miles northwest of the PSA. The monitoring site is located at 1630 N. Main St., in Los Angeles. The following Table 4-10 shows exceedances of NAAQS and CAAQS for the most recently available annual values for the monitoring site.

Table 4-10
Los Angeles – N. Main St. Air Monitoring Station

Standard	2005	2006	2007
OZONE STANDARD			
Maximum Concentration 1-hour Standard (ppm)	0.121	0.108	0.115
Maximum Concentration 8-hour Standard (ppm)	0.098	0.079	0.103
Days > CAAQS 1-hour Standard (0.09 ppm)	2	8	3
Days > NAAQS 8-hour Standard (0.08 ppm)	1	0	2
NO_2 (1-Hour) STANDARD[a]			
Maximum Concentration (ppm)	0.126	0.111	0.104
Days > CAAQS (0.18 ppm)	0	0	0
PM10 (24-Hour) STANDARD			
Maximum Concentration (ug/m^3)	70.0	59.0	78.0
Days > CAAQS (50 ug/m^3)	3	3	1
Days > NAAQS (150 ug/m^3)	0	0	0
PM2.5 (24-Hour) STANDARD			
Maximum Concentration (ug/m^3)	73.7	56.2	51.2
Days > NAAQS (65 ug/m^3)[b]	2	0	0
CO (8-Hour) STANDARD			
Maximum Concentration (ppm)	3.01	2.68	2.15
Days > CAAQS (9.0 ppm)	0	0	0
Days > NAAQS (9.0 ppm)	0	0	0

4.7.5 Air Quality Impacts

Due to the region's poor air quality, officials encourage citizens to decrease the use of motor vehicles to reduce mobile emission sources in the area. One of the goals of the project is to develop mass transit and decrease overall motor vehicle use in the area in an effort to improve the regional air quality. Annually, the region's VMT will be expected to decrease as detailed in the proposed alternatives, thereby allowing for the reduction of pollution sources and area concentrations.

Sensitive Receptors

Some land uses are considered more sensitive to air pollution than others due to the types of population groups or activities involved. Sensitive population groups include children, the elderly, the acutely ill and the chronically ill, especially those with cardio-respiratory diseases.

Residential areas are also considered to be sensitive to air pollution because residents (including children and the elderly) tend to be at home for extended periods of time, resulting in sustained exposure to any pollutants present. Recreational land uses are considered moderately sensitive to air pollution. Although exposure periods are generally short, exercise places a high demand on respiratory functions, which can be impaired by air pollution. In addition, noticeable air pollution can detract from the enjoyment of recreation. Industrial and commercial areas are considered the least sensitive to air pollution as exposure periods are relatively short and intermittent and the majority of the workers tend to stay indoors most of the time. In addition, the working population is generally the healthiest segment of the general public.

The area surrounding the project site is urbanized and is located within the greater Los Angeles metropolitan area. Local receptor sites along the Eastside Transit Corridor Phase 2 consist of mixed residential and commercial property. Additional information about the sensitive receptors in the area is detailed in the preceding Community and Neighborhoods section.

Short-term localized impacts may occur as a result of initial construction efforts and improvements along the corridor. Although construction impacts to air quality may be substantial on occasion depending on the activity and weather conditions, these activities are expected to be intermittent and temporary in duration.

Long-term and regional operational impacts will be dependent on the choice of operation and level of activity. The Busway alternative (Alternative 2) will utilize compressed natural gas (CNG) buses along SR-60. This alternative will yield emissions reductions compared to other mobile sources (gasoline and diesel motor vehicles) for such emissions as volatile organic compounds (VOCs), CO, PM, and NOx. For assessment of the LRT alternatives (Alternatives 1, 3, 4, and 5), it is established that the light rail trains will be powered by electricity. Emissions of criteria pollutants will not be measurable along the route. Emissions related to

electric power associated at the source of electric production are generally not measurable at the point of utilization. Air quality impacts along the corridor routes (SR-60, W. Beverly, Whittier, and Washington Blvd.) will be insignificant for criteria pollutants; therefore, less than significant impacts are anticipated.

To assess the potential air quality benefit or impacts as a result of the Busway alternative by the year 2030, an analysis of the VMT in 2030 was conducted. The comparative results are detailed in the following table as it relates to nonattainment pollutants (VOC, NOx, and PM) and CO. Carbon monoxide attainment has recently been achieved in the SCAB. Evaluation of CO has been provided for attainment maintenance purposes and regional evaluation.

Emissions for each condition were calculated using CARB's most recent version for on-road mobile emissions modeling, EMFAC2007. Vehicle emissions modeling was based on grams/mile of pollutant per VMT. For a true comparative analysis, only emissions of roadway travel were evaluated. No assessment of fugitive emission losses or engine start emissions was conducted. Passenger vehicles (light duty automobiles and light duty trucks, Class 1 and 2 per EMFAC classification) were used in this analysis because the VMT from these vehicles are most likely to be offset through implementation of the alternatives. Therefore, only the emission factors for these vehicles were included as part of the analysis. The bus fleet in 2030 is expected to be powered by CNG. The alternative analysis utilized an emission factor for urban buses using only CNG. For the baseline estimate, the EMFAC model utilizes an emission factor for the urban bus fleet which does include some diesel powered vehicles.

Although CARB and transportation officials have determined daily VMT to increase by the year 2030, overall criteria emissions are expected to decrease as shown in Table 4-11. This is attributed to increased overall vehicle and fuel improvements by the year 2030 and accounts for vehicle turnovers to the newer improved vehicle models. The Busway alternative does show significantly reduced emissions from the current bus fleet and passenger vehicle emissions for which it is intended to offset.

The design alternatives will not cause or contribute to local or regional CO, PM or NOx violations or exceedances of attainment status or regulatory standards; therefore, less than significant impacts are anticipated. During the Draft EIR/EIS, alternatives will be evaluated on localized increases in emissions.

Table 4-11
Los Angeles County Area Criteria Emissions per VMT

		Baseline Passenger Vehicles[1] and Urban Buses	Year 2030 Passenger Vehicles[1]	Year 2030 Busway Alternative[2]
Daily VMT		383 Million	488 Million	0.84 Million
VOC	tons/day	42.93	4.24	0.21
	tons/year	15,669.45	1,547.6	77.9
CO	tons/day	1,122.34	262.83	0.48
	tons/year	409,654.1	95,932.95	176.13
NOx	tons/day	126.25	18.63	1.64
	tons/year	46,081.25	6,799.95	599.2
PM10	tons/day	5.5	7.71	.01
	tons/year	2,007.5	2,814.15	3.38

Source: California Air Resource Board, and EMFA C2007 emissions model. 2008 values were used for baseline.
[1] Includes light duty automobiles (LDA) and light duty trucks (LDT1 and LDT2)
[2] Urban buses using CNG

4.7.6 Evaluation Methodology

The analysis of potential air quality benefits or impacts for each alternative was conducted using the following steps:

- Obtain a summary, by roadway category and time of day, of VMT, vehicle hours traveled (VHT), and average speed for each alternative.
- Develop speed-dependent average emission factors for the vehicle types that will be most affected by the proposed transit alternatives.
- Calculate total vehicle emissions associated with each alternative, and rank the alternatives.

Roadway VMT, VHT, and Speed

The VMT, VHT and average speeds were provided by roadway type and time of day for each alternative. The nine (9) roadway types included: freeways, major/expressways, primary, secondary, HOV2, centroid connectors, ramps, HOV3, and toll roads. The traffic data were developed for specific times of day: morning (AM), midday (MD), evening (PM), and nighttime (NT). The daily total VMT and VHT and daily average speeds for each alternative are summarized in Tables 4-12 through 4-18.

Table 4-12
2030 No-Build Daily VMT, VHT and Average Speeds

Roadway Category	VMT	VHT	Average Speed (mph)
Freeways	1,783,924	3,319,666	32.2
Major/Expressway	429,186	1,464,620	17.6
Primary	1,019,172	3,668,571	16.7
Secondary	384,307	1,797,194	12.8
HOV2	369,113	640,139	34.6
Centroid Connectors	397,604	904,615	26.4
Ramps	69,436	160,914	25.9
HOV3	13,992	28,791	29.2
Toll	74,040	89,381	49.7
Grand Total	4,540,774	12,073,891	22.6

Table 4-13
2030 TSM Daily VMT, VHT and Average Speeds

Roadway Category	VMT	VHT	Average Speed (mph)
Freeways	1,783,407	3,308,248	32.3
Major/Expressway	429,365	1,467,319	17.6
Primary	1,018,965	3,669,159	16.7
Secondary	384,191	1,796,205	12.8
HOV2	369,027	641,134	34.5
Centroid Connectors	397,549	904,494	26.4
Ramps	69,492	161,062	25.9
HOV3	13,958	28,561	29.3
Toll	74,157	89,455	49.7
Grand Total	4,540,112	12,065,637	22.6

Table 4-14
2030 SR-60 LRT Daily VMT, VHT and Average Speeds

Roadway Category	VMT	VHT	Average Speed (mph)
Freeways	1,783,530	3,302,607	32.4
Major/Expressway	429,163	1,464,503	17.6
Primary	1,019,415	3,670,607	16.7
Secondary	384,394	1,807,879	12.8
HOV2	367,970	633,189	34.9
Centroid Connectors	397,526	904,464	26.4
Ramps	69,544	161,310	25.9
HOV3	13,910	28,422	29.4
Toll	74,163	89,453	49.7
Grand Total	4,539,616	12,062,435	22.6

Table 4-15
2030 SR-60 Busway Daily VMT, VHT and Average Speeds

Roadway Category	VMT	VHT	Average Speed (mph)
Freeways	1,783,135	3,299,385	32.4
Major/Expressway	428,900	1,466,965	17.5
Primary	1,019,180	3,669,639	16.7
Secondary	384,340	1,806,577	12.8
HOV2	368,948	639,434	34.6
Centroid Connectors	397,490	904,358	26.4
Ramps	69,465	161,366	25.8
HOV3	13,974	28,580	29.3
Toll	74,082	89,285	49.8
Grand Total	4,539,513	12,065,589	22.6

Table 4-16
2030 Beverly LRT Daily VMT, VHT and Average Speeds

Roadway Category	VMT	VHT	Average Speed (mph)
Freeways	1,783,795	3,298,823	32.4
Major/Expressway	429,076	1,464,255	17.6
Primary	1,019,694	3,675,573	16.6
Secondary	384,492	1,814,641	12.7
HOV2	368,059	634,406	34.8
Centroid Connectors	397,511	904,403	26.4
Ramps	69,525	161,298	25.9
HOV3	13,950	28,524	29.3
Toll	74,249	89,659	49.7
Grand Total	4,540,351	12,071,581	22.6

Table 4-17
2030 Whittier LRT Daily VMT, VHT and Average Speeds

Roadway Category	VMT	VHT	Average Speed (mph)
Freeways	1,783,211	3,300,633	32.4
Major/Expressway	429,021	1,460,975	17.6
Primary	1,019,018	3,671,432	16.7
Secondary	384,595	1,818,894	12.7
HOV2	368,702	638,260	34.7
Centroid Connectors	397,517	904,430	26.4
Ramps	69,487	160,871	25.9
HOV3	13,964	28,548	29.3
Toll	74,121	89,259	49.8
Grand Total	4,539,636	12,073,300	22.6

Table 4-18
2030 Washington LRT Daily VMT, VHT and Average Speeds

Roadway Category	VMT	VHT	Average Speed (mph)
Freeways	1,782,976	3,309,700	32.3
Major/Expressway	429,542	1,474,293	17.5
Primary	1,019,444	3,670,098	16.7
Secondary	384,320	1,806,149	12.8
HOV2	368,866	634,621	34.9
Centroid Connectors	397,518	904,436	26.4
Ramps	69,455	161,098	25.9
HOV3	13,957	28,555	29.3
Toll	74,189	90,417	49.2
Grand Total	4,540,266	12,079,367	22.6

Emissions Factors

Emission factors were developed using the CARB EMFAC2007 emissions model. The model was run in the Burden mode for specific speeds to generate speed-dependent emission factors for vehicles in Los Angeles County. The output includes speed-dependent emission factors for each of the EMFAC2007 motor vehicle types (e.g., light-duty catalyzed gasoline auto, heavy-duty diesel truck, urban bus, etc.).

For this analysis, it was assumed that the vehicles that would actually be removed from the road under the various build alternatives would be passenger cars, pickup trucks, and sport utility vehicles. The transit options under consideration would be targeting commuters that normally travel in these types of vehicles. These vehicles fall into three EMFAC2007 categories: light-duty auto (LDA), light-duty truck 1 (LDT1 - smaller pickups and SUVs), and light-duty truck 2 (LDT2 - larger pickups and SUVs). Composites of the LDA, LDT1 and LDT2 emission factors were developed, weighted by the total VMT traveled by each vehicle type in Los Angeles County.

The emission factors for PM10, NOx, SO2, and CO2 are summarized by speed in Table 4-19.

Table 4-19
2030 Emissions Factors from EMFAC2007

Speed, mph	NOx, gram/mile	CO_2, gram/mile	SO_2, gram/mile	PM10, gram/mile
11	0.078	800	0.008	0.071
14	0.072	690	0.007	0.061
15	0.071	659	0.006	0.058
16	0.069	630	0.006	0.055
17	0.068	603	0.006	0.053
18	0.066	579	0.005	0.051
21	0.063	516	0.005	0.046
22	0.061	498	0.005	0.045
23	0.060	482	0.004	0.044
25	0.058	453	0.004	0.042
26	0.058	440	0.004	0.040
27	0.057	428	0.004	0.039
28	0.056	417	0.004	0.039
31	0.054	389	0.003	0.037
32	0.054	382	0.003	0.036
33	0.053	375	0.003	0.036
39	0.050	346	0.003	0.033
40	0.050	344	0.003	0.033
41	0.050	342	0.003	0.033

Table 4-19
2030 Emissions Factors from EMFAC2007

Speed, mph	NOx, gram/mile	CO_2, gram/mile	SO_2, gram/mile	PM10, gram/mile
42	0.050	340	0.003	0.033
47	0.049	339	0.003	0.033
49	0.049	342	0.003	0.033
54	0.050	359	0.003	0.033
62	0.054	417	0.004	0.034
67	0.055	451	0.004	0.036
68	0.055	451	0.004	0.036
71	0.055	450	0.004	0.036

Emission Calculations

The daily emissions for each air pollutant are calculated by multiplying the pollutant emission factor for the appropriate, speed-dependent VMT on a given roadway type for a specific time of day (AM, MD, PM, or NT). The results are summed over all time periods to obtain the daily emissions for each alternative. These results are presented in Table 4-20.

While air quality impacts have been identified as one of the means to rank the alternatives, it should be noted here that the absolute difference between the best and worst options with regard to air pollutant emissions is less than one (1) percent. The alternatives continued to be ranked; however, the use of air quality impacts to select or screen out one or more alternatives is not feasible due to the lack of measurable differences between alternative emissions.

Table 4-20
2030 Emissions by Alternative

Speed, mph	NOx, lb/day	CO_2, lb/day	SO_2, lb/day	PM10, lb/day
No-Build	609.27	5,081,895	48.92	454.50
TSM	608.94	5,078,984	48.90	454.32
SR-60 LRT	608.79	5,075,123	48.90	453.94
SR-60 Busway	609.10	5,080,531	48.90	454.38
Beverly LRT	609.00	5,079,698	48.91	454.38
Whittier LRT	608.89	5,078,727	48.90	454.30
Washington LRT	609.18	5,082,572	48.91	454.61

4.7.7 Environmental Issues

The results presented in Table 4-20 indicate that emissions of NOx and SO2 are highest for the No-Build alternative, as anticipated. Somewhat unexpected are the results indicating emissions of CO2 and PM10 are highest under the Washington LRT Alternative, even higher than the No-Build emissions. Comparing the VMT, VHT and average speed between the Washington LRT (Table 4-18) and No-Build (Table 4-12) indicates that the average speeds are almost the same, the Washington LRT VMT is reduced by only 0.01 percent, but the VHT increased by roughly 0.05 percent. These differences are small enough that the regional transit assessment is too general or looks at too large of an area to accurately determine the Washington LRT impact in the Corridor. Completing a more focused analysis of each alternative may be appropriate for the Environmental Impact Report.

Emissions of NOx, CO2, and PM10 are lowest for the SR-60 LRT Alternative. The SR-60 Busway Alternative had the lowest emissions of SO2, although the difference between the SR-60 LRT and Busway Alternatives was less than 0.003 lb/day. Essentially, the SR-60 LRT Alternative provided the greatest benefit when considering reductions of NOx, SO2, and PM10 emissions, as well as considering reductions of greenhouse gas emissions. A ranked comparison of emission reductions, based on NOx, is presented in Table 4-21. The results are presented graphically in Figure 4-16, indicating the percent reduction relative to the No-Build emissions.

Table 4-21
Alternative Daily NOx Reductions Relative to No-Build Emissions

Speed, mph	NOx, lb/day	CO_2, lb/day	SO_2, lb/day	PM10, lb/day
No-Build	--	--	--	--
SR-60 LRT	0.480	6,771	0.016	0.562
Whittier LRT	0.378	3,168	0.015	0.204
2030 TSM	0.329	2,911	0.013	0.180
Beverly LRT	0.268	2,197	0.006	0.117
SR-60 Busway	0.168	1,364	0.016	0.115
Washington LRT	0.085	- 677	0.007	-0.109
Note: Negative (-) Values indicate an increase above the No-Build emissions.				

Alternative Rankings

The alternatives are ranked high, medium, and low as discussed below. High indicates that the alternative results in a relatively higher benefit to air quality and low impact (i.e., low emission levels of pollutants). Medium indicates that the alternative results in some benefit to air quality. Low indicates the alternative has little benefit to air quality or results in higher impacts to air quality relative to the other alternatives.

The No-Build alternative is ranked Low. It produces the highest emissions of NOx and SO2, and second highest emissions of PM10 and CO2. The TSM alternative would have an impact rating of Medium; it produces some benefits for all pollutants. The level of the benefits fall between the levels for Whittier LRT and Beverly LRT.

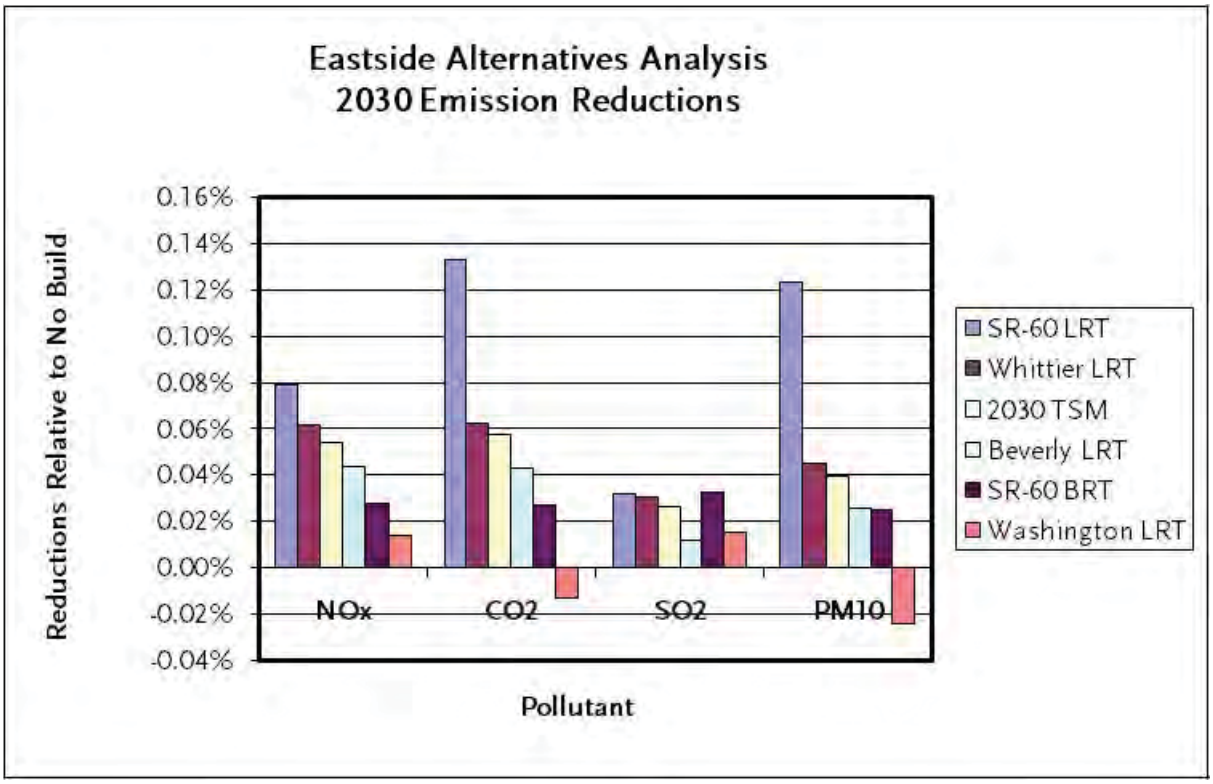
However, as noted above, the absolute differences in emissions between the alternatives is less than one (1) percent. Therefore, air quality benefits/impacts do not appear to provide a good distinction for selecting or screening out alternatives.

High: SR-60 LRT: This alternative provided the largest (air quality) benefits to NOx, PM10, and CO2, and second largest benefit to SO2. The PM10 and CO2 benefits of this alternative are more than twice that of the next best alternative.

Medium: Whittier LRT, Beverly LRT, and SR-60 Busway: These alternatives all provided some benefit to each of the air pollutants considered.

Low: Washington LRT: This alternative actually increased emissions of CO2 and PM10 above the No-Build scenario. In addition, this alternative had the lowest beneficial impact on NOx emissions and second-lowest beneficial impact on SO2 emissions.

Figure 4-16 Relative Emission Reductions by Alternative



4.8 Noise and Vibration

This section describes the PSA noise and vibration environment in terms of the existing ambient noise levels, the number of noise and vibration-sensitive land uses along each alternative alignment and the sensitivity of each alternative alignment to transit noise and vibration impact. The section also presents the applicable noise criteria found in guidance and regulations at the federal and local level. Noise and vibration are typically major concerns when evaluating the effects of a transit project on a surrounding community. By their nature, transit systems are located near populated areas and their noise and vibration generation can be significant at nearby residences and other sensitive land uses, such as schools, hospitals and churches. The intent of this section is to identify the major potential noise and vibration impact issues and regulatory requirements that will be evaluated in further detail in the Draft EIR/EIS.

4.8.1 Evaluation Methodology

Regulatory Framework

Project transit operations would be subject to Federal Transit Administration noise and vibration criteria. Project construction and operations would also be subject to the noise ordinances of the local jurisdictions in the PSA, namely nine cities and unincorporated County of Los Angeles.

Federal Noise and Vibration Impact Criteria

FTA Noise Impact Criteria

FTA has developed standards and criteria for assessing noise impacts related to transit projects. These standards, outlined in "Transit Noise and Vibration Impact Assessment" (FTA, 2006), are based on community reactions to noise. The criteria reflect changes in noise exposure using a sliding scale where the higher the level of existing noise, the smaller increase in total noise exposure is allowed. Some land use activities are more sensitive to noise than others, such as parks, churches, and residences, as compared to industrial and commercial uses. The FTA Noise Impact Criteria groups sensitive land uses into the following three categories:

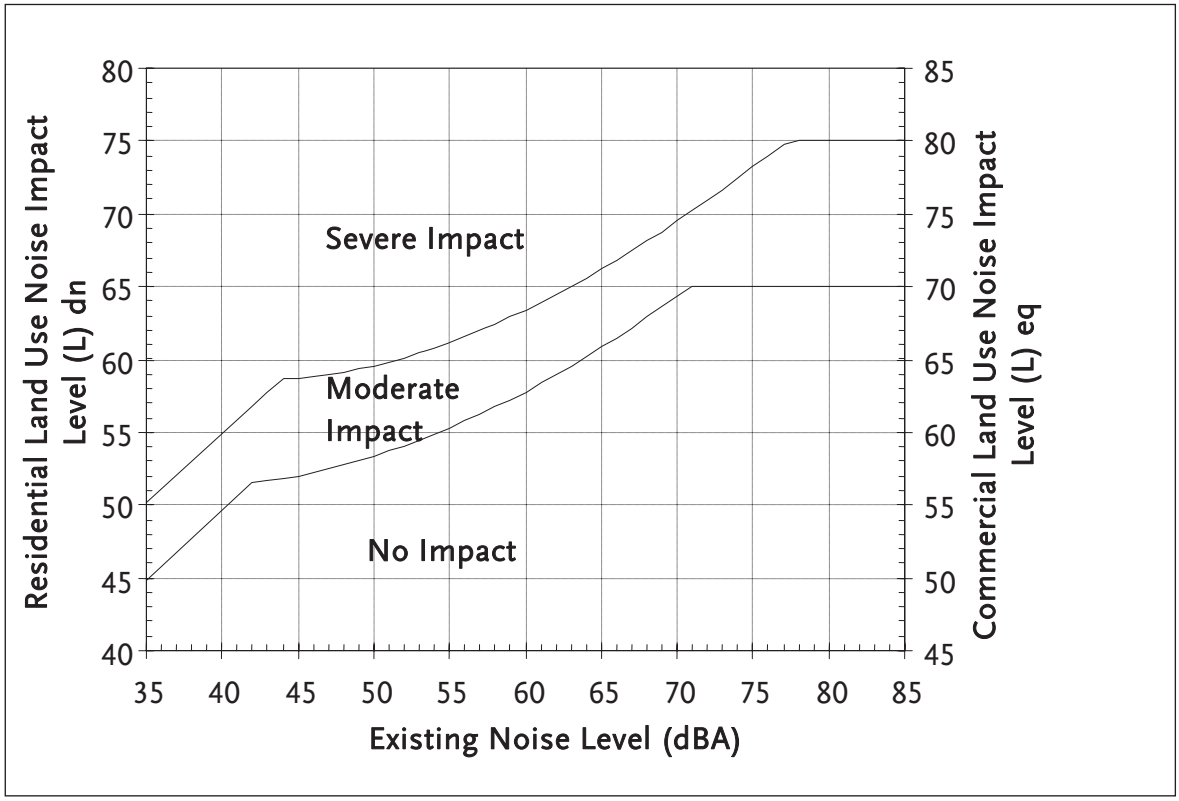
- Category 1 - Buildings or parks where quiet is an essential element of their purpose
- Category 2 - Residences and buildings where people normally sleep. This includes residences, hospitals, and hotels, where nighttime sensitivity is assumed to be of utmost importance
- Category 3 - Institutional land uses with primarily daytime use that depends on quiet as an important part of operations, including schools, libraries, and churches

The Day-Night Average Sound Level (LDN) is used to characterize noise exposure for residential areas and other buildings where people sleep (Category 2). Maximum 1-hour Equivalent Sound Level (Leq) (during the period that the facility is in use) is utilized for other

noise-sensitive land uses such as school buildings (Categories 1 and 3). The following two impact levels are included in the FTA criteria, as shown in Figure 4-17:

- Moderate Impact - In this range, other project-specific factors must be considered to determine the magnitude of the impact and the need for mitigation. These other factors may include the predicted increase over existing noise levels, the type and number of noise-sensitive land uses affected, existing outdoor-indoor sound insulation, and the cost effectiveness of mitigating noise to more acceptable levels.
- Severe Impact - Noise mitigation will be specified for severe impact areas unless there is no practical method of mitigating the noise.

Figure 4-17 Noise Impact Criteria for Transit Projects



Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006

FTA Vibration Impact Criteria

FTA has developed impact criteria for acceptable levels of ground-borne noise and vibration (May 2006). Table 4-22 summarizes the FTA impact criteria for ground borne vibration. These criteria are based on previous standards, criteria, and design goals, including noise and vibration guidelines from ANSI S3.29 (Acoustical Society of America, 1983) and the American Public Transit Association (APTA, 1981). Some buildings (e.g., concert halls, television and recording studios, and theaters) can be very sensitive to vibration, but do not fit into any of the three FTA's sensitive land use categories previously described. Because of these buildings' sensitivity to vibration, they usually warrant special attention during the environmental review of a rail project. Table 4-23 lists criteria for acceptable levels of ground-borne vibration for various types of special buildings.

Table 4-22
FTA Ground-Borne Vibration Impact Criteria

Land Use Category	Ground-Borne Vibration Impact Levels (VdB re 1 Micro-inch/sec)		
	Frequent Events[1]	Occasional Events[2]	Infrequent Events[3]
Category 1: Buildings where vibration would interfere with interior operations	65 VdB[4]	65 VdB[4]	65 VdB[4]
Category 2: Residences and buildings where people normally sleep	72 VdB	75 VdB	80 VdB
Category 3: Institutional land uses with primarily daytime use	75 VdB	78 VdB	83 VdB

Source: Transit Noise and Vibration Impact Assessment (FTA, May 2006)
Notes:
1 "Frequent Events" are defined as more than 70 vibration events of the same source per day. Most rapid transit projects fall into this category.
2 "Occasional Events" are defined as between 30 and 70 vibration events of the same source per day. Most commuter rail lines have this many events.
3 "Infrequent Events" are defined as fewer than 30 vibration events of the same kind per day. This category includes most commuter rail branch lines.
4 This criterion limit is based on levels that are acceptable for most moderately sensitive equipment, such as optical microscopes. Vibration-sensitive manufacturing or research will require detailed evaluation to define acceptable vibration levels. Ensuring lower vibration levels in a building often requires special design of the HVAC systems and stiffened floors.

Table 4-23
FTA Ground-Borne Vibration Impact Criteria for Special Buildings

Type of Building or Room	Ground-Borne Vibration Impact Levels (VdB re 11 micro-inch/sec)	
	Frequent Events[1]	Occasional or Infrequent Events[2]
Concert Halls	65 VdB	65 VdB
Television Studios	65 VdB	65 VdB
Recording Studios	65 VdB	65 VdB
Auditorium	72 VdB	80 VdB
Theaters	72 VdB	80 VdB

Source: Transit Noise and Vibration Impact Assessment (FTA, May 2006)
NOTES:
1 "Frequent Events" are defined as more than 70 vibration events per day.
2 "Infrequent Events" are defined as fewer than 70 vibration events per day. This category includes most commuter rail systems.

State Noise and Vibration Impact Criteria

The State of California uses the impact criteria developed by the FTA to determine acceptable levels of noise and ground-borne vibration.

Local Noise and Vibration Impact Criteria

County of Los Angeles

The Noise Control Ordinance of the County of Los Angeles, Section 12.08.440, Construction Noise, prohibits the operation of any tools or equipment used in construction, drilling, repair, alteration, or demolition work between weekday hours of 7:00 p.m. and 7:00 a.m. or at any time on Sundays or holidays, such that the sound from such operation creates a noise disturbance across a residential or commercial real-property line, except for emergency work of public service utilities or by variance issued by the health officer. The ordinance also provides noise restrictions for mobile and stationary (periods of ten days or more) construction activities during the daytime hours of 7:00 a.m. to 8:00 p.m. (Table 4-24).

At business structures, mobile equipment is restricted to a maximum noise level of 85 dBA for nonscheduled, intermittent, short-term operation of mobile equipment for all hours during daily operation, including Sunday and legal holidays.

Table 4-24
County of Los Angeles Mobile and Stationary Noise Restrictions

Mobile Equipment	Single-Family Residential	Multi-Family Residential	Semi-residential/ Commercial
Daily, except Sundays and legal holidays, 7:00 a.m. to 8:00 p.m.	75dBA	80dBA	85dBA
Daily, 8:00 p.m. to 7:00 a.m. and all day Sunday and legal holidays	60dBA	64dBA	70dBA
Stationary Equipment	Single-family Residential	Multi-family Residential	Semi-residential/ Commercial
Daily, except Sundays and legal holidays, 7:00 a.m. to 8:00 p.m.	60dBA	65dBA	70dBA
Daily, 8:00 p.m. to 7:00 a.m. and all day Sunday and legal holidays	50dBA	55dBA	60dBA

Cities within the PSA

The noise ordinances of the cities within the PSA, which vary by refined alignment alternative, will be reviewed in detail in the EIR/EIS for criteria and standards applicable to construction and operation of the project. The cities involved are: Monterey Park, Montebello, Rosemead, South El Monte, Industry, Pico Rivera, Whittier, Commerce and Santa Fe Springs.

4.8.2 Environmental Issues

Noise-Sensitive Man-made Resources

The Eastside Transit Corridor Phase 2 PSA currently experiences relatively high levels of ambient noise due to vehicle traffic and its dense urbanized character. Based on noise measurements conducted for the Metro Red Line Eastside Extension Final Engineering Design and previous Eastside Corridor environmental studies, existing 24- hour LDN sound levels on the major streets in the PSA are estimated to be approximately 75 dBA (decibels using the A-weighted scale). The LRT alternatives would produce noise and vibration from rail vehicle operation (engine and track noise) and from the sounding of bells and horns at grade crossings. Because noise and vibration diminish with the square of distance, the magnitude of the noise and vibration levels would depend greatly on the distance of residential and other sensitive receptors from the proposed light rail lines. At the same time, the impact in terms of the degree of change in noise levels is also dependent on the existing ambient levels in the areas near the alignments. In other words, where the alignment passes through quieter areas (open space, parks and in back of residences), the impact would be potentially greater than

where the alignment is in existing streets where higher ambient levels exist. Aerial LRT operations can generate substantial noise levels at greater distances from an alignment than at-grade operations at locations where the aerial operations enable noise to travel over adjacent buildings and other barriers to sound propagation.

The Busway alternative would add a noise source along SR-60 through the introduction of a bus lane that places the buses closer to sensitive receptors along the route. However, since there are few sensitive receptors adjacent to the SR-60 segment, this is not a major concern. Also, at high speeds and during acceleration from a stop, buses tend to be louder than comparable LRT trains. CNG buses tend to be noisier than diesel buses because of the additional noise of the bus CNG cooling mechanism.

Table 4-25 presents a comparison of the alternatives based on the number of noise sensitive institutional land uses (schools, churches, medical facilities) adjacent to the alignment and the residential population density within ½ mile of the stations (used as an indicator of the residential population density near the whole alignment).

As can be seen from the table below, Alternatives 1 and 2 pose lower potential noise and vibration impacts because of the low number of adjacent sensitive land uses and lower population density while Alternatives 3 and 4 pose the highest potential noise and vibration impacts because of the greater number of schools, churches and medical facilities near the alignment. Alternative 5 falls in the middle range of impacts. Subsequent environmental analysis will quantify the exact differences in noise and vibration impacts among the alternatives.

Table 4-25
Noise-Sensitive Land Uses

Alternative	Sensitive Land Uses Adjacent to Alignment	Relative Population Density within ½ Mile[1]
1 and 2 – SR-60	2	Low
3 – Beverly	19	Medium
4 – Whittier	22	Medium
5 – Washington	13	Medium

1. Low Represents a 2005 population density of less than 9,000 persons per square mile and 2030 population density of less than 11,000 per square mile; Medium represents a 2005 population density of 9,000 – 11,000 persons per square mile and 2030 population density of 11,000 – 13,000 per square mile; and High represents a 2005 population density of greater than 11,000 persons per square mile and 2030 population density of greater than 13,000 per square mile.

A comparison of the noise and vibration impact potential of each alternative follows:

Alternative 1 - SR-60 LRT -This LRT alternative poses the lowest potential LRT noise impacts because of the lowest number of sensitive land uses adjacent to the alignment and the relatively low population density.

Alternative 2 - SR-60 Busway -This is the Busway alternative, which generally follows the same route as Alternative 1. Compared to Alternative 1, this alternative is expected to be noisier because of the higher speed buses along SR-60 (this impact is mitigated by the few sensitive land uses along SR-60). The Busway alternative has lower potential for vibration impacts than the LRT alternatives because it uses rubber-tired vehicles.

Alternative 3 - Beverly LRT -This LRT alternative poses greater potential noise impacts than LRT Alternatives 4 and 5 (and greater than LRT Alternative 1) because of the greater degree of operations along the Whittier Greenway as part of the alignment. The greenway would place the trains behind residences backing up to the greenway. From a noise standpoint the concerns are the relatively short distances to the houses and the lower ambient noise levels in back of the houses compared to the street-fronting side.

Alternative 4 - Whittier LRT -This LRT alternative has the greatest number of noise sensitive land uses adjacent to the alignment and comparatively greater potential vibration impacts than Alternative 3 because of the aerial segments. It has lesser potential vibration impacts than Alternative 5 because of fewer aerial segments. For street-running light rail, vibration levels at distances greater than 30 feet are not expected to be of concern.

Alternative 5 - Washington LRT -Compared to Alternatives 3 and 4, this alignment has fewer noise sensitive land uses adjacent to the alignment and a medium population density. In terms of vibration impact potential, the aerial operations along the entire alignment (except for the Pomona Blvd. segment) implies a higher potential for vibration impact while the fewer adjacent sensitive land uses implies a lower potential for impact.

4.9 Ecosystems

This section examines the ecosystems and biological resources in the PSA and along the potential rights-of-way of each of the five refined alternatives. Topics discussed include the existing ecosystems and biological resources, the regulatory framework governing the protection of biological resources, and potential issues associated with biological resource impacts from the project.

4.9.1 Affected Environment

This section identifies areas within one-half mile of either side of the five refined alternatives that may be considered to support sensitive species, ecosystems, and biological resources. A search of the California Natural Diversity Database (CNDDB)[9] was conducted to identify sensitive plants and animals with the potential to occur in the PSA. The proposed alignments are located within the Los Angeles, El Monte, South Gate, and Whittier 7.5-minute quadrangles. Due to the highly urbanized and developed nature of the Los Angeles and South Gate quadrangles, only the El Monte and Whittier quadrangles were included in the CNDDB search. A review of natural areas, parks and other open spaces within one-half mile of either side of the five alternatives was also conducted.

In general, the proposed alignments and stations are located within a highly developed and urbanized area and biological resources are thus limited to a few parks and open space areas. Most of these parks, which are identified in the section on Parklands, are primarily landscaped areas, and wildlife species utilizing them are those adapted to living in an urban environment. While these parks offer limited habitat to support biological resources, many do contain mature trees and other vegetation that may be considered a biological resource as they provide potential roosting and nesting sites for birds, including raptors. Further, locally protected trees may be preserved within public parks and further investigation would be required to evaluate potential impacts to these resources.

In contrast to landscaped parks, the Whittier Narrows Recreation Area and the Puente Hills are large natural areas within the PSA that support substantial biological resources. Whittier Narrows Recreation Area is a Significant Ecological Area (SEA) as defined in the Los Angeles County General Plan. Puente Hills has also been proposed as a SEA. These natural areas support a variety of ecosystems and sensitive habitats, including wetlands, riparian, oak and walnut woodlands, and coastal sage scrub. Whittier Narrows and Puente Hills are a part of the Puente-Chino Hills Wildlife Corridor, which extends to the Cleveland National Forest in Orange County. This wildlife corridor provides valuable habitat for sensitive species and allows movement of wildlife populations to larger areas of habitat. Wildlife corridors are crucial to maintain genetic diversity and help offset the effects of habitat loss.

Table 4-26 presents rare wildlife and plant species listed on the California Natural Diversity Database as having the potential to occur within the El Monte and Whittier 7.5-minute quadrangles, which lie within the PSA. The PSA also lies within the Los Angeles and South Gate quadrangles, but these were not included in the CNDDB search due to the low potential for sensitive species to occur within these highly urbanized and developed quadrangles.

[9] California Natural Diversity Database, June, 2008. Wildlife and Habitat Data Analysis Branch, California Department of Fish and Game, Sacramento, CA.

Table 4-26 Special Status Wildlife and Plant Species with Potential to Occur in the PSA		
Common Name	Scientific Name	Status
Birds		
Western Yellow-billed Cuckoo	Coccyzus americanus occidentalis	FC/CE
Southwestern Willow Flycatcher	Empidonax traillii extimus	FE/CE
Coastal California Gnatcatcher	Polioptila californica californica	FT/SC
Least Bell's Vireo	Vireo bellii pusillus	FE/CE
Mammals		
Pallid Bat	Antrozous pallidus	SC
Western Mastiff Bat	Eumops perotis californicus	SC
Hoary Bat	Lasiurus cinereus	SC
Reptiles and Amphibians		
Southwestern Pond Turtle	Actinemys marmorata pallida	SC
Coast (San Diego) Horned Lizard	Phrynosoma coronatum (blainvillii population)	SC
Western Spadefoot	Spea hammondii	SC
Plants		
Mesa Horkelia	Horkelia cuneata ssp. puberula	SEC
Coulter's Goldfields	Lasthenia glabrata ssp. coulteri	SEC
Orcutt's Linanthus	Linanthus orcuttii	NVEC
Prostrate Vernal Pool Navarretia	Navarretia prostrata	SEC
California Orcutt Grass	Orcuttia californica	FE/CE/SEC
Brand's Star Phacelia	Phacelia stellaris	FC/SEC
Parish's Gooseberry	Ribes divaricatum var. parishii	PEC

FC - Candidate for Federal Listing (U.S. Fish and Wildlife Service)
CE - California Endangered (California Department of Fish and Game)
FE - Federally Endangered (U.S. Fish and Wildlife Service)
FT - Federally Threatened (U.S. Fish and Wildlife Service)
SC - Species of Concern in California (California Department of Fish and Game)
SEC - Seriously Endangered in California (California Native Plant Society)
NVEC - Not Very Endangered in California (California Native Plant Society)
PEC - Presumed Extinct in California (California Native Plant Society)
FEC - Fairly Endangered in California (California Native Plant Society)
Source: California Natural Diversity Database, June 2, 2008

4.9.2 Evaluation Methodology

Biological resources within one-half mile of either side of the refined alternatives are protected by several federal, state, and local laws and policies, as described in this section.

Federal

Endangered Species Act

The Endangered Species Act and subsequent amendments provide for the conservation of endangered and threatened species and the ecosystems upon which they depend. Section 7 of the Endangered Species Act requires federal agencies to aid in the conservation of listed species, and to ensure that the activities of federal agencies will not jeopardize the continued existence of listed species or adversely modify designated critical habitat. At the federal level, the U.S. Fish and Wildlife Service and the National Oceanic and Atmospheric Administration are responsible for administration of the Endangered Species Act.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act decrees that all migratory birds and their parts (including eggs, nests and feathers) are fully protected. Nearly all native North American bird species are protected by the act. Under the act, taking, killing, or possessing migratory birds is unlawful. Projects that are likely to result in taking of birds protected under the Migratory Bird Treaty Act will require the issuance of take permits from the U.S. Fish and Wildlife Service. Activities that would require such a permit would include destruction of migratory bird nesting habitat during the nesting season when eggs or young are likely to be present. Under the act, surveys are required to determine if nests will be disturbed and, if so, a buffer area with a specified radius around the nest would be established so that no disturbance or intrusion would be allowed until the young had fledged and left the nest. If not otherwise specified in the permit, the size of the buffer area would vary with species and local circumstances (e.g. presence of busy roads), and would be based on the professional judgment of the monitoring biologist.

State

California Endangered Species Act

The California Department of Fish and Game is responsible for administration of the California Endangered Species Act. Unlike the federal Endangered Species Act, there are no state agency consultation procedures under the California Endangered Species Act. For projects that affect both a state and federal listed species, compliance with the federal Endangered Species Act will satisfy the California Endangered Species Act if the California Department of Fish and Game determines that the federal incidental take authorization is "consistent" with the California Endangered Species Act. Projects that result in a take of a state only listed species require a take permit under the California Endangered Species Act. The federal and/or state acts also lend protection to species that are considered rare enough by the scientific community and trustee agencies to warrant special consideration, particularly

with regard to protection of isolated populations, nesting or den locations, communal roosts, and other essential habitat.

California Fish and Game Code Sections 3500 - 3705, Migratory Bird Protection

Sections 3500 through 3705 of the California Fish and Game Code regulate the taking of migratory birds and their nests. These codes prohibit the taking of nesting birds, their nests, eggs, or any portion thereof during the nesting season. Typically, the breeding/nesting season is from March 1 through August 30. Depending on each year's seasonal factors, the breeding season can start earlier and/or end later.

Local

Los Angeles County General Plan

The Los Angeles County General Plan[10] identifies Significant Ecological Areas containing biological resources and sets forth the goal of conserving these areas. While development within a Significant Ecological Area (SEA) is not prohibited, the general plan does require development to be limited and controlled in order to avoid impacting valuable biological resources.

Other local jurisdictions include the cities of Monterey Park, Rosemead, El Monte, Montebello, Pico Rivera, and Whittier. Several of these cities have adopted a General Plan, which establishes general policies with regard to conservation of biological resources and open space.

City of Los Angeles Native Tree Protection Ordinance

In an effort to slow the decline of native tree habitat, the City of Los Angeles passed a Native Tree Protection Ordinance (Ordinance No. 177,404), which became law on April 23, 2006. The Native Tree Protection Ordinance:

- Protects all native oak tree species (Quercus spp), California Sycamore (Platanus racemosa), California Bay (Umbellularia californica), and California Black Walnut (Juglans californica).
- Applies to protected trees four inches or greater in diameter at 4.5 feet above ground (multiple trunk trees are calculated by cumulative diameter).
- Applies to protected trees on private lots.
- Requires that a protected tree report be submitted by a registered consulting arborist, landscape architect, or pest control advisor who is also a certified arborist.

Pursuant to the Native Tree Protection Ordinance, removal of any protected tree requires a removal permit by the Board of Public Works. Any act that may cause the failure or death of a protected tree requires inspection by the City's Urban Forestry Division. Although the law

[10] Metro Joint Development Program, information available on www.metro.net

does not require a permit for the pruning of protected trees, the City recommends consultation with a certified arborist to ensure that the pruning of protected trees is performed carefully.

4.9.3 Environmental Issues

Alternative 1 SR-60 LRT

Alternative 1 passes directly through the Whittier Narrows Recreation Area. As such, further investigation is required to determine the impacts to sensitive biological resources existing in this area from disturbance during construction to long term effects of loss of habitat and/or wildlife corridor.

In addition, disturbance of mature trees that provide potential nesting sites for raptors and other birds may occur at other small parks located along the Alternative 1 alignment. Further investigation is required to evaluate potential impacts to individuals of sensitive species, and locally protected trees, since removal or disturbance of trees during the nesting season could result in the loss of potential nesting habitat.

Alternative 2 SR-60 Busway

The bus rapid transit (Busway) alternative alignment is similar to the alignment of Alternative 1 along SR-60. Potential effects to significant biological resources at the Whittier Narrows Recreation Area as well as parks located along the alignment should be further evaluated.

Alternative 3 Beverly LRT

The Alternative 3 alignment traverses the highly developed area along Beverly Blvd. As such, biological resources are limited along this alignment. The alignment crosses the Rio Hondo, a tributary to the Los Angeles River. At the crossing of the alignment, the Rio Hondo is a concrete-lined channel and does not support significant biological resources.

As described in the section on Parklands, many parks are located along the Alternative 3 alignment. Further investigation is required to evaluate potential impacts to individuals of sensitive species, and locally protected trees, since disturbance of mature trees within these parks could result in the loss of habitat.

Alternative 4 Whittier LRT

Similar to Alternative 3, the Alternative 4 alignment traverses a highly developed area along Whittier Blvd. with limited biological resources. Where it crosses the Rio Hondo, the channel is concrete-lined and does not support significant biological resources. Disturbance of mature and locally protected trees that support biological resources within parks along the alignment does warrant further investigation.

Alternative 5 Washington LRT

Similar to Alternatives 3 and 4, the Alternative 5 alignment traverses a highly developed area primarily along Washington Blvd. It crosses the concrete-lined Rio Hondo channel, which does not support substantial biological resources. As with all alignments, disturbance of mature and locally protected trees that support biological resources within parks warrants further investigation.

4.9.4 Summary

Biological resources existing within the PSA are located primarily within the Whittier Narrows Recreation Area and the Puente Hills. Whittier Narrows Recreation Area is a Significant Ecological Area (SEA) as defined in the Los Angeles County General Plan, and Puente Hills has also been proposed as a SEA. These natural areas support a variety of ecosystems and sensitive habitats and are important parts of the Puente-Chino Hills Wildlife Corridor.

In addition, mature trees within the PSA provide potential nesting sites for raptors and other birds and may be present along all the alternative alignments. Potential issues associated with biological resource impacts are summarized as follows:

- For Alternatives 1 and 2, further investigation is required to determine the impacts to sensitive biological resources within the Whittier Narrows Recreation Area from disturbance during construction to long term effects of loss of habitat and/or wildlife corridor.
- For all alternatives, further investigation is required to determine the impacts to individuals of sensitive bird species due to removal or disturbance of trees during the nesting season.
- For the portion of all alternatives that are located within the City of Los Angeles, compliance with the City of Los Angeles Native Tree Protection Ordinance will be required if locally protected trees are removed during construction.

4.10 Water Resources

This section describes the water resources within the PSA, as well as the potential effects of the alternatives on existing water resources. There are four main water supply sources available in the PSA, surface water, groundwater, imported surface water, and reclaimed water. Local surface water is available from the rivers and reservoirs throughout Los Angeles County. The rivers and reservoirs also provide water for recharging the groundwater basins in the area. Long-term water storage in the PSA is primarily in groundwater basins, and groundwater recharge occurs from percolation, spreading grounds, and injection wells. Imported surface water is delivered to the greater Los Angeles area from the California Aqueduct or the Colorado River Aqueduct. The alternatives have the potential to affect surface

and groundwater sources, water quality, and flood hazard areas; therefore, these will be discussed in more detail in the following sections.

4.10.1 Existing Conditions

Applicable Laws and Regulations

Federal

The Clean Water Act (CWA) establishes the basic structure for regulating discharges of pollutants into the waters of the U.S. and gives the EPA the authority to implement pollution control programs, such as setting wastewater standards for industries. In California, the EPA has delegated authority to the State Water Resources Control Board (SWRCB) and nine Regional Water Quality Control Boards (RWQCBs).

Section 401 of the CWA requires water quality certification from the applicable RWQCB for discharges of dredge or fill material to waters of the United States. The purpose of the certification is to ensure discharges comply with applicable State water quality laws.

Section 402 of the CWA controls point source discharges to waters of the United States. A National Pollutant Discharge Elimination System (NPDES) permit is required from the SWRCB for construction projects over an acre in size with the potential to discharge stormwater to waters of the United States.

Section 404 of the CWA regulates the discharge of dredged or fill material into waters of the United States (including wetlands) and requires a Section 404 permit from the United States Army Corps of Engineers (USACE).

Section 303(d) of the CWA requires states, territories and authorized tribes to develop a list of water quality-impaired segments of waterways. The list includes waters that do not meet water quality standards necessary to support the beneficial uses of that waterway. Water quality plans (called Total Maximum Daily Loads or TMDLs) are developed for these water bodies to improve water quality.

The National Flood Disaster Act requires cities and counties to adopt floodplain management ordinances to restrict or limit development within flood zone areas.

State

The Porter-Cologne Water Quality Control Act of 1970 established the SWRCB and nine RWQCBs within the State of California. These groups are the primary state agencies responsible for protecting California water quality to meet present and future beneficial uses and regulating appropriative surface rights allocations. The preparation and adoption of water quality control plans, or Basin Plans, and statewide plans, is the responsibility of the SWRCB.

Basin Plans consist of a designation or establishment for the waters within a specified area of beneficial uses to be protected and water quality objectives to protect those uses.

California Fish and Game Code Section 1600-1700 requires that any state or local government entity that proposes a project that will divert or obstruct the natural flow or change the bed, channel, or bank of any river, stream, or lake or use materials from a streambed obtain a Lake and Streambed Alteration Agreement from the California Department of Fish and Game (CDFG) prior to construction.

Local

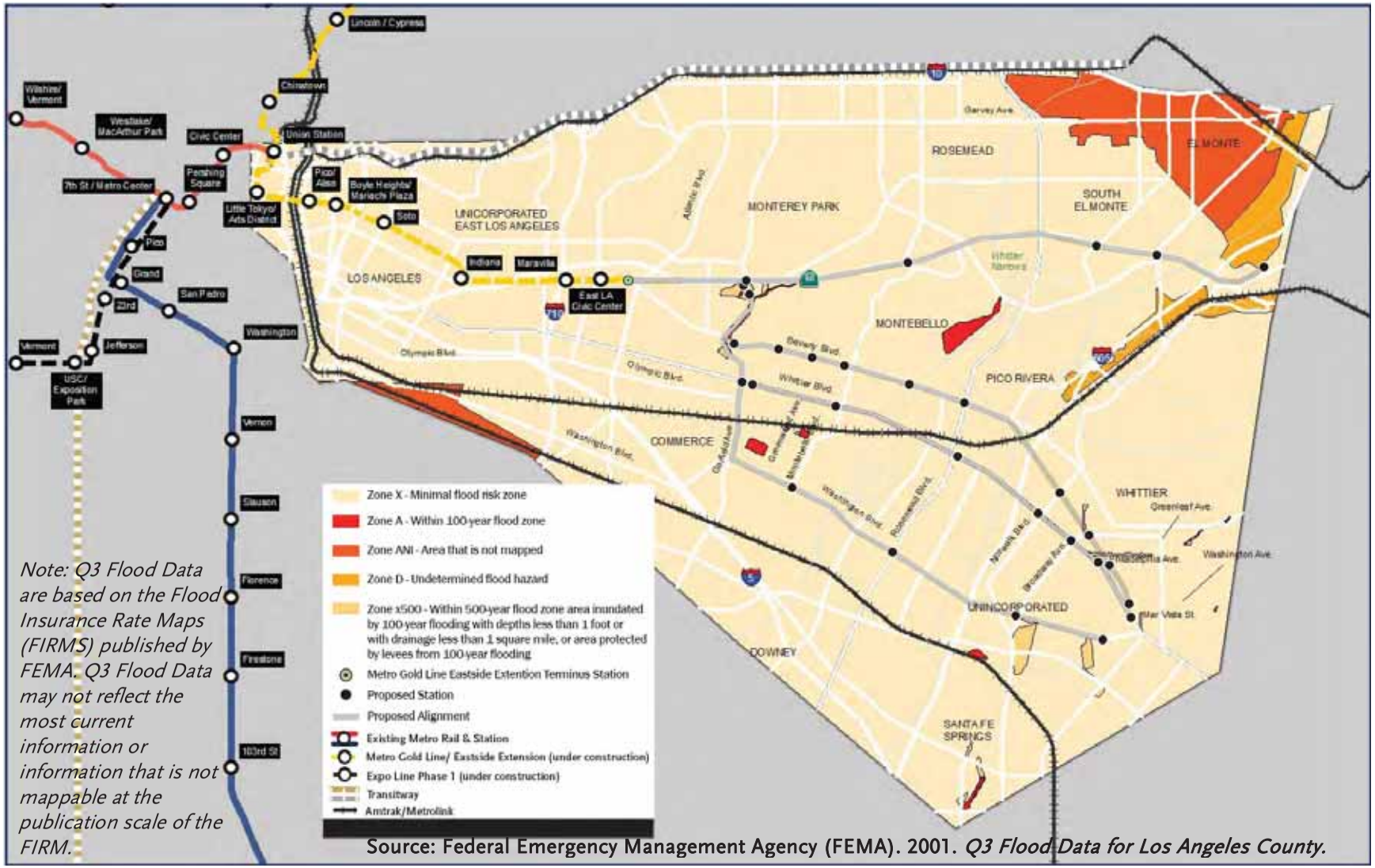
Local cities and counties can adopt ordinances or goals for water quality protection and floodplain management. When an alternative is selected for implementation, the local government ordinances and general plans will be reviewed for applicable requirements.

Flood Hazard Areas

According to the Federal Emergency Management Agency's Flood Insurance Rate Maps, several areas in the PSA are within the 100-year flood plain, an area that could be flooded by a storm with a one percent chance of occurring in any given year. As shown in Figure 4-18, the City of Montebello has four areas within the 100-year flood plain: an area along Garfield Ave. south of SR-60, two areas between Whittier Blvd. and Washington Blvd., and a larger area just west of the Rio Hondo. There is also a 100-year flood zone area in the City of Santa Fe Springs and in an unincorporated portion of Los Angeles County, just north of Santa Fe Springs.

As required by the National Flood Disaster Act (43 U.S.C 4001 et seq.), cities and counties have adopted floodplain management ordinances that restrict or limit development within flood zone areas. Generally, the ordinances require permits or other approvals prior to construction within these zones.

Figure 4-18 Flood Zones in PSA



Note: Q3 Flood Data are based on the Flood Insurance Rate Maps (FIRMS) published by FEMA. Q3 Flood Data may not reflect the most current information or information that is not mappable at the publication scale of the FIRM.

Source: Federal Emergency Management Agency (FEMA). 2001. *Q3 Flood Data for Los Angeles County.*

Surface Water Resources

A complex network of surface water resources exists in the PSA that provides flood control, water supply, recreation, and habitat benefits. The primary surface water resources within the PSA are the San Gabriel River and the Rio Hondo, Whittier Narrows Dam and Reservoir, and numerous spreading grounds used to recharge local groundwater basins.

Rio Hondo

The Rio Hondo is a tributary to the Los Angeles River, although it once formed the main channel of the San Gabriel River. The Rio Hondo originates in the Angeles National Forest and flows southwest to the confluence with the Los Angeles River in the City of South Gate, just southeast of downtown Los Angeles. The Rio Hondo Watershed covers approximately 142 square miles and forms a sub-watershed of the larger Los Angeles River Watershed. The majority of the Rio Hondo has been channelized in concrete for flood control purposes, with the exception of a four mile segment between South El Monte and Whittier Narrows.

The San Gabriel River is connected to the Rio Hondo through three man made channels:

- The Buena Vista Channel near Santa Fe Dam;
- The Lario Creek/Zone 1 Ditch in Whittier Narrows; and
- The Whittier Narrows Crossover Channel.

These channels allow water from the San Gabriel River to be delivered to the Rio Hondo for recharge of the groundwater basins through the Rio Hondo spreading grounds.

Within the PSA, the Rio Hondo Watershed covers portions of the Cities of El Monte, South El Monte, Rosemead, Monterey Park, Pico Rivera, Montebello, and Downey[11].

San Gabriel River

The San Gabriel River originates in the San Gabriel Mountains in the Angeles National Forest and flows southwest to empty into the Pacific Ocean in Seal Beach, near the Los Angeles and Orange County border. The San Gabriel River Watershed is approximately 689 square miles and covers portions of Los Angeles, Orange, and San Bernardino Counties. Although the San Gabriel River is not a tributary to the Los Angeles River, it is connected to the Los Angeles River by the Rio Hondo through three channels, as discussed above. The Los Angeles River empties into the Pacific Ocean just five miles north of the San Gabriel River in Seal Beach.

The San Gabriel River flows between two levees and has an earthen bottom to allow for groundwater recharge. Seven miles below Whittier Narrows, the river is channelized in concrete, but returns to an earthen bottom for the last three miles to the Pacific Ocean. Within the PSA, the San Gabriel River Watershed covers portions of the Cities of El Monte,

[11] San Gabriel Valley Council of Governments, et al. 2004. Rio Hondo Watershed Management Plan. Accessed on: May 22, 2008. Available at: http://www.rmc.ca.gov/rio_hondo/rh_index.html

South El Monte, Pico Rivera, Whittier, Downey and Santa Fe Springs[12].

Whittier Narrows Dam

The Whittier Narrows area was created by natural gap in the hills that form the southern boundary of the San Gabriel Valley[13]. The San Gabriel River and the Rio Hondo flow through this gap and are confined by Whittier Narrows Dam. The 605 Freeway (San Gabriel River Freeway) runs along the eastern side of the Whittier Narrows flood control basin while SR-60 (Pomona Freeway) crosses the flood control basin.

Whittier Narrows Dam captures runoff from the upstream watershed through the Rio Hondo and releases on the San Gabriel River made from Santa Fe Dam. The dam was constructed in 1957 and is operated by the U.S. Army Corps of Engineers. The primary purpose of the Whittier Narrows facility is to provide water conservation storage and flood control. The Whittier Narrows facility is the main component for the Los Angeles County Drainage Area flood control system[14]. There are actually two conservation pools behind the dam that generally remain empty until inflow of the rivers exceeds the recharge capacity of the San Gabriel River and downstream spreading grounds. During regular operations, the two rivers flow through the facility and remain separated by a crossover weir. During a storm event, if the Rio Hondo or San Gabriel conservation pools fill, releases occur to the downstream Rio Hondo and San Gabriel River channels.

Spreading Grounds

There are several spreading grounds in the PSA. These grounds contain shallow basins that allow surface water to percolate into the ground to recharge the groundwater basins. There are three basins below Whittier Narrows that make up the San Gabriel Coastal Basin Spreading Grounds and 20 basins east of the Rio Hondo that make up the Rio Hondo Coastal Basin Spreading Grounds. These spreading grounds occur in a geologic area called the Montebello Forebay and contain highly permeable soils that allow for deep percolation of surface waters. The spreading grounds are managed by Los Angeles County Public Works Department.

Groundwater Resources

Groundwater resources within the PSA provide an essential source of water for residential, commercial, and industrial uses and allow surface water runoff to be stored for later use. Groundwater basins in the PSA include the Central Sub-basin of the Coastal Plain of Los

[12] Watershed Conservation Authority. 2005. San Gabriel and Lower Los Angeles Rivers Watershed Original Draft Framework Integrated Regional Water Management Plan, July 2005. Accessed on May 23, 2008. Available at: http://ladpw.org/wmd/irwmp/docs/San%20Gabriel%20and%20Lower%20Los%20Angeles%20Rivers%20Watershed%20Original%20Draft%20IRWMP/Attachment%2003%20Draft%20IRWM%20Plan.pdf
[13] U.S Army Corps of Engineers, Los Angeles District. 2002. Whittier Narrows Dam. Accessed on: May 29, 2008. Available at: http://www.spl.usace.army.mil/resreg/htdocs/wnrh.html
[14] IBID

Angeles Groundwater Basin and the San Gabriel Valley Groundwater Basin.

San Gabriel Valley Groundwater Basin

The San Gabriel Valley Groundwater Basin covers approximately 167 square miles and includes water-bearing sediments underlying the San Gabriel Valley and a portion of the Santa Ana Valley[15]. The Raymond fault forms the northern boundary of the basin, while the Repetto, Merced, and Puente Hills form the southern boundary. The San Gabriel River and the Rio Hondo flow southwest across the basin and exit through Whittier Narrows, a gap between the Merced and Puente Hills[16]. Precipitation in the basin is approximately 15 to 31 inches per year, with an average of 19 inches per year[17].

Water-bearing materials of the basin include unconsolidated to semi-consolidated alluvium deposits from stream flows out of the San Gabriel Mountains. The deposits include Pleistocene and Holocene alluvium and the lower Pleistocene San Pedro Formation[18]. Recharge of the basin primarily occurs from percolation of precipitation and stream flow. Groundwater levels have fluctuated 95 feet in the past 20 years, and have only fluctuated about 30 feet since 1993[19]. Storage capacity in the basin (excluding the Raymond Groundwater Basin but including the Upper Santa Ana Valley Basin) is just under 11 million acre-feet. This basin supplies approximately 80 percent of the local groundwater supplies[20].

Central Sub-basin

The Central Sub-basin (also referred to as the Central Basin) is approximately 277 square miles in southeastern Los Angeles County and is bounded by the San Gabriel Valley to the north, Orange County Groundwater Basin to the east, and the West Coast Groundwater Basin to the southwest. The Whittier Narrows area of geologic uplift separates this sub-basin from the San Gabriel Valley Groundwater Basin. The Los Angeles and San Gabriel Rivers pass over this basin before entering the Pacific Ocean.

Annual precipitation in the basin is 11 to 13 inches with an average of 12 inches[21].

[15] California Department of Water Resources. 2004. California's Groundwater Bulletin 118: San Gabriel Valley Groundwater Basin, February 2004.
[16] IBID
[17] IBID
[18] IBID
[19] IBID
[20] Watershed Conservation Authority. 2005. San Gabriel and Lower Los Angeles Rivers Watershed Original Draft Framework Integrated Regional Water Management Plan, July 2005. Accessed on May 23, 2008. Available at: http://ladpw.org/wmd/irwmp/docs/San%20Gabriel%20and%20Lower%20Los%20Angeles%20Rivers%20Watershed%20Original%20Draft%20IRWMP/Attachment%2003%20Draft%20IRWM%20Plan.pdf
[21] California Department of Water Resources. 2004. California's Groundwater Bulletin 118: Coastal Plain of Los Angeles Groundwater Basin, Central Sub-basin, February 2004.

The Central Basin has been divided into pressure and forebay areas:

- The Los Angeles Forebay in the northern portion;
- The Montebello Forebay that extends south from Whittier Narrows and is a very important area of recharge;
- The Central Basin pressures area; and
- The Whittier area from the Puente Hills south to the Santa Fe Springs-Coyote Hills uplift.

Water bearing materials of the basin are found in the Holocene alluvium and the Pleistocene Lakewood and San Pedro Formation[22]. Historical flow has generally occurred from the northeast towards the Pacific Ocean in the southwest, but groundwater pumping has made the water level equal in most areas, decreasing subsurface outflow[23].

Groundwater recharge occurs through surface and subsurface flow, and through precipitation, stream flow, and applied water. Natural recharge is primarily from water flow through Whittier Narrows. Imported water and recycled water are used to recharge the Montebello Forebay at the Rio Hondo and San Gabriel spreading grounds[24]. Total storage capacity of the Central Basin is approximately 14 million acre-feet[25]. Groundwater levels have varied about 25 feet from 1961 to 1977, with a range of five to ten feet since 1996[26]. Approximately 50 percent of local water needs are supplied by this basin[27].

Groundwater Levels

Groundwater levels within the PSA vary and perched groundwater may be present throughout the potential corridor alignments.

Surface Water Quality

Most of the surface water within the PSA has been polluted by urban runoff from commercial, industrial, and residential land uses, as well as illegal dumping and trash[28].

The following impaired waterways within the PSA appear on the 2006 303d list:

- 6.4 miles of the San Gabriel River Reach 1 (Estuary to Firestone) is listed for Coliform bacteria and pH.

[22] IBID
[23] IBID
[24] IBID
[25] IBID
[26] IBID
[27] Watershed Conservation Authority. 2005. San Gabriel and Lower Los Angeles Rivers Watershed Original Draft Framework Integrated Regional Water Management Plan, July 2005. Accessed on May 23, 2008. Available at: http://ladpw.org/wmd/irwmp/docs/San%20Gabriel%20and%20Lower%20Los%20Angeles%20Rivers%20Watershed%20Original%20Draft%20IRWMP/Attachment%2003%20Draft%20IRWM%20Plan.pdf
[28] IBID

- 12 miles of San Gabriel River Reach 2 (Firestone to Whittier Narrows) is listed for Coliform bacteria and lead.
- Several of the San Gabriel River tributaries.
- 4.6 miles of the Rio Hondo Reach 1 (Confluence of the Los Angeles River to the Santa Ana Freeway) is listed for Coliform bacteria and trash.
- 4.9 miles of the Rio Hondo Reach 2 (At the spreading grounds) is listed for Coliform bacteria[29].
- Several water bodies associated with the Rio Hondo.

Groundwater Quality

San Gabriel Valley Groundwater Basin

Total dissolved solids (TDS) ranges around 90 to 4,288 milligrams per liter (mg/l) and averages 367 mg/l with the southern portion of the basin averaging 1,222 mg/l (DWR Unpublished Data; PBWM 1999 in DWR 2004). Four areas of the basin are Superfund Sites and Trichloroethylene, Perchloroethylene, and Carbon Tetrachloride contaminate the Whittier Narrows, Puente basin, Baldwin Park and El Monte areas. In addition, high levels of nitrates are found in the northeastern portion of the Pomona Basin and volatile organic compounds are found in the southern portion[30].

Central Basin

Data from public supply wells show TDS in the Central Basin ranges from 200 to 2,500 mg/l with an average of 453 mg/l. Samples from public wells show constituents with concentrations above Maximum Contaminant Levels (MCL) to be radiological, volatile organic carbons and semi-volatile organic carbons, primary inorganics, and nitrates[31].

4.10.2 Evaluation Methodology

The water resources analysis was completed at a preliminary level as site-specific details have not been developed. Existing alignments were reviewed to determine their potential to interfere with existing surface and groundwater resources and flood hazard areas. In the next stages of the planning process, engineering drawings and designs will be required to determine specific locations of proposed structures and the water resources that could be affected.

[29] State Water Resources Control Board. 2006. 2006 CWA Section 303d List of Water Quality Limited Segments Requiring TMDLs.
[30] California Department of Water Resources. 2004. California's Groundwater Bulletin 118: San Gabriel Valley Groundwater Basin, February 2004.
[31] California Department of Water Resources. 2004. California's Groundwater Bulletin 118: Coastal Plain of Los Angeles Groundwater Basin, Central Subbasin, February 2004.

4.10.3 Environmental Issues

Flood Hazard Consequences

Alternatives 3, 4, and 5 have the potential to be constructed within a 100-year flood zone along Garfield Ave. between Beverly Blvd. and SR-60. Any construction activities or alteration of the existing road in this area would require approval from the City of Montebello and would be subject to specific flood-related ordinances.

Each of the alternatives would cross the San Gabriel River and the Rio Hondo. Any structural features constructed near levees or other flood control facilities could require permits and/or approval from various agencies and may be subject to specific flood-related regulations. This work would need to be coordinated with The U.S. Army Corps of Engineers, the County of Los Angeles, and local city governments.

Surface Water Environmental Issues

All five of the refined alternative alignments would cross over the San Gabriel River and the Rio Hondo and would therefore have the potential to affect surface water. Surface water resources may be affected during construction of the alternatives if in-water work is required. Use of cofferdams or diversions in the rivers could result in changes in flow and changes in groundwater recharge potential. This would need to be further examined when engineering details are available. Additionally, because each of the alternatives would cross over the rivers, a Lake and Streambed Alteration Agreement may be required from the California Department of Fish and Game prior to construction.

During operation, the alternatives are unlikely to affect any surface water resources as an aerial alignment would be constructed to cross the two rivers. However, because of the multi-purpose function of the existing surface water resources in the area (flood control, groundwater recharge, recreation, etc.), consultation with the appropriate agencies (Los Angeles County, USACE) would need to occur prior to construction activities to ensure functions of these facilities are not compromised.

Groundwater Environmental Issues

All five of the refined alternative alignments have the potential to affect groundwater. Groundwater resources may be affected during construction of the alternatives if in-water work is required. As discussed above, the diversion of any waterways during construction could alter river flows and could affect groundwater recharge. Construction of impermeable surfaces (on previously undeveloped land) over the groundwater basins could decrease the potential for percolation and recharge. Detailed engineering plans are required to further analyze the groundwater effects from each of the alternatives.

Although none of the refined alternatives involve subsurface stations or tunnels, groundwater levels may be high in the PSA and could affect construction. Further analysis of groundwater

levels in the PSA should occur during the design phase. If perched groundwater is encountered during construction, some dewatering may be necessary.

Water Quality Environmental Issues

Temporary water quality impacts associated with the alternatives would generally be attributed to construction activities near surface water. Work within close proximity to waterways could introduce contaminants into surface water through spills, construction debris, and an increase in turbidity from dust and soil disturbance. Because of the highly permeable soils in the area, large spills would also have the potential to adversely affect groundwater quality. During the design stage of the project, appropriate measures would need to be developed to prevent water quality impacts such as a spill prevention plan, a hazardous materials management plan, and erosion and dust control plans.

A NPDES Construction Permit would need to be obtained from the State Water Resources Control Board prior to any construction near a waterway. This permit would require implementation of a Stormwater Pollution Prevention Plan with measures to reduce runoff and prevent discharges to surface water. In addition, a Streambed Alteration Agreement may be required from California Department of Fish and Game for work within or near a streambed.

Each of the alternatives would have the potential for permanent water quality impacts if excavated material is disposed in or near a waterway. Any excavated material, especially material excavated from within a potentially contaminated area, such as the existing Superfund Site located along SR-60, may contain contaminants that could exceed existing water quality standards. Placement of this material in waterways may be prohibited according to water quality and hazardous materials regulations and may require disposal off-site. The placement of fill within waters of the United States (including wetlands) would require a CWA 404 permit from the Army Corps of Engineers and Water Quality Certification from the Los Angeles Regional Water Quality Control Board (LARWQCB).

4.10.4 Summary

All of the alternatives have the potential to affect surface and groundwater resources, infrastructure, and water quality as they would need to cross the San Gabriel River and the Rio Hondo. Implementation of appropriate mitigation measures would likely reduce the potential for water quality effects during construction. Close coordination with USACE and the Los Angeles County Public Works Department would be required to ensure the proposed project does not interfere with existing flood control and water supply facilities.

The following permits and approvals may be required prior to implementation of any alternative:

- CWA Section 404 Permit from USACE

- CWA Section 401 Water Quality Certification from LARWQCB
- CWA Section 402 NPDES Permit for Construction Projects from SWRCB
- Lake and Streambed Alteration Agreement from CDFG
- Approval from USACE
- Local permits/approvals

4.11 Geology and Subsurface Conditions

This section describes the issues related to geology and subsurface conditions that impact the Eastside Transit Corridor Phase 2 project, including regulatory requirements. Seismicity and soil characteristics require consideration because of the proximity of fault rupture hazard areas and liquefaction-susceptible areas to the PSA.

4.11.1 Affected Environment

Applicable Laws and Regulations

Federal

The CWA and The Clean Air Act (CAA) provide provisions for reducing soil erosion relevant to air and water quality. The National Pollutant Discharge Elimination System (NPDES) process involves the prevention or reduction of pollutant runoff as a result of construction activities, including clearing, grading, or excavation.

State

The Alquist-Priolo Earthquake Fault Zoning Act of 1972 (P.R.C. § 2621 et seq.) addresses the hazard of surface fault rupture by prohibiting the development or construction of human occupied structures near active faults.

The Seismic Hazards Mapping Act of 1990 (P.R.C. § 2690-2699.6) requires the state to identify and map locations at risk of strong ground shaking, liquefaction, and landslides as a result of earthquakes. Cities and Counties use these maps to prepare their general plans and protect public health and safety.

Local

Local regulations are outlined in the County of Los Angeles General Plan, as well as in the General Plans of cities within the PSA. Local agencies regulate the development within a seismic hazard zone through permitting. Permits are not issued until geologic investigations have been completed and mitigation has been developed to address any issues.

Seismicity

Located within the Los Angeles Coastal Plain, the PSA is susceptible to relatively frequent regional earthquakes produced from a number of active and potentially active faults. Seismic

activity within the PSA has the potential to impact each of the five refined alternatives. However, alternatives with primarily at-grade segments are likely to be less impacted than alternatives with a majority of aerial segments, which are more susceptible to seismic activity because of their elevated structures. Important to note is the difficulty in predicting seismic occurrences and their potential impacts on developed structures.

Soils

The geologic makeup of soils within the PSA is in large part alluvium fill, alluvium deposits, and bedrock. The importance of characterizing soil is defining the potential for liquefaction conditions within the PSA.

4.11.2 Evaluation Methodology

The geology and subsurface conditions analysis was completed at a preliminary level as site-specific details have not been developed. Existing alignments were reviewed to determine their potential to have seismic or soils related impacts. In the next stages of the planning process, engineering drawings and designs will be required to determine specific locations of proposed structures and the possible geological impacts.

4.11.3 Environmental Issues

Faults and Ground Shaking

Active faults are defined by the California Mining and Geology Board as those that have had surface displacement within the last 11,000 years. Potentially active faults are those believed to have moved during the last 1.6 million years. The Los Angeles Eastside Corridor Supplemental EIR/EIS in 2002 identified 22 major named faults considered to be active within 40 miles of the proposed alternatives. Close to the PSA is the Whittier Fault, and within the PSA is the Elysian Park Thrust. A thrust fault is a type of a reverse, dip-slip fault in which the fault plane is less than 45 degrees. Generally cited as the source of the 5.9 Richter magnitude Whittier Narrows Earthquake on October 1, 1997, the Elysian Park Thrust is considered a blind thrust because of its concealed, deep nature.

Alternatives 1 and 2 traverse through the Whittier Narrows Recreational Area and would be adversely affected by any future earthquake along the Elysian Park Thrust. It is unknown how each of the LRT and Busway alternatives would be impacted differently; however, aerial sections of each alternative are most susceptible to earthquake impacts.

Significant ground shaking is a likely result of earthquakes on any nearby active or potentially active faults. It is not expected that one refined alternative is more or less vulnerable to seismic impacts than another refined alternative within the PSA.

Surface Fault Rupture Hazard Areas

According to the California Geological Survey's Fault Rupture Hazard Zones, the purpose of the Alquist-Priolo Earthquake Fault Zoning Act is to mitigate the hazard of surface fault

rupture by regulating the development or construction of human occupied structures near active faults. A surface fault rupture describes active fault movement that causes breaks through to the surface and generally follows fault lines. Fault rupture hazard areas are known as Alquist-Priolo Earthquake Fault Zones. The California Geological Survey identified a fault zone map for Los Angeles and El Monte, but the potential relationship between proposed transit alignments and known fault zones will need to be investigated in greater detail as a part of future environmental analysis.

Soils and Liquefaction

Conditions for earthquake liquefaction are saturated, loosely packed, fine-grained soils, which are transformed from a solid state into a liquid state in response to excess pore pressure resulting from earthquake ground shaking. In an effort to identify areas at risk for liquefaction, the State of California created Seismic Hazard Zone Maps that include the Los Angeles Quadrangle, El Monte Quadrangle, and Whittier Quadrangle-encompassing the PSA. As presented in Table 4-27, below, each alternative alignment traverses areas identified as having a potential for liquefaction.

As part of the next phase of environmental assessment, a comprehensive geotechnical investigation should be conducted to define liquefaction potential along each of the refined alternative alignments.

Table 4-27
Alignment Segments Susceptible to Earthquake Liquefaction

Alignment Alternative	Potential Liquefaction Area Locations
Alternative 1 & Alternative 2	Along SR-60 from the west side of Whittier Narrows Recreational Area to Workman Mill Rd.
Alternative 3	On Beverly Blvd. from the Rio Hondo (just east of Rea Dr.) to I-605
Alternative 4	On Whittier Blvd. from the Rio Hondo (just east of Natasha Lane) to I-605
	On Whittier Blvd. from Morrill Ave. (just west of Norwalk Blvd.) to East Rancho Dr. (just east of Broadway Ave.)
Alternative 5	On Washington Blvd. from the Rio Hondo (just east of S Bluff Rd.) to Pershing Dr. (just west of Whittier Blvd.)

4.11.4 Summary

The proximity of fault rupture hazard areas and liquefaction-susceptible areas to the PSA has impacts on all of the alternatives. Close consideration of regulatory requirements under the Alquist-Priolo Earthquake Fault Zoning Act of 1972 and the Seismic Hazards Mapping Act of 1990 are required during future alternative design. Issues pertaining to faults, ground shaking, fault rupture areas, and liquefaction should be addressed in the design stage, and a comprehensive geotechnical investigation should be conducted.

4.12 Hazardous Materials and Waste

This section addresses existing hazardous materials in the PSA and along the potential alternative rights-of-way. The description of hazardous materials along the alignments will be presented in future environmental review.

4.12.1 Affected Environment

A hazardous material is defined by the California Code of Regulations, Title 22, Section 66084 as a

> "substance or combination of substances which, because of its quantity, concentration, or physical, chemical, or infectious characteristics, may either (1) cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible illness; or (2) pose a substantial present or potential hazard to human health or environment when improperly treated, stored, transported or disposed of or otherwise managed."

Any hazardous material that is abandoned, discarded, or in storage prior to recycling is considered a "hazardous waste" by the California Health and Safety Code, Section 25124.

Applicable Laws and Regulations

Federal

The Resource Conservation and Recovery Act (RCRA, 42 United States Code 692) gives the USEPA authority to regulate the generation, transportation, and disposal of hazardous wastes.

The Hazardous Material Transportation Act (HMTA) requires special handling, packaging, placards, and manifesting of cargoes in its regulation of the transportation of hazardous materials.

The Comprehensive Environmental Response Compensation and Liability Act (CERCLA) addresses threats to public health or the environment by providing federal authority to respond directly to releases or threatened releases of hazardous substances.

The Lead-Based Paint Poisoning Prevention Act prohibited the use of lead-based paint in 1971, but surface and near surface soils along heavily used roadways, as well as many structures with lead-based undercoats have the potential to contain concentrations of lead above the legal limit.

Other federal regulations are derived from the following:

- CWA
- Superfund Amendment Reauthorization Act (SARA) Title 3
- 40 CFR 260-279 Federal Regulations on hazardous waste management
- 40 CFR, Section 301 et seq. Emergency Planning and Community Right to Know Act
- Toxic Substances Control Act (15 United States Code 2601)

State

The Health and Safety Code §25100 to §25250.28 and Title 22 C.C.R., Div. 4.5 requires that hazardous waste be managed according to applicable regulations: worker operational safety procedures as identified in Title 8 C.C.R; handling, storage, and exposure requirements; transportation and disposal requirements under a uniform hazardous waste manifest; and documentation procedures.

Chapter 6.95, §25503(a), of the California Health and Safety Code and Title 19 of the C.C.R §2729, et seq. require the establishment and implementation of a Hazardous Materials Business Plan and require businesses to identify business type, location, emergency contacts, emergency procedures, mitigation plans, and chemical inventory at each location.

California's Accidental Release Prevention Law allows local oversight of both state and federal programs. California Environmental Protection Agency's Department of Toxic Substances Control (DTSC) implements RCRA and enforces the Hazardous Waste Control Law.

Other state regulations include the California Department of Motor Vehicles; Hazardous Waste Materials Transportation Requirements (Vehicle Code Section 31303); and Title 26, Toxics and Title 17, Public Health from the California Code of Regulations.

Local

Local regulations are outlined in the County of Los Angeles General Plan, as well as in the General Plans of cities within the PSA. RWQCBs and local fire departments carry regulations below the state level.

PSA Setting

Identifying hazardous material facilities along each alignment is important for evaluating alternatives construction and operation. The bus rapid transit (Busway) and light rail transit (LRT) alternatives could have hazardous material-related impacts during construction and

operation at any locations identified as hazardous material sites along the alignment. At-grade segments of the proposed alignments have the lowest level of concern because construction of these segments is generally unobtrusive and within existing road right-of way. Aerial segments and station locations have higher levels of concern because of the intrusive nature of station and pile construction.

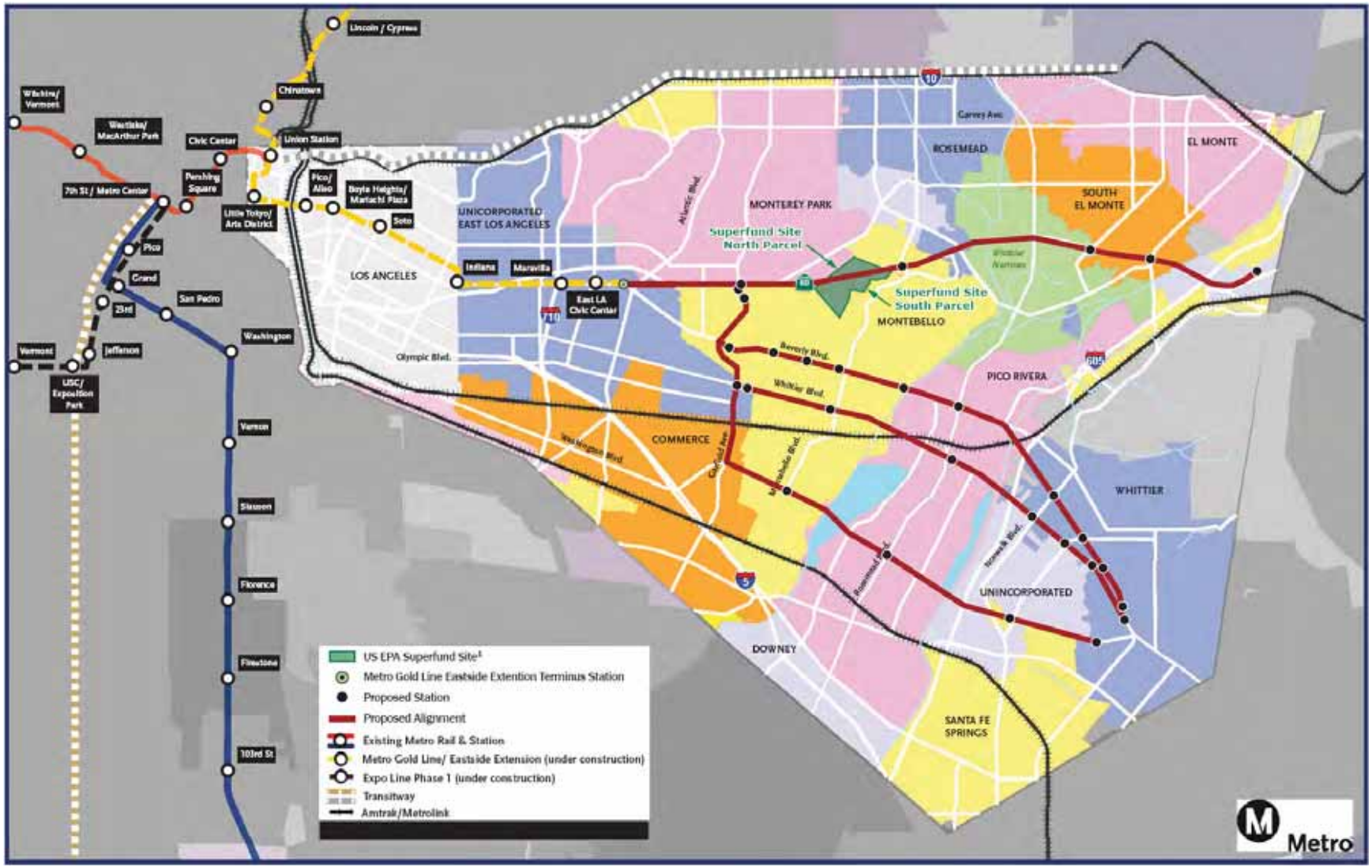
One difference between the Busway and LRT alternatives is the source of electromagnetic fields (EMF) created by the LRT overhead electrical power system. However, this is not likely to cause an increase in risks to human health because of the relatively weak EMF created by LRT systems.

The Busway Alternative 2 and the LRT Alternative 1 follow SR-60 in a side-running configuration using a combination of aerial and retained cut depending on the topography. This side-running configuration has potential hazardous material impacts because it crosses a U.S. EPA Superfund Site, the former Operating Industries, Inc (OII) landfill. This Superfund Site is not expected to prohibit these two alternative alignments; however, it would need closer evaluation and mitigation as determined in the full Draft EIR/EIS.

Superfund Site

Formerly the OII landfill, this Superfund site is located on the north and south side of SR- 60, within the Cities of Monterey Park and Montebello, as located on Figure 4-19. The site is managed, monitored, and maintained by New Cure, Inc., with direction and oversight for remediation provided by the EPA.

Figure 4-19 Superfund Sites in PSA



The north parcel is a 45-acre plot north of SR-60 between Greenwood Ave. and Paramount Blvd. Containing the leachate treatment facility and the thermal destruction facility, the north parcel is a City of Monterey Park redevelopment zone and is planned to be constructed into the Cascades Marketplace retail center. Operation and future construction of the retail center are not expected to be affected by the Eastside Transit Corridor Phase 2 refined alternatives[32].

The 145-acre south parcel was a landfill that operated from 1948 to 1984. The south parcel is located south of SR-60, from Greenwood Ave. to just west of Paramount Blvd. Nearly 400 wells extract landfill gas and liquid from the south parcel, and a network of pipelines conveys these flows to the treatment facilities on the north parcel. Nearly 100 sampling wells are used on the south parcel to monitor the effectiveness of groundwater cleanup measures underneath the landfill. Refined Alternatives 1 and 2 may affect remediation operations at the south parcel because of the side-running configuration of both alignments along the south parcel. It is unknown whether these alternative alignments will be contained within SR-60 right-of-way or whether the remediation operations encroach into SR-60 right-of-way, creating a direct conflict with the transit project. The EPA is required to review and approve any construction on Superfund property. New Cure, Inc. recommends the investigation of a center-freeway alignment as an alternative. Further analysis of the potential construction and operational impacts of these Busway and LRT alternatives is recommended in future project environmental review. If construction activities disturb hazardous materials, mitigation measures including removal, recycling, or a combination of the two, will be required. Hazardous materials mitigation measures are often costly and may be prohibitive for certain alternatives. Consequently, a full evaluation of hazardous materials conditions along each alternative alignment is recommended.

4.12.2 Evaluation Methodology

The hazardous materials and waste analysis was completed at a preliminary level as site-specific details have not been developed. Existing alignments were reviewed to determine their potential to have hazardous materials and waste related impacts. In the next stages of the planning process, engineering drawings and designs will be required to determine specific locations of proposed structures and the possible impacts.

4.12.3 Environmental Issues

Project construction and operation may cause adverse, human health or wildlife impacts, including increased risk to exposure or increased likelihood of hazardous waste migration.

Categories of hazardous material sites that need to be identified within the PSA include gas stations, dry cleaning facilities, automobile dealerships, auto repair facilities, commercial manufacturing, and shipping facilities.

[32] New Cure, Inc Web Site. 2007. New Cure, Inc. Accessed: 27 May 2008. < http://www.newcure.net/>.

Consideration of hazardous materials from abandoned oil wells, industrial and warehouse operations, coal gasification sites, and gasoline above ground storage tanks is recommended in future project environmental review.

Areas containing hazardous materials need to be identified and classified through field reconnaissance, from identified historical sources of hazardous substances, and from listed contaminated properties and hazardous waste sites under regulatory supervision. Division of Oil and Gas maps, Munger Oil Field maps, historical topographic maps, and aerial photographs can also be used for identification purposes. The following federal, state, and county databases are another source of hazardous material facility identification:

- National Priorities List of the USEPA
- Comprehensive Environmental Response Compensation and Liability Notification System
- Emergency Response Notification System
- Resource Conservation and Recovery Act Information database
- California Department of Health Bond Expenditure Plan for Hazardous Substance Cleanup
- California Environmental Protection Agency and the Department of Toxic Substances Control
- California Regional Water Quality Control Board, Leaking Underground Storage Tank Listings
- Underground Storage Tank Listings

4.12.4 Summary

Hazardous materials and waste areas within the PSA may impact each of the proposed alternatives. These areas need to be identified in future environmental studies to assess their impact on the project alignments. The Superfund site on the north and south side of SR-60, in the Cities of Monterey Park and Montebello, has the potential for adverse impacts on the Busway Alternative 2 and the LRT Alternative 1; possible impacts will need closer evaluation and mitigation as determined in the full Draft EIR/EIS.

4.13 Energy

This section identifies energy-related regulatory policies, describes the energy consumption within the PSA for each of the five refined alternatives, and assesses the potential impacts of the different alternatives. An evaluation of benefits and consequences of project alternatives on energy is also presented.

4.13.1 Affected Environment

Applicable Laws and Regulations

Federal

The SAFETEA-LU addresses improved safety, reduced traffic congestion, improved efficiency in freight movement, increased inter-modal connectivity, and environmental protection. The Act seeks to promote more efficient and effective transportation programs.

Section 403(b) of the Power Plant and Industrial Fuel Use Act of 1978 (P.L. 95-620) and Executive Order 12185, Conservation of Petroleum and Natural Gas (December 17, 1979, 44 F.R. §75093), encourage conservation of petroleum and natural gas.

State

The Energy Efficiency Standards (Title 24, Part 6) of the California Code of Regulations regulates energy used for heating, cooling, ventilation, water heating, and lighting. Local building permit processes enforce these standards, which applies to any building, including transit stations.

Local

Local regulations are outlined in the County of Los Angeles General Plan, as well as in the General Plans of cities within the PSA.

Energy Setting

The Los Angeles Eastside Corridor Supplemental EIR/EIS in 2002 presented the results of a direct energy analysis based on projected year 2020 corridor traffic volumes and total annual vehicle miles traveled (VMT). The analysis assessed direct energy consumption of vehicles within the corridor region, with consideration of the VMT and the variation of fuel consumption rates by vehicle type (automobile, truck, bus, or train). Total direct energy consumption, presented in British Thermal Units (BTUs), is reported for each alternative studied in the 2002 Supplemental EIR/EIS. A comparison of bus rapid transit (Busway) and LRT alternatives indicates the similarity in estimated energy requirements for both transit types. The similar overall length and transit type caused results to have negligible differences: total direct BTUs (in billions) are reported at 1,009,000 for the Busway alternative and 1,008,000 for the LRT alternatives. These values are determined using projected VMT values and assume an energy consumption factor of 6,233 BTU/Vehicle Mile for Passenger Vehicles, 41,655 BTU/Vehicle Mile for Transit Buses, and 77,739 BTU/Vehicle Mile for Light Rails.

The results of the Supplemental EIR/EIS analysis provide an indication of expected energy requirements for each of the refined alternatives. Alternatives 1, 3, 4, and 5 are all LRT alternatives that are expected to have similar energy requirements because of their common transit type. Differences in energy requirements between these four alternatives are expected only because of the slight variation in alignment length. Consequently, alternatives with longer lengths are expected to have higher energy requirements. Based on the results of the Supplemental EIR/EIS, it is expected that Alternative 2 will have similar energy requirements as the LRT alternatives, and especially Alternative 1 because both alternatives follow the same alignment.

Because the Supplemental EIR/EIS did not include analysis for all of the refined alternatives, further study is recommended to assess the energy consumption of the other alternatives. However, the similar direct energy consumption values reported for each of the alternatives in the 2002 Supplemental EIR/EIS suggest similar consumption values for the refined alternatives not studied in the 2002 Supplemental EIR/EIS. An alternative to this assumption is developing data for the prior non-studied alignments to provide a means for comprehensive comparison.

The installation and operation of the Eastside Transit Corridor Phase 2 system is not expected to increase energy consumption compared to a no-build alternative. As presented in the 2002 Supplemental EIR/EIS, the no-build alternative is expected to consume a value of 1,009,000 total direct BTUs (in billions)-slightly more than the LRT alternatives analyzed in that report because of the projected decrease in the VMT for automobiles and trucks for the LRT alternatives. Based on this evaluation of project impacts on energy, the Phase 2 project is not expected to have adverse, energy-related consequences.

4.13.2 Evaluation Methodology

The energy analysis was completed at a preliminary level as alignment details have not been developed. Proposed alignments were reviewed to determine their potential to have differences in energy requirements compared to each other and a no-build alternative. In the future stages of the planning process, engineering drawings and designs will be required to ensure that no energy-related consequences exist for the project.

4.13.3 Environmental Issues

The expectation is that the refined alternatives will reduce dependence on automobile use and subsequently reduce energy consumption. Energy consumption from each of the five refined alternatives include the operation and maintenance costs associated with the transit service and stations, as well as the energy-related costs of infrastructure construction. This includes overhead and/or underground electricity lines for the LRT alternatives and fuel (likely compressed natural gas or alternative fuels) for the bus alternative. It is not expected that the proposed alternatives will have significant, energy-related environmental issues.

4.13.4 Summary

A direct energy analysis was performed within the Supplemental EIR/EIS as a part of Phase 1 to determine an estimate of the energy consumption for different transit alternatives. Based on assumptions from this previous analysis, both LRT and Busway alternatives are expected to have similar consumption values. The Phase 2 system is not expected to increase energy consumption compared to a no-build alternative. It is recommended that further analysis of energy consumption for each of the refined alternatives be performed within the Draft EIR/EIS.

4.14 Parklands

This section describes parkland and recreational facilities in the PSA and along the potential right-of-way of each of the five refined alternatives, and identifies the potential effects of the alternatives. An evaluation of the benefits and consequences of the refined alternatives on parkland and recreational facilities is presented.

4.14.1 Affected Environment

Potential impacts to parkland and recreational facilities include both constructive use and direct effects. Constructive use effects include noise and vibration; impediment or alteration of access; changes in visual setting; and the introduction of conflicts with facility patrons, pedestrians, and bicyclists. Direct effects include acquiring parkland or recreational areas as right-of-way for an alternative and complying with regulatory requirements, as presented below.

Applicable Laws and Regulations

The following regulatory provisions apply to projects having potential impacts on parkland and recreational facilities.

Federal

Section 4(f) of the USDOT Act of 1966 prohibits the direct use of parklands and recreational areas for federally funded transportation projects unless no other prudent alternatives exist.

Section 6009(a) of the SAFETEA-LU amended Section 4(f) at Section 138 of Title 23 and Section 303 of Title 49 to address projects that have only de minimis impacts on lands protected by Section 4(f).

Section 6(f) of the Land and Water Conservation Fund Act of 1965 prohibits the conversion of property acquired or developed with Act grants to a non-recreational purpose without the approval of the U.S. Department of the Interior's National Park Service.

State

The California Public Park Preservation Act of 1971 (California Public Resources Code §5400 et seq.) requires a public agency that acquires public parkland for non-park uses to either provide compensation sufficient enough to acquire substantially equivalent replacement parkland or provide replacement parkland of comparable qualities.

Local

Local regulations are outlined in the County of Los Angeles General Plan, as well as in the General Plans of cities within the PSA.

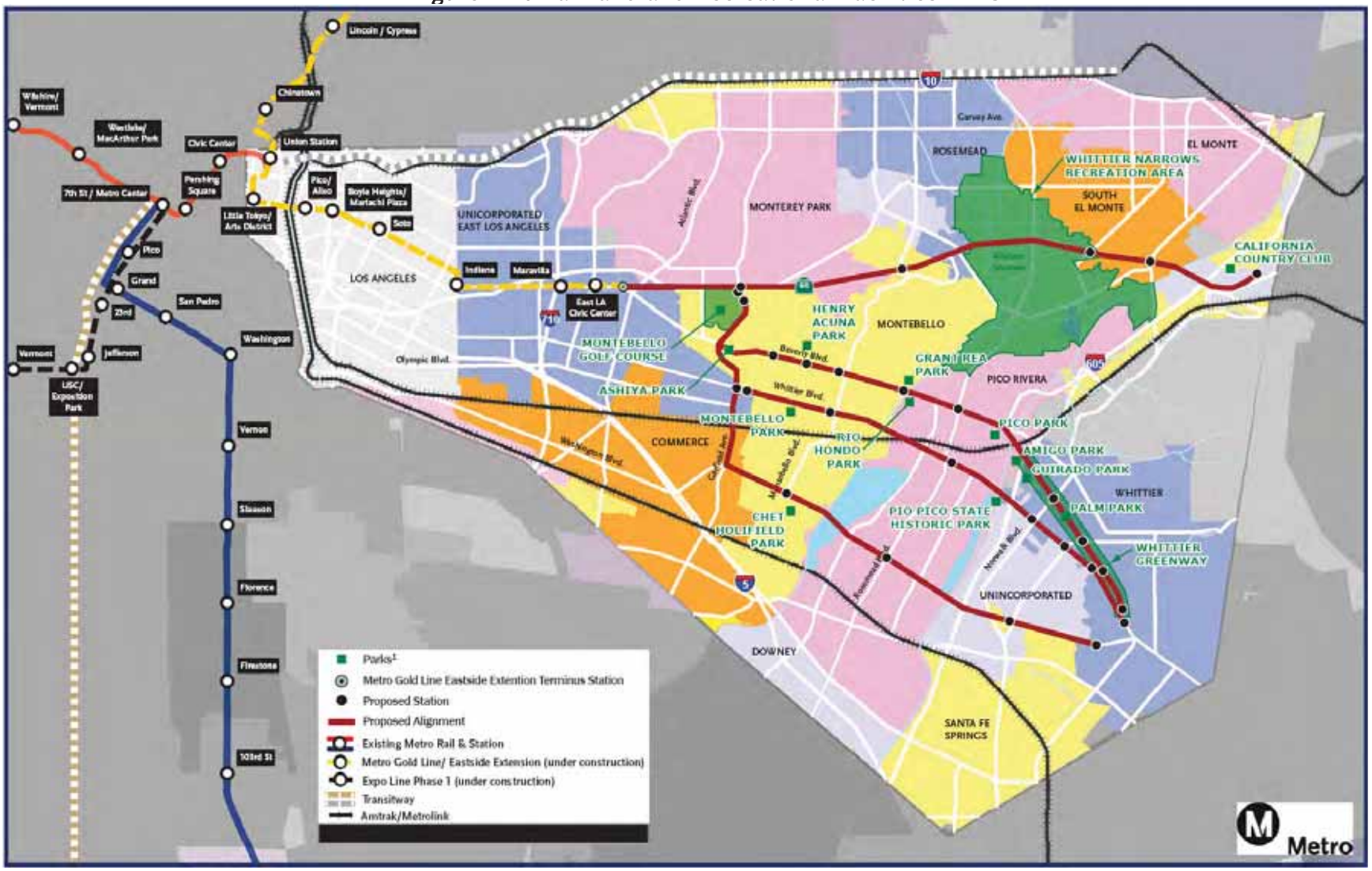
Applicability of Section 4(f)

The Department of Transportation Act of 1966 stipulates in Section 4(f) that federal funds cannot be used for any "program or project (other than any project for a park road or parkway under Section 204 of Title 23) requiring the use of any publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance, or land of an historic site of national, state, or local significance (as determined by the federal, state or local officials having jurisdiction over the park, area, refuge, or site)." Exceptions may be made if "(1) there is no feasible and prudent alternative to using that land, and (2) the program or project includes all possible planning to minimize harm to the park, recreational area, wildlife and waterfowl refuge, or historic site resulting from the use." The Draft EIR/EIS should consider the potential effects of Section 4(f) involvement and associated mitigation measures in dealing with publicly owned parks within the PSA. Potential Section 4(f) implications of parkland acquisition will be further investigated as part of the Draft EIR/EIS.

Parkland Setting within the PSA

Figure 4-20 presents the location of parkland and recreational facilities along each alignment on a PSA map. Parkland and recreational facilities adjacent to or near each of the alternative alignments are presented in Table 4-28 below.

Figure 4-20 Parkland and Recreational Facilities in PSA



[1] Park locations verified with Google Earth imagery

Table 4-28 Parkland and Recreational Facilities along Each Alignment Alternative

Alignment Alternative	Parkland /Recreational Facility	Location	City	Approximate Proximity to line/station
Alternative 1 SR-60 LRT and Alternative 2 SR-60 Busway	Montebello Golf Course	901 Via San Clemente	Montebello	adjacent to SR-60
	Whittier Narrows Recreation Area	SR-60-between Rio Hondo and N Santa Anita Ave.	--	adjacent to SR-60
	California Country Club	Northeast of SR-60/I-605 interchange	El Monte	2000 ft
Alternative 3 Beverly LRT	Montebello Golf Course	901 Via San Clemente	Montebello	adjacent to SR-60
	Ashiya Park	2700 W Beverly Blvd.	Montebello	north & south side of Beverly, east of Garfield
	Henry Acuna Park	600 N 18th St.	Montebello	500 ft north of alignment
	Grant Rea Park	600 Rea Dr.	Montebello	adjacent to Beverly to the north
	Rio Hondo Park	4632 Orange St.	Pico Rivera	< 500 ft south of Beverly just east of river
	Pico Park	9528 Beverly Blvd.	Pico Rivera	adjacent to Beverly to the south
	Amigo Park	5700 Juarez Ave.	Whittier	< 500 ft southwest of Whittier Greenway, on west side of I-605
	Guirado Park	5760 Pioneer Blvd.	Whittier	500 ft south of Whittier Greenway, on east side of I-605
	Palm Park	5703 Palm Ave.	Whittier	Whittier Greenway crosses thru Palm Park
	Whittier Greenway	From Beverly Blvd. at Rio Hondo to end of alignment	Whittier	alignment passes through greenway

Table 4-28 Parkland and Recreational Facilities along Each Alignment Alternative

Alignment Alternative	Parkland /Recreational Facility	Location	City	Approximate Proximity to line/station
Alternative 4 Whittier LRT	Montebello Golf Course	901 Via San Clemente	Montebello	adjacent to SR-60
	Ashiya Park	2700 W Beverly Blvd.	Montebello	north & south side of Beverly, east of Garfield
	Montebello Park	236 S Taylor Ave.	Montebello	adjacent to Whittier to the south
	Pio Pico State Historic Park	6003 Pioneer Blvd.	Whittier	adjacent to Whittier to the south
Alternative 5 Washington LRT	Montebello Golf Course	901 Via San Clemente	Montebello	adjacent to SR-60
	Ashiya Park	2700 W Beverly Blvd.	Montebello	north & south side of Beverly, east of Garfield
	Chet Holifield Park	1060 S Greenwood Ave.	Montebello	500 ft south of Washington

4.14.2 Evaluation Methodology

The parkland and recreational facilities analysis was completed at a preliminary level as site-specific details have not been developed. Each alternative is evaluated in this section based on the number of parkland and recreational facilities along the alignment and the type and degree of impacts resulting from each alternative. Consideration is also given to beneficial impacts, including increased connectivity between parkland and recreational areas and the public. Further investigation in the Draft EIR/EIS is recommended for those parkland and recreational facilities identified as potentially having direct or constructive use impacts.

4.14.3 Environmental Issues

Alternative 1 - LRT along SR-60

The Montebello Golf Course, the Whittier Narrows Recreation Area, and the California Country Club are the three recreational facilities along the Alternative 1 alignment. The proposed alignment is directly adjacent to the northern boundary of the public Montebello Golf Course, with a potential for constructive use impacts, including noise, changes to the visual setting, and alteration of access to the course. With a proposed station at Garfield Ave., near the northeast corner of the golf course, a possible benefit of this alternative is improved accessibility of the course for the public.

Direct impacts of this alternative, including Section 4(f) compliance and acquisition of right-of-way, are applicable to the Whittier Narrows Recreational Area. The proposed alignment passes directly through this recreational area, and the effects of resulting Section 4(f) involvement requires further investigation. There is potential for constructive use effects in the Whittier Narrows Recreational Area, including noise, impediment or alteration of access, changes in visual setting, and the introduction of conflicts with facility patrons, pedestrians, and bicyclists. Similarly to the Montebello Golf Course, this recreational area would benefit from increased accessibility to the public because of the proposed station at Santa Anita Ave.

The California Country Club is near the end of the proposed alignment. However, neither constructive use nor direct effects of the alignment are expected at this facility because of the distance between the alignment and the country club. Because this is a private country club, Section 4(f) considerations do not apply.

Alternative 2 - Busway along SR-60

This bus rapid transit (Busway) alternative alignment is similar to the alignment of Alternative 1, along SR-60. Therefore, impacts along this alignment are primarily the same as those presented for Alternative 1 above. There may be a higher potential for noise impacts from this bus alternative compared to the LRT Alternative 1.

Alternative 3 – Beverly LRT

This alternative has ten parkland or recreational facilities along its proposed alignment. Parkland and recreational facilities with possible direct impacts are Palm Park and the Whittier Greenway, while all other parks listed in Table 4-28 above for this alignment may experience constructive use impacts. Further evaluation is needed as more site-specific details are developed to determine the potential for impacts.

The proposed alignment traverses along the northern and eastern boundary of the Montebello Golf Course, posing potential for constructive use impacts, including noise, changes to the visual setting, and alteration of access to the course. There is the potential for users of the golf course to bear noise impacts associated with the alignment along SR-60 and Garfield Ave. With a proposed station at Garfield Ave., near the northeast corner of the golf course, a benefit of this alternative is improved accessibility of the course for the public.

Formerly a railroad track, the Whittier Greenway is a transformed bike and pedestrian trail and the proposed location for the end of this alignment. The right-of-way for the Greenway trail was acquired from Union Pacific Railroad in December 2001, and construction began in fall 2006. Project funding came from the Los Angeles County Metropolitan Transportation Authority grant funds and from the State of California (primarily statewide bond funds). The project construction is expected to be completed by the fall of 2008 after the completion of grading of the right-of-way, installation of an asphalt bicycle/pedestrian path, landscaping, lighting, and some walls and bridge repair. The trail is operated and maintained by the City of

Whittier's Park Department, and it is designed to connect various elements of the community and allow residents and visitors to hike or bike through town[33]. This alternative is proposed to traverse at-grade through the Whittier Greenway Trail and adjacent to the biking/hiking path, which would be relocated and re-landscaped as part of this alternative. Impacts of this path relocation will need to be analyzed as part of the Whittier Greenway Trail's Section 4(f) review for the Draft EIR/EIS.

Southeast of Norwalk Blvd., the alignment and the Whittier Greenway trail intersect Palm Park, which is susceptible to direct and constructive use impacts from this alternative. Analysis in terms of Section 4(f) requirements is necessary as a part of the Draft EIR/EIS for this segment of alignment through the Whittier Greenway Trial and Palm Park.

There is the potential for constructive use impacts from this alternative, including noise; impediment or alteration of access; changes in visual setting; and the introduction of conflicts with facility patrons, pedestrians, and bicyclists at the remaining parkland and recreation facilities listed in the table above for this alternative. Those facilities with the greatest potential for constructive use impacts are those that are directly adjacent to the alignment. These include Ashiya Park, Grant Rea Park, and Pico Park.

Proposed station locations are not adjacent to parklands along the alignment, and they are not expected to provide the beneficial effect of increased connectivity between parklands and the public.

Alternative 4 – Whittier LRT

The Montebello Golf Course, Ashiya Park, Montebello Park, and the Pio Pico State Historic Park are the four recreational facilities along the Alternative 4 alignment. The proposed alignment is directly to the north and east of the Montebello Golf Course and along Ashiya Park, Montebello Park, and Pio Pico State Historic Park.

As with Alternative 3, this alignment has the potential to generate constructive use impacts on users of the Montebello Golf Course, including noise, changes to the visual setting, and alteration of access to the course. This will need to be studied in more detail in the Draft EIR/EIS. With a proposed station at Garfield Ave., near the northeast corner of the golf course, a benefit of this alternative is improved accessibility of the course for the public.

This alignment could also generate constructive use impacts on the three remaining parks. However, Pio Pico State Historic Park and other publicly owned parks within the PSA qualify as protected Section 4(f) facilities; it is recommended that this be investigated in greater detail as a part of future project environmental review. Proposed station locations are not adjacent to parklands along the alignment, and they are not expected to provide the beneficial

[33] The Whittier Greenway Trail. Undated. The City of Whittier Park Department. Accessed 28 July 2008. <http://www.whittierch.org/>

effect of increased connectivity between parklands and the public.

Alternative 5 – Washington LRT

The Montebello Golf Course, Ashiya Park, and Chet Holifield Park are the three recreational facilities along the Alternative 5 alignment. The proposed alignment is directly adjacent to the north and east of the Montebello Golf Course and along Ashiya Park and Chet Holifield Park.

As with Alternatives 3 and 4, this alignment has the potential to generate constructive use impacts on users of the Montebello Golf Course, including noise and vibration, changes to the visual setting, and alteration of access to the course, which will be studied in greater detail in the Draft EIR/EIS phase. There is a proposed station at Garfield Ave., near the northeast corner of the golf course. A benefit of this alternative is improved accessibility of the course for the public.

Constructive use impacts may occur at Ashiya Park, which is directly adjacent to the alignment at Garfield Ave. and Beverly Blvd. No major direct or constructive use impacts are expected for Chet Holifield Park, which is nearly 500 ft south of the alignment on Greenwood Ave., south of Washington Blvd.

Proposed station locations are not adjacent to parklands along the alignment, and they are not expected to provide the beneficial effect of increased connectivity between parklands and the public.

4.14.4 Summary

Potential impacts to parkland and recreational facilities along the proposed alignments include both constructive use and direct effects. Analysis in future project phases should include review of each alignment's compliance with Section 4(f) requirements.

4.15 Summary of Environmental Issues

This section summarizes the environmental issues identified for the build alternatives being considered as a part of the AA analysis. Environmental issues for the No-Build and TSM alternatives have also been identified, where possible at this level of analysis, and will be carried forward for review as a part of NEPA/CEQA analysis. This summary section highlights environmental issues unique to specific alternatives and presents a rating by resource area of these environmental issues to provide readers and decision makers with the relative scale of effects that could be generated by alternative implementation. The relative scale assigns each alternative with a rating of high, medium, or low: with high representing a potentially significant effect that could not be mitigated, medium representing an effect that could be mitigated, and low representing an alternative with little or no effect. These ratings were developed based on preliminary investigation into each resource area using existing reports and studies, and a conceptual level of design for each alternative. Analysis that will be

completed in future project phases will refine the information used to develop these ratings and potentially identify issues that could change the ratings.

4.15.1 No-Build Alternative

The No-Build Alternative includes all projects that are identified for construction in the financially constrained Long Range Transportation Plan by the year 2030, but does not include the Eastside Transit Corridor Phase 2 project. The No-Build Alternative is used for comparison purposes in order to assess the relative benefits and impacts of the alternatives under consideration as compared to no action.

The No-Build Alternative would not provide transit generated mobility improvements to eastern Los Angeles County communities in the PSA beyond the eastern terminus of the Metro Gold Line currently under construction. Projected population growth and increases in travel demand would not be addressed. Transit dependant populations in the PSA would not benefit from improved access to a transit alternative.

Table 4-29 classifies the No-Build Alternative's effect on various environmental resource areas as high, medium, and low expected level of impact after completion of planned mitigation.

Table 4-29
Expected Level of Impact for No-Build Alternative Implementation

Resource Area	Impact Level
Visual and Aesthetic	L
Cultural Resources	L
Air Quality	H
Noise and Vibration	L
Ecosystems	L
Water Resources	L
Geology and Subsurface Conditions	L
Hazardous Substances	L
Energy	L
Parklands	L

4.15.2 TSM Alternative

The TSM Alternative, like the No-Build Alternative, includes all projects that are identified for construction in the financially constrained Long Range Transportation Plan by the year 2030, and goes beyond the No-Build Alternative to include a package of service improvements to the bus operations in the PSA. The TSM Alternative does not include the Eastside Transit Corridor Phase 2 project. This alternative is used for comparison purposes in order to assess the relative benefits and impacts of the alternatives under consideration.

The TSM Alternative would not provide the same level of transit generated mobility improvements to eastern Los Angeles County communities as the Eastside Transit Corridor Phase 2 project alternatives. Population growth and increases in travel demand would not be addressed by the TSM Alternative to the same degree as with implementation of one of the five build alternatives. Transit dependant populations in the PSA would not benefit to as great a degree as they would with the Build alternatives from improved access to one of the five build alternatives.

Table 4-30 classifies the TSM Alternative's anticipated effect on various environmental resource areas. Impacts are classified as high, medium, and low depending on the level of impacts anticipated after completion of planned mitigation.

Table 4-30
Expected Level of Impact for TSM Alternative Implementation

Resource Area	Impact Level
Visual and Aesthetic	L
Cultural Resources	L
Air Quality	M
Noise and Vibration	L
Ecosystems	L
Water Resources	L
Geology and Subsurface Conditions	L
Hazardous Substances	L
Energy	L

Table 4-30
Expected Level of Impact for TSM Alternative Implementation

Resource Area	Impact Level
Parklands	L

4.15.3 Alternative 1 - SR-60 LRT

Alternative 1 would develop a light rail alignment beginning at the eastern terminus of the Eastside Transit Corridor Phase 1 project and travel east along SR-60 to the alignment's proposed terminus near the 605 Freeway.

Alternative 1, as proposed, would be constructed primarily adjacent to SR-60 and would be expected to have less interaction with surface streets and residential neighborhoods during construction. The alternative would cross the San Gabriel River, the Rio Hondo, and the Whittier Narrows Recreation Area with the potential to affect ecosystems, water resources, parklands, and visual and aesthetic resources. Mitigation measures would be incorporated into project design to reduce the potential for negative effects. If carried forward for review in future project phases, the potential for adverse environmental effects associated with alternative implementation will be investigated in detail for all resource areas.

Alternative 1 would provide transit generated mobility improvements to eastern Los Angeles County communities in the PSA beyond the eastern terminus of the Metro Gold Line currently under construction. Projected population growth and increases in travel demand would be addressed by the new light rail alignment. Transit dependant populations in the PSA would benefit from improved access to a fixed transit alternative.

Table 4-31 classifies Alternative 1's effect on various environmental resource areas as high, medium, and low expected level of impacts after completion of planned mitigation.

Table 4-31
Expected Level of Impact for Alternative 1 – SR-60 LRT Implementation

Resource Area	Impact Level
Visual and Aesthetic	M
Cultural Resources	M
Air Quality	L

Table 4-31
Expected Level of Impact for Alternative 1 – SR-60 LRT Implementation

Resource Area	Impact Level
Noise and Vibration	L
Ecosystems	M
Water Resources	L
Geology and Subsurface Conditions	M
Hazardous Substances	M
Energy	L
Parklands	M

4.15.4 Alternative 2 – SR-60 Busway

Alternative 2 would develop a bus rapid transit line beginning at the eastern terminus of the Eastside Transit Corridor Phase 1 project that travels east along SR-60 to the alignment's proposed terminus near the 605 Freeway.

Alternative 2, as proposed, would be constructed primarily adjacent to SR-60 and would be expected to have less interaction with surface streets and residential neighborhoods during construction. The alternative would cross the San Gabriel River, the Rio Hondo, and the Whittier Narrows Recreation Area with the potential to affect ecosystems, water resources, parklands, and visual and aesthetic resources. Mitigation measures would be incorporated into project design to reduce the potential for negative effects. If carried forward for review in future project phases, the potential for adverse environmental effects associated with alternative implementation will be investigated in detail for all resource areas.

Alternative 2 would provide transit generated mobility improvements to eastern Los Angeles County communities in the PSA beyond the eastern terminus of the Metro Gold Line currently under construction. Projected population growth and increases in travel demand would be addressed by the new bus rapid transit alignment. Transit dependant populations in the PSA would benefit from improved access to a fixed transit alternative.

Table 4-32 classifies Alternative 2's effect on various environmental resource areas as high, medium, and low expected level of impacts after completion of planned mitigation.

Table 4-32
Expected Level of Impact for Alternative 2 – SR-60 Busway Implementation

Resource Area	Impact Level
Visual and Aesthetic	M
Cultural Resources	M
Air Quality	M
Noise and Vibration	L
Ecosystems	M
Water Resources	L
Geology and Subsurface Conditions	M
Hazardous Substances	M
Energy	L
Parklands	M

4.15.5 Alternative 3 - Beverly LRT

Alternative 3 would develop a light rail alignment beginning at the eastern terminus of the Eastside Transit Corridor Phase 1 project that travels east along SR-60 to Garfield Ave. where it turns south to Beverly Blvd. and then east along Beverly Blvd. and the Whittier Greenway to the alignment's proposed terminus at Mar Vista St.

Alternative 3, as proposed, would be constructed alongside SR-60 and along surface streets after the turn south at Garfield Ave. Construction of the alignment would be expected to affect these surface streets and residential neighborhoods along the Whittier Greenway with short-term construction related traffic congestion. The alternative would cross the San Gabriel River and the Rio Hondo and utilize the Whittier Greenway with the potential to affect ecosystems, water resources, parklands, and visual and aesthetic resources. Mitigation measures would be incorporated into project design to reduce the potential for negative effects. If carried forward for review in future project phases, the potential for adverse environmental effects associated with alternative implementation will be investigated in detail for all resource areas.

Alternative 3 would provide transit generated mobility improvements to eastern Los Angeles County communities in the PSA beyond the eastern terminus of the Metro Gold Line currently under construction. Projected population growth and increases in travel demand would be addressed by the new light rail alignment. Transit dependant populations in the PSA would benefit from improved access to a fixed transit alternative.

Table 4-33 classifies Alternative 3's effect on various environmental resource areas as high, medium, and low expected level of impacts after completion of planned mitigation.

Table 4-33
Expected Level of Impact for Alternative 3 – Beverly LRT Implementation

Resource Area	Impact Level
Visual and Aesthetic	M
Cultural Resources	M
Air Quality	M
Noise and Vibration	M
Ecosystems	L
Water Resources	L
Geology and Subsurface Conditions	M
Hazardous Substances	L
Energy	L
Parklands	M

4.15.6 Alternative 4 - Whittier LRT

Alternative 4 would develop a light rail alignment beginning at the eastern terminus of the Eastside Transit Corridor Phase 1 project that travels east along SR-60 to Garfield Ave. where it turns south to Whittier Blvd. and then east along Whittier Blvd. to the alignment's proposed terminus at Mar Vista St.

Alternative 4, as proposed, would be constructed alongside SR-60 and along surface streets after the turn south at Garfield Ave. Construction of the alignment would be expected to affect

these surface streets and residential neighborhoods alignment with short-term construction related traffic congestion. Sections of Whittier Blvd. have recently been upgraded with streetscape improvement projects that could be affected by development of the light rail alignment. The alternative would cross the Rio Hondo and San Gabriel Rivers with the potential to affect ecosystems, water resources, parklands, and visual and aesthetic resources. Mitigation measures would be incorporated into project design to reduce the potential for negative effects. If carried forward for review in future project phases, the potential for adverse environmental effects associated with alternative implementation will be investigated in detail for all resource areas.

Alternative 4 would provide transit generated mobility improvements to eastern Los Angeles County communities in the PSA beyond the eastern terminus of the Metro Gold Line currently under construction. Projected population growth and increases in travel demand would be addressed by the new light rail alignment. Transit dependant populations in the PSA would benefit from improved access to a fixed transit alternative.

Table 4-34 classifies Alternative 4's effect on various environmental resource areas as high, medium, and low expected level of impacts after completion of planned mitigation.

Table 4-34
Expected Level of Impact for Alternative 4 – Whittier LRT Implementation

Resource Area	Impact Level
Visual and Aesthetic	M
Cultural Resources	M
Air Quality	M
Noise and Vibration	M
Ecosystems	L
Water Resources	L
Geology and Subsurface Conditions	M
Hazardous Substances	L
Energy	L
Parklands	L

4.15.7 Alternative 5 - Washington LRT

Alternative 5 would develop a light rail alignment beginning at the eastern terminus of the Eastside Transit Corridor Phase 1 project that travels east along SR-60 to Garfield Ave. where it turns south to Washington Blvd. and then east along Washington Blvd. to the alignment's proposed terminus near the intersection of Washington and Whittier Blvds.

Alternative 5, as proposed, would be constructed alongside SR-60 and along surface streets after the turn south at Garfield Ave. Construction of the alignment would be expected to affect these surface streets and residential neighborhoods alignment with short-term construction related traffic congestion. The alternative would cross San Gabriel River and the Rio Hondo with the potential to affect ecosystems, water resources, parklands, and visual and aesthetic resources. Mitigation measures would be incorporated into project design to reduce the potential for negative effects. If carried forward for review in future project phases, the potential for adverse environmental effects associated with alternative implementation will be investigated in detail for all resource areas.

Alternative 5 would provide transit generated mobility improvements to eastern Los Angeles County communities in the PSA beyond the eastern terminus of the Metro Gold Line currently under construction. Projected population growth and increases in travel demand would be addressed by the new light rail alignment. Transit dependant populations in the PSA would benefit from improved access to a fixed transit alternative.

Table 4-35 classifies Alternative 5's effect on various environmental resource areas as high, medium, and low expected level of impacts after completion of planned mitigation.

Table 4-35
Expected Level of Impact for Alternative 5 – Washington Blvd. Implementation

Resource Area	Impact Level
Visual and Aesthetic	M
Cultural Resources	M
Air Quality	H
Noise and Vibration	M
Ecosystems	L
Water Resources	L

Table 4-35
Expected Level of Impact for Alternative 5 – Washington Blvd. Implementation

Resource Area	Impact Level
Geology and Subsurface Conditions	M
Hazardous Substances	L
Energy	L
Parklands	L

4.15.8 Conclusions

The Eastside Transit Corridor Phase 2 project alternatives would all provide mobility improvements in eastern Los Angeles County communities in the PSA and provide opportunities for improving these communities' quality of life through access to a new fixed transit alignment. As outlined in the environmental issue analysis presented in this section, many of the alternatives at this preliminary level of analysis would be expected to generate similar levels of effects for the environmental resource areas. At this conceptual stage of design, it does not appear that there are any fatal flaw environmental issues that would preclude any of the build alternatives from further consideration. It is expected that environmental analysis conducted as part of future project phases will identify environmental issues that have not yet been identified, as well as more accurately estimate the level of mitigation provided by measures being included as a part of project design.

Table 4-36 presents the summary of the alternatives' effect on environmental issues by environmental resource area.

Table 4-36
Summary of Expected Impacts for Eastside Transit Corridor Phase 2 Project Alternatives

Resource Area	No-Build Alt.	TSM Alt.	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Land Use & Economic Development	L	L	L	L	L	L	L
Catalyst for Public/Private Economic Revitalization	L	L	L	L	L	L	L
Displacement	L	L	H	H	L	M	M
Community & Neighborhood	L	L	M	M	M	M	M
Visual and Aesthetic	L	L	M	M	M	M	M
Cultural Resources	L	L	M	M	M	M	M
Air Quality	H	M	L	M	M	M	H
Noise and Vibration	L	L	L	L	M	M	M
Ecosystems	L	L	M	M	L	L	L
Water Resources	L	L	L	L	L	L	L
Geology and Subsurface Conditions	L	L	M	M	M	M	M
Hazardous Substances	L	L	M	M	L	L	L
Energy	L	L	L	L	L	L	L
Parklands	L	L	M	M	M	L	L

Key: H - High, M - Medium, L - Low

5.0 COST AND FINANCIAL ANALYSIS

5.1 Capital Costs

The following sections present information on the capital cost estimating approach and the results of the capital cost estimates.

5.1.1 Capital Cost Estimating Approach

Unit costs used in preparing the capital cost estimate were derived from a number of sources; the most common was Metro's other projects. The information is estimated in 2008 cost based upon information from the Expo Phase 2 and Orange Line Phase 2. Due to their recent construction bids, these were considered accurate measures of costs. Table 5-1 contains unit costs that were used to estimate costs for Eastside Phase 2 Alternatives. All unit costs were prepared using the Standard Constructor Code cost categories that are used by FTA to ensure compatible cost estimates. Estimates are in 2008 dollars. Additional detail regarding specific unit cost derivation is provided in the *Eastside Corridor Phase 2 Cost Analysis Technical Memorandum*, August 2008.

Table 5-1: Unit Prices

SCC No.	Cost Category	Units	*Unit Price	**Allocated Contingency
10.031	Guideway: At-grade in mixed traffic New Roadway	Route Mile	$2,900	25%
10.032	Guideway: At-grade in mixed traffic No New Road	Route Mile	$2,400	25%
10.033	Guideway: At-grade in mixed traffic Single Track	Route Mile	$1,450	25%
10.041	Guideway: Aerial Not In Roadway	Route Mile	$70,000	25%
10.042	Guideway: Aerial structure Long Span Bridge	Route Mile	$77,000	25%
10.043	Guideway: Aerial structure Transition To Aerial	Route Mile	$35,000	25%
10.044	Guideway: Aerial structure Reconstruct Bridge	Route Mile	$70,000	25%
10.045	Guideway: Aerial structure Not In Roadway	Route Mile	$74,000	25%
10.091	Track: Direct fixation	Route Mile	$3,800	15%
10.110	Track: Embedded	Route Mile	$4,860	15%
10.120	Track: Embedded Single Track	Route Mile	$2,430	15%

Table 5-1: Unit Prices

SCC No.	Cost Category	Units	*Unit Price	**Allocated Contingency
20.011	LRT At-grade station, Center Mile	Each	$5,000	25%
20.012	LRT At-grade station, Split Platform	Each	$6,000	25%
20.013	LRT At-grade station, Split Half Platform	Each	$3,000	25%
20.021	LRT Aerial station, Center Platform	Each	$10,000	25%
20.022	Busway At-grade, Center Platform	Each	$2,000	25%
20.023	Busway Aerial, Center Platform	Each	$4,200	25%
20.061	Automobile parking: Small Parking Lot	Each	$1,500	25%
20.062	Automobile parking: Large Parking Lot	Each	$3,000	25%
20.063	Automobile parking: Large Parking Deck	Each	$4,000	25%
20.065	Automobile parking: Small Parking Deck	Each	$2,000	25%
20.066	Automobile parking: Small Parking Structure	Each	$3,000	25%
20.067	Automobile parking: Large Parking Structure	Each	$6,000	25%
30.030	Heavy Maintenance Facility	Square Feet	$630	15%
40.021	Site Utilities, Utility Relocation Roadway	Route Mile	$2,900	30%
40.022	Site Utilities, Utility Relocation Aerial	Route Mile	$2,300	30%
40.050	Site Structures: Noise Walls	Route Mile	$1,056	30%
40.060	Pedestrian Bike Path	Route Mile	$1,056	30%
50.010	Train control and signals	Route Mile	$3,000	30%
50.021	Traffic signals and crossing protection	Route Mile	$850	30%
50.022	Grade Crossings Gates	Each	$500	30%
50.030	Traction power supply: substations	Route Mile	$2,500	30%
50.040	Traction power distribution: catenary and third rail	Route Mile	$3,400	30%
50.050	Communications	Route Mile	$2,900	30%
50.060	Fare collection system and	Each	$860	30%

Table 5-1: Unit Prices

SCC No.	Cost Category	Units	*Unit Price	**Allocated Contingency
	equipment			
50.070	Central Control	Each	$2,400	30%
60.010	Purchase Of Real Estate	Square Feet	$0.20	40%
70.010	Light Rail	Each	$3,500.00	5%
70.040	Bus	Each	$4,000.00	5%
70.050	Other Busway	Each	$7,500.00	5%
80.010	Preliminary Engineering	%	3% Construction Costs SSC 10-50	15%
80.020	Final Design	%	7% Construction Costs SSC 10-50	15%
80.030	Project Management for Design and Construction	%	10% Construction Costs SSC 10-50	15%
80.040	Construction Administration & Management	%	5% Construction Costs SSC 10-50	15%
80.060	Legal; Per Route Mile; Review Fees by other agencies, cities, etc.	%	10% Construction Costs SSC 10-50	15%
80.070	Surveys, Testing, Investigation, Inspection	%	2% Construction Costs SSC 10-50	15%
80.080	Start up	%	0.5% Construction Costs SSC 10-50	15%
80.090	Art Work	%	1.5% Construction Costs SCC 10-50	15%

*2008 Construction Dollars (in thousands).
**Allocated Contingency Percentage Added To Cost Categories

Quantity take-offs were based on recent alignment plans and the alignment descriptions provided in the *Eastside Corridor Phase 2 Urban Design and Engineering Technical Memorandum*, August 2008. Right-of-way was based on recent alignment plans and documentation regarding right-of-way requirements. Route measurements along each alignment were quantified from the plan sheets stationing. Quantities for unit item, such as grade crossing gates and parking garages, were also tallied from the plan sheets.

5.1.2 Capital Costs Results

The capital cost estimates are provided in Table 5-2. The lowest cost alternatives of the five considered in the detailed screening analysis was Alternative 2 – SR-60 Busway and Alternative 3 – Beverly LRT. Alternatives 1 & 5 are estimated to have construction costs in

excess of $1 billion due to large sections of aerial alignment and aerial station configurations. All alternatives have project costs over a $1 billion dollars when accounting for Right-of-Way, Vehicles, Professional Services, and Unallocated Contingency.

Table 5-2: Cost Estimates

Alternative	Construction Cost*	Project Costs**
Alternative 1 – SR-60 LRT	$1039	$1719
Alternative 2 – SR-60 Busway	$834	$1401
Alternative 3 – Beverly LRT	$665	$1086
Alternative 4 – Whittier LRT	$844.5	$1383.5***
Alternative 5 – Washington LRT	$1145.9	1764.7

* Construction cost column includes hard costs and contingencies as established by each cost category. 2008 dollars (in millions)
** Includes RIGHT-OF-WAY, Vehicles, Professional Services is total hard and soft cost.
*** Depending upon route options or combination of options the cost to construct could be higher or lower by as much as $50,000,000.

5.2 Operating and Maintenance Costs

This section will cover the approach in developing the operating and maintenance (O&M) cost methodology to estimate the potential costs for each alternative. Operating and maintenance cost results will also be included in this section of the AA report.

5.2.1 Operating and Maintenance Cost Estimating Approach

This section describes the operating and maintenance cost methodology and provides a general overview of the LRT, Busway and bus cost model structures, required inputs, and formulas used to estimate labor and non-labor expenses.

5.2.1.1 Methodology

Fully Allocated Cost Model

The fully allocated cost model structure was used to estimate annual operating and maintenance (O&M) costs for each project alternative. Each cost allocation model assumes that each expense incurred by a transit system is “driven” by supply variables,

such as vehicle revenue-miles, train revenue-hours, and peak-vehicles. A unit cost is developed for each supply variable by disaggregating operating expense data (i.e. National Transit Database [NTD] data), which is reported by object class and function, and assigning cost drivers (i.e. annual revenue bus hours or miles) to each expense object. To derive unit costs, the expenses assigned to each supply variable are summed and divided by the annual quantity supplied. To determine total O&M costs, the unit cost for each supply variable is multiplied by the projected annual units of service.

For example, the bus model cost driver variable for Expense Object 501.01, Operator Salaries/Wages, is annual revenue bus hours. Existing operator salary costs, as reported in the NTD, are divided by bus hours to derive the unit cost per bus hour. Then, the proposed alternative bus hours would be multiplied by the unit cost to determine estimated labor costs. This process is repeated for all cost driver variables to determine total estimated system O&M costs.

Six O&M models were used to estimate and evaluate the operating and maintenance costs for each alternative:

- Metro LRT Operations
- Metro Busway Operations
- Metro Bus Operations
- Montebello Bus Lines Operations
- Norwalk Transit System Bus Operations
- Foothill Bus Operations

The following sections include a general overview of each cost model with respect to model structure and inputs.

5.2.1.2 Metro LRT Operations O&M Model

Since Metro currently operates Light Rail Transit (LRT), O&M estimates were developed based on the Metro Gold Line financial and operating data for fiscal year 2008. The following sections include a general overview of the Metro LRT operations cost model structure and required inputs.

Structure and Inputs

Metro's Gold line LRT operating costs for fiscal year 2008 were derived from the Metro FY 2008 Adopted Budget (Activity Based Gold Line Cost Model) and were allocated to five variables: route miles, yards, annual revenue train-hours, annual revenue car-miles, and peak light rail vehicle (LRV) cars.

The following equation summarizes the fully-allocated cost model used to estimate annual O&M costs for the study alternatives:

$$\text{Estimated Annual O\&M Cost} = \text{Route-Mile Unit Cost} \times \text{Projected Route-Miles} + \text{Yard Unit Cost} \times \text{Projected Yards} + \text{Train-Hour Unit Cost} \times \text{Projected Train-Hours} + \text{Car-Mile Unit Cost} \times \text{Projected Car Miles} + \text{Peak LRV Unit Cost} \times \text{Projected Peak LRV Cars}$$

Where:

- Route-Miles: Total number of directional route miles.
- Yards: Total number of maintenance and storage facilities.
- Annual Revenue Train-Hours: Total hours of revenue service operated by all trains in one year.
- Annual Revenue Car-Miles: Total miles of revenue service operated by all trains in one year.
- Peak LRV Cars: The maximum number of passengers vehicles scheduled in service at the same time.

FY 2008 expenses and units of service for each variable are presented in Table 5-3. Operating expenses assigned to each variable were summed and divided by FY 2008 units of service to derive unit costs.

Table 5-3 Metro LRT FY 2008 Expense Allocations and Unit Costs

	FULL ALLOCATION				
EXPENSE OBJECT	Rt.-Miles	Yards	Train-Hrs	Car-Miles	LRVs
Wages & Benefits	2,853,501	2,853,501	6,798,038	4,992,979	0
Materials & Supplies	257,125	257,125	0	1,062,268	50,832
Other	1,938	1,938	0	3,174	41,981
Services	356,453	356,453	0	30,819	0
Propulsion Power	0	0	0	2,089,821	0
Non-Revenue Vehicles	157,211	157,211	0	0	0
Facilities Maintenance	699,501	699,501	0	0	0
Transit Security	0	0	0	9,284,537	0
General Manager	0	598,727	0	0	0
Revenue	0	0	0	0	1,182,870
Service Development	0	0	0	0	363,484
Safety	0	0	0	0	372,854
Casualty & Liability	0	0	0	549,607	0
Workers' Comp	0	0	0	0	800,246
Utilities	0	371,710	0	371,710	0
Other Metro Operations	0	108,757	0	0	0
Building Costs	0	247,470	0	0	0
Copy Services	0	0	0	0	37,331
Support Department Costs	0	0	0	0	3,650,210
Total Operating Expenses:	4,325,728	5,652,392	6,798,038	18,384,915	6,499,808
FY2008 Units of Service	13.7	1.0	43,925	1,653,458	18
Unit Cost (oper. expenses only)	$315,747	$5,652,392	$154.76	$11.12	$361,100

The unit costs derived from the fully allocated model were applied to the projected operating statistics generated for each project alternative to estimate total O&M costs. Cost estimates for each alternative are found in Section 5.2.2.

5.2.1.3 Metro Busway Operations O&M Model

Since Metro currently operates Bus Rapid Transit (Busway), O&M estimates were developed based on the Orange Line financial and operating data for fiscal year 2008. The following sections include a general overview of the Metro Busway operations cost model structure and required inputs.

Structure and Inputs

Metro's Orange Line Busway operating costs for fiscal year 2008 were derived from the Metro FY 2008 Adopted Budget (Activity Based Orange Line Cost Model) and were allocated to five variables: route miles, garages, annual revenue bus-hours, annual revenue bus-miles, and peak buses.

The following equation summarizes the fully-allocated cost model used to estimate annual O&M costs for the study alternatives:

Estimated Annual O&M Cost	=	Route-Mile Unit Cost x Projected Route-Miles	+	Garages Unit Cost x Projected Garages	+	Bus-Hours Unit Cost x Projected Bus-Hours	+	Bus-Miles Unit Cost x Projected Bus-Miles	+	Peak Bus Unit Cost x Projected Peak Buses

Where:

- Route-Miles: Total number of directional route miles.
- Garages: number of bus storage and maintenance garages.
- Annual Revenue Bus-Hours: Total hours of revenue service operated by all trains in one year.
- Annual Revenue Bus-Miles: Total miles of revenue service operated by all trains in one year.
- Peak Buses: The maximum number of passengers vehicles scheduled in service at the same time.

FY 2008 expenses and units of service for each variable are presented in Table 5-4. Operating expenses assigned to each variable were summed and divided by FY 2008 units of service to derive unit costs.

Table 5-4 Metro Busway FY 2008 Expense Allocations and Unit Costs

	FULL ALLOCATION				
EXPENSE OBJECT	Rt.-Miles	Garages	Bus-Hrs	Bus-Miles	Buses
Wages & Benefits	0	0	5,252,705	1,737,712	0
Control Center	0	0	247,143	0	0
Fuel	0	0	0	757,556	0
Material & Supplies	0	0	0	666,700	0
Fueling Contractor Reimbursement	0	0	0	(85,603)	0
Maintenance Support	11,647	11,647	0	0	0
Non-Revenue Vehicles	4,018	4,018	0	0	0
Facility Maintenance	1,654,412	1,654,412	0	0	0
Transit Security	0	0	0	6,428,766	0
General Managers	0	637,737	0	0	0
Revenue	0	0	0	0	1,128,043
Service Development	0	0	0	0	81,294
Casualty & Liability	0	0	0	909,178	0
Workers' Comp	0	0	488,361	162,787	0
Utilities	0	0	0	148,326	0
Other Metro Operations	0	42,284	0	0	0
Building Costs	0	140,912	0	0	0
Copy Services	0	0	0	0	19,950
Support Department Costs	0	0	0	0	441,935
Total Operating Expenses:	1,670,077	2,491,010	5,988,209	10,725,422	1,671,222
FY2008 Units of Service	15.0	0.5	101,561	1,619,412	27
Unit Cost (oper. expenses only)	$111,338	$4,982,019	$58.96	$6.62	$61,897

The unit costs derived from the fully allocated model were applied to the projected operating statistics generated for each project alternative to estimate total O&M costs. Cost estimates for each alternative are found in Section 5.2.2.

5.2.1.4 Metro Bus Operations O&M Model

O&M estimates were developed based on Metro's bus financial and operating data for fiscal year 2008. The following sections include a general overview of the Metro bus operations cost model structure and required inputs.

Structure and Inputs

Metro's bus operating costs for fiscal year 2008 were used from the Metro FY 2008 Adopted Budget (Activity Based Bus Cost Model) and were allocated to five variables: route miles, garages, annual revenue bus-hours, annual revenue bus-miles, and peak buses.

The following equation summarizes the fully-allocated cost model used to estimate annual O&M costs for the study alternatives:

Estimated Annual O&M Cost	=	Route-Mile Unit Cost x Projected Route-Miles	+	Garage Unit Cost x Projected Garages	+	Bus-Hour Unit Cost x Projected Bus-Hours	+	Bus-Mile Unit Cost x Projected Bus-Miles	+	Peak Buses Unit Cost x Projected Peak Buses

Where:

- Route-Miles: Total number of directional bus route miles.
- Garages: number of bus storage and maintenance garages.
- Annual Revenue Bus-Hours: Total hours of revenue service operated by all trains in one year.
- Annual Revenue Bus-Miles: Total miles of revenue service operated by all trains in one year.
- Peak Buses: The maximum number of passengers vehicles scheduled in service at the same time.

FY 2008 expenses and units of service for each variable are presented in Table 5-5. Operating expenses assigned to each variable were summed and divided by FY 2006 units of service to derive unit costs and adjusted to FY2008 dollars at 4 percent per annum for inflation.

The unit costs derived from the fully allocated model were applied to the projected operating statistics generated for each project alternative to estimate total O&M costs. Cost estimates for each alternative are found in Section 5.2.2.

5.2.1.5 Montebello Bus Lines Operations O&M Model

Since Eastside Transit Corridor Phase 2 would affect Montebello Bus Lines operations, O&M estimates were developed based on fiscal year 2006 Montebello Bus Lines operating statistics. The following sections include a general overview of the Montebello Bus Lines operations cost model structure and required inputs.

Table 5-5 Metro Bus FY 2008 Expense Allocations and Unit Costs

	FULL ALLOCATION				
EXPENSE OBJECT	Rt.-Miles	Garages	Bus-Hrs	Bus-Miles	Buses
Wages & Benefits	0	0	339,799,542	120,784,155	0
Control Center	0	0	7,810,633	0	0
Services	0	0	55,996	1,387,101	0
Training	839,699	839,699	5,528,742	0	0
Scheduling & Planning	0	0	3,714,552	0	0
Fuel	0	0	0	53,833,804	0
Materials & Supplies	0	0	206,302	43,894,475	0
Fueling Contractor Reimbursement	0	0	0	(2,222,023)	0
Maintenance Support	8,180,979	8,180,979	0	193,000	0
Power Plant Assembly	0	0	0	4,971,708	0
Accident Repair	0	0	0	1,940,677	0
Wheelchair Lifts	0	0	0	165,780	0
Painting	0	0	0	659,577	0
Windows	0	0	0	19,578	0
Non-Revenue Vehicles	2,570,170	2,570,170	0	0	0
Facility Maintenance	16,319,328	16,319,328	0	0	0
Transit Security	0	0	0	21,013,238	0
General Managers	0	13,766,337	0	0	0
Revenue	0	0	0	0	17,234,811
Service Development	0	0	0	0	6,947,388
Safety	0	0	0		1,731,373
Casualty & Liability	0	0	0	0	55,958,642
Workers' Comp	0	0	0	0	38,300,894
Transitional Duty Program	0	0	0	0	2,498,517
Utilities	0	0	0	7,159,937	0
Other Metro Operations	0	4,148,887	0	0	0
Building Costs	0	7,711,409	0	0	0
Copy Services	0	0	0	0	1,087,675
Support Department Costs	0	0	0	0	46,613,787
Purchased Transportation	0	0	38,254,175	0	0
Enterprise Fund Debt	0	0	0	0	2,240,099
Total Operating Expenses:	27,910,175	53,536,808	395,369,942	253,801,007	172,613,186
FY2008 Units of Service	4,527	15.0	7,776,000	96,458,000	2,675
Unit Cost (operating expenses only)	$6,165	$3,569,121	$50.84	$2.63	$64,528

Structure and Inputs

The Montebello Bus Lines O&M cost model uses the same five variables and cost equation as used for the Metro bus model. The Montebello bus cost model was based on FY 2006 National Transit Database reports. The Montebello Bus Lines fiscal year 2006 motor bus operating costs, reported by Object Class and Function, were allocated to five variables: route miles, garages, annual revenue bus-hours, annual revenue bus-miles, and peak buses.

FY 2006 expenses and units of service for each variable are presented in Table 5-6. Operating expenses assigned to each variable were summed and divided by FY 2006 units of service to derive unit costs.

Table 5-6 Montebello Bus FY 2006 Expense Allocations and Unit Costs

	FULL ALLOCATION				
EXPENSE OBJECT	Rt-Miles	Garages	Bus-Hrs	Bus-Miles	Buses
501.01 Operators Salaries/Wages	0	0	5,430,492	0	0
501.02 Other Salaries/Wages	308,524	7,325	286,550	1,562,576	749,937
502.00 Fringe Benefits	5,859	225,126	4,140,848	1,296,425	756,648
503.00 Services	0	20,892	0	579,276	1,721,761
504.01 Fuel & Lubricants	0	0	0	2,125,472	138,936
504.02 Tires & Tubes	0	0	0	0	0
504.03 Other Materials & Supplies	16,401	49,204	0	1,129,723	120,710
505.00 Utilities	96,512	96,512	0	0	0
506.00 Casualty/Liability	0	0	0	1,083,060	0
507.00 Taxes	0	0	0	0	0
508.00 Purchased Transportation	0	0	354,030	0	0
509.00 Miscellaneous Expenses	0	41,416	0	25,255	142,391
510.00 Expense Transfers	0	0	0	0	0
Total Operating Expenses:	427,296	440,474	10,211,920	7,801,787	3,630,383
FY2006 Units of Service	222.8	2	253,239	2,793,960	77
Unit Cost (operating expenses only)	$1,918	$231,828	$40.33	$2.79	$47,148

The unit costs derived from the fully allocated model were applied to the projected operating statistics generated for each project alternative to estimate total O&M costs. Cost estimates for each alternative are found in Section 5.2.2.

5.2.1.6 Norwalk Transit System Bus Operation O&M Model

Since the Eastside Transit Corridor Phase 2 would affect Norwalk Transit System bus operations, O&M estimates were developed based on fiscal year 2006 Norwalk Transit System bus operating statistics. The following sections include a general overview of the Norwalk Transit System bus operations cost model structure and required inputs.

Structure and Inputs

The Norwalk Transit System O&M cost model uses the same five variables and cost equation as used for the Metro bus model. The NTS bus cost model was based on FY 2006 National Transit Database reports. NTS fiscal year 2006 motor bus operating costs, reported by Object Class and Function, were allocated to five variables: route miles, garages, annual revenue bus-hours, annual revenue bus-miles, and peak buses.

FY 2006 expenses and units of service for each variable are presented in Table 5-7. Operating expenses assigned to each variable were summed and divided by FY 2006 units of service to derive unit costs.

Table 5-7 Norwalk Transit System FY 2006 Bus Expense Allocations and Unit Costs

	FULL ALLOCATION				
EXPENSE OBJECT	Rt-Miles	Garages	Bus-Hrs	Bus-Miles	Buses
501.01 Operators Salaries/Wages	0	0	2,527,586	0	0
501.02 Other Salaries/Wages	15,111	231,283	226,246	651,463	458,245
502.00 Fringe Benefits	3,018	127,642	1,443,437	390,331	320,873
503.00 Services	408	64,726	0	39,992	413,280
504.01 Fuel & Lubricants	0	0	0	848,249	0
504.02 Tires & Tubes	0	0	0	72,940	0
504.03 Other Materials & Supplies	0	0	0	767,572	203,530
505.00 Utilities	53,789	53,789	0	0	0
506.00 Casualty/Liability	0	0	0	277,383	0
507.00 Taxes	0	2,847	0	0	0
508.00 Purchased Transportation	0	0	0	0	0
509.00 Miscellaneous Expenses	790	113,983	0	30,689	82,697
510.00 Expense Transfers	0	0	0	0	0
Total Operating Expenses:	73,116	594,269	4,197,269	3,078,619	1,478,625
FY2006 Units of Service	167.0	1	100,371	1,274,412	36
Unit Cost (operating expenses only)	$438	$495,225	$41.82	$2.42	$41,073

The unit costs derived from the fully allocated model were applied to the projected operating statistics generated for each project alternative to estimate total O&M costs. The Monterey Park Spirit Bus also has motor bus service within the PSA that would be affected. The Norwalk Transit System bus operations cost model and unit costs were used to determine estimated costs for Monterey Park Spirit Bus due to unavailable 2006 NTD data and comparable size of operations for both transit systems. Cost estimates for each alternative are found in Section 5.2.2.

5.2.1.7 Foothill Transit Zone Bus Operations O&M Model

Since the Metro Gold line Eastside Extension Metro would affect Foothill Transit Zone bus operations, O&M estimates were developed based on fiscal year 2006 Foothill Transit Zone bus operating statistics. The following sections include a general overview of the Foothill Transit Zone bus operations cost model structure and required inputs.

Structure and Inputs

The Foothill Transit Zone O&M cost model uses the same five variables and cost equation as used for the Metro bus model. The Foothill bus cost model was based on FY 2006 National Transit Database reports.

Foothill Transit Zone fiscal year 2006 motor bus operating costs, reported by Object Class and Function, were allocated to five variables: route miles, garages, annual revenue bus-hours, annual revenue bus-miles, and peak buses. FY 2006 expenses and units of service for each variable are presented in Table 5-8. Operating expenses assigned to each variable were summed and divided by FY 2006 units of service to derive unit costs.

Table 5-8 Foothill Transit Zone FY 2006 Bus Expense Allocations and Unit Costs The

	FULL ALLOCATION				
EXPENSE OBJECT	Rt-Miles	Garages	Bus-Hours	Bus-Miles	Buses
501.01 Operators Salaries/Wages	0	0	0	0	0
501.02 Other Salaries/Wages	0	0	0	0	0
502.00 Fringe Benefits	0	0	0	0	0
503.00 Services	0	1,024,441	0	0	8,192,302
504.01 Fuel & Lubricants	0	0	0	9,764,546	0
504.02 Tires & Tubes	0	0	0	0	0
504.03 Other Materials & Supplies	0	0	0	0	0
505.00 Utilities	0	0	0	0	0
506.00 Casualty/Liability	0	0	0	0	0
507.00 Taxes	0	0	0	0	0
508.00 Purchased Transportation	0	0	39,364,590	0	0
509.00 Miscellaneous Expenses	0	0	0	0	0
510.00 Expense Transfers	0	0	0	0	0
Total Operating Expenses:	0	1,024,441	39,364,590	9,764,546	8,192,302
FY2006 Units of Service	894.3	2.0	736,395.0	11,895,676	306.0
Unit Cost (operating expenses only)	$0	$512,221	$53.46	$0.82	$26,772

Unit costs derived from the fully allocated model were applied to the projected operating statistics generated for each project alternative to estimate total O&M costs. Cost estimates for each alternative are found in Section 5.2.2.

5.2.2 Operating and Maintenance Cost Results

The following sections include a description of the project alternatives and the estimated annual O&M costs for the following alternatives:

- No-Build Alternative
- Baseline/TSM Alternative
- Alternative 1 (SR-60 LRT)
- Alternative 2 (SR-60 Busway)
- Alternative 3 (Beverly LRT)
- Alternative 4 (Whittier LRT)
- Alternative 5 (Washington LRT)

5.2.2.1 Cost Estimates

The estimated annual O&M costs of LRT, Busway and bus operations for each of the Eastside Transit Corridor Phase 2 project alternatives are summarized in this section. The annual O&M cost estimates are based on the 2030 design year operating plans and ridership projections. These "future" cost estimates, however, are presented in 2008 dollars.

LRT O&M Cost Estimates

There are four LRT alternatives considered for this study. Table 5-10 shows the system characteristics and estimated annual O&M costs for Metro operations for the FY 2008 Gold Line, the No-Build and TSM/Baseline alternatives and the four LRT project alternatives. Costs are presented in 2008 dollars.

Metro Busway O&M Cost Estimates

There is one Busway alternative considered for this study. Table 5-11 shows the system characteristics and estimated annual O&M costs for Metro Busway operations for the SR-60 Busway project alternative. Total costs are presented in 2008 dollars.

Bus O&M Cost Estimates

Table 5-12 shows the system characteristics and estimated annual O&M costs for Metro bus, Montebello Bus Lines, Norwalk Transit System, Monterey Park Spirit Bus and Foothill Transit Zone bus operations for each of the study alternatives.

Table 5-9 Metro LRT Annual O&M Cost Estimates (2008 dollars)

System Scenario	FULL ALLOCATION Route Miles	Yards	Train Hours	Car Miles	Peak LRVs
FY 2008 Gold Line LRT Unit Costs	$315,747	$5,652,392	$154.76	$11.12	$361,100
FY 2008 Units	13.7	1.0	43,925	1,653,458	18
FY 2008 Cost by Variable	$4,325,728	$5,652,392	$6,798,038	$18,384,915	$6,499,808
Total FY 2008 Cost					$41,660,880
No-Build, TSM, SR-60 BRT	19.5	1.1	85,200	3,159,200	44
O&M Cost by Variable	$6,157,057	$6,217,631	$13,185,950	$35,127,365	$15,888,420
Total Annual LRT O&M Cost					$76,576,423
Increment Over FY 2008					$34,915,543
SR-60 LRT Alternative	28.2	1.6	112,760	4,562,100	58
O&M Cost by Variable	$8,904,052	$9,043,826	$17,451,264	$50,726,309	$20,943,826
Total Annual LRT O&M Cost					$107,069,277
Increment Over TSM					$30,492,854
Beverly Alternative	30.0	1.6	130,780	4,861,800	68
O&M Cost by Variable	$9,472,396	$9,043,826	$20,240,123	$54,058,694	$24,554,830
Total Annual LRT O&M Cost					$117,369,870
Increment Over TSM					$40,793,447
Whittier Alternative	28.6	1.6	122,610	4,625,300	64
O&M Cost by Variable	$9,030,351	$9,043,826	$18,975,696	$51,429,034	$23,110,428
Total Annual LRT O&M Cost					$111,589,335
Increment Over TSM					$35,012,913
Washington Alternative	28.8	1.6	112,760	4,669,000	58
O&M Cost by Variable	$9,093,500	$9,043,826	$17,451,264	$51,914,937	$20,943,826
Total Annual LRT O&M Cost					$108,447,353
Increment Over TSM					$31,870,931

Table 5-10 Metro Busway Annual O&M Cost Estimates (2008 dollars)

System Scenario	FULL ALLOCATION Route Miles	Garages	Bus Hours	Bus Miles	Buses
FY 2008 BRT Unit Costs	$111,338	$4,982,019	$54.15	$5.96	$119,687
SR-60 BRT Alternative	9.7	0.5	73,030	1,030,900	12
O&M Cost by Variable	$1,079,983	$2,491,010	$3,954,804	$6,145,285	$1,436,244
Total Annual BRT O&M Cost					$15,107,326

Table 5-11 Bus Annual O&M Cost Estimates

Alternative	Route Miles	Garages	Bus-Miles	Bus Hours	Buses	Total O&M Cost	Incremental Cost
	FULL ALLOCATION		-----Annual Revenue-----				
No Build							
Metro Bus	268.1	1	18,640	1,536	126		
O&M Cost by Variable	$1,652,909	$3,569,121	$947,739	$4,042	$8,130,565	$ 14,304,375	-
Montebello Bus Lines	165.6	2	6,011	636	56		
O&M Cost by Variable	$ 317,595	$ 440,474	$ 242,379	$ 1,776	$ 2,640,279	$ 3,642,502	-
Norwalk Transit System	44.4	1	1,715	126	7		
O&M Cost by Variable	$ 19,439	$ 495,225	$ 71,709	$ 304	$ 287,510	$ 874,187	-
Monterey Park Spirit Bus	4.4	1	118	18	1		
O&M Cost by Variable	$ 1,926	$ 495,225	$ 4,926	$ 43	$ 41,073	$ 543,193	-
Foothill Bus	23.4	2	422	42	3		
O&M Cost by Variable	$ -	$ 1,024,441	$ 22,580	$ 34	$ 80,317	$ 1,127,372	-
Total Corridor Bus Cost					193	**$ 20,491,629**	-
2030 TSM Baseline							
Metro Bus	290.7	1.4	26,820	2,154	177		
O&M Cost by Variable	$1,792,244	$4,996,769	$1,363,640	$5,668	$11,421,508	$19,579,828	$5,275,453
Montebello Bus Lines	179.7	2	7,610	786	69		
O&M Cost by Variable	$ 344,637	$ 463,656	$ 306,855	$ 2,195	$ 3,253,200	$ 4,370,543	$ 728,041
Norwalk Transit System	44.4	1	1,715	126	7		
O&M Cost by Variable	$ 19,439	$ 495,225	$ 71,709	$ 304	$ 287,510	$ 874,187	$ -
Monterey Park Spirit Bus	4.4	1	118	18	1		
O&M Cost by Variable	$ 1,926	$ 495,225	$ 4,926	$ 43	$ 41,073	$ 543,193	$ -
Foothill Bus	23.4	2	422	42	3		
O&M Cost by Variable	$ -	$ 1,024,441	$ 22,580	$ 34	$ 80,317	$ 1,127,372	$ -
Total Corridor Bus Cost					257	**$26,495,124**	**$6,003,495**
SR-60 BRT							
Metro Bus	290.7	1.1	20,336	1,665	137		
O&M Cost by Variable	$1,792,244	$3,926,033	$1,034,002	$4,381	$8,808,112	$15,564,772	($4,015,056)
Montebello Bus Lines	179.7	2	7,610	786	69		
O&M Cost by Variable	$ 344,637	$ 463,656	$ 306,855	$ 2,195	$ 3,253,200	$ 4,370,543	$ -
Norwalk Transit System	44.4	1	1,715	126	7		
O&M Cost by Variable	$ 19,439	$ 495,225	$ 71,709	$ 304	$ 287,510	$ 874,187	$ -
Monterey Park Spirit Bus	4.4	1	118	18	1		
O&M Cost by Variable	$ 1,926	$ 495,225	$ 4,926	$ 43	$ 41,073	$ 543,193	$ -
Foothill Bus	23.4	2	422	42	3		
O&M Cost by Variable	$ -	$ 1,024,441	$ 22,580	$ 34	$ 80,317	$ 1,127,372	$ -
Total Corridor Bus Cost					217	**$22,480,068**	**($4,015,056)**
SR-60 LRT							
Metro Bus	290.7	1.1	20,336	1,665	137		
O&M Cost by Variable	$1,792,244	$3,926,033	$1,034,002	$4,381	$8,808,112	$15,564,772	($4,015,056)
Montebello Bus Lines	179.7	2	7,610	786	69		
O&M Cost by Variable	$ 344,637	$ 463,656	$ 306,855	$ 2,195	$ 3,253,200	$ 4,370,543	$ -
Norwalk Transit System	44.4	1	1,715	126	7		
O&M Cost by Variable	$ 19,439	$ 495,225	$ 71,709	$ 304	$ 287,510	$ 874,187	$ -
Monterey Park Spirit Bus	4.4	1	118	18	1		
O&M Cost by Variable	$ 1,926	$ 495,225	$ 4,926	$ 43	$ 41,073	$ 543,193	$ -
Foothill Bus	23.4	2	422	42	3		
O&M Cost by Variable	$ -	$ 1,024,441	$ 22,580	$ 34	$ 80,317	$ 1,127,372	$ -
Total Corridor Bus Cost					217	**$22,480,068**	**($4,015,056)**

Alternative	FULL ALLOCATION Route Miles	Garages	-----Annual Revenue----- Bus-Miles	Bus Hours	Buses	Total O&M Cost	Incremental Cost
Beverly LRT							
Metro Bus	292.7	1.1	20,580	1,689	139		
O&M Cost by Variable	$1,804,574	$3,926,033	$1,046,388	$4,444	$8,937,169	$15,718,608	($3,861,220)
Montebello Bus Lines	179.7	2	7,610	786	69		
O&M Cost by Variable	$ 344,637	$ 463,656	$ 306,855	$ 2,195	$ 3,253,200	$ 4,370,543	$ -
Norwalk Transit System	44.4	1	1,715	126	7		
O&M Cost by Variable	$ 19,439	$ 495,225	$ 71,709	$ 304	$ 287,510	$ 874,187	$ -
Monterey Park Spirit Bus	4.4	1	118	18	1		
O&M Cost by Variable	$ 1,926	$ 495,225	$ 4,926	$ 43	$ 41,073	$ 543,193	$ -
Foothill Bus	23.4	2	422	42	3		
O&M Cost by Variable	$ -	$ 1,024,441	$ 22,580	$ 34	$ 80,317	$ 1,127,372	$ -
Total Corridor Bus Cost					219	**$22,633,904**	**($3,861,220)**
Beverly LRT w/ Loop							
Metro Bus	292.7	1.1	20,580	1,689	139		
O&M Cost by Variable	$1,804,574	$3,926,033	$1,046,388	$4,444	$8,937,169	$15,718,608	($3,861,220)
Montebello Bus Lines	179.7	2	7,610	786	69		
O&M Cost by Variable	$ 344,637	$ 463,656	$ 306,855	$ 2,195	$ 3,253,200	$ 4,370,543	$ -
Norwalk Transit System	44.4	1	1,715	126	7		
O&M Cost by Variable	$ 19,439	$ 495,225	$ 71,709	$ 304	$ 287,510	$ 874,187	$ -
Monterey Park Spirit Bus	4.4	1	118	18	1		
O&M Cost by Variable	$ 1,926	$ 495,225	$ 4,926	$ 43	$ 41,073	$ 543,193	$ -
Foothill Bus	23.4	2	422	42	3		
O&M Cost by Variable	$ -	$ 1,024,441	$ 22,580	$ 34	$ 80,317	$ 1,127,372	$ -
Total Corridor Bus Cost					219	**$22,633,904**	**($3,861,220)**
Whittier LRT							
Metro Bus	294.1	1.1	20,931	1,698	139		
O&M Cost by Variable	$1,813,206	$3,926,033	$1,064,255	$4,468	$8,969,433	$15,777,394	($3,802,434)
Montebello Bus Lines	179.7	2	7,610	786	69		
O&M Cost by Variable	$ 344,637	$ 463,656	$ 306,855	$ 2,195	$ 3,253,200	$ 4,370,543	$ -
Norwalk Transit System	44.4	1	1,715	126	7		
O&M Cost by Variable	$ 19,439	$ 495,225	$ 71,709	$ 304	$ 287,510	$ 874,187	$ -
Monterey Park Spirit Bus	4.4	1	118	18	1		
O&M Cost by Variable	$ 1,926	$ 495,225	$ 4,926	$ 43	$ 41,073	$ 543,193	$ -
Foothill Bus	23.4	2	422	42	3		
O&M Cost by Variable	$ -	$ 1,024,441	$ 22,580	$ 34	$ 80,317	$ 1,127,372	$ -
Total Corridor Bus Cost					219	**$22,704,083**	**($3,802,434)**
Washington LRT							
Metro Bus	294.1	1.1	20,931	1,698	139		
O&M Cost by Variable	$1,813,206	$3,926,033	$1,064,255	$4,468	$8,969,433	$15,777,394	($3,802,434)
Montebello Bus Lines	179.7	2	7,610	786	69		
O&M Cost by Variable	$ 344,637	$ 463,656	$ 306,855	$ 2,195	$ 3,253,200	$ 4,370,543	$ -
Norwalk Transit System	44.4	1	1,715	126	7		
O&M Cost by Variable	$ 19,439	$ 495,225	$ 71,709	$ 304	$ 287,510	$ 874,187	$ -
Monterey Park Spirit Bus	4.4	1	118	18	1		
O&M Cost by Variable	$ 1,926	$ 495,225	$ 4,926	$ 43	$ 41,073	$ 543,193	$ -
Foothill Bus	23.4	2	422	42	3		
O&M Cost by Variable	$ -	$ 1,024,441	$ 22,580	$ 34	$ 80,317	$ 1,127,372	$ -
Total Corridor Bus Cost					219	**$22,704,083**	**($3,802,434)**

1. All Metro costs estimated in FY 2008 dollars.
2. Cost for other transit providers are based on FY 2006 dollars and adjusted to FY 2008 dollars at 4% per annum for inflation.
3. Incremental cost for 2030 TSM Alternative is the cost difference compared to No-Build total operations and maintenance cost. Incremental cost for all build alternative is the cost difference compared to 2030 TSM Alternative total operations and maintenance cost.

5.2.2.2 Cost Summary and Incremental Costs

Table 5-13 summarizes the estimated annual O&M costs for each of the Eastside Transit Corridor Phase 2 project alternatives. Costs are presented in 2008 dollars. The incremental O&M costs for each of the Build Alternatives relative to each corridor's respective Baseline/TSM are presented below.

Table 5-12 Eastside Transit Corridor Phase 2 Annual O&M Estimates

Input Measure	No Build	Baseline/ TSM	Alternative 1 SR-60 LRT	Alternative 2 SR-60 BRT	Alternative 3 Beverly	Alternative 4 Whittier	Alternative 5 Washington
Metro LRT Cost	$ 76,576,423	$ 76,576,423	$ 107,069,277	$ 76,576,423	$ 117,369,870	$ 111,589,335	$ 108,447,353
Metro BRT Cost	$ -	$ -	$ -	$ 15,107,326	$ -	$ -	$ -
Metro Bus Cost	$ 14,304,375	$ 19,579,828	$ 15,564,772	$ 15,564,772	$ 15,718,608	$ 15,777,394	$ 15,766,305
Montebello Bus Lines Cost	$ 3,939,731	$ 5,112,918	$ 5,112,918	$ 5,112,918	$ 5,112,918	$ 5,112,918	$ 5,112,918
Norwalk Transit System Bus Cost	$ 945,521	$ 1,022,675	$ 1,022,675	$ 1,022,675	$ 1,022,675	$ 1,022,675	$ 1,022,675
Monterey Park Spirit Bus Cost	$ 587,518	$ 635,459	$ 635,459	$ 635,459	$ 635,459	$ 635,459	$ 635,459
Foothill Transit Zone Bus Cost	$ 1,219,365	$ 1,318,866	$ 1,318,866	$ 1,318,866	$ 1,318,866	$ 1,318,866	$ 1,318,866
Total Annual O&M Cost	**$ 97,572,932**	**$ 104,246,169**	**$ 130,723,967**	**$ 115,338,438**	**$ 141,178,396**	**$ 135,456,647**	**$ 132,303,577**
Incremental Annual O&M Cost	**$ -**	**$ 6,673,237**	**$ 26,477,798**	**$ 11,092,269**	**$ 36,932,227**	**$ 31,210,478**	**$ 28,057,408**

(1) All costs estimated in FY 2008 dollars.
(2) Incremental Cost of the TSM/Baseline Alternative is relative to the No-Build Alternative.
(3) Incremental cost of the build alternatives is relative to Baseline/TSM Alternative.

5.3 Financial Feasibility

This section describes the sources of funding available to and under consideration by Metro for the purposes of fixed guideway transit development, including the development of the Eastside Transit Corridor Phase 2. This includes a summary of major funding sources identified for projects in the Metro Long Range Plan, a description of the two existing local funding sources, a summary of recent initiatives advanced by Metro to secure additional local funding, and a summary of the experience elsewhere in the US in the application of dedicated funding to support transit initiatives.

5.3.1 Fixed Guideway Project Funding Assumptions in the Metro 2008 Draft Long Range Transportation Plan

The 2008 Draft Long Range Transportation Plan identifies the participation by local (i.e., Metro), state, and federal government in its major capital programs. Local participation is primarily funded by proceeds of Proposition A of 1980 and Proposition C of 1990 (described in the following section). Local participation ranges from 7.4 percent to 37.5 percent; this broad range is the result of project timing and the availability of state and federal grants. Table 1 summarizes the amounts of funds by source (local, state and federal) for recent rail transit projects. As shown in the table, the local funds share ranges from as low as seven percent to over 37 percent; state funds are highly variable, ranging from nearly zero to as much as 90 percent, and the federal share ranges from nearly zero to more than 60 percent.

Table 5-13 Metro Long Range Plan Project Funding Assumptions

Source of Funds	Amount	Percent
Eastside Light Rail Project (Phase 1)		
Local Funds	$160.6	17.9%
State Funds	$220.6	24.5%
Federal Funds	$517.6	57.6%
Total	$898.8	
Exposition Light Rail Transit Project (Phase 1)		
Local Funds	$63.9	7.4%
State Funds	$728.8	90.8%
Federal Funds	$15.6	1.8%
Total	$862.3	
Exposition Light Rail Transit Project (Phase 2)		
Local Funds	$579.3	35.6%
State Funds	$343.8	21.0%
Federal Funds	$708.6	43.4%
Total	$1,631.7	
Crenshaw Transit Corridor Project		
Local Funds	$397.0	37.5%
State Funds	$2.7	0.3%
Federal Funds	$657.0	62.2%
Total	$1,056.7	

5.3.2 Existing Dedicated Local Funding

The primary sources of local funding to Metro are two one-half cent taxes on gross receipts of retailers from the sale of tangible personal property sold at retail in Los Angeles County and use tax at the same rate upon the storage, use or other consumption in the County, subject to certain limited exceptions. These taxes were approved by the voters of Los Angeles County in November 1980 (Proposition A) and November 1990 (Proposition C). As approved by the voters, both the Proposition A Sales Tax and the Proposition C Sales Tax are not limited in duration.

Metro is required to allocate the proceeds of the Proposition A Sales Tax as follows:

Use	Percentage
Local Allocation	25%
Rail Development Program	35%
Discretionary	40%

Up to 5% of the Proposition A Sales Tax revenues received may be used by Metro to pay administrative costs.

Metro is required to allocate the proceeds of the Proposition C Sales Tax as follows:

Use	Percentage
To local jurisdictions for local transit based on population	20%
To Metro to expand rail and bus security	5%
To Metro for construction and operation of the bus transit and rail system	40%
To Metro for commuter rail, construction of transit centers, park-and-ride lots, and freeway bus stops	10%
To Metro for transit-related improvements to streets and state highways	25%

5.3.3 Recent Local and State Efforts to Secure New Funding

On July 17, 2008, Metro management briefed the Metro Board Audit Committee on a proposed one-half cent sales tax increase to fund transportation projects within Los Angeles County. This included a review of the draft ordinance and expenditure plan for the proposed sales tax and provided an outline of the requirements to put a measure on the November 4, 2008 ballot and an overall status of the sales tax measure effort.

The Metro Board's efforts to get the referendum on the Ballot were initially thwarted by the Los Angeles County Board of Supervisors, which failed to back the proposed tax increase on July 6, 2008.

On August 31, 2008, the California Assembly approved, AB 2321, a bill that allows the half-cent sales tax increase to be placed on the November 4 ballot in Los Angeles County. One step remains in order for the sales tax measure to appear on the ballot, however. It still

must be signed within 30 days by the Governor. However, the Governor has threatened to veto all bills coming to his desk until the Legislature agrees on a state budget. The issue is further complicated by the Governor's proposal to resolve a near-term state budgetary shortfall with a temporary increment to the state sales tax.

5.3.4 Evaluation of Funding Sources

While an increase in retail sales tax dedicated to transportation is preferred by Metro management and the Metro Board, other sources of funding may be considered if the measure does not get on the November 2008 ballot or if the ballot measure fails. Many types of dedicated funding sources have been successfully implemented in recent years at both the state and local level to support transportation development. The underlying principles to identify and implement such sources are well understood and documented by the Center for Transportation Excellence (www.cfte.org).

When selecting new revenue sources or augmenting existing sources, a number of general criteria are considered:

- Financial: This factor addresses the fundamental question of the expected yield from the revenue source. Generally, this is judged on the basis of a "reasonable" rate of taxation given the size of the tax base. For example, if a sales tax is under consideration, a tax rate of 0.1 percent or 1.0 percent would be judged in the "reasonable" range, while a tax rate of 10.0 percent would be well outside the reasonable range. However, for narrower taxes such as a hotel/motel tax, the reasonable range might be higher. A related factor is stability – a source that could experience significant annual fluctuations would be judged less suitable than a source with less likelihood of year-to-year variance. For example, the employer-paid "head tax" in Portland, Oregon, resulted in a much more stable source of funding than a retail sales tax, which would have been more subject to economic cycles. Finally, this factor addresses the extent to which the revenue stream can be indexed to inflation. This is important because many elements of the costs to be funded are closely tied to inflation.
- Political: This factor addresses equity, or the extent to which the incidence (or burden) of dedicated funding source matches the incidence of the provision of or the benefit from the services that the source funds. For example, if a jurisdiction funds ten percent of the revenues, it should receive approximately ten percent of service. This factor also addresses differential impacts among demographic groups. Retail sales taxes, for example, have been criticized as inequitable because they are regressive, burdening lower income households more than upper income households.
- Legal: Any dedicated source of funding must adhere to various State constitutional, statutory, and regulatory limitations. In some cases, there are existing limitations to

potential revenue sources. In Florida, for example, there are severe limitations to local option motor fuels taxes. Even if the local funding needs were the equivalent of only a ten cent per gallon tax, the State Constitution limits counties to just pennies per gallon. In addition, the source should ideally have a tie to a transportation purpose. Taxes on motor vehicle sales, motor vehicle registration, driver licensing, parking, rental cars, and motor fuels and highway tolls all have a direct tie to transportation.

- Administrative: This factor addresses the actual methodology of revenue collection and the ease and cost of administration. Revenue sources that rely on existing collection mechanisms are generally preferred. For example, in most states with a pre-existing state sales tax, the state will act as the collection agent for a local sales tax. Unique new taxes may require that the benefiting agency directly collect the revenues and conduct enforcement. One example of the latter is the Triangle Transit Authority in North Carolina, which collects its own rental car tax and performs its own enforcement, including audits of taxpayers (i.e., rental car companies).

Table 5-14 summarizes a review of alternative dedicated revenue sources for public transportation that have been applied in the US in the last decade.

5.3.5 Conclusions

Metro recognizes that securing a sufficient, stable, and reliable source of local funding provides the essential basis for its overall funding plan and specifically for the Eastside Transit Corridor Phase 2 project. State funding, which has been used in the past, may have an important role in the funding of the project, but the current California fiscal situation suggests that state funding may not be a reliable source in the near future.

Federal participation in the project is also expected; the total amount of funding and the timing of the receipt of these funds will depend on the availability of discretionary federal funds in an increasingly competitive landscape. To qualify for Section 5309 New Starts grants, the project will have to meet FTA cost-effectiveness criteria or have strong political support in conjunction with reasonable cost-effectiveness. The opportunity also exists to apply so-called flexible funds from the Surface Transportation Program (STP) and Congestion Mitigation –Air Quality Program (CMAQ), but the availability of these funds for this project are by no means certain. In the near-term, these funds are committed in the Long Range Transportation Plan to other projects; and in the long-term, these funds face intense competition from many local priorities, including highway projects. The determination of how these funds are applied is made by the Southern California Association of Governments, the metropolitan planning organization for the region.

Table 5-14 Funding Outlook

Source/ Example	*Financial* Revenue Growth/ Stability	*Financial* Revenue Yield	*Financial* Indexing	*Political* Public Perception/ Equity	*Legal* Legality/ Tie to Transportation	*Administrative* Assessment & Collection
Atlanta, GA *Buffalo, NY* *Charlotte, NC* *Chicago, IL* *Dallas, TX* *Houston, TX* *Santa Clara, CA* *San Diego, CA* *St. Louis, MO*	▪ Tax revenue is affected by economic conditions. ▪ Provides reliable revenue flow if State economy remains strong.	▪ There is potential for large revenue yield, especially as population and median income levels grow.	▪ Sales tax revenues have a direct relationship to price levels and inflation.	▪ Tax is regressive; lower income individuals spend greater portion of disposable income. ▪ Tax is unpopular with local retailers who fear a negative impact to business.	▪ Sales tax has no direct tie to transportation. ▪ Legislation would be required to impose new sales tax rates.	▪ Mechanism in place to collect the local-generated tax revenue.
Corporate Income Tax *New York, NY*	▪ Revenue growth can be affected by economic conditions and existing industry mix.	▪ Corporate income tax revenue is cyclical and follows state and local business patterns.	▪ Tax has an indirect tie to inflation because corporate income reflects price levels over longer time periods.	▪ Indirect negative impact on investment and corporate growth.	▪ No direct tie to transportation.	▪ Mechanism in place to collect the local-generated tax revenue.
Portland, OR	▪ Tax paid by employers and is based on gross payroll paid to employees.	▪ Potential for sufficient long-term yield if employment levels continue to grow.	▪ Inflation has indirect effect if payrolls try to keep pace with increasing costs of living.	▪ Tax may face opposition from local business community.	▪ No tie to transportation.	▪ No collection mechanism at either the State or local level.
Personal Income Tax	▪ Salary and wage distributions account for majority of the revenue collected. ▪ Tax normally produces stable revenue flow.	▪ Traditionally, personal income tax has reliable revenue yield.	▪ Inflation has an indirect effect in so far as salaries and wages keep pace with inflation.	▪ Raising the tax is politically unpopular. ▪ State has tried in past to lower the income tax rate. ▪ Opponents claim increasing the tax has a negative economic impact and inhibits income generation and resulting productivity.	▪ Legislation would be required to impose new income tax rates. ▪ No direct tie to transportation.	▪ Mechanism in place to collect the local-generated tax revenue.

Source/ Example	*Financial* Revenue Growth/ Stability	*Financial* Revenue Yield	*Financial* Indexing	*Political* Public Perception/ Equity	*Legal* Legality/ Tie to Transportation	*Administrative* Assessment & Collection
Real Estate Property Tax *San Francisco, CA*	▪ Stable revenue source, but fluctuates with real estate trends and property values. ▪ Revenue growth contingent on property trends.	▪ Sufficient revenue yield, but any increase would tend to reduce municipal revenue potential.	▪ Property values do not always follow inflationary trends.	▪ Tax is already heavily burdened, potential for stiff public opposition.	▪ No direct tie to transportation.	▪ Collection mechanism in place.
Hillsborough County, FL	▪ Revenue stability affected by personal property value fluctuations.	▪ Adding intangible property increases yield and progressivity.	▪ Some personal property values will track price levels.	▪ Tax is a major local revenue source and is already heavily burdened	▪ Tax has direct tie to transportation if levied against auto values.	▪ Collection mechanism in place. ▪ Complex tax that is difficult to enforce.
Motor Fuel Gallonage Tax *Cleveland, OH Miami, FL Washington, DC*	▪ Stable revenue flow as long as economic conditions remain strong. ▪ Limited revenue growth potential as technical advances improve fuel efficiency.	▪ A local option fuel tax tends to reduce statewide tax increase potential.	▪ Must be indexed to inflation because tax is based on a gallonage method. ▪ Potential long run yield not as reliable as a *% of motor fuel tax* or other indexed bases. Larger revenue output if consumers were taxed on the % of fuel purchased.	▪ Reinstating a recently reduced tax may generate negative reactions. ▪ Opportunity to promote the tax as pro-environment (i.e.: represents effort to achieve clean air goals).	▪ Tax has a direct tie to transportation. ▪ Levy is actually a user charge rather than a "traditional" tax.	▪ State collection mechanism in place.
Motor Vehicle Registration Fees *Seattle, WA*	▪ Stable revenue if the per capita growth of automobiles grows with the State's economy.	▪ Potential exists for low revenue yield.	▪ Fee would have to be indexed for inflation.		▪ Registration fees have a direct tie to transportation. ▪ The levy is a user charge not a tax.	▪ State collection mechanism in place.

Source/ Example	*Financial* Revenue Growth/ Stability	Revenue Yield	Indexing	*Political* Public Perception/ Equity	*Legal* Legality/ Tie to Transportation	*Administrative* Assessment & Collection
Parking Receipt Tax	▪ Reliable revenue (i.e. will have inflationary growth) if single-occupancy drivers continue to grow. ▪ Growth contingent on businesses remaining in CBD.	▪ Revenue yield is low and costs to enforce and collect may exceed revenue gain.	▪ Tax is not related to current price levels.	▪ Not visible to commuters, tax is embedded in parking price. ▪ Directly affects parking providers who will likely oppose the tax as anti-business.	▪ Relationship to transportation in that tax revenue is generated by commuters.	▪ No collection process in place at either State or local level.
Surface parking surcharge	▪ Reliable revenue if single-occupancy commuters grows. ▪ Growth contingent on businesses remaining in CBD. ▪ If successful, revenues diminish over time.	▪ Yield affected if businesses decide to relocate to outlying communities.	▪ Levied as a flat fee surcharge priced as an absolute dollar amount. ▪ Not indexed to increase with the cost of parking.	▪ Parking rates currently low. ▪ Downtown commercial occupants may relocate if parking rates increased.	▪ Tie to transportation in that tax revenue is generated by commuters.	▪ Implementation will require coordinating with private parking vendors and businesses located in the CBD.
Raleigh-Durham, NC	▪ Tax levied on amount charged for auto rental. ▪ Small tax base, limited growth potential. ▪ Revenue flow affected more by non-resident traffic.	▪ Low yield may be deterrent.	▪ Tax may be levied on a per day basis or as % of the total rental charge.	▪ Considered more of a burden to non-residents.	▪ Tax has a tie to transportation.	▪ State level collection mechanism in place.
Vehicle Emissions Fee	▪ Normally paid as an annual flat fee but may be levied based on vehicle miles traveled.	▪ Limited revenue growth; revenue yield may be a disincentive.	▪ Levied as a flat fee priced as an absolute dollar amount.	▪ May limit other auto usage revenue, such as gas tax increase. ▪ Palatable to public if tax achieves clean air standards and improves quality of life.	▪ Emissions tax has a direct link to transportation. Will require legislation to change existing emission standards.	▪ State level collection mechanism in place.

Source/ Example	*Financial* Revenue Growth/ Stability	Revenue Yield	Indexing	*Political* Public Perception/ Equity	*Legal* Legality/ Tie to Transportation	*Administrative* Assessment & Collection
Charlotte, NC	▪ Fee levied on the number of cars per household and is paid as an annual flat fee.	▪ Limited revenue growth; yield may be a disincentive.	▪ Levied as a flat fee priced as an absolute dollar amount.	▪ Fee is a user charge; may be unpopular and viewed as an unnecessary public burden.	▪ Fee has a tie to transportation.	▪ No in place collection mechanism, could be collected with personal property or vehicle registration fee.
Real Estate Transfer Tax *Washington, DC*	▪ Tax that applies to the transfer value of real property deeds. ▪ Unreliable growth, collections infrequent and unpredictable.	▪ Revenue yield may not be sufficient due to infrequency of transfers.	▪ Tax values are contingent on the value of transferred property.	▪ Opposition from real estate partnerships, realtors or other ventures managing extensive property holdings.	▪ No tie to transportation.	▪ State currently levies a *real estate* conveyance tax assessed on the purchase price of conveyed property. Seller pays the tax.
Albany, NY	▪ Excise tax on recorded mortgages. ▪ Low revenue growth since tax is one-time levy on mortgage recording.	▪ Low yields where property purchases and mortgage recordings are below the national average and/or declining.	▪ Tax collections are based on the recorded liens. ▪ Inflation has no direct effect	▪ Tax could be unpopular with general public; a real estate property tax is already collected at the local level.	▪ No tie to transportation.	▪ No collection mechanism at either the State or local level.
New York, NY *San Francisco, CA*	▪ Interfund transfers among municipal agencies. ▪ Growth depends on volume of municipal revenues collected.	▪ Low revenue yield and uncertain revenue source. ▪ Many variables affect a municipality's ability to run fund surpluses.	▪ Fees collected from the general public are not indexed to price levels.	▪ Revenue transfers are not visible to the public.	▪ No tie to transportation.	▪ No transfer process in place.

Source/ Example	*Financial* Revenue Growth/ Stability	Revenue Yield	Indexing	*Political* Public Perception/ Equity	*Legal* Legality/ Tie to Transportation	*Administrative* Assessment & Collection
Incremental Tax Financing District	▪ Surcharge on the incremental increase of selected property values. ▪ Revenue growth affected by property value fluctuations.	▪ Low revenue yield.	▪ Property values are not indexed to current price levels.	▪ Surcharge may face opposition from property owners and developers.	▪ If the assessment district is based on transportation benefits, then tie to transportation.	▪ No collection mechanism. ▪ Modifications are needed to govern the set-up of new districts.
Benefit Assessment District *Rt. 28 / Dulles, VA*	▪ Surcharge levied on property within defined areas that has benefited from local improvements.	▪ Low revenue yield.	▪ Property values are not indexed to current price levels.	▪ Surcharge may face opposition from property owners and developers.	▪ If the assessment district is based on transportation benefits, then tie to transportation	▪ District must be defined and collection mechanism put into place.
Value Capture *Atlanta, GA* *St. Louis, MO* *Washington, DC*	▪ Public/private partnership where private sector compensates public agency for transit development costs that generate economic value.	▪ Yield dependent upon the economic value of the completed transit facility or project.	▪ Value capture is not indexed to current price levels.	▪ Can be a popular way to enlist private investment.	▪ If facility or project involves transportation, then there is a tie to transportation.	▪ Projects would have to be identified and developed to assess value capture opportunities.

6.0 PUBLIC INVOLVEMENT PROCESS & AGENCY COORDINATION

In July of 2007, Metro initiated a comprehensive public participation program for the Metro Eastside Transit Corridor Phase 2. This outreach program utilized various communication tools to reach out to the large PSA encompassing over 80 square miles. Stakeholders and interested parties were informed and educated of the Alternatives Analysis (AA) Study and given multiple opportunities to submit comments on the scope of work, alternatives being considered and study results. Arellano Associates assisted Metro in conducting the public outreach program, including the planning and facilitation of meetings, development of collateral materials and documentation of public input. Numerous meetings and briefings were held throughout the AA Study, including Early Scoping Meetings, Community Workshops, Technical Advisory Committee (TAC) meetings and project briefings to elected officials, city staffs and project stakeholders.

6.1 Early Scoping Meetings

The Federal Transit Authority (FTA) gave Metro approval to conduct Early Scoping Meetings, initiating the 30-day public comment period, between November 1 and November 30, 2007. A total of four public Early Scoping Meetings plus one Resource Agency Scoping Meeting were held between November 8 – 15, 2007, to inform the public and agencies of the AA study and garner input regarding routes, modes, stations and configurations preferences as well as their concerns for potential impacts. The public Early Scoping Meetings were held in the Cities of Whittier, Montebello, Rosemead and Pico Rivera. The resource agency scoping meeting was held at Metro Headquarters.

6.1.1 Notification

To encourage participation in the Early Scoping Meetings, Metro utilized every opportunity and communication tool available to notify the public, as shown below:

Early Scoping Meeting notification, included:

- Minimize travel times to points accessible from the Metro rail and bus network
- Placement of legal notice in Federal Register

- Mailing of invite brochures to 65,281 addresses within one-quarter mile of potential alignments
- Mailing of invite to 862 additional records, including project stakeholder database, interested party list of people attending previous study meetings and resource agency list
- Emailing e-vite to 178 stakeholders
- Placement of media advertisements in 17 print publications
- Coordination of webpage links with 14 corridor jurisdictions
- Placement of five roadside banners along heavily traveled corridors, including:
    - Los Angeles – Eastside Phase 1 Terminus (Atlantic/Pomona)
    - Pico Rivera – Pico Park on Beverly Blvd.
    - Los Angeles County – Offices for Supervisorial Districts 1 and 4
    - Whittier – Uptown Whittier on Greenleaf Ave.
    - Montebello – City Park on Whittier Blvd.
- Meeting message on project helpline

6.1.2 Early Scoping Summary

The five early scoping meetings were very well attended with over 220 participants. During the early scoping period, 159 comments were collected, including 80 verbal and 79 written. Comments received indicated overwhelming support of the project goals and provided strong direction for alignment considerations. Some of the strongest support was for Whittier Blvd. as the preferred alignment, and SR-60 Freeway and Washington Blvd. listed as strong secondary alternatives for consideration. Comments also indicated that Beverly Blvd. should be avoided due to narrow right-of-way and established pine trees lining the boulevard in the City of Whittier. In terms of the transit mode preferred, the majority of the comments supported light rail technology and suggested grade separation where necessary due to high traffic volumes. The following table summarizes all the input received during the early scoping period:

Table 6-1 Comments Summary Totals

Routes	Modes	Configuration	Issues
Whittier Yes – 41	LRT Yes – 32	At-Grade – 1	Parking – 5
Whittier Blvd. No – 6	LRT No - 3	Subway – 18	Safety – 5
Beverly Yes – 17	Busway Yes - 2	Elevated - 8	Property values – 4
Beverly No – 35	Busway No - 9		Trees on Beverly - 4
SR - 60 Yes – 31	Streetcar Yes– 5		Congestion – 4
SR - 60 Fwy. No - 15	Streetcar No - 1		Graffiti – 3
Washington Yes – 28	Metro Rapid bus - 2		TOD – 3
Washington No - 3	Monorail – 2		Cost – 3
Atlantic – 9	Bus – 1		Crime – 2
UP Right-of-Way – 6			Washington geo – 2
Garfield – 4			Right-of-Way takes – 1
605 Fwy. - 4			Noise – 1
Greenway – 3			Decision process – 1
Olympic – 3			Performance – 1
Pomona to Paramount Blvd. – 2			North/South Connection – 1
Rosemead – 2			Business impacts – 1
Lambert – 2			Transients – 1
El Monte Busway – 1			Construction – 1
5 Fwy. – 1			Incentives – 1
Any route – 1			

6.2 Community Workshops

Building on the input received from the Early Scoping Meetings, Metro hosted four additional Community Workshops in April 2008, providing PSA stakeholders an update on the 17 potential and five refined alternatives, including alignment configurations, screening criteria and next steps. Meetings were held between April 9 – 17, 2008 in the Cities of Whittier, South El Monte, Montebello and Pico Rivera.

6.2.1 Notification

Public notification of the Community Workshops for the Eastside Transit Corridor Phase 2 AA Study was completed using a variety of communication tools similar to those used for the Early Scoping Meetings, including:

- Mailing of invite brochures to 936 stakeholders in project database
- Public counter distribution to 17 cities and public agencies
- Emailing e-vite to 178 stakeholders
- Placement of media advertisements in 17 print publications
- Coordination of webpage links with 14 corridor jurisdictions
- Screen slates on local cable access channels
- Placement of five roadside banners along heavily traveled corridors (same locations as identified previously for Early Scoping)
- Meeting message on project helpline
- Stakeholder briefings

6.2.2 Community Workshops Summary

The Community Meetings were well attended with a total of 163 community members participating in the four community workshops. Comments were received during and after community workshops, including a total of 96 recorded comments: 49 verbal and 47 written.

Similar to comments received in the Early Scoping Meetings, the majority of participants indicated support for the Eastside Transit Corridor Phase 2 project. Comments primarily focused on the preferences between the five refined alternatives as well as community concerns regarding potential environmental impacts to the surrounding communities.

Taken as a whole, the comments received during the community workshops indicate that the community has a deep understanding of the issues and strong opinions on which alternatives should move forward. Reviewing comments received, both Alternatives 2 and 11 had the strongest community support. Table 6-2 summarizes the community support and opposition for the refined alternatives.

Table 6-2 Summary of Support for Refined Alternatives

Preferences per person/comment received	SR-60 LRT Alternative 2	Whittier LRT Alternative 11	Washington LRT Alternative 13	SR-60 Busway Alternative 15	Beverly LRT Alternative 6
Support	38	29	2	2	3
Oppose	5	1	7	0	3
Support as 2nd choice	2	1	1	0	0
Support as 3rd choice		1			

6.3 Project Briefings

In addition to publicly noticed meetings, project briefings were also held for various groups that represent the Eastside Transit Corridor Phase 2 PSA to establish and maintain a dialogue throughout the study. Project briefing agendas included a range of topics, such as the purpose of the study, project background, scope and schedule as well as the dates for public meetings. Presentations also provided an overview of the Alternatives Analysis Process, Federal New Start process and possibilities of alternatives, including modes, alignment, configuration and station locations.

Regular project briefings were provided to the following four key groups: elected officials, Technical Advisory Committee (TAC), key stakeholders, and city councils and staffs. Details of these briefings are discussed below:

6.3.1 Elected Officials

The Eastside Transit Corridor Phase 2 project team conducted project briefings to a combination of 20 federal, state and local elected offices and groups. The purpose of the briefings was to provide a project status, potential alternatives and outreach strategy updates as well as maintain an open dialogue for the life of the study. The elected offices included Federal, State and County district representatives, Metro Board of Directors, City Councils, and Local Councils of Governments.

6.3.2 Technical Advisory Committee

A Technical Advisory Committee was organized as part of the AA process for the purpose of keeping high level stakeholders informed of the study's progress, technical evaluation methodology, scope of work and community outreach. TAC members included staffs from the following entities: corridor cities and federal, state and regional regulatory agencies. Six TAC meetings were held at Metro Headquarters. Tours of the Eastside Transit Corridor Phase 1 construction and Metro Gold Line operations were also held for those interested TAC member Cities.

6.3.3 City Briefings/Work Sessions

In addition to the TAC, the project team conducted individual city briefings and working sessions to interested cities. The agendas for these briefings and working sessions were tailored to each individual city and project milestones. This allowed the project team to coordinate area specific information and work through technical issues. A total of 20 city briefings and work sessions were conducted for the Eastside Transit Corridor Phase 2 project.

6.3.4 Stakeholder Briefings

Smaller group briefings were also conducted as requested to inform the PSA communities of the project status. These individual meetings were valuable in building project consensus and helping to navigate through the community issues, especially as they relate to specific groups. A total of six stakeholder briefings were conducted with local service and business organizations, including rotary clubs, Chambers of Commerce, business associations, hospital and academic institutions.

6.4 Outreach Summary

In an effort to maintain multi-leveled communication to elected offices, city staffs, project stakeholders and regulatory agencies involved in the process, a total of 53 briefings and nine public meetings were completed. Combined, the Early Scoping Meetings and Community Workshops drew approximately 383 participants providing over 250 comments. In general, support for extending the Eastside Transit Corridor project farther east was overwhelming, including the desire to continue using light rail technology. However the support for a particular alignment was generally split between Alternatives 2 and 11. Concerns raised by the public focused primarily on parking, safety, construction, limited right-of-way and noise. Table 6-3 provides a detailed list of all outreach meetings.

Table 6-3 Outreach Meeting Record

Type	STAKEHOLDERS	CONTACT NAME	PURPOSE	MEETING DATE & TIME	LOCATION	Metro	CDM/DMJM HARRIS	AA
COMPLETED MEETINGS						Team Members in Attendance		
EARLY SCOPING MEETINGS								
Early Scoping Meeting	**Agency Scoping Meeting- Los Angeles County Metropolitan Transportation Authority**	David Monks	Scoping	**Thursday Nov. 8, 2007 10:00 a.m. - 12:00 p.m.**	Metro 1 Gateway Plaza Los Angeles, CA 90012	Kimberly Yu David Monks Tham Nguyen Henry Gonzalez Jose Ubaldo	Brent Ogden Monica Villalobos Ray Sosa	Chester Britt Yesenia Arias Raul Velazquez
Early Scoping Meeting	**Palm Park - Whittier**	Nicole Sales 562-908-3670	Scoping	**Thursday, Nov. 8, 2007 6:30 p.m. - 8:30 p.m.**	Palm Park 5703 Palm Ave. Whittier, CA 90601	Kimberly Yu David Monks Tham Nguyen Henry Gonzalez Jose Ubaldo	Brent Ogden Monica Villalobos Ray Sosa	Chester Britt Yesenia Arias Raul Velazquez
Early Scoping Meeting	**Senior Center at City Park - Montebello**	Vicente Gutierrez 323-887-4540	Scoping	**Saturday, Nov. 10 9:00 a.m. - 12:00 p.m.**	Senior Center at City Park 115 South Taylor Ave. Montebello, CA 90640	Kimberly Yu David Monks Tham Nguyen Henry Gonzalez Jose Ubaldo	Monica Villalobos Ray Sosa	Chester Britt Yesenia Arias Raul Velazquez
Early Scoping Meeting	**Potrero Heights Elementary School- Rosemead**	Jill Rojas 626-307-7011	Scoping	**Wednesday, Nov. 14, 2007 6:30 p.m. - 8:30 p.m.**	Potrero Heights Elementary School 8026 East Hill Dr. Rosemead, CA 91770	Kimberly Yu David Monks Tham Nguyen Henry Gonzalez Jose Ubaldo	Brent Ogden Monica Villalobos Ray Sosa	Chester Britt Yesenia Arias Raul Velazquez
Early Scoping Meeting	**North Park Middle School - Pico Rivera**	John Lopez 562-801-5137	Scoping	**Thursday, Nov. 15, 2007 6:30 p.m. - 8:30 p.m.**	North Park Middle School/Cafeteria 4450 Durfee Ave. Pico Rivera, CA 90660	Kimberly Yu David Monks Tham Nguyen Henry Gonzalez Jose Ubaldo	Brent Ogden Monica Villalobos Ray Sosa	Chester Britt Yesenia Arias Raul Velazquez

Type	STAKEHOLDERS	CONTACT NAME	PURPOSE	MEETING DATE & TIME	LOCATION	Metro	CDM/DMJM HARRIS	AA
COMPLETED MEETINGS						Team Members in Attendance		
COMMUNITY WORKSHOPS								
Community Workshop	**Community Workshop - Whittier**	Kimberly Yu/ David Monks	Follow up	**Wednesday, April 9, 2008 6:30 p.m. - 8:30 p.m.**	Uptown Senior Center 13225 Walnut St. Whittier, CA 90602	Kimberly Yu David Monks	Brent Ogden Monica Villalobos	Yesenia Arias
Community Workshop	**Community Workshop - South El Monte**	Kimberly Yu/ David Monks	Follow up	**Saturday, April 12, 2008 10:00 a.m. - 12:00 p.m.**	South El Monte Senior Center/Dining Central Ave. Room 1556 South El Monte, CA	Kimberly Yu David Monks Tham Nguyen	Brent Ogden Monica Villalobos	Chester Britt Yesenia Arias
Community Workshop	**Community Workshop - Montebello**	Kimberly Yu/ David Monks	Follow up	**Monday, April 14, 2008 6:30 p.m. - 8:30 p.m.**	Senior Center at City Park 115 South Taylor Ave. Montebello, CA 90640	Kimberly Yu David Monks Tham Nguyen	Brent Ogden Monica Villalobos	Chester Britt Yesenia Arias
Community Workshop	**Community Workshop - Pico Rivera**	Kimberly Yu/ David Monks	Follow up	**Thursday, April 17, 2008 6:30 p.m. - 8:30 p.m.**	North Park Middle School/Cafeteria 4450 Durfee Ave. Pico Rivera, CA 90660	Kimberly Yu David Monks Tham Nguyen	Brent Ogden Monica Villalobos	Chester Britt Yesenia Arias
ELECTED OFFICIAL'S BRIEFINGS								
Elected	**Metro Board of Director's staff** Claudette Moody for Board Chair Pam O'Connor	David Monks	Introductory	**Wednesday, Oct. 10, 2007 8:30 a.m.**	Metro 1 Gateway Plaza 3rd fl. –Board Chair's Conf. Rm. Downtown LA	Robin Blair Diego Cardoso David Monks Kimberly Yu	Jim De La Loza	Chester Britt

Type	STAKEHOLDERS	CONTACT NAME	PURPOSE	MEETING DATE & TIME	LOCATION	CDM/DMJM HARRIS Metro	CDM/DMJM HARRIS	AA
COMPLETED MEETINGS						Team Members in Attendance		
Elected	**Federal/State Briefing** Belinda Ortiz, LA Councilman Jose Huizar Office; Gina Semenza, US Senator Barbara Boxer Office; Perla Hernandez, Congresswoman Grace Napolitano Office; Kimberly Tachiki,Congresswoman Lucille Roybal-Allard Office; Joseph Martinez, Congresswoman Hilda Solis Office	Marisa Valdez Yeager	Introductory	**Wednesday, Oct. 10, 2007 1:00 p.m.**	Los Angeles County Supervisor Gloria Molina East and Southeast Los Angeles Field Office 4801 East Third St. Los Angeles, CA	Diego Cardoso Kimberly Yu David Monks Marissa Yeager	Ray Sosa	Chester Britt Yesenia Arias
Elected	**Office of US Congresswoman Linda T.Sanchez Patrick Rodriguez**	Marisa Valdez Yeager	Introductory	**Wednesday, Oct. 24, 2007 11:00 a.m.**	District Office 17906 Crusader Ave. Ste. 100 Cerritos, CA	Kimberly Yu Marisa Valdez-Yeager		Yesenia Arias
Elected	**Montebello City Council**	David Monks - Metro	Introductory / Public comment	**Wednesday, Oct. 24, 2007 6:30 p.m.**	Montebello City Council Chambers 1600 W. Beverly Blvd. Montebello, CA	David Monks		
Elected	**Office of Los Angeles County Supervisor Gloria Molina, First Supervisorial District** Nicole Englund, Sr. Transportation and Planning Deputy	Kimberly Yu	Introductory	**Monday, Oct. 29, 2007 2:30 p.m.**	Downtown District Office 856 Kenneth Hahn Hall of Admin. 500 West Temple St. , Los Angeles, CA	Diego Cardoso Robin Blair Susan Gilmore Kimberly Yu David Monks	Ray Sosa Monica Villalobos	Yesenia Arias

Type	STAKEHOLDERS	CONTACT NAME	PURPOSE	MEETING DATE & TIME	LOCATION	CDM/DMJM Metro	HARRIS	AA
COMPLETED MEETINGS						Team Members in Attendance		
Elected	**Gateway Council of Governments** Richard Powers, Executive Director Karen Heit, Deputy Director for Bonnie Lowenthal	Kimberly Yu	Introductory	**Tuesday, Dec. 11, 2007 9:00 a.m.**	Gateway COG Offices 16401 Paramount Blvd. Paramount, CA	Kimberly Yu Tham Nguyen Susan Gilmore Sharad Mulchand Ernest T. Morales		Chester Britt
Elected	**Office of Los Angeles Mayor, Antonio Villaraigosa** Marisa Perez, Associates Director of Transportation Heidi Sickler, Policy Analyst	Marisa Valdez Yeager	Introductory	**Wednesday, Dec. 17, 2007 11:00 a.m.**	Los Angeles City Hall 200 North Spring St. , Room 303 Los Angeles, CA 90012	Robin Blair Kimberly Yu		
Elected	**San Gabriel Valley Council Of Governments Transportation Committee Meeting**	Kimberly Yu	Introductory	**Thursday, Jan. 17, 2008 4:30 p.m.**	Edison Technology Center Irwindale, CA	David Monks Kimberly Yu		Yesenia Arias
Elected	**Metro Board of Director's staff** Claudette Moody for Board Chair Pam O'Connor Ray Harris for Boardmember Knabe	Kimberly Yu/ David Monks	Follow up	**Monday, Feb. 11, 2008**	Metro 1 Gateway Plaza 3rd floor –Board Chair's Conf. Rm. Downtown LA	David Monks Kimberly Yu		
Elected	**Metro Board of Director's staff** Nicole Englund, and Veronica Sr. Transportation and Planning Deputy	Kimberly Yu/ David Monks	Follow up	**Tuesday Feb. 12, 2008**	Metro 1 Gateway Plaza 3rd floor –Board Chair's Conf. Rm. Downtown LA	David Monks Kimberly Yu		
Elected	**Board Staff Briefing**	Kimberly Yu/ David Monks	Follow up	**Monday, March 3, 2008 10:00 a.m.**	Metro 1 Gateway Plaza Downtown LA	David Monks Kimberly Yu		

Type	STAKEHOLDERS	CONTACT NAME	PURPOSE	MEETING DATE & TIME	LOCATION	Metro	CDM/DMJM HARRIS	AA
COMPLETED MEETINGS						Team Members in Attendance		
Elected	**Planning and Programming Committee**	Kimberly Yu/ David Monks	Follow up	**Wednesday, March 19, 2008 1:00 p.m.**	Metro 1 Gateway Plaza Downtown LA			
Elected	**Metro Board Meeting**	Kimberly Yu/ David Monks	Follow up	**Thursday, March 27, 2008 9:00 a.m.**	Metro 1 Gateway Plaza Downtown LA	Kimberly Yu David Monks Tham Nguyen		
Elected	**Montebello City Council**	Tham Nguyen	Introductory	**Wednesday, April 9, 2008 6:30 p.m.**	Montebello City Hall Council Chambers 1600 W. Beverly Blvd. Montebello, CA	Tham Nguyen	Bob Hertz	Chester Britt
Elected	**Montebello City Council - Phase 1 Tour and Phase 2 Briefing**	Kimberly Yu/ David Monks	Field Visit	**Thursday, May 1, 2008 9:30 a.m.**	Metro 1 Gateway Plaza Downtown LA	Diego Cardoso Kimberly Yu David Monks	Monica Villalobos	Chester Britt
Elected	**Commerce City Council - Study Session**	Kimberly Yu	Receive and File	**Thursday, May 6, 2008 6:30 p.m.**	Commerce City Hall City Council Chambers 2535 Commerce Way Commerce, CA	Kimberly Yu David Monks		
Elected	**City of Pico Rivera - City Council Study Session**	Julia Gonzalez	Introductory	**Wednesday, June 17, 2008 6:00 p.m.**	Pico Rivera City Hall Council Chambers 6615 Passons Blvd. Pico Rivera, CA	Diego Cardoso Kimberly Yu David Monks Henry Gonzalez Tham Nguyen	Brent Ogden Bob Hertz	Chester Britt Yesenia Arias
Elected	**City of Montebello - City Council Study Session**	Laura Cornejo	Follow up	**Tuesday, July 1, 2008 6:00 p.m.**	Montebello City Hall Council Chambers 1600 W. Beverly Blvd. Montebello, CA	Kimberly Yu David Monks Tham Nguyen	Brent Ogden Ray Sosa Monica Villalobos	Yesenia Arias

Type	STAKEHOLDERS	CONTACT NAME	PURPOSE	MEETING DATE & TIME	LOCATION	Metro	CDM/DMJM HARRIS	AA
COMPLETED MEETINGS						Team Members in Attendance		
Elected	**Metro- San Gabriel Valley Governance Council**	David Monks	Introductory	**Thursday, July 10, 2008 2:00 p.m.**	The Gas Company Building 9240 Firestone Blvd. Downey, CA	Kimberly Yu		Yesenia Arias
Elected	**City of Whittier - City Council Study Session**	Martin Brown	Follow up	**Tuesday, July 22, 2008 6:00 p.m.**	Whittier City Hall 13230 Penn St. Whittier, CA	Tham Nguyen David Monks	Brent Ogden	Chester Britt
TECHNICAL ADVISORY COMMITTEE (TAC)								
TAC	**Federal Transit Administration**	Carol Inge	Project Update	**Friday, Dec. 13, 2007**	Metro 1 Gateway Plaza 3rd floor –Board Chair's Conf. Rm. Downtown LA	Carol Inge Kimberly Yu		
TAC	**Technical Advisory Committee - Regulatory Agencies**	Kimberly Yu/ David Monks	Follow up	**Wednesday, Feb. 13, 2008 10:00 a.m.**	Metro 1 Gateway Plaza Downtown LA	Diego Cardoso Robin Blair Susan Gilmore Kimberly Yu David Monks	Monica Villalobos Bob Hertz	Yesenia Arias Chester Britt
TAC	**Technical Advisory Committee - Project Cities**	Kimberly Yu/ David Monks	Follow up	**Wednesday, Feb. 20, 2008 10:00 a.m.**	Metro 1 Gateway Plaza Downtown LA	Diego Cardoso Robin Blair Susan Gilmore Kimberly Yu David Monks	Monica Villalobos Bob Hertz	Yesenia Arias Chester Britt
TAC	**Technical Advisory Phase 1 Project Tour**	Kimberly Yu/ David Monks	Field Visit	**Tuesday, March 18, 2008 9:30 a.m.**	Metro 1 Gateway Plaza Downtown LA	Diego Cardoso Kimberly Yu David Monks	Monica Villalobos	

Type	STAKEHOLDERS	CONTACT NAME	PURPOSE	MEETING DATE & TIME	LOCATION	Metro	CDM/DMJM HARRIS	AA
COMPLETED MEETINGS						Team Members in Attendance		
TAC	**Technical Advisory Committee - Project Cities**	Kimberly Yu/ David Monks	Follow up	**Wednesday, March 26, 2008 10:00 a.m.**	Metro 1 Gateway Plaza Downtown LA	Kimberly Yu David Monks Tham Nguyen	Brent Ogden Monica Villalobos Bob Hertz	Chester Britt
TAC	**SCAG - RSTIS Committee Meeting**	Tham Nguyen	Introductory	**Thursday, March 27, 2008 1:30 p.m.**		Tham Nguyen		
CITY BRIEFINGS								
City	**City of Downey** Gerald Caton, City Manager	Barbara - City Manager Administrative Assistant (562) 904-7246	Introductory	**Tuesday, Oct. 16, 2007 10:00 a.m.**	Downey City Hall City Manager's Conf. Rm. 3rd Fl. 11111 Brookshire Ave. Downey, CA	Kimberly Yu Tham Nguyen		Chester Britt
City	**City of Commerce** Linda Kay Oliveri, Acting City Manager Bob Zarrilli, Community Development Director Danilo Baston, Planning Services Manager	Rebecca Kuhn (323) 722-4805	Introductory	**Wednesday, Oct. 17, 2007 3:00 p.m.**	Commerce City Hall City Manager's Conf. Rm. 2535 Commerce Way Commerce, CA	Kimberly Yu David Monks Henry Gonzalez		Yesenia Arias
City	**City of Montebello** Randy Narramore, City Manager; Steve Huson, Fire Chief	Randy Narramore (323) 887-1200	Introductory	**Thursday, Oct. 18, 2007 10:00 a.m.**	Montebello City Hall 1600 W. Beverly Blvd. Montebello, CA	Kimberly Yu David Monks Tham Nguyen Peter Vorhees Henry Gonzalez	Brent Ogden	Chester Britt Yesenia Arias

Type	STAKEHOLDERS	CONTACT NAME	PURPOSE	MEETING DATE & TIME	LOCATION	CDM/DMJM Metro	HARRIS	AA
COMPLETED MEETINGS						Team Members in Attendance		
City	**City of Rosemead** Rey Alfonso, City Engineer; Matt Everling, Planning Services Manager Chris Marcarello, Administrative Services Officer	Chris Marcarello (626) 569-2110	Introductory	**Thursday, Oct. 18, 2007 1:30 p.m.**	Rosemead City Hall 8838 East Valley Blvd. Rosemead, CA	Kimberly Yu Tham Nguyen David Monks	Brent Ogden	Chester Britt
City	**City of Whittier** Nancy Mendez, Assistant City Manager Fran Schields, Director of Community Services Martin Brown, Management Analyst	Melonie - City Manager Administrative Assistant (562) 464-3301	Introductory	**Thursday, Oct. 18, 2007 3:00 p.m.**	Whittier City Hall Main Floor 13230 Penn St. Whittier, CA	Kimberly Yu Tham Nguyen David Monks		Chester Britt
City	**City of South El Monte** Anthony Ybarra, City Manager Ron Kenny, Director of Community Services	Maria Cardoso - City Manager Administrative Assistant (626) 579-6540	Introductory	**Monday, Oct. 22, 2007 2:30 p.m.**	South El Monte City Hall 1415 Santa Anita Ave. (Main Fl), South El Monte, CA	Kimberly Yu David Monks Peter Vorhees	Ray Sosa	Chester Britt
City	**City of El Monte** James W. Mussenden, City Manager; Dante G. Hall, Assistant City Manager Eugene Moy, Redevelopment Director Deborah Moraza, Transportation Services Manager Kev Tcharkhoutian, City Engineer	James W. Mussenden	Introductory	**Tuesday, Oct. 23, 2007 9:00 a.m.**	El Monte City Hall East City Manager's Offices 11333 Valley Blvd. El Monte, CA	Kimberly Yu David Monks Peter Vorhees	Ray Sosa	Chester Britt

Type	STAKEHOLDERS	CONTACT NAME	PURPOSE	MEETING DATE & TIME	LOCATION	Metro	CDM/DMJM HARRIS	AA
COMPLETED MEETINGS						Team Members in Attendance		
City	**City of Pico Rivera** Julia Gonzalez, Sr. Planner; Bob Spencer, Sr. Public Information Officer; Raymond Chavez, Sr. Coordinator Business and Community Outreach	Sandra - City Manager's Administrative Assistant (562) 942-2000	Introductory	**Friday, October 26, 2007 3:30 p.m.**	Pico Rivera City Hall 6615 Passons Blvd. Pico Rivera, CA	Kimberly Yu David Monks Peter Voorhees Henry Gonzalez	Ray Sosa	Chester Britt Yesenia Arias
City	**City of Bell** Annett Peretz, Director of Community Services Diana Maroquin, Supervisor of Education and Events Luis Ramirez, Deputy City Engineer	Annett Peretz - Director of Community Services (323) 733-1596	Introductory	**Thursday, Nov. 1, 2007 8:30 a.m.**	City of Bell Community Center 6250 Pine Ave. Bell, CA	Tham Nguyen David Monks Peter Voorhees		Yesenia Arias
City	**City of Monterey Park** Tung Nguyen, Transportation Manager Michael Ho, Assistant City Engineer	Valerie - City Manager's Administrative Assistant (626) 307-1255	Introductory	**Friday, Nov 2, 2007 3:00 p.m.**	Monterey Park City Hall 320 W. Newmark Ave. Monterey Park, CA	Tham Nguyen Peter Voorhees		Chester Britt Yesenia Arias
City	**City of Santa Fe Springs** Don Jensen, Director of Public Works Tom Lopez, Assistant Director of Public Works Al Fuentes, Planning Consultant	Vivian - City Manager's Administrative Assistant (562) 868-0511 ext.7510	Introductory	**Tuesday, Nov. 6, 2007 9:00 a.m.**	City of Santa Fe Springs 11710 E. Telegraph Rd. Santa Fe Springs, CA	Tham Nguyen David Monks		

Type	STAKEHOLDERS	CONTACT NAME	PURPOSE	MEETING DATE & TIME	LOCATION	Metro	CDM/DMJM HARRIS	AA
COMPLETED MEETINGS						Team Members in Attendance		
City	**Pico Rivera Cable Access Channel TV Interview**	Sybil MacDonald	Introductory	**Thursday, March 20, 2008 10:00 a.m.**	Mission Meridian Gold Line Station	Diego Cardoso Kimberly Yu David Monks		Sybil MacDonald
City	**City of El Monte** James W. Mussenden, City Manager Dante Hall – Assistant City ManagerDeborah Moraza – Transportation Services ManagerDave Gondek – Engineer	Deborah Moraza	Follow up	**Thursday, May 8, 2008 10:00 a.m.**	El Monte City Hall West Administrative Conference Rm. 11333 Valley Blvd. El Monte, CA	Kimberly Yu		Chester Britt
City	**City of Santa Fe Springs** Don Jensen, Director of Public Works Tom Lopez, Assistant Director of Public Works Paul Ashworth - Director of Planning	Don Jensen	Follow up	**Monday, May 12, 2008 8:00 a.m.**	City of Santa Fe Springs 11710 E. Telegraph Rd. Santa Fe Springs, CA	Kimberly Yu David Monks		Chester Britt
City	**City of Whittier** Nancy Mendez, Assistant City Manager; Fran Schields, Director of Community Services Martin Brown, Management Analyst Chris Magdusku, City Engineer Jeff Collier - Director of	Martin Brown	Follow up	**Monday, May 12, 2008 10:30 a.m.**	Whittier City Hall Main Floor 13230 Penn St. Whittier, CA	Kimberly Yu David Monks	Brent Ogden	Chester Britt

Type	STAKEHOLDERS	CONTACT NAME	PURPOSE	MEETING DATE & TIME	LOCATION	Metro	CDM/DMJM HARRIS	AA
COMPLETED MEETINGS						Team Members in Attendance		
	Community Development							
City	**City of Pico Rivera** Chuck Fuentes, City Manager Jeff Prang, Assistant City Manager Michael L. Moore, Director of Public Works Julia Gonzalez, Deputy Director of Community Development	Julia Gonzalez	Follow up	**Monday, May 12, 2008 2:00 p.m.**	Pico Rivera City Hall 6615 Passons Blvd. Pico Rivera, CA	Kimberly Yu David Monks	Brent Ogden Monica Villalobos	Yesenia Arias
City	**City of Rosemead** Oliver Chi, City Manager Steve Beer, Director of Public Works Matt Everling, Planning Services Manager	Matt Everling	Follow up	**Tuesday, May 13, 2008 10:00 a.m.**	Rosemead City Hall 8838 East Valley Blvd. Rosemead, CA	Kimberly Yu David Monks		Chester Britt
City	**City of South El Monte** Anthony Ybarra, City Manager Jennifer Vazquez, Assistant City Manager Ron Kenny, Director of Community Manuel Mancha, Director of Community Development	Tony Ybarra	Follow up	**Thursday, May 15, 2008 9:00 a.m.**	South El Monte City Hall 1415 Santa Anita Ave. (Main Fl), South El Monte, CA	Tham Nguyen David Monks		

Type	STAKEHOLDERS	CONTACT NAME	PURPOSE	MEETING DATE & TIME	LOCATION	Metro	CDM/DMJM HARRIS	AA
COMPLETED MEETINGS						Team Members in Attendance		
City	**City of Monterey Park** June Yotsuya, City Manager Tung Nguyen, Transportation Manager Margarita Cruz, Director of Economic Development	Tung Nguyen	Follow up	**Friday, May 16, 2008** **10:00 a.m.**	Monterey Park City Hall 320 W. Newmark Ave. Monterey Park, CA	Kimberly Yu David Monks	Monica Villalobos	Raul Velazquez
City	**City of Whittier - Parks and Recreation Committee**	Martin Brown	Introductory	**Tuesday, June 24, 2008** **6:00 p.m.**	Whittier City Hall 13230 Penn St. Whittier, CA	Kimberly Yu David Monks Tham Nguyen		Chester Britt
STAKEHOLDER BRIEFINGS								
Stakeholder	**Montebello Chamber of Commerce** - Governmental Affairs Committee	Andrea Wagg	Introductory	**Thursday, May 8, 2008** **12:00 p.m.**	Montebello Chamber of Commerce 817 West Whittier Blvd. St. 200 Montebello, CA	Kimberly Yu		Chester Britt
Stakeholder	**Rio Hondo Community College District - Board of Trustees**	Russell Castaneda-Calleros	Introductory	**Wednesday, May 14, 2008** **6:00 p.m.**	Rio Hondo College 3600 Workman Mill Rd. Whittier, CA	Kimberly Yu David Monks		
Stakeholder	**Montebello Chamber of Commerce - Business Association TOD Presentation and Discussion**	Giuseppe Veneziano	Introductory	**Tuesday, May 27, 2008** **7:00 p.m.**	Jimmy's Family Restaurant 701 W. Whittier Blvd.	Roger Moliere Kimberly Yu David Monks	Monica Villalobos	Chester Britt
Stakeholder	**Montebello Chamber of Commerce - Board of Directors**	Teri, Director of Operations	Introductory	**Wednesday, May 28, 2008** **8:00 a.m.**	Montebello Chamber of Commerce 817 W. Whittier Blvd. St. 200 Montebello, CA	Kimberly Yu David Monks	Monica Villalobos	Chester Britt

Type	STAKEHOLDERS	CONTACT NAME	PURPOSE	MEETING DATE & TIME	LOCATION	CDM/DMJM HARRIS Team Members in Attendance		
COMPLETED MEETINGS						Metro		AA
Stakeholder	**Presbyterian Intercommunity Hospital**	David Monks	Introductory	**Thursday, July 17, 2008 10:00 a.m.**	PIH 12401 Washington Blvd. Whittier, CA	David Monks		Chester Britt
Stakeholder	**Whittier Uptown Association**	David Monks	Introductory	**Friday, July 18, 2008 10:00 a.m.**	Atrium Business Court 6528 Greenleaf Ave. Whittier, CA	Kimberly Yu David Monks		Chester Britt
Stakeholder	**Whittier Rotary Club**	David Monks	Introductory	**Friday, Aug. 01, 2008 1:00 p.m.**	Radisson - Whittier 7320 Greenleaf Ave Whittier, CA 90602	David Monks		Chester Britt

7.0 Comparative Analysis of Alternatives

7.1 Approach

This section summarizes the analysis of the five build alternatives, the no-build alternative, and the TSM alternative based on how well they serve the goals set forth in Section 2. It provides a general overview of factors including mobility, land use, cost effectiveness, environmental impacts, equity, and community needs for each alternative. Section 2-6 provides more detailed discussion of the proposed routes and the alternatives evaluation process. The five preferred build alternatives identified in the preceding sections are:

- Route 60 (SR-60) LRT
- SR-60 Bus Rapid Transit (Busway)
- Beverly LRT
- Whittier LRT
- Washington LRT

The comparative evaluation information presented in this section is organized by the six goals of the Eastside Transit Corridor Phase 2 project. It includes and expands upon FTA New Starts Evaluation and Rating criteria (such as mobility improvements, environmental benefits, operating efficiencies, cost-effectiveness, and transit-supportive land use).

7.2 Effectiveness in Improving Mobility

The objectives of Goal 1 were designed to evaluate mobility improvements gained by a fixed guideway transit system. They include:

Goal 1: Improve Mobility, Accessibility, and Connectivity of the Transit System and Region

- Provide convenient access and improve connectivity to the regional transit system
- Increase transit ridership
- Provide improved access to employment centers
- Minimize transfers and improve connectivity with other modes of transit
- Provide for the long-term expansion of the transit system

Table 7-1 compares the five fixed guideway alternatives and the No-Build and TSM options using several criteria that support the overall goal of improving the regional transit system. The table identifies each alternative's potential to lure riders and provide travel time savings over existing transit service and driving on local highways during peak hours.

Table 7-1 Mobility, Accessibility, and Connectivity

Alternative	No-Build	TSM	1	2	3	4	5
1.a. Travel Time Savings from end of line compared to No-Build (Minutes)							
To Atlantic Blvd.	-	SR-60 28 Beverly 13 Whittier 15 Washington 12	64	64	27	28	32
To Union Station	-	SR-60 28 Beverly 13 Whittier 15 Washington 12	64	64	27	28	32
Headway (minutes)	-	-	5 peak / 10 off-peak	5 peak / 10 off-peak	5 peak / 10 off-peak	5 peak / 10 off-peak	5 peak / 10 off-peak
Average Speed (mph)	-	-	33.3	33.7	22.6	22.8	33
Average Station Spacing (miles)	-	-	1.4	1.4	0.7	0.8	1.3

Table 7-1 Mobility, Accessibility, and Connectivity

Alternative	No-Build	TSM	1	2	3	4	5
1.b. Travel Time (station to station travel time) from Eastside Gold Line Extension terminus (Minutes)							
To Atlantic Blvd.	SR-60 80 Beverly and Whittier 52 Washington 49	SR-60 52 Beverly 39 Whittier and Washington 37	16	15	23	24	17
To Union Station	SR-60 99 Beverly and Whittier 72 Washington 69	SR-60 72 Beverly 56 Whittier and Washington 57	35	41	43	43	36
1.c. Transit ridership potential							
Project Boardings	-	-	13,319	7,516	13,469	14,358	15,893
Net new transit riders	-	-	4,301	2,116	5,010	4,992	6,407
1.d. Hours of transportation	-	-	3,867	1,745	5,316	5,169	6,403

Table 7-1 Mobility, Accessibility, and Connectivity

Alternative	No-Build	TSM	1	2	3	4	5
user benefits							
1.e. Congestion relief (reduction in highway travel demand in the PSA) (VMT)	4,540,774	4,540,112	4,539,616	4,539,513	4,540,351	4,539,636	4,540,266
1.f. Peak period total highway time (from TAZ to TAZ) from end of line (Minutes)							
To Atlantic Blvd.	SR-60 35 Beverly, Whittier, and Washington 27	SR-60 35 Beverly, Whittier, and Washington 27	35	35	27	27	27
To Union Station	SR-60 52 Beverly and Whittier 46 Washington 44	SR-60 52 Beverly and Whittier 46 Washington 44	52	52	46	46	44
1.g Peak period total transit time (from TAZ to TAZ) from end of line (Minutes)							

Table 7-1 Mobility, Accessibility, and Connectivity

Alternative	No-Build	TSM	1	2	3	4	5
To Atlantic Blvd.	SR-60 121 Beverly and Whittier 71 Washington 67	SR-60 76 Beverly 55 Whittier 53 Washington 52	35	35	41	40	32
To Union Station	SR-60 147 Beverly and Whittier 97 Washington 93	SR-60 103 Beverly 81 Whittier and Washington 79	52	52	61	59	52
1.h. Estimated change in transit mode share	6.362%	6.826%	7.109%	7.005%	7.337%	7.331%	7.463%
1.i. Ability to extend farther east	N/A	N/A	Extension east to San Gabriel Valley	Extension east to San Gabriel Valley	Extension southeast to Orange County	Extension southeast to Orange County	Extension southeast to Orange County

- Travel Time Savings (Table 7-1, 1.a) – All five alternatives would provide travel time savings compared to the No-Build. In addition, the Build alternatives would also yield significantly higher improvement over the No-Build compared to the TSM improvements.

- Station to Station Travel Time (Table 7-1, 1.b) – Whereas the TSM would improve station to station travel times by about 12 minutes compared to the No-Build, the Build alternatives would cut travel times by about 13 to 22 minutes compared to the TSM, and by about 25 to 34 minutes compared to the No-Build.

- Transit Ridership Potential (Table 7-1, 1.c) – Project Boardings would range from about 7,500 riders (Alternative 2, SR-60 Busway) to nearly 16,000 riders (Alternative 5, Washington LRT), with all of the LRT alternatives serving more than 13,000 daily riders. Net new transit riders compared to the TSM would range from 5,000 to 6,400 for Alternatives 3 through 5 (Beverly, Whittier and Washington LRT), and from 2,100 to 4,300 riders for Alternatives 2 and 1 (along SR-60), respectively.

- User Benefits (Table 7-1, 1.d) – All five of the Build Alternatives would yield travel time benefit hours over the TSM Alternative. User benefits ranging from about 5,200 hours to 6,400 hours would result from implementation of Alternatives 3, 4, and 5 (Beverly, Whittier and Washington LRT). Alternative 1 (SR-60 LRT) would yield significantly lower user benefits, with about 3,800 hours and Alternative 2 (SR-60 Busway) would provide a low level of user benefit at about 1,750 hours.

- Congestion Relief (Table 7-1, 1.e) – All five Build alternatives would reduce Vehicle Miles of Travel (VMT) compared to the No-Build. Alternatives 1, 2, and 4 would also reduce VMT compared to the TSM Alternative; however, Alternatives 3 and 5 (Beverly LRT and Washington LRT) would not.

- Peak Period Total Highway Time (Table 7-1, 1.f) – Highway travel times between travel zones at the beginning and end of line would not be significantly changed either with the TSM Alternative or with any of the Build Alternatives.

- Peak Period Total Transit Time (Table 7-1, 1.g) – By contrast, all five of the Build Alternatives would yield transit time savings compared to the TSM and No-Build Alternatives as tabulated in criterion 1.g. The greatest savings would occur with the two SR-60 alternatives (in part due to the relatively poor transit access provided under the No-Build and TSM Alternatives). For Alternatives 3 through 5 (Beverly, Whittier and Washington LRT, respectively) transit travel time savings of 13 to 20 minutes relative to the TSM Alternative would be provided.

- Estimated Change in Transit Mode Share (Table 7-1, 1.h) – Although the regional transit mode share is projected to increase by about 6.3 to 6.8 percent under the No-Build or TSM Alternative, the Build Alternatives would increase the mode share to over

7.0% (with Alternative 2, SR-60 Busway) or nearly as high as 7.5% (with Alternative 5, Washington LRT).

- Ability to Extend Farther East (Table 7.1, 1.i) – Alternatives 1 and 2 along the SR-60 Freeway are potentially extendable to the east in the San Gabriel Valley whereas Alternatives 3 through 5 would be potentially extendable to the southeast into Orange County.

Figure 7-1 is a graphic comparison of the station-to-station travel times, including the total time to Union Station. SR-60 LRT, which is the shortest, has the lowest travel time, closely followed by Washington LRT, which is fully grade-separated. The Beverly and Whittier LRT alternatives are the slowest.

Figure 7-1 Station to Station Travel Times

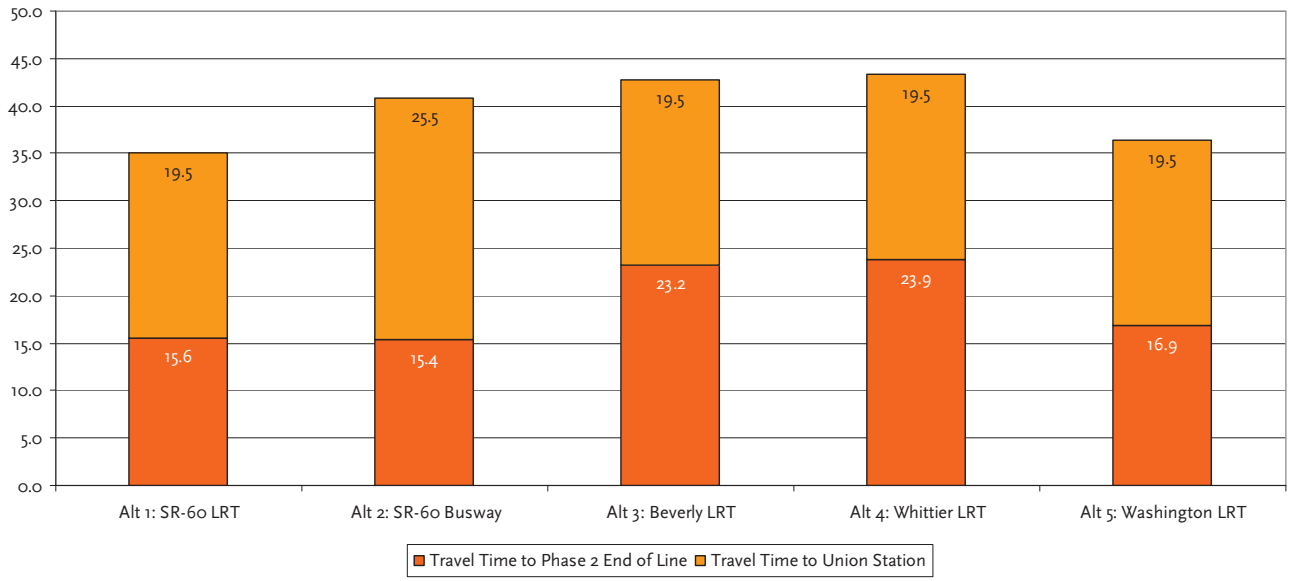


Figure 7-2 depicts the ridership results graphically, including the total Gold Line ridership. The Washington LRT alternative has the highest ridership both in terms of total daily riders as well as net new transit trips. This is closely followed by the Whittier LRT alternative and Beverly LRT. The two SR-60 alternatives have the lowest ridership.

Figure 7-2 Project and Total Gold Line Ridership (Year 2030)

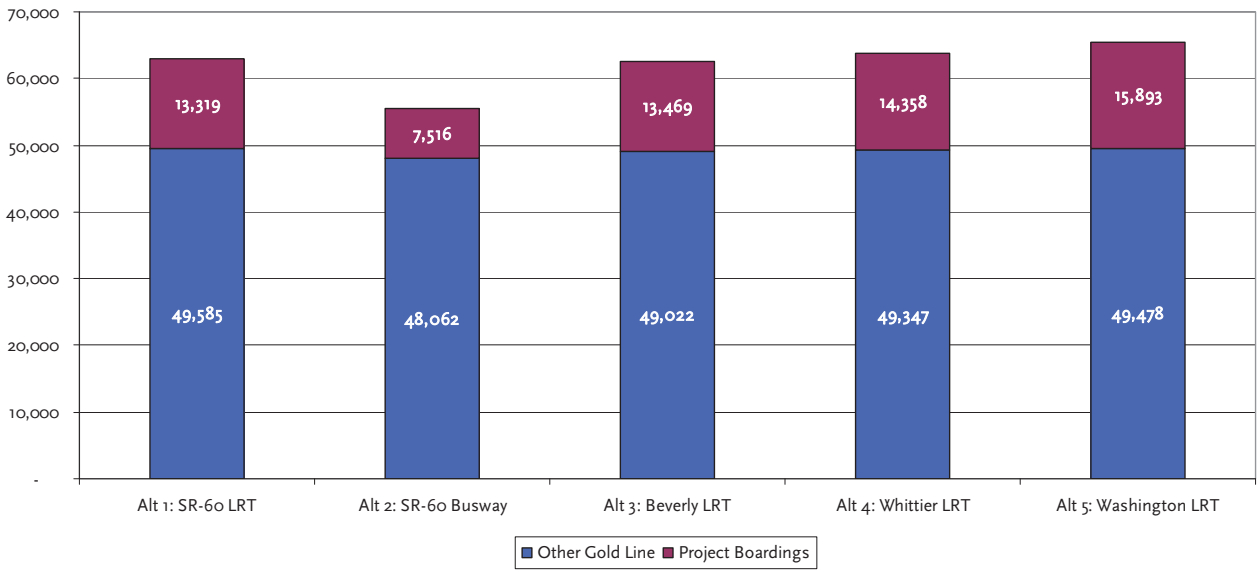
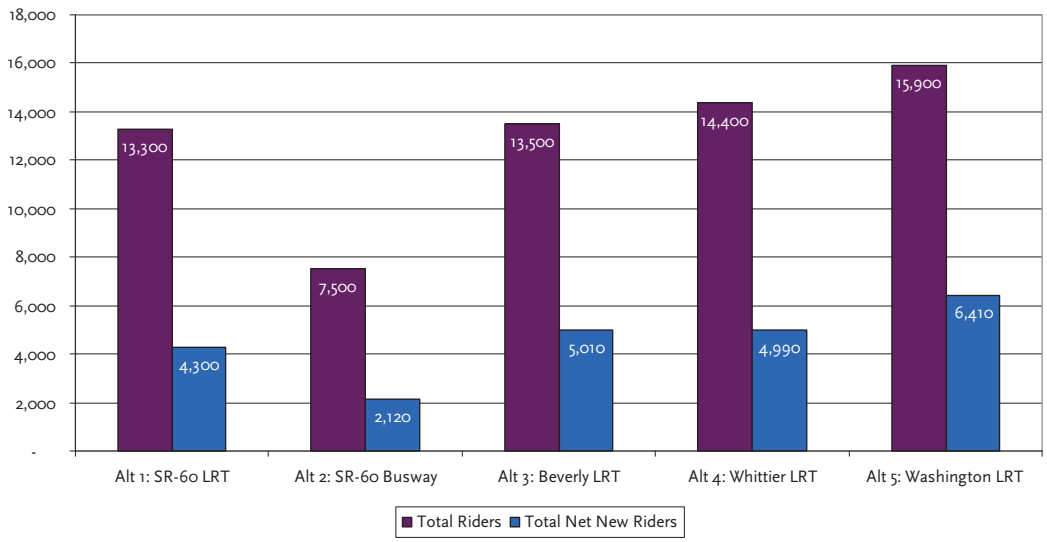


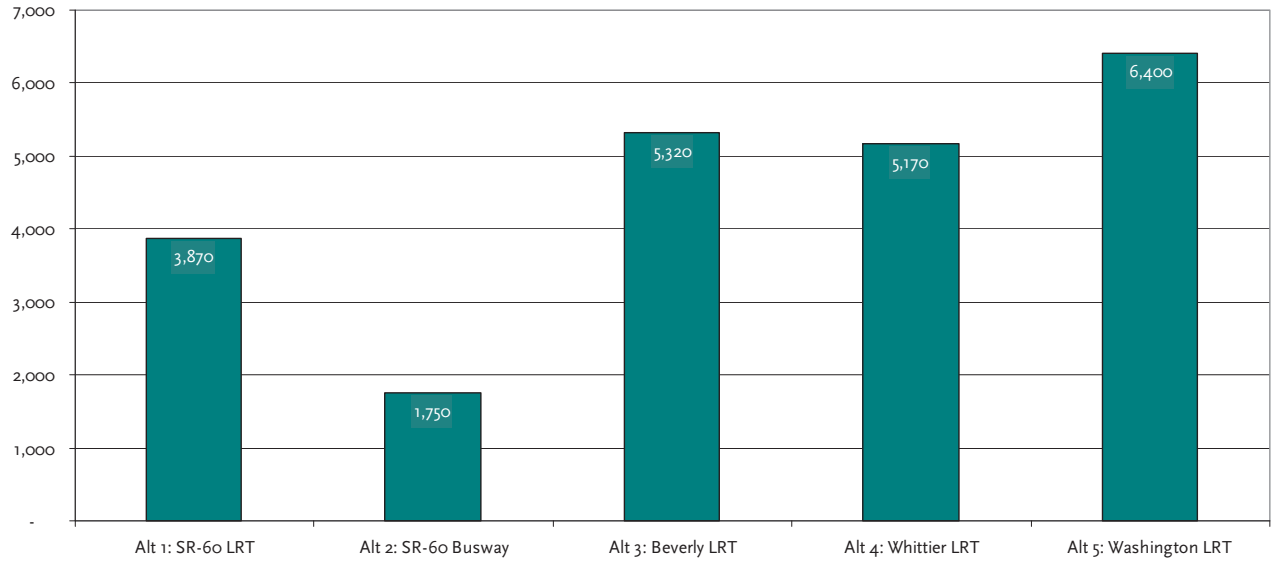
Figure 7-3 provides a graphic comparison of total daily riders and net new transit riders (compared to the TSM alternative). Alternative 5, Washington LRT, has the highest total ridership and the greatest number of net new transit riders. However, Alternative 3, Beverly LRT, which has the third highest total ridership, has the second highest number of net new riders, indicating it is second only to Washington LRT in drawing motorists out of their cars.

Figure 7-3 Daily Ridership (Year 2030)



The distribution of user benefit hours is graphically depicted in Figure 7-4. Similar to net new transit riders, the user benefit is relative to the travel time computed for the TSM alternative. The results closely follow the Net New Transit Trips rankings, with the Washington LRT delivering the highest user benefit, followed by the Beverly LRT and then Whittier LRT alternatives. The SR-60 alternatives yield the lowest level of user benefit hours.

Figure 7-4 User Benefit Hours



Summary

The two alternatives along SR-60 would yield the greatest travel time savings over existing bus service, given the potential for full grade separation, but they would generate the fewest riders because land uses surrounding freeways are typically not ideal for transit and pedestrian accessibility. Transit stations located along freeways are often unpleasant for passengers to access on foot, and few residents choose to locate their homes within walking distance of freeways. The SR-60 Busway alternative would achieve speeds similar to the SR-60 LRT alternative, but using a different transit mode than the Phase 1 Eastside LRT Extension would require passengers to transfer at the Atlantic Station. This transfer would lengthen the overall travel time from Union Station to stops east of Atlantic Blvd., thus causing the Busway option to attract fewer riders than the LRT option.

Alternatives 3 and 4 (Beverly LRT and Whittier LRT, respectively) would take longer than the SR-60 alternatives to traverse the full length of the PSA because trains would be operating at lower speeds, mostly at-grade in the medians of busy arterial streets. This track configuration also introduces the potential for trains to spend time stopped at red lights. Nevertheless, Alternatives 3 and 4 would attract more riders than either SR-60 alternative, largely because the adjacent land uses are more pedestrian-oriented and stations are within ½ mile of more residential areas and activity centers.

The elevated Washington LRT (Alternative 5) features both full grade separation and transit-supportive adjacent land uses, allowing it to provide travel times only two minutes longer than the SR-60 LRT alternative while outperforming all of the other alternatives from the standpoint of

ridership and user-hours of benefit. This is likely because the Washington LRT alternative combines the speed advantages of grade separation with proximity to some residential and employment centers. It should be noted, however, that the ridership, congestion relief, and transit mode share change estimates for Alternatives 1 and 3 through 5 are probably close enough together to be considered virtually equal, given the wide margin of uncertainty inherent in such predictions.

7.3 Transit Supportive Land Use

The objectives of Goal 2 take into consideration current and anticipated future planning efforts to maximize and create land use opportunities along the Eastside Transit Corridor.

Goal 2: Support Local Land Use Objectives

- Work with local planning agencies to identify and implement transit improvements in support of infill development
- Provide transit service to regionally significant education, medical, and shopping sites
- Help create community and transit centers
- Identify joint development opportunities
- Enhance urban design features

Table 7-2 outlines the projected year 2030 population and employment densities within one-half mile of the proposed stations along each alternative alignment. High densities within walking distance of stations can promote ridership when the transit system provides direct connections to major activity centers. Having a station within walking distance is typically more attractive to riders than having to drive or take a feeder bus to the station, since the latter two options require an additional transfer. The final row of the table briefly summarizes the planned developments near each alignment, as well as the transit-supportive policies adopted by the municipalities along the proposed alignments.

The SR-60 stations (Alternatives 1 and 2) are located in areas with lower population and employment densities than the stations along the other alternative alignments. This is likely because the stations are located near freeway interchanges with major cross streets, which consume much of the land within walking distance.

The other three alternatives have much higher population and employment densities near their stations. Alternative 4, Whittier LRT, serves the area with the highest population density, and Alternative 5, Washington LRT, stations are located near the most jobs. However, the densities around Alternatives 3 through 5 are all within 1,000 jobs and persons per square mile of each other.

Table 7-2 Population Density, Employment Density, and Local Land Use Policies

Alternatives	1		2		3		4		5	
2. a. Population Density, 2030										
2030 Population Density (per square mile) within 1/2 mile of stations along alignments	6,131	M	6,131	M	11,145	H	11,959	H	11,003	H
2.b. Employment Density, 2030										
2030 Employment Density (per square mile) within 1/2 mile of stations along alignment	2,099	M	2,099	M	3,581	H	3,778	H	4,125	H
2.c. Right-of-Way Impacts (Sq. ft/land use)										
2.d. Urban fit potential, including pedestrian accessibility and urban design enhancement opportunities	long-term development growth for Montebello Town Center; potential transit village at Santa Anita; Whittier Narrows open space access; Monterey Park General Plan supports multi-modal transit centers; Rosemead General Plan stresses improved transit near development		long-term development growth for Montebello Town Center potential transit village at Santa Anita; Whittier Narrows open space access; Monterey Park General Plan supports multi-modal transit centers; Rosemead Genearl Plan stresses improved transit near development		Montebello General Plan goal to improve transit facilities servicing new development; Pico Rivera General Plan seeks adequate connections to regional transit network; Whittier Specific Plan specifies high-density residential w/ street enhancements		Whittier Blvd Specific Plan targets mixed-use development & coordination of transportation services; in addition, mixed-use zone to expand from Downtown Montebello to support higher density TODs		Commerce General Plan supports development situated along major corridors, supported by transit system; however, area currently zoned for heavy commercial/ light industrial uses, not conducive for mixed-use/ urban TOD	

Note: Criteria ranked comparatively. H=High, M=Medium, L=Low

Ranking scale of “high”, “medium”, “low” based on various statistics, including weighted average calucluation of projected total population and employment density served within ½ mile of station locations along alignment.

7.4 Cost Effectiveness and Financial Feasibility

This section presents a comparative evaluation of the efficiency of the refined alternatives. A number of efficiency metrics have been evaluated. The efficiency metrics compare the performance of the various build alternatives in terms of estimated travel time savings and projected ridership compared to project characteristics, such as cost and route miles.

Goal 3: Cost Effectiveness & Financial Feasibility

The objectives of Goal 3 are to measure the cost and financial benefits of a fixed guideway transit solution these include:

- Provide a cost effective project which moves the most people at the lowest cost
- Improve operating efficiency and cost effectiveness

7.4.1 Efficiency Metrics

There are a number of evaluation criteria that provide a comparison between the five alternatives based upon the measures of ridership benefit compared to cost and other project metrics.

For the purpose of this evaluation, the following criteria were considered:

- Dollars per Net New Hour of User Benefit – Annualized capital plus operations & maintenance dollars per annual hour of travel time savings (net over TSM, 2008 dollars)
- Dollars per Net New Transit Rider – Annualized capital plus operations & maintenance dollars per annual additional system-wide transit riders (linked trips; net over TSM)
- Riders per Route Mile – Total daily riders per route mile of the extension
- Riders per Million Capital Dollars Invested – Total annual riders per 2008 capital cost (millions)

Key cost-effectiveness criteria are evaluated by comparing the benefits beyond the TSM alternative to the costs in excess of the TSM alternative, as described further below.

7.4.2 TSM Data

For the purpose of comparison to the build alternatives, the TSM option was evaluated. The following considerations were used to develop the cost of the TSM alternative:

- TSM Facilities Capital Cost – Includes “rapid bus” type intersection and running way improvements, such as traffic signal controller upgrades, field communications, signage, and striping coupled with bus stops and enhanced bus transfer facilities at Phase 1 terminal site. The total capital cost of the TSM improvements is estimated at $190-million.

- TSM Vehicles Cost – Includes addition of about 175 to 190 buses (standard length and 60 foot) with 2.5 replacements over the life of the fixed capital facilities.
- TSM Operations and Maintenance Cost – Savings of about $4,000,000 per year in bus operations with the build alternatives. (This would be more than offset by the increase in LRT or bus operating cost for the build alternatives; however the TSM operational cost is netted out in the cost effectiveness calculations.)
- TSM Ridership – The modeling of the TSM alternative identified total Gold Line ridership of about 54,500 daily riders, which represents an increase over the No-Build of about 6,150 daily riders and an improvement of user benefit hours of 6,070 daily hours compared to the No- Build Alternative.

7.4.3 Efficiency Results

Table 7-3 summarizes the cost and user benefits efficiency evaluation results. The LRT alternatives had significantly higher operating costs than the Busway, No-Build, and TSM alternatives. However, in the case of Alternative 3 (Beverly LRT), these costs were offset by high volumes of new daily transit trips, thus lowering the cost per new daily transit trip and cost per hour of user benefit well below half those for the Busway alternative. The annualized cost per new daily transit trips and hour of user benefit for Alternative 3 is $69 and $65 respectively. Both Alternatives 1 and 2 fared poorly with respect to these two criteria, and Alternatives 4 and 5 yielded results moderately higher than those of Alternative 3.

Based upon the improvement over the TSM alternative, Alternative 3, Beverly LRT, yields the lowest cost per net new rider and also delivers the lowest cost per user benefit hour. Alternatives 4 and 5, the Whittier LRT and Washington LRT, are moderately cost-effective whereas the two SR-60 alternatives are the least cost-effectivene. These results are depicted graphically in Figures 7-5 and 7-6.

It should be noted that $20 per net new rider historically represents the order of magnitude threshold defining a cost effective project according to federal funding provisions. Currently, the Federal Transit Administration New Starts threshold for federal funding eligibility is a cost-effectiveness of $24.99 per user benefit hour. While none of the alternatives achieves this level of cost-effectiveness,further route and project refinement in the Draft EIR/EIS phase should result in a more cost effective project. Improvements in the bus-rail interface, station placement, and construction cost reductions should be identified to improve overall project efficiencies.

Table 7-3 Costs and User Benefits

Alternatives	No-Build	TSM	1	2	3	4	5
3.a Capital Cost Estimate	N/A	N/A	$1,719M	$1,401M	$1,086M	$1,383M	$1,765M
3.b. User benefits hours	N/A	N/A	3,867	1,745	5,316	5,169	6,403
3.c. Annual O&M costs	$42M	$77M	$107M	$50M	$117M	$111M	$108M
3.d. Annualized cost per new daily transit trips compared to No-Build and TSM Alternatives	N/A	N/A	$109	$160	$67	$79	$75
3.e. Annualized cost per hour of transit system user benefit compared to No-Build and TSM Alternative	N/A	N/A	$121	$193	$63	$77	$75

All monetary figures presented in 2008 dollars

Figure 7-5 Dollars per User Benefit Hour

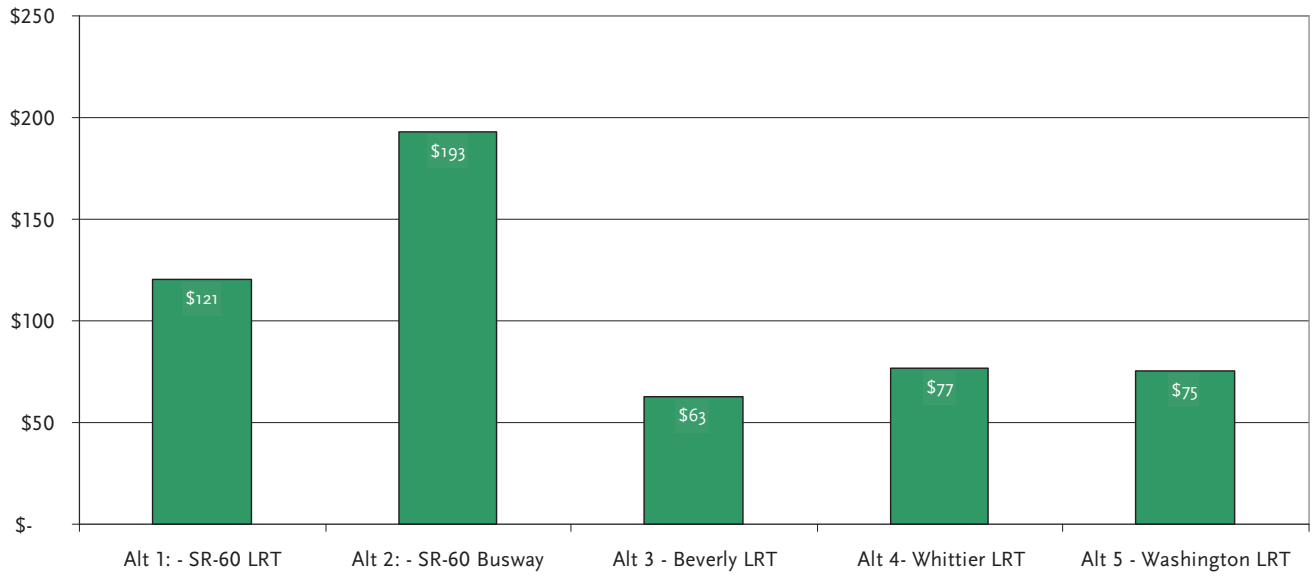
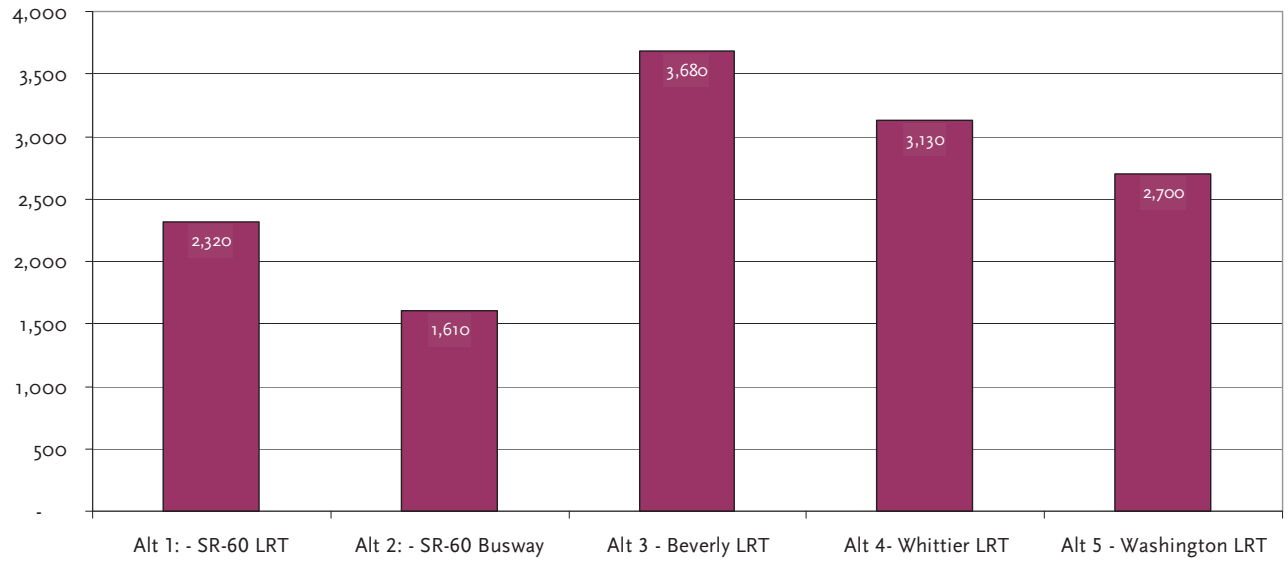
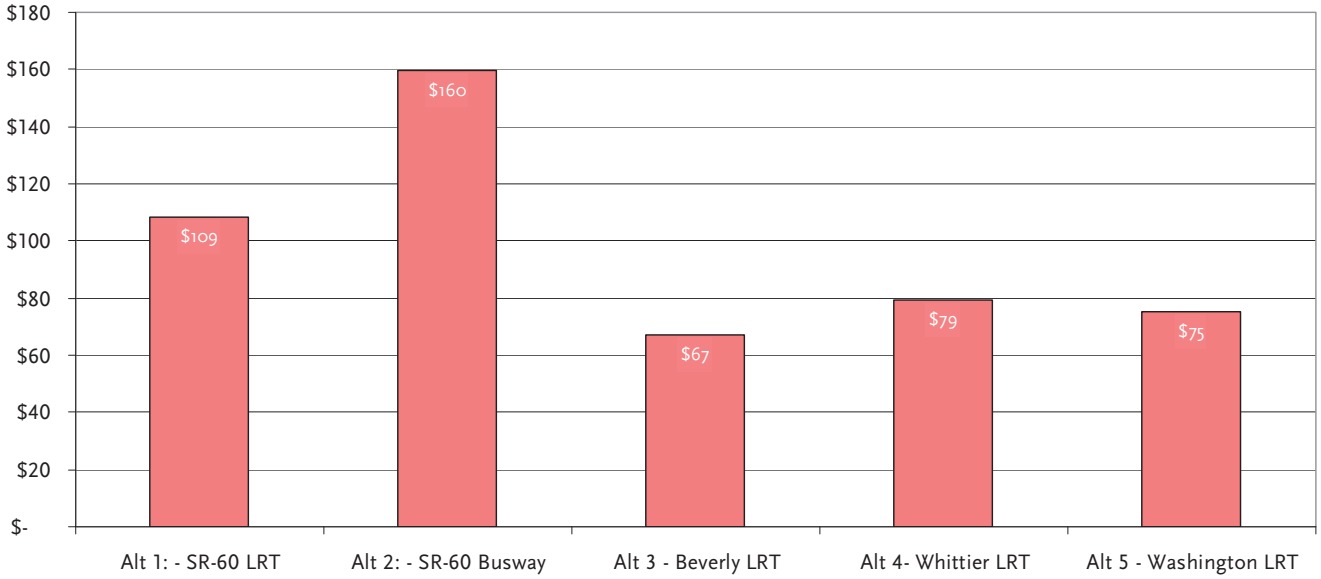


Figure 7-6 Annual Riders per $ Capital (millions)



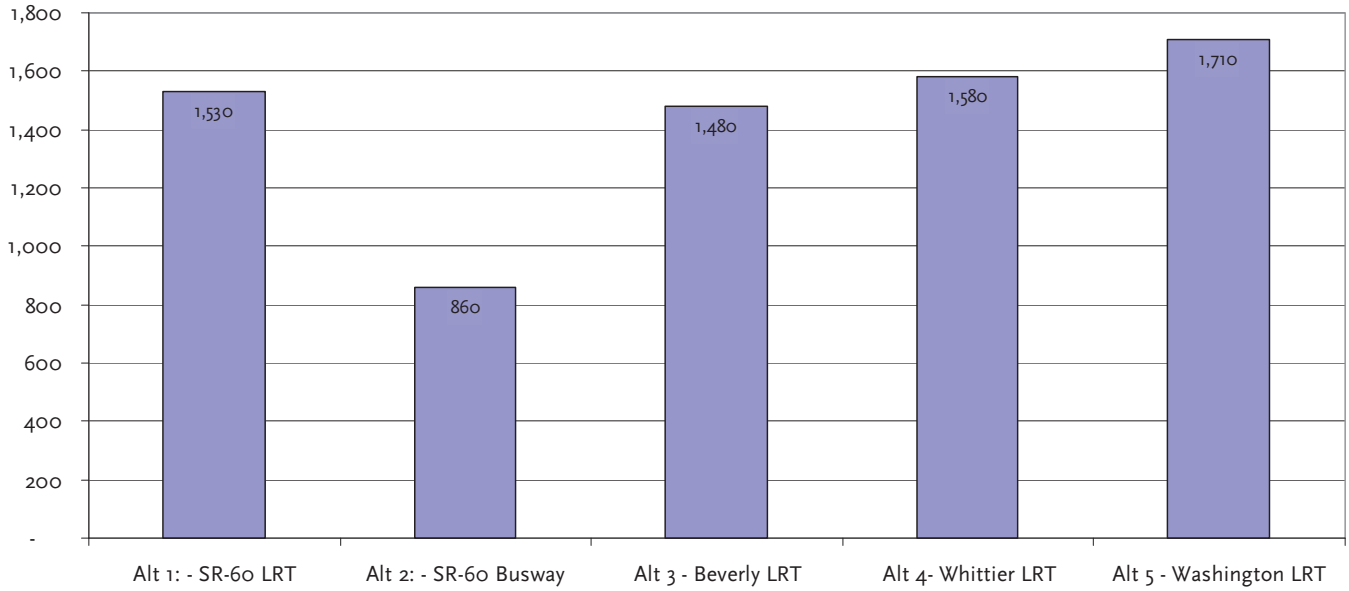
A criterion sometimes used to measure cost effectiveness is total annual riders versus the capital investment in millions of dollars. For the purposes of this computation, riders have been annualized assuming 319 revenue days per year (based upon data for systems which operate seven days a week shown in the National Transit Database). Figure 7-7 depicts the results graphically. Consistent with some of the other criteria, Alternative 3 (Beverly LRT), is the most productive. Alternative 4 (Whittier LRT) and Alternative 5 (Washington LRT) are in the middle of the range, and the two SR-60 alternatives are ranked lowest.

Figure 7-7 Dollars per Net New Rider



One other metric that was evaluated was the productivity of the alternatives in terms of total daily riders per route mile of guideway. These results are presented in Figure 7-8. Similar to the other criteria, the LRT options performed better than the busway option, and Alternative 5, Washington LRT, performed the best. However, there is not much variation between Washington LRT and the other LRT alternatives.

Figure 7-8 Daily Riders per Route Mile



7.4.4 Uptown Whittier Streetcar Loop

The conceptual engineering process included development of an "Uptown Whittier Streetcar Loop", which consisted of a one-way counterclockwise loop around Uptown Whittier that could be used as a design option with either the Beverly LRT or the Whittier LRT alternatives. This option would result in measurably different ridership and cost performance and was therefore evaluated as a sub-alternative.

The results of the Uptown Whittier Streetcar Loop evaluation include the following:

- Increased Travel Time – The Loop option would increase the travel time for the Beverly alternative from 23.2 minutes to 29.4 minutes. A similar change would be expected if it were used in combination with the Whittier LRT.
- Reduced Riders – Although the Loop was found to increase total riders slightly from 13,500 to 13,560 (which is not significantly higher); the net new transit ridership compared to the TSM option was reduced slightly from 5,010 to 4,690 (most likely due to the increased run time.
- Increased Cost – The Loop would increase the length of the alignment from 9.1 to 10.5 route miles and would also result in higher capital costs, rising from $870 million to $930 million.

- Decreased Cost Effectiveness – As a result of the higher cost and lower ridership, the cost-effectiveness of the Beverly alternative would drop from $67 per net new rider to $87 per net new rider and from $63 per user benefit hour to $80 per user benefit hour.
- Operational Issues – In addition to the negative cost-effectiveness findings, the Loop would introduce negative operational factors due to the fact that the alignment would need to share the travel lanes with automobile traffic due to narrow street widths.

As a result of these cost-effectiveness and operational issues, the Uptown Whittier Loop is not recommended for further consideration, neither as an option for the Beverly LRT alternative as specifically evaluated, nor as an option to the Whittier LRT, which would yield similar results. The summary of recommendations (Section 7.10), lists the recommendations identified for further evaluation.

7.5 Environmental

Goal 4 evaluates various measures of sustainability that seek to minimize impacts of projected growth and offset this with the benefit of a transit investment. A more detailed environmental evaluation will be conducted as part of the Eastside Transit Corridor Phase 2 Draft EIR/EIS. The information below is a preliminary assessment and identification of topics to address in greater detail in the next phase.

Goal 4: Plan for Projected Growth in a Sustainable Manner

- Implement an alternative that minimizes adverse impacts on the environment
- Decrease dependency on the single occupancy vehicle
- Reduce VMT within the PSA
- Reduce growth in traffic congestion and improve air quality

Table 7-4 summarizes each alternative's potential to minimize physical impacts to the environment and reduce vehicle delay and emissions. The table provides a broad, general comparison of the alternatives' effects using "low," "medium," and "high" rankings. The rankings presented in Table 7-4 were estimated using an unweighted average of the resource specific rankings presented in Section 4. The rankings generally indicate for a "low" rating minimal or no effect and in some cases a potentially beneficial effect, for "medium ratings a moderate effect and for "high" ratings a lare and in some cases potentially significant effect. All of the alternatives present the potential to reduce vehicular delay by drawing solo drivers off of the road and onto the transit system (4a). However, some of these benefits are offset by the removal of roadway lanes for use as transit right-of-way that will be necessary under some alternatives. The expected level of impact to resources (4b) refers to the negative effects of constructing and operation the alternative. The last row (4c) compares each alternative's impact on reducing emissions of PM10 or less, NOx, and SOx, all of which can harm air quality. Since cars stuck in

traffic tend to generate more harmful emissions per mile driven, a reduction in congestion would impart environmental benefits.

Of the five build alternatives, Alternatives 1 and 2 (SR-60 LRT and Busway) would provide the greatest reductions in emissions and vehicle delay, but the impacts associated with its construction and operation would be relatively high. The other alternatives would yield a more modest change in emissions, but also fewer impacts to resources, similar to TSM. Alternatives 3 and 4 have less potential to reduce overall vehicle delay in the PSA because, unlike the other alternatives, they would permanently remove long stretches of arterial street lanes for rail use. Alternative 5 (Washington LRT), would generate small reductions in emissions and relatively few impacts to resources, similar to the No-Build Alternative.

Table7-4 Sustainability and Environmental Impacts

Alternative	No-Build	TSM	1	2	3	4	5
4.a Reduction in vehicular delay compared to No-Build Alternative	-	-	H	H	L	M	H
4.b. Expected level of impact after mitigation to biological, social and physical resources	L	L	M	M	L	L	L
4.c. Potential for reductions in PM10, NOx and SOx emissions	L	M	H	H	M	M	L

7.6 Equity

One of the goals of a transit investment is to ensure that it benefits transit dependent communities within the PSA in an environmentally just way. Goal 5 identifies the ways in which the Eastside Transit Corridor Phase 2 project can do that.

Goal 5: Meet the Needs of the Transit Dependent

- Maintain or enhance transit services
- Provide affordable access to education, employment, and health resources in Los Angeles County
- Provide outreach and communications to transit dependent populations within the corridor

Table 7-5 identifies information relevant to transit dependent communities. There are a number of characteristics used to define transit dependent communities, such as number of low-income households within one-half mile. Explanations of the criteria used to identify equity issues in the table below are as follows:

- Zero-car household -occupants are reliant on transit, bicycles, walking, and rides from friends and relatives for mobility. They generate transit trips when the system effectively serves local activity centers.
- A transit dependent household is different from a zero-car household in that transit is the only mode by which its occupants may complete a trip. Transit dependency varies based on trip length and type, and can thus be difficult to measure in absolute terms.
- Most transit riders reside in low-income households. As such, proximity to low-income households can boost ridership on a transit line. However, the majority of low-income people still have access to a car, and they will only use transit if it provides viable, inexpensive transportation to their desired destinations. It is important to note that some low-income households might also be counted in the “zero-car households” figure.
- People age 18 and under and 65 and over are likely to benefit from improved transit service because they may not be old enough to obtain a drivers licenses, have lost the physical ability to drive due to deteriorating sensory and motor skills, or cannot afford to drive.

In addition, access to employment opportunities, education facilities, and health resources is vital to a community, and transit service to these locations can be beneficial, especially to people in the categories described above.

Table 7-5 Transit-Supportive Demographics

Alternatives	1		2		3		4		5	
5.a Evaluation of support provided to transit dependent populations 1/2 mile of stations along alignments (2005)										
Zero Car Households	2,711	L	2,711	L	7,152	H	7,695	H	5,873	M
Public Transit Dependent	975	L	975	L	2,016	H	2,311	H	1,833	M
# of Low-income HH	6,270	M	6,270	M	8,315	M	12,261	H	10,245	H
Population 18 and under	13,736	M	13,736	M	29,583	H	31,483	H	27,702	H
Populations 65 and older	6,300	L	6,300	L	11,212	H	10,771	H	9,654	H
5.b. Potential construction impacts on transit dependent communities	L		L		M		M		L	

Alternatives were ranked relative to the support for transit-using communities based on a scale of "high", "medium", or "low". The ranking scale is based on various statistics, including total, high, median, and low values within 1/2 mile of station locations in 2005.

Stations along Alternatives 3 through 5 are located with one-half mile of significantly more low-income, zero-car, and transit dependent households, as well as persons 18 and under and 65 and over. This is likely because Alternatives 1 and 2 are adjacent to the Pomona Freeway (SR-60) and are near fewer households of any income level. As such, the data does not necessarily indicate that the people living near Alternatives 3 through 5 are poorer or more transit dependent than those near Alternatives 1 and 2. The figures for Alternatives 3 through 5 are all reasonably close to each other, though Alternative 5 lags slightly behind the other two for most of the criteria

The greatest numbers of potential right-of-way acquisition sites occur along Alternatives 3 and 4. Because these two alternatives have long stretches of median-running at-grade right-of-way and several at-grade stations, it is likely that private property on either side of the street will need to be used for roadway widening. These possible acquisition sites are mostly located near stations at major intersections and involve only commercial properties. It should be noted that none of the acquisition sites along any of the alternative alignments are residential parcels. The extent to which property acquisitions will be necessary is unclear, and further study will be conducted during the EIR/EIS phase. As such, Alternatives 3 and 4 have been tentatively assigned acquisition impact ratings of "medium" (row 5b).

Alternatives 1 and 2 have been assigned "low" acquisition impact ratings because they travel entirely within the existing right-of-way of SR-60. Any acquisition sites will be limited to areas adjacent to stations. Similarly, Alternative 5 follows an entirely aerial alignment beyond SR-60. Only minor property acquisitions on Washington Blvd. are anticipated since the aerial support columns require considerably less roadway space than at-grade tracks.

Nearly all of the property acquisition impacts are in areas with high volumes of low-income families and in areas where the population is mostly Hispanic. Many of the areas also have a sizeable White population, though not a majority. These demographic trends are predominant throughout the PSA and are not unique to the property acquisition sites. That is to say, the property acquisitions occur in areas that are typical of the entire PSA and do not appear to be targeted at any one minority or income group. Again, detailed evaluation of impacts to environmental justice communities and mitigation measures will be conducted in the Draft EIR/EIS phase.

7.7 Community Involvement Response

Involving the community and stakeholders in the decision-making process is an important part of identifying a transit solution that addresses the needs of the PSA. The following objectives listed under Goal 6 were identified during the AA study process.

Goal 6: Respond to Community Needs and Support

- Involve the community in a meaningful and productive planning process
- Build community and political support through effective communication and integration with local and regional plans

Several public input workshops have been held for the Eastside Transit Corridor Phase 2 project in order to involve PSA communities as much as possible in the planning process, build political and local support for the extension, and establish effective lines of communication. The following table summarizes public comments from the April public meetings, where participants were presented with the results of the 17 initial alternatives and introduced to the five refined alternatives. Not all participants provided direct feedback on the five alternatives. Table 7-6

summarizes those comments recorded and any specific considerations that members of the public identified. The “high”, “medium, and “low” ratings on the table are based on number of favorable comments that each alternative received relative to the others.

Overall, Alternative 1 and 4 garnered the most public support. However, meeting participants were concerned about possible impacts to the OII Superfund Site on the south side of the Pomona Freeway. With regard to Alternative 4, Whittier Blvd. was the preferred alignment. In particular, the eastern portion of this alternative would provide greater access to Whittier College and Uptown Whittier. Public comments called for coordination with the Whittier Uptown Specific Plan and mitigation of parking and traffic impacts during construction. There was few public comments specific on the remaining alternatives. Alternative 3, Beverly LRT, received a small number of people in support and others opposed. Alternative 2, SR-60 Busway, did not receive any public support. In general, participants favored LRT. Alternative 5 was the only proposal that received more negative comments than favorable ones. Though this corridor was identified as a secondary choice in some cases, this was largely due to participants perceiving this alignment to have fewer right-of-way impacts than the others.

Table 7-6 Public Comments

Alternatives	1	2	3	4	5
6.a Pubic Input (based on April public comments on five refined alternatives)	H	L	M	H	L
In-favor	34	0	3	28	2
Opposed	5	0	3	1	4
Mode	LRT	LRT	LRT	LRT	LRT
Additional Considerations	Impacts to OII Superfund site. Consider combining truck route with LRT extension. SR-60 secondary choice for alignment.	Impacts to OII Superfund site. Preference for LRT over Busway.	Use aerial crossing at portions along Beverly where right-of-way is constrained. Potential Impacts to nearby schools and parks.	Whittier was preferred corridor alignment, with grade separations. Improves access at eastern end to Whittier College. Consider Whittier Uptown Specific Plan. Impacts to parking and traffic during construction. Concerns about aerial structure and graffiti.	Use of eminent domain. Washington Blvd was preferred as a secondary choice in alignment after Whittier and SR-60.

7.8 Summary of Key Comparison Measures

Based on the project's six stated goals and the environmental analysis, transportation analysis, and public outreach performed as part of this alternatives analysis study, the following table summarizes the benefits and disadvantages of each promising build alternative. The criteria used are:

- Ridership forecasts
- Expected travel time
- Impacts to arterial streets
- New transit trips and change in transit mode share
- User benefits
- Transit-supportive land use
- Employment density
- Population density
- Amount of property acquisition needed
- Proximity to historic resources, sensitive receptors, biological resource areas, and hazardous materials sites
- Proximity to noise and vibration-sensitive receptors
- Geologic constraints
- Construction and operation costs
- Public response

Table 7-7 provides a summary of the comparison of alternatives identified in this report.

Table 7-7 Comparison of Alternatives

	Alternatives				
	SR-60 LRT	SR-60 Busway	Beverly LRT	Whittier LRT	Washington LRT
Transportation	*Travel Time*: Fastest overall (16 minutes) *Daily Ridership*: Lowest of LRT alternatives (13,500) *Net New Transit Riders*: Lowest overall (4,300) *User Benefit Hours*: Fewest of LRT alternatives (3,870 daily) *Impacts to Arterial Streets*: Minimal, due to freeway alignment *Other*: Only LRT alternative which is located to conveniently serve communities north of SR-60	*Travel Time*: 16 minutes, but all riders continuing on Phase 1 will incur a 6-minute transfer at Atlantic Station. *Daily Ridership*: Lowest overall (7,500) *Net New Transit Riders*: Lowest overall (2,120) *User Benefit Hours*: Fewest overall (1,750) *Impacts to Arterial Streets*: Minimal, due to freeway alignment *Other*: Similar to SR-60 LRT, location is convenient to communities north of SR-60	*Travel Time*: Slower than most other alternatives (23 minutes) *Daily Ridership*: Nearly lowest ridership of LRT Alternatives (13,500) *Net New Transit Riders*: Second highest overall (5,010) *User Benefit Hours*: Second highest overall (5,320) *Impacts to Arterial Streets*: Potentially greatest, due to extensive at-grade segments	*Travel Time*: Slowest of the build alternatives (24 minutes) *Daily Ridership*: Second highest (14,400) *Net New Transit Riders*: (4,990) is nearly as high as Alternative 2 *User Benefit Hours*: Second highest (5,170) *Impacts to Arterial Streets*: Potentially high, but mitigated by aerial segments	*Travel Time*: Nearly fastest overall (17 minutes) *Daily Ridership*: Highest overall (15,900) *Net New Transit Riders*: Highest overall (6,410) *User Benefit Hours*: Greatest overall (6,400) *Impacts to Arterial Streets*: Low, due to aerial alignment

	Alternatives				
	SR-60 LRT	SR-60 Busway	Beverly LRT	Whittier LRT	Washington LRT
Environment	*Transit-Supportive Land Uses*: Fewest overall *Employment Density*: Lowest overall *Population Density*: Lowest overall *Property Acquisitions*: Most overall, mostly vacant *Historic Resources*: None nearby *Noise-Sensitive Receptors*: Fewest overall *Other*: Crosses potentially-sensitive biological resource and hazmat areas	*Transit-Supportive Land Uses*: Fewest overall *Employment Density*: Lowest overall *Population Density*: Lowest overall *Property Acquisitions*: Most overall, mostly vacant *Historic Resources*: None nearby *Noise-Sensitive Receptors*: Fewest overall *Other*: Crosses potentially-sensitive biological resource and hazmat areas	*Transit-Supportive Land Uses*: Greatest overall *Employment Density*: High *Population Density*: High *Property Acquisitions*: Fewest overall, mostly vacant *Historic Resources*: None nearby *Noise-Sensitive Receptors*: Second most overall *Other*: Crosses 100-year flood zone	*Transit Supportive Land Uses*: Moderate *Employment Density*: High *Population Density*: Highest overall *Property Acquisitions*: Moderate amount, none vacant (most non-vacant acquisitions overall) *Historic Resources*: Moderate amount nearby *Noise-Sensitive Receptors*: Most overall *Other*: Crosses 100-year flood zone	*Transit-Supportive Land Uses*: Moderate amount *Employment Density*: Highest overall *Population Density*: High *Property Acquisitions*: Moderate amount, mostly vacant *Historic Resources*: None nearby *Noise-Sensitive Receptors*: Moderate number *Other*: Crosses 100-year flood zone

	Alternatives				
	SR-60 LRT	SR-60 Busway	Beverly LRT	Whittier LRT	Washington LRT
Cost/Public Support	*Capital Costs*: Nearly highest ($1.72 billion) *Annual O&M Costs*: Moderately high ($26.5 million) *Cost Per User Benefit Hour*: Second worst ($121) *Cost Per Net New Rider*: Second worst ($109) *Public Comment Support*: Greatest (38 in favor, 5 opposed)	*Capital Costs*: Moderate *Annual O&M Costs*: Lowest ($11 million) *Cost Per User Benefit Hour*: Poorest ($193) *Cost Per Net New Rider*: Poorest ($160) *Public Comment Support*: 2 in favor, none opposed	*Capital Costs*: Lowest of the build alternatives ($1.1 billion) *Annual O&M Costs*: Highest ($34 million) *Cost Per User Benefit Hour*: Best ($63) *Cost Per Net New Rider*: Best ($67) *Public Comment Support*: 3 in favor, 3 opposed	*Capital Costs*: Mid-range ($1.38 billion)*Annual O&M Costs*: Mid-range ($31 million) *Cost Per User Benefit Hour*: Mid-range ($77) *Cost Per Net New Rider*: Mid-range($79) *Public Comment Support*: High, 29 in favor, 1 opposed	*Capital Costs*: Highest ($1.765 billion) *Annual O&M Costs*: Second lowest ($28 million) *Cost Per User Benefit Hour*: Mid-range ($75) *Cost Per Net New Rider*: Mid-range ($75) *Public Comment Support*: Lowest, 2 in favor, 7 opposed

In short, the compromises made by each alternative between speed, cost, and transit-preferential route are as follows.

Alternative 1 – SR-60 LRT

- Transit unfriendly route, but achieves a high enough speed to offset the drop in ridership
- High speed and nearly full grade separation comes at a high cost
- Serves communities north of SR-60.

Alternative 2 – SR-60 Busway

- Transit unfriendly route, and a time-consuming transfer is required to switch between modes at Atlantic station
- High speed and nearly full grade separation come at a high construction cost, but operating costs are very low compared to LRT
- Using a mode with low operating costs comes at the expense of an additional transfer and a large loss of riders
- Serves communities north of SR-60.

Alternative 3 – Beverly LRT

- Lowest cost to construct, but at-grade crossings slow down trip times
- Surrounding land uses are conducive to transit use, but the lower speeds still yield somewhat fewer riders per route mile than the faster SR-60 Alterantives and the Washington Alternative.

Alternative 4 – Whittier LRT

- Moderate cost to construct, potential for traffic and/or land use impacts due to corridor constraints
- Surrounding land uses are conducive to transit use, but the lower speeds still result in less riders per route mile than the Washington Alternative.

Alternative 5 – Washington LRT

- High cost to construct, but also yields high speeds
- Surrounding land uses are moderately conducive to transit use, and, combined with the high speeds, this alternative draws the most riders
- Serves communities along the southern portion of the PSA.

7.9 Trade-Offs Between Alternatives

Alternatives 1, 2, and 5 are grade separated and would allow the shortest travel times along the Phase 2 segment. Alternatives 3 and 4 would be slower, but they would pass through more densely populated areas than Alternatives 1 and 2 (the SR-60 routes). Despite its suboptimal location, Alternative 1 ridership volumes would be comparable to Alternatives 3 and 4 because the higher operating speed would be more attractive to potential users. Though Busway is not inherently slower than LRT, Alternative 2 (SR-60 Busway) would attract fewer riders than Alternative 1 (SR-60 LRT) because Phase I of the Eastside Extension is currently under construction as an LRT line, and using a different mode for Phase 2 would require a transfer at the Atlantic Station. Alternative 5 would have the highest ridership because it traverses a well-established employment corridor at speeds similar to Alternatives 1 and 2.

Alternatives 1, 2, and 5 offer travel times up to 20 minutes faster than driving on nearby highways during peak hours. Alternatives 3 and 4's travel times would be nearly the same as driving.

Each alternative's potential to change the PSA's overall transit mode share is similar.

All alternatives pass near potential TOD project sites, and the municipal governments along the alignments are supportive of improved transit services. Alternative 5 (Washington LRT) passes through commercial manufacturing areas that house many jobs, but are zoned in a way that is not ideal for future TOD projects.

Busway would have among the highest capital costs, but very low operating costs. Nevertheless, the loss of ridership due to the added transfer makes it the most cost-inefficient option from the standpoint of cost per unit of user benefit. Alternative 3 fares best under this measure; it attains the same ridership estimates as the faster Alternative 1 and 5 options because it runs through a denser corridor, but costs less to build and operate.

Alternative 1 presents the best opportunities for reducing greenhouse gas emissions, but its construction and operation would negatively impact local biological, social, and physical resources the most. Alternative 2 would have similar negative impacts, and only reduce emissions to a moderate degree. Alternatives 3 and 4 would have relatively small negative impacts, but would still provide a moderate reduction in emissions. Alternative 5, like the No-Build Alternative, would have few negative impacts and few opportunities for emissions reductions.

Alternatives 3, 4, and 5 are near more low-income, zero-car, and transit-dependent households than Alternatives 1 and 2. This is because Alternatives 1 and 2 are near fewer households altogether. Similarly, there are more people age 18 and under and age 65 and over near Alternatives 3, 4, and 5.

Public input from the April Public meetings overwhelmingly favors Alternatives 1 and 4, practically to the exclusion of the others. Alternative 1 is preferred for its access to northern tiers cities,

access to the Montebello Town Center (regional shopping center), Whittier Narrow's regional park, and minimal roadway impacts (given that it is side-running along the SR-60 Freeway). Alternative 4, garnered for its notable location along Whittier Blvd., which is a major east-west corridor in the PSA connecting major residential, educational and recreational activity centers within the PSA, such as Whittier College, Uptown Whittier (a major retail/cultural center with a main street feel), and major commercial developments along Whittier Blvd.

7.10 Summary of Recommendations

The evaluation of alternatives documented in this report considered five separate build alternatives as well as a No-Build Alternative and a Baseline/TSM Alternative. The No-Build and Baseline/TSM Alternatives will be carried forward for further evaluation as part of a Draft EIS/EIR. Three of the five fixed-guideway (Build) alternatives are recommended for Metro Board approval and detailed environmental study during the Draft EIS/EIR. The recommendations represent the most promising alternatives for the Eastside Transit Corridor Phase 2 and are based on the evaluation presented in this report. Furthermore, the recommendations factor in additional refinements that have emerged from this analysis in order to improve cost-effectiveness, minimize negative impacts and capture the greatest benefit.

Two of the build alternatives, Alternative 2: SR-60 BRT and Alternative 4: Whittier LRT, are not recommended for further consideration due to the following factors:

Alternative 2: SR-60 BRT

- Lowest ridership and net new transit riders of any alternative
- Lowest user benefit hours of any alternative
- Only alternative that would require a modal transfer between Eastside Phase 2 and the Gold Line
- Cost effectiveness is far lower than any other alternative
- Contains the least transit-supportive land use of the alternatives
- Contains the lowest employment and population density of the alternatives

Alternative 4: Whittier LRT

- Slower travel time than most other alternatives
- Potential for significant impacts to arterial streets
- Potential for substantial change in neighborhood character since land use in many areas is up to the sidewalk and aerial configuration would result in aesthetic changes that might be undesirable.

The three recommended alternatives proposed for further study are listed below. Figure 7-9 provides an illustration.

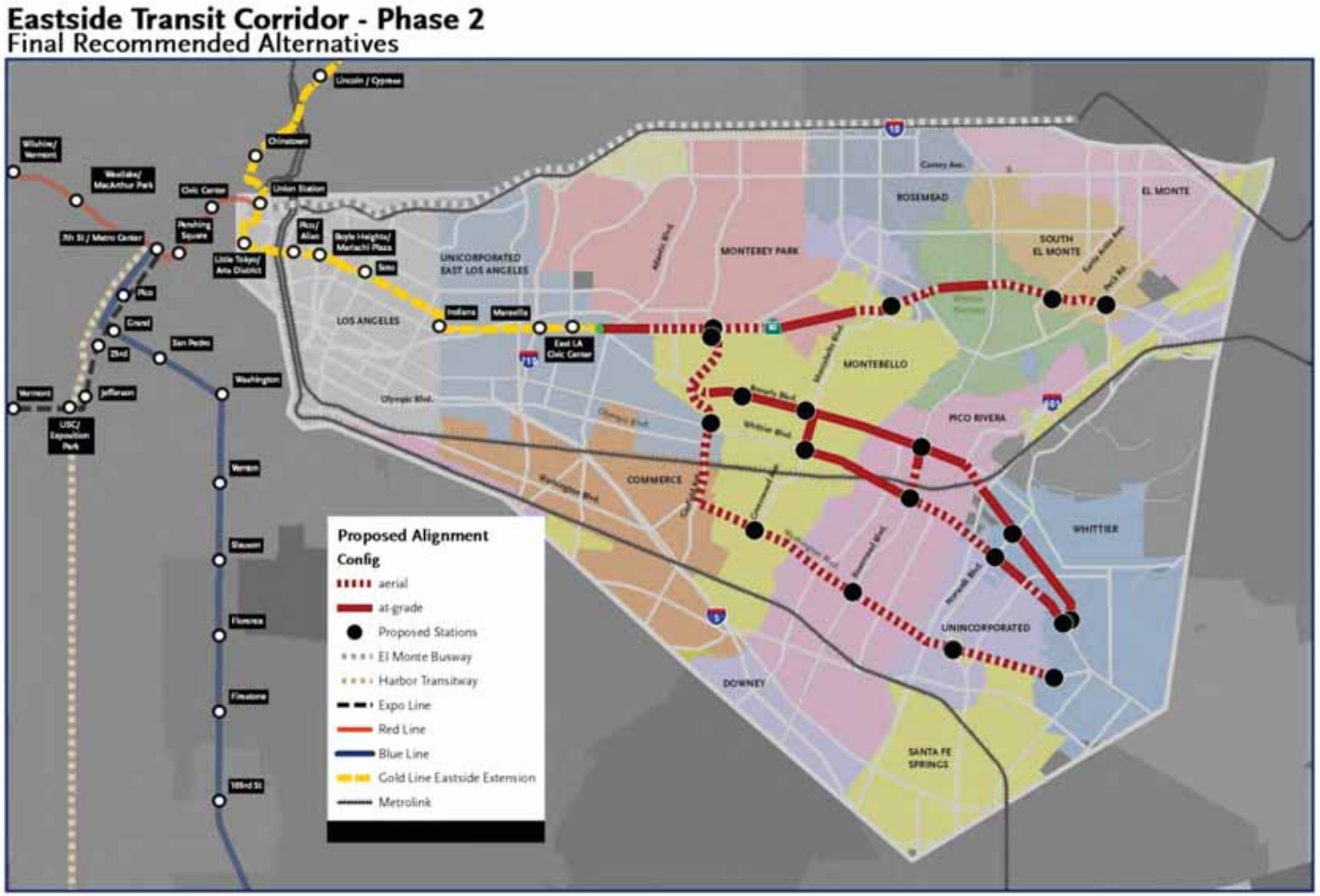
- SR-60 LRT
  - Reduce project length to Peck Rd.
  - Evaluate potential for transit oriented development at each potential station site

- Beverly LRT
  - Re-evaluate candidate station locations
  - Further evaluate Whittier Greenway option through West and Central Whittier
  - Evaluate combining with Whittier LRT east of Montebello Blvd. (refer to Whittier alternative below)

- Beverly/Whittier LRT
  - Evaluate feasibility of alignment of alignment along Whittier Blvd. from Montebello Blvd. east to Mar Vista St. (combined with Beverly LRT as described above)
  - Further evaluate at-grade v.s. grade separated alignment sections

- Washington LRT
  - Evaluate feasibility of potential at-grade configuration east of Rosemead Blvd.

Figure 7-9 Final Recommended Alternatives



Alternative 1: SR-60 LRT

Alternative 1 was retained for further consideration largely due to its proximity to the communities north of SR-60. The alternatives has lower ridership and user benefit hours than the other recommended alternatives, but does have the advantages of the fastest travel time and the ability to intercept traffic from SR-60. This alternative also had the greatest public support based on the public meetings conducted to date.

Alternative 3: Beverly LRT

Alternative 3 scored well in categories related to ridership and user benefits despite its longer travel time than Alternative 1. There is a high concentration of transit-supportive land use and high employment and population density which make this alternative attractive from the standpoint of serving transit dependent and providing opportunities for transit oriented development. The capital cost of this alternative is the lowest of all alternatives, but operating costs would be high. Nevertheless, it is the most cost-effective of all alternatives with respect to cost per user benefit hour and cost per net new transit rider. Public opinion on this alternative was evenly split.

Alternative 5: Washington LRT

Alternative 5 has the second fastest travel time despite having greater route miles than other alternatives. The daily ridership and net new transit riders are the highest of all alternatives studied. The alternative also has the highest level of user benefit hours and low potential for substantial disruption to arterial streets due to a predominant aerial alignment. There is a moderate amount of transit-supportive land use and the highest level of employment density in the area surrounding Alternative 5. This alternative has the highest capital cost due to the length of the route and the amount of aerial structure which would be necessary. Its cost-effectiveness is in the middle range of all the build alternatives and the alternative has the lowest level of public support based on comments received at public meetings.

The recommendations of the study team are to further refine the three fixed-guideway alternatives discussed above to identify a locally preferred alternative. Some of the necessary refinement will focus on the design options associated with Alternative 3: Beverly LRT. It is the opinion of the study team, based on the data and analysis conducted thus far and substantial field review, that a combination of alignments utilizing portions of Beverly Boulevard and Whittier Boulevard need to be further investigated. This reasoning is based on the likelihood that such design options could capture the high employment and residential density of these areas, capitalize on the transit-supportive land use features, and minimize potentially substantial impacts which would occur with either a complete alignment on Beverly or Whittier Boulevards.

Additional recommendations of the study team include further analysis of SR-60 LRT and Washington LRT in order to determine which of these corridors could benefit more from provision of fixed-guideway transit.

Recommendations to Improve Cost Effectiveness

In order to better position the project for potential federal funding, measures should be taken to improve the cost effectiveness as the project is further developed. The following strategies and/or measures should be considered during the EIR/EIS phase:

- SR-60 LRT – As the end-of-line station is primarily a freeway intercept location, and as the Peck Rd. station is generally situated to intercept the same traffic as the Crossroads Pkwy. terminal station studied in the AA, it is recommended that this alternative be cut back to Peck Rd. and re-evaluated both with respect to land use opportunities and stations as well as capital cost for a reduced length to improve its cost-effectiveness.
- Beverly LRT – The Beverly LRT option may be difficult to implement west of Montebello Blvd. due to constraints; however, stations along Whittier Blvd. east of Montebello Blvd. are good attractors of trips. A combination of segments of Beverly LRT west of Montebello Blvd. and segments of Whittier LRT east of Montebello Blvd. may improve the cost-effectiveness of the Beverly LRT option and could be studied in the EIR/EIS phase of the project.
- Washington LRT – The Washington LRT was defined as fully grade-separated. However, there are sections where the alignment could potentially be brought to grade, which may result in a more cost-effective solution. These potentials could be studied in the EIR/EIS phase of the project.
- Minimum Operable Segment – Due to the crossing of the Rio Hondo between Montebello and Pico Rivera as well as the combined crossing of the San Gabriel River and I-605 Freeway between Pico Rivera and Whittier, construction of the full project studied in the AA is costly. A shorter extension would have similar operational feasibility, reduced cost, and potentially high enough ridership to result in improved cost-effectiveness (similar to the suggestion for SR-60 LRT) and should be studied in the EIR/EIS phase.

Appendix A: References

American National Standards of the Acoustical Society of America, 1998. *American National Standard Guide to the Evaluation of Human Exposure to Vibration in Buildings*.

American Public Transit Association, 1981. *Guidelines for Design of Rapid Transit Facilities*.

California Department of Health Services, 1988. *Expenditure Plan for the Hazardous Substance Cleanup Bond Act of 1984*.

City of Commerce. "2020 General Plan." http://www.ci.commerce.ca.us/plan2020.htm. Accessed on August 27, 2008.

City of Commerce. "Transportation Services." http://www.ci.commerce.ca.us/transportation.htm. Accessed on August 26, 2008.

City of Downey. "General Plan – Downey Vision 2025." http://www.downeyca.org/city_planning_gp.php. Accessed on August 27, 2008.

City of El Monte. "Community Development." http://www.ci.el-monte.ca.us/Citygov/comdevelop/comdevmain.html. Accessed on August 26, 2008.

City of El Monte. "General Plan." http://www.ci.el-monte.ca.us/envision/documents.html. Accessed on August 27, 2008.

City of Los Angeles. "General Plan." http://www.lacity.org/PLN/Cwd/GnlPln/index.htm. Accessed on August 27, 2008.

City of Montebello. "Community and Economic Development." http://www.cityofmontebello.com/departments/edd.htm. Accessed on September 3, 2008.

City of Montebello. "General Plan." http://www.cityofmontebello.com. Accessed on August 27, 2008.

City of Montebello. "Montebello Bus Lines Schedules." http://www.cityofmontebello.com/departments/TRANSIT/schedule.htm. Accessed on August 26, 2008.

City of Monterey Park. "Economic Development." http://www.ci.monterey-park.ca.us/home/index.asp?page=1268. Accessed on August 26, 2008.

City of Monterey Park. "General Plan." http://www.ci.monterey-park.ca.us/home/index.asp?page=692. Accessed on August 27, 2008.

City of Monterey Park. "Redevelopment in Monterey Park." http://www.ci.monterey-park.ca.us/home/index.asp?page=277. Accessed on September 3, 2008.

City of Monterey Park. "Transportation Services and Information." http://www.ci.monterey-park.ca.us/home/index.asp?page=862. Accessed on August 26, 2008.

City of Norwalk. "Norwalk Transit System." http://www.ci.norwalk.ca.us/transportation.asp. Accessed on August 26, 2008.

City of Pico Rivera. "General Plan." http://www.ci.pico-rivera.ca.us/government/citydepartments/communitydevel.html. Accessed on August 27, 2008.

City of Pico Rivera. "Redevelopment Projects." http://www.ci.pico-rivera.ca.us/ourcommunity/redevelprojects.html. Accessed on August 26, 2008.

City of Pico Rivera. "Redevelopment Projects." http://www.ci.pico-rivera.ca.us/ourcommunity/redevelprojects.html. Accessed on September 3, 2008.

City of Rosemead. "General Plan – Public Review Draft." http://www.cityofrosemead.org/Home/tabid/36/Default.aspx. Accessed on August 27, 2008.

City of Santa Fe Springs. "General Plan." http://www.santafesprings.org. Accessed on August 26, 2008.

City of South El Monte. "Economic Development." http://www.ci.south-el-monte.ca.us/index.php?option=com_content&task=view&id=41&Itemid=74. Accessed on September 3, 2008.

City of South El Monte. "General Plan." http://www.ci.south-el-monte.ca.us. Accessed on August 26, 2008.

City of Whittier. "General Plan." http://www.whittierch.org. Accessed on August 26, 2008.

"Greenway Trail Update." http://www.whittierch.org/pdfs/GWTUpdatedCommunityFlyer061708.pdf. Accessed on September 3, 2008.

City of Whittier. "Uptown Whittier Specific Plan." http://insidewhittier.com/cgi-bin/store.cgi?&Category=uptown. Accessed on August 27, 2008.

City of Whittier. "Whittier Dial-a-Ride." http://www.cityofwhittier.org/content/CS02.html. Accessed on August 26, 2008.

College Toolkit. "College Search." http://www.collegetoolkit.com. Accessed on August 26, 2008.

Comstock Homes. "The Villages at Heritage Springs." http://thevillagesatheritagesprings.com. Accessed on August 26, 2008.

Comstock Homes. "Veranda Crest – Pico Rivera." http://comstock-homes.com/3_12.asp. Accessed on August 26, 2008.

County of Los Angeles. "General Plan." http://planning.co.la.ca.us/generalplan/default.htm. Accessed on August 27, 2008.

Federal Transit Administration, 2006. *Transit Noise and Vibration Impact Assessment*.

Federal Transit Administration. "Additional Guidance on Local Initiation of Alternatives Analysis Planning Studies." http://www.fta.dot.gov/printer_friendly/planning_environment_2590.html. Accessed on August 27, 2008.

Federal Transit Administration. "New Starts Project Planning & Development." http://www.fta.dot.gov/planning/planning_environment_5221.html. Accessed on August 27, 2008.

Foothill Transit. "Schedules." http://www.foothilltransit.org/Schedules_Routes/schedules.htm. Accessed on August 26, 2008.

Freeman, Tung, and Bottomley. "Whittier Boulevard Specific Plan." http://www.ftburbandesign.com/Whittier_Boulevard_Specific_Plan. Accessed on August 27, 2008.

Los Angeles County Department of Public Works. "Traffic Counts." http://ladpw.org/tnl/trafficCounts. Accessed on August 26, 2008.

Los Angeles County Metropolitan Transportation Authority, 1994. *Rail Transit Design Criteria & Standards*.

Los Angeles County Metropolitan Transportation Authority, 1998. *Regional Transit Alternatives Analysis*.

Los Angeles County Metropolitan Transportation Authority, 2000. *Eastside Transit Corridor Study Re-Evaluation/Major Investment Study*.

Los Angeles County Metropolitan Transportation Authority, 2001. *2001 Long Range Transportation Plan.*

Los Angeles County Metropolitan Transportation Authority, 2002. *Los Angeles Eastside Corridor Final Supplemental Environmental Impact Statement/Final Subsequent Environmental Impact Report*.

Los Angeles County Metropolitan Transportation Authority, 2002. *Final Report, Los Angeles Metro Rapid Demonstration Program*.

Los Angeles County Metropolitan Transportation Authority, 2003. *Short Range Transportation Plan for Los Angeles County*.

Los Angeles County Metropolitan Transportation Authority, 2004. *Congestion Management Program for Los Angeles*.

Los Angeles County Metropolitan Transportation Authority, 2005. *Bicycle Transportation Strategic Plan*.

Los Angeles County Metropolitan Transportation Authority, 2008. *Draft 2008 Long Range Transportation Plan*.

Los Angeles County Metropolitan Transportation Authority, 2008. *Eastside Transit Corridor Phase 2 Alternatives Analysis Initial Screening Report*.

Los Angeles County Metropolitan Transportation Authority, 2008. *Eastside Transit Corridor Phase 2 Alternatives Analysis Methodology Report*.

Los Angeles County Metropolitan Transportation Authority, 2008. *Eastside Transit Corridor Phase 2 Early Scoping Outreach Report*.

Los Angeles County Metropolitan Transportation Authority, 2008. *Eastside Transit Corridor Phase 2 Cost Analysis Technical Memorandum*.

Los Angeles County Metropolitan Transportation Authority, 2008. *Eastside Transit Corridor Phase 2 Urban Design and Engineering Technical Memorandum*.

Los Angeles County Metropolitan Transportation Authority. "Joint Development Program." http://www.metro.net/projects_programs/joint_development.htm. Accessed on September 3, 2008.

Los Angeles County Metropolitan Transportation Authority. "Metro Bus and Rail System Map." http://www.metro.net/riding_metro/maps/images/System_Map.pdf. Accessed on August 26, 2008.

Los Angeles County Metropolitan Transportation Authority. "Metro Rail System Map." http://www.metro.net/riding_metro/maps/images/rail_map.pdf. Accessed on August 26, 2008.

Los Angeles County Metropolitan Transportation Authority. "Ridership Statistics." http://www.metro.net/news_info/ridership_avg.htm. Accessed on August 26, 2008.

Los Angeles County Metropolitan Transportation Authority. "Timetables." http://www.metro.net/riding_metro/riders_guide/planning_trip.htm. Accessed on August 26, 2008.

New Cure, Inc. New Cure, Inc. http://www.newcure.net. Accessed on September 3, 2008.

San Gabriel Valley Council of Governments, 2004. *Rio Hondo Watershed Management Plan*. http://www.rmc.ca.gov/plans/rio_hondo/Rio%20Hondo%20Water%20Management%20Plan_small.pdf. Accessed on September 3, 2008.

Southern California Air Quality Management District, 1993. *California Environmental Quality Act Air Quality Handbook*.

Southern California Association of Governments, 2001. *SR-60 Truck Lane Feasibility Study*.

Southern California Association of Governments, 2004. *2004 Regional Transportation Plan*

Southern California Association of Governments, 2007. *State of the Region Report*.

Southern California Association of Governments, 2008. *Draft 2008 Regional Transportation Plan*.

Southern California Association of Governments. "Census Data (Year 2000 Census Data)." http://www.scag.ca.gov/census. Accessed on August 26, 2008.

Southern California Regional Rail Authority. "Metrolink Fact Sheet." http://www.metrolinktrains.com/documents/About/Fact_Sheet_Dec07_2Q.pdf. Accessed on August 26, 2008.

State of California Department of Fish and Game. "California Natural Diversity Database." http://www.dfg.ca.gov/biogeodata/cnddb. Accessed on August 27, 2008.

State of California Department of Housing and Community Development. "TOD Housing Program." http://www.hcd.ca.gov/fa/tod. Accessed on September 3, 2008.

State of California Department of Toxic Substances Control. "DTSC Databases." http://www.dtsc.ca.gov/database/index.cfm. Accessed on August 27, 2008.

State of California Department of Water Resources, 2005. *San Gabriel and Lower Los Angeles Rivers Watershed Original Draft Integrated Regional Water Management Plan*. http://www.ladpw.org/wmd/irwmp/index.cfm?fuseaction=DocumentListing&directory=San%20Gabriel%20

and%20Lower%20Los%20Angeles%20Rivers%20Watershed%20Original%20Draft%20IRWMP. Accessed on September 3, 2008.

State of California Department of Water Resources. California s Groundwater Bulletin: 118. San Gabriel Valley Groundwater Basin; February 2004.

State of California Department of Water Resources. California s Groundwater Bulletin: 118. Coastal Plain of Los Angeles Groundwater Basin, Central Sub-basin; February 2004.

State of California Environmental Protection Agency, State Water Resources Control Board. "Division of Water Quality – Underground Storage Tank Program." http://www.waterboards.ca.gov/water_issues/programs/ust. Accessed on August 27, 2008.

State of California Environmental Protection Agency, State Water Resources Control Board, 2004. *2006 CWA Section 303d List of Water Quality Limited Segments Requiring TMDLs*.

State of California Public Utilities Code. http://www.leginfo.ca.gov/calaw.html. Accessed on August 26, 2008

United States Census Bureau. "Census 2000 Gateway." http://www.census.gov/main/www/cen2000.html. Accessed on August 26, 2008.

United States Environmental Protection Agency. "Comprehensive Environmental Response, Compensation, and Liability Information System – Superfund – Hazardous Waste Sites." http://www.epa.gov/Region4/r4data/cerclis/index.htm. Accessed on August 27, 2008.

United States Environmental Protection Agency. "Emergency Response Notification System – Database of oil and hazardous substances spill reports." http://www.epa.gov/Region4/r4data/erns/index.htm. Accessed on August 27, 2008.

United States Environmental Protection Agency. "National Priorities List." http://www.epa.gov/superfund/sites/npl/index.htm. Accessed on August 27, 2008.

United States Environmental Protection Agency. "RCRAInfo – Resource Conservation and Recovery Information System." http://www.epa.gov/Region4/r4data/rcris/index.htm. Accessed on August 27, 2008.

United States Environmental Protection Agency. "Underground Storage Tanks." http://www.epa.gov/OUST. Accessed on August 27, 2008.

Vestar Development Company. "Property Management." http://vestar.com/newsite/PropMngmt.html. Accessed on August 26, 2008.

Appendix B: List of Acronyms

AA ..... Alternatives Analysis
AADT ..... Annual Average Daily Traffic
ADT ..... Average Daily Traffic
APTA ..... American Planning Transit Association
BRT ..... Bus Rapid Transit
CAAQS ..... California Ambient Air Quality Standards
CARB ..... California Air Resources Board
CalEPA ..... California Environmental Protection Agency
CBD ..... Central Business District
CCAA ..... California Clean Air Act
CDFG ..... California Department of Fish and Game
CE ..... Conceptual Engineering
CEQA ..... California Environmental Quality Act
CERCLA ..... Comprehensive Environmental Response Compensation and Liability Act
CMP ..... Congestion Management Program
CNDDB ..... California Natural Diversity Database
CNG ..... Compressed Natural Gas
CO ..... Carbon Monoxide
CO2 ..... Carbon Dioxide
CTPP ..... Census Transportation Planning Package
CWA ..... Clean Water Act
dBA ..... A-weighted Decibel Scale
DOT ..... Department of Transportation
DTSC ..... Department of Toxic Substances Control
EIR/EIS ..... Environmental Impact Report/ Environmental Impact Statement
EMFAC ..... Emission Factor Air Quality Monitoring Program
EPA ..... Environmental Protection Agency
Extension ..... Metro Gold Line Eastside Extension
FCAA ..... Federal Clean Air Act
FHWA ..... Federal Highway Administration
FRA ..... Federal Railroad Administration
FTA ..... Federal Transit Administration
HMTA ..... Hazardous Material Transportation Act
HOV ..... High Occupancy Vehicle
I-5 ..... Interstate 5
I-10 ..... Interstate 10
I-105 ..... Interstate 105
I-605 ..... Interstate 605

I-710 ..... Interstate 710
LARWQCB ..... Los Angeles Regional Water Quality Control Board
LDA ..... Light Duty Automobile
LDN ..... Day-Night Level
LDT ..... Light Duty Trucks
LOS ..... Level of Service
LRT ..... Light Rail Transit
LRTP ..... Long Range Transportation Plan
LRV ..... Light Rail Vehicle
Metro ..... Los Angeles County Metropolitan Transit Authority
mg/m3 ..... milligrams per cubic meter
$\mu g/m^3$ ..... micrograms per cubic meter
MIS ..... Major Investment Study
MOS ..... Minimum Operable Segment
MPH ..... Miles per Hour
MPHPS ..... Miles per Hour per Second
NAAQS ..... National Ambient Air Quality Standards
NEPA ..... National Environmental Policy Act
NHPA ..... National Historic Preservation Act
NO_2 ..... Nitrogen Dioxide
NOx ..... Nitrogen Oxide
NPDES ..... National Pollutant Discharge Elimination System
NRHP ..... National Register of Historic Places
NRIS ..... National Register Information System
NTS ..... Norwalk Transit System
O_3 ..... Ozone
OCS ..... Overhead Catenary System
OHP ..... Office of Historic Preservation
OII ..... Operating Industries, Inc
O&M ..... Operating and Maintenance
Pb ..... Lead
P&R ..... Park and Ride
PM_{10} and $PM_{2.5}$ ..... Particulate Matter
ppm ..... parts per million
PSA ..... Project Study Area
RCRA ..... Resource Conservation and Recovery Act
RTP ..... Regional Transportation Plan
RWQCBs ..... Regional Water Quality Control Boards
SAFETEA-LU .... Safe, Accountable, Flexible, Efficient, Transportation Equity Act: A Legacy for Users
SARA ..... Superfund Amendment Reauthorization Act
SCAB ..... South Coast Air Basin

SCAG ..... Southern California Association of Governments
SCAQMD ..... South Coast Air Quality Management District
SCRRA ..... Southern California Regional Rail Authority
SEA ..... Significant Ecological Area
SHPO ..... State Historic Preservation Office
SO_2 ..... Sulfur Dioxide
SOx ..... Sulfur Oxide
SR-57 ..... State Route 57
SR-60 ..... State Route 60
SR-72 ..... State Route 72
SWRCB ..... State Water Resources Control Board
TAC ..... Technical Advisory Committee
TDS ..... Total Dissolved Solids
TMDLs ..... Total Maximum Daily Loads
TOD ..... Transit Oriented Development
TSM ..... Transportation System Management
V/C ..... Volume Capacity Ratio
VdB ..... Vibration Decibels
VHT ..... Vehicle Hours Traveled
VMT ..... Vehicle Miles Traveled
VOC ..... Volatile Organic Compounds
UMTA ..... Urban Mass Transportation Administration
USACE ..... United States Army Corps Engineers
USDOT ..... United States Department of Transportation

Appendix C: List of Preparers

Metro – *Project Lead Agency*

Kimberly Yu
Stephen Fox
Dave Monks
Tham Nguyen
Girish Roy
Bruce Shelburne
Rick Wilson
Dana Woodbury

CDM

Project Management, Agency Coordination, Transportation Planning, Environmental Analysis

Ray Sosa
Monica Villalobos
Yara Jasso
Kansai Uchida
Juan Ramirez
Jennifer Jones
Fred Glick
Kim Scheller
Chris Park
Hank Boucher
John Pehrson
Ryan Moniz
Stacy Porter

DMJM | Harris

Project Management, Alternative Analysis, Traffic Impact Assessment, Engineering Design

Brent Ogden
Rob Hertz
Tim Erney
Ryan Park
Anthony Mangonon
Dave Leverenz
Werner Abrego
Kristofer Bartelle

AECOM Consult

Travel Demand Forecasting, Financial Planning/Analysis

Jim de la Loza
Patrick Coleman
Christy Grier

HDR | S.R. Beard & Associates

Operations Planning, O&MCosts, Cultural Resources

John Mason
Marcus Arnold
Jerri Horst
Pamela Cecere

EDAW

Urban Design, Station Area Planning

Vaughn Davies
Helen Choi
Gaurav Srivaspava

Arellano Associates

Public Outreach

Chester Britt

Yesenia Arias

Morgner Construction Management

Project Controls Support, Right of Way and Real Estate Analysis, Property Acquisition

Irv Camhi

Andrew D'Alfonso

D'Leon Consulting Engineers

Coordination Meetings, Civil Design, Drainage, Roadways/Street Design

Domingo D'leon

Jose Varias

Marcus Negrete

Appendix D: List of Technical Reports

Document Name	Completion Date
Task 1.0 Administration & Management	
PIP	11/15/07
Task 2.0 Agency & Community Participation	
Public Participation Plan	
Task 3.0 Alternatives Definition	
NOP/NOI (Early Scoping Notice)	9/19/08
Purpose & Need and Corridor Definition	6/25/08
Analysis Methodology Report	3/21/08
Alternatives Screening Report (Draft)	5/5/08
Task 4.0 AA/EIR/EIS Conceptual Engineering & Urban Design	
Initial Conceptual Alternatives	11/2/07
Urban Design and Engineering Technical Memorandum (Draft)	8/15/08
Initial Cost Estimates (Draft)	8/15/08
Task 5.0 Ridership Forecasting and Performance Indicators	
Operating Plan (Draft)	9/3/08
Operating Costs (Draft)	9/3/08
Initial Ridership Estimates and Performance Measures	8/29/08
Ridership Report (including Model Documentation)	10/29/08
Task 6.0 Comparative Analysis of Alternatives	
Conceptual Engineering Feasibility Technical Memorandum	6/20/08
Environmental Technical Memorandum (Draft)	7/3/08
Cost Analysis Technical Memorandum	9/12/08
Ridership, CE & Performance Technical Memorandum	9/19/08