Los Angeles County
Metropolitan Transportation Authority

West Santa Ana Branch Transit Corridor

Draft EIS/EIR Chapter 6: Evaluation of Alternatives

Metro®

WEST SANTA ANA BRANCH TRANSIT CORRIDOR PROJECT

Draft EIS/EIR Chapter 6: Evaluation of Alternatives

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Draft Environmental Impact Statement/ Environmental Impact Report

LEAD AGENCIES: Federal Transit Administration of the U.S. Department of Transportation; Los Angeles County Metropolitan Transportation Authority

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ACRONYMS AND ABBREVIATIONS

Acronym	Definition
CEQA	California Environmental Quality Act
EIR	environmental impact report
EIS	environmental impact statement
FTA	Federal Transit Administration
LPA	Locally Preferred Alternative
Metro	Los Angeles County Metropolitan Transportation Authority
Metro Board	Metro Board of Directors
MSF	maintenance and storage facility
NEPA	National Environmental Policy Act
O&M	operating and maintenance
Project	WSAB Transit Corridor Project
VMT	vehicle miles traveled
WSAB	West Santa Ana Branch

6 EVALUATION OF ALTERNATIVES

6.1 Introduction

This chapter draws upon and summarizes the information provided in the prior chapters of this Draft Environmental Impact Statement/Environmental Impact Report (EIS/EIR) to compare the Build Alternatives, including the design options and maintenance and storage facility (MSF) site options. These comparisons are considered in terms of effectiveness in meeting the Purpose and Need (see Chapter 1) of the West Santa Ana Branch (WSAB) Transit Corridor Project and were used to identify the staff preferred alternative and the environmentally superior alternative.

The information included in this chapter provides agency stakeholders and the general public with an understanding of the benefits and trade-offs of the four Build Alternatives and the No Build/No Project Alternative, two design options, and two MSF site options being considered for the WSAB corridor within Los Angeles County. The information in this chapter, in particular the identification of the staff preferred alternative, will also be considered by the Los Angeles County Metropolitan Transportation Authority (Metro) Board of Directors (Board) to select the Locally Preferred Alternative, which will occur after circulation of the Draft EIS/EIR.

6.2 Staff Preferred Alternative

Both the National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA) recommend identifying the preferred alternative in the Draft EIS/EIR. Per Federal Transit Administration (FTA) Standard Operating Procedures No. 5 Alternatives, the NEPA preferred alternative is the alternative identified as the favored course of action by the lead agency(ies) during the environmental review process. This Standard Operating Procedure recommends that FTA identify the preferred alternative in the Draft EIS in order to give the public; federal, state, and local agencies; and tribal governments an opportunity to comment on the preferred alternative prior to the publication of the combined Final EIS/Record of Decision. In anticipation of a joint Final EIS/Record of Decision, this section identifies the staff preferred alternative and summarizes the rationale for identification of that alternative. CEQA also requires identification of the "proposed project[1]."

Therefore, in compliance with NEPA and CEQA, a staff preferred alternative has been identified from among the four Build Alternatives under consideration. Additional information on alternatives considered and alternatives considered and rejected is presented in Chapter 2, Project Description, and Appendix A of this Draft EIS/EIR. In addition to considering the effectiveness in meeting the Purpose and Need and environmental impacts and benefits, the financial capacity to construct, operate, and maintain the Project as well as strategies to fund the Project were primary considerations in determining the staff preferred alternative. Section 6.3 provides information on the effectiveness of each Build Alternative in meeting the Purpose and Need; the environmental impacts and benefits are summarized in Section 6.4. Based on these considerations, Alternative 3 has been identified as the staff

[1] According to Section 15378 of the *CEQA Guidelines*, the term "Project" means the whole of an action, which has a potential for resulting in either a direct physical change in the environment or a reasonably foreseeable indirect physical change in the environment. Within this Draft EIS/EIR, the "proposed project" refers to the whole of an action and to the underlying physical activity being approved.

preferred alternative, which is the favored course of action by Metro in the Draft EIS/EIR considering the benefits, costs, environmental impacts, and financial capacity of the No Build/No Project Alternative and the four Build Alternatives. The formal adoption of the Locally Preferred Alternative (LPA) by the Metro Board of Directors will occur after the Draft EIS/EIR circulation and the review of public and agency comments.

Table 6.1 presents the capital and operating and maintenance (O&M) costs associated with each Build Alternative along with characteristics of the alignments, including length, configuration (at grade, aerial, and underground), number of stations, length of alignment in shared right-of-way with existing rail, and length of alignment needing freight track relocation. The capital cost estimates for the Build Alternatives are in 2020 dollars and range from $1.9 billion for Alternative 4 to $8.8 billion for Alternative 2. These costs are inclusive of stations, guideway and track elements, sitework, rights-of-way, soft costs (professional services), vehicles, and unallocated contingency assumptions. Capital cost associated with the option costs and MSF site options are included in Section 6.5. Generally, capital costs decrease as the length of the alignment and number of stations decrease. The *West Santa Ana Branch Transit Corridor Project Final Advanced Conceptual Engineering Capital Cost Report* (Metro 2021x), included as Appendix P of this Draft EIS/EIR, details the capital cost assumptions, and the *West Santa Ana Branch Transit Corridor Project Final Operating and Maintenance Costs Report* (Metro 2021w), included as Appendix Q of this Draft EIS/EIR, provides information on the O&M assumptions for each of the Build Alternatives. Information on funding strategies is included in Appendix R of this Draft EIS/EIR.

Total capital costs for Alternatives 1 and 2 are significantly higher ($8.1 and $8.8 billion, respectively) than Alternatives 3 and 4 ($4.4 and $1.9 billion, respectively) due to the length of the alignment and the resulting number of stations. Additionally, both Alternatives 1 and 2 have portions of the alignment that are underground; generally, underground alignments are the costliest, followed by aerial and at-grade alignments.

For comparison purposes, capital costs in Table 6.1. are also presented on a per-mile basis to establish a relative cost expenditure by a fixed unit of measurement. Because each alternative would require construction of an MSF, the cost per mile includes the capital cost associated with the MSF site option. Based on this comparison, Alternative 3 would have the lowest cost per mile at $331 to $346 million in 2020 dollars depending on which MSF site option is selected, followed by Alternative 4, Alternative 1, and Alternative 2. Therefore, Alternative 3 has been identified as the staff preferred alternative.

The length of the alignment and number of stations also affects annual O&M costs. Alternative 2 is estimated to have the highest O&M costs among the four Build Alternatives ($101 million) because this alternative also includes short-line service during peak travel times between the Slauson/A Line Station and 7th St/Metro Center. This short-line service would add $5 to $13 million per year[2] compared to Alternative 1, which has a similar length and number of stations as Alternative 2, but has an annual O&M cost of $87 million. Alternatives 3 and 4 are estimated to have lower annual operating expenses ($67 million and $41 million, respectively) as a result of their shorter alignments and fewer number of stations compared to Alternatives 1 and 2.

[2] The range of O&M costs (estimated $5 to $13 million) for Alternative 2 to run the short-line service depends on the number of extra trips scheduled during the peak hour.

Table 6.1. Build Alternative Cost and Features

Cost/Features	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Capital cost (2020$[1]) without MSF[2, 4]	$8.1 billion	$8.8 billion	$4.4 billion	$1.9 billion
Capital cost (2020$[1]) with MSF[3, 4]	$8.5 billion – $8.8 billion	$9.2 billion – $9.5 billion	$4.9 billion – $5.1 billion	$2.3 billion – $2.6 billion
Capital cost per mile with MSF (2020$[1, 4])	$442 million – $455 million	$479 million – $490 million	$331 million – $346 million	$355 million – $389 million
Annual O&M cost (2020$[1])	$87 million	$101 million	$67 million	$41 million
Alignment length (miles)	19.3	19.3	14.8	6.6
At-grade length (miles)	12.3	12.3	12.2	5.6
Aerial length (miles)	4.7	4.7	2.6	1.0
Underground length (miles)	2.3	2.3	0	0
Number of stations	11	12	9	4
Shared right-of-way with rail (miles)	11.4	11.4	10.1	2.0
Freight relocation needed (miles)	8.1	8.1	8.1	1.3

Source: Metro 2021x and 2021w
Notes: [1] 2020$ refers to dollar values assumed in Fiscal Year 2020.
[2] All estimated costs generally include guideway and track elements, stations, stops, terminals, intermodal and support facilities, sitework and special conditions, systems, right-of-way, vehicles, professional services, and unallocated contingencies. Variable costs not included in the table are Design Options 1 and 2 for Alternative 1 and the maintenance and storage facilities site options (see Table 6.4 for these costs).
[3] Costs range from the low end (with the Bellflower MSF site option) to the high end (with the Paramount MSF site option). See Table 6.4 for more details.
[4] The capital cost estimates will be further refined as the project advances through the project development process and more detailed engineering is undertaken.
MSF = maintenance and storage facility; O&M = operating and maintenance

6.3 Effectiveness in Meeting Purpose and Need

This section compares the Build Alternatives in terms of meeting the Purpose and Need/Goals and Objectives of the Project.

The Purpose and Need for the Project is summarized in Chapter 1 of this Draft EIS/EIR. Overall, the purpose of the Project is to provide high-quality, reliable transit service to meet the future mobility needs of residents, employees, and visitors who travel within and through the corridor. In particular, the Project's purpose includes four major points:

- Establish a reliable transit service that will enhance connectivity and reduce travel times to local and regional destinations
- Accommodate future travel demand, including the high number of transit trips made by Study Area residents
- Improve access for densely populated neighborhoods, major employment centers, and other key regional destinations where future growth is forecasted to occur within the Study Area

- Address mobility and access constraints faced by transit-dependent communities, thereby improving transit equity

Each Build Alternative addresses the Purpose and Need/Goals and Objectives, but to varying degrees. Table 6.2 provides a summary of each Build Alternative's ability to address the Purpose and Need and an evaluation of the environmental benefits. This comparison identifies mobility and connectivity for historically underserved and transit-dependent communities, travel time improvements on local and regional transportation networks, and accommodation of substantial future employment and population growth. The information in Table 6.2. is based on the analyses of the Build Alternative presented in Chapter 3, Transportation, and Chapter 4, Affected Environment/Environmental Consequences, of this Draft EIS/EIR.

Table 6.2. Alternatives Benefit Evaluation

Purpose and Need	Environmental Benefits	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Establish a reliable transit service that will enhance connectivity and reduce travel times to local and regional destinations.	Regional mobility and connectivity[1]	High	High	Medium	Low
	User benefit hours[2]	15,400	19,700	8,400	4,000
Accommodate future travel demand, including the high number of transit trips made within the Study Area.	Average weekday daily boardings (2042)	60,839	82,826	30,964	11,119
	Population growth (percent change from 2017 to 2042 within ¼ mile of alignment)	60%	75%	59%	62%
	Employment growth (percent change from 2017 to 2042 within ¼ mile of alignment)	32%	25%	22%	20%
	Vehicle miles traveled (VMT) reduction (existing plus project compared to existing conditions)	216,100 (-0.05%)	215,000 (-0.05%)	71,800 (-0.02%)	36,300 (-0.01%)
	Emissions and greenhouse gas reduction	Greatest reduction	Greatest reduction	Moderate reduction	Least reduction

Purpose and Need	Environmental Benefits	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Improve access for densely populated neighborhoods, major employment centers, and other key regional destinations where future growth is forecasted to occur within the Study Area.	Community benefits (number of cities and communities in City of Los Angeles served within ½ mile of stations[3])	12 cities (3 communities in City of Los Angeles)	12 cities (3 communities in City of Los Angeles)	12 cities (1 community in City of Los Angeles)	5 cities (0 communities in City of Los Angeles)
	Economic benefits[4] (jobs gained in the region)	81,700 – 89,800 construction jobs 245 permanent jobs	88,100 – 89,800 construction jobs 282 permanent jobs	44,000 – 45,700 construction jobs 189 permanent jobs	22,400 – 24,000 construction jobs 113 permanent jobs
	Economic benefits (2020$[4]) (generated/earned in economic activity per year in the region)	$6.6 million	$7.6 million	$5.1 million	$3.0 million
Address mobility and access constraints faced by transit-dependent communities, thereby improving transit equity.	Approximate residential population within ½ mile of stations[5]	236,000	260,000	203,000	90,400
	Daily new transit trips (average number of trips per mile)	952	1,048	622	720

Source: Prepared for Metro in 2021

Notes: [1] Based on number of proposed stations that would improve local and regional access, mobility, and connectivity to transit. A "High" score indicates a greater number of stations (11 to 12) to increase mobility and connectivity; a "Medium" score indicates a moderate number of stations (9 to 10) to increase mobility and connectivity; and a "Low" score indicates a lower number of stations (< 9) to increase mobility and connectivity.

[2] User benefit hours presented in total daily hours. This value is based on travel time savings and cost savings that new riders and existing riders would experience.

[3] For purposes of this analysis, the City of Los Angeles is split into Central City, Central City North, and Southeast Los Angeles Community Plan Areas. These are considered established communities within the Affected Area. As such, the number of communities in the City of Los Angeles is described in the table.

[4] 2020$ refers to dollar values assumed in Fiscal Year 2020.

[5] The number presented is person-year jobs (one job for one person for one year).

[6] The residential populations identified are located within ½ mile of the station areas for each Build Alternative.

Alternatives 1 and 2 would have the longest alignments (approximately 19.3 miles) and, therefore, would serve the largest number of residents and provide the greatest amount of connectivity. As such, a reduction in vehicle miles traveled (VMT), number of daily boardings, emissions and greenhouse gas reduction, and economic benefits are all highest under these alternatives, as shown in Table 6.2. Alternatives 3 and 4 would serve a smaller

number of residents and provide lower connectivity as a result of the shorter alignments associated with these alternatives. Therefore, reductions in VMT, emissions and greenhouse gas reduction, number of daily boardings, and economic benefits are all lower compared to Alternatives 1 and 2. Alternative 3 would serve 12 cities, which is comparable to the number of cities that would be served by Alternatives 1 and 2. Additionally, compared to Alternative 4, Alternative 3 would provide a larger economic benefit, with $5.1 million generated versus $3.0 million.

All of the Build Alternatives would achieve the four major elements of the Project's Purpose by establishing reliable transit service, accommodating future travel demand, improving access, and addressing mobility and access constraints faced by transit-dependent communities in the corridor. Additionally, while Alternatives 1 and 2 would have the greatest amount of environmental benefits, these alternatives would also need to address the greatest extent of environmental effects given the longer alignments and greater number of stations.

As stated in Section 6.2 and shown in Table 6.1, Alternative 4 would have the lowest capital cost and economic benefits ($3.0 million) compared to the other Build Alternatives. However, Alternative 3 is the most cost-effective on a per-mile basis with inclusion of the MSF site (Table 6.1), which is required to support operation of the Project. Alternative 3 would connect 12 cities and generate around $5.1 million in economic activity per year. Therefore, Alternative 3 would still provide many of the same benefits as Alternatives 1 and 2 ($6.6 and $7.6 million in economic benefits, respectively), but slightly fewer due to the shorter length of the alignment. Alternative 4 would provide the least amount of benefits and would not be as cost-effective on a per-mile basis compared to Alternative 3.

6.4 Environmentally Superior Alternative

Per *CEQA Guidelines* Section 15126.6 (e)(2), identifying an "environmentally superior alternative" is required. The determination of this alternative is based on the results of the technical analysis of the alternatives as presented in the Draft EIS/EIR. The environmentally superior alternative is the alternative found to have an overall environmental advantage compared to the other alternatives. Pursuant to *CEQA Guidelines* Section 15126.6(b), alternatives with the potential for avoiding or substantially lessening significant impacts may be considered even if they are more costly. The goal of identifying the environmentally superior alternative is to assist decision-makers in the project approval process. However, the public agency is not required by CEQA to select the environmentally superior alternative as the approved project.

This section provides a comparison of the alternatives in terms of environmental impacts and benefits based on the detailed analysis provided in Chapter 3, Transportation, and Chapter 4, Affected Environment/Environmental Consequences of this Draft EIS/EIR. Overall, Alternatives 3 and 4 would have a shorter alignment and result in fewer environmental impacts compared to Alternatives 1 and 2. However, to further understand the alternatives from an environmental impact comparison, several other factors are also considered, including issue areas that have the greatest potential to result in long-term, significant impacts; community concerns; and overall benefit that each alternative would provide.

Table 6.3 presents a comparison of the environmental operational and construction impacts for each Build Alternative. Following the table is a summary discussion of the environmental considerations for each Build Alternative to identify an environmentally superior alternative. Refer to Table 6.2 for the environmental benefits by Build Alternative.

Table 6.3. Comparison of Operational and Construction Impacts by Build Alternative

	Environmental Areas of Consideration[1]	No Build/No Project Alternative	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Operational Impacts	Unmitigated traffic impacts (level-of-service)[2]	No impacts	12 intersections affected	12 intersections affected	12 intersections affected	0 intersections affected (with mitigation)
	Consistency with land use and plans development	Significant and unavoidable impacts	Significant and unavoidable impacts	Significant and unavoidable impacts	Significant and unavoidable impacts	Less than significant (with mitigation)
	Permanent full and partial acquisitions[3]	No Impacts	37 full 254 partial 220 total affected parcels	38 full 309 partial 283 total affected parcels	25 full 188 partial 172 total affected parcels	17 full 54 partial 59 total affected parcels
	Displacements (number of businesses and residential properties to be displaced)	No Impacts	89 businesses 21 residential units	108 businesses 21 residential units	65 businesses 21 residential units	18 businesses 8 residential units
	Number of employees and residents displaced	No Impacts	601 employees 78 residents	687 employees 78 residents	352 employees 78 residents	115 employees 32 residents
	Noise (number of severe and moderate noise impacts – before mitigation)	No Impacts	201 severe 126 moderate impacts	206 severe 122 moderate impacts	183 severe 105 moderate impacts	135 severe 29 moderate impacts
	Noise (number of severe and moderate noise impacts – after mitigation)	No Impacts	71 severe 147 moderate impacts	71 severe 147 moderate impacts	70 severe 138 moderate impacts	45 severe 73 moderate impacts
	Vibration (number of vibration impacts – before mitigation)	No Impacts	102 vibration impacts	101 vibration impacts	96 vibration impacts	62 vibration impacts

	Environmental Areas of Consideration[1]	No Build/No Project Alternative	Alternative 1	Alternative 2	Alternative 3	Alternative 4
	Vibration (number of vibration impacts – after mitigation)	No Impacts	14 vibration impacts	14 vibration impacts	13 vibration impacts	11 vibration impacts
	Hazardous materials (number of known, potential, or historical environmental site concerns)	No Impacts	619	634	298	79
	Archaeological (number of archaeological resources within Affected Area)	No Impacts	8	1	1	0
	Transportation-related closures (full or partial) (permanent)[4]	No Impacts	Road: 14 closures Sidewalk: 3 closures	Road: 14 closures Sidewalk: 3 closures	Road: 12 closures Sidewalk: 1 closure	Road: 9 closures Sidewalk: 1 closure
Construction Impacts	Number of access effects to community facilities	No Impacts	17 community assets and residences	17 community assets and residences	15 community assets and residences	6 community assets and residences
	Truck trips (round trip)	No Impacts	121,630 trips	123,140 trips	55,330 trips	21,830 trips
	Maximum daily regional emissions during construction – threshold exceeded?	No Impacts	Yes (NO_x)	Yes (NO_x)	No	No
	Total construction greenhouse gas emissions ($MTCO_2e$)	No Impacts	42,098 $MTCO_2e$	43,961 $MTCO_2e$	24,838 $MTCO_2e$	15,307 $MTCO_2e$

	Environmental Areas of Consideration[1]	No Build/No Project Alternative	Alternative 1	Alternative 2	Alternative 3	Alternative 4
	Construction impacts to private property[5]	No Impacts	76 construction laydown areas 238 affected parcels	80 construction laydown areas 235 affected parcels	41 construction laydown areas 191 affected parcels	17 construction laydown areas 87 affected parcels
	Hazardous subsurface gases present	No Impacts	Yes	Yes	No	No
	Total fuel consumption during construction	No Impacts	836,237 gallons of gasoline 10,287,344 gallons of diesel	836,237 gallons of gasoline 10,507,855 gallons of diesel	536,447 gallons of gasoline 7,300,229 gallons of diesel	468,414 gallons of gasoline 6,046,132 gallons of diesel
	Construction-related closures (full or partial) (temporary)[4]	No Impacts	Road: 34 closures Sidewalk: 28 closures	Road: 40 closures Sidewalk: 34 closures	Road: 31 closures Sidewalk: 26 closures	Road: 19 closures Sidewalk: 16 closures

Source: Prepared for Metro in 2021

Notes: [1]This table lists the major environmental subject areas with distinguishing impact findings among the alternatives.

[2] Level-of-service was used for NEPA purposes only.

[3] Parcels are identified by parcel boundaries and APN. "Affected Parcels" is not a total sum of the full and partial acquisitions. More than one partial acquisition may occur on a single parcel.

[4] Refer to Table 3.49 in Chapter 3 for additional information for each closure.

[5] "Affected parcels" counts all parcels impacted by either a construction laydown area or a temporary construction easement.

MTCO2e = metric tons of CO_2 equivalent; NO_x = nitrous oxide

6.4.1 No Build/No Project Alternative

Table 6.3 presents the environmental impact findings of the No Build/No Project Alternative to provide a comparison with the Build Alternatives. The No Build/No Project Alternative represents year 2042 conditions without the Project; a detailed description of assumptions for this scenario are provided in Chapter 2, Project Description. As shown in Table 6.3, the No Build/No Project Alternative would result in no impacts under all of the environmental topics with the exception of consistency with land use and plans development. As discussed in Section 4.1.5 of the Land Use Section, operation-related impacts for the No Build/No Project Alternative would limit the opportunity to intensify land uses at potential project station areas and throughout the corridor. This would limit jurisdictions from developing compact communities around a public transit system. As such, the No Build/No Project Alternative would result in a less than significant impact for land use impacts. Overall, the No Build/No Project Alternative would have the least number of impacts compared to the other Alternatives.

Since the No Build/No Project Alternative would not include a new rail service in the Study Area, it would provide no environmental benefits to the region. The No Build/No Project Alternative would also not achieve any of the project objectives, and therefore would not

address the Purpose and Need of the Project. As such, the No Build/No Project Alternative would not be the environmentally superior alternative when compared to the other Build Alternatives, even when impacts are considered.

6.4.2 Alternative 1 Environmental Summary

As shown in Table 6.3, Alternative 1 would result in the highest number of vibration impacts, moderate noise impacts, and the second-highest number of severe noise impacts compared to the other Build Alternatives. Mitigation has been identified for these impacts; however, not all impacts would be fully mitigated. Alternative 1 would have the highest number of unmitigated vibration impacts and severe noise impacts. After mitigation, Alternative 1 would result in the second-highest number of moderate noise impacts. This alternative would have the potential to affect the greatest number of archaeological sites. Alternative 1 would affect the second-highest number of parcels and would displace the second-highest number of businesses and employees. This alternative would displace the highest number of residential units and residents. This alternative would also be located in proximity to the second-highest number of hazardous materials sites, which would affect capital cost and potentially result in delays during construction to account for remediation efforts.

Construction of Alternative 1 would result in large amounts of import and export quantities of soil, largely due to the tunnel segment. This would require increased truck trips, which would increase the greenhouse gas emissions from construction vehicles and fuel used, compared to Alternatives 3 and 4. Emissions levels for NO_X would exceed the regional threshold even after mitigation, and hazardous subsurface gases would be encountered during construction of the tunnel segment. Construction would impact the second-highest number of streets and sidewalks and the most private property.

Alternative 1 would provide regional benefits, as shown in Table 6.2. Specifically, this alternative would provide the greatest VMT reductions, and would be comparable to Alternative 2 in terms of emissions/greenhouse gas reductions during operation. Alternative 1 would have the second-highest user benefit hours, daily new transit trips, and average weekday daily boardings. During construction, this alternative would be comparable to Alternative 2 in terms of the number of jobs created.

Given the trade-offs of the environmental benefits compared to environmental impacts, mitigation, property acquisition requirements, and risks associated with hazardous materials, Alternative 1 would not be the environmentally superior alternative.

6.4.3 Alternative 2 Environmental Summary

Similar to Alternative 1, Alternative 2 would require a considerable level of mitigation given the number of significant impacts (Table 6.3). Alternative 2 would result in the highest number of severe noise impacts and the second-highest number of vibration impacts and moderate noise impacts compared to the other Build Alternatives. After mitigation, Alternative 2 would result in the highest number of moderate noise impacts and would have the same number of unmitigated vibration and severe noise impacts as Alternative 1. Alternative 2 would permanently affect the highest number of parcels and displace the greatest number of businesses. This alternative would have the same number of displacements of residential units and residents as Alternative 1. This alternative would also be located in proximity to the highest number of hazardous materials sites, which would

affect capital cost and potentially result in delays during construction to account for remediation efforts.

Similar to Alternative 1, construction of Alternative 2 would result in exceedances of emissions levels for NO_X and effects related to hazardous subsurface gases due to the tunnel segment. Additionally, construction would require increased truck trips, which would increase the greenhouse gas emissions from construction vehicles and fuel used compared to Alternatives 3 and 4. Alternative 2 would create the largest amount of construction jobs out of the four Build Alternatives, but construction would also impact the greatest number of streets and sidewalks and the second-highest number of private properties.

Because Alternative 2 would result in considerably more environmental impacts, mitigation measures, and affect the greatest number of parcels, Alternative 2 would not be the environmentally superior alternative.

6.4.4 Alternative 3 Environmental Summary

As shown in Table 6.3, Alternative 3 would result in a lower number of vibration impacts and both moderate and severe noise impacts compared to Alternatives 1 and 2. Mitigation has been identified for these impacts; however, not all impacts would be fully mitigated. After mitigation, Alternative 3 would result in less vibration impacts and noise impacts compared to Alternatives 1 and 2. Alternative 3 would affect a lower number of parcels displacing approximately 25 to 50 percent fewer businesses and employees (compared to Alternatives 1 and 2). This alternative would have the same number of displacements of residential units and residents as Alternatives 1 and 2. This alternative would also be located in proximity to a considerably lower number of hazardous materials sites than Alternatives 1 and 2 due to the shorter length of the alignment.

As described previously, Alternative 3 would not include a tunnel segment, which would decrease construction impacts such as excavation quantities, emissions, and fuel usage. As a result, NO_X levels would be below the regional threshold. Additionally, effects associated with hazardous subsurface gas would be avoided. While construction would still impact private property as well as streets and sidewalks along the alignment, impacts would be far less than Alternatives 1 and 2. The number of construction jobs created would be less than Alternatives 1 and 2, but would still result in approximately 44,000 to 45,700 jobs[3] resulting in substantial economic benefits.

Alternative 3 would be the environmentally superior alternative when compared to the No Project Alternative and Alternatives 1, 2, and 4 based on the trade-offs among environmental benefits, impacts, and capital cost.

6.4.5 Alternative 4 Environmental Summary

As shown in Table 6.3, Alternative 4 would result in the lowest number of impacts, which is attributed to this alternative having the shortest alignment. Specifically, this alternative would result in the lowest number of vibration and moderate and severe noise impacts, both with and without mitigation. Alternative 4 would also have the smallest effect on properties and would displace the lowest number of businesses, employees, and residential units. This alternative would also be located in proximity to the lowest number of hazardous materials

[3] The number presented is person-year jobs (one job for one person for one year)

sites. This alternative would be the only alternative without the potential to affect archaeological sites, would not have significant and unavoidable impacts associated with consistency with land use plans and development, and would not affect operation of intersections after mitigation. Although intersection operations would not be adversely impacted, Alternative 4 would result in 9 road closures and 1 sidewalk closure.

Similar to Alternative 3, Alternative 4 would not include a tunnel segment, which would decrease construction impacts such as excavation quantities, emissions, and fuel usage. Because this alternative would have the shortest alignment, the quantities of each of these impacts would be the smallest of the four Build Alternatives. Similar to Alternative 3, NO_X levels would be below the regional threshold and affects associated with hazardous subsurface gas would be avoided. Additionally, construction of this alternative would result in impacts to the fewest number of streets, sidewalks, and private properties. While these reduced impacts are beneficial, construction of Alternative 4 would create the fewest jobs, estimated between 22,400 to 24,000 jobs[4], which is approximately half of the number of jobs created by Alternative 3.

Given the limited regional environmental benefits, Alternative 4 would not be the environmentally superior alternative when compared to the other Build Alternatives, even when the reduced impacts and mitigation are considered.

6.4.6 Environmental Superior Alternative Findings

As summarized in the prior sections, while each of the Build Alternatives would result in varying levels of impacts and benefits, Alternative 3 would have an overall environmental advantage compared to the other Build Alternatives. Alternative 3 would have fewer permanent acquisitions, business displacements, noise and vibration impacts, and be in proximity to fewer hazardous materials sites compared to Alternatives 1 and 2. Construction of Alternative 3 would affect access to fewer community facilities, require fewer construction laydown areas, and would not result in exceedances in daily regional emissions compared to Alternatives 1 and 2. Due to the lack of connectivity and limited benefits achieved with four stations, Alternative 4 would provide a lower level of environmental benefits to the region when compared to the other Build Alternatives. Overall, Alternative 3 would generate environmental benefits by providing mobility and connectivity to transit-dependent populations in 12 cities throughout the corridor, as well as $5.1 million in economic activity annually to the region. As such, Alternative 3 is identified as the environmentally superior alternative pursuant to CEQA requirements.

6.5 Evaluation of Options

6.5.1 Design Options

This section presents a comparison of the design options for Alternative 1. These options are summarized in Chapter 2, Section 2.5.2.2 under the subheading "Design Options" and are as follows:

- Design Option 1: Changes the northern terminus to behind the east side of the historic Los Angeles Union Station (LAUS) building and the Metropolitan Water District (MWD) building below the baggage area parking facility
- Design Option 2: Adds the Little Tokyo Station

[4] The number presented is person-year jobs (one job for one person for one year)

Table 6.4 shows the capital and O&M cost and number of additional boardings if either or both of the design options are selected.

Table 6.4. Alternative 1: Design Option Cost and Boardings

Design Option	Capital Cost	Operating and Maintenance Cost	Boardings (daily)
Design Option 1: LAUS at MWD	-$108 million	No change	+6,000 riders
Design Option 2: Add the Little Tokyo Station	+$533 million	+$0.7 million	+8,000 riders
Both design options	+$425 million	+$0.7 million	+14,000 riders

Source: Metro 2021x
Costs and boardings for design options are relative to Alternative 1 without design options
Note: LAUS = Los Angeles Union Station; MWD = Metropolitan Water District

In general, because Design Option 1 (MWD) would be similar in terms of construction means and methods, length of track, station facilities, and operations, there would not be significant differences in capital costs, O&M costs, and environmental impacts. As shown in Table 6.4, Design Option 1 (MWD) would decrease capital cost by approximately $108 million. This design option would offer better access from the southeast side of Los Angeles Union Station, which is near retail and restaurant activities, with a shorter distance to connect to other rail platforms and bus stops compared to Alternative 1 with the station located at LAUS Forecourt. As such, Design Option 1 (MWD) would result in a greater number of project boardings than Alternative 1 (66,800 daily boardings for Alternative 1 with Design Option 1 (MWD) compared to 60,800 daily boardings without the design option).

Design Option 2 would add an underground station in Little Tokyo, thereby creating an opportunity for direct transfers to Regional Connector (future connection of the L [Gold] Line from Little Tokyo Station to 7th Street/Metro Center Station). This design option would increase capital cost by approximately $533 million (Table 6.4). O&M cost would increase by approximately $0.7 million because there would be an additional station to operate and maintain. This station would increase daily boardings by 8,000 for a total of 68,800 daily boardings compared to Alternative 1 without either design option.[5] Although adding this station would provide new access and transfer opportunities, there are community concerns with impacts related to access and noise, dust, and vibration nuisances during construction. Construction of this design option would also increase emissions and require additional temporary street and sidewalk closures. This design option would also require acquisitions on 4 additional parcels and displace one additional business.

6.5.2 Maintenance and Storage Facility Options

This section discusses the two MSF site options for the Project. The two options are summarized as follows with additional information provided in Chapter 2, Section 2.5.3:

- Paramount MSF site option
- Bellflower MSF site option

[5] If both Design Option 1 and Design Option 2 are selected, there would be 72,200 daily boardings, an increase of 11,400 daily boardings compared to Alternative 1 without either design option.

All of the Build Alternatives could be supported by either MSF site option, and both options would have sufficient capacity to accommodate the number of vehicles required. Table 6.5 presents a comparison of the MSF site options.

Table 6.5. MSF Site Option Comparison

Considerations	MSF Site Options	
	Paramount MSF Site	Bellflower MSF Site
MSF site size	22 acres	21 acres
LRV capacity	Up to 80 LRVs	Up to 80 LRVs
Capital cost	$681 million	$458 million
Number of acquisitions needed (excluding lead track)	4 parcels	2 parcels
Number of displaced businesses	5 existing businesses	2 existing businesses
Acquisitions of residential property (including lead track)	Yes (8 additional parcels)	No

Source: Metro 2021x
Note: LRV = light rail vehicles; MSF = maintenance and storage facility

Major considerations for an MSF site are cost and potential environmental impacts. The Paramount MSF site option would have a higher capital cost (approximately $681 million) compared to the Bellflower MSF site option (approximately $458 million). The Paramount MSF site option would have a greater capital cost due to the lead tracks, an additional grade crossing, site work, and special conditions needed to connect the MSF site to the project alignment.

For environmental considerations, the Paramount MSF site option would require a larger number of acquisitions (four affected parcels) compared to the Bellflower MSF site (two affected parcels). The Paramount MSF site lead tracks would be located east of existing freight tracks, which would cause the existing freight track to move farther into the residential properties west of the alignment, adding to the number of acquisitions for this site. The Bellflower MSF site would be directly accessible to the Metro rail right-of-way, so lead tracks would not be required. The Paramount MSF site would displace five retail and industrial manufacturer businesses, including the Paramount Swap Meet and Paramount Drive-in Theater. In comparison, the Bellflower MSF site would displace two businesses, including the Hollywood Sports Paintball and Airsoft Park and Bellflower BMX business. No residential properties would be affected by the Bellflower MSF site. Given the acquisitions related to the lead track and greater number of displacements associated with the Paramount MSF site option, the Bellflower MSF site option would have fewer displacement impacts.

Overall, the Bellflower MSF site would require fewer acquisitions, displace fewer businesses, and have lower capital cost compared to the Paramount MSF site. Therefore, the Bellflower MSF site option is the preferred site. For the Bellflower MSF site to be viable, the City of Bellflower would need to rezone the site and end its lease with the current occupants. Metro is continuing to coordinate with the City of Bellflower to discuss this MSF site.

6.6 Locally Preferred Alternative Potential Implementation Strategy

The formal adoption of the LPA by the Metro Board will occur after the Draft EIS/EIR circulation and the review of public and agency comments received on the Draft EIS/EIR. As part of the Metro Board action, a decision may be made to phase implementation of the LPA. Any such decision would be made in consideration of public comments and funding availability. An environmental reevaluation could be required depending on the phasing selected.

6.7 Next Steps

The information presented in this chapter is intended to summarize and highlight the important trade-offs among the four Build Alternatives. These trade-offs are discussed under the context of 1) the staff preferred alternative; 2) meeting the Purpose and Need of the Project; and 3) the environmentally superior alternative. Each of these considerations offers agency stakeholders, the general public, and decision-makers an opportunity to assess major environmental distinctions and the high-level trade-offs among the alternatives.

Following circulation of this Draft EIS/EIR for public comment and review, the Metro Board will identify an LPA after consideration of public comments and other relevant information. The LPA will be evaluated in the Final EIS/EIR. After certification of the Final EIS/EIR, Metro will adopt and approve the LPA for implementation.