
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 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). 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 squeezing 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

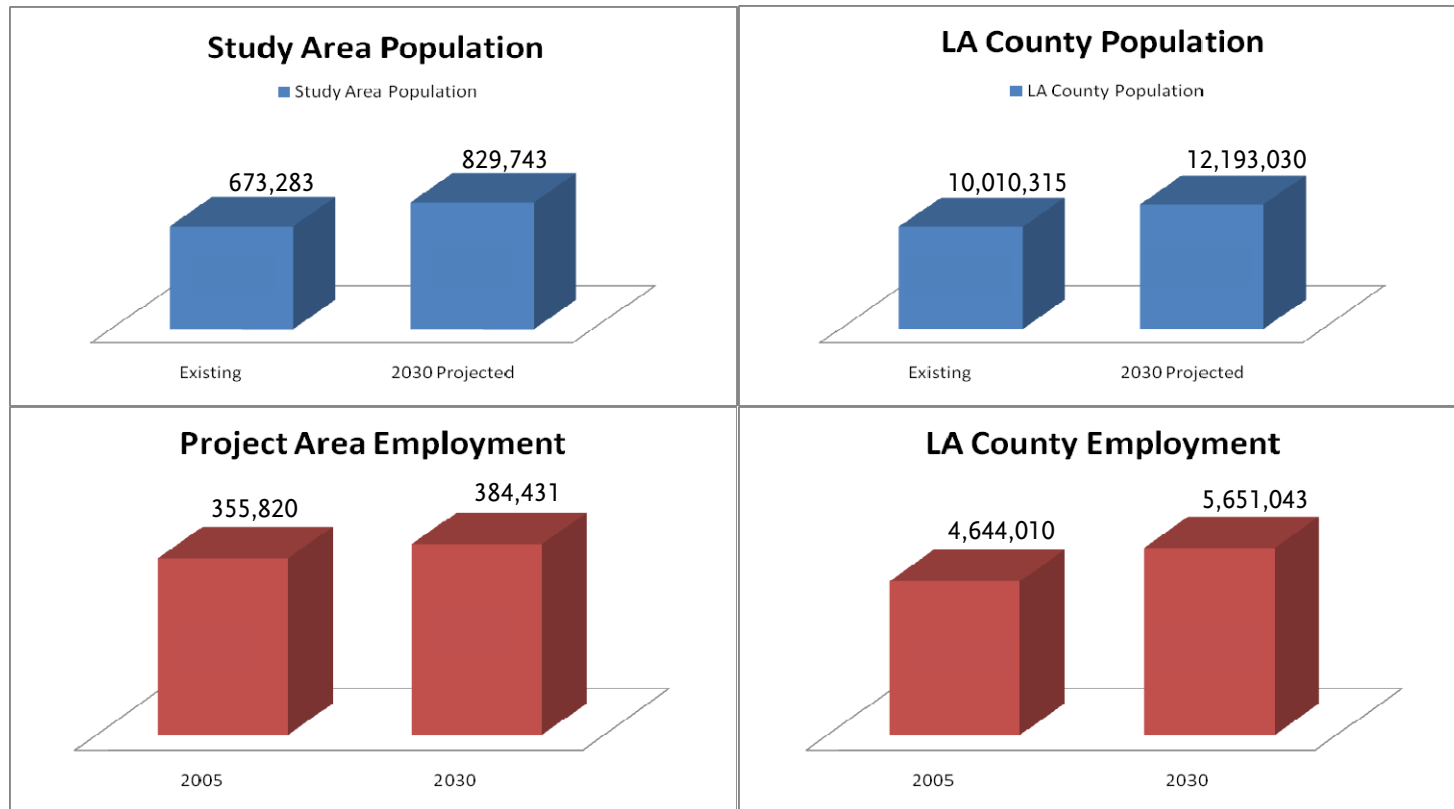
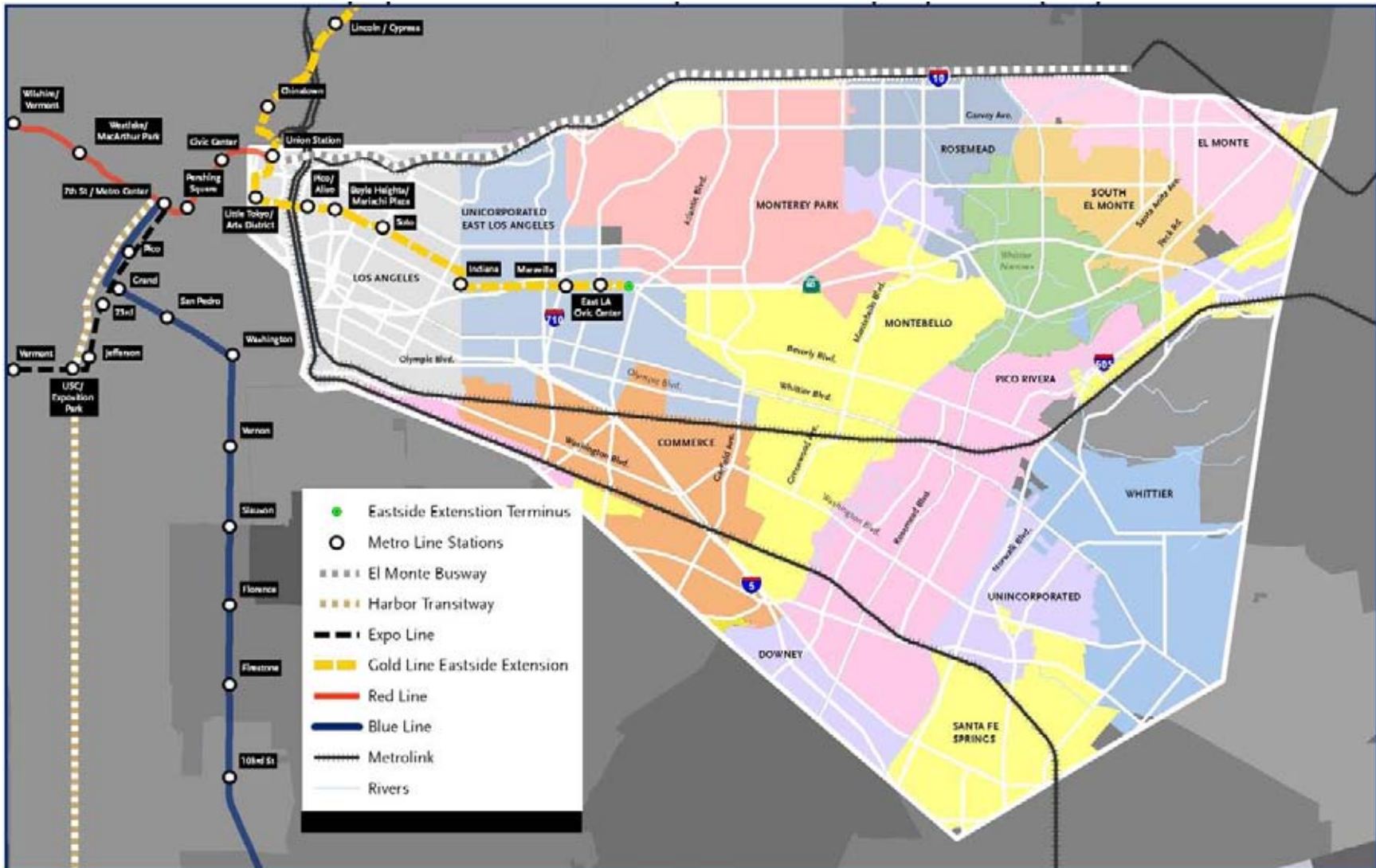


Figure S-2 Project Study Area



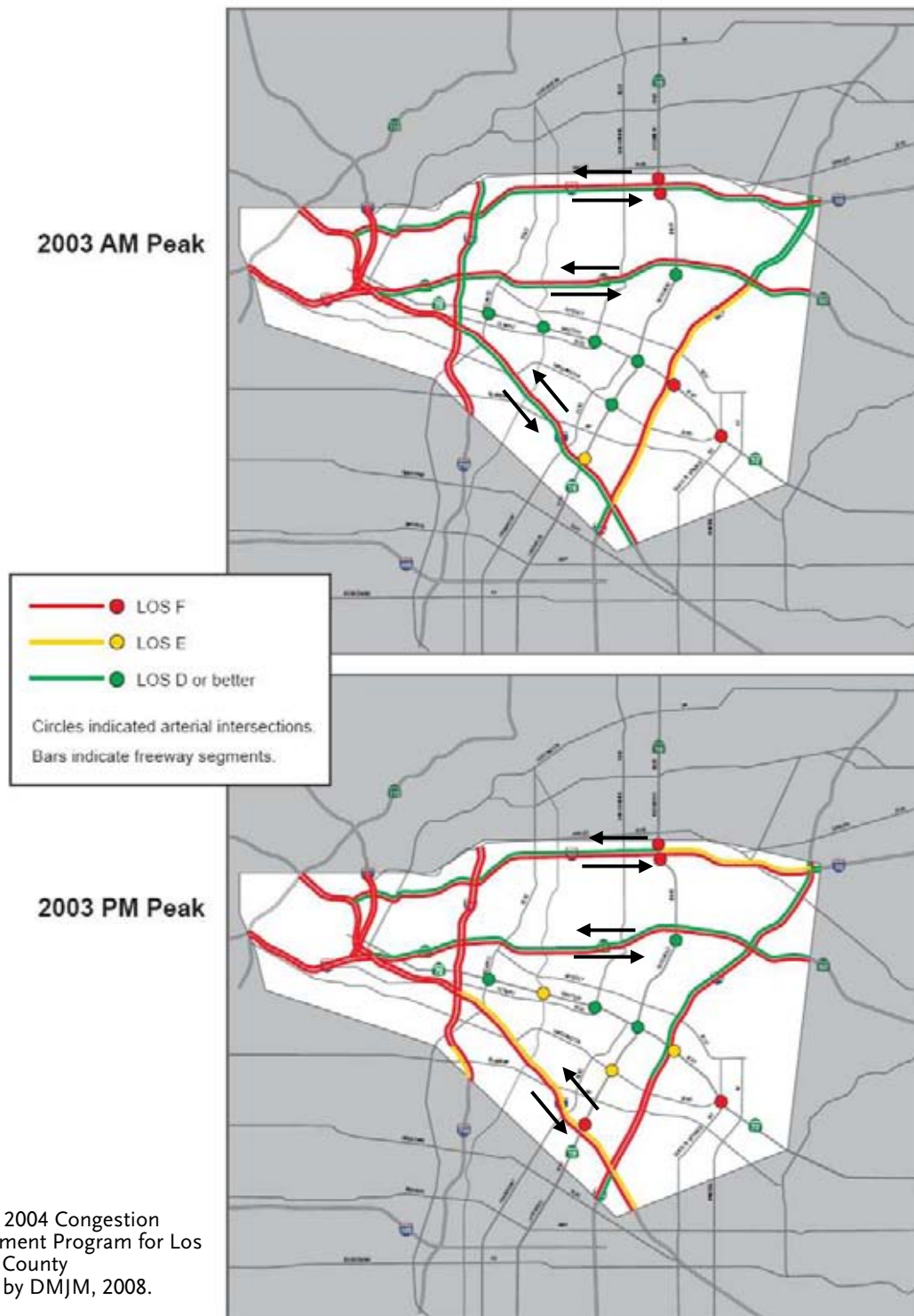
The Metro Eastside Transit Corridor Phase 2 study will evaluate transit connections to the 6-mile Metro Gold Line Eastside Extension Phase 1 project. This would also strengthen the PSA's connection to Metro's growing network of light rail, heavy rail, and bus rapid transit lines. At Union Station, passengers 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 down to the 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					
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

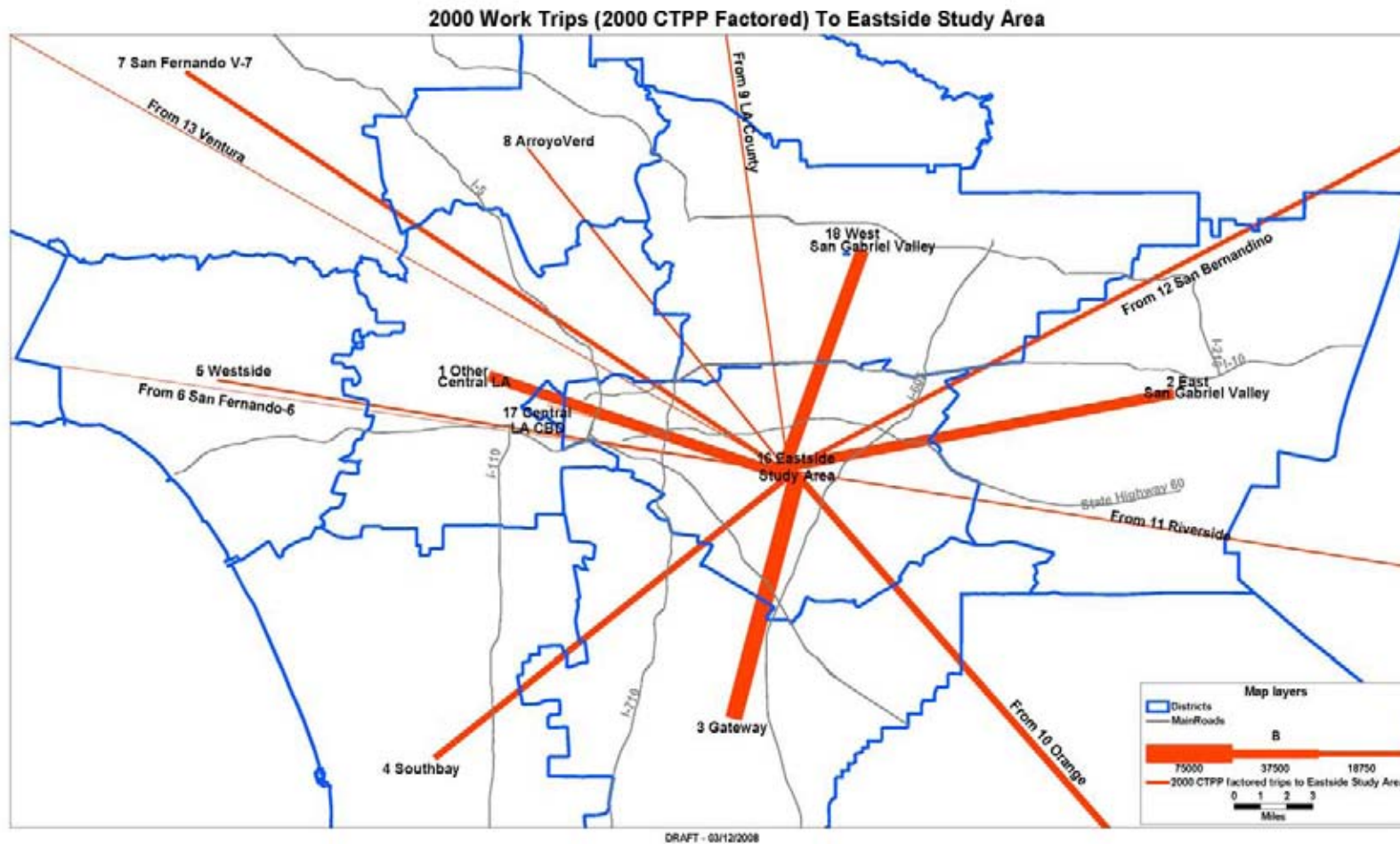
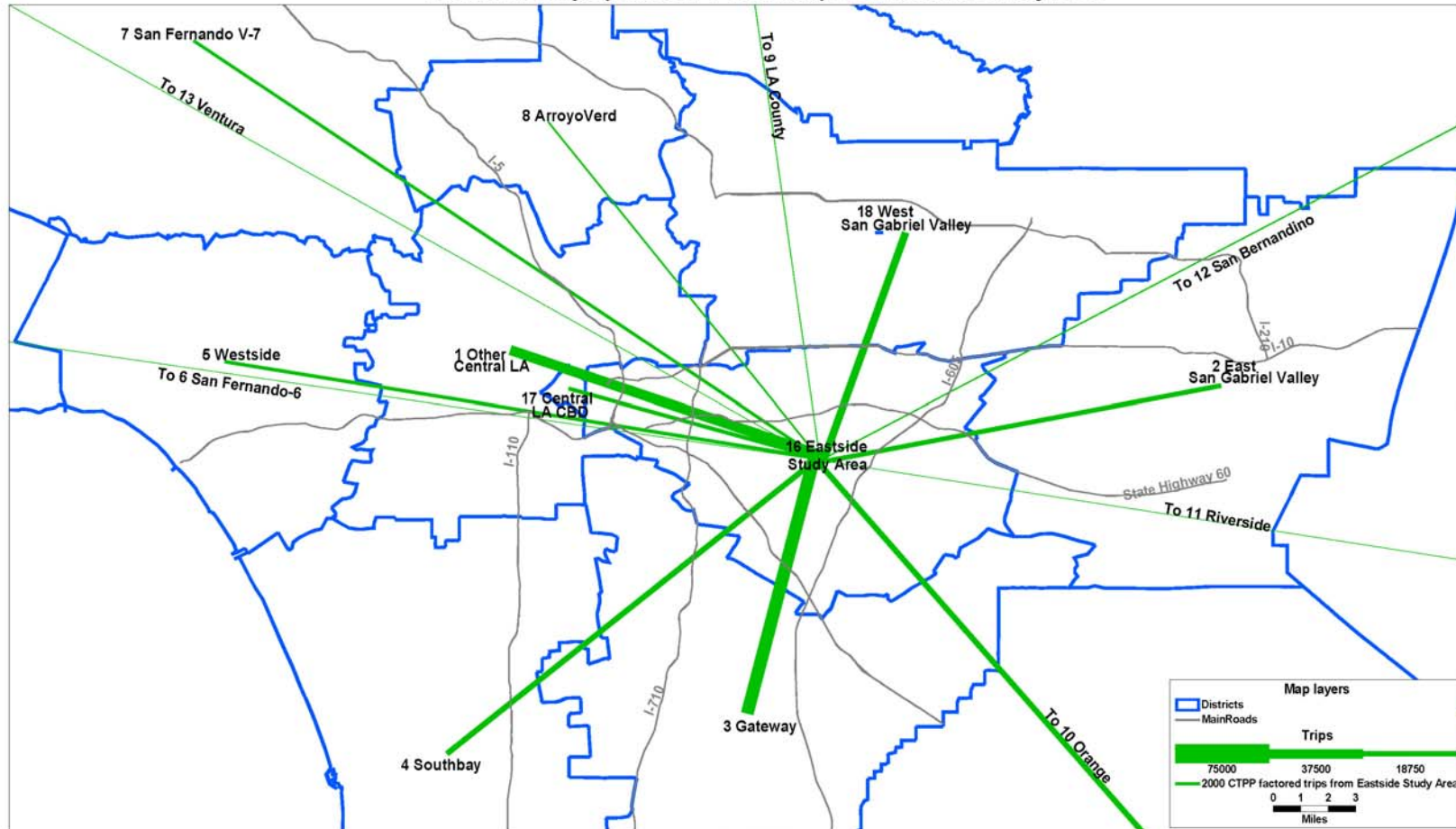


Figure S-5

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.

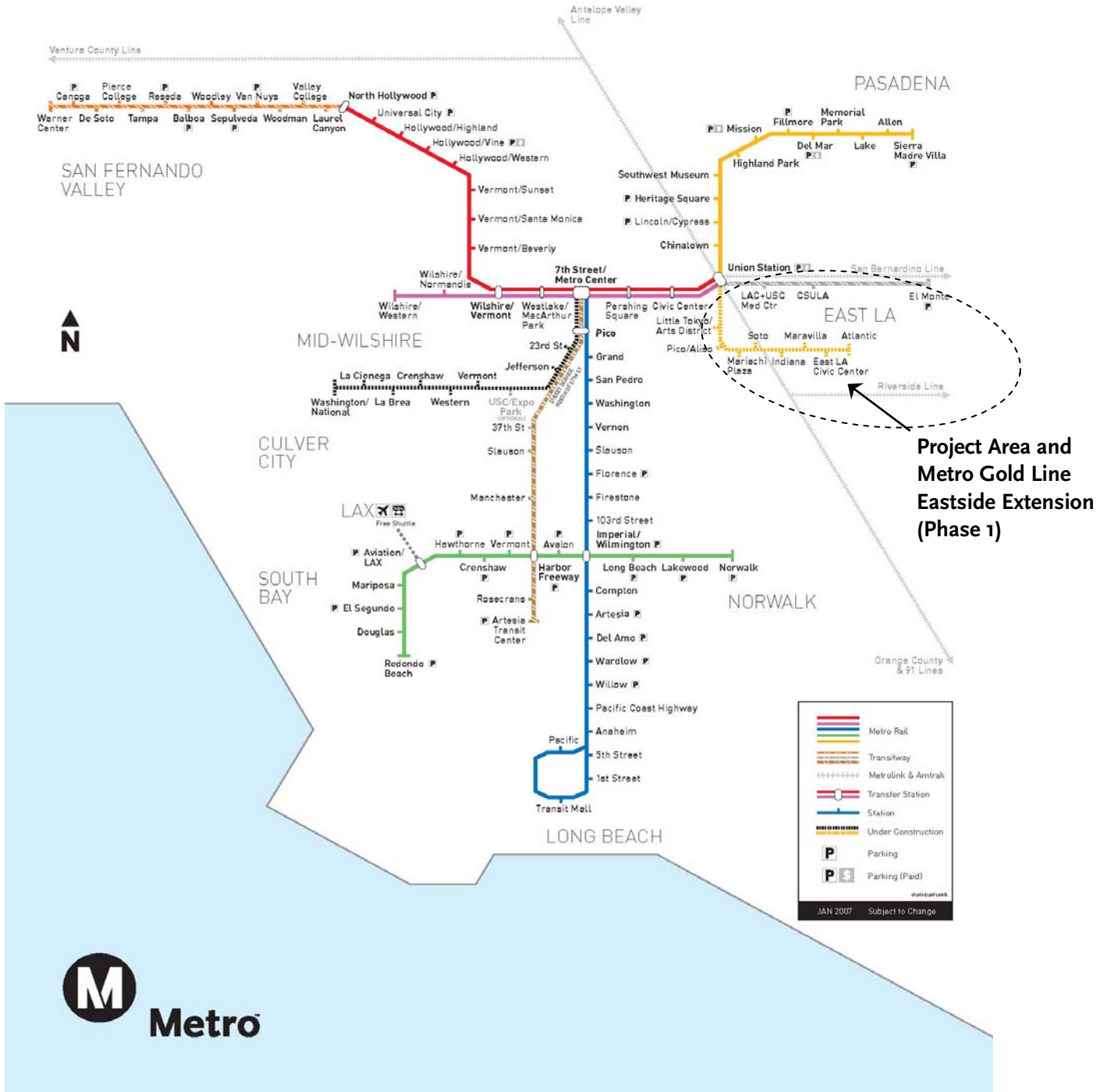
The Southern California Association of Governments' (SCAG) 2030 Regional Transportation Plan outlines several projects in and around the PSA aimed at maximizing the effectiveness, safety, and reliability of Southern California's transportation system. These projects include widening I-5 and adding one 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

Go Metro

metro.net



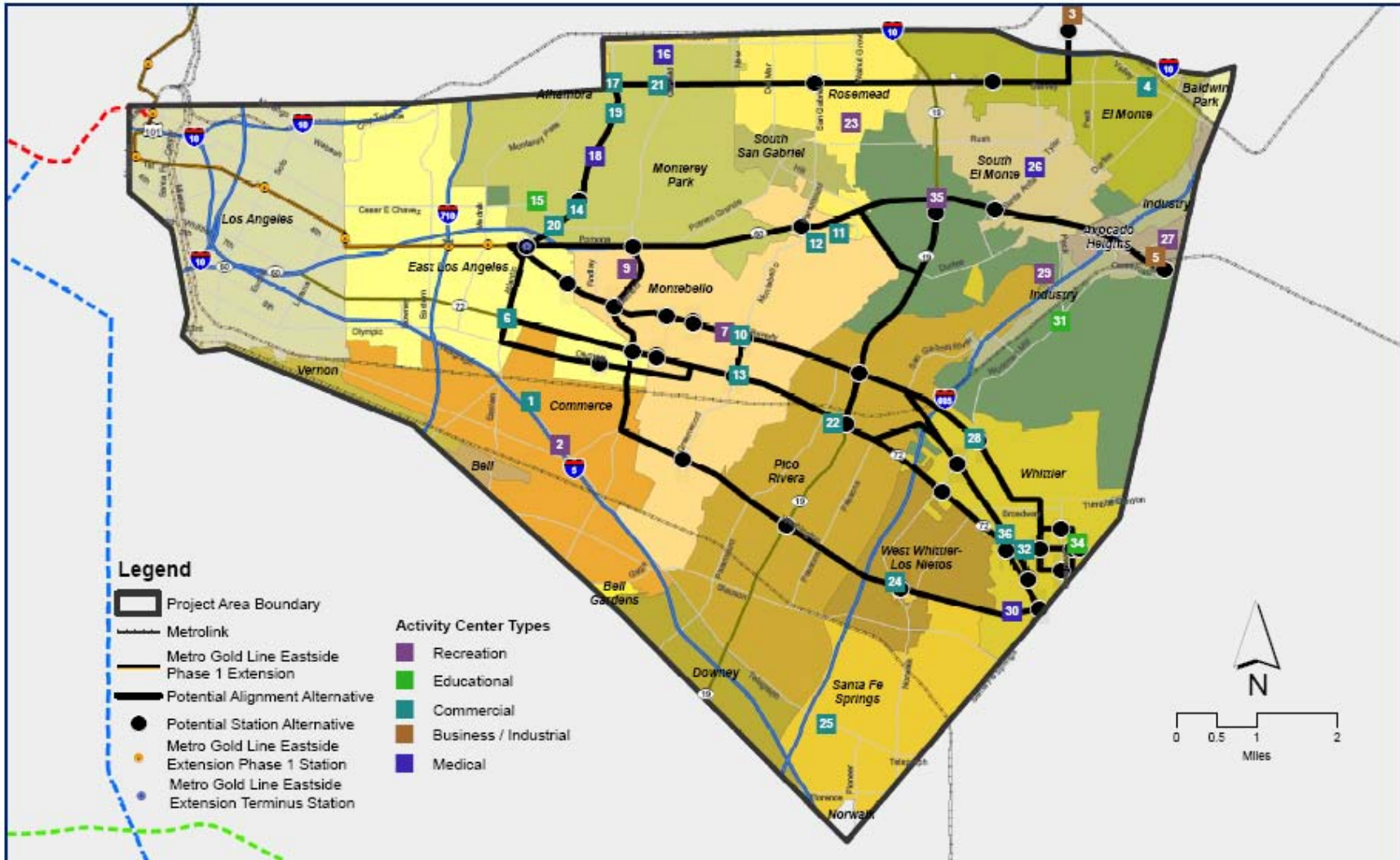
Source: Metro 2008. Graphics provided by CDM http://www.metro.net/images/rail_map.pdf

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.

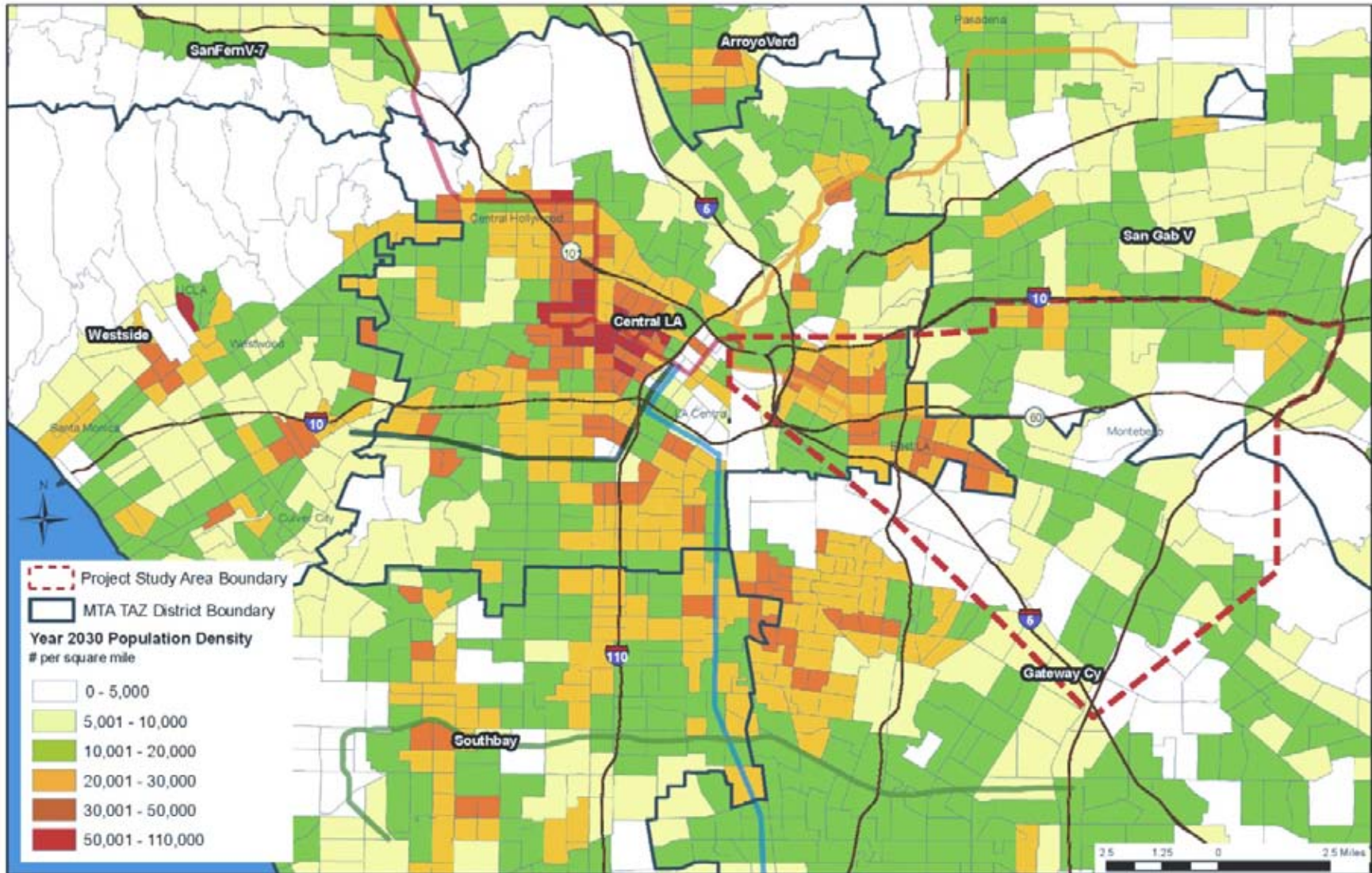
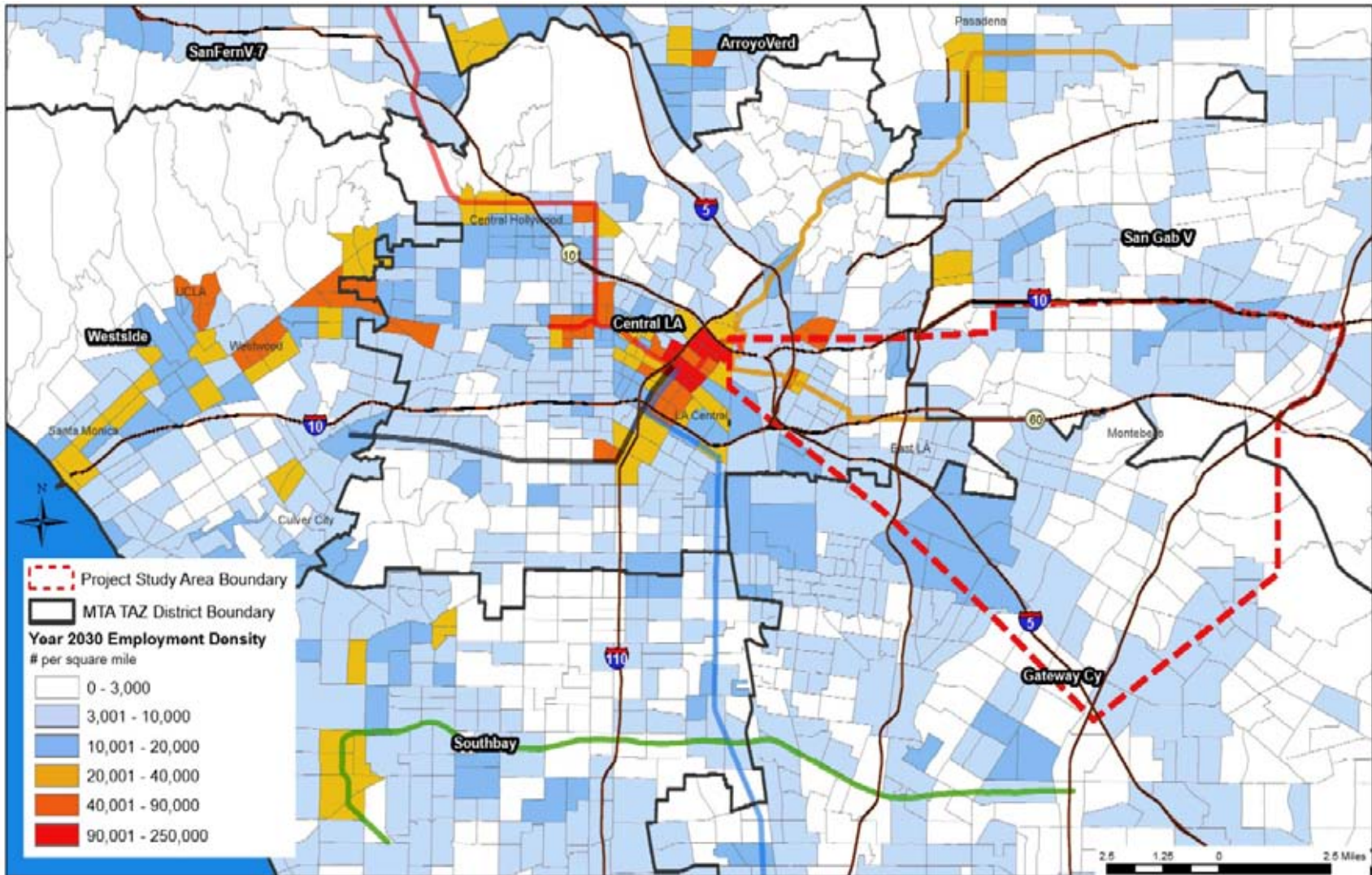
Figure S-8 2030 Regional Population Density


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

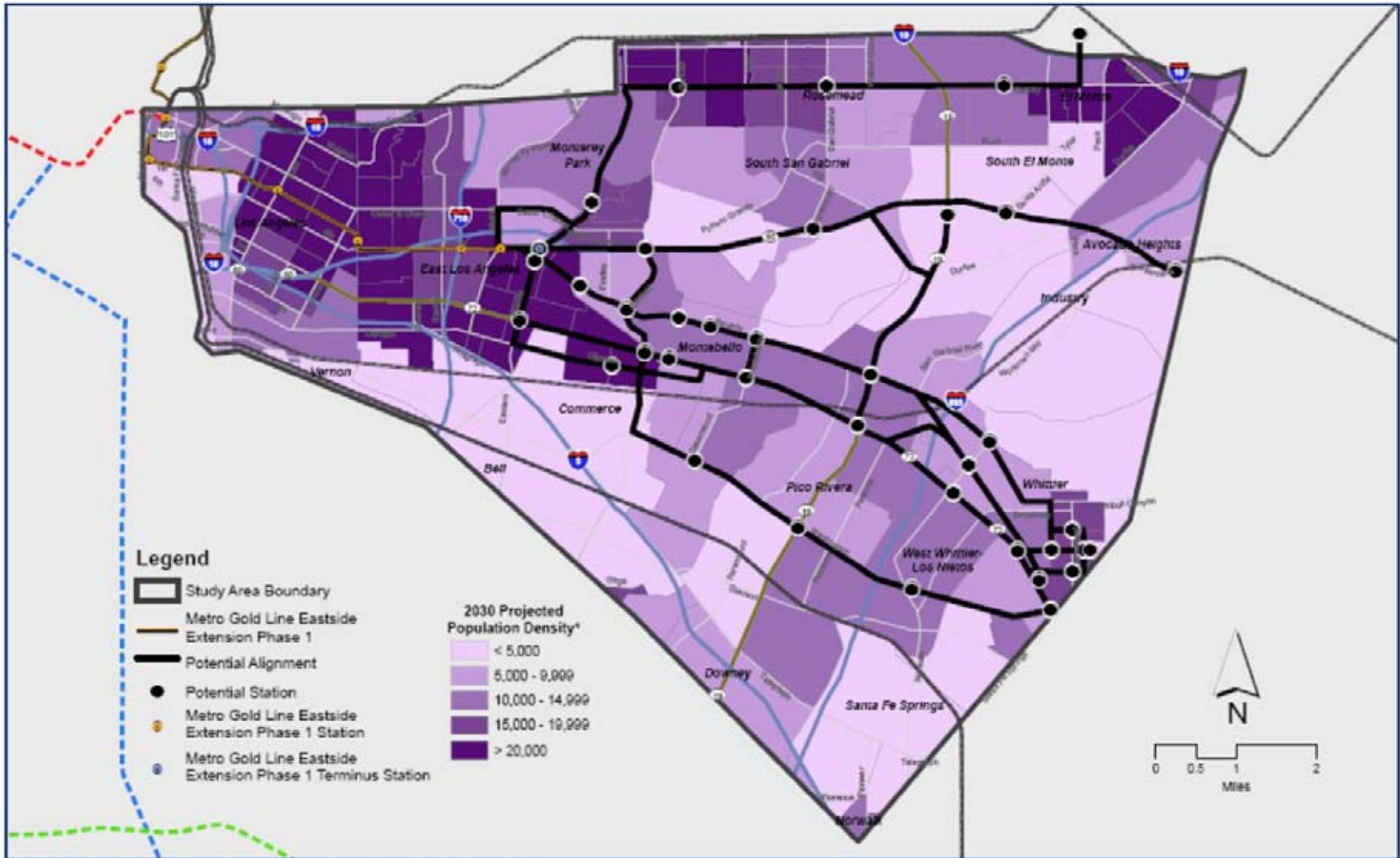
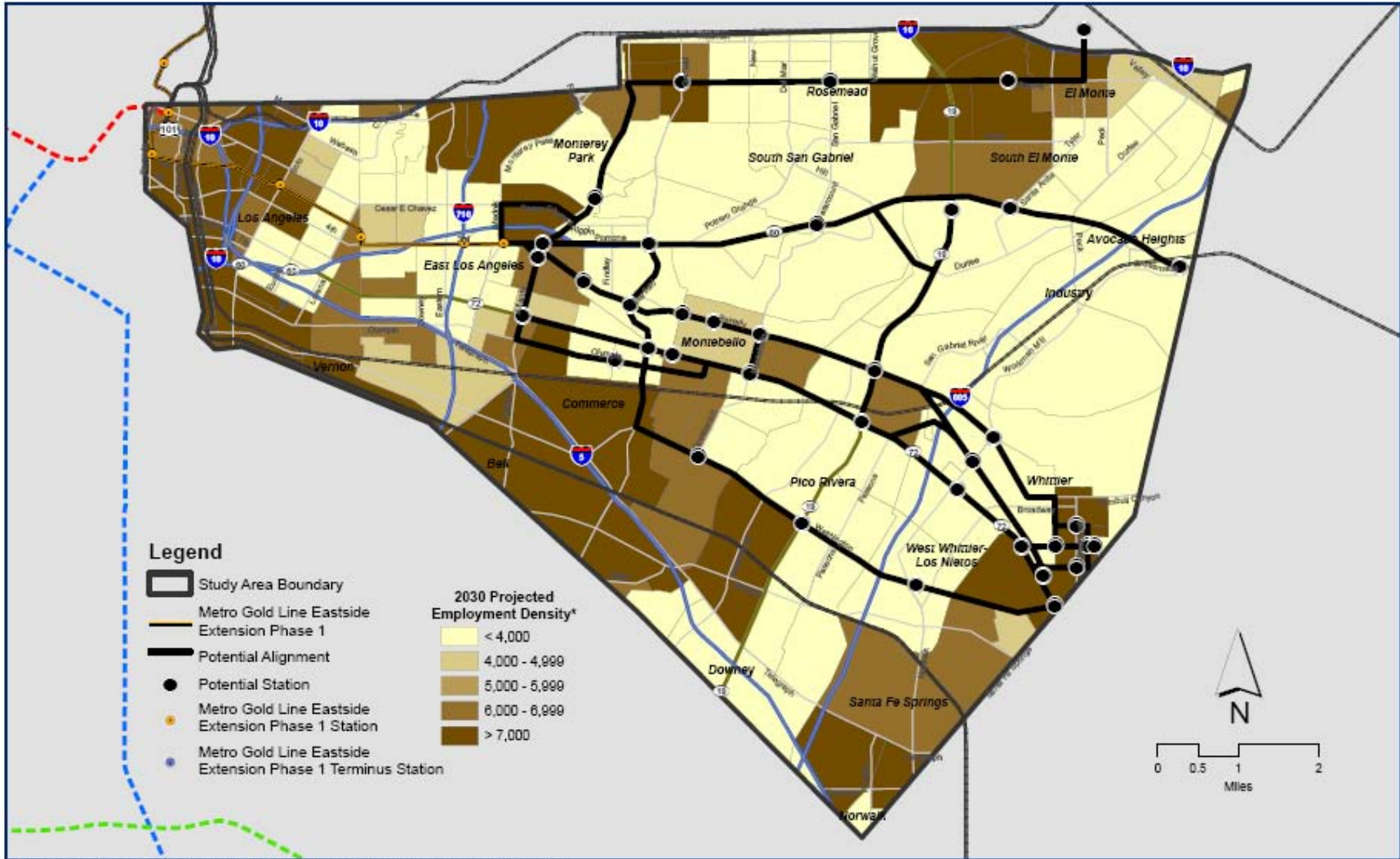


Figure S-11 2030 Employment Density in PSA



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-riden 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

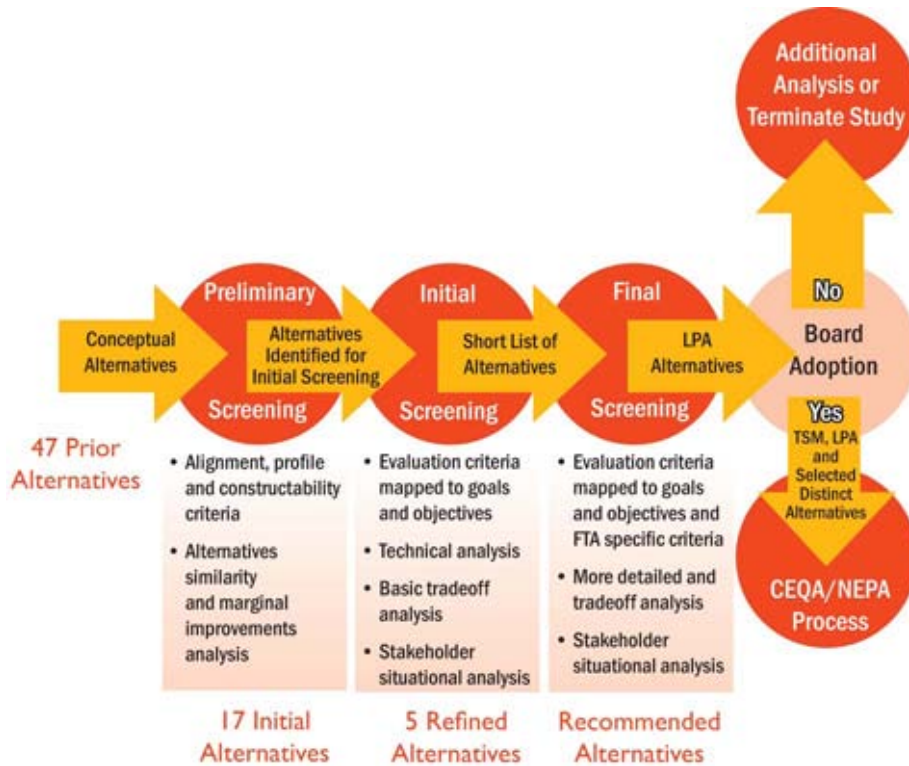
Screening Process

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


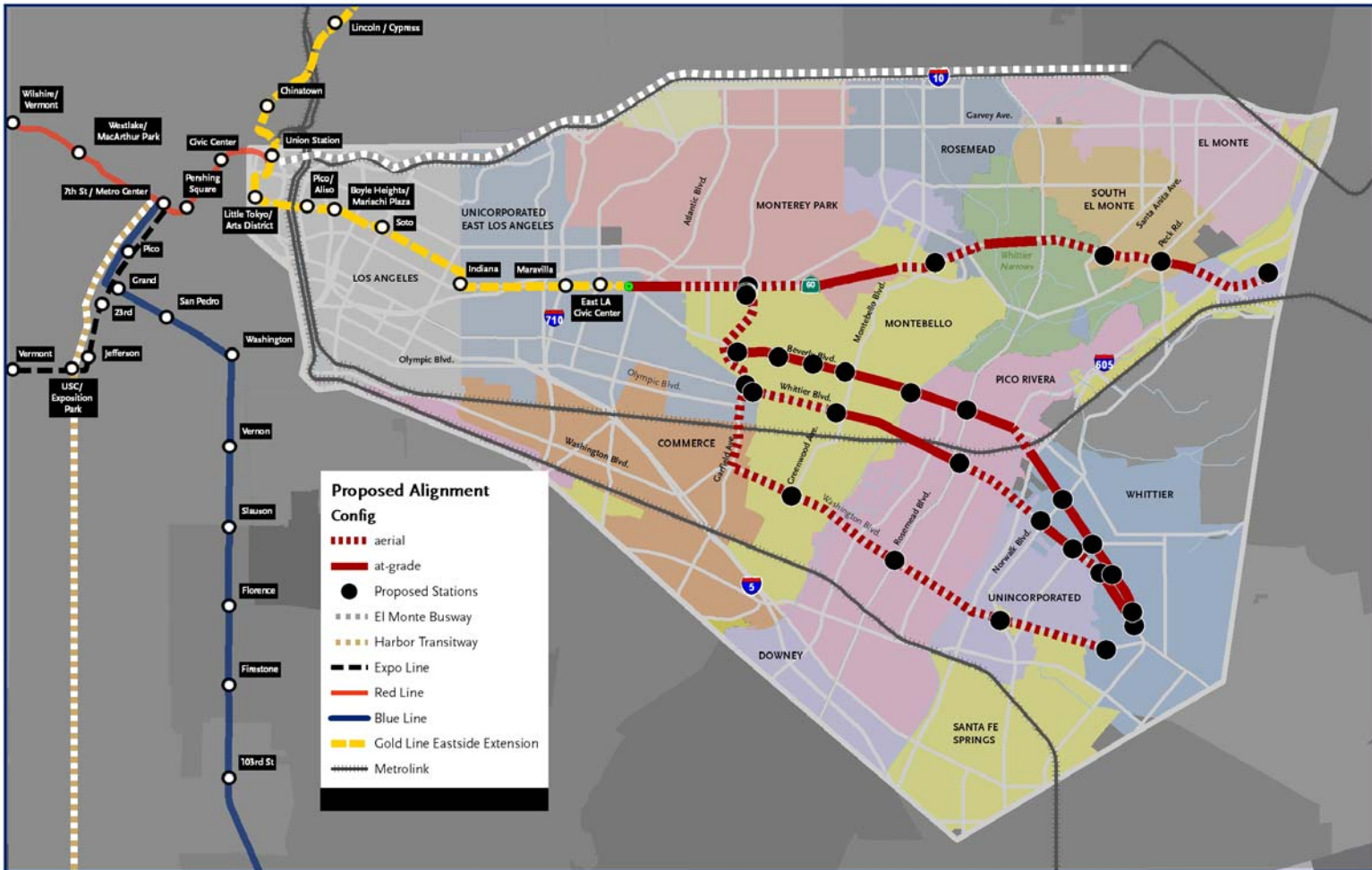
Source: Graphic developed by CDM, 2008.

- 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

Eastside Transit Corridor - Phase 2
 Refined Alternatives



S.3 Evaluation of Alternatives

S.3.1. Transportation Impacts

Transit

Operating Plans

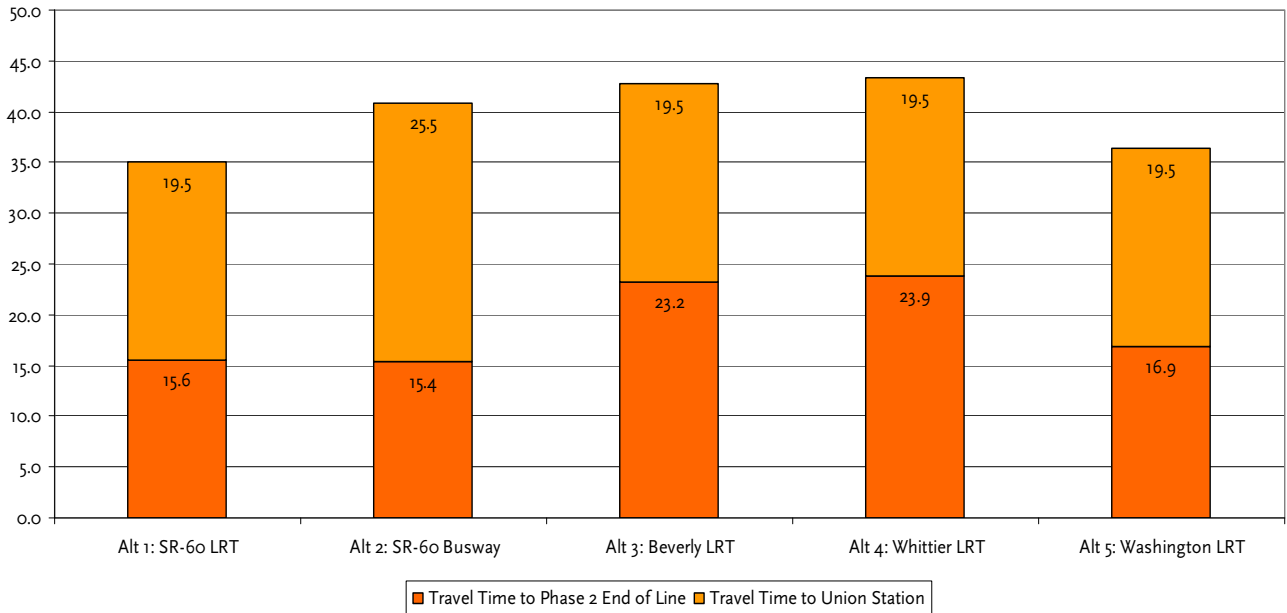
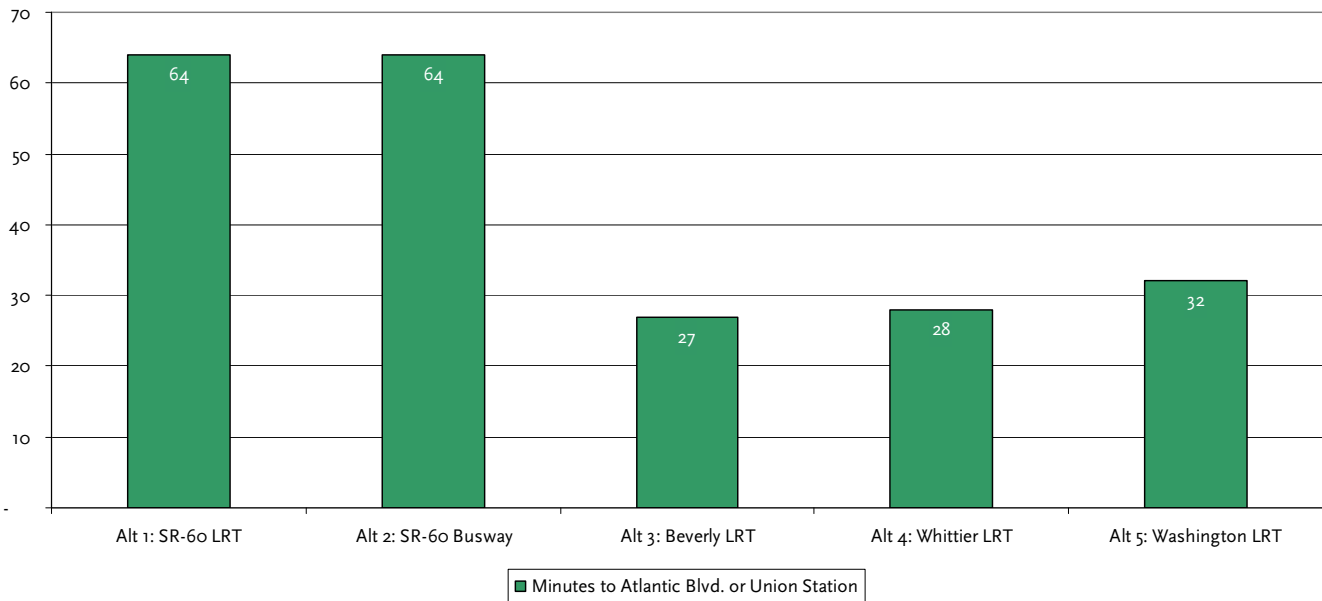
When modeling the transportation impacts of each of the proposed alternatives, it was assumed that trains and buses would operate every five minutes during peak periods and every ten minutes during off-peak periods. Service would operate from 4am to 1:30am, consistent with hours of operation on the rest 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

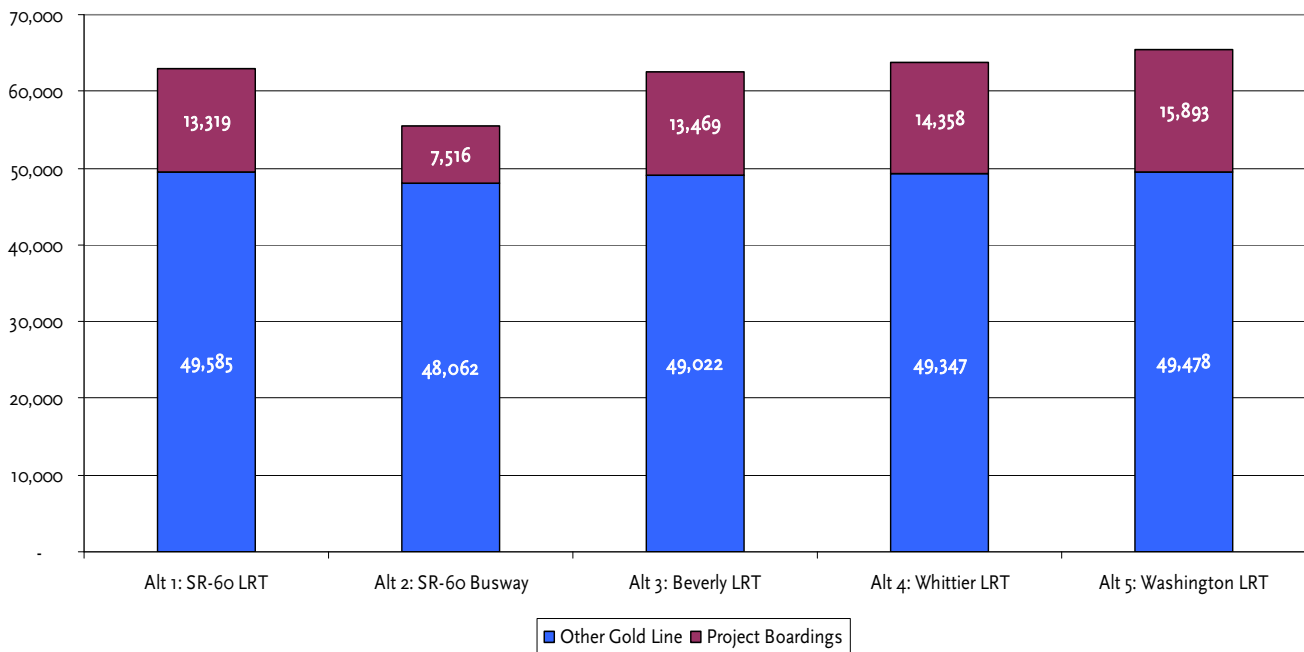
Implementation of the Phase 2 extension would result in substantial savings in travel time to Atlantic Blvd. and to Union Station – As shown in Figure S-15. Travel time savings would range from about one half hour with Alternatives 3–5. The SR-60 alternatives would yield higher savings, but this is largely 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

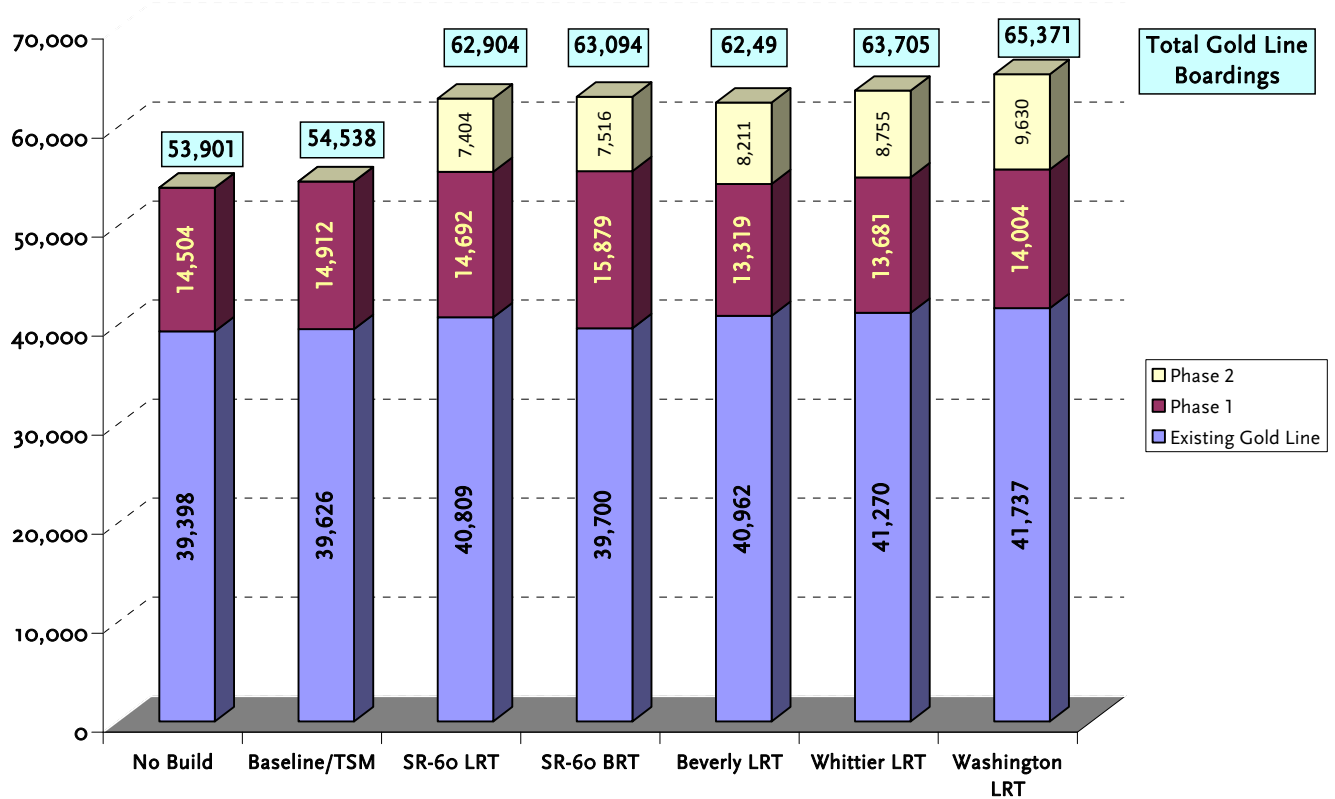


The model results showed the highest Phase 2 ridership as well as the highest overall Metro Gold Line transit ridership volumes for Alternative 5. For this alternative, the model estimated total boardings of about 15,900 riders using the Eastside Transit Corridor Phase 2 by 2030. Alternatives 1, 3, and 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.

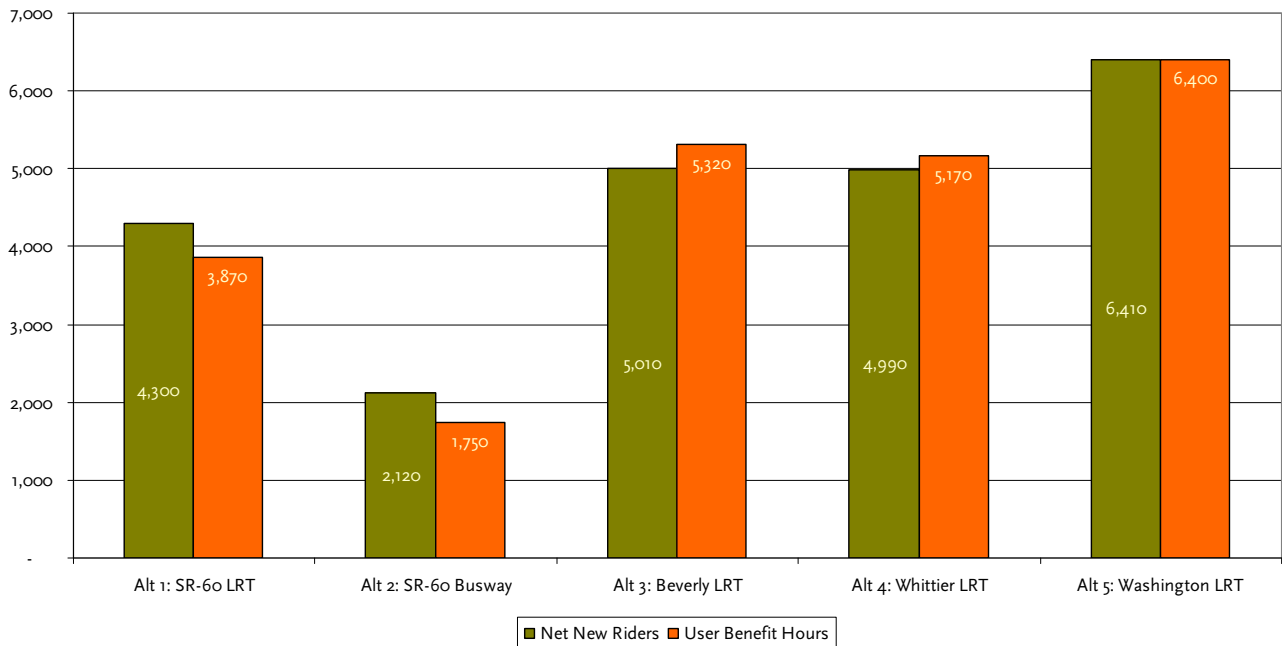
The Eastside Corridor Phase 2 project would bring increases in transit mode share within the PSA and small reductions in VMT. The best performing alternative from a ridership standpoint was Alternative 5 (Washington LRT), which would attract 6,000 new transit trips per day, a 17% increase over the current 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

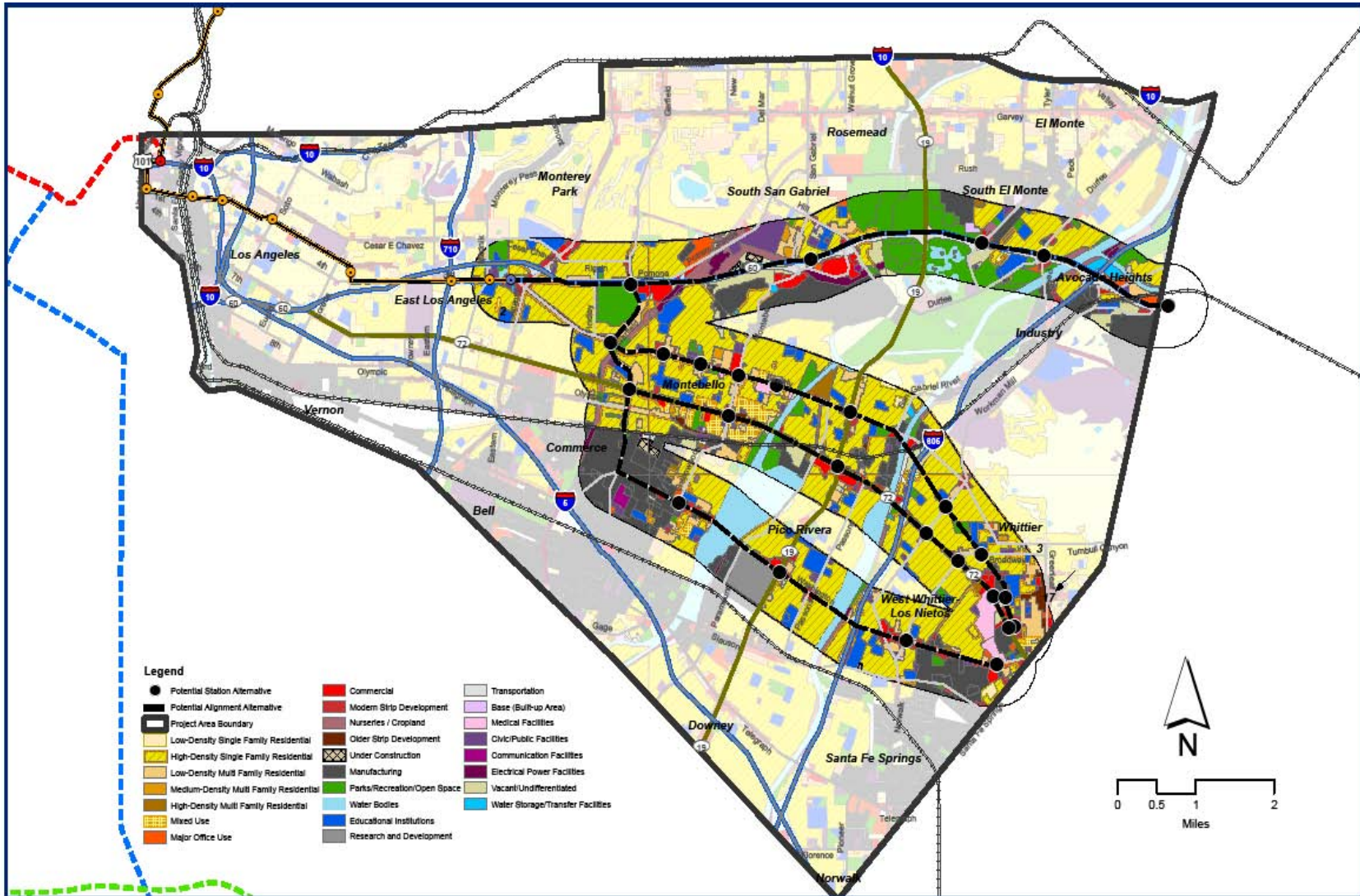
Overall, the environmental impacts of all of the alternatives are projected to be mostly low or moderate. The No-Build and TSM Alternatives have few negative effects overall, and the build alternatives would impose a mixture of mostly low and moderate impacts. The No-Build Alternative would generate 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 Oil Superfund site. Consider combining truck route with LRT extension. SR-60 secondary choice for alignment.	Impacts to Oil 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		<p><u>Travel Time:</u> Fastest overall (16 minutes)</p> <p><u>Daily Ridership:</u> Lowest of LRT alternatives (13,500)</p> <p><u>Net New Transit Riders:</u> Lowest overall (4,300)</p> <p><u>User Benefit Hours:</u> Fewest of LRT alternatives (3,870 daily)</p> <p><u>Impacts to Arterial Streets:</u> Minimal, due to freeway alignment</p> <p><u>Other:</u> Only LRT alternative which is located to conveniently serve communities north of SR-60</p>	<p><u>Travel Time:</u> 16 minutes, but all riders continuing on Phase 1 will incur a 6-minute transfer at Atlantic Station.</p> <p><u>Daily Ridership:</u> Lowest overall (7,500)</p> <p><u>Net New Transit Riders:</u> Lowest overall (2,120)</p> <p><u>User Benefit Hours:</u> Fewest overall (1,750)</p> <p><u>Impacts to Arterial Streets:</u> Minimal, due to freeway alignment</p> <p><u>Other:</u> Similar to SR-60 LRT, location is convenient to communities north of SR-60</p>	<p><u>Travel Time:</u> Slower than most other alternatives (23 minutes)</p> <p><u>Daily Ridership:</u> Nearly lowest ridership of LRT Alternatives (13,500)</p> <p><u>Net New Transit Riders:</u> Second highest overall (5,010)</p> <p><u>User Benefit Hours:</u> Second highest overall (5,320)</p> <p><u>Impacts to Arterial Streets:</u> Potentially greatest, due to extensive at-grade segments</p>	<p><u>Travel Time:</u> Slowest of the build alternatives (24 minutes)</p> <p><u>Daily Ridership:</u> Second highest (14,400)</p> <p><u>Net New Transit Riders:</u> (4,990) is nearly as high as Alternative 2</p> <p><u>User Benefit Hours:</u> Second highest (5,170)</p> <p><u>Impacts to Arterial Streets:</u> Potentially high, but mitigated by aerial segments</p>	<p><u>Travel Time:</u> Nearly fastest overall (17 minutes)</p> <p><u>Daily Ridership:</u> Highest overall (15,900)</p> <p><u>Net New Transit Riders:</u> Highest overall (6,410)</p> <p><u>User Benefit Hours:</u> Greatest overall (6,400)</p> <p><u>Impacts to Arterial Streets:</u> Low, due to aerial alignment</p>

Alternatives					
	SR-60 LRT	SR-60 Busway	Beverly LRT	Whittier LRT	Washington LRT
Environment	<u>Transit-Supportive Land Uses:</u> Fewest overall <u>Employment Density:</u> Lowest overall <u>Population Density:</u> Lowest overall <u>Property Acquisitions:</u> Most overall, mostly vacant <u>Historic Resources:</u> None nearby <u>Noise-Sensitive Receptors:</u> Fewest overall <u>Other:</u> Crosses potentially-sensitive biological resource and hazmat areas	<u>Transit-Supportive Land Uses:</u> Fewest overall <u>Employment Density:</u> Lowest overall <u>Population Density:</u> Lowest overall <u>Property Acquisitions:</u> Most overall, mostly vacant <u>Historic Resources:</u> None nearby <u>Noise-Sensitive Receptors:</u> Fewest overall <u>Other:</u> Crosses potentially-sensitive biological resource and hazmat areas	<u>Transit-Supportive Land Uses:</u> Greatest overall <u>Employment Density:</u> High <u>Population Density:</u> High <u>Property Acquisitions:</u> Fewest overall, mostly vacant <u>Historic Resources:</u> None nearby <u>Noise-Sensitive Receptors:</u> Second most overall <u>Other:</u> Crosses 100-year flood zone	<u>Transit Supportive Land Uses:</u> Moderate <u>Employment Density:</u> High <u>Population Density:</u> Highest overall <u>Property Acquisitions:</u> Moderate amount, none vacant (most non-vacant acquisitions overall) <u>Historic Resources:</u> Moderate amount nearby <u>Noise-Sensitive Receptors:</u> Most overall <u>Other:</u> Crosses 100-year flood zone	<u>Transit-Supportive Land Uses:</u> Moderate amount <u>Employment Density:</u> Highest overall <u>Population Density:</u> High <u>Property Acquisitions:</u> Moderate amount, mostly vacant <u>Historic Resources:</u> None nearby <u>Noise-Sensitive Receptors:</u> Moderate number <u>Other:</u> Crosses 100-year flood zone

		Alternatives				
		SR-60 LRT	SR-60 Busway	Beverly LRT	Whittier LRT	Washington LRT
Cost/Public Support		<u>Capital Costs:</u> Nearly highest (\$1.72 billion) <u>Annual O&M Costs:</u> Moderately high (\$26.5 million) <u>Cost Per User Benefit Hour:</u> Second worst (\$121) <u>Cost Per Net New Rider:</u> Second worst (\$109) <u>Public Comment Support:</u> Greatest (38 in favor, 5 opposed)	<u>Capital Costs:</u> Moderate <u>Annual O&M Costs:</u> Lowest (\$11 million) <u>Cost Per User Benefit Hour:</u> Poorest (\$193) <u>Cost Per Net New Rider:</u> Poorest (\$160) <u>Public Comment Support:</u> 2 in favor, none opposed	<u>Capital Costs:</u> Lowest of the build alternatives (\$1.1 billion) <u>Annual O&M Costs:</u> Highest (\$34 million) <u>Cost Per User Benefit Hour:</u> Best (\$63) <u>Cost Per Net New Rider:</u> Best (\$67) <u>Public Comment Support:</u> 3 in favor, 3 opposed	<u>Capital Costs:</u> Mid-range (\$1.38 billion) <u>Annual O&M Costs:</u> Mid-range (\$31 million) <u>Cost Per User Benefit Hour:</u> Mid-range (\$77) <u>Cost Per Net New Rider:</u> Mid-range (\$79) <u>Public Comment Support:</u> High, 29 in favor, 1 opposed	<u>Capital Costs:</u> Highest (\$1.765 billion) <u>Annual O&M Costs:</u> Second lowest (\$28 million) <u>Cost Per User Benefit Hour:</u> Mid-range (\$75) <u>Cost Per Net New Rider:</u> Mid-range (\$75) <u>Public Comment Support:</u> 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

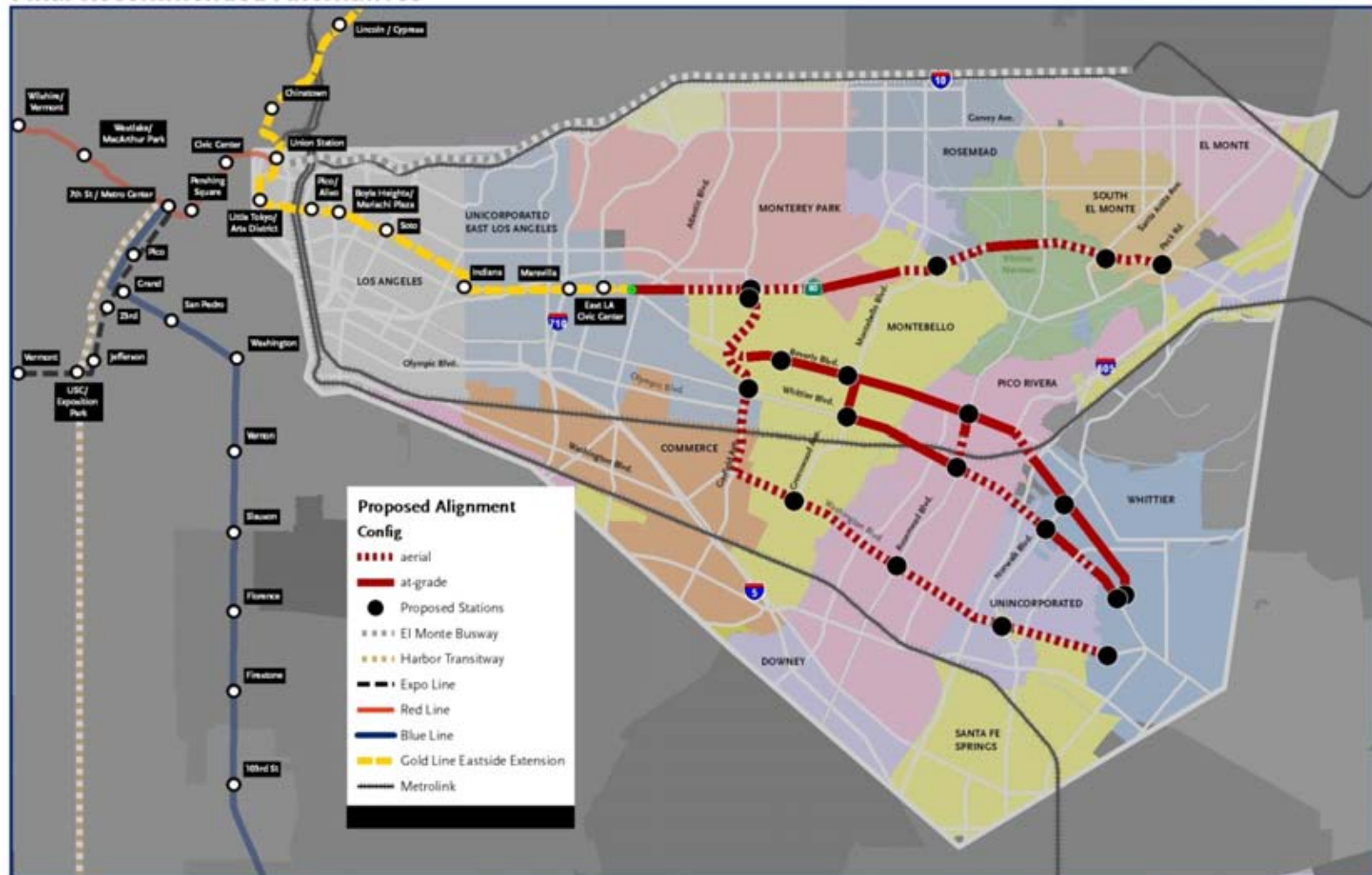
- a. Evaluate feasibility of alignment along Whittier Blvd. from Montebello Blvd. east to Mar Vista St. (combined with Beverly LRT as described above)
- b. Further evaluate at grade vs. grade separated alignment sections

4. Washington LRT

- a. Evaluate feasibility of potential at-grade configuration east of Rosemead Blvd.

Figure S-20 Final Recommended Alternatives

Eastside Transit Corridor - Phase 2
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.